Attachment A

City of Port Angeles Draft Stormwater Management Plan

City of Port Angeles

DRAFT

Stormwater Management Program

Revised: March 3, 2009

As required by the

Western Washington Phase II Municipal Stormwater Permit

State of Washington – Department of Ecology

Municipal Stormwater Permit Coverage Number: WAR04-5028

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Background and Intent

The City of Port Angeles (City) was issued a Western Washington Phase II Municipal Stormwater Permit (Permit) on January 17, 2007. The Permit was issued by the State of Washington's Department of Ecology in compliance with the State of Washington Water Pollution Control Law (Chapter 90.48 Revised Code of Washington) and the Federal Water Pollution Control Act (Title 33 United States Code, Section 1251 et seq).

The Permit authorizes the City to discharge from the municipal separate storm sewer system (MS4) to surface waters and ground waters of the state.

The City is developing this Stormwater Management Program (SWMP) to address the specific requirements of Special Condition S5 of the Permit: "Stormwater Management Program for Cities, Towns, and Counties." The SWMP is a set of planned actions and activities designed to reduce the discharge of pollutants to the maximum extent practicable and to protect water quality. At this time, the City is not relying on any other entity to implement any of the components of the SWMP.

The organization of the City's SWMP reflects the five core components required by Special Condition S5:

1. Public Education and Outreach
2. Public Involvement and Participation
3. Illicit Discharge Detection and Elimination
4. Controlling Runoff from New Development, Redevelopment, and Construction Sites
5. Pollution Prevention and Operation and Maintenance for Municipal Operations

The City's draft SWMP will be updated and submitted to the Department of Ecology annually as required. Electronic copies of updates will be available on the City's stormwater web page. Updates for each calendar year will be submitted by March 31 of the following year. **The SWMP is a draft document and shall not be considered fully developed until so designated by the City.** Many of the activities described in the SWMP are planned activities, and their inclusion in this document does not guarantee that they will be implemented as described. The Permit deadline for final SWMP development is August 19, 2011.

The public is encouraged to participate in the development of the SWMP. Please contact the Department of Public Works and Utilities with questions, comments or suggestions.

Mail:	321 East Fifth St – P.O. Box 1150 Port Angeles, WA 98362
Phone:	(360) 417-4830 (stormwater hotline) (360) 417-0411 (general City number)
Email:	stormwater@cityofpa.us
Website:	http://www.cityofpa.us/Stormwater.htm

1) Public Education and Outreach

The City's public education and outreach program is being developed consistent with the Permit goal: "to reduce or eliminate behaviors and practices that cause or contribute to adverse stormwater impacts."

a) Education and Outreach Program

The Permit has established education and outreach goals for four categories based on target audiences and subject areas. The City's program is structured to match these four categories, lasted as i-iv below.

Because education and outreach activities often span several target audiences and subject areas, a matrix has been prepared to clarify the relationship of each planned activity to the Permit requirements. The matrix is included as Appendix A. The matrix is a planning document and includes completed, ongoing, and anticipated activities. Updates will be provided with each annual update of the SWMP. The following sections provide details on anticipated and ongoing public education and outreach program activities.

i.) General public

Education and outreach goals:

- *General impacts of stormwater flows into surface waters*
- *Impacts from impervious surfaces*
- *Source control BMPs and environmental stewardship actions and opportunities in the areas of pet waste, vehicle maintenance, landscaping, and buffers*

The program to meet these goals may include the following components:

- **Stormwater website**: the City's stormwater website contains information on general stormwater impacts, impervious surfaces, and opportunities for the public to help improve stormwater quality within the watershed. The webpage may be found at http://www.cityofpa.us/Stormwater.htm. The website will be updated as more information becomes available. Specific updates are planned to include a list of frequently asked questions, a list of upcoming stormwater-related events, additional links to other websites, and copies of educational materials developed under this program.

- **Informational brochures:** will be made available at facilities such as Port Angeles City Hall (customer service and billing desk, Public Works and Utilities reception area), Clallam County Courthouse, Port Angeles Public Library, City Pier (Arthur D. Feiro Marine Life Center), Peninsula College, and others. The informational brochures will be designed to address the education goals listed above. As brochures are developed, electronic copies will be made available through the City's stormwater webpage.

- **Newspaper advertisements**: the City plans to periodically place stormwater-related information in the local newspaper (Peninsula Daily News). This information will be designed to address the education goals listed above and will be timed to reflect the greater impact during the wet winter season. Electronic

copies of all newspaper advertisement will be made available through the City's stormwater webpage.

- **Utility bill mailers**: educational mailers will periodically be sent out with monthly utility bills, thereby reaching all of the City's utility customers. The mailers will be developed to create a progressive flow of general stormwater related information with practical tips for home and business owners to help improve water quality. Copies of mailers will also be made available on the City's stormwater website and as handouts. The first mailer was sent out with the February 2008 utility bills. No mailers have been sent yet in 2009.

- **Participation in existing events**: educational materials (posters, brochures/handouts, maps, etc) will be distributed at existing local and regional events that attract members of the target audiences. City representatives will be present to answer questions. Events are anticipated to include: Clallam County Fair, North Olympic Land Trust's Streamfest, Port Angeles KONP Home Show, and others. Event-specific materials will be developed and distributed as appropriate. Announcements of upcoming events and copies of materials used at events will be available on the City's stormwater website.

ii.) General public, home-based and mobile businesses

Education and outreach goals:

- *BMPs for use and storage of automotive chemicals, hazardous cleaning and yard care products, carwash soaps, and other hazardous materials*
- *Impacts of illicit discharges and how to report them*

The program to meet these goals may include the following components:

- **Hazardous materials workshops**: business owners will be invited to a series of workshops designed to educate them on BMPs for the use and storage of hazardous materials, such as those described in the Permit requirement. Participants will receive information regarding BMPs selection and implementation, rules and enforcement, local examples, and additional resources available. They will have the opportunity to give questions and comments. These will be processed into a list of FAQs for later distribution to the target audience.

- **Illicit discharge information for the general public**: general illicit discharge information will be distributed to the general public. The information will take the form of one or more of the general public program components described in the previous section. Information will include a description of illicit discharges, applicable laws, environmental effects, preventative measures, reporting measures, and links to other sources of information. A "stormwater hotline" is available for public reporting of illicit discharges (360-417-4830).

- **Illicit discharge mailers to commercial customers**: a mailer will be created and distributed to all commercial customers. The mailer will specifically describe the legal, technical, and environmental issues associated with illicit discharges, as well as providing examples of common sources of illicit discharges from commercial facilities. The mailer will include links to further information and

resources for business owners, as well as contact information for City staff. Where the City is aware of an existing problem, a letter will be sent to the commercial customer to highlight the problem and to provide specific BMPs available to the business to correct the issue.

iii.) Homeowners, landscapers, and property managers

Education and outreach goals:

- *Yard care techniques protective of water quality*
- *BMPs for use and storage of pesticides and fertilizers*
- *BMPs for carpet cleaning and auto repair and maintenance*
- *Low Impact Development techniques, including site design, pervious paving, retention of forests and mature trees*
- *Stormwater pond maintenance*

The program to meet these goals may include the following components:

- **Informational mailers to target audience:** mailers designed to address the specific education goals will be sent to the target audience. The audience will be selected based on classification in directories such as telephone books and web searches.

- **Informational brochures at target commercial establishments:** informational brochures/handouts will be designed to address the specific education goals. The brochures will be placed at businesses within the target group or that cater to the target audience. Examples may include: lawn and garden stores, hardware stores, general stores, landscaping businesses, florists, real estate offices, property management offices, and others. Permission to place the brochures will be obtained from business owners prior to placement. Brochures will be replaced periodically.

- **BMP and LID incentives programs:** the City plans to develop a stormwater incentives program that will offer financial incentive to home and business owners who implement certain stormwater BMPs, including LID technology, on their properties. The City will offer workshops, informational materials, and other support for this program. Examples of similar programs in other jurisdictions include Portland, Oregon and Ann Arbor, Michigan.

iv.) Engineers, contractors, developers, review staff, and land use planners

Education and outreach goals:

- *Technical standards for flow control and pollution prevention*
- *Technical standards for stormwater site and erosion control plans*
- *Low Impact Development techniques, including site design, pervious paving, retention of forests and mature trees*

The program to meet these goals may include the following components:

- **Stormwater Management Manual for Western Washington:** a copy of the most recent version of the Department of Ecology's manual is available at the

City's Public Works and Utilities Department's Engineering Services Office so that designers can access the manual without purchasing or printing it. Staff are available by appointment to assist with the use of the manual.

- **City staff will organize workshops:** Workshops will discuss upcoming changes in the stormwater development standards. Development standards are being revised to reflect the NPDES Permit and the DOE 2005 Stormwater Management Manual for Western Washington.
- **BMP and LID incentives programs:** see description in previous section
- **City staff training:** City engineering and review staff will attend training sessions as available to further knowledge of technical standards, LID techniques, regulatory requirements, and other stormwater-related topics.

b) Measurement of Understanding and Adoption Among Targeted Audiences

This requirement is under appeal by the Coalition of Governmental Entities at this time. Upon resolution of the appeal, the City will determine what steps will be taken.

c) Public Education and Outreach Recordkeeping

The City will track and maintain records of all public education and outreach activities conducted. An electronic database of this information is maintained by the City's Public Works and Utilities Department. The database contains the following entries:

- Name of outreach activity/distribution/event
- Date(s)
- Location(s)
- City personnel involved
- Target audience(s)
- Contact information for other group(s)
- Subject area(s)
- Attendance/distribution (actual or approximate)
- Educational materials used (flyers, handouts, slide shows, posters, etc)
- Notes/other

The public education and outreach database is available from the City upon request. An updated version will be included with each annual report and as Appendix B in each annual update of the SWMP. Copies of all material used during public education and outreach activities will be maintained, as well as photos, descriptions of feedback, lessons learned, and other information.

The public education and outreach matrix described at the beginning of Section 1 and included as Appendix A will also be maintained and updated.

2) Public Involvement and Participation

The SWMP will include opportunities for public involvement and participation to ensure that the program addresses the goals and expectations of the public as well as the requirements of the Permit. Public comments will be tracked and responded to as appropriate.

a) Public Involvement in SWMP

The public will have the following opportunities for participation:

- Direct contact with City staff: an email address, phone number, and mailing address will be provided on all City stormwater information distributed. The public will be encouraged to contact City staff at any time with questions or concerns.
- Web page: the City's stormwater web site (http://www.cityofpa.us/ Stormwater.htm) includes the draft SWMP, encourages public involvement and participation in the development of the SWMP, and gives contact information.
- Public hearings: all City policy decisions will follow standard City procedure and will be brought before City Council through the public hearing process. This includes rate changes, new or revised ordinances, and other official policy decisions. The public will be notified as required and will have a chance to comment during the hearings.
- Engineering counter handout: The SWMP is available in the Public Works and Utilities (PW&U) reception area.
- Stormwater workshops: the City may hold one or more workshops to discuss stormwater issues and the stormwater management program.

The current contact information for public involvement is:

Mail:	P.O. Box 1150, Port Angeles, WA 98362
Phone:	(360) 417-4830 (stormwater hotline)
	(360) 417-0411 (general City number)
Email:	stormwater@cityofpa.us
Website:	http://www.cityofpa.us/Stormwater.htm

All opportunities for public involvement and comments received will be tracked on a spreadsheet maintained by the Department of Public Works and Utilities. The City will consider comments as they are received and will follow up with the public as appropriate.

b) Availability of Information to the Public

The most recent annual report to Department of Ecology, the SWMP that was submitted with the most recent annual report, and other submittals required by the Permit will be made available to the public on the City's stormwater webpage. The documents will also be available to the public at the Department of Public Works and Utilities (321 East Fifth

St, Port Angeles) upon request. Staff will be available by appointment to discuss the documents with any interested parties.

3) Illicit Discharge Detection and Elimination

a) Municipal Storm Sewer System Map

The City's stormwater system is mapped electronically in the City's Geographic Information System (GIS). The data contained in the map is updated and corrected as information is gathered in the field or as new development occurs. Updates are made based on field sketches, design plans, as-built plans, aerial photography, and/or other sources of information that become available.

The stormwater GIS layers contain information on manholes, catchbasins, outfalls, pipes, ditches, culverts, detention ponds, and drainage basins. Other layers within the City's overall GIS dataset contain information relevant to stormwater as well, for example: land use, land cover, zoning, impervious surfaces, topography, natural hydrology, and combined sewers. Aerial photography is also available, with the most recent flyover performed in 2006. This information is available to City employees at any time, and can be made available to the public or other organizations upon request.

i) Location of Known Outfalls, Receiving Waters and Structural BMPs

The locations of all known outfalls, receiving waters, and structural BMPs owned, operated and/or maintained by the City have been mapped in the GIS. Additional information regarding tributary conveyances (pipes, ditches, etc), associated drainage areas, and land use will be developed where required.

ii) Connections to MS4

The City continuously updates the stormwater GIS with any new connections or infrastructure allowed or authorized by the City. New connections are mapped from development plans, project plans, field reports, and/or other sources as appropriate.

iii) Areas Not Discharging to Surface Waters

All of the areas served by the City-owned MS4 discharge into surface waters, however there may be privately owned infiltration facilities within the City that discharge to groundwater.

iv) Information Available to Ecology

The City's stormwater GIS is available to Ecology upon request. The City can provide the required mapping information in electronic format and can meet the mapping standards described on Ecology's website, with the exception of metadata, which the City does not have available in electronic format at this time.

v) Information Available to Secondary and Co-Permittees

The City does not currently have any secondary or co-permittees.

b) Illicit Discharge Ordinance

The City will develop an illicit discharge ordinance for the separate stormwater system. The ordinance will be written to satisfy the criteria listed in the Permit, including: discharge categories that are NOT prohibited (3.b.i), discharge categories that ARE prohibited (3.b.ii), categories of discharge identified as significant sources of pollution to waters of the State (3.b.iv), escalating enforcement procedures (3.b.v), and enforcement strategies (3.b.vi). The ordinance will have two public hearings and will be put before City Council for approval. The City expects to have the ordinance in place by the Permit deadline for this task (August 16, 2009).

c) Detection Program

The City will develop and implement an ongoing Illicit Discharge Detection Program that will contain the elements required by the permit. Each element is discussed in the following sections. The City will use the Center for Watershed Protection's "Illicit Discharge Detection and Elimination" program manual to as a guidance document to assist with program development.

i) Priority Areas

The City will prioritize receiving waters based on likelihood of illicit discharges and existing water quality issues. Factors to be considered may include: land use, commercial and industrial activities, stored materials, history of known complaints/spills, and system knowledge. Prioritization will be complete by February 2010, with three high priority water bodies identified for field assessment.

ii) Field Assessment

Field assessment of the three high priority receiving water bodies described in the previous section will be conducted by February 2011. Field assessment of at least one high priority water body will be made each year thereafter. Field assessment activities may include, but not be limited to, visual inspection during dry weather and field screening for illicit discharges. "Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments" (Center for Watershed Protection, October 2004) will be used as a guidance document during field assessment.

iii) Nature of Discharges

Any illicit discharges discovered by or reported to the City will be characterized in terms of potential public or environmental threat. The City will investigate any complaints, reports, or monitoring information that indicates a potential illicit discharge, spill, or illegal dumping within seven days. Problems and violations determined to be emergencies or otherwise judged to be urgent or severe will be investigated immediately.

The City has an existing "Accidental Spill Prevention Program" that is administered through the Wastewater Collection Superintendent. This program is currently geared toward spills of hazardous materials into the sanitary and combined sewer systems, however many of its components could be modified to include the separate storm sewer system. The Accidental Spill Prevention Program uses a Pollution Investigation Checklist to ensure that all staff follow the appropriate notification procedures and that information is collected in chronological order. Maintenance staff are trained in the use of these procedures and regular practice sessions are conducted. The Accidental Spill Prevention Program and associated forms are available at City Hall.

iv) Tracing Source(s) of Discharges

The City will trace the source of illicit discharges using one or more of the following means and methods:

- Visual observation
- Tracing upstream from manhole to manhole
- Dye testing
- Sewer inspection camera
- Water sampling and analysis
- Site inspections of potential sources

Additional tracing methods will be employed as available and applicable. The results of the tracing investigation will be entered onto appropriate forms and used for follow-up activities.

v) Removing Source(s) of Discharges

Once identified, sources of illicit discharges will be removed, using enforcement authority as needed. Notification will be similar to the notification procedures described in the City's existing "Accidental Spill Prevention Program." Entities receiving notification include: the property owner, City of Port Angeles Wastewater Collection, Fire Department, Wastewater Treatment Plant, Streets Division, Deputy Director of Operations, City Engineer, Director of Public Works & Utilities, City Manager, Washington State Department of Ecology 24-Hour Spill Reporting Hotline, Ecology SW Regional Water Quality Office, State Department of Health, State Department of Fish and Wildlife, Clallam County Department of Health, Feiro Marine Lab, Lower Elwha Klallam Tribe, the Port of Port Angeles, and others as appropriate.

d) Public Information

The City will utilize its Public Education and Outreach Program, as described in Section 1, to disseminate information about illicit discharges.

i) Distribute Information to Target Audiences

See Section 1.A – Public Education and Outreach Program.

ii) Hotline for Public Reporting of Discharges and Spills

The City's stormwater hotline will be used for public reporting of discharges and spills. The hotline number will be published with all stormwater information and is available on the City's stormwater website. The hotline number is (360) 417-4830. The public will also be able to report discharges, spills, or other concerns via the City's stormwater email address: stormwater@cityofpa.us. Both the hotline and email are checked regularly by City staff.

e) Program Evaluation and Assessment

The City will track the following information, as required by the Permit:

- Number and type of spills or illicit discharges identified
- Inspections made
- Feedback received from public education efforts (see Section 1 – Public Education and Outreach)

Public reporting of illicit discharges will be tracked using the form developed by the Center for Watershed Protection (see Appendix C). Electronic and paper copies of all records, including follow up reports and actions, will be maintained at the Public Works and Utilities office. A summary of this information will be included in the City's Annual Report.

f) Illicit Discharge Training

The City will provide appropriate training for municipal field staff as described below.

i) Field Staff Training

The City will ensure that all municipal field staff who are responsible for identification, investigation, termination, cleanup, and reporting of illicit discharges, including spills, improper disposal, and illicit connections are trained to conduct these activities. Follow-up training will be provided as needed to address changes in procedures, techniques, or requirements. The City will document and maintain records of training provided and staff trained.

ii) Ongoing Training Program

The City will develop and implement an ongoing training program for all municipal field staff, who, as part of their normal job responsibilities, might come into contact with or otherwise observe an illicit discharge or illicit connection to the storm sewer system. Staff will be trained on the identification of an illicit discharge/connection and on the proper procedures for reporting and responding to the illicit discharge/connection. Follow-up training will be provided as needed to address changes in procedures, techniques, or requirements. The City will document and maintain records of training provided and staff trained.

4) Controlling Runoff from New Development, Redevelopment, and Construction Sites

The City will develop, implement, and enforce a program to reduce pollutants in stormwater runoff from new development, redevelopment, and construction site activities. The program shall be applied to all sites one acre and greater, including projects less than one acre that are part of a larger common plan of development or sale. The program will apply to both private and public development, including roads.

a) Runoff Ordinance

The City will develop an ordinance that addresses runoff from new development, redevelopment, and construction site activities at sites one acre and greater. The City will also retain all existing local policies and procedures for sites less than one acre. The ordinance will include the adoption of most of the Department of Ecology's most recent (currently 2005) Stormwater Management Manual for Western Washington.

i) Minimum Requirements, Technical Thresholds, and Definitions

When the DOE manual is adopted, the minimum requirements, technical thresholds, and definitions in Appendix 1 of the permit will become effective for the City.

ii) Site Planning Process, and BMP Selection and Design

When the most recent DOE stormwater management manual is adopted, the site planning processes and Best Management Practice (BMP) selection and design contained in the manual will become effective for the City.

iii) Legal Authority to Inspect Private Facilities

The runoff ordinance will include provisions allowing City inspectors the legal authority to inspect private stormwater facilities that discharge into the City's MS4.

iv) Provisions to Allow LID

The City has an existing Planned Low Impact Development (PLID) overlay zone ordinance that allows developers to apply non-structural preventative actions and source reduction approaches. The City also works with developers on a case by case basis to apply select LID BMPs, such as pervious pavements, to new development.

v) Erosivity Waiver

At this time, the City has not decided to allow construction sites to apply the Erosivity Waiver in Appendix 1, Minimum Requirement #2 of the permit. Therefore, the City does not plan to include enforcement sanctions for construction sites that provide notice of intent to apply the waiver but do not meet the requirements.

b) Permitting Process

The City will develop a permitting process with plan review, inspection, and enforcement capability as described below. The permitting process will be applied to both private and public projects greater than one acre, and will be administered by qualified personnel.

i) Review of Stormwater Site Plans

The City will review stormwater site plans as part of the permitting process. The plans will be reviewed for compliance with the Runoff Ordinance, including the minimum requirements, technical thresholds, and definitions in Appendix 1 of the permit. The City will work with developers to ensure that stormwater site plans meet the criteria established by both the Department of Ecology and local authorities.

ii) Pre-Construction Inspection of Development Sites

During site plan review, City staff will use the definitions and requirements in Appendix 7 of the permit (Identifying Construction Site Sediment Transport Potential) to determine which sites have a high potential for sediment transport. These high priority sites will be inspected by qualified personnel prior to clearing and grading activities.

iii) Inspection of Development Sites During Construction

Qualified City staff will inspect all known permitted development sites during construction to verify proper installation and maintenance of required erosion and sediment controls. Enforcement will be used as required.

iv) Post-Construction Inspection of Development Sites

Qualified City staff will inspect all permitted development sites upon completion of construction and prior to final approval or occupancy. The purpose of the inspection will be to ensure proper installation of permanent stormwater controls such as stormwater facilities and structural BMPs. City staff will also verify that a maintenance plan is completed and that responsibility for maintenance is clearly assigned. Enforcement will be used as required.

v) Inspection Compliance

The City will maintain compliance with sections ii, iii, and iv above by the presence and records of an established inspection program designed to inspect all sites and achieving at least 95% of scheduled inspections.

vi) Enforcement Strategy

The City will develop an enforcement strategy to respond to cases of non-compliance.

vii) Erosivity Waiver

At this time, the City has not decided to allow construction sites to apply the Erosivity Waiver in Appendix 1, Minimum Requirement #2 of the permit. Therefore, the City will perform review and inspection tasks for all construction sites as described above.

c) Operation and Maintenance of Post-Construction Stormwater Facilities

The City will develop and implement a program to verify adequate long-term operation and maintenance of post-construction stormwater facilities and BMPs that are permitted pursuant to the City's permit process.

i) Operations and Maintenance Ordinance

The City will develop and adopt a maintenance ordinance that clearly identifies the party responsible for maintenance, requires inspection of facilities, and establishes enforcement procedures.

ii) Maintenance Standards

The City plans to adopt the most recent version (currently 2005) of the Department of Ecology's Stormwater Management Manual for Western Washington. When the manual is adopted, the maintenance standards included in Chapter 4 of Volume V will become effective for the City.

iii) Annual Inspections

The City will annually inspect all stormwater treatment and flow control facilities (other than catch basins). This inspection schedule may be adjusted for a different frequency if maintenance records can so justify.

iv) Inspections During Construction

The City will inspect all new flow control and water quality treatment facilities, including catch basins, for new residential developments that are a part of a larger common plan of development every six months during the period of heaviest house construction. The purpose of the inspections will be to identify maintenance needs and enforce compliance with maintenance standards as necessary.

d) Recordkeeping

The City will keep and maintain records of inspections and enforcement actions by staff. This will include inspection reports, warning letters, notices of violations, and other enforcement actions. Records of maintenance inspections and maintenance activities will also be maintained.

e) Notice of Intent Availability

Copies of the "Notice of Intent for Construction Activity" and the "Notice of Intent for Industrial Activity" are available to representatives of proposed new development and redevelopment. Paper copies can be found at City Hall at the Planning Counter and at the front desk of the Engineering Department. The City's stormwater website also directs owners of construction sites and industrial facilities to the Ecology websites where they can find additional information and electronic copies of the notices of intent.

f) Training

The City will verify that all staff responsible for implementing the program to control runoff from new development, redevelopment, and construction sites are trained to conduct these activities. Follow-up training will be provided as required. The City will document and maintain records of training.

5) Pollution Prevention and Operation and Maintenance for Municipal Operations

The City will develop and implement an operations and maintenance program that includes a training component and has the goal of preventing or reducing pollutant runoff from municipal operations. The planned program elements are described below.

a) Maintenance Standards

The City plans to adopt the most recent version (currently 2005) of the Department of Ecology's Stormwater Management Manual for Western Washington. When the manual is adopted, the maintenance standards included in Chapter 4 of Volume V will become effective for the City. The City will use the maintenance standards to determine if/when maintenance is required. Exceeding the maintenance standards between inspections is not a violation of the permit.

When an inspection identifies an exceedence of a maintenance standard, maintenance shall be performed within the following timeframes:

- Within 1 year for wet pool facilities and retention/detention ponds
- Within 6 months for typical maintenance
- Within 9 months for maintenance requiring re-vegetation
- Within 2 years for maintenance that requires capital construction of less than $25,000

These timeframes may be exceeded if there are circumstances that are beyond the City's control. Such circumstances may include, but not be limited to, denial or delay of access by property owners, denial or delay of necessary permit approvals, and unexpected reallocations of maintenance staff to perform emergency work. For each such exceedence of the required timeframes, the City will document the extenuating circumstances.

b) Annual Inspections

The City will perform annual inspections of all municipally owned or operated permanent stormwater treatment and flow control facilities, other than catch basins. The City will take appropriate maintenance actions in accordance with the maintenance standards described above.

The City may reduce the inspection frequency based on inspection records. The reduction will be based on inspection records for double the length of time of the

proposed inspection frequency, or upon written statements based on actual inspection and maintenance experience and certified as required.

c) Spot Checks

The City will perform "spot checks" of potentially damaged permanent treatment and flow control facilities (other than catch basins) after major storm events (greater than 24-hour 10-yr). If the spot checks indicated widespread damage and/or maintenance needs, the City will inspect all stormwater treatment and flow control facilities that may be affected. Repairs and other maintenance actions will be taken based on inspection results and in accordance with the City's maintenance standards.

d) Catch Basin Inspections

The City will perform inspections of all catch basins and inlets owned and/or operated by the City at least once before the end of the Permit term (February 2012). Catch basins and inlets will be cleaned based on inspection results and in accordance with the maintenance standards established in the 2005 *Stormwater Management Manual for Western Washington*. Decant water will be disposed of in accordance with Appendix 6 of the Permit – *Street Waste Disposal*.

The City may choose to inspect the catch basins and inlets on a "circuit basis" as described in the Permit. In either case, inspection and maintenance actions will be fully documented.

e) Inspection Program

The City's inspection program will be constructed to comply with the requirements in sections a, b, c, and d above. The inspection program will be designed to inspect all sites and to achieve inspection at 95% of sites. The program will include full documentation of activities using forms, databases, photos, and other methods.

The City also has an existing large diameter culvert inspection program. The major culverts that conduct the City creeks under roads are visually inspected in the late summer of each year. Maintenance deficiencies are corrected before the wet winter season begins.

f) Road Runoff Control and Maintenance

The City will establish and implement practices to reduce stormwater impacts associated with runoff from streets, parking lots, roads or highways owned or maintained by the permittee, and road maintenance activities conducted by the permittee The following activities will be addressed:

- Pipe cleaning
- Culvert cleaning
- Ditch maintenance
- Street cleaning
- Road repair and resurfacing, including pavement grinding
- Snow and ice control

- Utility installation
- Pavement striping maintenance
- Maintaining roadside areas, including vegetation management
- Dust control

g) Public Land Runoff Control and Maintenance

The City will establish and implement policies and procedures to reduce pollutants in discharges from all lands owned or maintained by the City, including, but not limited to, parks, open space, road right-of-way, maintenance yards, and stormwater treatment and flow control facilities. The policies and procedures will address, but not be limited to:

- Application of fertilizer, pesticides, and herbicides including the development of nutrient management and integrated pest management plans
- Sediment and erosion control
- Landscape maintenance and vegetation disposal
- Building exterior cleaning and maintenance

h) Training Program

The City will implement an on-going operations and maintenance training program for employees whose construction, operations or maintenance job functions may impact stormwater quality. The training will address the importance of protecting water quality, the requirements of the permit, operation and maintenance standards, inspection procedures, selecting appropriate BMPs, ways to perform job activities to prevent or minimize impacts to water quality, and procedures for reporting water quality concerns, including potential illicit discharges. Follow-up training will be provided as needed to address changes in procedures, techniques, or requirements. Training will be documented.

i) Stormwater Pollution Prevention Plans

The City will develop and implement a Stormwater Pollution Prevention Plan (SWPPP) for all heavy equipment maintenance or storage yards and material storage facilities that it owns and/or operates. The City's applicable facilities and current status of SWPPPs or similar documents for each are summarized in the following table. While not all of the documents listed are specifically SWPPPs, they all have relevance to the prevention, containment, and handling of substances that could result in the pollution of municipal stormwater. The City will develop SWPPPs for all facilities that are required to have them.

Table 1: Status of Stormwater Pollution Prevention Plans for City Facilities

Facility Name	Facility Use	Document	Status
Sanitary and Storm Sewer Collection System	Collection of sanitary and combined sewerage	"Accidental Spill Prevention Program"	Most Recent Revision: April, 2005
Corp Yard	Maintenance, equipment & materials storage for water, wastewater, & streets utilities	"City of Port Angeles Maintenance Facility Stormwater Pollution Prevention Plan"	Completed July, 2007
Port Angeles Wastewater Treatment Plant	Wastewater treatment plant (secondary treatment)	"City of Port Angeles Wastewater Treatment Plant SWPPP"	December, 2001
Regional Transfer Station	Solid waste transfer station (previously a landfill)	"Port Angeles Landfill Stormwater Pollution Prevention Plan"	Completed November 2006
Electric Utility Handling & Warehouse Building	Electric transformer storage and handling	"Spill Prevention Control and Countermeasure Plan"	Completed November 2003
CSO Facilities	Combined sewer collection, storage, and conveyance, and discharge	"Port Angeles WWTP Combined Sewer Overflow Pollution Prevention Plan"	Completed July 2004

Several of these facilities are regulated by their own environmental permits. See the table below for a listing of individual stormwater or other related permits.

Table 2: Existing Individual Stormwater and Stormwater-Related Permits

Facility Name	Type of Permit	Permit Number
Regional Transfer Station	NPDES General Permit for Stormwater Discharges Associated with Industrial Activities	WAR005613
Regional Transfer Station	Solid Waste Closure Permit	SLW98-0001
Port Angeles Wastewater Treatment Plant/CSO Facilities	NPDES Waste Discharge Permit	WA0023973

In addition, there are approximately twenty non-City-owned facilities in Port Angeles that are regulated by NPDES General Industrial Stormwater Discharge Permits. Because these facilities are regulated directly by the Department of Ecology, their individual stormwater collection infrastructure is not considered part of the municipal stormwater system, although in some cases they do discharge into it.

j) Recordkeeping

The City will maintain records of inspections and maintenance or repair activities conducted.

Documents Referenced

"1996 Port Angeles Stormwater Management Plan" City of Port Angeles, 1996

"2006 Annual CSO Report" City of Port Angeles, May 2007

"Accidental Spill Prevention Program" City of Port Angeles, Revised April 25, 2005

"City of Port Angeles Maintenance Facility SWPPP" (Project No. 06-14 in progress) City of Port Angeles, 2007

"Combined Sewer Overflow Reduction Facilities Plan – General Sewer Plan" City of Port Angeles, June 2006

"Illicit Discharge Detection and Elimination – A Guidance Manual for Program Development and Technical Assessments" Center for Watershed Protection, October 2004

"Port Angeles Landfill Stormwater Pollution Prevention Plan" City of Port Angeles, November 2006

"Port Angeles WWTP Combined Sewer Overflow Pollution Prevention Plan" City of Port Angeles, July 2004

"Spill Prevention Control and Countermeasure Plan" (Electric Utility) City of Port Angeles, November 2003

"Western Washington Phase II Municipal Stormwater Permit" State of Washington Department of Ecology, Issued January 17, 2007

SWMP Appendix A
Public Education and Outreach Activity Matrix

DRAFT

Public Outreach Plan Activity Matrix

Update: March 4, 2009

Planned Program Component	General Public			General Public, Businesses		Homeowners, Landscapers, Property Managers					Engineers, Contractors, Developers, Review Staff, Land Use Planners	
Target Audience	General Public			General Public, Businesses		Homeowners, Landscapers, Property Managers					Engineers, Contractors, Developers, Review Staff, Land Use Planners	
Subject Area	general impacts of stormwater flows into surface waters	impacts from impervious surfaces	source control BMPs and environmental stewardship actions	BMPs for automotive chemicals, cleaning supplies, carwash soaps, hazardous materials	impacts of illicit discharges, how to report them	yard care techniques	BMPs for pesticides and fertilizers	BMPs for carpet cleaning and auto repair and maintenance	LID techniques	stormwater pond maintenance	technical standards for stormwater site and erosion control	LID techniques
Stormwater website	√	√	√		√	√						
Informational brochures	√	√	√		√	√						
Newspaper advertisements	√	√	√			√						
Utility bill mailers	√	√	√		√	√						
Participation in existing events	√	√	√		√	√						
Hazardous materials workshops				√			√	√				
Illicit discharge information for general public					√							
Illicit discharge mailers to commercial customers				√	√		√	√				
Informational mailers						√	√	√				
Informational brochures at businesses						√	√	√				
LID workshops & tours									√		√	√
BMP and LID incentives program									√	√	√	√
Commerical certification program			√	√			√	√	√	√	√	√
Construction Site Runoff Ordinance Requirements Workshop											√	√
SWMM availability			√	√			√	√	√	√	√	√

SWMP Appendix B
Public Education and Outreach Tracking Spreadsheet

Public Education and Outreach Tracking Spreadsheet - 2009 Events
City of Port Angeles

2009 Activities / Events	Date(s)	Location(s)	City Personnel	Target Audience	Contact Information (other groups)	Subject Area(s)	Attendance/Distribution	Educational Materials Used	Notes/Other
Land Development Workshop	15-Jan-09	Lincoln Center	Kathryn Neal	Local municpality planning staff and engineers for City of Port Angeles, Clallam County and Sequim	Susan Chadd Susanc@olympus.net	Focus on the Stormwater Management Plan and upcoming ordinances related to stormwater for 2009	Approximately 35 people	Power Point Presentation and SWMP	
Elwha Morse Management Team (EMMT) Meeting	Janaury 22, 2009	Clallam County Commissioners Board Room	Terri Partch	Clallam County and Port Angeles planning staff, policy makers and engineers	Hannah Merril Hmerrill@co.clallam.wa.us	Stormwater Management Plan and upcomming ordinances for 2009	Approximately 15 people	Power Point Presentation, SWMP, Illicit discharge flier	County Commissioner was very interested/concerned about the City's plans. Requested that the presentation be given in front of the entire County Commission
Low Impact Land Development Seminar	4-Feb-09	Jameston S'Kallam Tribal center, Blyn	Terri Partch	Builders and developers, landscapers, Clallam County, and Sequim city officials, local agency land development staff including Jefferson County, Sequim, Port Angeles and Clallam County	Susan Chadd Susanc@olympus.net	NPDES permit, local water quality issues, Construction Stormwater Ordinance	approximately 60 people	Power Point Presentation	Conference put on by Built Green of Clallam County. Wide diversity in the audience, developers, loggers, Mayor for the City of Sequim, Clallam County Planning Director
KONP Home Show 2009	February 28th through March 1, 2009	Port Angeles High School Gymnasium	Terri Partch, Mayor Gary Braun, Glenn Cutler	General public, homeowners	tpartch@cityofpa.us	Fecal Coliform awareness. Gave away compostable dog waste pick up bags. "Green" yard care products. Provided "buyers guides" of local products rated as "lowest hazzard" by the Washingon Toxics Coalition	Uncertain . 5,000-10,000	Fecal coliform awareness poster (developed by Snohomish County). Compostable dog waste pick up bags. Car washing into the Strait poster developed by PSP. Yard care products "buyers guides" and the SWMP	
Presentation to the Utility Advisory Commission	12-May-09	Jack Pittis Conference Room, City Hall	Terri Partch	City officials and Council	tpartch@cityofpa.us	Construction Stormwater Ordinance and new stormwater requirements (City's Urban Services Standards)	approximately 10 people	Power Point Presentation	
Presentation to the North Peninsula Builders Association	18-May-09	City Council Chambers	Terri Partch	NPBA, realtors and local engineers	FaLeana Wech <faleana-npba@olypen.com>	Construction Stormwater Ordinance and new requirements	8 people	Power Point Presentation	Regular meeting of the NPBA advertised through their membership organization.
Presentation to the Port Angeles City Council. (Public Meeting)	2-Jun-09	City Council Chambers	Terri Partch	City officials, general public	tpartch@cityofpa.us	First reading of the amendments to the Port Angeles Municipal Code to reflect NPDES Phase II requirements	Approximately 20 people	Power Point Presentation	Representative of the NPBA (Steve Zenovic) and Ed Chadd (leader of Clallam County Streamkeepers) spoke at the meeting in favor of the new ordinances
Evening Presentation to the Geneal Public regarding new stormwater ordinances	10-Jun-09	City Council Chambers	Terri Partch	General public, home owners	tpartch@cityofpa.us	Explaination of the resons behind the new ordinances, and new requirements related to construction sites, public and private system operations and mainteance, illicit discharges and LID .	Approximately 25 people	Power Point Presentation and discussion	Lots of concern over "unfunded mandates" and why it was necessary in PA. Concern over car washing and dog waste control.
Lunchtime Presentation to the Geneal Public regarding new stormwater ordinances	11-Jun-09	City Council Chambers	Terri Partch	General public, home owners	tpartch@cityofpa.us	Explaination of the resons behind the new ordinances, and new requirements related to construction sites, public and private system operations and mainteance, illicit discharges and LID .	Approximately 30 people	Power Point Presentation and discussion	Lots of concern over "unfunded mandates" and why it was necessary in PA. Concern over car washing and dog waste control.
Presentation to the Port Angeles City Council (Public Meeting)	16-Jun-09	City Council Chambers	Terri Partch	City officials, general public	tpartch@cityofpa.us	Second reading and adoption of the amendments to the Port Angeles Municipal Code to reflect NPDES Phase II requirements	Approximately 20 people	Power Point Presentation	Council concern over cost and interference into private property rights. Ordinance was adopted.
Utility bill flier on the illicit discharge program	Aug-09		Terri Partch	General Public, homeowners, businesses	tpartch@cityofpa.us	Illicit discharge ordinance-target of wash water, pet waste, lawn and garden care	Approximately 10,700	Flier	Received several calls on the flier. Some were angry, some reported IDDE incidents, some wanted clarification.
Clallam County Fair	August 20th -24th, 2009	County Fair Grounds, Merchant's Annex	Terri Partch, Steve sperr, Glenn Cutler and other City employees	General public, home owners	tpartch@cityofpa.us	Pet waste, green gardening, car washing	Approximately 20,000 attendees	Posters, dog waste bag give aways, contest to identify greenest weed control product	
B-Wet Grant support	October 2009-May 2010	Individual class rooms and Peabody Creek from NPS Visitor's Center to Creek outfall at the Harbor	Terri Partch and City elected officials	4th and 5th grade students, teachers and parents in Port Angeles and Sequim School Districts	tpartch@cityofpa.us	water quality and negitive effects on water quality and biota from pet waste, fertizers and pest control products and car washing	Approximately 1200	Water quality tests for temperature, pH, surfactants turbidity, watershed notebooks	City supported program with funding, maps and testing equipment. An educator visited the classrooms before the field potion of the program to help with understanding of watersheds, etc.
Presentation to the Board of the Clallam County Conservation District	8-Dec-09	Conservation District offices in Port Angeles	Terri Partch	Conservation District Board and Staff	tpartch@cityofpa.us	Stormwater Management Plan	14	Power point, educaton and outreach materails made over the year, SWMP	The Board seemed very interested and had some good suggestions on how to have better outreach materials and places to have the materials.

SWMP Appendix C
Illicit Discharge Tracking Form
From the Center for Watershed Protection

Illicit Discharge Incident Tracking Sheet

Incident Location *(complete one or more below)*			
Latitude and longitude:			
Closest street address:			
Nearby landmark:			
Primary Location Description	**Secondary Location Description:**		
☐ Stream corridor (*In or adjacent to stream)*	☐ Outfall	☐ In-stream flow	☐ Along banks
☐ Upland area *(Land not adjacent to stream)*	☐ Near storm drain	☐ Near other water source (storm water pond, wetland, etc.):	
Narrative description of location:			

Upland Problem Indicator Description		
☐ Dumping	☐ Oil/solvents/chemicals	☐ Sewage
☐ Wash water, suds, etc.	☐ Other: _____	

Stream Corridor Problem Indicator Description				
Odor	☐ None	☐ Sewage	☐ Rancid/Sour	☐ Petroleum (gas)
	☐ Sulfide (rotten eggs); natural gas	☐ Other: Describe in "Narrative" section		
Appearance	☐ "Normal"	☐ Oil sheen	☐ Cloudy	☐ Suds
	☐ Other: Describe in "Narrative" section			
Floatables	☐ None:	☐ Sewage (toilet paper, etc)	☐ Algae	☐ Dead fish
	☐ Other: Describe in "Narrative" section			
Narrative description of problem indicators:				
Suspected Violator (name, personal or vehicle description, license plate #, etc.):				

Please submit this form (within 24 hours, if possible) to Terri Partch, Stormwater Engineer for the City of Port Angeles for investigation (it can be faxed to (360) 417-4709 or hand delivered), call the stormwater hotline at (360) 417-4830, or send an email to stormwater@cityofpa.us. If the spill presents a severe or imminent threat to human health or the environment also contact the department of Ecology, Northwest Region 1-425-649-7000 within 24 hours.

Attachment B

Public Education and Outreach Tracking Spreadsheet

Public Education and Outreach Tracking Spreadsheet - 2009 Events
City of Port Angeles

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Attachment C

Now Science Program Documentation

Feiro Marine Life Center

Progress Report October 1 – October 31, 2009 N.O.W. Science

- Confirm program fiscal partners – City of Port Angeles, Marine Resource Committee
- Prepare news release for school district
- Schedule NOW classes for fall 2009
- Coordinate schedule with program partners – Olympic Coast National Marine Sanctuary, Olympic National Park, Clallam Conservation District
- Clarify busing requirements with school districts
- Complete program module
- Order supplies
- Plan and implement staff training with OCNMS, ONP & CCD
- Plan and implement volunteer training – 7 volunteers (3 per session)
- Prepare pre-visit presentation
- Prepare field journal
- Visit 10 classrooms in Port Angeles, Sequim and Crescent school districts
- Provide field investigation to 10 classes in Port Angeles, Sequim and Crescent school districts
- Total student visits through October 31, 2009 - 242

Chaperones	51
Total Number	293

- Prepare follow-up letter with survey monkey questionnaire and poster contest

Feiro Marine Life Center

Progress Report November 1 – December 31, 2009 N.O.W. Science

- Continuing scheduling NOW classes
- Coordinate schedule with program partners – Olympic Coast National Marine Sanctuary, Olympic National Park, Clallam Conservation District
- Clarify busing requirements with school districts
- Visit 9 classrooms in Port Angeles, Sequim and Crescent school districts
- Provide field investigation to 9 classes in Port Angeles, Sequim and Crescent school districts
- Total student visits through December 31, 2009 416

  Chaperones 74

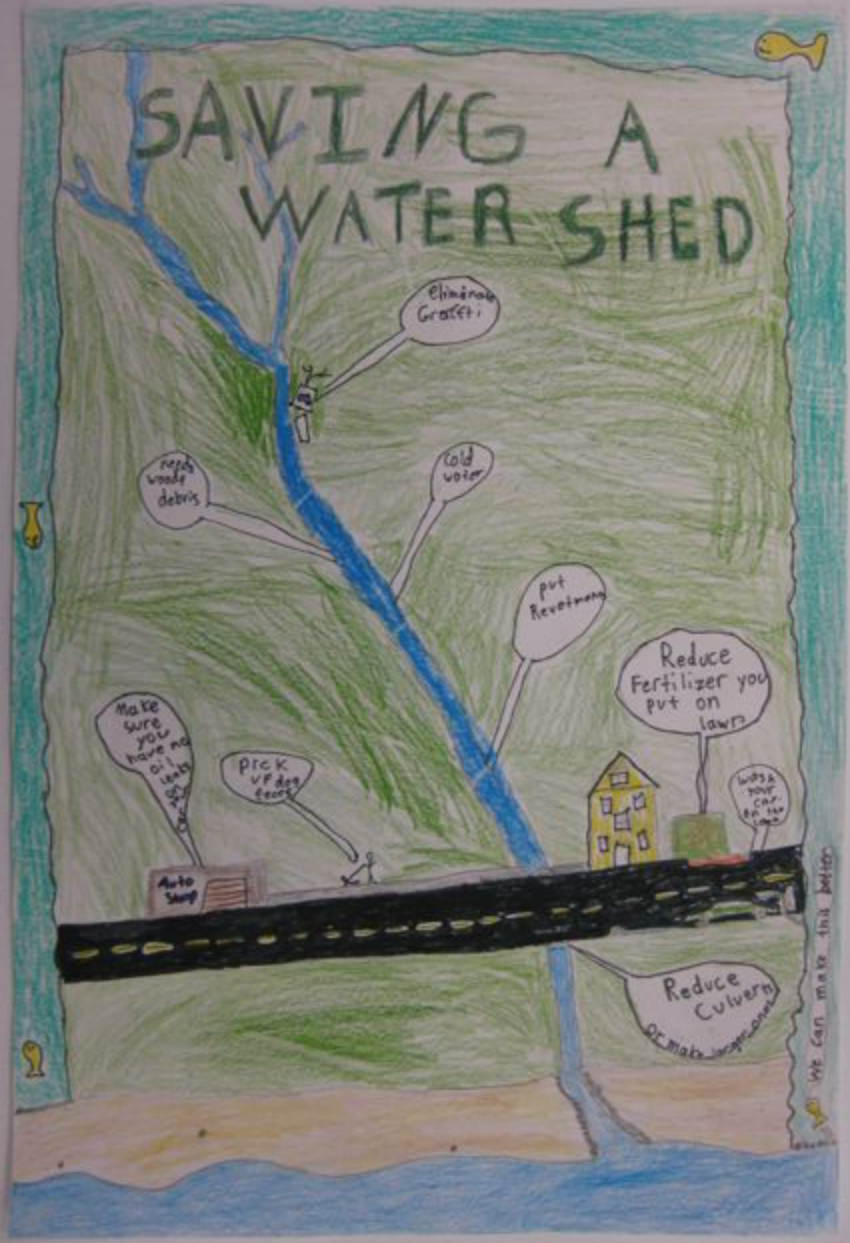
  _____

  Total Number **490**
- Implement follow up evaluation
- Implement post visit poster contest
- Plan evaluation review meeting
- Review posters

Feiro Marine Life Center

Progress Report January 1 – February 28, 2010 N.O.W. Science

- Coordinate formative evaluation with program partners – Olympic Coast National Marine Sanctuary, Olympic National Park, Clallam Conservation District
- Review evaluation and Survey Monkey results
- Conduct evaluation meeting
- Visit schools in Sequim, Port Angeles and Crescent School Districts to present awards to poster contest recipients
- Provide follow-up letter to schools
- Contact remaining 5th grade classes to schedule for spring


SAVING A WATER SHED
Eliminate Graffiti
remove woode debris
cold water
put Revetment
Reduce Fertilizer you put on lawn
Make sure you have no oil leaks
Pick up dog feces
Auto Shop
wash your car on the lawn
Reduce Culvert or make wooden
We can make this better

SAVE The SEA!
How You Can Help?
• Pick up after your dog
• Use less pestisides / fertilizer
• Wash car on the lawn
• When you are out camping, if you wash clothes and dishes don't use soap
• Through your trash in a nearby Garbage can
Marin

Be Smart, When You wash Your car!!
Wash your car on the lawn or at a car wash to keep from polluting the water. If the soap goes down a street drain it goes to the bay of water close to you which makes it harder for fish to survive.

Save our watershed!!

- Wash your car on the lawn!
- That way the soap soaks into the grass!

Pick up Poop!
rain is washing poisons down drains and into the ocien.
Wash your car in grass and pick up dogs poop
Soap, poop, minure and fattilizer are being drained into the ocien and killing animals that live in the sea.

HOW TO SAVE A WATERSHED

pick up your trash and make sure it ends up in the trash!!! That will help our water (watershed)

wash cars in the yard so all the soap and soap related chemicals dont go down a storm-drain and go in the (watershed)

then we do ph tests and then the (watershed) is healthy.

Insted of pestacides use ladybugs
they kill apids
Pesticide
(Ladybugs)
weee!!!!
!!yay!!!!!
ANgery!!!
icat
AHHH
AHHH
AHHH
AHHHHHH
hey dog
poof to!!!
pestacides
to brightll
mahrdeahn
I think we
bring to
win

Let's all help to keep our watershed clean!

What is clean?

- ☑ plant life
- ☑ Bug's
- ☑ lot's of fish
- ☑ Animals
- ☑ no trash

how can we help?

STOP!!!

Top 6.

WARNING

SAVE A WRAPPER SAVE A BIRD

1. Stop littering
2. Stop washing cars on the street
3. Pick up your dog poop
4. Stop fertilizing
5. Pick up your trash or if you even come across someone else's garbage
6. Fix your oil leak

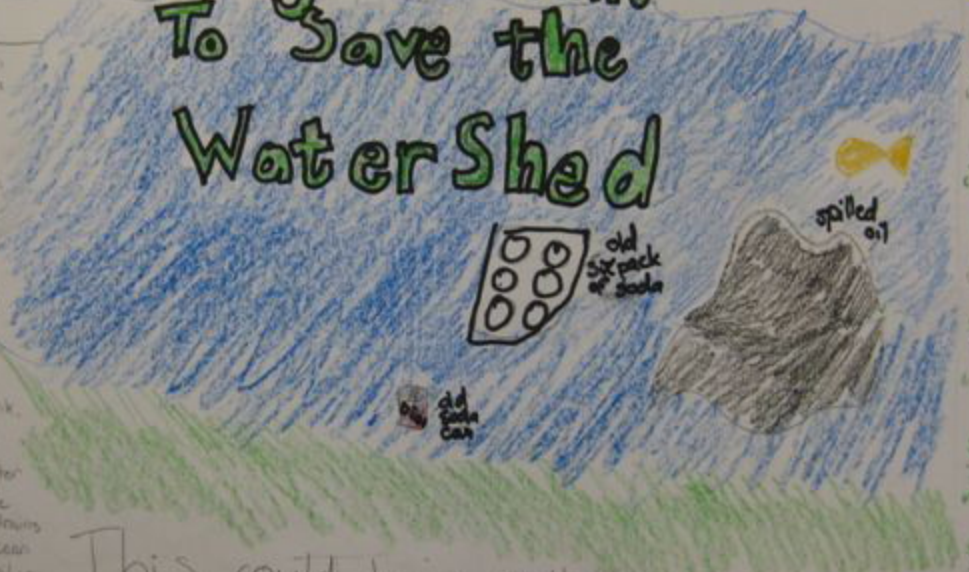
Did you know? That there is an island in the middle of the Ocean that most of our garbage ends up there and washes up on shore and most of the birds eat that garbage and feed it to their baby's and they die. So throw away your garbage in the trash.

PLEASE HELP!!! ME...

Why We Want To Save the WaterShed

Facts

- The fishermen in our town need clean water to fish.
- The people who go camping at Salt Creek don't want to see trash on the beach that the water brings up on the shore.
- The people who go boogie boarding don't want to see trash floating around in the ocean.
- Everyone needs clean water to drink.
- Everyone wants to bathe in clean water
- All the litter on the roads go into street drains or blow into the ocean
- All or most of the oil you spill in your lawn will most likely end some point of time go into the ocean



This could be a pretty beach if people didn't litter all the time.

Save me

We are all connected by the water of the world

Think about what you do

VISIONS

www.portangelesschools.org

INSIDE: Foundation Awards • Picturing America Programs
DOE Bus Purchase • Dry Creek Fruit & Vegetable Grant
Teachers' Technology Grants • NOLS Collaborative Grant

FALL 2009

NOW Partners Schools with Local Agencies

"We're off and running with the NOW science program for elementary students," Deborah Moriarty, education coordinator for the Art Feiro Marine Life Center announced.

NOW, the acronym for North Olympic Watershed is a collaborative venture which represents the educational efforts of some of the Olympic Peninsula's best resources. Led by educators from the Olympic Park Institute and Feiro Marine Life Center and supported by National Oceanic and Atmospheric Administration's (NOAA) Olympic Coast National Marine Sanctuary and Olympic National Park, fourth through eighth grade students from Port Angeles, Crescent and Sequim School Districts are provided field science opportunities right here on the North Olympic Peninsula.

Through this unique program, students visit their regional watersheds in diverse locations, from the pristine upper watersheds found in Olympic National Park to the managed and altered watersheds that feed into the Strait of Juan de Fuca. The curriculum meets Washington State Grade Level Expectations (GLEs) and national standards, as well as NOAA'S Ocean Literacy Principles.

The elementary NOW Science Program provides an opportunity for students in grades four and five to learn about their local watershed and develop a better understanding of the relationship between ecological conditions and human land use.

Feiro educator Lucia Napolitano helps Hamilton students, left to right, Katyn Flores, Kim Flores (parent), Aubrey Best, Lisa Bell, Kaitlyn Latimer, Moriah Hellwig, Mary Conway and Billy Sommers identify ways to keep our watersheds healthy.

Olympic National Park Resource & Education Specialist Dean Butterworth (middle) helps Hamilton students Mary Conway (left) and Katyn Flores read results from a water test.

"Our question to elementary students is: *'What is the health of Peabody Creek?'*" Moriarty explained. "Students study both biotic and abiotic factors which are key to healthy streams. Working with Feiro Director Bob Campbell along Peabody Creek, they observe the state of the riparian zone and the creek substrate. They look at what types of insects live in the stream, if any at all, and they also conduct a number of tests to help them determine the stream's health. Some of these tests include pH, turbidity, temperature and dissolved oxygen. They even identify whether there are harmful detergents in the stream."

"When we look at the greater goal of stewardship," Moriarty continued, "we need to have simple things for individuals to do that are do-able and that don't overwhelm us. Picking up your dog's waste, washing your car on the grass, keeping oils and paints out of storm drains and limiting the use of fertilizers are all small steps we each can take toward keeping our streams, rivers and ultimately our ocean, clean. Working with the Olympic National Park, the City of Port Angeles, the Clallam County Conservation District, the Feiro and the Olympic Coast National Marine Sanctuary, shows we all have the same goal – to educate our community about the place we live in order for each of us to become better stewards. We can all work together on behalf of our students' education to make this happen."

NOTES
From the Superintendent

Welcome to the fall start of our school year and our first issue of three Visions newsletters! School is well underway and incredible teaching and learning activities are happening in and outside of our classrooms. I'm on track to reach my goal of visiting each school and all of our classrooms. So far I've spent all of my "in-class time" at Port Angeles High School and Franklin Elementary School. I have been able to visit 92 classes out of 287. ***195 to go!***

Teachers and staff members are working together to help our students reach that big milestone, graduation! Mid-October 304 PAHS students were lining up to take the PSAT [Preliminary SAT/ National Merit Scholarship qualifying Test], one senior, 133 juniors, 115 sophomores and 55 freshmen! Almost 50% of the class of 2011 is taking the test! Our District mission to *"create and sustain learning communities that prepare each student to live, work, and learn successfully in a changing world"* is the foundation of our dedication and commitment to our students. Whether our graduates have a goal of going on to a four-year college, gaining a vocational degree, or getting a job in the work force, we want to support their plans and efforts!

We expect all students, 100%, to graduate. It's a full court press on the part of all teachers, kindergarten though twelfth grade, to guide our students to that end! Did you know that our current kindergarteners make up our "Class of 2022?!" And, it's countdown for our Class of 2010 from Port Angeles and Lincoln High Schools! ***It Takes a Community to Raise a Port Angeles Graduate!***

I'd like to thank all of the organizations who have supported our teaching and learning through grant awards. Those featured in *Visions* are just a few of the many that support our District.

— Dr. Jane Pryne, Superintendent

ADVOCACY • ACHIEVEMENT • ACCOUNTABILITY

Foundation Awards Grants to Schools

Port Angeles EDUCATION FOUNDATION

Last year District teachers were awarded 16 grants totaling $10,510 from the Port Angeles Education Foundation (PAEF). These grants benefited every elementary and middle school student, plus about 120 high school students, the PAEF reported.

Jefferson Elementary received a grant to continue its unique partnership with the Jefferson Parent Teacher Organization and the City of Port Angeles to teach all fourth graders to swim. Fifty-three children participated in the swimming lesson program, and 31 students moved up one level by the end of the program. Jefferson fourth grade teachers Sue-Ellen Kraft and Jeanne Wolfley commented that all students felt more confident and comfortable in the water. "One measurement of the success of the program is the movement forward of the participants and their enjoyment of the process. This program is highly successful because not only are the children learning new skills, but they love it!" Kraft and Wolfley said.

Additional PAEF grants ensured all Port Angeles elementary students experienced the Pacific Science Center's Science on Wheels exhibit and all sixth graders visited Stevens Middle School in preparation for their move to seventh grade. Other grants have funded a summer reading program for high risk first graders, the purchase of supplies for Jefferson's all-school "Enrichment Cluster Extravaganza," Franklin's Multi-Age Community program transportation for enrichment cluster activities, guest author Nancy Woodman's visit to Franklin and Dry Creek Schools, and audio equipment for Dry Creek's literacy program listening stations.

The Foundation has been awarding grants to schools and teachers for over fifteen years. District teachers, school administrators, paraeducators, and parent groups can apply for grant projects that focus on creative and innovative ideas in the classroom. Grant parameters and applications are posted to the district's website: **www.portangelesschools.org/parents/paef.html.** Applications for new grants are due by Friday, November 20 to the Central Services Building, 216 East Fourth Street.

Funds for the grants are raised from the proceeds of the Foundation's Annual Dinner, which is held each April. In addition to school and teacher grants, the Foundation presents scholarships to graduating Port Angeles seniors and assists with student special needs, medical services and counseling.

Franklin Receives Picturing America Program

Franklin teacher Suzanne Keegan talks with her first grade class about the Lansdowne portrait of George Washington painted by Gilbert Stuart in 1796.

Franklin Elementary School was one of over 56,000 schools and public libraries across the nation awarded the Picturing America program this summer. Picturing America is a free initiative from the National Endowment for the Humanities (NEH) that helps teach American history and culture by bringing some of the country's great art directly to classrooms and libraries.

"We are really excited to use Picturing America resources in our classrooms," said Principal Amity Butler. "The program will enrich our classroom learning by allowing our students access to some of our nation's important art. Kudos to teacher Suzanne Keegan for writing the grant on behalf of Franklin staff and students!"

Franklin was awarded 40 large, high-quality reproductions of great American art and a comprehensive teachers resource book to facilitate the use of the works of art in core subjects. Picturing America's art resources are designed to enhance the study of American history, social studies, language arts, literature and civics.

"The work has been well received by students so far," Keegan added. "I have used some pictures in questions and answer sessions and the ideas that the students pulled out were so interesting. They saw things that my adult mind didn't see. I didn't see things because I was looking for bigger ideas, but they saw the tiniest details."

"Teachers may also use the art in their lessons for social studies, science, math, literature," Keegan explained, "whatever applies to their teaching and learning process at the time. There are beautiful pieces, traditional and non-traditional, that will cause deep thinking and constant connections to our world today."

First piloted to 1,500 schools in January 2008, the program was launched nationally in February 2008 and awarded to over 26,000 schools and public libraries across the country in the first application period. To date, over 76,000 schools, public libraries, and Head Start centers nationwide have been awarded this education resource. *Information provided by National Endowment for the Humanities.*

DOE Helps Bus Purchase

The District received a School Bus Replacement Grant for $60,000 earlier this year to help replace three of its primary use buses through the Washington State Department of Ecology's Air Quality Program. The grant funds were intended to help replace the oldest and most heavily polluting diesel school buses in the State of Washington.

"The reduction in emissions is huge between the new and old vehicles," Bus Mechanic Dave Eckenberg said. "Replacing the buses was the safest way to go for emissions purposes. The new diesel buses with the ultra low sulfur gas are much safer for the kids."

"Money generated from a grant such as the one from the Department of Ecology is added to our transportation vehicle fund," explained Transportation Supervisor Jerry Eldred. "Since we are paid back for bus purchases over an 8-15 year period from the State, this money enables us to purchase buses sooner than we could ordinarily do. Earlier bus replacement allows us to remove older higher polluting buses from service at a faster rate." Eldred said the school district replaced three of its 1988 Ward school buses. "The replacement of these vehicles is not only beneficial to our children, but beneficial to our entire community by reducing the health hazards of running these older buses," he added.

Three Blue Bird Model BBCV3303S buses were purchased as replacements to the old Wards. "The total cost for the three buses was $280,656.20, including tax," Eldred said. The primary source of district bus funding is through the depreciation schedule which generates the state allocation of funds only for the purchase of new buses. Once funds are moved to the transportation account, they may be only used for purchase of school buses or vehicles that transport students.

Dry Creek Receives Fresh Fruit and Vegetable Grant

Leelah Smith, a fifth grade student in Gunnar Thomason's class, stands with Principal Kate Wenzl as she prepares a bowl of apples and plums for delivery to her Dry Creek classmates.

Dry Creek Elementary was awarded a $27,000 grant to enable participation in the U.S. Department of Agriculture (USDA) Fresh Fruit and Vegetable Program during the 2009-10 school year. The program, a partnership between the USDA and the Office of Superintendent of Public Instruction (OSPI), provides all Dry Creek students a variety of fresh fruit and vegetables throughout the school day.

"Fruit or vegetables are put into big bowls in the lunchroom each day," Principal Kate Wenzl explained. "After morning recess, a representative from each classroom picks up its bowl and takes this healthy snack down to their classroom."

"Students are very excited about eating fresh fruits and vegetables while they are working in the classrooms," Wenzl added. "The snacks are consumed quickly and help students focus on their studies."

"Last week I was covering a math lesson in a fifth grade classroom," she recalled. "The bowl of sliced carrots provided the class was consumed in a very short time! While we reviewed the previous night's homework, we had to speak a little louder over the loud crunching sounds of mathematicians eating their carrots! Still, our students were focused on learning! We are so pleased to have this opportunity to promote healthy eating habits at Dry Creek Elementary!"

Sodexo Food Services, the District's contracted food services agent, plans and administers the fresh fruits and vegetable program. "Our goal is to purchase as much as we possibly can locally," Director John Koch said. Interested farm representatives can contact Koch by phone at 360.565.1941 or email at **jkoch@portangelesschools.org.**

In addition to the Dry Creek program, Koch is working with interested parents and members of the District's Nutrition and Physical Activity Advisory Committee to serve an alternative menu at Jefferson Elementary for six weeks beginning in January. The group is working together on recipes and a menu.

The Nutrition and Physical Activity Advisory Committee is also part of the sponsoring team for the Farm-to-Cafeteria Conference November 5, 10 a.m. to 4:00 p.m. at the Jamestown S'Klallam Tribal Center. For more information about the conference, send an email of interest to: **farmtocafnow@yahoo.com.**

Teachers Receive Technology Grants

District teachers are among 200 educators state-wide awarded grants funded by the Teaching & Learning in the 21st Century (TL21) Program. Mark Valentine, English and Language Arts teacher at Port Angeles High School, and Roosevelt Elementary teachers Jody Adams and Teresa Thorson were among the awardees.

The trio will receive instruction for integrating the latest technological advances into regular classroom instruction and practice. Each has already received a laptop for use in the classroom and soon will purchase an interactive whiteboard. Equipment and software will enable each to capture instructional events for digital broadcasts.

"We'll be learning and implementing such processes as using a web cam for student discussion or presentations, building web pages and blogs, creating state-of-the-art PowerPoint® presentations and digital filming," Valentine said. "We'll be doing all this while building teaming relationships with colleagues, and of course gaining access to multiple Internet resources available for instructors."

"At Roosevelt we are hoping to use our training to expand the use of technology for our primary students and enhance our curriculum," added Adams and Thorson. "Students will benefit through the use of media presentations that will incorporate a wide array of the newest technological resources."

Having current technology entices students to move with us into the future, the three agreed. "Since many of the jobs and careers that our students will have in the approaching years do not yet even exist," they summarized, "becoming familiar with technological means while at the same time learning how to use these resources with critical thinking assures that our students will be prepared for the impending challenges."

Additionally, Franklin teacher Maria Kays received an Enhanced Peer Coaching grant that prepares teachers to serve as peer coaches in the use of technology in the classroom. Kays and fellow teacher Barry Burnett will collaborate to integrate technology with instruction and student learning.

District, NOLS Receive Collaborative Grant

The Port Angeles School District and the North Olympic Library System's (NOLS) Port Angeles Library received a $12,000 "Supporting Student Success" grant in late September from the Washington State Library. The grant provides money to purchase books and other library materials to support the civics and history Classroom-Based Assessments (CBAs) at Port Angeles High School, Dry Creek Elementary School and Hamilton Elementary School. The assessments, developed by the Washington State Office of Superintendent of Public Instruction, are used by classroom teachers to gauge student understanding in social studies, the arts, and health and fitness.

"Supporting Student Success" grants are given to public libraries and schools in Washington that collaborate to help students complete CBAs in social studies, and to educate students and teachers about public library resources and services that can help in this area.

"We're excited to partner with the public library on this grant project," said Port Angeles High School Librarian Eve Datisman. "We'll be able to add lots of new books to the school and public library collections," said Keitha Owen, Port Angeles Main Library Manager. "These materials will not only be available to students and teachers, but to members of the public, as well."

District library staff will train teachers to use NOLS online database of historic local newspapers and other databases.

Duplicate copies of these materials will be available in the classrooms, as well as at the Port Angeles Library, where they will be available for check-out by community members.

The project began in October and concludes in June 2010.

For additional information, contact Paula Barnes, NOLS Library Director, 360.417.8525, **pbarnes@nols.org** or Eve Datisman, Port Angeles High School Librarian, 360.565.1601, **edatisman@portangelesschools.org.**

DISTRICT-WIDE ONLINE CALENDAR!

Our District introduced its online "Tandem for Schools" calendar for use by all schools this year. The calendar provides scheduling information about school events and activities in an online format for each school. Events are listed by the school's abbreviation, i.e., DC for Dry Creek Elementary, PAHS for Port Angeles High School, HAM for Hamilton Elementary, etc. *View **Calendar of Events** on the home page at **www.portangelesschools.org** to view the calendar!*

A CALL FOR 2009-10 VOLUNTEERS

The District has announced a request for committee volunteers for the 2009-10 school year. There are current openings for community and parent volunteers on the Technology Instruction Task Force, Fiscal Advisory Committee, Nutrition & Physical Activity Advisory Committee, Policy Review Committee, and Instructional Materials Committee.

Please send a letter of interest to Superintendent Jane Pryne, Port Angeles School District, 216 East Fourth Street, Port Angeles, WA 98362. Questions may be directed to Michelle Pace by phone at 360.565.3700 or by email at **info@portangelesschools.org.**

DISTRICT PLANS FOR FLU SEASON

"Cover Your Cough. Clean Your Hands!" These reminders may seem like simple steps to avoid getting the flu or infecting others, but they are important measures for students and reminders to parents and families as they prepare for the upcoming flu season.

- Wash hands often with soap and water. Always wash after coughing or sneezing. If soap and water are not nearby, use an alcohol-based hand cleaner.
- Cover coughs and sneezes with your elbow or a tissue. Throw dirty tissues away and have children wash their hands.
- Do not touch eyes, nose, or mouth. Germs can spread this way.
- Stay away from people who are sick.
- Children who are sick should stay home from school and daycare until they are better.

Look for ***Health and Safety News*** on the home page: **www.portangelesschools.org.**

Tracking Student Success:

LESLEY EVERETT

Port Angeles High School Class of 2002

I attended the MAC (Multi-Aged Community) at Franklin Elementary and to this day, it's one of my favorite memories from the Port Angeles school system. Students from each grade worked together on projects like historical reenactments, the design and building of a structurally sound popsicle stick bridge, and ecological assessment plans for the salmon eggs we raised and released into local rivers. The MAC taught me to really enjoy school from an early age and to tackle problems in creative, innovative ways.

Years later, I was lucky to have John Gallagher, Jennifer Duncan-Taylor, and Derek Johnson as science teachers at Port Angeles High School; their dedication and exuberance sparked my interest in science. Jennifer Duncan-Taylor's biology class first introduced me to the world of human genetics and heritable diseases. Challenged to understand both the basic science and the practical applications of genetic research, our class analyzed DNA samples from a theoretical forensic investigation and we traced genetic traits through our own family pedigrees.

With support from PAHS science teachers, I attended a summer hands-on lab program for high school students at the Fred Hutchinson Cancer Research Center, focusing on the biological and bio-ethical aspects of hematological diseases. The experience at Fred Hutch showed me exactly what it means to be a research scientist and highlighted the tremendous career opportunities available to me in major academic and biomedical research centers. This led me to an undergraduate degree in biochemistry and internships at Amgen Pharmaceuticals and the NIH.

Following a Gates Foundation scholarship to the University of Cambridge for a Masters in Epidemiology, I am now pursuing a joint MD/PhD degree in the Medical Scientist Training Program at the University of Michigan. This past summer I spent six weeks in Ghana, conducting a sickle cell disease research project in rural villages to assess the availability of diagnostic and therapeutic resources available in these isolated areas, and to assess the environmental, behavioral, and socio-economic factors that contribute to patients' painful disease manifestations.

Look for for more ***Tracking Student Success*** features at **www.portangelesschools.org.**

PORT ANGELES SCHOOL DISTRICT

Visions
All Port Angeles School District students will reach high standards and graduate prepared with knowledge, skills, and abilities to choose a successful future.

Mission
The Port Angeles School District creates and sustains learning communities that prepare each student to live, work, and learn successfully in a changing world.

Board Members
Steve Baxter, Dr. Patti Happe, Cindy Kelly, Lonnie Linn, Nancy McLaughlin

Superintendent Dr. Jane Pryne

Published by:
Port Angeles School District No. 121
216 East Fourth Street
Port Angeles, WA 98362
360.457.8575
www.portangelesschools.org

Editor: Tina Smith-O'Hara
Design: Laurel Black Design, Inc.

Questions or Comments?
Write to us at: *Visions*
c/o Port Angeles School District,
216 E. Fourth St., Port Angeles, WA 98362, or call 360.457.8575

NONDISCRIMINATION POLICY: The Port Angeles School District complies with all federal and state rules and regulations and does not discriminate on the basis of race, color, national origin, sex or handicap. This holds true for all students who are interested in participating in educational programs and/or extracurricular school activities. Inquiries regarding compliance and/or grievance procedures may be directed to Mary Hebert, Title IX/RCW 28A.640 Compliance Officer, and/or Mark Jacobson, Section 504 Coordinator, 360.457.8575, 216 E. Fourth St., Port Angeles, WA 98362-3023.

PORT ANGELES SCHOOL DISTRICT
216 E. Fourth St. • Port Angeles, WA 98362-3023

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PAID
Olympic Mailing Services
ECRWSS

POSTAL CUSTOMER

SERVICE CONTRACT

PUBLIC EDUCATION AND OUTREACH SERVICES BY FEIRO MARINE LIFE CENTER

THIS AGREEMENT is made and entered into this 23 day of FEBRUARY, 2010, between the City of Port Angeles, a Municipal Corporation of the State of Washington (hereinafter called the "City") and Feiro Marine Life Center, a 501 (c) (3) non profit corporation (hereinafter called "Feiro").

The City and Feiro, in consideration of the performance of the terms and conditions hereinafter mentioned, agree as follows:

ARTICLE I
CONTRACT DOCUMENTS

The Contract consists of the attached Exhibit A - Scope of Services, Exhibit B - Agreed Pricing, Exhibit C - Project Schedule and this Service Contract. All obligations of the City and Feiro are fully set forth and described herein.

In the event of a discrepancy between any of the Contract Documents, as above defined, the City shall make written interpretation thereof, which interpretation shall govern.

ARTICLE II
SERVICES

Feiro agrees to provide all labor, equipment, supplies and materials to provide public education and outreach on stormwater as outlined in Exhibit A.

ARTICLE III
CONTRACT PRICE

As complete and exclusive consideration for all services to be performed by Feiro, the City shall make payments to Feiro in accordance with Exhibit B, Proposed Pricing. Feiro agrees to provide all work and services for a total compensation not to exceed $3,933.63. No claims for additional compensation exist without written amendment to this Contract. Invoices on this amount may be submitted once per month, and will be paid on the percentage of Contract completion.

ARTICLE IV
TERM

This Contract shall become effective upon execution by both parties, and continue to September 30, 2010, at which date the Agreement will terminate.

ARTICLE V
ASSIGNMENT

Feiro shall arrange and pay for any and all transportation of school children through their appropriate school district transportation services. Except for transportation, Feiro shall not assign any of its responsibility under this Contract without the express written consent of the City.

ARTICLE VI
APPLICABLE LAW AND VENUE

This Contract shall be governed by, and construed in accordance with, the applicable laws of the State of Washington. Any legal proceedings to determine the rights and obligations of the parties hereunder shall be brought and heard in Clallam County.

ARTICLE VII
INSURANCE REQUIREMENTS

Feiro shall procure and maintain for the duration of the Service Contract, insurance against claims for injuries to persons or damage to property which may arise from or in connection with the performance of the work hereunder by Feiro, their agents, representatives, employees or subcontractors. Failure by Feiro to maintain the insurance as required shall constitute a material breach of contract upon which the City may, after giving five working days notice to Feiro to correct the breach, immediately terminate the Service Contract or at its discretion, procure or renew such insurance and pay any and all premiums in connection therewith, with any sums so expended to be repaid to the City on demand, or at the sole discretion of the City, off set against funds due Feiro from the City.

a. Minimum Scope of Insurance

Feiro shall obtain insurance of the types described below:

i. Commercial General Liability insurance shall be written on ISO occurrence form CG 00 01 and shall cover liability arising from premises, operations, stop gap liability, independent contractors, products-completed operations, personal injury and advertising injury, and liability assumed under an insured contract. The Commercial General Liability insurance shall be endorsed to provide the Aggregate Per Project Endorsement ISO form CG 25 03 11 85. There shall be no endorsement or modification of the Commercial General Liability insurance for liability arising from explosion, collapse or underground property damage. The City shall be named as an insured under the Contractor's Commercial General Liability insurance policy with respect to the work performed for the City using ISO Additional Insured endorsement

CG 20 10 10 01 and Additional Insured-Completed Operations endorsement CG 20 37 10 01 or substitute endorsements providing equivalent coverage.

b. Minimum Amounts of Insurance

Feiro shall maintain the following insurance limits:

i. Commercial General Liability insurance shall be written with limits no less than $1,000,000 each occurrence, $1,000,000 general aggregate and a $1,000,000 products-completed operations aggregate limit.

c. Other Insurance Provisions

The insurance policies are to contain, or be endorsed to contain, the following provisions for Commercial General Liability insurance.

i. Feiro's insurance coverage shall be primary insurance as respect to the City. Any insurance, self-insurance, or insurance pool coverage maintained by the City shall be in excess of Feiro's insurance and shall not contribute with it.

ii. Feiro's insurance shall not be cancelled or reduced as to coverage by either party, except after forty-five (45) days prior written notice by certified mail, return receipt requested, has been given to the City.

d. Acceptability of Insurers

Insurance is to be placed with insurers with a current A.M. Best rating of not less than A:VII.

e. Verification of Coverage

Feiro shall furnish the City with original certificates and a copy of the amendatory endorsements, including but not necessarily limited to the additional insured endorsement, evidencing the Commercial General Liability insurance of Feiro before commencement of the work.

ARTICLE VIII
INDEPENDENT CONTRACTOR STATUS

The relation created by this Contract is that of owner-independent contractor. Neither Feiro nor its employees are employees of the City and are not entitled to the benefits provided by the City to its employees. Feiro, as an independent contractor, has

the authority to control and direct the performance of the details of the services to be provided. Feiro shall assume full responsibility for payment of all Federal, State, and local taxes or contributions imposed or required, including, but not limited to, worker's compensation, unemployment insurance, Social Security, and income tax.

ARTICLE IX
NONDISCRIMINATION

During the performance of this Contract, the parties shall conduct their business in a manner which assures fair, equal and nondiscriminatory treatment of all persons, without respect to race, creed, color, sex, Vietnam era veteran status, disabled veteran condition, physical or mental handicap, or national origin, and, in particular:

1. The parties will maintain open hiring and employment practices and will welcome applications for employment in all positions from qualified individuals who are members of the above stated minorities.

2. The parties will comply strictly with all requirements of applicable federal, state or local laws or regulations issued pursuant thereto, relating to the establishment of nondiscriminatory requirements in hiring and employment practices and assuring the service of all patrons and customers without discrimination with respect to the above-stated minority status.

ARTICLE X
TERMINATION OF CONTRACT

In the event that any of the provisions of this Contract are violated by Feiro or by Feiro's subcontractors, the City may serve written notice of intention to terminate such Contract upon Feiro, which notice shall specify the reasons therefore. Unless within thirty (30) days after serving such notice upon Feiro such violation shall cease and an arrangement for the correction thereof satisfactory to the City be made, the Contract shall, upon the expiration of the said thirty (30) days, cease and terminate. In the event of any such termination, the City may purchase the materials necessary for complete performance of this Contract, and Feiro shall be liable to the City for any excess cost thereby.

ARTICLE XI
SEVERABILITY

If any term or condition of this Contract or the application thereof to any person(s) or circumstances is held invalid, such invalidity shall not affect other terms, conditions, or applications which can be given effect without the invalid term, condition, or application. To this end the terms and conditions of this Contract are declared severable.

ARTICLE XII
WAIVER

Waiver of any breach of any term or condition of this Contract shall not be deemed a waiver of any prior or subsequent breach, no term or condition of this Contract shall be held to be waived, modified, or deleted except by a written instrument signed by the parties hereto.

FEIRO MARINE LIFE CENTER

By: _____

Title: President

Dated: Feb. 17, 2010

ATTEST:

_____

CITY OF PORT ANGELES

By: _____
Director of Public Works and Utilities

Dated: 23 February 2010

APPROVED AS TO FORM:

_____
William Bloor, City Attorney

ATTEST:

_____
Janessa Hurd, City Clerk

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Service Contract Exhibit A

Public Education and Outreach Services
By Feiro Marine Life Center

Scope of Services:

North Olympic Watershed (NOW) Science, a program of Feiro Marine Life Center, is an environmental education program that promotes locally relevant, systemic experiential learning in the k-12 environment.
NOW Science recognizes that knowledge and commitment built from firsthand experience, especially in the context of one's community and culture, is essential for achieving environmental stewardship. Feiro strives to carefully select experiences engendering discovery and wonder, and nurturing a sense of community to connect students with their watershed, and help reinforce an ethic of responsible citizenship.

NOW (North Olympic Watershed) Science provides these opportunities for students of the Sequim, Port Angeles, and Crescent School District to become involved in local watershed issues by studying the Elwha Dam removal and restoration process, and Peabody Creek, in their own community.

Feiro Marine Life Center will:

- Provide a pre-visit to all 4th and 5th grade classrooms in the Port Angeles, Sequim and Port Angeles schools to outline and introduce watershed concepts.

- Create or use existing pre- and post-education evaluation tools or techniques to document and analyze students' behavior/knowledge change with respect to ocean literacy concepts, and watershed connections.

- Train staff or volunteer helpers for project.

- Cover transportation costs for schools included in project.

- Provide a hands-on, inquiry based, classroom, lab, and watershed educational opportunity for at least 1,000 4th and 5th grade students from Sequim, Port Angeles, Crescent Schools, and home school groups.

- Support groups interested in a spring clean-up of Peabody Creek.

- Promote behavior change in issues related to watershed health including, but not limited to, washing your car at a car wash or on the lawn, picking up after your pets, using lawn

and garden fertilizers sparingly, and disposing of oils paints and other chemicals at a hazardous waste facility.

Service Contract Exhibit B

Public Education and Outreach Services
By Feiro Marine Life Center

Agreed Pricing:

$ 638.83 student transportation

$3,294.80 educator costs - approx 180 hours – includes program development, instructional material development, implementation and evaluation

$3,933.63

Service Contract Exhibit C

Public Education and Outreach Services
By Feiro Marine Life Center

Project Schedule:

- Schedule all 5th grade and all 4th grade students for visits by May of 2010
- Visit to classrooms: By May 2010
- Classes to Feiro: By May 2010
- First year NOW Science Complete: June 15, 2010
- First year Evaluation Due: September 2010

Attachment D

Agendas, Meeting Notes and Power Point Presentations for Public Involvement in the SWMP

ELWHA MORSE MANAGEMENT TEAM AGENDA

Thursday ◈ 22 January 2009 ◈ 3:00-5:00pm
Clallam County Commissioner's Board (big) Room

3:00 Greetings/Introductions

1. Terri Partch: City of Port Angeles Stormwater Management Plan
2. Review November Meeting Notes edits/changes etc.
3. Today's Agenda additions/changes
4. Cathy/Cynthia: Rulemaking update
5. Water Quality & Water Quantity Sub-committee prioritized recommendations
6. Instream/Habitat & Education/Outreach Sub-committees meeting times
7. Brief Announcements

5:00 Meeting Adjourn

NEXT MEETING: FEB. 26, 2009, 3-5pm, Clallam Co. Commissioner's Board Rm.

DRAFT

City of Port Angeles

Ordinance Revisions Required for Stormwater NPDES Phase II Compliance

Presentation to the Elwha – Morse Management Team (EMMT)

January 22, 2009

By Terri Partch, P.E.

Outline

- NPDES Permit effective February 16, 2007
- Stormwater Management Program Overview (SWMP)
- Three new ordinances related to clean stormwater will be in place by August 15, 2009

Stormwater Management Program (SWMP)

1. Public Education & Outreach
2. Public Involvement and Participation
3. Illicit Discharge Elimination
4. Development Runoff Control
5. Operations & Maintenance

Public Education and Outreach

Four Target Audiences

- General Public
- Homebased and Mobile Buisnesses
- Homeowners, Landscapers and Property Owners
- Engineers, Contractors, Developers, City Government Review Staff and Land Use Planners

Public Education and Outreach - Continued

Events Attended and Information Distributed in 2008 and planned for 2009

- KONP Home show
- Clallam County Fair
- North Olympic Land Trust Streamfest
- Utility Bill Mailer
- Ordinance Target Audience Meetings

Illicit Discharge Detection and Elimination (IDDE) Program

a. Mapping

b. Ordinance preventing illegal/illicit discharges to the stormwater system

c. Program Requirements to Support the Ordinance

d. Public Education

e. Program Evaluation and Assessment / Annual Report

f. Staff Training Requirements

IDDE Ordinance

The ordinance must prohibit the following discharges unless certain conditions are met:

- Waterline and fire hydrant flushing
- Lawn watering
- Swimming pool water discharges
- Street and sidewalk wash water, water used to control dust and external building wash down water
- Other non stormwater discharges

IDDE Program Requirements to Support the Ordinance

- Adopt “Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments, “Center for Watershed Protection, October 2004
- Develop procedures, handbooks and forms for City field crews to help characterize, trace and remove sources of illicit discharge
- Train City field crews to identify and remove illicit discharges

Runoff Control
from
New Development, Redevelopment, and Public and Private Construction Sites

a. **Ordinance** to reduce pollutants in runoff from any site disturbance 1 acre or greater

b. **New Permitting, Plan Review, Inspection and Enforcement Process to Support the Ordinance**

c. Keep Records of Inspections and Enforcement Actions

d. Make available DOE Permit forms, i.e. NOI forms

e. **Staff Training Requirements -** Implement a training program for all staff responsible for permitting, plan review, construction site inspections and enforcement

Construction Site Runoff Ordinance

The ordinance must include:

- The minimum requirements, technical thresholds and definitions in Appendix 1 of the Permit.
- A site planning process, BMP selection and design criteria that will protect water quality to the Maximum Extent Practicable (MEP) **Option:** Adopt 2005 DOE Stormwater manual or develop an equivalent manual
- Give the City the legal authority to inspect private stormwater facilities
- Provisions which allow Low Impact Development (LID) techniques- **complete**
- Evaluate and adopt enforcement measures

New Permitting, Plan Review, Inspection and Enforcement Process

Permitting must include the following elements:

- Require and review a stormwater pollution prevention plan (SWPPP). Option: limited waiver option
- Inspect sites with a high potential for erosion before clearing and grading
- Inspect sites during construction and upon completion of construction to verify proper installation of BMPs
- Keep records of the inspection program. Achieve 95% of all scheduled inspections.
- Develop an enforcement strategy.

Operation and Maintenance Ordinance for Private Stormwater Facilities

The ordinance must:

- Clearly identify the party responsible for maintenance
  - Property owner
  - City maintenance crew
  - Developer impact fee (maintenance contracted by City)
- Require regular inspection to DOE standards
- Establish enforcement procedures

Operation and Maintenance Program Requirements for Public Stormwater Facilities

- Establish maintenance standards by adopting Chapter 4, Volume 5 of the DOE Manual
- Develop a program to annually inspect all stormwater treatment and flow control facilities
- Develop a program to spot check all flow control facilities after major (3.3 inches of rainfall in 24 hours) storms
- Document the City's inspection and maintenance program

Operation and Maintenance Program Requirements for Public Stormwater Facilities

- Establish and implement practices to reduce stormwater impacts from all City maintenance operations
- Establish and implement practices to reduce pollutants from all City owned or maintained lands
- Train City employees on how their job impacts stormwater quality and how to select BMPs to reduce or eliminate impacts
- Develop SWPPPs for all City owned maintenance or industrial yards-complete

Questions & Comments

ELWHA-MORSE MANAGEMENT TEAM MEETING
January 22, 2009
Notes prepared by: **Melissa Coughlin**

In Attendance:

Hannah Merrill, Clallam County N.R. Planner
Cathy Lear, Clallam County Planning Biologist
Kathryn Neal, City of Port Angeles
Scott Johns, City of Port Angeles
Matthew Beirne, Lower Elwha Klallam Tribe
Cynthia Nelson, WA Dept. of Ecology (via telephone)
Mike Kitz, PUD
John Cambalik, Puget Sound Partnership
Robbie Mantooth, Education/Environment Caucus
Terri Partch, City of Port Angeles
Mike Langley, Sunland Water District
Gary Gleason, CCPC
Gary Dougherty, CCD
Melissa Coughlin, Independent Contractor

3:00 P.M. Meeting Began

I. Introductions

- Introductions all around, review of last meeting's notes to take place after Terri Partch's presentation.

II. Announcements

- Moved to later in the meeting as time allows.

III. City of Port Angeles Stormwater Management Plan – Terri Partch (Stormwater Manager/Engineer for the City of Port Angeles)

- The City of Port Angeles received the *National Pollutant Discharge Eilimination System* (NPDES) permit in February, 2007. The Stormwater Management Plan is the City's response to the requirements of the permit. Implementation of the plan controls stormwater (from a flow perspective as well as illicit discharge detection).
- Three new ordinances related to clean stormwater will be in place by August 15, 2009.
- Terri passed out copies of the City's Stormwater Plan for feedback from EMMT members.
- There are five basic elements of the plan:
    - Public Education & Outreach
    - Public Involvement & Participation – currently trying to get people's input on the plan.
    - Illicit Discharge Elimination – connections to stormdrain that shouldn't be there.
    - Development Runoff Control: very strict control of all stormwater runoff from all development sites, (redevelopment & new construction).
    - Operations & Maintenance: Best management practices for private and public facilities will be reviewed.
- **Public Education & Outreach**: Four target audiences: (1) General Public; (2) Homebased and Mobile Businesses; (3) Homeowners, Landscapers and Property Owners; (4) Engineers, Contractors, Developers, City Government Review Staff, and Land Use Planners.
- **Public Involvement & Participation**: Events attended & information distributed in 2008 and planned for 2009: KONP Home show; Clallam County Fair; North Olympic Land Trust Streamfest; Utility Bill Mailer; Ordinance Target Audience Meetings.
- Goal through targeting different groups is to increase awareness of best stormwater practices, especially with regard to pesticide use, washing cars on impervious surfaces (which will actually be illegal as defined by new ordinances,) and other behaviors that negatively impact runoff. Hotline to alert staff of breach of ordinances will be established.
- **Illicit Discharge Detection and Elimination (IDDE) Program**: Mapping; Ordinance preventing illegal/illicit discharges to the stormwater system; Program requirements to support the ordinance; Public education; Program evaluation and assessment / Annual report; Staff training requirements.
- IDDE ordinance must prohibit the following discharges *unless* certain conditions are met: waterline and fire hydrant flushing, watering lawns, swimming and hot tub discharge, street and sidewalk wash water, anything that could harm creek (herbicides, pesticides, chlorine, and detergents).
- EMMT members discussed possible conditions which would meet standards for some practices (e.g. vitamin C and ultraviolet treatments for pools prior to discharge).
- IDDE Program Requirements to Support the Ordinance: Adopt "Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments", Center for Watershed Protection, October 2004; Develop procedures, handbooks and forms for City field crews to help characterize, trace and remove sources of illicit discharge; Train City field crews to identify and remove illicit discharges.
- Runoff Control from New Development, Redevelopment, and Public and Private Construction Sites: Ordinance to reduce pollutants in runoff from any site disturbance one acre or greater; New Permitting, Plan Review, Inspection and Enforcement Process to support the ordinance: Keep records of inspections and enforcement actions; Make

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available WDOE permit forms, i.e. NOI forms; Staff Training Requirements: Implement a training program for all staff responsible for permitting, plan review, construction site inspections and enforcement

- Construction Site Runoff Ordinance: The ordinance must include: The minimum requirements, technical thresholds and definitions in Appendix 1 of the Permit; A site planning process, BMP selection and design criteria that will protect water quality to the Maximum Extent Practicable (MEP) Option: Adopt 2005 WDOE Stormwater manual or develop an equivalent manual: Give the City the legal authority to inspect private stormwater facilities; Provisions which allow Low Impact Development (LID) techniques; Evaluate and adopt enforcement measures.
- Gary Gleason was concerned about the ability to adopt certain sections of the WDOE 2005 Stormwater Manual. Terri knew about the discussions where the City had shown unwillingness to adopt. The permit requires adoption of the manual or an equivalent manual – which will have to be demonstrated to be equivalent. Gary Gleason said that Barbara Kitchens and crew (professional lobbyists) were involved; County will attempt to come up with stormwater manual with EPA grant funds (received by the Conservation District) to work on manual. This item is on the workplan for 2008. He asked what coordination is happening with County programs. Terri said the Streamkeepers data is useful to support the effectiveness of program – about the extent of City & County coordination. All agreed there was a communication problem. Minimum requirements and definitions are 60-70% of the manual.
- Robbie Mantooth asked if pharmaceutical pollution is addressed in program. Terri said it is under requirements in providing stormwater treatment. There is a matrix for what (and under what) conditions and which items, some of the BMPs (Best Management Practices) may help, but pharmaceuticals aren't specifically listed as pollutant of concern- infiltration may help remove some. Scott Johns thought that was a wastewater, not stormwater issue. Kathryn Neal mentioned that pharmaceutical pollution is a topic brought up in every public meeting, falls under different set of treatment discussions. John Cambalik said it is also a landfill issue. Collection is easiest remedy (except those pharmaceuticals absorbed through the body and becomes bio-waste – may need to develop new technology to remove.
- **New Permitting, Plan review, Inspection and Enforcement Process**: Permitting must include the following elements:
    - Require and review a stormwater pollution prevention plan (SWPPP). Option: limited waiver option.
    - Inspect sites with a high potential for erosion before clearing and grading.
    - Inspect sites during construction and upon completion of construction to verify proper installation of BMPs.
    - Keep records of the inspection program. Achieve 95% of all scheduled inspections.
    - Develop an enforcement strategy.
- **Operation and Maintenance Ordinance for Private Stormwater Facilities**: The ordinance must:
    - Clearly identify the party responsible for maintenance: Property owner; City maintenance crew; Developer impact fee (maintenance contracted by City).
    - Require regular inspection to WDOE standards.
    - Establish enforcement procedures.
- **Operation and Maintenance Program Requirements for Public Stormwater Facilities:** Establish maintenance standards by adopting Chapter 4, Volume 5 of the WDOE Manual; Develop a program to annually inspect all stormwater treatment and flow control facilities; Develop a program to spot check all flow control facilities after major storms (3.3 inches of rainfall in 24 hours); Document the City's inspection and maintenance program.
- **Operation and Maintenance Program Requirements for Public Stormwater Facilities**: Establish and implement practices to reduce stormwater impacts from all City maintenance operations; Establish and implement practices to reduce pollutants from all City owned or maintained lands; Train City employees on how their job impacts stormwater quality and how to select BMPs to reduce or eliminate impacts; Develop SWPPPs for all City owned maintenance or industrial yards (task complete). Annual and spot checks included. All in accordance to the WDOE manual. Each section relates to specific section of the permit.
- Eliminate mixing stormwater and sewage by 2015. Gary Gleason asked if the tank on the old Rayonier property would hold water for treatment for reuse. Terri said the tank will hold water for the wastewater treatment plant (in the event we have a lot of stormwater) which will be directed to treatment plant when flow becomes lower (so treatment plant can handle the volume) and be treated like any flow from City. Gary Gleason asked if there was any way the City of Port Angeles could reuse the stormwater instead of dumping into the salt chuck, since there is such a need for water to use in parks, street washing, etc. Kathryn Neal said that because the City is set on a hill, geographically it naturally delivers water to streams, artificial system (pipes) delivers to marine or sends to wastewater treatment. Not best setup to deliver stormwater inland. Best bet – distributed approach which treats stormwater on individual site. Gary Gleason wondered if there was a way to reuse stormwater on eastside instead of potable water from the Dungeness River. Gary suggested giving the stormwater presentation to the Planning Commission.

IV. Meeting Notes Review – All

- No corrections to EMMT meeting notes for November 20th, 2008.

V. Rule Making Update – Cynthia Nelson (Washington Department of Ecology), Cathy Lear (Clallam County)

- Rule making update is on the DRMT agenda for February. Had planned for public workshop prior to that, but will not be ready. Workshop planned for early February will more likely happen in late February.
- Plan to file draft rule in April, which will start clock of 180 days within there will be a public hearing, formal taking of written and oral comments, and response to comments. Final version of rule will be effective 30 days after the WDOE Director signs off.
- Currently in the informal process: Rule is discussed at working committees, DRMT, different stakeholder meetings. Rule has to be ready six weeks ahead of time for internal analysis: small business analysis and economics review. The Quilicene/Snow Rule began work first and is finalizing and drafting the rule language. It will file prior to Dungeness filing. Because of staff limitations (rule writer to go on maternity leave soon) and other considerations there must be time between filings.
- Items that must be finished by rule effective date: (1) Draft Rule – once filed will have 6 months; (2) MOA with WDOE and County – need to develop and figure out who to administer; (3) Water Exchange: mitigation program (foundation for which will be in the Rule itself); (4) Guidance Document: handbook at County offices that explains mitigation process (this can be developed during the 180 day time span).
- Need to have water in the exchange.
- Rule will be effective October/November – won't be irrigating then.
- Mike Kitz asked when and how MOA will come about. Cynthia Nelson said it was included in the Watershed Plan. Discusses how water is available under the rule. Determine water supply at County (for permits). Watershed Plan also discussed joint management, including process for well-diggers to come to County to show where property owners want wells drilled. Also discussed drilling at deeper levels. In upper layers water levels drop and pollution is a problem. County needs to (hopefully quickly) develop ordinances in relation to rule-making.
- At last EMMT meeting Andy Brastadt discussed breadth of issues and distributed a handout of permit and review process – this is just beginning.
- Gary Gleason said there had been an extensive discussion at the Planning Commission meeting on the 2009-2010 workplan especially on the Carlsborg septic/sewer situation. PUD currently only supplies ½ the water of the Carlsborg UGA. When will the PUD be able to receive expanded water rights to supply water to the other ½ of the Carlsborg UGA? Cynthia said the PUD needs to bring to Ecology what their current water rights are, what they will need, etc. They have an application on file with WDOE, but haven't given the details needed.
- Discussion on zoning changes in Carlsborg area if sewer system goes in began. Wasn't clear if this was sewer issue or issue of water rights.
- Cynthia Nelson said that House Bill 1494, currently in the legislature, addresses water banking. The Yakima Basin is allowed to have water banking, but what about the rest of the state? The bill looks at broadening the ability of establishing water banking outside of Yakima. Would like people involved with water (like local PUDs) to contact legislature representatives supporting this. Water bank/exchange is a means of allocating water from existing water rights. Rule will set framework for making future water allocating decisions. It will protect current level of instream flows. After the effective date of the Rule, the Rule will affect new water rights, not existing ones. Representatives Lynn Kessler and Kevin Van De Wege both are interested in the Quilicene/Snow Rule progress and WDOE representatives have met with Senator James Hargrove recently on the Rule.
- Basic flow recommendations come from watershed plans. Winter and spring high flows may be diverted for storage or for aquifer recharge to protect hydrologic cycle and fish needs during low flow times.
- Using grant money, the County has hired Washington Water Trust, which has partnered with economist from Deschutes, Oregon who has marketing expertise on moving water around. Currently working on strategies. The "who" and "how" of the water administration has not been determined yet. Will develop a simple process for landowner to come to County office for water. There will be a big shift as people will have to come to County and pay for mitigation for water. Mike Kitz asked what it would cost for a single family to buy into water mitigation process. Cynthia didn't know what it would be here exactly, but in Walla Walla the waterbank charges a one-time fee of about $2,000 at the time the building permit is issued. Transaction is a large part of the cost.
- Also looking for ideas on incentives for people to be more efficient with water use, especially reducing use during critical, low-flow periods. Discussion began on cluster development and LID (low-impact development) practices to improve water use efficiencies. John Cambalik suggested the County adopt the LID standard and ordinances that were provided last year.
- Cynthia invited anyone with questions to contact her.

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VI. Water Quality & Water Quantity, Instream/ Habitat & Education/ Outreach Sub-committee prioritized Recommendations – Hannah Merrill (Clallam County)

- Hannah Merrill asked the team to table this for this meeting, Ron Kaufmann has been attempting to get feedback on prioritizations from various committee members, Ron will continue those efforts and will work with Hannah on consolidating that.

VII. Brief Announcements – John Cambalik (Puget Sound Partnership)

- Realizing people may not have the time to read the entire Action Agenda that has been prepared (and is on the PSP website, http://www.psp.wa.gov/); John copied and distributed sections of the action agenda for EMMT member's focus. He briefly reviewed:
  - Action Agenda – Section A.3 deals with water quantity – John suggested cross-checking with EMMT watershed plan.
  - Priority C: Reduce the sources of water pollution (includes stormwater actions).
  - Section E deals with how to better work together.
  - Section E 3 deals with bi-annual Science Workplan. Ecosystem Conference is coming up in February.
  - John suggested looking at Question 4: Where do we start? To consider how to prioritize EMMT's plan.
  - Large, double-sided handout on specific action areas included columns: "Ecosystem benefits provided by action area / Local threats to ecosystem benefits / Priority action area strategies". (Chart included columns for Strait of Juan de Fuca Action Area and the Hood Canal Action Area.
- Puget Sound Partnership has created a non-profit completely separate from the PSP. Have hired a lobbyist and Director. Goal is to seek funding from non-traditional sources.
- Implementation plan will depend on what funding is available.
- Entire Action Agenda is downloadable at: http://www.psp.wa.gov/aa_action_agenda.php (or Google: Puget Sound Partnership).
- Gary Gleason brought up updating the saltwater management plan. John answered that the Shoreline Master Plan is scheduled for 2011; usually it is a two to three-year process. There are funds to update at the local level. Recommended that the City and County work together on this in this financial climate of budget cuts.
- Hannah Merrill, Mike Langley, and representatives from the North Olympic Salmon Coalition attended a meeting yesterday and discussed, among other items, that the first tier of cuts for WDFW is the Watershed Steward Program. Michael Blanton is the steward for this and other watershed areas. Hannah suggested writing a letter of support (from individuals and from EMMT as a group) for this program, she will send out a draft letter of support from EMMT via e-mail.
- Other announcements: LID Conference February 4th, ECONET is on January 28th (for more information: http://www.psp.wa.gov/econet.php), next EMMT meeting is 2/26.

Meeting Adjourned at 5:00 P.M.

Handouts:

- "City of Port Angeles Port Angeles stormwater management plan" – handout from Terri Partch, for comments, ideas, concerns, and other input.
- "Green Scaping – the Easy Way to a Greener Healthier Yard, EPA" – flyer from Terri Partch used at public outreach events.
- "Land Uses, Generating Sites, & Activities that may produce illicit discharge" – handout from Terri Partch used at public outreach events.
- From John Cambalik: handouts from the action agenda: "Priority C: Reduce the sources of water pollution"; "Question 4: Where do we start?"; "A.3 Protect and conserve freshwater resources to increase and sustain water availability for instream and human uses"; "E.3 Continually improve the scientific basis for management actions in the Puget Sound through a comprehensive and prioritized regional science program"; and a large printout of "Hood Canal Action Area" and "Strait of Juan de Fuca Action Area" charts which included benefits, threats and priority strategies columns.

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Clallam Conservation District

1601 E. Front Street Bldg A Suite A Port Angeles, WA 98362 (360) 452-1912 Fax (360) 452-5088

AGENDA
Regular Monthly Meeting
3:00 p.m. December 8, 2009
USDA Service Center
1601 E. Front St., Ste A, Port Angeles

3:00 CALL TO ORDER and AGENDA REVIEW

3:05 APPROVAL OF MINUTES: November 10 regular meeting

REPORTS

3:10 Staff Reports

3:45 USDA Reports
Natural Resources Conservation Service
Resource Conservation and Development Council

3:50 WSU Extension Report

3:55 Treasurer's Report

4:10 Announcements/Public Comment

OLD BUSINESS

4:15 Section 125 Cafeteria Plan Approval

4:20 WACD Resolutions and State Meeting Report
Washington Conservation District

4:30 Engineering Services Request for Qualifications

NEW BUSINESS

4:35 City of Port Angeles Stormwater Management Program - 14

5:00 Schedule 2010 Board of Supervisors Election

5:05 Cooperator Agreements:

Cost-Share Applications:

5:10 REVIEW OFFICIAL ACTIONS OF MEETING
ADJOURN

Upcoming Events:

City of Port Angeles

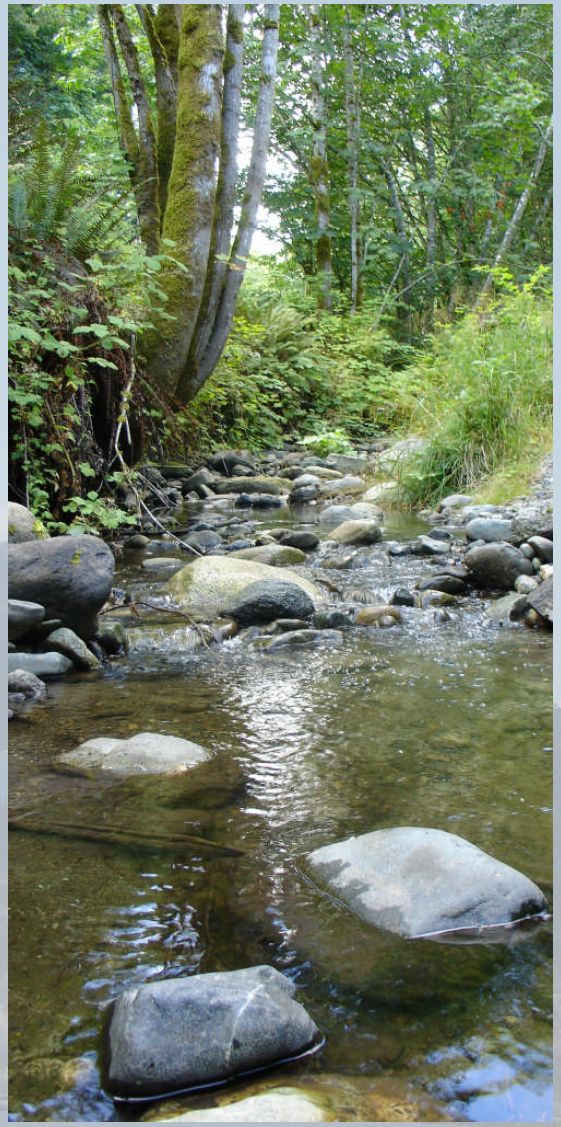
Stormwater Management Program Overview

to the Clallam County Conservation District

December 8, 2009

Stormwater Management Program (SWMP)

1. Public Education & Outreach
2. Public Involvement and Participation
3. Illicit Discharge Elimination
4. Development Runoff Control
5. Operations & Maintenance



2009-2010 Public Education and Outreach / Public Involvement

- Presentations at the Land Development Workshop and Low Impact Land Development Seminar
- Public meetings regarding the stormwater ordinances and their effect
- KONP Home Show, Clallam County Fair
- Utility bill flier covering Illicit Discharge program for homeowners
- Attended training on education and outreach with social media

2009 -2010 Illicit Discharge Elimination

- Continued monitoring and responding to reports of illicit discharges on the stormwater hotline (417-4830) and stormwater email stormwater@cityofpa.us
- Passed ordinance making non-stormwater discharges illegal and setting up an enforcement system
- Utility bill flier
- Trained City crews on identification, tracing and elimination. (More training due 2/15/2010).
- Full program implementation due August 19, 2011

2009-2010 Development Runoff Control

Passed ordinance with new requirements for developments and redevelopments over an acre.

New Requirements for Sites that Disturb 1 Acre or More

- Development of Stormwater Site Plan and Permanent Stormwater Control Plan
- Preparation of a Construction Stormwater Pollution Prevention Plan (SWPPP)
- Source control Best Management Practices (BMPs) must be applied
- Stormwater must be managed on site, unless the developer can show that flooding or erosion will occur

Highlights of the PAMC Revisions

New Requirements for Sites that Disturb **1 Acre or More - Continued**

- Runoff Treatment (four levels – basic, enhanced, oil and phosphorous)
- Flow Control – flow off the site must be limited to flow from the site in a forested condition (exception for some redevelopment)
- Wetland Protection – Discharges to wetlands must maintain the existing hydrologic conditions, hydrophytic vegetation and substrate characteristics
- All new treatment and flow control facilities must be maintained to the DOE standards and schedule

Highlights of the PAMC Revisions

Requirements for Sites that
Disturb **Less Than 1 Acre:**

- Preparation of a plans for both temporary and permanent measures to control stormwater
- Flow control for projects that will cause the capacity of the downstream pipe system to be exceeded
- If it is in the best interest of the public, runoff treatment may be required.
- Maintenance schedule for all permitted flow control and treatment facilities to include maintenance activities, schedule and person responsible. Schedule must be recorded with the plat

Highlights of the PAMC Revisions

Incentive Program for Projects which Disturb Less than 1 acre

Developer/owner does two of the following:

- Implements roof downspout controls
- Mitigates for 10% of the pollution generating impervious surface on the site by installing flow dispersion BMPs, preserving natural vegetation or by installing LID techniques.
- Developer amends the soil as recommended in BMP - T5.13 to absorb potential runoff

The City would then reduce the stormwater fee for the site by 25%, per year

2009 - 2010 Private Operations and Maintenance

Stormwater ordinance passed June 16th includes private O&M requirements. The City must:

- Clearly identify the party responsible for maintenance
- Require regular inspection of private facilities to DOE standards
- Use enforcement procedures as necessary

2009-2010 Operation and Maintenance for Public Stormwater Facilities

- DOE maintenance standards were adopted
- Two new stormwater utility workers were hired
- Implement full public O&M requirement by February 15, 2010. The City must:
  - Annually inspect all stormwater treatment and flow control facilities
  - Spot check all flow control facilities after major (3.3 inches of rainfall in 24 hours) storms
  - Document the City's inspection and maintenance program

Operation and Maintenance Program Requirements for Public Stormwater Facilities -Continued

- Reduce stormwater impacts from all City maintenance operations
- Reduce pollutants from all City owned or maintained lands
- Train City employees on how their job impacts stormwater quality and how to select BMPs to reduce or eliminate impacts
- Develop SWPPPs for all City owned maintenance or industrial yards-complete

General SWMP Program Requirements

- Develop program to receive public comments on SWMP
- SWMP annual update
- Annual report to Ecology

catch basin label

silt fence for 8th St Bridges project

Questions & Comments

Clallam Conservation District
1601 E. Front Street Bldg A Suite A Port Angeles, WA 98362 (360) 452-1912 Fax (360) 452-5088

MINUTES
Regular Monthly Meeting December 8, 2009

Supervisors Present: Donald Hatler, Nash Huber, Joe Murray, Marilyn Pollock, Ben Smith
Associate Supervisors Present: Karen Larsen
Staff Present: Joe Holtrop, District Manager; Meghan Adamire, Jennifer Coyle-Bond, Gary Dougherty; Conservation Planners; Sarah Mylchreest, Administrative Assistant
Others Present: Terri Partch, City of Port Angeles, Derek Rocket, Department of Ecology, Ken Hobson, citizen

Joe Murray called the meeting to order at 3:06 PM.

Approval of Minutes

Nash Huber moved to approve the minutes from the November 10, 2009 meeting. Don Hatler seconded. Motion approved.

REPORTS

Staff Reports

Jennifer Coyle-Bond – Jennifer continued working on website redesign. She provided technical assistance for roof runoff/water harvesting for the Clark farm (large barn). Also conducted site visits for Kirkby Roseveare (Matriotti Cr. buffer planting/BMPs), Josh & Erika Steffan (farm plan update, manure storage, also managing 400+ acres of hay in Sequim area), and Bruce Aitkens (Brooklyn Ln. wetland/farm BMPs).

Gary Dougherty – Website, a few site visits with people on stormwater management issues, helping Carol Creasy with County stormwater consultant selection. Carrie Blake soccer field proposal, DOE grant didn't look very feasible due to grant match and the low amount the City of Sequim had to offer. Carrie Blake Park can't have a gravel parking lot due to the City's commercial development standards. NAWCA Lake Farm grant was terminated - good news is that the grant funds we spent (~$2000) won't have to be returned. Meetings with city of Sequim, looking at adopting LID in Sequim. Goodman Creek is held up for awhile until things dry up.

Meghan Adamire – Meghan Adamire reported that she finished Conservation Reserve Enhancement Program (CREP) conservation plans for Genny Dean and Conrad and Leslie Eaton and will be taking them to the Farm Service Agency meeting on Thursday for final approval. Meghan also reported that Joanna McLean has had some beaver damage on her CREP project, Meghan is pursuing different options to protect the CREP trees. Meghan will be meeting with the McCarter family next week to discuss enrolling about eight acres of their property along Meadowbrook Creek into CREP and removing a failing undersized culvert.

Joe Holtrop – prepared website organizational concepts and content outline. Dungeness Irrigation project is out to bid. The bid opening will be on December 15, 2009. Contractors may have difficulty in meeting the performance bid if they are chosen for both projects. Jay Peterson suggests that bids be opened 2 hours apart to give contractors the option to not submit their second bid. Letters of support were written for grant proposals for the County: one for alternative to on-site septics feasibility study in Dungeness, one for LID demonstration project at the courthouse. Attended meetings of the Dike Setback and Dungeness Instream Flow committees.

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United States Department of Agriculture (USDA) Reports – Report from Jim Poffel: there have been changes to the EQIP program that will make it more difficult for Clallam County producers to get funding. There will not be geographic pools for funding. Instead, a separate pool of funding will be created for small farms (<41 acres).

WSU Extension report – none

Treasurer's Report

Ben Smith moved to approve the November 2009 financial report as presented. Marilyn Pollock seconded. Motion approved.

Announcements/Public Comment – Ken Hobson introduced himself. He is new to the area. He previously worked at the Lincoln Conservation District in Oregon.
Derek Rocket, Nonpoint Water Quality Enforcement officer with the Department of Ecology offered his assistance.

OLD BUSINESS

Section 125 Cafeteria Plan – Sarah Mylchreest reported that the Section 125 Cafeteria Plan documents have been purchased from Core Documents. Sarah made the necessary changes in QuickBooks to implement the plan starting January 1, 2010. Duane Wolfe, CPA, reviewed the plan and the procedures with Sarah. The Board has the option to amend the plan to include a 2 ½ month grace period at the end of each plan year. Employees who have not used up their Flexible Spending plan amounts during the calendar year would have the additional grace period.

Nash Huber moved to approve adoption of the Section 125 Cafeteria Plan effective January 1, 2010. Marilyn Pollock seconded. Motion approved.

Don Hatler moved to amend the Section 125 plan to include a 2 ½ month grace period. Ben Smith seconded. Motion approved.

(See Section 125 Resolution and Amendment to Section 125 attached.)

WACD Annual Meeting Report – Joe Holtrop, Don Hatler, and Marilyn Pollock attended the WACD annual meeting in Spokane. Both of Clallam Conservation District's resolutions passed.

Engineering Services Request for Qualifications – Joe Holtrop reported that he is working on the request for qualifications and also the plan of work and budget for 2010. He will send drafts out prior to the next Board meeting.

NEW BUSINESS

Presentation by Terri Partch, City of Port Angeles Civil Engineer – Terri reported on the requirements for the City of Port Angeles's Phase II Stormwater permit, including public education and outreach. She explained what the City is doing to fulfill requirements of the permit and asked for Clallam Conservation District's input.

Schedule for 2010 Board of Supervisors Election – The Washington State Conservation Commission requests that elections be held on February 9 or March 2, 2010 in order to see whether common election dates will increase voter participation. There was uncertainty whether the dates chosen would be changed by the Commission.

Ben Smith moved to hold the Board of Supervisors election on March 2 providing Washington State Conservation Commission does not choose a different date, in which case we will hold the election on that date. The election will be held from 3-7 p.m. at locations to be announced in Sequim and Port Angeles. Marilyn Pollock seconded. Motion approved.

Don Halter moved to appoint Sarah Mylchreest as Election Officer. Nash Huber seconded. Motion approved.

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Cooperator Agreements – none
Cost Share Applications – none

Meeting adjourned at 5:35 pm.

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Attachment E

Stormwater Management Program - Public Comments

ELWHA-MORSE MANAGEMENT TEAM MEETING

January 22, 2009

Notes prepared by: **Melissa Coughlin**

Public comments are highlighted

In Attendance:

Hannah Merrill, Clallam County N.R. Planner
Cathy Lear, Clallam County Planning Biologist
Kathryn Neal, City of Port Angeles
Scott Johns, City of Port Angeles
Matthew Beirne, Lower Elwha Klallam Tribe
Cynthia Nelson, WA Dept. of Ecology (via telephone)
Mike Kitz, PUD
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Mike Langley, Sunland Water District
Gary Gleason, CCPC
Gary Dougherty, CCD
Melissa Coughlin, Independent Contractor

3:00 P.M. Meeting Began

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- Introductions all around, review of last meeting's notes to take place after Terri Partch's presentation.

II. Announcements

- Moved to later in the meeting as time allows.

III. City of Port Angeles Stormwater Management Plan – Terri Partch (Stormwater Manager/Engineer for the City of Port Angeles)

- The City of Port Angeles received the *National Pollutant Discharge Eilimination System* (NPDES) permit in February, 2007. The Stormwater Management Plan is the City's response to the requirements of the permit. Implementation of the plan controls stormwater (from a flow perspective as well as illicit discharge detection).
- Three new ordinances related to clean stormwater will be in place by August 15, 2009.
- Terri passed out copies of the City's Stormwater Plan for feedback from EMMT members.
- There are five basic elements of the plan:
    - Public Education & Outreach
    - Public Involvement & Participation – currently trying to get people's input on the plan.
    - Illicit Discharge Elimination – connections to stormdrain that shouldn't be there.
    - Development Runoff Control: very strict control of all stormwater runoff from all development sites, (redevelopment & new construction).
    - Operations & Maintenance: Best management practices for private and public facilities will be reviewed.
- **Public Education & Outreach**: Four target audiences: (1) General Public; (2) Homebased and Mobile Businesses; (3) Homeowners, Landscapers and Property Owners; (4) Engineers, Contractors, Developers, City Government Review Staff, and Land Use Planners.
- **Public Involvement & Participation**: Events attended & information distributed in 2008 and planned for 2009: KONP Home show; Clallam County Fair; North Olympic Land Trust Streamfest; Utility Bill Mailer; Ordinance Target Audience Meetings.
- Goal through targeting different groups is to increase awareness of best stormwater practices, especially with regard to pesticide use, washing cars on impervious surfaces (which will actually be illegal as defined by new ordinances,) and other behaviors that negatively impact runoff. Hotline to alert staff of breach of ordinances will be established.
- **Illicit Discharge Detection and Elimination (IDDE) Program**: Mapping; Ordinance preventing illegal/illicit discharges to the stormwater system; Program requirements to support the ordinance; Public education; Program evaluation and assessment / Annual report; Staff training requirements.
- IDDE ordinance must prohibit the following discharges *unless* certain conditions are met: waterline and fire hydrant flushing, watering lawns, swimming and hot tub discharge, street and sidewalk wash water, anything that could harm creek (herbicides, pesticides, chlorine, and detergents).
- EMMT members discussed possible conditions which would meet standards for some practices (e.g. vitamin C and ultraviolet treatments for pools prior to discharge).
- IDDE Program Requirements to Support the Ordinance: Adopt "Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and Technical Assessments", Center for Watershed Protection, October 2004; Develop procedures, handbooks and forms for City field crews to help characterize, trace and remove sources of illicit discharge; Train City field crews to identify and remove illicit discharges.
- Runoff Control from New Development, Redevelopment, and Public and Private Construction Sites: Ordinance to reduce pollutants in runoff from any site disturbance one acre or greater; New Permitting, Plan Review, Inspection and Enforcement Process to support the ordinance: Keep records of inspections and enforcement actions; Make

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available WDOE permit forms, i.e. NOI forms; Staff Training Requirements: Implement a training program for all staff responsible for permitting, plan review, construction site inspections and enforcement

- Construction Site Runoff Ordinance: The ordinance must include: The minimum requirements, technical thresholds and definitions in Appendix 1 of the Permit; A site planning process, BMP selection and design criteria that will protect water quality to the Maximum Extent Practicable (MEP) Option: Adopt 2005 WDOE Stormwater manual or develop an equivalent manual: Give the City the legal authority to inspect private stormwater facilities; Provisions which allow Low Impact Development (LID) techniques; Evaluate and adopt enforcement measures.
- Gary Gleason was concerned about the ability to adopt certain sections of the WDOE 2005 Stormwater Manual. Terri knew about the discussions where the City had shown unwillingness to adopt. The permit requires adoption of the manual or an equivalent manual – which will have to be demonstrated to be equivalent. Gary Gleason said that Barbara Kitchens and crew (professional lobbyists) were involved; County will attempt to come up with stormwater manual with EPA grant funds (received by the Conservation District) to work on manual. This item is on the workplan for 2008. He asked what coordination is happening with County programs. Terri said the Streamkeepers data is useful to support the effectiveness of program – about the extent of City & County coordination. All agreed there was a communication problem. Minimum requirements and definitions are 60-70% of the manual.
- Robbie Mantooth asked if pharmaceutical pollution is addressed in program. Terri said it is under requirements in providing stormwater treatment. There is a matrix for what (and under what) conditions and which items, some of the BMPs (Best Management Practices) may help, but pharmaceuticals aren't specifically listed as pollutant of concern- infiltration may help remove some. Scott Johns thought that was a wastewater, not stormwater issue. Kathryn Neal mentioned that pharmaceutical pollution is a topic brought up in every public meeting, falls under different set of treatment discussions. John Cambalik said it is also a landfill issue. Collection is easiest remedy (except those pharmaceuticals absorbed through the body and becomes bio-waste – may need to develop new technology to remove.
- **New Permitting, Plan review, Inspection and Enforcement Process**: Permitting must include the following elements:
    - Require and review a stormwater pollution prevention plan (SWPPP). Option: limited waiver option.
    - Inspect sites with a high potential for erosion before clearing and grading.
    - Inspect sites during construction and upon completion of construction to verify proper installation of BMPs.
    - Keep records of the inspection program. Achieve 95% of all scheduled inspections.
    - Develop an enforcement strategy.
- **Operation and Maintenance Ordinance for Private Stormwater Facilities**: The ordinance must:
    - Clearly identify the party responsible for maintenance: Property owner; City maintenance crew; Developer impact fee (maintenance contracted by City).
    - Require regular inspection to WDOE standards.
    - Establish enforcement procedures.
- **Operation and Maintenance Program Requirements for Public Stormwater Facilities:** Establish maintenance standards by adopting Chapter 4, Volume 5 of the WDOE Manual; Develop a program to annually inspect all stormwater treatment and flow control facilities; Develop a program to spot check all flow control facilities after major storms (3.3 inches of rainfall in 24 hours); Document the City's inspection and maintenance program.
- **Operation and Maintenance Program Requirements for Public Stormwater Facilities**: Establish and implement practices to reduce stormwater impacts from all City maintenance operations; Establish and implement practices to reduce pollutants from all City owned or maintained lands; Train City employees on how their job impacts stormwater quality and how to select BMPs to reduce or eliminate impacts; Develop SWPPPs for all City owned maintenance or industrial yards (task complete). Annual and spot checks included. All in accordance to the WDOE manual. Each section relates to specific section of the permit.
- Eliminate mixing stormwater and sewage by 2015. Gary Gleason asked if the tank on the old Rayonier property would hold water for treatment for reuse. Terri said the tank will hold water for the wastewater treatment plant (in the event we have a lot of stormwater) which will be directed to treatment plant when flow becomes lower (so treatment plant can handle the volume) and be treated like any flow from City. Gary Gleason asked if there was any way the City of Port Angeles could reuse the stormwater instead of dumping into the salt chuck, since there is such a need for water to use in parks, street washing, etc. Kathryn Neal said that because the City is set on a hill, geographically it naturally delivers water to streams, artificial system (pipes) delivers to marine or sends to wastewater treatment. Not best setup to deliver stormwater inland. Best bet – distributed approach which treats stormwater on individual site. Gary Gleason wondered if there was a way to reuse stormwater on eastside instead of potable water from the Dungeness River. Gary suggested giving the stormwater presentation to the Planning Commission.

IV. Meeting Notes Review – All

- No corrections to EMMT meeting notes for November 20th, 2008.

Public comments received during Clallam Conservation District presentation, 12/8/2009

1. We should have product toxicity fliers at the points of sale (Walmart, Ariport Gardens, Costco, Gross's Nursery.
2. (Comment on the IDDE utility bill stuffer) Instead of telling perople what they shouldn't do, we should tell people what they should do. (offer solutions).
3. The Conservation District has lawn care recommendations fliers also.
4. The Conservation District is interested in LID standards. Gary Dourghty would like a copy of the Kitsap County builders manual.
5. The conservation District is interested in supporting program goals and message. What can we do together? We discussed an upcoming collaboration on a natural lawn care course to be held in April 2010.

Attachment F

City of Port Angeles Municipal Code, Chapter 13.63 Stormwater - Utility and Regulations

Chapter 13.63

STORMWATER - UTILITY AND REGULATIONS

Sections:

13.63.010 Purpose.
13.63.020 Incorporated by Reference.
13.63.030 Applicability.
13.63.040 Definitions.
13.63.050 Stormwater Utility Established.
13.63.060 Jurisdiction.
13.63.070 Operation and Management.
13.63.080 Transfer of Property.
13.63.090 Monthly Charge.
13.63.100 Rate Adjustment.
13.63.110 Billing and Payment.
13.63.120 Remedies for Failure to Pay Stormwater Service Fees.
13.63.130 Non-Stormwater, Illegal Discharges and Dumping Prohibited.
13.63.140 Illicit Connections and Uses.
13.63.150 Stormwater Discharge Into Sanitary Sewer System Prohibited.
13.63.160 Unpolluted Stormwater Discharge Shall Have Approved Outlet.
13.63.170 Review by Department of Community and Economic Development.
13.63.180 Stormwater Discharge Permits.
13.63.190 Stormwater Design and Construction Requirements.
13.63.200 Professional Engineer - When Required.
13.63.210 Off-site Analysis.
13.63.220 Geotechnical Analysis.
13.63.230 Soils Analysis.
13.63.240 Permit Modifications.
13.63.250 Erosion and Sedimentation Control.
13.63.260 Property Owner Responsible for Stormwater System Maintenance.
13.63.270 Maintenance Covenant Required for Privately Maintained Drainage Facilities.
13.63.280 City Inspections of Privately Maintained Stormwater Facilities.
13.63.290 City Acceptance of New Stormwater Facilities.
13.63.300 City Acceptance of Existing Stormwater Facilities.
13.63.310 Easements, Tracts and Covenants.
13.63.320 Extensions - When Required.
13.63.330 Extensions - Application.
13.63.340 Extensions - Preparation of Plans and Specifications.
13.63.350 Extensions - Inspection - Fee - Deposit Required.
13.63.360 Construction of Main Extensions.
13.63.370 Acceptance of Main Extensions.
13.63.380 Extensions - Construction Drawings.
13.63.390 Main Extensions Deeded to City.
13.63.400 Violations of This Chapter.
13.63.410 Inspection.
13.63.420 Inspection Procedures.
13.63.430 Test Procedures.
13.63.440 Stop Work Orders.
13.63.450 Cumulative Civil Penalty.

13.63.460 Aiding or Abetting.
13.63.470 Order to Maintain or Repair.
13.63.480 Notice of Violation - Assessment of Penalty.
13.63.490 Appeal and Disposition.
13.63.500 Liability for Costs of Investigation.
13.63.510 Collection of Civil Penalty.
13.63.520 Compromise Settlement and Disposition of Suits.
13.63.530 Hazards.

13.63.010 - Purpose. The purpose of this Chapter is to establish a storm and surface water management program and utility in order to accomplish the following goals:

A. Establish a stormwater capital facilities plan and small project funding program for projects which will:

1. protect property owners adjacent to developing and developed land from increased runoff rates, which could cause erosion of abutting property;

2. decrease drainage-related damage to public and private property;

3. maintain safe City streets and rights-of-way;

4. minimize water quality degradation and control of sedimentation of creeks, streams, ponds, and other water bodies; and

5. preserve and enhance the aesthetic quality of waters;

B. Promote sound development policies and construction procedures, which respect and preserve the City's watercourses; and

C. Provide public education, outreach, participation, and involvement in the protection of water quality.

D. Establish general rules and regulations for the service and extension of service from the stormwater system.

The storm and surface water management program shall consist of stormwater regulations and a stormwater utility, which shall be implemented and operated by the City's Department of Public Works and Utilities in accordance with standards established by the appropriate governmental entities with jurisdiction. (Ord. 3367§2, 8/15/2009)

13.63.020 - Incorporated by Reference. The City hereby incorporates the following documents into this Chapter:

A. The City of Port Angeles' Urban Services Standards and Guidelines adopted pursuant to Chapter 18.08 PAMC.

B. Chapters 3 and 4, Volume I, Appendices 1-C, 1-D and 1-E, Volume I; Chapters 3 and 4, Volume II, Volume III, Volume IV and Volume V of the Department of Ecology's 2005 Stormwater Management Manual for Western Washington, or most recent update.

C. Appendix I of the City of Port Angeles' Western Washington Phase II Municipal Stormwater Permit, issued in January of 2007, or the most recent update.

D. 2005 Low Impact Development Technical Guidance Manual for Puget Sound published by the Puget Sound Action Team, or the most recent update.

All of these documents are on file within the office of the City Engineer and can be viewed upon request. (Ord. 3367§2, 8/15/2009)

13.63.030 - Applicability. The provisions of this chapter shall apply to all direct and indirect connections to the City's stormwater system, including direct outfalls to the City's streams or marine waters. (Ord. 3367§2, 8/15/2009)

13.63.040 - Definitions. The following definitions shall apply to this Chapter:

A. AKART - All Known, Available, and Reasonable methods of prevention, control, and Treatment.

B. Arterial - PRINCIPAL ARTERIALS: Principal arterials provide service for principal traffic movements within the City. They serve centers of activity; intra-area travel between Port Angeles and other large communities and between principal trip generators. Principal arterials serve the longest trips and carry the principal portion of trips entering and leaving the overall area. Typically they are the highest traffic volume corridors in the City. The design year ADT is approximately 5,000 to 30,000 vehicles per day or more. They frequently carry important intra-urban as well as intercity bus routes.

The spacing of principal arterials usually varies from about 1 mile in highly developed business areas to 5 miles or more in rural areas. Service to abutting land should be subordinate to the provisions of travel service to principal traffic movements; this service should be incidental to the primary functional responsibility of the street. Desirably it is located on community and neighborhood boundaries or adjacent to but not through principal shopping centers, parks, and other homogeneous areas.

MINOR ARTERIALS: Minor arterials interconnect with and augment the principal arterial system. Minor arterials connect principal arterials to collector arterials and small generators. They provide medium size trip generators, such as less intensive commercial development, high schools and some junior high/grade schools, warehousing areas, active parks and ballfields, and other land uses with similar trip generation potential. They distribute travel to smaller geographic areas and communities than those identified with the principal arterial system. They provide service for trips of moderate length of a somewhat lower level of travel mobility than principal arterials. The design year ADT is approximately 2,500 to 15,000.

COLLECTOR ARTERIALS: Collector arterials provide both land access service and traffic circulation within residential neighborhoods and commercial and industrial areas. It differs from the arterial system in that facilities on the collector system may penetrate residential neighborhoods, distributing trips from the arterials through the areas to their ultimate destinations. The collector also collects traffic from local streets in residential neighborhoods and channels it onto minor and principal arterials. The collector arterial street may also carry local bus routes.

C. Best Management Practices (BMPs)- mean schedules of activities, prohibitions of practices, general good housekeeping practices, pollution prevention and educational practices, maintenance procedures, and structural or managerial practices to prevent or reduce the discharge of pollutants directly or indirectly to stormwater, receiving waters, or stormwater conveyance systems. BMPs also include treatment practices, operating procedures, and practices to control site runoff, spillage or leaks, sludge or water disposal, or drainage from raw materials storage.

D. Certified Erosion and Sediment Control Lead (CESCL) - means an individual who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by the Washington State Department of Ecology (see BMP C160 in the Stormwater Management Manual for Western Washington (2005)). A CESCL is knowledgeable in the principles and practices of erosion and sediment control. The CESCL must have the skills to assess site conditions and construction activities that could impact the quality of stormwater and, the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges. Certification is obtained through a Washington State Department of Ecology approved erosion and sediment control course. Course listings are provided online at Ecology's web site.

E. Clean Water Act - means the federal Water Pollution Control Act (33 USC Section 1251 et seq.), and any subsequent amendments thereto.

F. Commercial/Multiple Property - means all property zoned or used for multifamily, commercial, retail, public, government, non-profit and all other non-residential uses.

G. Director - means the City of Port Angeles Director of Public Works and Utilities or his or her designee.

H. Effective Impervious Surface - those impervious surfaces that are connected via sheet flow or discrete conveyance to a drainage system. Impervious surfaces on residential development sites are considered ineffective if the runoff is dispersed through at least one hundred feet of native vegetation in accordance with BMP T5 30 - "Full Dispersion," as described in Chapter 5 of Volume V of the Stormwater Management Manual for Western Washington (2005).

I. Ground Water - means water in a saturated zone or stratum beneath the surface of the land or below a surface water body.

J. Hazardous Materials - means any material, including any substance, waste, or combination thereof, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may cause, or significantly contribute to, a substantial present or potential hazard to human health, safety, property or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

K. Highway - a main public road connecting towns and cities.

L. Hyperchlorinated - means water that contains more than 10mg/liter chlorine.

M. Illicit Discharge - means any direct or indirect non-stormwater discharge to the City's stormwater system, except as expressly allowed by this chapter.

N. Illicit Connection - means any man-made conveyance that is connected to a municipal separate storm sewer without a permit, excluding roof drains and other similar type connections. Examples include sanitary sewer connections, floor drains, channels, pipelines, conduits, inlets, or outlets that are connected directly to the municipal separate storm sewer system.

O. Impervious Surface - a hard surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling.

P. Land Disturbing Activity - Any activity that results in movement of earth, or a change in the existing soil cover (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance practices are not considered land-disturbing activity.

Q. Maintenance - Repair and maintenance includes activities conducted on currently serviceable structures, facilities, and equipment that involves no expansion or use beyond that previously existing and results in no significant adverse hydrologic impact. It includes those usual activities taken to prevent a decline, lapse, or cessation in the use of structures and systems. Those usual activities may include replacement of dysfunctional facilities, including cases where environmental permits require replacing an existing structure with a different type structure, as long as the functioning characteristics of the original structure are not changed. One example is the replacement of a collapsed, fish blocking, round culvert with a new box culvert under the same span, or width, of roadway. See also Road Maintenance exemptions in Section 1 of the NPDES Appendix included in this chapter.

R. Municipal Separate Storm Sewer System (MS4) - means a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains): owned or operated by the City of Port Angeles:

1. Designed or used for collecting or conveying stormwater;

2. Which is not part of a Publicly Owned Treatment Works (POTW). "POTW" means any device or system used in treatment of municipal sewage or industrial wastes of a liquid nature which is publicly owned; and

3. Which is not a combined sewer. "Combined sewer" means a system that collects sanitary sewage and stormwater in a single sewer system.

S. National Pollutant Discharge Elimination System (NPDES) Stormwater Discharge Permit - means a permit issued by the Environmental Protection Agency (EPA) (or by the Washington Department of Ecology under authority delegated pursuant to 33 USC Section 1342(b)) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

T. Native Vegetation - Vegetation comprised of plant species, other than noxious weeds, that are indigenous to the coastal region of the Pacific Northwest and which reasonably could have been expected to naturally occur on the site. Examples include trees such as Douglas Fir, western hemlock, western red cedar, alder, big-leaf maple, and vine maple; shrubs such as willow, elderberry, salmonberry, and salal; and herbaceous plants such as sword fern, foam flower, and fireweed.

U. New Development - Land disturbing activities, including Class IV - general forest practices that are conversions from timber land to other uses; structural development, including construction or installation of a building or other structure; creation of impervious surfaces; and subdivision, short subdivision and binding site plans, as defined and applied in Chapter 58.17 RCW. Projects meeting the definition of redevelopment shall not be considered new development.

V. Non-stormwater discharge - means any discharge to the storm drain system that is not composed entirely of stormwater.

W. Person - means any individual, association, organization, partnership, firm, corporation or other entity recognized by law and acting as either the owner of a premises or as the owner's agent.

X. Pollutant - means anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; oil and other automotive fluids; nonhazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects and accumulations, so that same may cause or contribute to pollution; floatables (objects or substances which float); pesticides, herbicides, and fertilizers; hazardous substances and wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues that result from constructing a building or structure; and noxious or offensive matter of any kind.

Y. Pollution-Generating Impervious Surface (PGIS) - Those impervious surfaces considered to be a significant source of pollutants in stormwater runoff. Such surfaces include those which are subject to: vehicular use; industrial activities, or storage of erodible or leachable materials, wastes, or chemicals, and which receive direct rainfall or the run- on or blow-in of rainfall. Erodible or leachable materials, wastes, or chemicals are those substances which, when exposed to rainfall, measurably alter the physical or chemical characteristics of the rainfall runoff. Examples include erodible soils that are stockpiled, uncovered process wastes, manure, fertilizers, oily substances, ashes, kiln dust, and garbage dumpster leakage. Metal roofs are also considered to be PGIS unless they are coated with an inert, non-leachable material (e.g., baked-on enamel coating).

1. A surface, whether paved or not, shall be considered subject to vehicular use if it is regularly used by motor vehicles. The following are considered regularly-used surfaces: roads, unvegetated road shoulders, bike lanes within the traveled lane of a roadway, driveways, parking lots, unfenced fire lanes, vehicular equipment storage yards, and airport runways.

2. The following are not considered regularly-used surfaces: paved bicycle pathways separated from and not subject to drainage from roads for motor vehicles, fenced fire lanes, and infrequently used maintenance access roads.

Z. Pollution-Generating Pervious Surfaces (PGPS) - Any non-impervious surface subject to use of pesticides and fertilizers or loss of soil. Typical PGPS include lawns, landscaped areas, golf courses, parks, cemeteries, and sports fields.

AA. Pre-Developed Condition - The native vegetation and soils that existed at a site prior to the influence of Euro-American settlement. The pre-developed condition shall be assumed to be a forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to settlement.

BB. Premises - means any building, lot, parcel of land, or portion of land, whether improved or unimproved, including adjacent sidewalks and parking strips.

CC. Project Site - That portion of a property, properties, or right-of-way subject to land disturbing activities, new impervious surfaces, or replaced impervious surfaces.

DD. Receiving Waters - Bodies of water or surface water systems to which surface runoff is discharged via a point source of stormwater or via sheet flow.

EE. Redevelopment - On a site that is already substantially developed (i.e., has 35% or more of existing impervious surface coverage), the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities.

FF. Replaced Impervious Surface - For structures, the removal and replacement of any exterior impervious surfaces or foundation. For other impervious surfaces, the removal down to bare soil or base course and replacement.

GG. Single Family Property - means all property used for single family residential uses.

HH. Site - The area defined by the legal boundaries of a parcel or parcels of land that is (are) subject to new development or redevelopment. For road projects, the length of the project site and the right-of-way boundaries define the site.

II. Source Control BMP - A structure or operation that is intended to prevent pollutants from coming into contact with stormwater through physical separation of areas or careful management of activities that are sources of pollutants. The Department of Ecology's Stormwater Management Manual for Western Washington (2005) separates source control BMPs into two types. Structural Source Control BMPs are physical, structural, or mechanical devices, or facilities that are intended to prevent pollutants from entering stormwater. Operational BMPs are nonstructural practices that prevent or reduce pollutants from entering stormwater. For further examples or details, refer to the Department of Ecology's Volume IV of the Stormwater Management Manual for Western Washington (2005).

JJ. Stormwater - means runoff during and following precipitation and snowmelt events, including surface runoff and drainage.

KK. Stormwater Pollution Prevention Plan (SWPPP) - means a document which describes the best management practices and activities to be implemented by a person to identify sources of pollution or contamination at a premises and the actions to eliminate or reduce pollutant discharges to stormwater, stormwater conveyance systems, and/or receiving waters to the maximum extent practicable.

LL. Stormwater System - means all natural and manmade systems which function together or independently to collect, store, purify, discharge and convey stormwater. Included are all stormwater facilities as well as natural systems such as streams and creeks and all natural systems which convey, store, infiltrate or divert stormwater.

MM. Threshold Discharge Area - An onsite area draining to a single natural discharge location or multiple natural discharge locations that combine within one-quarter mile downstream (as determined by the shortest flowpath). The examples in Figure 2.1 below illustrate this definition. The purpose of this definition is to clarify how the thresholds of the stormwater requirements are applied to project sites with multiple discharge points.

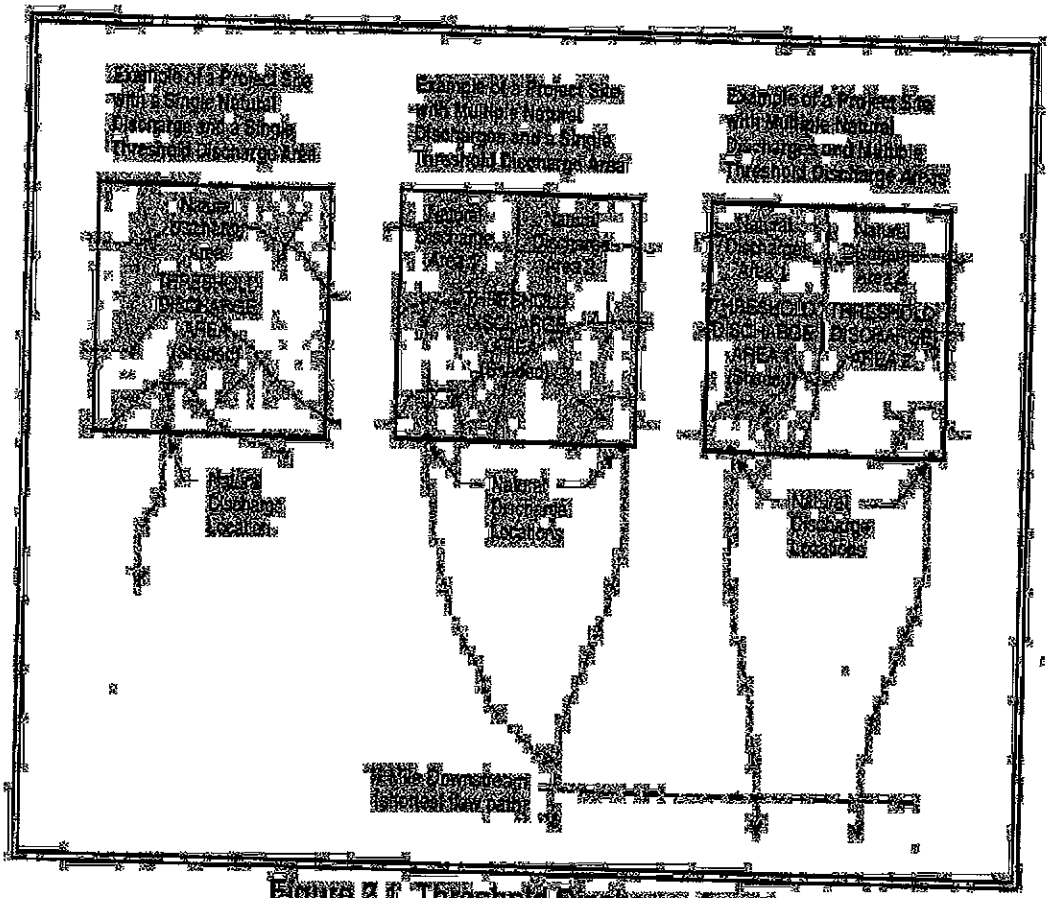

Figure 2.1 Threshold Discharge Areas

NN. Wetland - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands. (Ord. 3367§2, 8/15/2009)

13.63.050 - Stormwater Utility Established. There is hereby created and established a storm and surface water utility (also referred to as the "stormwater utility"). The stormwater utility shall be administered under direction of the Director of Public Works and Utilities. The stormwater utility shall perform the functions, and have the authority, as set forth in Chapter 35.67 RCW and in this Chapter for managing, regulating, and controlling the City's stormwater management program. (Ord. 3367§2, 8/15/2009)

13.63.060 - Jurisdiction. The City shall have jurisdiction over all storm and surface water facilities within the City's boundaries. No modifications or additions shall be made to the City's storm and surface water facilities without the prior approval of the City. (Ord. 3367§2, 8/15/2009)

13.63.070 - Operation and Management. The stormwater utility shall be managed and operated in accordance with applicable sections of the City's Western Washington Phase II Municipal Stormwater Permit, the City's Urban Services Standards and Guidelines and PAMC 13.63. (Ord. 3367§2, 8/15/2009)

13.63.080 - Transfer of Property. All equipment, properties, and property rights and interests owned or held by the City, however acquired, insofar as they relate to or concern storm or surface water sewage, are hereby transferred to the stormwater utility. This includes by way of example and not limitation, all properties and property rights and interests acquired by adverse possession or by prescription in and to the drainage and storage of storm or surface waters over and under lands, watercourses, streams, ponds and sloughs to the full extent of inundation caused by the largest storm or flood condition. (Ord. 3367§2, 8/15/2009)

13.63.090 - Monthly Charge.

A. Effective January 1, 2008, the owners of all real property in the City containing impervious surfaces shall pay a monthly stormwater utility charge at the rate as set forth in this Section.

B. Single-family and duplex residential fees. The monthly stormwater utility charge for each single-family and duplex residential property shall be $ 6.00.

C. The monthly stormwater utility charge for all commercial/multiple property shall be calculated by dividing the total impervious area in square feet by 4000 square feet, times the single family and duplex residential fee. The minimum monthly fee for a commercial/multiple property shall be not less than the monthly fee for a single-family dwelling, and the maximum monthly fee shall be not more than ten times the monthly fee for a single-family dwelling.

D. City streets, State highways, private streets with storm and surface facilities in place meeting City standards, and other public or private owned properties or portions thereof having their own NPDES permitted storm and surface water runoff facilities which do not discharge to City facilities shall be exempt from the monthly charges set forth in this Section. (Ord. 3367§2, 8/15/2009)

13.63.100 - Rate Adjustment.

A. Stormwater utility fees will be reduced by 25% for existing sites, new development or redevelopment projects that meet the following conditions:

1. Overall project disturbance is less than one acre.

2. Project proponent implements two of the following:

a. Roof Downspout Controls as described in Chapter 3, Volume III of the most recent edition of the Department of Ecology's Stormwater Management manual for Western Washington (DOE Manual).

b. Installation of BMPs or LID techniques to mitigate for impervious area equal to at least 10% of the site/lot. Specific BMPs and LID techniques are described in Chapter 5, Section 5.05.03 of the City's Urban Services Standards and Guidelines.

c. Amend the Soil as recommended in BMP T5.13 in the DOE manual in all disturbed areas not covered by new improvements.

3. Best Management Practices (BMPs) listed above must be designed in accordance with the DOE Manual.

4. LID Techniques must be designed in accordance with the most recent version of the Low Impact Development Technical Guidance Manual for Puget Sound.

5. BMPs and LID facilities must be maintained by the property owner and continue to function as they were designed.

B. A property owner may request a rate adjustment to the monthly charge set forth in PAMC 13.63.100, only if the property contains no impervious surfaces or if the property owner disagrees with the City's calculations of the rate, or the amount of impervious area used by the City in calculating the rate, under PAMC 13.63.100C. A request for an adjustment shall be submitted in writing to the Director of Public Works and Utilities. If the property contains no impervious surfaces, the rate shall be adjusted to zero. If the City's calculations or amount of impervious surfaces under PAMC 13.63.100C is incorrect, the rate shall be adjusted accordingly. Approved adjustments will be applied prospectively except that reimbursement for overcharges paid by the property owner will be made by the City for the year during which the adjustment is requested and for the prior year.

C. Any person aggrieved by a decision of the Director of Public Works and Utilities relating to a request for a rate adjustment authorized by PAMC 13.63.110 may appeal the Director's decision to the City Manager within 30 days of the date of the Director's decision. The City Manager's decision shall be final. (Ord. 3367§2, 8/15/2009)

13.63.110 - Billing and Payment. Stormwater utility fees shall be billed annually by Clallam County on behalf of the City in conjunction with the County's property tax bill. Discounts for low-income senior citizens and disabled citizens will be applied in accordance with Chapter 13.20 PAMC. Stormwater utility fees billed pursuant to this Section shall be due and payable semiannually on the same dates each year that the County's property tax bill is due and payable and shall be delinquent if not paid by the due date. All delinquent accounts billed pursuant to this Section will be subject to penalty charges the same as those imposed for delinquent property taxes. (Ord. 3367§2, 8/15/2009)

13.63.120 - Remedies for Failure to Pay Stormwater Service Fees.

A. Termination of water service. The Director of Public Works and Utilities or designee is authorized to terminate water service to any property owner, unless said water service is received by a residential tenant, who fails to pay the stormwater utility service fees imposed by this Chapter. Termination of such water service shall not limit other remedies available to the City.

B. Lien for delinquent charges - Interest. Pursuant to RCW 35.67.200 et seq. The City shall have a lien for delinquent and unpaid stormwater charges. A stormwater lien shall be effective for one year without the necessity of any writing or recording of the lien with the County Auditor. Enforcement and foreclosure of any stormwater lien shall be in the manner provided by state law. Interest on the unpaid balance shall be eight percent per annum or such rate as may hereafter be authorized by law.

C. Other remedies. The City shall have all other legally available remedies for enforcing and collecting delinquent and unpaid stormwater charges. (Ord. 3367§2, 8/15/2009)

13.63.130 - Non-Stormwater, Illegal Discharges and Dumping Prohibited.

A. Except as provided in subsections B and C below, no person shall throw, drain or otherwise discharge, cause or allow others under it's control to throw, drain or otherwise discharge into the stormwater system any materials other than stormwater.

B. The following discharges into the stormwater system are prohibited, unless the stated conditions are met:

1. Discharges from potable water sources, including waterline flushing, hyperchlorinated waterline flushing, fire hydrant system flushing and pipeline hydrostatic test water. Planned discharges shall be dechlorinated to a concentration of 0.1 ppm or less, pH adjusted, if necessary (to meet water quality standards), and volumetrically and velocity controlled to prevent resuspension of sediments in the MS4.

2. Discharges from lawn watering and other irrigation runoff shall be minimized.

3. Dechlorinated swimming pool discharges. The discharges shall be dechlorinated to a concentration of 0.1 ppm or less, pH adjusted and re-oxygenized, if necessary, and volumetrically and velocity controlled to prevent resuspension of sediments in the MS4 and the property owner has obtained a Stormwater Discharge Permit from the City. Swimming pool cleaning waste water and filter backwash shall not be discharged to the MS4.

4. Street and sidewalk wash water, water used to control dust, and routine external building wash down that does not use detergents. To avoid washing pollutants into the MS4, Permittee must minimize the amount of street wash and dust control water used. At active construction sites, street sweeping must be performed prior to washing the street.

5. Other non-stormwater discharges. The discharges shall be in compliance with the requirements of the stormwater pollution prevention plan reviewed by the City, which addresses such discharges.

6. Any discharges from a construction site. Discharges must be in conformance with the stormwater pollution prevention plan (SWPPP) reviewed by the Permittee.

7. Combined sewer overflow (CSO) discharges. This discharge must be in conformance with a current National Pollution Discharge Elimination System Permit, approved by the Washington State Department of Ecology.

C. The following categories of non stormwater discharges are specifically allowed:

1. Diverted stream flows
2. Rising ground waters
3. Uncontaminated ground water infiltration (as defined at 40 CFR 35 2005(20)).
4. Uncontaminated pumped ground water
5. Foundation drains
6. Air conditioning condensation
7. Irrigation water from agricultural sources that is commingled with urban stormwater
8. Springs
9. Water from crawl space pumps
10. Footing drains
11. Flows from riparian habitats and wetlands
12. Non-stormwater discharges covered by another NPDES permit
13. Discharges from emergency fire fighting activities in accordance with the City of Port Angeles' Stormwater NPDES Permit Section S2 Authorized Discharges. The City's Stormwater NPDES Permit is available to view in the office of the City Engineer. (Ord. 3367§2, 8/15/2009)

13.63.140 - Illicit Connections and Uses.

A. The stormwater system of the City of Port Angeles, natural and artificial, may only be used to convey stormwater runoff, and any discharge meeting the permit conditions within a current National Pollutant Discharge Elimination System Permit, approved by the Washington State Department of Ecology.

B. Except as provided in the preceding paragraph, no person shall use this system, directly or indirectly, to dispose of any solid or liquid matter other than stormwater. No person shall make or allow any connection to the stormwater system which could result in the discharge of polluting matter. Connections to the stormwater system from the interiors of structures are prohibited. Connections to the stormwater system for any purpose other than to convey stormwater or groundwater are prohibited and shall be eliminated. (Ord. 3367§2, 8/15/2009)

13.63.150 - Stormwater Discharge Into Sanitary Sewer System Prohibited.

A. No person shall discharge or cause to be discharged any stormwater, surface water, ground water, roof runoff, subsurface drainage, uncontaminated cooling water, or unpolluted industrial process waters into any sanitary sewer, unless otherwise approved by the Director based on lack of feasible alternatives or unless the discharge meets the condition outlined in 13.63.140 (A).

B. No person shall make connection of roof downspouts, exterior foundation drains, area drains, or other sources of stormwater surface runoff or groundwater to a building sewer or building drain which in turn is connected directly or indirectly to a public sanitary sewer, unless such connection is otherwise approved in writing by the Director based on lack of feasible alternatives or other appropriate factors. (Ord. 3367§2, 8/15/2009)

13.63.160 - Unpolluted Stormwater Discharge Shall Have Approved Outlet.

A. Stormwater shall be discharged to such sewers as are specifically designated as combined sewers or storm sewers, or to a natural outlet approved by the Director.

B. Storm drainage from hard-surfaced or graded areas, such as parking lots, service station yards, and storage yards, shall enter the public storm sewer system or other outlet approved by the Director and as required by this Chapter and as such facilities are available. Such storm drainage shall not be connected to or allowed to enter a sanitary sewer, unless otherwise approved in writing by the Director based on lack of feasible alternatives or other appropriate factors. (Ord. 3367§2, 8/15/2009)

13.63.170 - Review by Department of Community and Economic Development. Any proposed site development activities shall be reviewed by the City of Port Angeles Department of Community and Economic Development to determine the permits required. (Ord. 3367§2, 8/15/2009)

13.63.180 - Stormwater Discharge Permits. Stormwater Discharge Permits, issued by the City of Port Angeles Department of Public Works and Utilities, shall be required for any of the following activities:

A. Draining water from a chlorinated water source such as a swimming pool or hot tub.

B. Car washing which is not permitted as a commercial or industrial use, and which drains directly or indirectly to the City's stormwater system.

C. All new development or redevelopment which does not require a Building Permit, but which discharges stormwater either directly or indirectly to the City's stormwater system. (Ord. 3367§2, 8/15/2009)

13.63.190 - Stormwater Design and Construction Requirements.

A. All site development activities shall comply with the standards, specifications and requirements contained in the City of Port Angeles' Urban Services Standards and Guidelines.

B. For all site developments that disturb 1 acre or more, the City adopts and requires the use of the minimum requirements, thresholds and definitions defined in Appendix 1 of the City of Port Angeles' Western Washington Phase II Municipal Stormwater Permit.

C. For all site developments that disturb 1 acre or more or which require a stormwater treatment , flow control, or low impact development (LID) facility, the City adopts and requires the use of Chapters 3 and 4, Volume I, Appendices 1-C, 1-D and 1-E, Volume I, Chapters 3 and 4, Volume II, Volume III, Volume IV and Volume V of the Department of Ecology's 2005 Stormwater Management Manual for Western Washington, or most recent update.

D. Low Impact Development (LID) facilities are encouraged to improve water quality and aesthetics, as well as to reduce the size and cost of flow control and treatment facilities. LID facilities proposed in any site development shall be designed in accordance with the 2005 Low Impact Development Technical Guidance Manual for Puget Sound and shall take into account site and soil conditions, access and long term maintenance.

E. Stormwater Site Plans and Permanent Stormwater Control Plans in accordance with Chapters 3 and 4 of Volume I of the Department of Ecology's 2005 Stormwater Management Manual for Western Washington are required and will be reviewed by the City for all site development activities that disturb 1 acre or more.

F. Adjustments to the Minimum Requirements may be granted by the City provided that a written finding of fact is prepared which addresses the following issues:

1. The adjustment provides substantially equivalent environmental protection.

2. Based on sound engineering practices, the objectives of safety, function, environmental protection and facility maintenance are met.

G. Exceptions to the Minimum Requirements may be granted by the City following legal public notice of an application for an exception, legal public notice of the City's decision on the application, and written findings of fact that document the City's determination to grant an exception.

The City may grant an exception to the minimum requirements if such application imposes a severe and unexpected economic hardship. To determine whether the application imposes a severe and unexpected economic hardship on the project applicant, the exception applicant must consider and document with written findings of fact the following:

1. The current (pre-project) use of the site, and

2. How the application of the minimum requirement(s) restricts the proposed use of the site compared to the restrictions that existed prior to the adoption of the minimum requirements; and

3. The possible remaining uses of the site if the exception were not granted; and

4. The uses of the site that would have been allowed prior to the adoption of the minimum requirements; and

5. A comparison of the estimated amount and percentage of value loss as a result of the minimum requirements versus the estimated amount and percentage of value loss as a result of requirements that existed prior to adoption of the minimum requirements; and

6. The feasibility for the owner to alter the project to apply the minimum requirements. In addition, any exception must meet the following criteria:

a. The exception will not increase risk to the public health and welfare, nor be injurious to other properties in the vicinity or downstream of the project, or injurious to the quality of waters of the state; and

b. The exception is the least possible exception that could be granted to comply with the intent of the Minimum Requirements.

H. The Council shall establish fees for stormwater related inspections. Inspection fees shall be detailed in the PAMC 3.70.110. (Ord. 3367§2, 8/15/2009)

<u>13.63.200 - Professional Engineer – When Required</u>. Site development activities shall require the submittal of documents prepared by a qualified professional engineer when one of the following conditions exists:

A. Any land use or building or development on real property which disturbs 1 acre or greater;

B. Any land use or building or development on real property which requires a flow control, treatment or LID facility;

C. Any improvements within the boundaries of the City of Port Angeles right-of-way for which the City will ultimately assume responsibility for maintenance; or

D. Any site development activity that the Director deems to be in the public's best interest to require that certain site development activity permit application submittal documents be prepared by a professional civil engineer. (Ord. 3367§2, 8/15/2009)

13.63.210 - Off-site Analysis. All site development activities which disturb 1 acre or more shall include, along with other required submittal documents, an off-site drainage analysis as described in the City's Urban Services Standards and Guidelines Manual. The off-site analysis shall be prepared by a qualified professional engineer and based on a field investigation of the development's off-site contributing and receiving drainage areas. (Ord. 3367§2, 8/15/2009)

13.63.220 - Geotechnical Analysis. All site development activities where grading or the construction of retention facilities, detention facilities, infiltration facilities or other stormwater facilities are proposed on slopes greater than 15 %, within two hundred feet of slopes steeper than thirty percent, near a landslide area, near an Environmentally Sensitive Area, or where the Director deems that the proposed construction poses a potential hazard due to its proximity to a slope, shall, when required by the Director, include a geotechnical analysis, prepared by a qualified engineer. The geotechnical analysis shall address the effects of groundwater interception and infiltration, seepage, potential slip planes and changes in soil bearing strength. (Ord. 3367§2, 8/15/2009)

13.63.230 - Soils Analysis. All site development activities where infiltration facilities are proposed or where the soils underlying the proposed project have not been mapped, or where existing soils maps of the project site are inconsistent, or where the Director deems that existing soils maps of the project site are not of sufficient resolution to allow proper engineering analysis, shall include a soils investigation report. (Ord. 3367§2, 8/15/2009)

13.63.240 - Permit Modifications. Proposed modifications to an approved Permit must be submitted to the Department of Community and Economic Development and be reviewed for compliance with this chapter. Substantial proposed modifications, as determined by the Director, shall require additional review fees and shall require re-issuance of the required permit. Minor proposed modifications may be accepted by the Director without requiring the re-issuance of the accepted permit or the payment of additional review fees. (Ord. 3367§2, 8/15/2009)

13.63.250 - Erosion and Sedimentation Control.

A. All final drainage, grading, clearing or other site development activities requiring acceptance from the City of Port Angeles Department of Public Works and Utilities shall include a plan for the control of erosion and sedimentation as required in Chapter 6 of the City's Urban Service Standards and Guidelines Manual and in Chapter 15.28 of the Port Angeles Municipal Code for the period beginning with the commencement of site development activity and continuing without interruption until permanent site stabilization is achieved.

B. No clearing, grubbing, grading or other construction activity may take place on a project site until an erosion and sedimentation control plan has been approved by the Department of Public Works and Utilities. (Ord. 3367§2, 8/15/2009)

13.63.260 - Property Owner Responsible for Stormwater System Maintenance.

A. Any person or persons holding title to a property for which stormwater facilities and BMP's have been required by the City of Port Angeles shall be responsible for the continual operation, maintenance and repair of the stormwater facilities and BMP's in accordance with the provisions of this chapter.

B. For privately maintained stormwater facilities, the maintenance requirements specified in the Washington State Department of Ecology's 2005 Stormwater management Manual for Western Washington, Chapter 4, Volume V, shall be enforced against the owner(s) of the subject property served by the stormwater facility. (Ord. 3367§2, 8/15/2009)

13.63.270 - Maintenance Covenant Required for Privately Maintained Drainage Facilities.

A. Prior to the beneficial use of a project constructed under a City Building Permit or a Stormwater Discharge Permit, the owner shall record a maintenance covenant which guarantees the City of Port Angeles that the stormwater facilities shall be properly operated, maintained and inspected. The restrictions set forth in such covenant shall be included in any instrument of conveyance of the subject property and shall be recorded with the Clallam County Auditor.

B. Maintenance covenants shall remain in force for the life of the development, or until the responsibility for the operation and maintenance of the subject stormwater facilities is accepted by the City of Port Angeles.

C. Maintenance covenants shall include the maintenance standards specified by the Department of Ecology's 2005 Stormwater Management Manual for Western Washington, Chapter 4, Volume V, a list of maintenance activities and proposed inspection intervals for each element of the private stormwater system, and a guarantee that any maintenance necessary for any element of the stormwater system will be performed to the standards specified by the Department of Ecology's 2005 Stormwater Management Manual for Western Washington, Chapter 4, Volume V and within the following schedule:

1. Within 1 year for wet pool facilities and retention/detention ponds;
2. Within 6 months for typical maintenance;
3. Within 9 months for maintenance requiring re-vegetation;
4. Within two years for maintenance that requires capital construction of less than $25,000. (Ord. 3367§2, 8/15/2009)

13.63.280 - City Inspections of Privately Maintained Stormwater Facilities. The City is authorized to enter at all reasonable times in or upon any property, public or private, for the purpose of operating or maintaining the storm and surface water facilities, or to inspect or investigate any condition relating to the stormwater utility; provided, that the City shall first obtain permission to enter from the owner or person responsible for such premises. If entry is refused, the City shall have recourse to every remedy provided by law to secure entry. Notwithstanding the foregoing, whenever it appears to the City that conditions exist requiring immediate action to protect the public health or safety, the City is authorized to enter at all reasonable times in or upon any property, public or private, for the purpose of inspecting, investigating or correcting such emergency condition. (Ord. 3367§2, 8/15/2009)

13.63.290 - City Acceptance of New Stormwater Facilities. The City will accept for maintenance those new residential stormwater facilities constructed under an approved City Building Permit or Stormwater Discharge Permit that meet the following conditions:

A. Improvements in residential plats/PRD's have been completed on at least eighty percent of the lots, unless waived by the Director; and

B. All drainage facilities have been inspected and accepted by the Director and said drainage facilities have been in satisfactory operation for at least two years; and

C. All drainage facilities reconstructed during the maintenance period have been accepted by the Director; and

D. The stormwater facility, as designed and constructed, conforms to the provisions of this chapter; and

E. All easements and tracts required under this chapter, entitling the City to properly operate and maintain the subject drainage facility, have been conveyed to the City of Port Angeles and have been recorded with the Clallam County Auditor; and

F. For non-standard drainage facilities, an operation and maintenance manual, including a maintenance schedule, has been submitted to and accepted by the City of Port Angeles;

G. A complete and accurate set of reproducible mylar as-built drawings have been provided to the City of Port Angeles.

H. A maintenance fee will be assessed to cover the City's costs for maintenance of the stormwater facilities for the life of the development. The fee will be determined based on the complexity and maintenance requirements of the system and the City's labor and equipment costs. (Ord. 3367§2, 8/15/2009)

13.63.300 - City Acceptance of Existing Stormwater Facilities. The City of Port Angeles will accept for maintenance those stormwater facilities for residential developments existing prior to the effective date of the ordinance codified in this chapter that meet the following conditions:

A. Improvements in residential plats/PUD's have been completed on at least eighty percent of the lots; and

B. An inspection by the Director has determined that the stormwater facilities are functioning as designed; and

C. The stormwater facilities have had at least two years of satisfactory operation and maintenance, unless otherwise waived by the Director; and

D. The person or persons holding title to the properties served by the stormwater facilities submit a petition containing the signatures of the title holders of more than fifty percent of the lots served by the stormwater facilities requesting that the City maintain the stormwater facilities; and

E. All easements required under this chapter, entitling the City to properly operate and maintain the subject stormwater facilities, have been conveyed to the City of Port Angeles and have been recorded with the Clallam County Auditor; and

F. The person or persons holding title to the properties served by the stormwater facilities shows proof of the correction of any defects in the drainage facilities, as required by the Director.

G. A maintenance fee will be assessed to cover the City's costs for maintenance of the stormwater facilities for the life of the development. The fee will be determined based on the complexity and maintenance requirements of the system and the City's labor and equipment costs. (Ord. 3367§2, 8/15/2009)

13.63.310 - Easements, Tracts and Covenants.

A. Drainage easements shall be provided in a proposed development for all stormwater conveyance systems that are not located in public rights-of-way or tracts. The drainage easements shall be granted to the parties responsible for providing on-going maintenance of the systems.

B. Drainage easements through structures are not permitted.

C. Stormwater facilities that are to be maintained by the City of Port Angeles, together with maintenance access roads to the facilities, shall be located in a public right-of-way, separate tract dedicated to the City of Port Angeles, or drainage easement located in designated open space. The exception is for stormwater conveyance pipes that may be located within easements on private property, provided that all catch basins can be accessed without entering private property.

D. All runoff from impervious surfaces, roof drains and yard drains shall be directed so as not to adversely affect adjacent properties. Wording to this effect shall appear on the face of all final plats/PUD's, and shall be contained in any covenants required for a development. (Ord. 3367§2, 8/15/2009)

13.63.320 - Extensions - When Required. A storm drain main extension may be required whenever more than one (1) residence or customer is provided service and either the property to be served does not abut a storm drain main or the existing storm drain main is not adequate to provide the necessary service. Main extensions shall be extended to the far side (upstream) property line of the premises being served. (Ord. 3367§2, 8/15/2009)

13.63.330 - Extensions - Application.

A. The person desiring a storm drain main extension shall apply to the Director requesting permission to extend the City's storm system.

B. The Director shall review the application, and, if the requested extension is determined to be a proper extension of the storm system, shall provide the petitioner with the design requirements for the extension.

C. If the requested main extension is determined to be an improper extension of the storm system, the application shall be denied. (Ord. 3367§2, 8/15/2009)

13.63.340 - Extensions - Preparation of Plans and Specifications. Upon receipt of the design requirements from the Department, the petitioner shall prepare plans and specifications for the extension to be prepared. All design and construction plans and specifications shall be in accordance with this Chapter and the City's Urban Services Standards and Guidelines Manual. The completed plans and specifications shall have a valid Washington State Professional Engineer's seal and endorsement and shall be submitted to the Department for review and approval. (Ord. 3367§2, 8/15/2009)

13.63.350 - Extensions - Inspection - Fee - Deposit Required. After approval of the plans and specifications, the Department shall provide the petitioner with an estimate of the construction inspection fee. A permit for construction will be issued after the inspection fees and estimated main connection charges have been deposited with the City Treasurer. If the Director determines that the remaining funds are not adequate to provide necessary inspection for project completion, the petitioner shall be notified of such and an estimate of additional inspection fee required will be provided. The additional fees shall be deposited with the City Treasurer prior to depletion of the funds on deposit. Any monies unexpended from the inspection deposit upon completion of the project shall be returned to the petitioner. (Ord. 3367§2, 8/15/2009)

13.63.360 - Construction of Main Extensions.

A. Storm drain main extensions may be made by private contract, through local improvement district procedure, or by Department forces.

B. Any main extension built by parties other than the Department's forces shall be done by a licensed and bonded contractor of the State of Washington.

C. Extension by the Department's forces shall be at the expense of the person requesting construction of the main.

D. All main extensions must be in the City's frontage of the applicant's property and/or other public rights-of-way. (Ord. 3367§2, 8/15/2009)

13.63.370 - Acceptance of Main Extensions.

A. The City reserves the right to reject any installation not inspected and approved by the Department.

B. Upon satisfactory completion of all required tests and acceptance of the main extension, the Department shall cause the extension to be connected to the City system. All costs incurred in such connection(s), including overhead and administrative charges, shall be the responsibility of the petitioner. Any adjustment on the actual cost of installation because of variance between the estimate and the actual cost shall be adjusted by refund upon completion of the job by the petitioner or by payment by the petitioner to the City of any additional expense above the estimate.

C. No storm drain main extension shall be put into service other than for test purposes by duly authorized personnel until the main extension has been accepted by the City and all fees and charges have been paid. (Ord. 3367§2, 8/15/2009)

13.63.380 - Extensions - Construction Drawings.

A. Upon completion of a main extension, the petitioner shall provide the Department a reproducible mylar drawing that accurately indicates the main extension and appurtenances as actually installed in plan and profile.

B. No main extension will be accepted until satisfactory "as built" drawings are provided. (Ord. 3367§2, 8/15/2009)

13.63.390 - Main Extensions Deeded to City.

A. The permit holder shall provide the City with a deed of conveyance for all main extensions as a condition of acceptance of the main extension by the City.

B. The transfer of any main to the City shall be on the condition that the owner, district, company, constructor, or contributor shall transfer or provide for any necessary and proper franchise. (Ord. 3367§2, 8/15/2009)

13.63.400 - Violations of This Chapter. The construction or installation of any structure, the connection to a public storm drainage facility, the illicit or illegal discharge to a public storm drainage facility, violations of the construction site stormwater pollution prevention plan, or the failure to operate and maintain a permitted stormwater facility which violate the provisions of this chapter shall be declared to be unlawful and a public nuisance and may be abated as such through the use of civil penalties, stop-work orders, water service shut offs, education and outreach as well as any other remedies which are set forth in this chapter, including, but not limited to, revocation of any permits. If the Director chooses to utilize Title 9 of this Code then a violation of any provision of this chapter shall constitute a Class II misdemeanor. Each violation shall constitute a separate infraction for each and every day or portion thereof during which the violation is committed, continued or permitted. The choice of enforcement action taken and the severity of any penalty shall be based on the nature of the violation, the damage or risk to the public or to public resources, and the response of the offender to less severe enforcement actions. (Ord. 3367§2, 8/15/2009)

13.63.410 - Inspection.

A. Routine Inspections. The Director or his designee shall have access to any site for which a site development activity permit has been issued pursuant to Section 13.63.270 during regular business hours for the purpose of on-site review and to insure compliance with the terms of such permit. The applicant for any such permit shall agree in writing, as a condition of issuance thereof, that such access shall be permitted for such purposes.

B. Inspection for Cause. Whenever there is cause to believe that a violation of this title has been or is being committed, the director or his designee is authorized to inspect the project, and any part thereof reasonably related to the violation, during regular business hours, and at any other time reasonable in the circumstances. The applicant for any site development activity permit under this chapter shall, as a condition of issuance of such permit, agree in writing that such access to the project site, which inhibits the collection of information relevant to enforcement of the provisions of this chapter, shall be grounds for issuance of a stop work order by the Director or his designee. (Ord. 3367§2, 8/15/2009)

13.63.420 - Inspection Procedures. Prior to making any inspections, the Director or his assignee shall present identification credentials, state the reason for the inspection and request entry.

A. If the property or any building or structure on the property is unoccupied, the Director or his assignee shall first make a reasonable effort to locate the owner or other person(s) having charge or control of the property or portions of the property and request entry.

B. If after reasonable effort, the Director or his assignee is unable to locate the owner or other person(s) having charge or control of the property, and has reason to believe the condition of the site or of the stormwater drainage system creates an imminent hazard to persons or property, the inspector may enter. (Ord. 3367§2, 8/15/2009)

13.63.430 - Test Procedures. In the event that water quality testing is utilized in determining whether a violation of this chapter has occurred, the water quality test procedures shall be followed as described in the most recent edition of the Code of Federal Regulations, Part 136. (Ord. 3367§2, 8/15/2009)

13.63.440 - Stop Work Orders. Stop work order means a written notice, signed by the Director or his assignee, that is posted on the site of a construction activity, which order states that a violation of a City of Port Angeles ordinance has occurred and that all construction-related activity, except for erosion and sedimentation control activities authorized by the Director, is to cease until further notice. The Director may cause a stop work order to be issued whenever the Director has reason to believe that there is a violation of the terms of this section. The effect of such a stop work order shall be to require the immediate cessation of such work or activity until authorization is given by the Director to proceed. (Ord. 3367§2, 8/15/2009)

13.63.450 - Cumulative Civil Penalty. Every person who violates this chapter, or the conditions of a Building Permit or Stormwater Discharge Permit plan, may shall be liable for a civil penalty. The penalty shall not be less than one hundred dollars or exceed one thousand dollars for each violation. This penalty shall be in addition to any other penalty provided by law. Each and every such violation shall be a separate and distinct offense, and each day of continued or repeated violation shall constitute a separate violation. (Ord. 3367§2, 8/15/2009)

13.63.460 - Aiding or Abetting. Any person who, through an act of commission or omission, aids or abets in the violation shall be considered to have committed a violation for the purposes of the civil penalty. (Ord. 3367§2, 8/15/2009)

13.63.470 - Order to Maintain or Repair. The Director shall have the authority to issue to an owner or person an order to maintain or repair a component of a stormwater facility or BMP to bring it in compliance with this section. The order shall include:

A. A description of the specific nature, extent and time of the violation and the damage or potential damage that reasonably might occur;

B. A notice that the violation or the potential violation cease and desist and, in appropriate cases, the specific corrective actions to be taken; and

C. A reasonable time to comply, depending on the circumstances. (Ord. 3367§2, 8/15/2009)

13.63.480 - Notice of Violation - Assessment of Penalty. Whenever the Director has found that a violation of this section has occurred or is occurring, the Director is authorized to issue a notice of violation directed to the person or persons identified by the Director as the violator.

A. The notice of violation shall contain:

1. The name and address of the property owner;

2. The street address, when available, or a legal description sufficient to identify the building, structure, premises or land upon or within which the violation is occurring;

3. A statement of the nature of such violation(s);

4. A statement of the action that is required to be taken within twenty-one days from the date of service of the notice of violation, unless the Director has determined the violation to be hazardous and to be requiring immediate corrective action, or unless the corrective action constitutes a temporary erosion control measure;

5. A statement that a cumulative civil penalty in the amount of not less than one hundred dollars and not exceeding one thousand dollars per day shall be assessed against the person to whom the notice of violation is directed for each and every day following the date set for correction on which the violation continues; and

6. A statement that the Director's determination of violation may be appealed to the City Manager by filing written notice of appeal, in duplicate, with the City Manager's Office within twenty days of service of the notice of violation. The per diem civil penalty shall not accrue during the pendency of such administrative appeal unless the violation was determined by the Director to be hazardous and to require immediate corrective action or was determined by the Director to constitute a temporary erosion control measure.

B. The notice of violation shall be served upon the person(s) to whom it is directed either personally or by complaint in superior court proceedings or by mailing a copy of the notice of violation by certified mail. (Ord. 3367§2, 8/15/2009)

13.63.490 - Appeal and Disposition. A notice of violation issued pursuant to this chapter shall have the following appeal options:

A. Within thirty days from the date of receipt of the notice of violation, the aggrieved person may make application for relief from penalty to the Director. Such application shall contain any information relevant to the situation that the aggrieved party believes the Director should consider. The Director may cancel, lower or affirm the penalty.

B. Within fifteen days from the date of receipt of the Director's response to said application for relief from penalty, the aggrieved party may have the appeal considered by the City Council at its next available regularly scheduled meeting date following the filing of the appeal. The City Council shall issue their decision within fifteen days of the completion of the hearing. The aggrieved party shall be notified by certified mail of the determination of the City Council. (Ord. 3367§2, 8/15/2009)

13.63.500 - Liability for Costs of Investigation. Any person found to be in violation of this chapter shall be responsible for the costs of investigation by the City. Such cost may include the analytical services of a certified laboratory. (Ord. 3367§2, 8/15/2009)

13.63.510 - Collection of Civil Penalty. The civil penalty constitutes a personal obligation of the person(s) to whom the notice of violation is directed. Penalties imposed under this chapter shall become due and payable thirty days after receiving notice of penalty unless an appeal is filed. The City attorney, on behalf of the City, is authorized to collect the civil penalty by use of appropriate legal remedies, the seeking or granting of which shall neither stay nor terminate the accrual of additional per diem penalties so long as the violation continues. (Ord. 3367§2, 8/15/2009)

13.63.520 - Compromise Settlement and Disposition of Suits. The Director and the City Attorney are authorized to enter into negotiations with the parties or their legal representatives named in a lawsuit for the collection of civil penalties to negotiate a settlement, compromise or otherwise dispose of a lawsuit when to do so will be in the best interest of the City, provided that a report shall be submitted to the City Manager in any instance when a compromise settlement is negotiated. (Ord. 3367§2, 8/15/2009)

13.63.530 - Hazards.

A. Whenever the Director determines that any existing construction site, erosion/sedimentation problem, drainage facility, illicit discharge or illicit connection poses a hazard to public safety or substantially endangers property, or adversely affects the condition or capacity of the drainage facilities, or adversely affects the safety and operation of City right-of-way, or violates State water pollution laws, the person to whom the permit was issued, or the person or persons holding title to the property within which the construction site, erosion/sedimentation problem, drainage facility, illicit discharge or illicit connection is located, shall upon receipt of notice in writing from the Director, repair or otherwise address the cause of the hazardous situation in conformance with the requirements of this chapter.

B. Should the Director have reasonable cause to believe that the situation is so adverse as to preclude written notice, he may take the measures necessary to eliminate the hazardous situation, provided that he shall first make a reasonable effort to locate the owner before acting, in accordance with Section 13.63.270. In such instances, the person or persons holding title to the subject property shall be obligated for the payment to the City of Port Angeles of all costs incurred by the City. If costs are incurred and a bond pursuant to this chapter or other City requirement has been posted, the Director shall have the authority to collect against the bond to cover costs incurred. (Ord. 3367§2, 8/15/2009)

Attachment G

IDDE Utility Bill Stuffer

Reminder !

The City's new stormwater ordinance becomes effective on August 15th. The ordinance requires the City to ensure that only rain water enters the City's storm drain system. **Please do your part to prevent the pollution of our creeks by:**

- Keeping all wash water out of the storm drains (such as washing cars, houses, sidewalks, boats)
- Pick up pet waste
- Compost or dispose of yard waste (grass clippings, etc)
- Use less toxic products (rated by the Washington Toxics Coalition at www.watoxics.org/homes-and-gardens/lawn-and-garden) for fertilizers and pest control
- Don't over water your lawn or yard (Over watering sends all of the fertilizers and pesticides out to the creeks.)
- Do not dump anything (paint, motor oil, etc.) into the storm drains

If you do see someone dumping pollutants into the storm drains, or something other than rain water entering a storm drain, please call the City Stormwater Hotline at 417-4830, or Terri Partch, the City Stormwater Program Manager at 417-4811.

Thanks for your help!

Attachment H

Stormwater Hotline Call Register

Stormwater Hotline Calls

Date	Time	Call Description / Complaint	Response
6/19/2009		Where can I was my 32 foot motor home? Property owner Dan Thompson living near the corner of Lopez and Chase	Spoke to Don Thompson about pulling his motor home on to the lawn or taking it to a commercial car wash. He said that non of the car washes in town were able to accomodate the turning radius of his motor home. I suggested taking the vehicle to one of the permitted charity car washes (held in parking lots that drain to the sanitary sewer).
09/01/09	11:36 AM	Diesel oil 2109 W 15th, leaves in stormdrain 2132 W. 10th	See IDDE tracking sheet.
09/11/09		90 wt fluid spill near the intersection of L Street and 18th. Street crew responding.	Street crew reported and cleaned up the spill.
09/18/09		Car washing- Washing two large vehicles. Damon and Lisa Harrell are the property owners-1317 E 7th Street	See attached letter.
10/29/09		Dirt and grime at the intersection of Monroe and Highway 101. Reported by Ron 460-3375	No investigation made due to huge work load. Outside of Permit boundary.
11/16/09		Turbid water with oil sheen off of Del Hur site (4333 Tumwater Truck Route). Reported by Eric W. City staff	See IDDE tracking sheet. Investigation pending.
11/16/09		Oil sheen in the alley comming from Olympic Tire on First Street. Problem has been continuously increasing over 1 year.	No investigation has been made yet.
11/18/09	12:06 PM	Drainage problem near Madrona Woods housing development. Standing water filling up a culvert. Water is moving toward Fairchild Heights apartments.	Requested street crews to respond.
12/17/09	4:38 PM	Discolored water seep near Morse Creek next to Highway 101 - Report by Ken Hobson	No investigation made due to huge work load. Outside of Permit boundary.
12/29/09	1:17 PM	Question on oil water separator maintenance from Hilton Turnbull, James Town S'Kllam Tribe Biologist	Contacted Hilton with requested information.
01/08/10	10:58 AM	Cleaning driveway with Tide to remove moss growth-Kathleen Huffy-rental location 201 Fogarty	Spoke with the property owner and told her that using tide on the driveway was not ok. I told her that the recommended method was removal by hand.
1/11/2010		Coffee Pot discharging cofee and washwater into the curb and gutter	Investigation is pending.
1/27/2010		402 East 12th residence -Car washing	A letter was sent notifying them of the new ordinance and requirements and stating that car wash water can't enter the City's stormsystem.
2/1/2010		Peabody Creek Oil Sheen/Spill	Investigation was made within 27 minutes of receiving notification. No discharge was found.
2/2/2010		Hancock Avenue -Red discharge into curb and gutter from behind newly constructed retaining wall - possible iron flocculant	Invesigation was made. Investigation is still pending.
2/9/2010		224 South Jones Street-Car washing incident	A letter was sent notifying them of the new ordinance and requirements and stating that car wash water can't enter the City's stormsystem.
2/9/2010		Fairmount mobile home park -potential leaking sanitary lines or service	Investigation is pending.
2/11/2010		4th and Lincoln fluid from building drains on parking lot pavement	Investigation was made with the owner of the building. The discharge to the parking area was found to be air conditioning condensate.
3/1/2010		Unknown pollution source into White's Creek from culvert just north of 101	Investigation is pending.

Attachment I

Ilicit Discharge Investigations/Responses

Illicit Discharge Incident Tracking Sheet

Incident Location *(complete one or more below)*			
Latitude and longitude:			
Closest street address: 2109 West 15th Street			
Nearby landmark:			
Primary Location Description	**Secondary Location Description:**		
☐ Stream corridor *(In or adjacent to stream)*	☐ Outfall	☐ In-stream flow	☐ Along banks
☒ Upland area *(Land not adjacent to stream)*	☒ Near storm drain	☐ Near other water source (storm water pond, wetland, etc.):	
Narrative description of location:			

Upland Problem Indicator Description		
☐ Dumping	☒ Oil/solvents/chemicals	☐ Sewage
☐ Wash water, suds, etc.	☐ Other: _____	

Stream Corridor Problem Indicator Description				
Odor	☐ None	☐ Sewage	☐ Rancid/Sour	☐ Petroleum (gas)
	☐ Sulfide (rotten eggs); natural gas	☐ Other: Describe in "Narrative" section		
Appearance	☐ "Normal"	☐ Oil sheen	☐ Cloudy	☐ Suds
	☒ Other: Describe in "Narrative" section			
Floatables	☒ None:	☐ Sewage (toilet paper, etc)	☐ Algae	☐ Dead fish
	☐ Other: Describe in "Narrative" section			
Narrative description of problem indicators: Clear oil diesel spill which the owners has attempted to clean up with some sort of adsorbent (detergent?)				
Suspected Violator (name, personal or vehicle description, license plate #, etc.): Property owner Karen and Bryan O'Donnel 2109 West 15th Street phone: 452-6277				

Please submit this form (within 24 hours, if possible) to Terri Partch, Stormwater Engineer for the City of Port Angeles for investigation (it can be faxed to (360) 417-4709 or hand delivered), call the stormwater hotline at (360) 417-4830, or send an email to stormwater@cityofpa.us. If the spill presents a severe or imminent threat to human health or the environment also contact the department of Ecology, Northwest Region 1-425-649-7000 within 24 hours.

9/4/09
owner called (Brian O'Donnel) called to say that he had contacted the renter Garder Prichard to clean it up. He will call back to confirm.

9/3/09 I called and left a msg saying that the City would perform the cleanup and bill the owner unless the oil/etc was cleaned up within 24 hours. (approx 3:00pm)

9/3/2009

9/3/2009

9/3/2009

8/3/2009

18th St
16th St
N St
Aurora Ct
15th St
14th St
Owen Ave
Dillwood Pl
Evans Ave
12th St
M St
16th St

Illicit Discharge Incident Tracking Sheet

Incident Location *(complete one or more below)*			
Latitude and longitude:			
Closest street address: 319 Peabody Street			
Nearby landmark:			
Primary Location Description	**Secondary Location Description:**		
☒ Stream corridor *(In or adjacent to stream)*	☐ Outfall	☐ In-stream flow	☒ Along banks
☐ Upland area *(Land not adjacent to stream)*	☐ Near storm drain	☐ Near other water source (storm water pond, wetland, etc.):	
Narrative description of location: Fluid leakage is coming from behind south culvert wing wall for 96" culvert which crosses Peabody Street (on the east side of the street).			

Upland Problem Indicator Description		
☐ Dumping	☐ Oil/solvents/chemicals	☐ Sewage
☐ Wash water, suds, etc.	☐ Other: __None-Source is not apparent_____	

Stream Corridor Problem Indicator Description				
Odor	☒ None	☐ Sewage	☐ Rancid/Sour	☐ Petroleum (gas)
	☐ Sulfide (rotten eggs); natural gas	☐ Other: Describe in "Narrative" section		
Appearance	☐ "Normal"	☒ Oil sheen	☐ Cloudy	☐ Suds
	☒ Other: Describe in "Narrative" section			
Floatables	☒ None:	☐ Sewage (toilet paper, etc)	☐ Algae	☐ Dead fish
	☐ Other: Describe in "Narrative" section			
Narrative description of problem indicators: Orange yellow staining. Oil sheen. Orange/yellow fungus growth.				
Suspected Violator (name, personal or vehicle description, license plate #, etc.): Unknown.				

Please submit this form (within 24 hours, if possible) to Terri Partch, Stormwater Engineer for the City of Port Angeles for investigation (it can be faxed to (360) 417-4709 or hand delivered), call the stormwater hotline at (360) 417-4830, or send an email to stormwater@cityofpa.us. If the spill presents a severe or imminent threat to human health or the environment also contact the department of Ecology, Northwest Region 1-425-649-7000 within 24 hours.

Peabody Creek
212
12 in
CONC
Incident location
LL089B
95
LL089
96 in
CONC
221
412
413
413
Peabody St
3rd St
424
24 in
CONC
18 in
CONC
4th St
319
LL088A
103.1
LL088
103.5
LL088B
103.2

11/4/2009

11/4/2009

11/4/2009

11/4/2009

11/4/2000

CITY OF PORT ANGELES
WASHINGTON, U.S.A.
Public Works & Utilities Department

September 25, 2009

Damon and Lisa Harrell
1317 East 7th Street
Port Angeles, Washington 98362

Dear Mr. and Mrs. Harrell,

The City received call from one of your neighbors who observed you washing your cars on your property on September 20th. According to the observer, the wash water entered the curb and gutter in front of your house.

As you may or may not know, the City passed a stormwater ordinance on August 15th which prohibits any substance which is not rain water from entering the City's stormdrain system, which would include the curb and gutter in front of your house. You may not be aware, but the water that enters the curb and gutter in front of your house runs to a storm drain inlet just to the west. This inlet carries all of your wash water through a system of pipes and dumps it, untreated, directly into the Strait at Francis Street Park.

Please do not continue to allow wash water (or any substance which is not rain water) to enter the curb and gutter in front of your home. Alternatives to car washing in your driveway may include washing the vehicles on your lawn, if the water will infiltrate, or taking your vehicles to a commercial car wash (these are all tied into our sanitary system) or to one of the City permitted charity car washes (these also drain to the sanitary system).

Please call me or email me if you have any questions or concerns at 417-4811 or tpartch@cityofpa.us. Thank you.

Sincerely,

Terri L Partch

Terri Partch, P.E.
Civil Engineer and Stormwater Manager

Phone: 360-417-4800 / **Fax:** 360-417-4542
Website: www.cityofpa.us / **Email:** publicworks@cityofpa.us
321 East Fifth Street - P.O. Box 1150 / Port Angeles, WA 98362-0217

From: Terri Partch
To: Jeff Young
Date: 8/10/2009 4:46 PM
Subject: Fwd: Re: Crestwood

CC: Kathryn Neal; Roger Vess

Jeff,

Please read below. This may be a possible sanitary leak on a City line. The property owner thinks that it might be water, but if so it's some terrible looking water. (I took another look at this GIS-it could be a water service line, too.) Another thing to note, whatever is leaching out of this area has been going on long enough to be shown in the orthophotos on our GIS system.

Thanks.

Terri

>>> Terri Partch 8/10/2009 4:38 PM >>>
David,

I took a look at his and talked to John in their administrative office. He says that they believe it is related to a waterline leak. They have a plumber who is bringing a back hoe tomorrow to do some digging. I told him that it didn't look like water to me. The water appears to be coming from a large white box in front of their property. The manager John said it was a water valve, but I see no water line in our GIS system there. There is however a sanitary line running just south of the sidewalk. There is no odor, but a distinctive metallic looking staining on the sidewalk with a milky white/oily looking sheen and some fungus growth. I told him to call me to let me know what they find out.

Can you tell me how long you've noticed it?

Thanks again for bringing it to our attention..

Terri

Terri Partch, P.E.
Civil Engineer
321 E Fifth Street
P.O. Box 1150
Port Angeles, Washington 98362-0217
phone:360-417-4811
fax:360-417-4709

>>> "David R. McCoy" <paratran@olypen.com> 8/10/2009 3:51 PM >>>

Good Afternoon, Terri!

Have you had an opportunity to check out the runoff at Crestwood on E. Lauridsen Blvd? For the past several days, there has developed a good bit of algae-looking sludge w/a definite oil sheen to it. It actually appears to be a slip/fall hazard due to the build-up. It is at the East end of the Drive-up entry across from Jones Street.

Have a Great Day!

David R. McCoy, GM / CCTM

Paratransit Services of Clallam County

2417 W. 19th Street,

From: Terri Partch
To: David McCoy
Date: 8/10/2009 4:38 PM
Subject: Re: Crestwood

CC: Kathryn Neal; Roger Vess

David,

I took a look at his and talked to John in their administrative office. He says that they believe it is related to a waterline leak. They have a plumber who is bringing a back hoe tomorrow to do some digging. I told him that it didn't look like water to me. The water appears to be coming from a large white box in front of their property. The manager John said it was a water valve, but I see no water line in our GIS system there. There is however a sanitary line running just south of the sidewalk. There is no odor, but a distinctive metallic looking staining on the sidewalk with a milky white/oily looking sheen and some fungus growth. I told him to call me to let me know what they find out.

Can you tell me how long you've noticed it?

Thanks again for bringing it to our attention..

Terri

Terri Partch, P.E.
Civil Engineer
321 E Fifth Street
P.O. Box 1150
Port Angeles, Washington 98362-0217
phone:360-417-4811
fax:360-417-4709

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Have a Great Day!

David R. McCoy, GM / CCTM

Paratransit Services of Clallam County

2417 W. 19th Street,

Port Angeles, WA 98363

360.457.5345, Fax: 360.406.3000

Paratransit Services is committed to being the model for quality transportation and community services. Through innovation, integrity, and dedication, Paratransit Services will continue to make important contributions to the quality of life of our customers.

Port Angeles, WA 98363

360.457.5345, Fax: 360.406.3000

Paratransit Services is committed to being the model for quality transportation and community services. Through innovation, integrity, and dedication, Paratransit Services will continue to make important contributions to the quality of life of our customers.

Crestwood- 8-10-09

Hot Box

Chambers St
9th St
Lauridsen Blvd
Jones St
6 in CONC
6 in CONC
6 in CONC
8 in PVC
12 in CONC
15 in CONC
6 in PVC
6 in PVC
24 in CONC
48 in
8 in PVC
Crestwood Bldg
1030
1036
815
1103
1111
1114
1120
1130
1134
1203
1105
1115
1121
1127
1133
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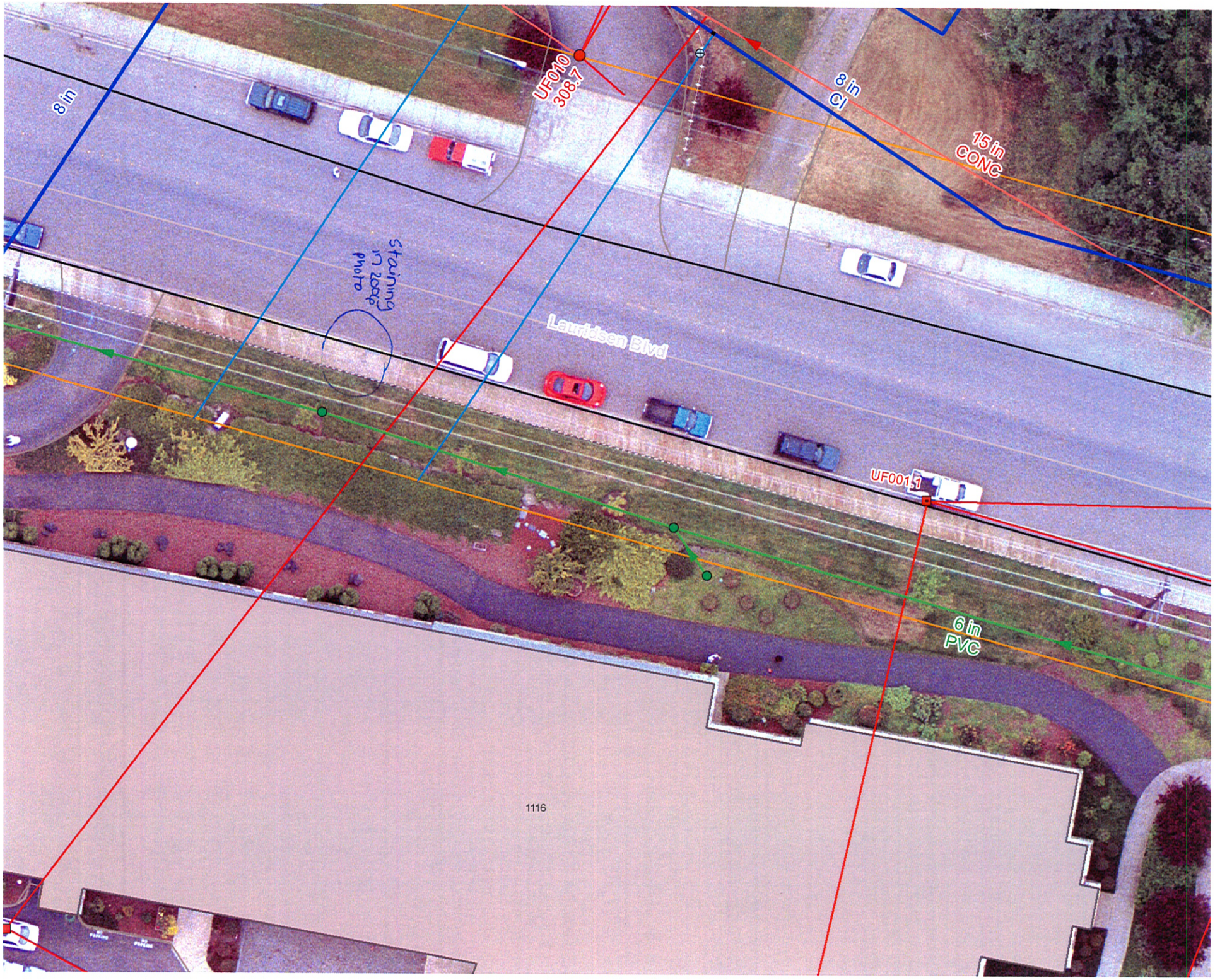
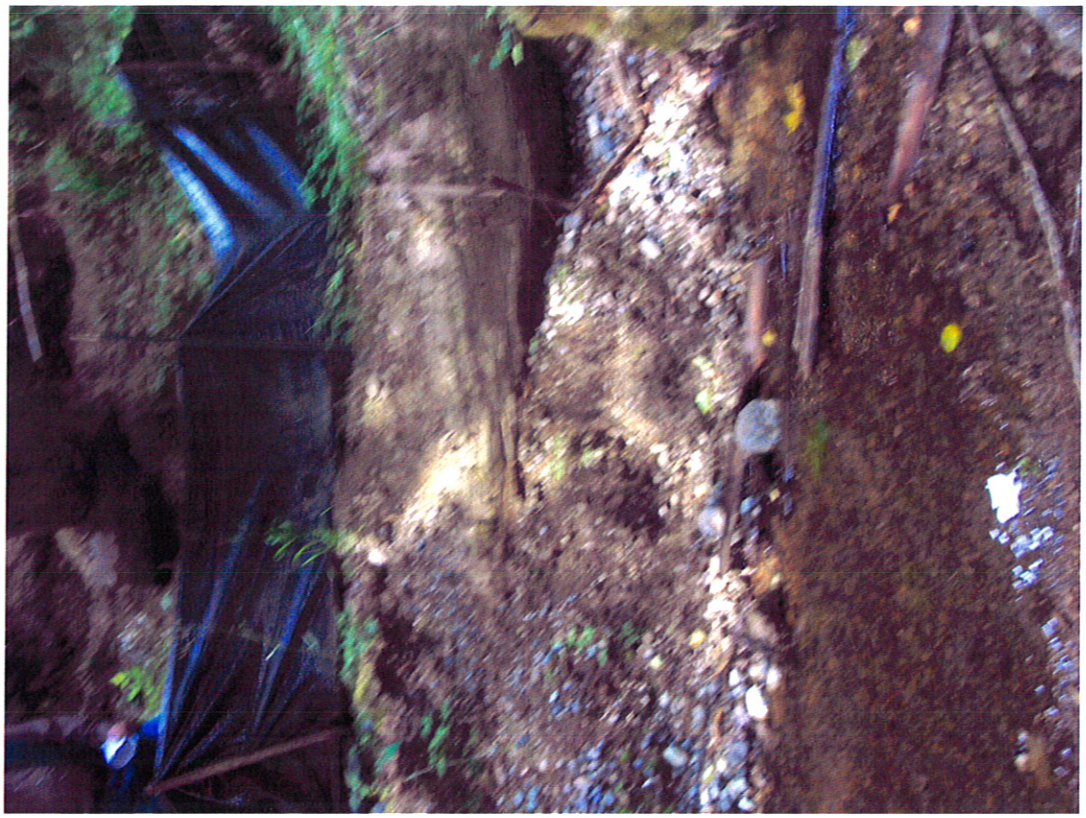
1105
1119
1111
1123
1133


8 in
UF010
308.7
8 in
CI
15 in
CONC
Staining in 2006 photo
Lauridsen Blvd
UF001.1
6 in
PVC
1116



Crestwood- 8-10-09

Crestwood- 8-10-09

Crestwood- 8-10-09

Crestwood- 8-10-09

Crestwood- 8-10-09

Crestwood- 8-10-09

Illicit Discharge Incident Tracking Sheet

Incident Location *(complete one or more below)*			
Latitude and longitude:			
Closest street address: Tumwater Truck Route and HWY 101 Intersection – Del Hur facility 4333 S. Tumwater Truck Route			
Nearby landmark:			
Primary Location Description	**Secondary Location Description:**		
☐ Stream corridor *(In or adjacent to stream)*	☐ Outfall	☐ In-stream flow	☐ Along banks
☒ Upland area *(Land not adjacent to stream)*	☐ Near storm drain	☒ Near other water source (storm water pond, wetland, etc.): Tumwater Creek	
Narrative description of location: Just east of Del Hur facility at Tumwater Truck Route and Highway 101.			

Upland Problem Indicator Description		
☐ Dumping	☒ Oil/solvents/chemicals	☐ Sewage
☐ Wash water, suds, etc.	☒ Other: Turbidity_____	

Stream Corridor Problem Indicator Description				
Odor	☐ None	☐ Sewage	☐ Rancid/Sour	☐ Petroleum (gas)
	☐ Sulfide (rotten eggs); natural gas	☐ Other: Describe in "Narrative" section		
Appearance	☐ "Normal"	☐ Oil sheen	☐ Cloudy	☐ Suds
	☐ Other: Describe in "Narrative" section			
Floatables	☐ None:	☐ Sewage (toilet paper, etc)	☐ Algae	☐ Dead fish
	☐ Other: Describe in "Narrative" section			
Narrative description of problem indicators: Turbid water leaving gravel parking lot/storage area. Some oil sheen in water also.				
Suspected Violator (name, personal or vehicle description, license plate #, etc.): Del Hur company				

Please submit this form (within 24 hours, if possible) to Terri Partch, Stormwater Engineer for the City of Port Angeles for investigation (it can be faxed to (360) 417-4709 or hand delivered), call the stormwater hotline at (360) 417-4830, or send an email to stormwater@cityofpa.us. If the spill presents a severe or imminent threat to human health or the environment also contact the department of Ecology, Northwest Region 1-425-649-7000 within 24 hours.

OVERSIZE LOAD
TRAIL KING
ASPEN

25
MPH

Attachment J

IDDE General Awareness, Response and Enforcement Training -
Sign in Sheets and Power Point Presentations

IDDE Response and Enforcement Training Agenda
Port Angeles, WA

July 30, 2009

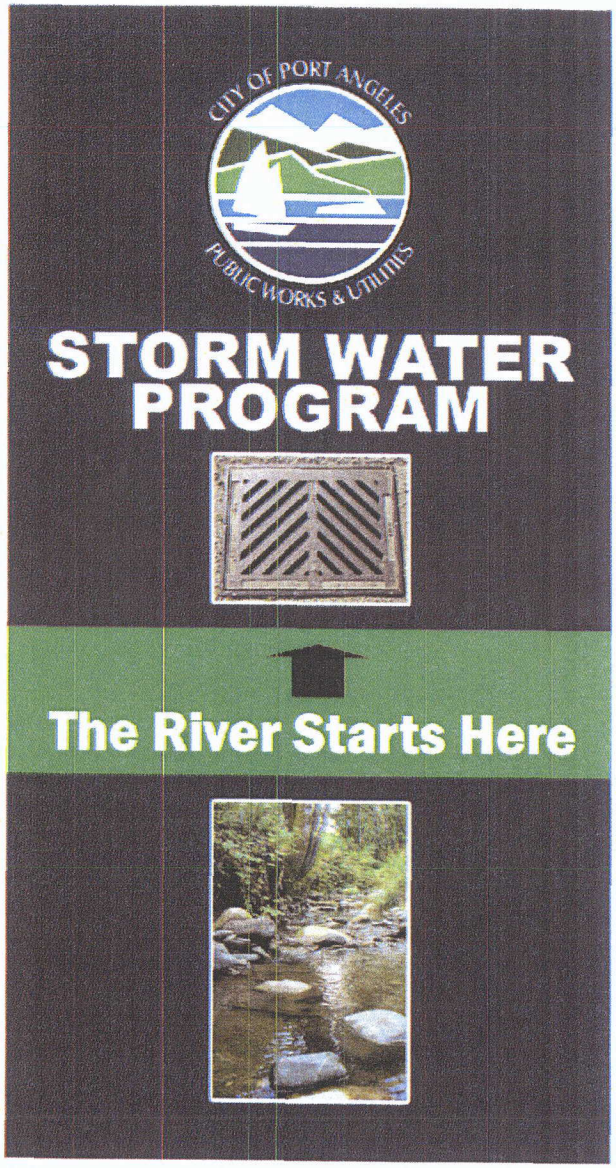
Time		**Length**
7:15 – 7:30	Registration	15 min
7:30 – 8:30	Session 1 – IDDE General Awareness	1 hour
8:30 – 8:45	Break	15 min
8:45 – 10:45	Session 2 – IDDE Response & Enforcement	2 hours
10:45 – 11:45	Session 2 – Field exercise	1 hour
11:45 – 12:00	Wrap-up and evaluations	15 min

Illicit Discharge Response and Enforcement Training Sign In

Session I - General Awareness	
Name	**Department**
Steve Sperr	PW Engineering
Jay Direlbiss	WW Collection
Jason Holbrook	water
Dennis Edgington	Water Div.
Roger Vess	Eng
James Burke	ENG.
Rick R Mooney	St.
Jack Graves	St.
John Hayduk	Street
Eric Wheatley	Street
Guy Wehr	ST. DEPT
Eric Walnath	Eng.
Jeff Young	WW
PAT BARTHOLD	CAO
Jim Lierly	Com Dev
Jam McCalub	Street Div.
Terri L Pam	Engineering

Illicit Discharge Response and Enforcement Training Sign In

Session II - Response and Enforcement	
Name	Department
~~Jason Baer~~	~~Water~~
~~Jeff Graves~~	~~Water~~
~~[illegible]~~	~~[illegible]~~
~~[illegible]~~	~~Street~~
~~Cody Romero~~	~~St.~~
~~[illegible] Mooney~~	~~St.~~
~~Josh Graves~~	~~St~~
Eric Wheatley	Street
Scott Johns	CED
Jeff Young	WW
Art Barnhardt	CED
Jim Liberly	Com Dev
~~Ian McCabe~~	~~Street Div~~
James Burke	ENG
Terri Lpez	Engineering
Guy Weber	ST. DEPT



Illicit Discharge Response and Enforcement Training

July 30th, 2009

Session 1 7:30-8:30

Session 2 8:45-12:00

Stream flushing - Dennis

Illicit Discharge Detection & Elimination (IDD&E)
General Awareness Training

Port Angeles Washington

July 30, 2009

Herrera Environmental Consultants

Introductions

Rebecca Dugopolski
rdugopolski@herrerainc.com
(206) 441-9080

George Iftner
giftner@herrerainc.com
(206) 441-9080

2

- Description of NPDES permit - why we are here.

Restrooms? Cell Phones?

Restrooms?

Please silence your cell phones.

3

Today's Agenda

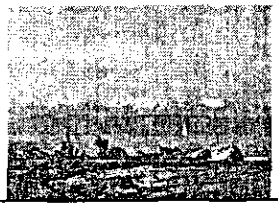
Time		Length
7:30 - 8:30	Session 1 - IDD&E General Awareness	1 hour
8:30 - 8:45	Break	15 minutes
8:45 - 10:45	Session 2 - IDD&E Response & Enforcement	2 hours
10:45 - 11:45	Session 2 - Field exercise	1 hour
11:45 - 12:00	Wrap-up, questions, and evaluations	15 min

4

Eric Guy

Why are we here today?

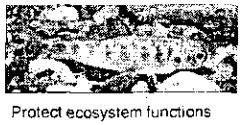
- New NPDES Phase II Municipal Stormwater Permit
- Training Requirements
- Reduce spills and improve water quality



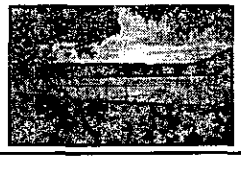
5

Why do we manage stormwater?

Maintain public spaces and infrastructure, ensure public safety, prevent flooding, etc.



Protect ecosystem functions and recreational uses of receiving waters

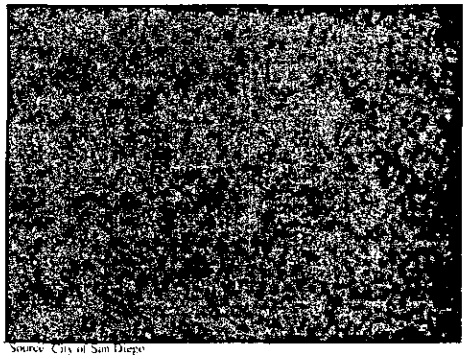


6

Impacts From Stormwater

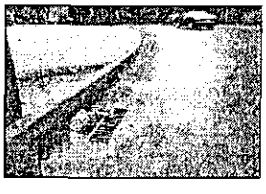
- ✓ Water pollution
- ✓ Flooding
- ✓ Structural damage
- ✓ Channel degradation

Stormwater Video



Source: City of San Diego

Session 1
Illicit Discharge Detection & Elimination (IDD&E) General Awareness



Learning Objectives

- Understand what your City is required to do for IDD&E under the NPDES Municipal Stormwater permit
- Understand what illicit discharges and connections are and how to identify them
- Know how to report and respond to illicit discharges and connections
- Be aware of how to stay in compliance with the permit

Outline

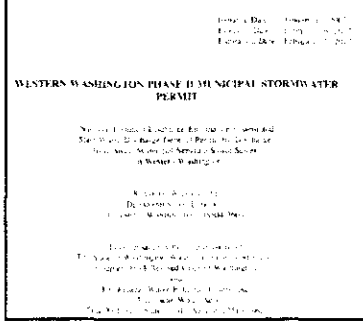
- **NPDES Municipal Stormwater Permit**
- Warm-up exercise
- Overview of illicit discharge investigations
- How to identify illicit discharges
- How to report and respond to an illicit discharge
- Questions?

NPDES Municipal Stormwater Permit

NPDES Municipal Stormwater Permit

▪ **Clean Water Act (1972)**	Fishable, swimmable waters, prevent the release of toxics
▪ **NPDES Permit**	National Pollutant Discharge Elimination System
▪ **Several types of NPDES Permits**	Municipal, Construction, Industrial, Boatyards
▪ **Permit Authority**	Delegated to the Washington State Department of Ecology by EPA

NPDES Municipal Stormwater Permit
Phase II Permit



- Phase I (populations > 100,000)
- Phase II (generally populations >10,000)
- Phase II NPDES municipal stormwater permit issued by Ecology in 2007
- Permit term is 5 years and it will be renewed

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Perhaps a little less background for the street crews.

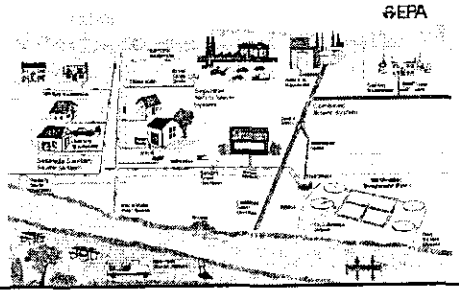
NPDES Municipal Stormwater Permit
Non-point Source Pollution

- Point source pollution: a single identifiable *localized* source of pollution
- Non-point sources of pollution: *diffuse in nature* - introduction of impurities into a surface-water body or an aquifer, usually through a non-direct route
- Most non-point source pollutants fall into six categories:
  1. Sediment
  2. Nutrients
  3. Acid and salts
  4. Heavy metals
  5. Toxic chemicals
  6. Pathogens

NPDES Municipal Stormwater Permit
Stormwater Management Program Requirements

1. Map your storm sewer outfalls, receiving waters, and stormwater facilities

EPA



16

what to do with mapping

NPDES Municipal Stormwater Permit
Stormwater Management Program Requirements

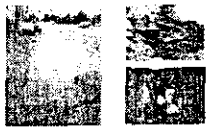
2. Develop and implement an IDD&E ordinance
   - Prohibited discharges
   - Allowable discharges
   - Conditional discharges

- Plumbing Code
  - Illegal cross-connections

- Health Code
  - Discharge of harmful substances

Municipal Stormwater General Permit

Writing Regulations to Prohibit Illicit Discharges, Dumping, and Illegal Connections



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NPDES Municipal Stormwater Permit
Stormwater Management Program Requirements

3. Implement an on-going IDD&E program (to identify, investigate, terminate, clean-up illicit discharges and spills)
4. Inform public employees, businesses, and the general public of the hazards associated with illegal discharges and improper disposal of waste
5. Develop procedures for IDD&E program evaluation and assessment
6. Provide appropriate training for municipal field staff on identification and reporting of illicit discharges into MS4s

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Outline

- NPDES Municipal Stormwater Permit
- **Warm-up exercise**
- Overview of illicit discharge investigations
- How to identify illicit discharges
- How to report and respond to an illicit discharge
- Questions?

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Warm-up Exercise

What is a Municipal Separate Storm Sewer System or MS4?

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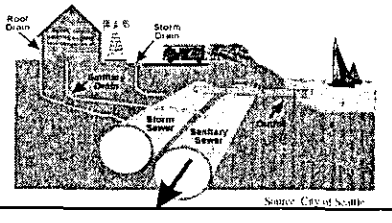
MS4

MS4: the separate storm sewer system that includes ditches, curbs, gutters, storm sewers, and similar means of collecting or conveying runoff that do not connect with a wastewater collection system or treatment plant



Source: City of Seattle

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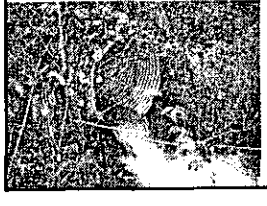
Warm-up Exercise

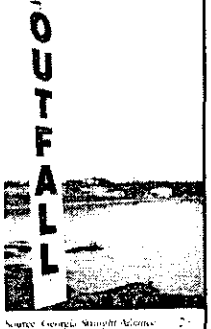
What is an outfall?

Outfall

Outfall:

A point source where a Municipal Separate Storm Sewer System discharges to waters of the State (40 CFR 122.2)





Warm-up Exercise

What does illicit mean?

- Not allowed
- Unlawful
- Breaking social norms

Warm-up Exercise
Illicit Discharge

CFR 40 122.26(b)(2):

- ...any discharge to a municipal separate storm sewer system that is not composed entirely of stormwater except permitted discharges and fire fighting related discharges.
  - Unique frequency, composition, and modes of entry
  - Can result from interaction of sewage disposal system and the MS4
  - Produced from pollution-generating sites, failing septic fields, spills, or dumping

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Warm-up Exercise
Illicit Connection

Phase II Permit Definition:

- Any man-made conveyance that is connected to a municipal separate storm sewer without a permit, *excluding roof drains and other similar type* connections.
- Examples: sanitary sewer connections, floor drains, channels, pipelines, conduits, inlets, or outlets connected directly to the MS4

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Warm-up Exercise

Are these Illicit Discharges?

- Water from roof drains?
- Water from fire fighter training?
- Wash water from a charity car wash?
- Basement sump pump water?

Not.

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Warm-up Exercise

Are these Illicit Discharges?

- Groundwater discharges? No
- Fire hydrant flushing?
- Swimming pool water?
- Construction dewatering?
- Wash water from buildings & sidewalks?

Outline

- NPDES Municipal Stormwater Permit
- Warm-up exercise
- **Overview of illicit discharge investigations**
- How to identify illicit discharges
- How to report and respond to an illicit discharge
- Questions?

Overview of Illicit Discharge Investigations

1. **Outfall Reconnaissance Inventory (ORI)**
2. Storm Drain Network Investigations
3. Drainage Area Investigations
4. On-Site Investigations
5. Septic System Investigations

more about mapping

1. ORI - Purpose

- Locate and map all outfalls
- Identify areas with potential illicit connections or discharges
- Determine conditions of outfall structures
- Locate potential sample collection points
- Identify failing septic systems along stream banks
- Locate abandoned dumps along streambanks

1. ORI - Field Planning Considerations

- Wait at least 48 hours after rainfall to survey outfalls
- Personnel safety and safety equipment
- Property rights
- Traffic control
- Confined space entry
- Opening manhole covers
- Crew size
- Communication and security
- First aid, terrain, plants, insects, and animals

1. ORI - Field Procedure

- Photographs
- Measurements
- GPS/record location
- Type of outfall
- Record physical condition of outfall & headwall
- Record stream conditions
- Verify ownership

2. Storm Drain Network Investigation

- Strategically inspect manholes within the storm drain network
- Measure chemical and physical parameters
- Isolate discharges to a specific segment of the storm drain network
- Follow up with on-site investigation at a specific property

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response to call - evaluate through mapping & sampling

3. Drainage Area Investigation

- Analyze land use in an area where a suspicious discharge is observed
- Drive-by windshield survey to identify business, industrial site or other source
- Use GIS to analyze land use and industrial permits

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4. On-site Investigations

- Pinpoint the exact source of a discharge in a drainage segment
- Identify plumbing cross-connections
- Three approaches: dye testing, smoke testing, and video testing

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5. Septic System Investigations

- Used to find failing septic systems
- Ask the homeowner about the age of their system, when it was last maintained, etc.
- Do a surface condition analysis of the yard
- Conduct a detailed system inspection

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200 left in City

Outline

- NPDES Municipal Stormwater Permit
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- How to report and respond to an illicit discharge
- Questions?

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How to Identify Illicit Discharges – Common Sources

- Illegal dumping practices (95%) *
- Broken sanitary sewer line (81%)
- Cross-connections (71%)
- Connection of floor drains to storm sewer (62%)
- Sanitary sewer overflows (52%)
- Inflow / infiltration (48%)
- Straight pipe sewer discharge (38%)
- Failing septic systems (33%)
- Improper RV waste disposal (33%)
- Pump station failure (14%)

* Percentages based on survey of national respondents by the Center for Watershed Protection

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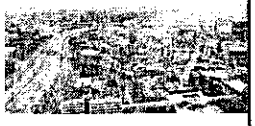
Consider Land Uses & Potential Generating Sites

- Residential: car washing, spills, dumping
- Commercial/Industrial: plumbing tapped into MS4, material storage, dumping
- Municipal: snow and ice removal, vehicle maintenance, material storage



snow and ice removal.

40

What are we really looking for?

- If it hasn't rained for 24 – 48 hours, the storm drain should be dry
- Ground water is usually crystal clear
- If it looks or smells polluted, it probably is
- Streaks of lush green grass during dry weather may suggest that something is wrong

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Key Observations

Odor

- Industrial sources: spoiled organic products (rotten egg smell), oil, gasoline, chemicals, solvents
- Sewage sources: foul odor

Color/Turbidity

- Ground water is usually clear and colorless
- Illicit discharges are often turbid or discolored water

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Key Observations

Floatable Matter

- Industrial sources: animal fats, food products, oils, solvents, sawdust, foams, packing materials, fuels
- Sanitary sources: fecal matter, other sanitary wastes

Deposits and Stains

- Coatings that remain on the streambank or on the outfall structure after a non-stormwater discharge has ceased.
- Industrial sources: often dark staining
- Sanitary sources: *black and gray*

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Key Observations

Vegetation

- Inhibited or excessive growth at the outlet based on surrounding conditions
- Consider weather conditions and time of year

Structural Damage

- Industrial discharges: abnormal pH can cause pitting or spalling of outfall structures
- Don't confuse damage with the results of aging, hydraulic scour, or poor construction

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Key Observations

Streambank Observations

- Exposed fill, old dump sites
- Discharging septic system
- Erosion

45

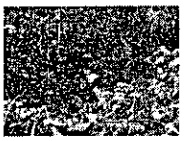
Types of Outfalls

- Storm sewer outfalls
- Natural drainages
- Constructed ditches
- Foundation drains
- Weep holes in concrete walls?

Discharges - Modes of Entry

Direct entry

- Plumbing cross-connections: sewage, industrial, or commercial
- Straight pipe discharge



Indirect entry

- Groundwater seepage
- Spills
- Dumping
- Outdoor washing activities

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Discharge - Frequency

Continuous discharges

- Occur most or all of the time (i.e., sewage cross-connection or failing septic field)

Intermittent discharges

- Occur over a few hours per day or a few days per year (i.e., industrial cross-connection)

Transitory discharges

- Occur rarely (i.e., vehicle accidents, spills, ruptured tanks, sewer main break, illegal dumping)

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Distinguishing Visual Observations

- Natural phenomena
- Nutrient discharges
- Sewage discharges
- Other discharges (wash water, industrial, petroleum, sediment from construction)

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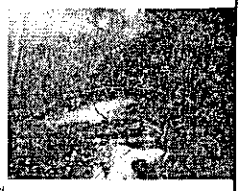
Natural Phenomena

- Organic oily sheen
- Foaming and tannins
- Iron bacteria
- Sediment
- Algae



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Bacterial organic oily sheen

~~perm~~ tap on top - will break up

oil will not.

oil - rainbow sheen.

foaming - soap bubbles not natural.

Iron bacteria - can be natural

sediment can be natural

algae blooms.. can be natural but excacerbated.

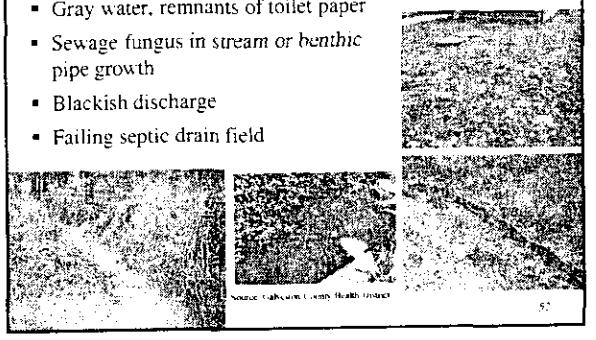
Nutrient Discharges

- Nutrient enriched discharge from residential lawn, garden runoff, or agriculture

blue green color · nutrients.

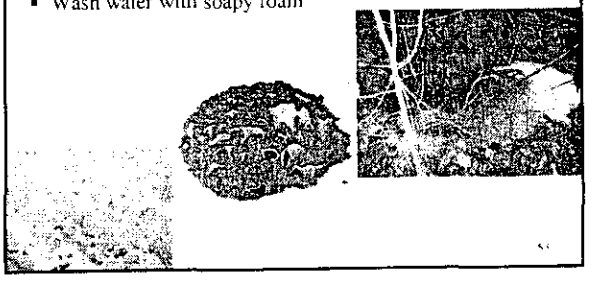
Sewage Discharges

- Gray water, remnants of toilet paper
- Sewage fungus in stream or *benthic* pipe growth
- Blackish discharge
- Failing septic drain field

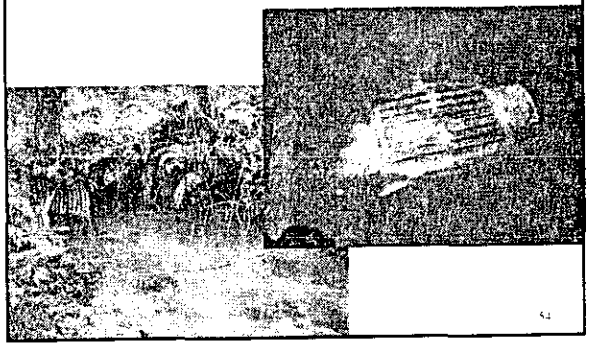


Other Discharges

- Oily discharge with rainbow sheen or odor
- Wash water with soapy foam



Does this look like an Illicit Discharge?



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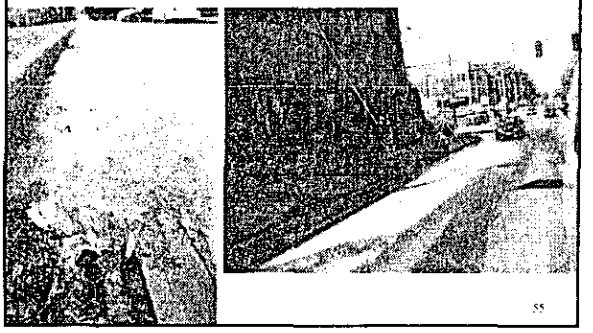

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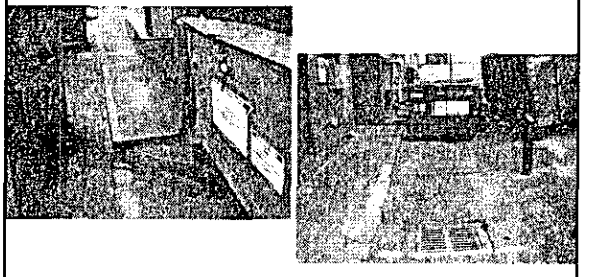
Does this look like an
Illicit Discharge?



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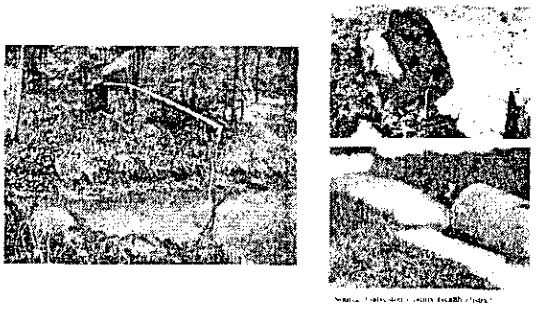
Does this look like an
Illicit Discharge?



Outline

- NPDES Municipal Stormwater Permit
- Warm-up exercise
- Overview of illicit discharge investigations
- How to identify illicit discharges
- **How to report and respond to an illicit discharge**
- Questions?

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How to Report an Illicit Discharge

- City Stormwater Hotline: (360) 417-4830
- Used for public reporting of discharges and spills.
- The public is also able to report discharges, spills, or other concerns via the City's stormwater email address: stormwater@cityofpa.us.

How to Report an Illicit Discharge

- Ecology Southwest Regional Office: 360-407-6300
- Under state law, the Department of Ecology must be notified when a regulated waste or hazardous material that posses an imminent threat to life, health or the environment is released – regardless of the quantity (WAC 173-303-145)

How to Respond to an Illicit Discharge

- Report it to your City immediately
- If public safety is threatened also call 911
- Take detailed notes and time/dated photographs
- Document the discharge location, type of material if known, and whether it is threatening a receiving water
- Note who was spoken to, what was said, and the responsible party if known
- A supervisor at your City may also need to notify the Department of Ecology

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Review of Learning Objectives

- Understand what your City is required to do for IDD&E under the NPDES municipal stormwater permit
- Understand what illicit discharges and connections are and how to identify them
- Know how to report and respond to illicit discharges and connections
- Be aware of how to stay in compliance with the permit

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Questions?

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Break

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Illicit Discharge Detection & Elimination (IDD&E)
Response & Enforcement

Port Angeles, Washington

July 30, 2009

Herrera Environmental Consultants

George-

Learning Objectives

- Reinforce how to prevent illicit discharges
- Learn how to identify and investigate illicit discharges
- Understand how to terminate and clean up illicit discharges
- Learn valuable lessons gathered from other jurisdictions

2

Galveston

Organization

- **Preventing illicit discharges**
- Identifying illicit discharges and connections
- Investigating illicit discharges
- Data management
- Terminating illicit discharges
- Interactive case study exercise
- Field exercise
- Questions, and evaluation

3

Preventing Illicit Discharges

- Neighborhood Discharges: public outreach, stenciling storm drains, septic system maintenance, household hazardous waste disposal, education about car washing
- Generating Sites: outreach to businesses, spill prevention education and response plans, employee training and site inspections
- Municipal Operations: review pollution prevention and operations and maintenance procedures (best management practices)

Organization

- Preventing illicit discharges
- **Identifying illicit discharges and connections**
- Investigating illicit discharges
- Data management
- Terminating illicit discharges
- Interactive case study exercise
- Field exercise
- Wrap-up, questions, and evaluation

Roger
Septic field monitoring by county.

Identifying Illicit Discharges & Connections

Use Your Eyes and Ears

- Citizen complaints and IDD&E hotline
- Develop an interconnected team – road crews, utility workers, parks staff, and others see the City everyday
- Plan reviewers – review projects and can anticipate potential for illicit discharges
- Building inspectors, health department inspectors – identify cross connections?

Desktop Screening → me

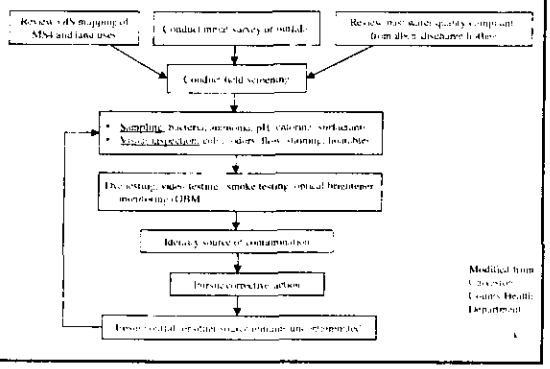
Review your GIS mapping

- Drainage area boundaries
- Land use/parcel maps
- Density of industrial NPDES permits
- Age of development
- Septic system density
- Hydrology/flow data

Priorities for investigation

- Past discharge complaints
- Areas with poor water quality
- High density of septic systems
- Older industrial operations
- Areas with aging infrastructure

Identifying Illicit Discharges



Modified from Cuyahoga County Health Department

Physical Indicators - Color

Color	Possible Sources
Tan to brown	Runoff from rainfall, construction, or soil erosion
Blue green/ brown green	Sewage, plankton bloom, fertilizer runoff, vehicle wash water, tracing dye
Milky white	Paint, lime, or grease
Milky or dirty gray	Gray water or wastewater (musty odor present)
Black	Septic wastewater, sulfuric acid, turnover of oxygen depleted water (hydrogen sulfide odor?)
Dark red, purple, blue, black	Fabric dye, paper ink from industrial operations
Orange-red	Iron deposits, iron bacteria, tracing dye
Bright yellow green	Anti-freeze, algae bloom, tracing dye

Source: Cuyahoga County Health Department, Accounting Manual for Identifying and Eliminating Illicit Connections to MS4

Physical Indicators - Odor

Odor	Possible Sources
Musty	Partially treated sewage, livestock waste, algae
Rotten egg/hydrogen sulfide	Raw sewage, sulfuric acid, anaerobic water
Sewage/fecal	Raw sewage
Chlorine	Broken drinking water line, swimming pool water, wastewater treatment plant or industrial discharge
Sharp, acrid, or pungent	Chemicals or pesticides
Rotten/spoiled	Restaurant food waste
Gasoline	Fuel spill, spent petroleum industrial discharge

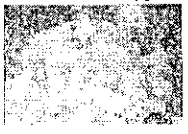
Source: Cuyahoga County Health Department A Guidance Manual for Identifying and Eliminating Illicit Connections to MS4s

Physical Indicators - Other

- Turbidity: suspended soil particles, plankton, microscopic organisms - most useful during dry weather
- Water Temperature: Warm water temperature during cold weather may indicate sewage
- Flow: Observed during dry weather? Determining flow helps set investigation priorities

Physical Indicators – Other

- Excessive vegetation: algae or excessive growth near outfall
- Absence of vegetation: dead or stunted plant life
- Sewage fungus: a soft, gray, filamentous bacteria associated with low dissolved oxygen conditions.



Source: CWP/IDDE Guidance Manual

- Floatables: sanitary waste, residential, commercial, or industrial sources

Physical Indicators - Other

- Conductivity: High values may indicate sanitary wastewater, septage, industrial water, or irrigation water
- Surface scum: film or foam? Organic or petroleum sheen?
- Outfall Damage: spalling, cracking, chipping, corrosion
- Debris: trash, etc.? Not necessarily an illicit discharge
- Stains or deposits: iron-oxide bacteria, oil, or powder

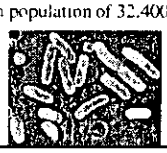
<220 ms.

soap/natural suds (foaming tannins)

Biological Indicators

Fecal Coliform Bacteria

- High levels of organisms can indicate sewage
- *E. coli* is specific to humans and other warm-blooded animals.
- A relatively inexpensive laboratory method can detect them.
- Waste from one adult human produces 2 billion fecal coliform/day[1]
- Snohomish County, WA study estimated that the daily production of dog waste from 126,000 dogs in the County is roughly equivalent to a human population of 32,400



Additional Indicators

- Bacteria DNA analysis/microbial source tracking (MST)
- Caffeine: a Puget Sound study found it in 160 of 216 samples[1]
- Pharmaceuticals/drugs, endocrine disrupters that change, imitate, or block hormones.
- Viruses, linked to humans and sewage
- Infrared heat detection systems (IHDS)

Common Chemical Indicators

- pH (86%*)
- Chlorine (76%)
- Specific conductivity (62%)
- Ammonia (52%)
- Surfactants (48%)
- Fecal coliform (33%)
- Fluoride (33%)
- Copper (29%)
- Fluorescence (24%)
- Phenols (14%)
- Potassium (14%)
- Detergents (10%)
- Dissolved oxygen (10%)
- Hardness (10%)
- Iron (10%)

* Percentages represent the number of respondents in a national survey that reported using the indicator during IDDE field screening

Source: CWP IDDE Guidance Manual

Common Chemical Indicators

Ammonia (NH_3)

- Produced by decay of organic nitrogen compounds
- Use to identify sanitary wastewater & septic tank effluent
- Can also indicate ammonia based cleaners & fertilizer runoff
- If you detect it, the source is from a fairly recent discharge

Fluoride or Chlorine

- Added to potable water supplies
- May indicate tap water, sewage, irrigation water, swimming pool water
- Some communities do not fluoridate their water (test for chlorine instead)

ammonia - degrades quickly
(recent source)

Common Chemical Indicators

Surfactants

- Found in household detergents
- Anionic surfactants are "methylene blue active substances (MBAS)"
- Colorimetric method: surfactant reacts with methylene blue (results expressed in ppm [mg/L])

react with

colorimeter

Optical brighteners

- Also found in household detergents
- Use to identify sanitary wastewater
- OBM traps installed in MS4
- Fluorescence under black light

trap installed in storm sewer
look at in black light will flouresce

Recommended Indicators for Field Screening

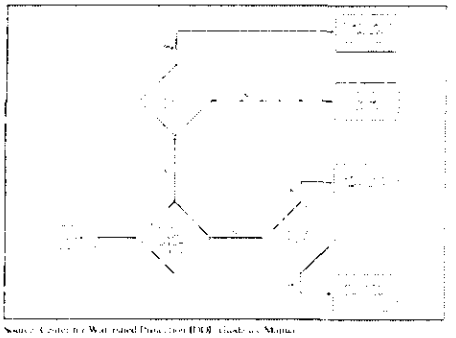
Recommended

- Temperature - meter
- pH - meter or test strips
- Conductivity - meter
- Ammonia – test strips (or field test kit)
- Surfactants – field test kit

Optional

- Fecal coliform – laboratory analysis
- Potassium – colorimeter
- Fluoride - colorimeter
- Total chlorine - field test kit
- Dissolved oxygen – meter
- Dye testing - dye packets
- Smoke testing
- Video testing

Data Evaluation



Source: Center for Watershed Protection IDDE Guidance Manual

Decision tree - to be added to the IDDE Plan.

Parameters and Associated Flow Sources

Parameter	Natural Water	Potable Water	Sanitary Wastewater	Septic Tank Effluent	Industrial Water	Wash Water	Alone Water	Irrigation Water
Fluorides	▲	■	■	■	▲	■	■	Not Indic
Hardness Change	▲	▲	■	■	▲	■	■	■
Surfactants	▲	▲	■	▲	▲	■	▲	▲
Fluorescence	▲	▲	■	■	▲	■	▲	▲
Potassium	▲	▲	■	■	▲	▲	▲	▲
Ammonia	▲	▲	■	■	▲	▲	▲	▲
Odor	▲	▲	■	■	■	▲	▲	▲
Color	▲	▲	▲	▲	■	▲	▲	▲
Clarity	▲	▲	■	■	■	■	▲	▲
Floatables	▲	▲	■	▲	■	▲	▲	▲
Deposit / Stains	▲	▲	■	▲	■	▲	▲	▲
Vegetation Change	▲	▲	■	■	■	▲	▲	■
Structural Damage	▲	▲	▲	▲	■	▲	▲	▲
Conductivity	▲	▲	■	■	■	▲	■	■
Temp. Change	▲	▲	▲	▲	■	▲	▲	▲
pH	▲	▲	▲	▲	■	▲	▲	▲

▲ Low concentration ■ High concentration ▲ Slight concentration

Benchmark Concentrations to Identify Industrial Discharges

Benchmark	Concentration	Notes
Ammonia (mg/L)	≥ 50	• Concentrations higher than the benchmark can identify a few industrial discharges
Potassium (mg/L)	≥ 20	• Excellent indicator of a broad range of industrial discharges
Color (Units)	≥ 500	• Supplemental parameter that identifies a few specific industrial discharges
Conductivity (µS/cm)	≥ 2,000	• Identifies a few industrial discharges • May be useful to distinguish between industrial sources
Hardness (mg/L as $CaCO_3$)	≤ 10 ≥ 2,000	• Identifies a few industrial discharges • May be useful to distinguish between industrial sources
pH (Units)	≤ 5	• Only captures a few industrial discharges • High pH values may also indicate an industrial discharge or residential wash water discharge
Turbidity (NTU)	≥ 1,000	• Supplemental parameter that identifies a few specific industrial discharges

Source: Center for Watershed Protection IDDE Guidance Manual

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Ball park industrial sources

0.25 mg/L level of concern

Organization

- Preventing illicit discharges
- Identifying illicit discharges and connections
- **Investigating illicit discharges**
- Data management
- Terminating illicit discharges
- Interactive case study exercise
- Field exercise
- Wrap-up, questions, and evaluation

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Illicit Discharge Investigation Process

1. **Outfall reconnaissance inventory (ORI)**
2. Storm drain network investigations
3. Drainage area investigations
4. On-site investigations
5. Septic system investigations

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ORI - Approach

Common Approach to Outfall Screening

- Visual inspection of outfalls
- Qualitative assessment: flow, water color, odor, turbidity, floatables & sediment
- Test grab water samples – field or laboratory analysis
- Complete the ORI field form (8 sections)

ORI - Field Form (Section 1)

Source: Center for Watershed Protection, IDDE Guidance Manual

ORI - Field Form (Section 2)

LOCATION	MATERIAL	SHAPE	DIMENSIONS (in)	CONDITION

Source: Center for Watershed Protection, IDDE Guidance Manual

ORI - Field Form (Section 3)

FIELD DATA FOR FLOWING OUTFALLS			
PARAMETER	RESULT	UNIT	EQUIPMENT

Source: Center for Watershed Protection IDDE Guidance Manual

ORI - Field Form (Sections 4 & 5)

INDICATOR	CHECK (✓) PRESENT	DESCRIPTION	COMMENTS

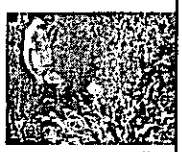
Source: Center for Watershed Protection IDDE Guidance Manual

ORI - Field Form (Sections 6 - 8)

Source: Center for Watershed Protection IDDE Guidance Manual

ORI - GPS Instead of Field Form?

- GPS: set up data dictionary in the office to replace paper field form?
- Data dictionary is an electronic field form, multiple choice questions, uniform data collection process
- GPS field data is easily uploaded into a database in the office
- Save time and money?



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~~Field~~ Trimble GPS.

setup data dictionary in GPS unit

ORI – GPS Data Dictionary

- Storm Water Outfall
- Impacted Buffer
- Utility Impact
- Channel Modification
- Trash and Debris
- Severe Bank Erosion
- Water Quality
- Access Point
- Impacted Wetland
- Stream Crossing Ford
- Stream Crossing Bridge
- Stream Crossing Culvert
- Aggradation
- Miscellaneous Barriers

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ORI - Field Equipment

- Vehicle
- GPS unit
- Laptop with GIS layers loaded
- Backpack
- First aid kit
- PPE (nitrile gloves, sunscreen, reflective vests, hip waders, etc.)
- Catch basin puller
- Sledge hammer
- Camera
- Dry erase board and marker
- Field forms, waterproof pens, clipboard
- Tape measure
- Flashlight
- Field meters (temp., conductivity, etc.)
- Wide mouth sample bottle (field tests)
- Laboratory sample bottles and coolers
- Extendable pole for sample collection
- Watch with second hand for measuring flow (or stopwatch)
- pH strips
- Ammonia strips or test kit
- OBM traps
- Dye
- Spray paint
- Rope
- Extra batteries
- Machette

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Illicit Discharge Investigation Process

1. Outfall Reconnaissance Inventory (ORI)
2. **Storm Drain Network Investigations**
3. Drainage Area Investigations
4. On-Site Investigations
5. Septic System Investigations

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Storm Drain Network Investigations

Narrows source to a single segment of a storm drain

Three approaches for exploring the MS4 network:

1. Move up the trunk
2. Split the storm drain network
3. Move down the network

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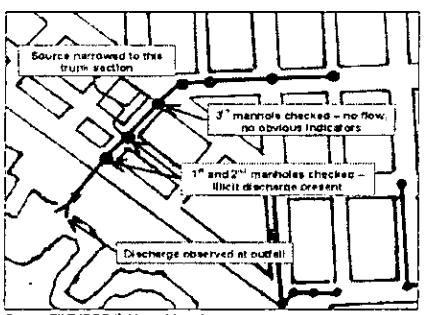
Storm Drain Network – Approaches

1. Move up the Trunk



Source: CWP IDDE Guidance Manual

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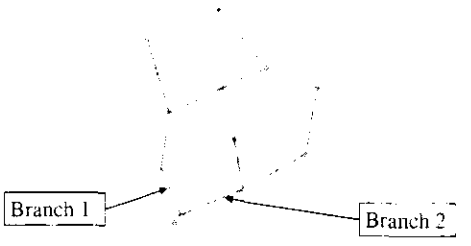
Storm Drain Network – Approaches
2. Split the Drainage Network



GIS on lap top for mapping - or paper mapping

Storm Drain Network – Approaches
3. Move Down the Network

- Start inspection at headwaters of the MS4 and move down the pipe (from clean to dirty)
- Useful for large or complex drainage systems
- Useful for tracking discharges from construction sites

Storm Drain Network – Tools

Three Tools for exploring the network

1. Inspect manholes
2. Optical brightener monitoring (OBM) traps
3. Intensive sampling

Storm Drain Network – Tools
1. Inspect Manholes

What to look for

- Presence of flow?
- Colors and odors?
- Floatables, suds?
- Deposits or stains?
- Flow during dry weather?

Pros & Cons?

- Easy and cheap to do
- Can narrow down the rough location of a problem
- May require traffic control and no parking notices

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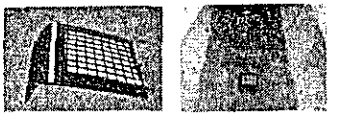
Storm Drain Network – Tools
2. Optical Brightener Monitoring

- Optical brighteners: a mix of organic compounds used to whiten fabrics, plastics, paints, etc.
- Very common in laundry detergents and waste water
- Install optical brightener monitoring (OBM) traps
- Retrieve OBM trap after a few days
- Look for fluorescence of whiteners under a black light
- Pros & Cons?



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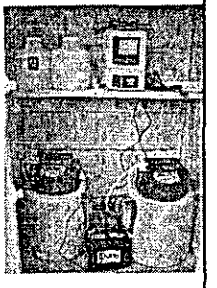
Source: Center for Watershed Protection

optical brightener traps - Stream keepers

Storm Drain Network – Tools
3. Intensive Sampling Technique

- Used to find off-hours or intermittent flows
- Flow meters – relatively inexpensive
- Auto samplers – expensive but can be left unattended
- Will not point to a specific source or specific property



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flow meters

autosamplers.

Illicit Discharge Investigation Process

1. Outfall Reconnaissance Inventory (ORI)
2. Storm Drain Network Investigations
3. **Drainage Area Investigations**
4. On-Site Investigations
5. Septic System Investigations

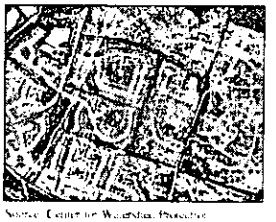
Drainage Area Investigations

1. Rapid Windshield Survey
   - Drive through drainage area to link a business or property to the illicit discharge you observed
   - Effective if illicit discharge has unique characteristics (i.e., soapy water and there is a laundromat nearby?)
   - Useful for small drainage areas
   - When field crews are familiar with local businesses

Source: Center for Watershed Protection

Drainage Area Investigations

2. Detailed drainage area investigation
   - Use maps, GIS data, and land use information to pinpoint likely generating sources.



Source: Center for Watershed Protection

Illicit Discharge Investigation Process

1. Outfall Reconnaissance Inventory
2. Storm Drain Network Investigations
3. Drainage Area Investigations
4. **On-Site Investigations**
5. Septic System Investigations - infrared imagery

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On-Site Investigations

- Used to pinpoint the exact source or connection producing a discharge within a storm drain network
- Three Basic Approaches:
  1. Dye testing
  2. Video Inspection
  3. Smoke testing

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On-Site Investigations
Dye Testing - Applications

In the Storm Sewer

- Use to complete mapping of your MS4
- Find inter-connections to storm sewer
- Find leaks from a sanitary sewer to MS4

At a Facility

- Determine if illicit connections exist
- Test sinks, toilets, floor drains

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On-Site Investigations
Dye Testing - Before You Start

- Review sewer and storm drain maps
- Notify property owners
- Notify local agencies
- Determine staffing needs

2-3people
sometimes use
radios

Source: Center for Watershed Protection

On-Site Investigations
Dye Testing – Equipment & Safety

- Obtain site utility plan
- Million candle power light
- Two-way radios
- Non-toxic, FDA-approved dye, 2 different colors
- Field records (fixtures tested, date, time, and dye color)
- Mark plans in the field with sketch of your findings
- Take photographs

On-Site Investigations
Dye Testing - Pros & Cons

Pros

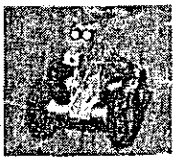
- Easy to do
- Materials are inexpensive
- Results will show specific source

Cons

- Time consuming in low flow
- Difficult to see dye
- Need homeowner's/business owner's cooperation
- Public reaction to dye in streams

On-Site Investigations
Video Inspection - Applications

Video inspection



- To see illicit taps
- To see the condition of the storm sewer line
- To create a permanent record

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On-Site Investigations
Video Inspection – What to Look For

- Heavily stained pipe
- Grease build-up on pipe walls
- Table scraps
- Toilet paper or paper products
- Soap suds
- Chemicals (if in an industrial area)
- Paint
- Other waste products

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On-Site Investigations
Video Inspection – Pros and Cons

Pros
- *May have equipment in-house*
- Easy to see active taps
- Create a record of observation
- Only way to observe pipe between 2 manholes
- Minimally intrusive

Cons
- Expensive to do and time consuming
- Difficult to see inactive taps
- Does not work on obstructed sewers
- May require confined space entry
- Does not work in small diameter or water-filled pipes

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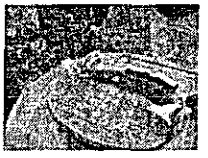
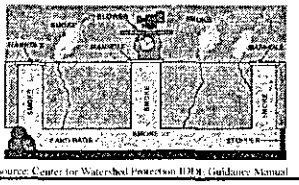
On-site Investigations
Smoke Testing - Applications

- Used to isolate discharges
- Can be used to detect infiltration and inflow into the MS4
- May be used instead of video





Source: Center for Watershed Protection IDDE Guidance Manual

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On-site Investigations
Smoke Testing – Pros and Cons

Pros
- Good option to video when pipes are small
- Inexpensive and easy to do
- Can detect breaks in MS4 and cross-connections

Cons
- Must notify the public
- Smoke can cause respiratory irritation for residents

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Illicit Discharge Investigation Process

1. Outfall Reconnaissance Inventory
2. Storm Drain Network Investigations
3. Drainage Area Investigations
4. On-Site Investigations
5. **Septic System Investigations**

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Septic System Investigations

Three Methods

1. Homeowner surveys
   - Do drains in the house work well?
   - Do the toilets back up frequently?
   - How many people live there?
   - Any wet, smelly spots in the yard?
   - When was the system last maintained?

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Clallam County

Roger has contact?

Septic System Investigations

2. Observe the yard surface condition
   - Wet, spongy ground surface
   - Damage to drain field from vehicles, heavy objects
   - Visible cave-ins
   - Obvious system bypasses, pipes to ditches, etc.

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Septic System Investigations

3. Detailed inspection
   - Certified professional
   - Check the integrity of septic system, depth of solids, etc.
   - Estimate distance to surface water, ground water, and surface water sources.
   - Dye testing sometimes also used

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Organization

- Preventing
- Identifying illicit discharges and connections
- Investigating illicit discharges
- **Data management**
- Terminating illicit discharges
- Interactive case study exercise
- Field exercise
- Wrap-up, questions, and evaluation

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Clallam County Septic system inspections
Call the Health Dept.

Data Management

ArcGIS, I-map, Microsoft Excel, Access Database,?

- Download photos and GPS location data
- Download field data from water quality sensors
- Store laboratory analytical results
- Compare illicit discharge information to GIS layers of land use, sewer lines, etc.
- Review data, generate reports for Ecology
- Support enforcement actions

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Data Management
Clark County, WA

- Herrera surveyed over 50 miles of stream corridor (2007 – 2009).
- Created unique geodatabase to store GPS coordinates and other data, photos, etc.
- Recorded GPS data: storm water outfalls, bank erosion, damaged culverts, water quality impacts, trash / debris
- Identified 21 capital improvement projects: Stormwater Control Facility Improvements, Stormwater Facility/Infrastructure Maintenance, Habitat Restoration/Enhancement, etc.

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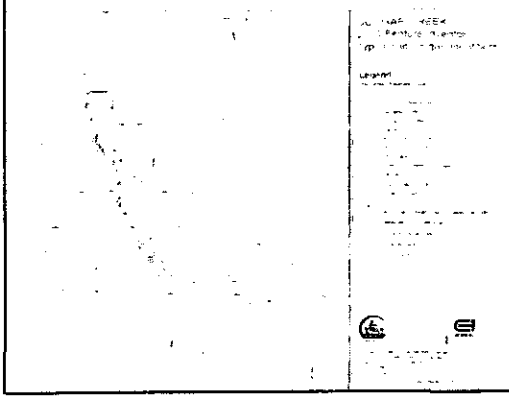
Clark County, WA



Ask Bill about geodata base

link photos/

Organization

- Preventing illicit discharges
- Identifying illicit discharges and connections
- Investigating illicit discharges
- Data management
- **Terminating illicit discharges**
- Interactive case study exercise
- Field exercise
- Wrap-up, questions, and evaluation

Terminating Illicit Discharges

1. Determine who the responsible party is:
   - Municipality? Initiate spill response or issue work order.
   - Private property? Issue a notice of violation.
2. Eliminate the discharge and confirm it is no longer an issue
3. Complete documentation

Terminating Illicit Discharges

Escalating Enforcement Actions

1. Written warning with voluntary compliance - minor violations
2. Written notice ordering compliance - remedial measures necessary, time schedule, penalties assessed for non-compliance
3. Civil penalties and collection (or community service?) - daily financial penalty
4. Criminal prosecution – for intentional and flagrant violations
5. Emergency cease and desist order
6. Disconnection from the MS4 – turn off water service to a property in an emergency situation or when a property owner fails to comply

Could have coordinated better - on penalties

Terminating Illicit Discharges

- Public education is key
- Response will vary depending on the type of discharge and location
- Rapid, effective spill response is also key – educate contractors
- In-house contractors/staff to make repairs as part of routine maintenance activities

janitorial services - education & outreach.

Terminating Illicit Discharges

- Transitory discharges: usually corrected with changes in behavior, spill containment, installing proper BMPs, and clean-up procedures
- Indirect discharges: broken sewer lines, pump station failures or failing septic field corrected through structural repairs
- Direct discharges: sewage cross connections, straight pipes, and industrial and commercial cross connections corrected through simple plumbing projects or excavation and repair of sewer lines

Terminating Illicit Discharges

How is Correction Confirmed?

- At the source
- Downstream (sampling or sand bagging)
- Dye testing or video inspection (internal plumbing or lateral connection)

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Organization

- Preventing illicit discharges
- Identifying illicit discharges and connections
- Investigating illicit discharges
- Data management
- Terminating illicit discharges
- **Interactive case study exercise**
- Field exercise
- Wrap-up, questions, and evaluation

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Case Studies

- Work together in teams
- Use photos and clues to help you identify the most likely cause of the discharge
- Refer back to slides on color, odor, and other indicators (slides 9 & 10, etc.)
- One person from each team will present your best guess
- *You have 10 minutes*

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Organization

- Preventing illicit discharges
- Identifying illicit discharges and connections
- Investigating illicit discharges
- Data management and evaluation
- Terminating illicit discharges
- Interactive case study exercise
- **Field exercise**
- Wrap-up, questions, and evaluation

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Preview of Field Exercise

- Drive to a site and observe an outfall
- Complete the ORI field form
- Record GPS data, photograph outfalls
- Collect and analyze samples for pH, turbidity, conductivity, ammonia, and surfactants

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Field Exercise

(Dry outfall video)

(Flowing outfall video)

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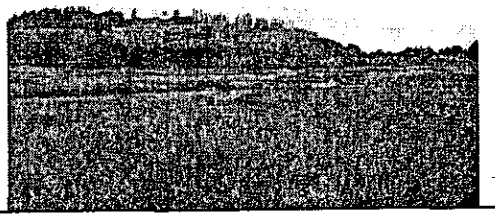
Recap of Learning Objectives

- Reinforce how to prevent illicit discharges
- Learn how to identify and investigate illicit discharges
- Understand how to terminate and clean up illicit discharges
- Learn valuable lessons gathered from other jurisdictions

Questions & Evaluation



Illicit Discharge Detection & Elimination (IDD&E)
Case Study Answers

Port Angeles, Washington

July 30, 2009

Herrera Environmental Consultants

Case Study #1

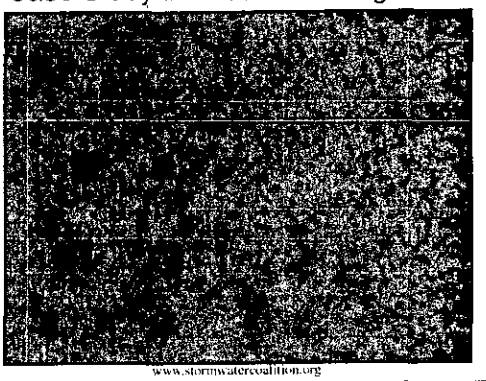
- It hasn't rained in 5 days and you open a manhole cover 50 feet down gradient from a busy intersection
- You observe soapy water flowing through the storm sewer and the suds look fresh
- Flow in the pipe is minimal (estimated to be <5 gpm)
- You observe a restaurant, gas station, movie theater, and dry cleaner located at the intersection upstream from the manhole
- What kind of test(s) could you do to try to pinpoint the source of the discharge?
- What do you suspect may be the source of the discharge?

Case Study #1 – Car Washing

City of Everett, WA

- Charity car washes pop up periodically and discharge soapy vehicle wash water to the storm sewer
- Commercial car washes have spent hundreds of thousands of dollars to revamp facilities to treat wash water
- Sometimes it is difficult for the City to strike a balance

Case Study #1 - Car Washing Video

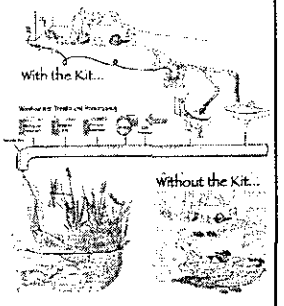


www.stormwatercoalition.org

4

Car Wash Kits

- Can often be borrowed
- Plastic tub inserted in catch basin
- Electric submersible pump in plastic tub
- Protect with traffic cones
- Outlet hose from pump to nearest toilet, sink, or floor drain (connected to sanitary sewer!)



Source: King County

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Case Study #2

- A citizen calls to complain of suspicious people dumping liquids into a catch basin in a residential neighborhood
- The people in question reportedly have a white work van, were "doing something" at the curbside for a few hours, and then left. The caller has seen the same van in the area several times before.
- You collect a sample of water from a catch basin near the scene: you detect surfactants at a concentration >0.25 mg/L and observe a slight oily sheen
- What do you think the source of the discharge might be?

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Case Study #2 – Mobile Cleaning Operations

- Mobile auto detailers working curbside in residential neighborhoods
- Mobile carpet cleaning companies
- Mobile commercial floor cleaning companies (grocery stores, malls, etc.)
- Some of these types of businesses routinely dump wash water into storm drains…
- Education and enforcement are key to prevention

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Case Study #3

- An intermittent discharge seems to be occurring about 3 days a week at a busy industrial area
- A water sample collected from a manhole has foul rotten and bleach odors, a reddish hue, and contains surfactants
- You've already dye tested all of the adjacent facilities and found no illicit connections to the MS4
- What might be the source of the discharge?

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Case Study #3 – Floor Cleaning

- A janitorial service would clean the floors at a meat packing facility very early in the morning
- While on her way to work, a City employee who had recently received IDD&E training observed a janitor dumping soapy, bloody wash water into a catch basin
- The janitor's response was, "well they let us do it in the other City…."

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Case Study #4

- An outfall was investigated due to elevated bacteria levels detected in continuous dry weather flow
- The flow was followed to the first upstream manhole where an incoming lateral line was observed discharging sudsy water with phosphate measured at 3.10 mg/L

Adapted from: Galveston County Health Department. A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)

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Case Study #4 - Phosphates

- *The lateral line was coming from* a car dealership
- The shop floor was being cleaned by hosing the wastewater outside to a storm drain, and vehicles were being washed near the drain instead of on the car wash pad

Adapted from: Galveston County Health Department. A Guidance *Manual for Identifying and Eliminating* Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)

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Case Study #5

- Water with a pH of *11.07* was observed flowing from an outfall
- The water had a milky white color and some suds
- Land use in the area was commercial
- What could be causing the discharge and what additional information would you want to *confirm* it?

Adapted from: Galveston County Health Department. A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)

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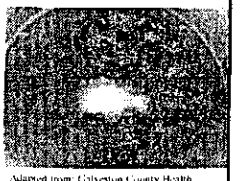
Case Study #5 - pH

- The source was tracked to a car dealership discharging paint and vehicle wash water to a floor drain
- A plumber was hired to properly reconnect the floor drain to the sanitary sewer instead of the storm sewer

High pH in stormwater is also a common problem at construction sites caused by freshly poured concrete

Case Study #6

- A high-beam spotlight was used to observe billowing suds within a concrete storm drain discharging into a creek
- Chlorine residual was measured to be greater than 3 mg/L
- Businesses in the area include a dry cleaner, several restaurants, and an oil change facility
- What might be the source of the discharge?



Adapted from: Galveston County Health Department. A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)

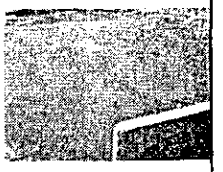
Case Study #6 - Chlorine

- A restaurant was identified upstream that had experienced a large grease spill
- Chlorine had been sprinkled over the grease and then the area was power washed
- The wash water drained into an open pipe in the driveway that was connected directly to the storm drain

Adapted from: Galveston County Health Department. A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)

Case Study #7

- *Residents had complained* for years about foul odors in an area ditch
- No septic systems exist in the neighborhood
- What might be going on at this site and how would you investigate?



Adapted from: Galveston County Health Department: A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (MS4)

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Case Study #7 - Ammonia

- The connection was traced to two homes with sanitary sewer lines plumbed directly to the storm sewer

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Case Study #8

- An investigation in a commercial area turns up soapy, oily water in the MS4. The discharge shows up like clockwork around 6:30 pm every night.
- You look around and see home improvement stores, a 10-minute oil change facility, a tire store, and a few *restaurants*
- What do you think the source of the discharge might be?

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Case Study #8 – 10 Minute Oil Change Facility

Wayne County, MI

- Dye testing revealed that the floor drain was plumbed into the building's perimeter footing drain
- Employees assumed the floor drain was plumbed to the sanitary sewer and were dumping oily floor wash water into the drain at the end of each day
- City planners and building inspectors are key IDD&E team members who can help prevent problems like this from occurring

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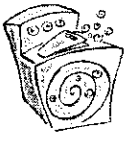
Case Study #9

- Surfactants are discovered in water discharging to a ditch
- Most homes in the area are on septic systems and have sump pumps
- A homeowner interviewed close to the discharge states that his septic system appears to be functioning properly
- The homeowner says that he remodeled the basement about 10 years after the home was built
- *What questions would you want to ask the homeowner?*
- What do you think might be going on at the site?

20

Case Study #9 – New Plumbing Connection

- The homeowner revealed that he had installed a washing machine in the basement and plumbed it to discharge the wastewater into a sump
- The sump pump discharged via a pipe straight out to the ditch



21

Case Study #10

- In 1996, the Department of Ecology officially declared Burnt Bridge Creek to be severely polluted with fecal coliform; the creek discharges to Lake Vancouver.
- City workers home in on a commercial building in the area constructed in the early 70's as the likely source
- Describe how dye testing facilities or video taping the storm sewer lines that lead to the creek might help City workers locate the source of the discharge?

22

Case Study #10 - Vancouver, WA

Vancouver sewer flows again, but not into creek

THE ASSOCIATED PRESS

VANCOUVER, Wash. -- A building in Vancouver that houses offices of state environmental regulators is now hooked up to the correct sewer line, so its waste is no longer flowing into a nearby creek.

A survey of the city's stormwater system recently found that a wrong connection from the building had, for years, allowed raw sewage to flow almost a mile into Burnt Bridge Creek.

23

Case Study #10 - Vancouver, WA

The building houses leased offices of the state Department of Fish and Wildlife and the Department of Ecology, which 13 years ago declared that the creek was severely polluted with fecal coliform.

The problem was fixed, and workers on Friday were able to end a week of using portable toilets.

Ecology workers are continuing to measure fecal coliform in the creek, which empties into Vancouver Lake.

24

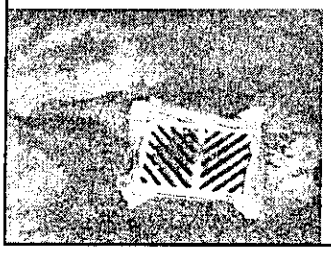
Case Study #11

- You see a suspicious liquid at a construction site flowing toward a catch basin.
- List some of the sources that could be causing the discharge
- How would you investigate this discharge?

25

Case Study #11

- The liquid turns out to be hydraulic fluid from a broken line on an excavator.



26

Case Study #12

- You respond to a call from a citizen complaining of sudden hunger pangs related to a discharge they have just observed
- You arrive at the scene and smell cinnamon and observe seagulls flying around overhead.
- Land use in the immediate area appears to be entirely residential.
- What do you think the source of the discharge might be?

27

Case Study #12

- The source of the discharge was a truck carrying doughnut glaze that lost control and rolled over in King County, WA. WSDOT was called in to help cleanup the sugary mess oozing toward a culvert.

Source: Seattle Times 6/15/09. Photo by Lynn Thompson

28

Illicit Discharge Detection & Elimination (IDD&E) References

IDD&E Awareness, Response, and Enforcement

Resources at the Center for Watershed Protection's website (http://www.cwp.org):

- ORI Field Sheet & Database
- Illicit Discharge Hotline Incident Tracking Sheet
- Chemical Mass Balance Model (CMBM) Setup & Input File
- Inappropriate Discharge Detection and Elimination: What Phase I Communities Are Doing to Address the Problem (Zielinski and Brown 2003)

Other Interesting Reading:

- A Guidance Manual for Illicit Discharge Detection and Elimination. Stormwater Magazine (Stormwater Magazine 2007)
  http://www.forester.net/sw_0701_guidance.html
- A Watershed-Based Approach to Stormwater Management (Stormwater Magazine 2005)
  http://www.forester.net/sw_0507_watershed.html
- Illicit Discharge Detection and Dry Weather Flows (Stormwater Magazine 2005)
  http://www.forester.net/sw_0507_illicit.html
- Illicit Discharge Detection and Elimination (Stormwater Magazine 2004)
  http://www.forester.net/sw_0403_illicit.html
- Microbial Source Tracking Study for South Cypress Creek (City of Memphis, TN 2003):
  http://www.cityofmemphis.org/pdf_forms/MicrobialSourceTrackingStudy.pdf
- Sherlocks of Stormwater: Effective Investigation Techniques for Illicit Connection and Discharge Detection (Wayne County Department of Environment 2003)
  http://www.epa.gov/owow/nps/natlstormwater03/40Tuomari.pdf

National Guidance on Related Topics:

- Decentralized Wastewater Treatment Systems: A Program Strategy
  http://www.epa.gov/owm/septic/pubs/septic_program_strategy.pdf

- Voluntary National Guidelines for Management of Onsite and Clustered (Decentralized) Wastewater Treatment Systems
  http://cfpub.epa.gov/owm/septic/septic.cfm?page_id=289

- U.S. EPA's Menu of BMPs: Volunteer Monitoring
  http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm?action=factsheet_results&view=specific&bmp=17

Components of Effective IDDE Programs:

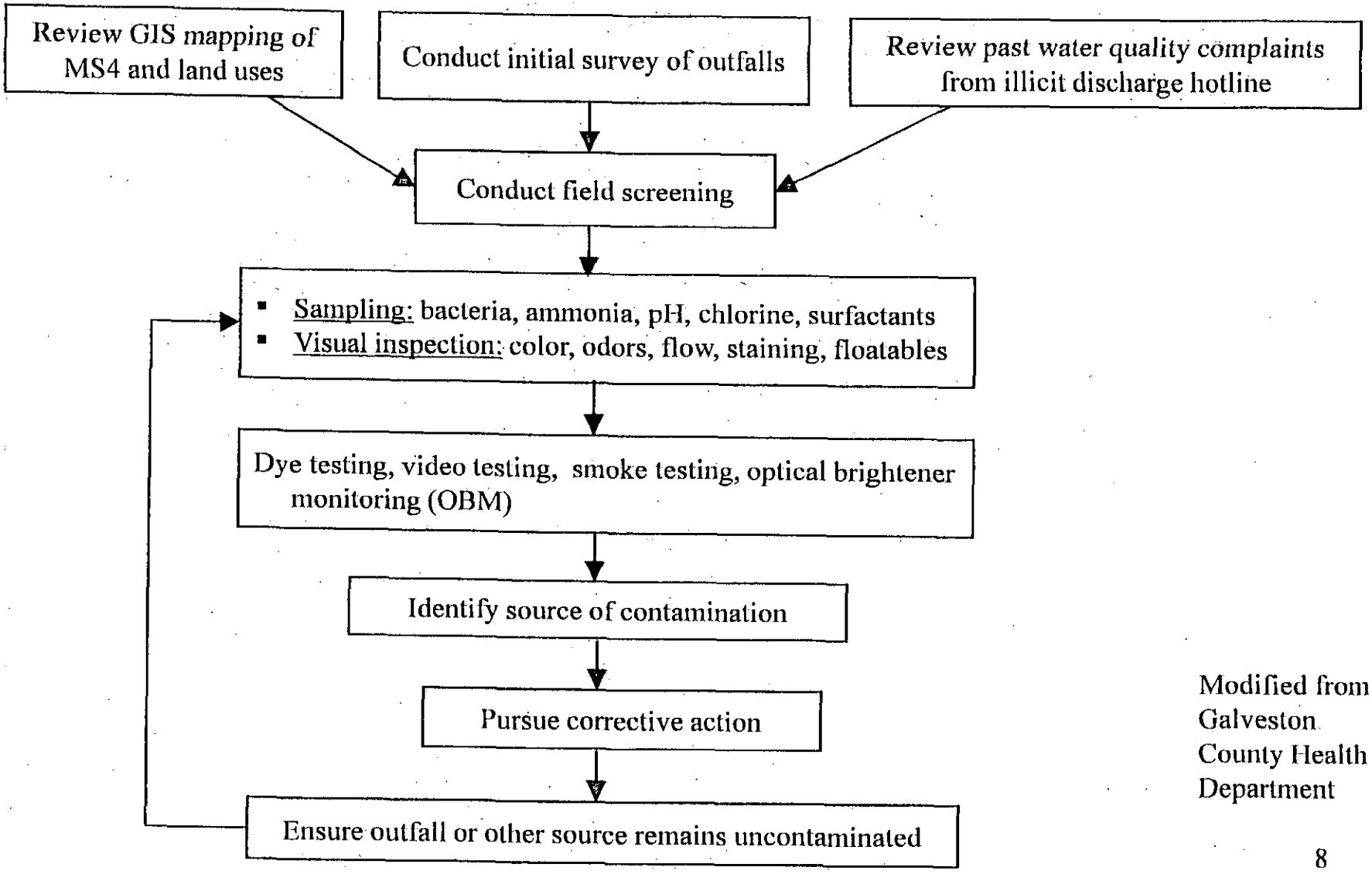
- U.S. EPA's Stormwater Phase II Final Rule Fact Sheet Series: IDDE Minimum Control Measure
  http://www.epa.gov/npdes/pubs/fact2-5.pdf

- U.S. EPA's Menu of BMPs: Illicit Discharge Detection and Elimination
  http://www.epa.gov/npdes/stormwater/menuofbmps/illicitdischarge

- The Rouge River Project Illicit Discharge Elimination Program
  www.rougeriver.com/techtop/illicit/index.html

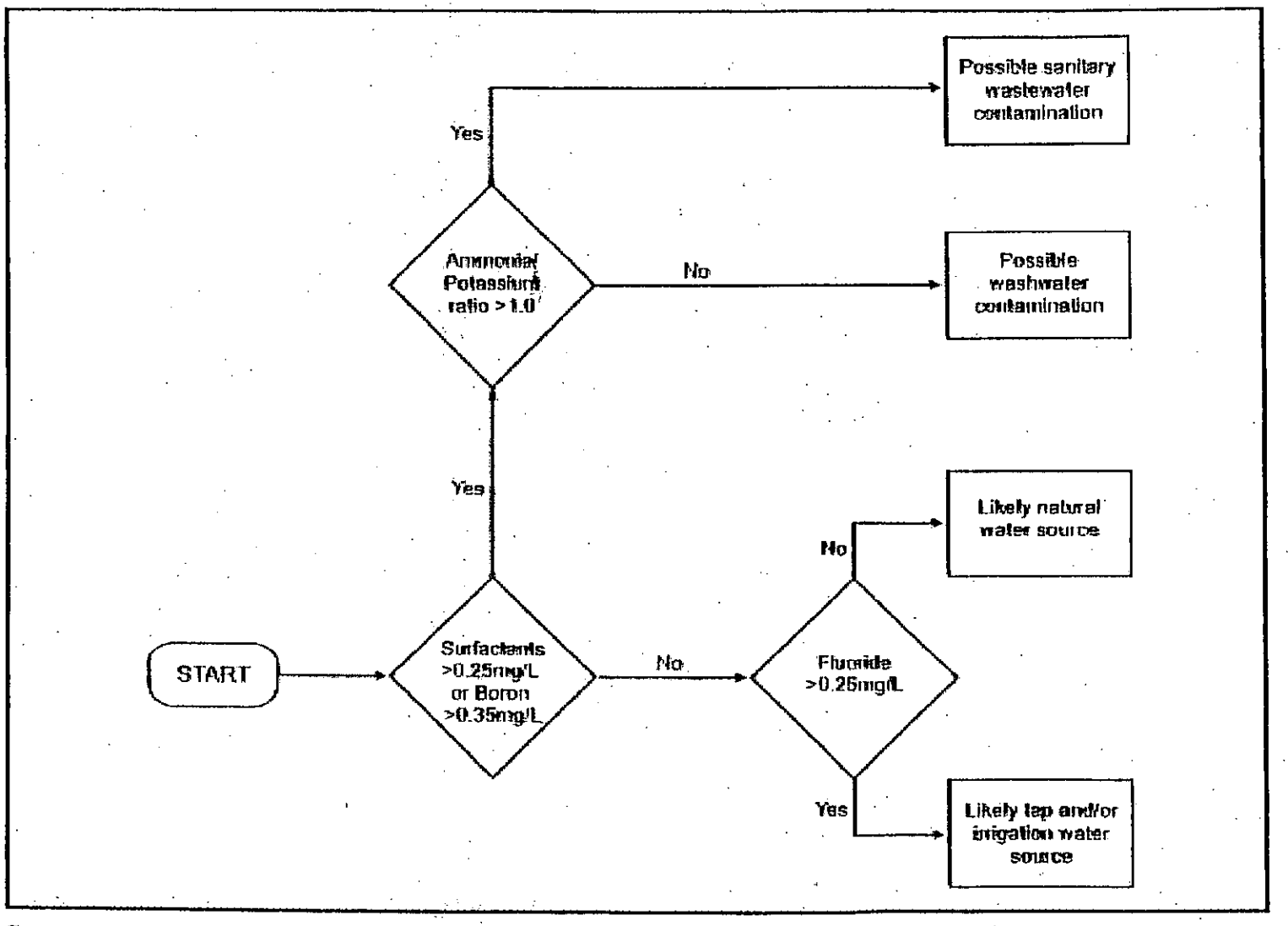
- A Guidance Manual for Identifying and Eliminating Illicit Connections to Municipal Separate Storm Sewer Systems (Galveston County Health District, 2002)
  www.gchd.org/pages/pollution/GuideManual.pdf

Identifying Illicit Discharges



Modified from: Galveston County Health Department

Data Evaluation



Source: Center for Watershed Protection IDDE Guidance Manual

Parameters and Associated Flow Sources

Parameter	Natural Water	Potable Water	Sanitary Wastewater	Septic Tank Effluent	Industrial Water	Wash Water	Rinse Water	Irrigation Water
Fluorides	▲	■	■	■	♦	■	■	Not listed
Hardness Change	▲	♦	■	■	♦	■	■	■
Surfactants	▲	▲	■	▲	▲	■	▲	▲
Fluorescence	▲	▲	■	■	▲	■	▲	▲
Potassium	▲	▲	■	■	▲	▲	▲	▲
Ammonia	▲	▲	■	■	▲	▲	▲	▲
Odor	▲	▲	■	■	■	♦	▲	▲
Color	▲	▲	▲	▲	■	▲	▲	▲
Clarity	▲	▲	■	■	■	■	♦	▲
Floatables	▲	▲	■	▲	■	♦	♦	▲
Deposit/Stains	▲	▲	■	▲	■	♦	♦	▲
Vegetation Change	▲	▲	■	■	■	♦	▲	■
Structural Damage	▲	▲	▲	▲	■	▲	▲	▲
Conductivity	▲	▲	■	■	■	♦	■	■
Temp. Change	▲	▲	♦	▲	■	♦	♦	▲
pH	▲	▲	▲	▲	■	▲	▲	▲

▲ Low concentration ■ High concentration ♦ Variable concentration

Adapted from "Investigation of Inappropriate Pollutant Entries into Storm Drainage Systems – A User's Guide". EPA/600/R-92/238. Jan. 1993. p. 26

Benchmark Concentrations to Identify Industrial Discharges

Benchmark	Concentration	Notes
Ammonia (mg/L)	**≥ 50**	▸ Concentrations higher than the benchmark can identify a few industrial discharges
Potassium (mg/L)	**≥ 20**	▸ Excellent indicator of a broad range of industrial discharges
Color (Units)	**≥ 500**	▸ Supplemental parameter that identifies a few specific industrial discharges
Conductivity (µS/cm)	**≥ 2,000**	▸ Identifies a few industrial discharges ▸ May be useful to distinguish between industrial sources
Hardness (mg/L as $CaCO_3$)	**≤ 10** **≥ 2,000**	▸ Identifies a few industrial discharges ▸ May be useful to distinguish between industrial sources
pH (Units)	**≤ 5**	▸ Only captures a few industrial discharges ▸ High pH values may also indicate an industrial discharge or residential wash water discharge
Turbidity (NTU)	**≥ 1,000**	▸ Supplemental parameter that identifies a few specific industrial discharges

Source: Center for Watershed Protection IDDE Guidance Manual

Attachment K

City of Port Angeles Urban Services Standards and Guidelines,
Chapter 5 - Stormwater and Chapter 6- Clearing and Grading

CHAPTER 5 - STORMWATER

"URBAN SERVICES STANDARDS AND GUIDELINES"

CITY OF PORT ANGELES - PUBLIC WORKS & UTILITIES DEPARTMENT

5.01 PURPOSE AND POLICY

The purpose of these standards and requirements is to improve water quality in all of the streams and local water bodies, and to control connections to the City's stormwater system.

The standards in this chapter are intended to be applied by the City Engineer while reviewing proposed drainage facilities and stormwater discharges pursuant to PAMC 13.61 and 13.63. They are intended to implement the most recent version of Department of Ecology's Stormwater Manual for Western Washington (DOE Manual), and represent the minimum standards for the design and construction of permanent storm drainage facilities in the City of Port Angeles. They clarify, and in some cases strengthen, the DOE Manual's Best Management Practices (BMPs) for use within the City. In the case of conflict between the Urban Services Standards and Guidelines and the DOE Manual, the more stringent standard will apply.

5.02 STORMWATER DISCHARGE PERMIT

A. A Stormwater Discharge Permit will be required for any activity that affects stormwater by discharging runoff either directly or indirectly to the City's stormwater system. Activities that will require permits include:

- Draining water from a chlorinated water source such as a swimming pool or a hot tub.
- Charity car washes that are not permitted as a commercial or industrial use.
- All new development or redevelopment that does not require a building permit, but discharges stormwater either directly or indirectly to the City's stormwater system.

Stormwater Discharge Permits are not required for development or redevelopment projects that require a building permit or a Clearing and Grading Permit.

B. The Stormwater Discharge Permit will be effective for six months from the date of issuance, but may with due cause be extended for an additional six month period. The fee schedule for the review of plans for development or redevelopment will be set by resolution of the City Council. No fee will be required for draining of chlorinated water or charity car washes. A current schedule of fees is included in PAMC 3.70.110.

C. The Permitee shall comply with the following minimum conditions for Stormwater Discharge Permits for development and redevelopment:

- Submit a drainage plan for review and approval. Requirements for drainage plans are detailed in 5.05.
- Notify the City at least 48 hours before commencing the stormwater work.
- Notify the City at least 48 hours before tying into the City's stormwater system.
- Install stormwater facilities as shown in the approved drainage plan.
- Obtain approval in writing from the City for any drainage plan revisions.
- Provide safe access to allow the City to enter the site for the purpose of inspecting stormwater facilities for compliance with the approved drainage plan.
- Keep an up-to-date copy of the approved drainage plan on site during working hours.
- Ensure that all workmanship and materials are in accordance with these Standards, the DOE Manual and the most recent version of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction.

D. The Permitee shall comply with the following minimum conditions for Stormwater Permits for charity car washes:

- Comply with whatever measure(s) the City deems necessary to keep car wash water and chemicals from entering a storm drain or creek.
- Notify the City 48 hours before commencing the car wash.

E. Construction within environmentally sensitive areas or their buffers shall be incompliance with Chapter 15 of the PAMC, and is subject to the review and authority of the Director of Community and Economic Development.

5.03 GENERAL DESIGN CRITERIA FOR SITES THAT DISTURB 1 ACRE OR GREATER

5.03.01 APPLICABILITY

All projects that disturb 1 acre or more, or are part of a common plan for development or sale which will result in a disturbance of 1 acre or more must be evaluated through the following flow charts (Figures 5.1 through 5.3 below) to determine which of the Nine Minimum Requirements will apply (see Section 5.04), unless the project meets one of the following general exemptions:

1. Forest practices
2. Commercial agriculture
3. Oil and gas field activities or operations
4. Road maintenance in the following specific categories:
   - Pothole and square cut patching, overlaying or resurfacing with in-kind material without expanding the area of coverage, shoulder grading, reshaping or regarding drainage systems, crack sealing and vegetation management. **Overlaying or resurfacing which upgrades from dirt, gravel or chip seal to asphalt or concrete is not exempt.**
5. Underground utility projects are only subject to Minimum Requirement #2

All of these categories of exemptions have associated conditions. Before the developer proceeds with an exemption, the exemption must be discussed with and approved by the City Engineer.

Low Impact Development (LID) facilities are encouraged. LID facilities help to reduce project costs by reducing the volume of water which must be treated or detained. LID also enhances project aesthetics. LID facilities shall be designed in accordance with the 2005 Low Impact Development Technical Guidance Manual for Puget Sound (or most recent version) and shall take into account site and soil conditions, access and long term maintenance. See section 5.05.03 for more information.

5.03.02 REQUIREMENTS FOR STORMWATER SITE PLANS

The Stormwater Site Plan is a comprehensive report that contains all of the technical information and analysis necessary for the City to evaluate a proposed new development or redevelopment for compliance with stormwater requirements. Stormwater Site Plans must be in accordance with Chapter 3, Volume I of the DOE Manual and designed by or under the direction of a civil engineer licensed to practice in Washington State. See Section 5.04.01 for more information.

5.03.03 REQUIREMENTS FOR THE PERMANENT STORMWATER CONTROL PLAN

The Permanent Stormwater Control Plan is step five in the development of the Stormwater Site Plan. The Permanent Stormwater Control Plan guides the project designer through permanent stormwater BMP selection for the site. Permanent Stormwater Control Plans must be in accordance with Chapter 4, Volume I of the DOE Manual and designed by or under the direction of a civil engineer licensed to practice in Washington State. The following items clarify the DOE requirements:

1. Off site analysis is required. See Section 5.04.01 for more information.
2. No local water quality management plans exist at this time.
3. There is no requirement at this time for Phosphorus Control.

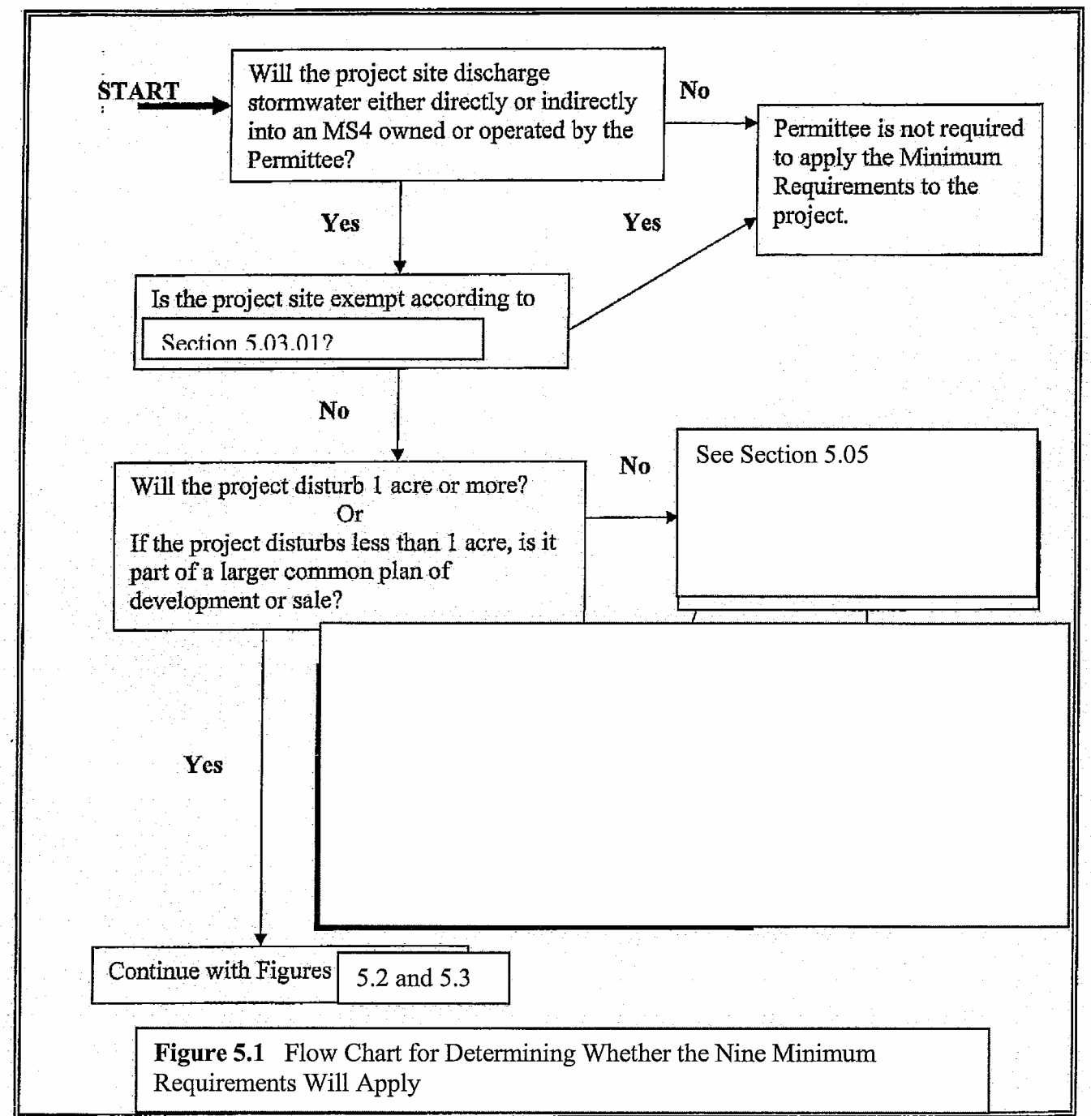


Figure 5.1 Flow Chart for Determining Whether the Nine Minimum Requirements Will Apply

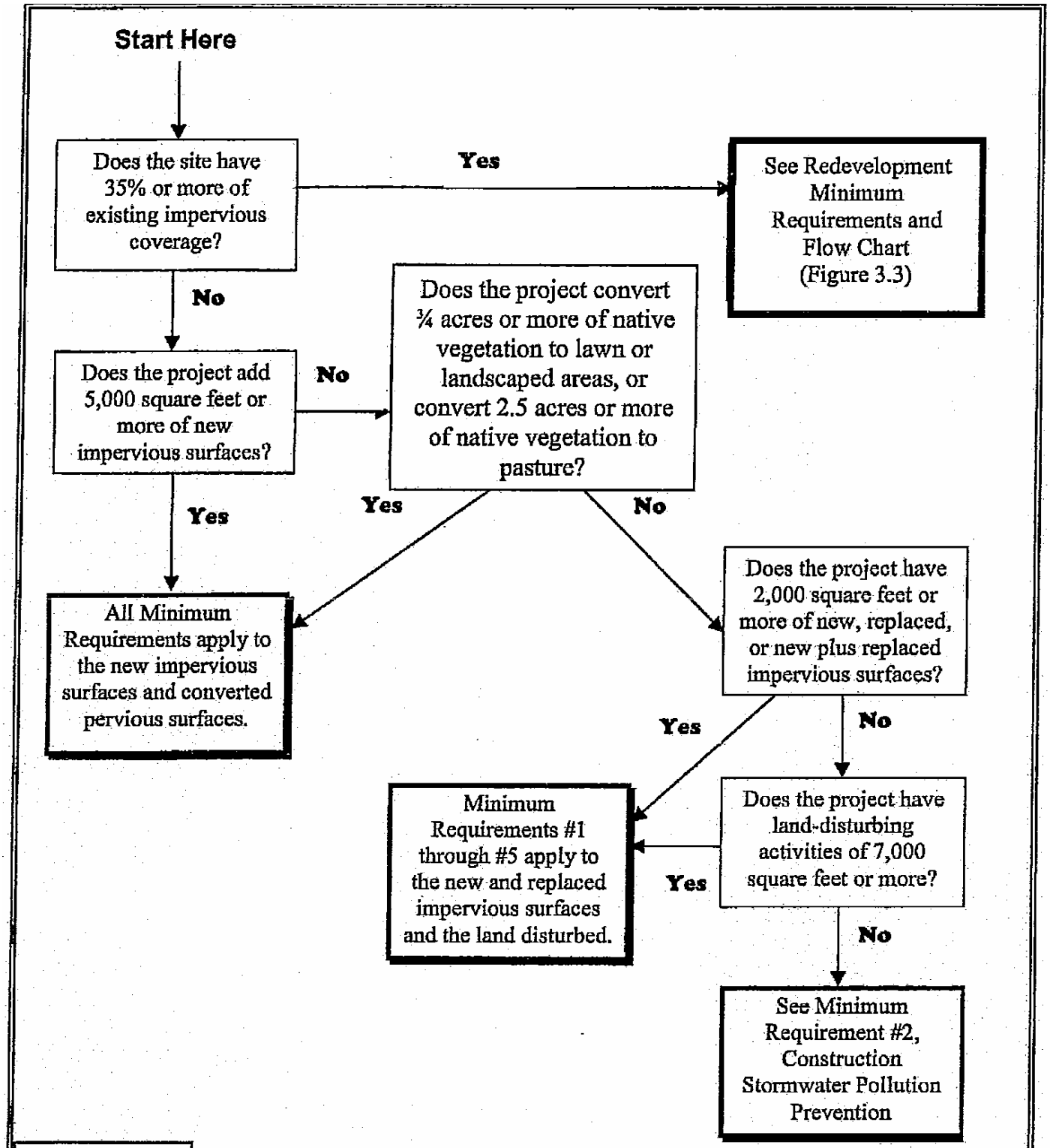


Figure 5.2 **Flow Chart for Determining Requirements for New Development**

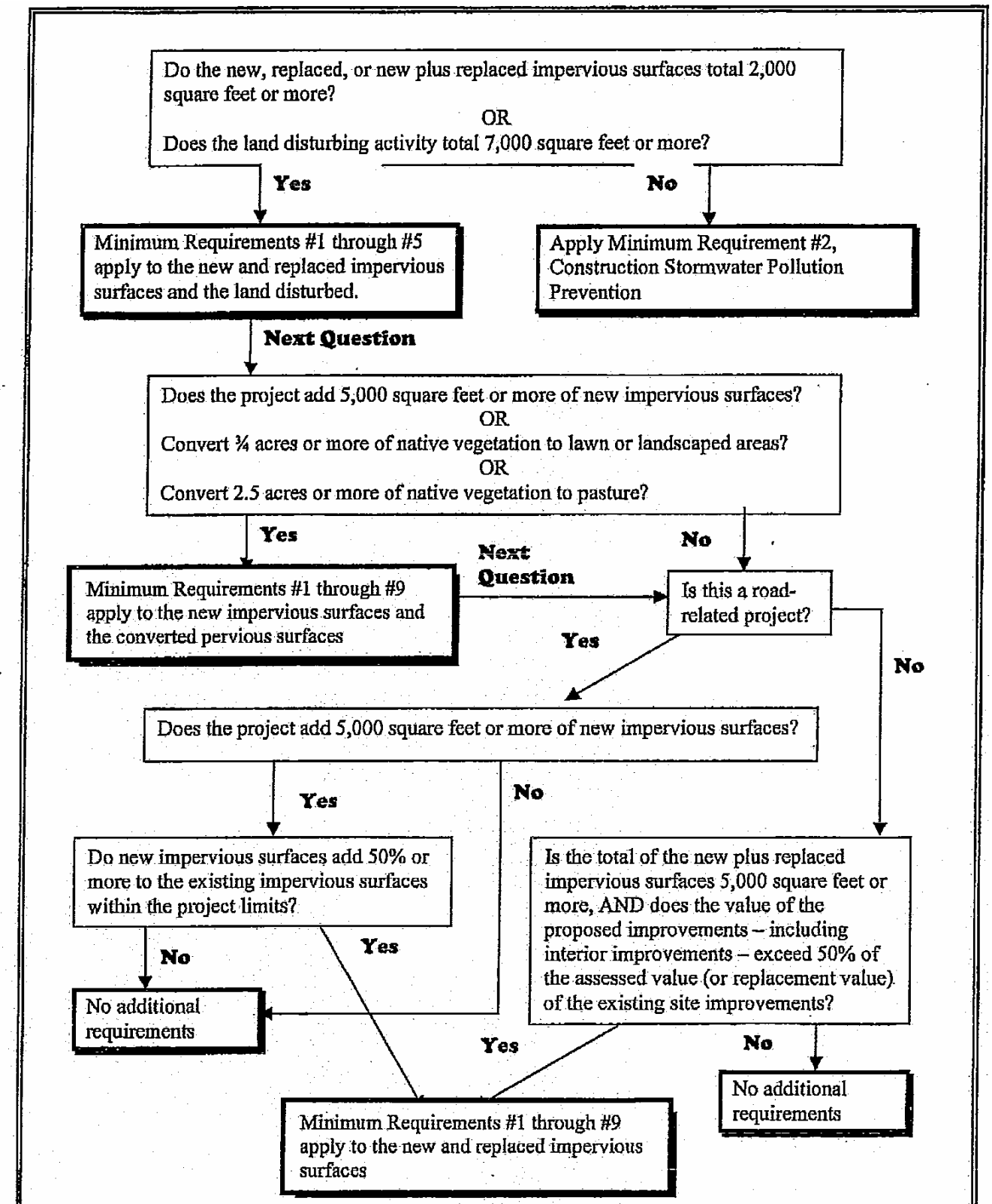


Figure 5.3 **Flow Chart for Determining Requirements for Redevelopment**

CHAPTER 5 - STORMWATER

5.04 NINE MINIMUM REQUIREMENTS

This section describes the Nine Minimum Requirements for stormwater management for development and redevelopment sites which meet the disturbance thresholds in Figures 5.1 through 5.3 in this document.

5.04.01 Minimum Requirement #1: Preparation of Stormwater Site Plans

The project proponent shall prepare a Stormwater Site Plan in accordance with Chapter 3 of Volume I of the most recent version of the Stormwater Management Manual for Western Washington (DOE Manual). The Stormwater Site Plan shall be designed by or under the direction of a civil engineer licensed to practice in Washington State. The Stormwater Site Plan is a comprehensive report that contains all of the technical information and analysis necessary for the City to evaluate a proposed new development or redevelopment for compliance with stormwater requirements. The following items clarify the DOE requirements:

Off site analysis is step 3 in the development of the Stormwater Site Plan. Off site analysis will be required for projects that add 5,000 sf or more of new impervious surface, or that convert ¾ acre of pervious surfaces to lawn or landscaped areas, or that convert 2.5 acres or more forested area to pasture. In addition:

- Off site analysis shall be in accordance with Section 2.6.2, Volume I of the DOE Manual, and Section 5.03.04.
- Analysis of upland erosion impacts, including landslide hazards is not required
- Analysis of violations of surface water quality standards as identified in a Basin Plan or TMDL is not required.
- Depending on the results of the off site analysis, the City may require mitigation of any problem identified or a quantitative analysis, as described in the same section of the DOE Manual.

5.04.02 Minimum Requirement #2: Construction Stormwater Pollution Prevention Plan - (SWPPP)

The project proponent shall prepare a SWPPP in accordance with Chapter 6 of the Urban Services Standards.

5.04.03 Minimum Requirement #3: Source Control of Pollution

All known, available and reasonable source control BMPs are required for all projects meeting the thresholds in Figures 5.1 through 5.3 in this document. Source control BMPs must be selected, designed, and maintained in accordance with Volume IV of the DOE Manual.

5.04.04 Minimum Requirement #4: Preservation of Natural Drainage Systems and Outfalls

Natural drainage patterns shall be maintained, and discharges from the project site shall occur at the natural location, to the maximum extent practicable. The manner by which runoff is discharged from the project site must not cause a significant adverse impact to downstream receiving waters and down gradient properties. All outfalls require energy dissipation.

5.04.05 Minimum Requirement #5: On-site Stormwater Management

The project proponent must design and place on-site stormwater management BMPs to infiltrate, disperse, and retain stormwater runoff onsite to the maximum extent feasible without causing flooding or erosion impacts. Roof Downspout Control BMPs, functionally equivalent to those described in Chapter 3, Volume III of the DOE Manual, and Dispersion and Soil Quality BMPs, functionally equivalent to those in Chapter 5, Volume V of the DOE Manual shall be required to reduce the hydrologic disruption of developed sites.

5.04.06 Minimum Requirement #6: Runoff Treatment

5.04.06.01 Project Thresholds

The following conditions require construction of stormwater treatment facilities (see Table 1 below):

- Projects in which the total of effective, pollution-generating impervious surface (PGIS) is 5,000 square feet or more in a threshold discharge area of the project, or
- Projects in which the total of pollution-generating pervious surfaces (PGPS) is three-quarters (3/4) of an acre or more in a threshold discharge area, and from which there is a surface discharge in a natural or man-made conveyance system from the site.

Table 1 Treatment Requirements by Threshold Discharge Area

	< 3/4 acres of PGPS	**≥ ¾ acres PGPS**	**< 5,000 sf PGIS**	**≥ 5,000 sf PGIS**
Treatment Facilities		✓		✓
Onsite Stormwater	✓	✓	✓	✓

PGPS pollution-generating pervious surfaces
PGIS = pollution-generating impervious surfaces
sf= square feet

5.04.06.02 Treatment-Type Thresholds

1. Oil Control:

   Treatment to achieve Oil Control applies to projects that have "high-use sites." High-use sites are those that typically generate high concentrations of oil due to high traffic turnover or the frequent transfer of oil. High-use sites include:

   a. An area of a commercial or industrial site subject to an expected average traffic (ADT) count equal to or greater than 100 vehicles per 1,000 square feet of gross building area.

   b. An area of a commercial or industrial site subject to petroleum storage and transfer in excess of 1,500 gallons per year, not including routinely delivered heating oil;

   c. An area of a commercial or industrial site subject to parking, storage or maintenance of 25 or more vehicles that are over 10 tons gross weight (trucks, buses, trains, heavy equipment, etc.);

   d. A road intersection with a measured ADT count of 25,000 vehicles or more on the main roadway and 15,000 vehicles or more on any intersecting roadway, excluding projects proposing primarily pedestrian or bicycle use improvements.

2. Phosphorus Treatment:

   At this time the City does not have water bodies that are affected by phosphorus, and phosphorous treatment is not currently required. However, the requirement to provide phosphorous control is determined by the City (e.g., through a management plan), or by the Department of Ecology (e.g., through a waste load allocation), and may be added at a later date.

3. Enhanced Treatment:

   Enhanced treatment for reduction in dissolved metals is required for the following types of project sites that discharge to Dry, Tumwater, Valley, Mill, Peabody, White's or Ennis Creek, or to waters or conveyance systems tributary to these creeks.

   a. Industrial project sites

   b. Commercial project sites

   c. Multi-family project sites

   d. High AADT roads as follows:

For roads and highways meeting the following criteria:

- Fully controlled and partially controlled limited access highways with Annual Average Daily Traffic (AADT) counts of 15,000 or more
- All other roads with an AADT of 7,500 or greater

However, such sites listed above that discharge directly (or, indirectly through a municipal storm sewer system) to waters which require basic treatment (Port Angeles Harbor or to the Strait of Juan de Fuca) and areas of the above-listed project sites that are identified as subject to Basic Treatment requirements, are not also subject to Enhanced Treatment requirements. For developments with a mix of land use types, the Enhanced Treatment requirement shall apply when the runoff from the areas subject to the Enhanced Treatment requirement comprises 50% or more of the total runoff within a threshold discharge area.

4. Basic Treatment:

Basic Treatment generally applies to:

a. Project sites that discharge to the ground, UNLESS:

    1. The soil suitability criteria for infiltration treatment are not met; (see Chapter 3 of Volume III of the DOE Manual for soil suitability criteria) or
    2. The project uses infiltration strictly for flow control, not treatment, and the discharge is within 1/4-mile of a phosphorus sensitive lake (use a Phosphorus Treatment facility), or within 1/4 mile of a fish-bearing stream, or a lake (use an Enhanced Treatment facility).

b. Residential projects not otherwise needing phosphorus control as designated by USEPA, the Department of Ecology, or by the City of Port Angeles; and

c. Project sites discharging directly to the Port Angeles Harbor or to the Strait of Juan de Fuca.

b. Project sites that drain to streams that are not fish-bearing, or to waters not tributary to fish-bearing streams;

c. Landscaped areas of industrial, commercial, and multi-family project sites, and parking lots of industrial and commercial project sites that do not involve pollution-generating sources (e.g., industrial activities, customer parking, storage of erodible or leachable material, 'wastes or chemicals) other than parking of employees' private vehicles. For developments with a mix of land use types, the Basic Treatment requirement-shall apply when the runoff from the areas subject to the Basic Treatment requirement comprises 50% or more of the total runoff within a threshold discharge area.

5.04.06.03 Treatment Facility Sizing

Water Quality Design Storm Volume:

The volume of runoff predicted from a 24-hour storm with a 6-month return frequency (a.k.a., 6-month, 24-hour storm).

Wetpool facilities are sized based upon the volume of runoff predicted through use of the Natural Resource Conservation Service curve number equations in Chapter 2 of Volume III of the DOE Manual for the 6-month, 24 hour storm. Alternatively, the 91st percentile, 24-hour runoff volume indicated by an approved continuous runoff model may be used.

5.04.06.04 Water Quality Design Flow Rate

1. Preceding Detention Facilities or when Detention Facilities are not required:

The flow rate at or below which 91% of the runoff volume, as estimated by the Western Washington Hydrologic Model (WWHM), will be treated. Design criteria for treatment facilities are assigned to

achieve the applicable performance goal at the water quality design flow rate (e.g., 80% TSS removal).

2. Downstream of Detention Facilities:

   The water quality design flow rate must be the full 2-year release rate from the detention facility.

   Alternative methods may be used if they identify volumes and flow rates that are at least equivalent.

   That portion of any development project in which the above PGIS or PGPS thresholds are not exceeded in a threshold discharge area shall apply on-site Stormwater Management BMPs in accordance with Minimum Requirement #5.

5.04.06.05 Treatment Facility Selection, Design, and Maintenance

Stormwater treatment facilities shall be:

- Selected in accordance with the process identified in Chapter 4, Volume I of the DOE Manual
- Designed in accordance with the design criteria in Volume V of the DOE Manual
- Maintained in accordance with the maintenance schedule in Volume V of the DOE Manual

5.04.06.06 Additional Requirements

The discharge of untreated stormwater from pollution-generating impervious surfaces to ground water will not be authorized by the City, except for the discharge achieved by infiltration or dispersion of runoff from residential sites through use of on-site Stormwater Management BMPs.

5.04.07 Minimum Requirement #7: Flow Control

5.04.07.01 Applicability

All projects which drain to Dry, Tumwater, Valley, Mill, Peabody, White's or Ennis Creek, or to waters or conveyance systems tributary to these creeks and which meet the thresholds in Figures 5.1 through 5.3 are required to provide flow control to reduce the impacts of stormwater runoff from impervious surfaces and land cover conversions.

If the discharge is to a stream that leads to a wetland, or to a wetland that has an outflow to a stream, both this minimum requirement (Minimum Requirement #7) and Minimum Requirement #8 apply.

5.04.07.02 Thresholds

The following require construction of flow control facilities and/or land use management BMPs that will achieve the standard flow control requirement for Western Washington (see Table 2):

- Projects in which the total of effective impervious surfaces is 10,000 square feet or more in a threshold discharge area, or
- Projects that convert 1/4 acres or more of native vegetation to lawn or landscape, or convert 2.5 acres or more of native vegetation, to pasture in a threshold discharge area, and from which there is a surface discharge in a natural or man-made conveyance system from the site, or
- Projects that through a combination of effective impervious surfaces and converted pervious surfaces cause a 0.1 cubic feet per second increase in the 100-year flow frequency from a threshold discharge area as estimated using the Western Washington Hydrology Model or other approved model.

That portion of any development project in which the above thresholds are not exceeded in a threshold discharge area shall apply on site Stormwater Management BMPs in accordance with Minimum Requirement #5.

Table 2 Flow Control Requirements by Threshold Discharge Area		
	Flow Control Facilities	**On-site Stormwater Management BMPs**
< 3/4 acres conversion to lawn/landscape, or < 2.5 acres to pasture		✓
≥ 3/4 acres conversion to lawn / landscape, or ≥ 2.5 acres to pasture	✓	✓
< 10,000 square feet of effective impervious area		✓
≥ 10,000 square feet of effective impervious area	✓	✓
≥ 0.1 cubic feet per second increase in the 100-year flood frequency	✓	✓

5.04.07.03 Standard Flow Control Requirements

a. Stormwater discharges shall match developed discharge durations to predeveloped durations for the range of predeveloped discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow. The predeveloped condition to be matched shall be a forested land cover unless:

- Reasonable, historic information is available that indicates the site was prairie prior to settlement (modeled as "pasture" in the Western Washington Hydrology Model); or
- The drainage area of the immediate stream and all subsequent downstream basins have had at least 40% total impervious area since 1985. In this case, the pre-developed condition to be matched shall be the existing land cover condition. Where basin-specific studies determine a stream channel to be unstable, even though the above criterion is met, the pre-developed condition assumption shall be the "historic" land cover condition, or a land cover condition commensurate with achieving a target flow regime identified by an approved basin study.

  This standard requirement is waived for sites that will reliably infiltrate all the runoff from impervious surfaces and converted pervious surfaces.

b. Flow Control BMPs shall be selected, designed, and maintained in accordance with Volume III of the DOE Manual.

5.04.08 Minimum Requirement #8: Wetlands Protection

5.04.08.01 Applicability

The requirements below apply only to projects whose stormwater discharges into a wetland, either directly or indirectly through a conveyance system. These requirements must be met in addition to meeting Minimum Requirement #6, Runoff Treatment.

5.04.08.02 Thresholds

The thresholds identified in Minimum Requirement #6 Runoff Treatment, and Minimum Requirement #7 Flow Control shall also be applied for discharges to wetlands.

5.04.08.03 Standard Requirements

a. Discharges to wetlands shall maintain the hydrologic conditions, hydrophytic vegetation, and substrate characteristics necessary to support existing and designated uses. The hydrologic analysis shall use the existing land cover condition to determine the existing hydrologic conditions unless directed otherwise by a regulatory agency with jurisdiction. A wetland can be considered for hydrologic modification and/or stormwater treatment in accordance with Guide Sheet 1B in Appendix I-D of the Stormwater Management Manual for Western Washington (2005).

b. Stormwater treatment and flow control facilities shall not be built within a natural vegetated buffer, except for:

- necessary conveyance systems as approved by the City; or
- As allowed in wetlands approved for hydrologic modification and/or treatment in accordance with Guide Sheet 1B in Appendix I-D in the DOE Manual.

5.04.09 Minimum Requirement #9: Operation and Maintenance

Project proponents must provide an operations and maintenance covenant meeting the requirements of Section 5.11.

5.04.10 Definitions Related to Minimum Requirements

Arterial - A road or street primarily for through traffic. A major arterial connects an interstate highway to cities and counties. A minor arterial connects major arterials to collectors. A collector connects an arterial to a neighborhood. A collector is not an arterial. A local access road connects individual homes to a collector.

Certified Erosion and Sediment Control Lead (CESCL) - means an individual who has current certification through an approved erosion and sediment control training program that meets the minimum training standards established by the Department (see BMP C160 in the Stormwater Management Manual for Western Washington (2005)). A CESCL is knowledgeable in the principles and practices of erosion and sediment control. The CESCL must have the skills to assess site conditions and construction activities that could impact the quality of stormwater and, the effectiveness of erosion and sediment control measures used to control the quality of stormwater discharges. Certification is obtained through an Ecology approved erosion and sediment control course. Course listings are provided online at Ecology's web site.

Effective impervious surface - Those impervious surfaces that are connected via sheet flow or discrete conveyance to a drainage system. Impervious surfaces on residential development sites are considered ineffective if the runoff is dispersed through at least one hundred feet of native vegetation in accordance with BMP T5 30 — "Full Dispersion,"' as described in Chapter 5 of Volume V of the Stormwater Management Manual for Western Washington (2005).

Highway — A main public road connecting towns and cities

Impervious surface - A hard surface area that either prevents or retards the entry of water into the soil mantle as under natural conditions prior to development. A hard surface area which causes water to run off the surface in greater quantities or at an increased rate of flow from the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earthen materials, and oiled, macadam or other surfaces which similarly impede the natural infiltration of stormwater. Open, uncovered retention/detention facilities shall not be considered as impervious surfaces for purposes of determining whether the thresholds for application of minimum requirements are exceeded. Open, uncovered retention/detention facilities shall be considered impervious surfaces for purposes of runoff modeling.

Land disturbing activity - Any activity that results in movement of earth, or a change in the existing soil cover (both vegetative and non-vegetative) and/or the existing soil topography. Land disturbing activities include, but are not limited to clearing, grading, filling, and excavation. Compaction that is associated with stabilization of structures and road construction shall also be considered a land disturbing activity. Vegetation maintenance practices are not considered land-disturbing activity.

Maintenance - Repair and maintenance includes activities conducted on currently serviceable structures, facilities, and equipment that involves no expansion or use beyond that previously existing and results in no significant adverse hydrologic impact. It includes those usual activities taken to prevent a decline, lapse, or cessation in the use of structures and systems. Those usual activities may include replacement of dysfunctional facilities, including cases where environmental permits require replacing an existing structure with a different type structure, as long as the functioning characteristics of the original structure are not changed. One example is the replacement of a collapsed, fish blocking, round culvert with a new box culvert under the same span, or width, of roadway. See also Road Maintenance exemptions in Section 5.03.01.

Native vegetation — Vegetation comprised of plant species, other than noxious weeds, that are indigenous to the coastal region of the Pacific Northwest and which reasonably could have been expected to naturally occur on the site. Examples include trees such as Douglas Fir, western hemlock, western red cedar, alder, big-leaf maple, and vine maple; shrubs such as willow, elderberry, salmonberry, and salal; and herbaceous plants such as sword fern, foam flower, and fireweed.

New development - Land disturbing activities, including Class IV -general forest practices that are conversions from timber land to other uses; structural development, including construction or installation of a building or other structure; creation of impervious surfaces; and subdivision, short subdivision and binding site plans, as defined and applied in Chapter 58.17 RCW. Projects meeting the definition of redevelopment shall not be considered new development.

Pollution-generating impervious surface (PGIS) - Those impervious surfaces considered to be a significant source of pollutants in stormwater runoff. Such surfaces include those which are subject to: vehicular use; industrial activities (as further defined in the glossary); or storage of erodible or leachable materials, wastes, or chemicals, and which receive direct rainfall or the run- on or blow-in of rainfall. Erodible or leachable materials, wastes, or chemicals are those substances which, when exposed to rainfall, measurably alter the physical or chemical characteristics of the rainfall runoff. Examples include erodible soils that are stockpiled, uncovered process wastes, manure, fertilizers, oily substances, ashes, kiln dust, and garbage dumpster leakage. Metal roofs are also considered to be PGIS unless they are coated with an inert, non-leachable material (e.g., baked-on enamel coating).

A surface, whether paved or not, shall be considered subject to vehicular use if it is regularly used by motor vehicles. The following are considered regularly-used surfaces: roads, unvegetated road shoulders, bike lanes within the traveled lane of a roadway, driveways, parking lots, unfenced fire lanes, vehicular equipment storage yards, and airport runways.

The following are not considered regularly-used surfaces: paved bicycle pathways separated from and not subject to drainage from roads for motor vehicles, fenced fire lanes, and infrequently used maintenance access roads.

Pollution-generating pervious surfaces (PGPS) - Any non-impervious surface subject to use of pesticides and fertilizers or loss of soil. Typical PGPS include lawns, landscaped areas, golf courses, parks, cemeteries, and sports fields.

Pre-developed condition — The native vegetation and soils that existed at a site prior to the influence of Euro-American settlement. The pre-developed condition shall be assumed to be a forested land cover unless reasonable, historic information is provided that indicates the site was prairie prior to settlement.

Project site - That portion of a property, properties, or right of way subject to land disturbing activities, new impervious surfaces, or replaced impervious surfaces.

Receiving waters - Bodies of water or surface water systems to which surface runoff is discharged via a point source of stormwater or via sheet flow.

Redevelopment - On a site that is already substantially developed (i.e., has 35% or more of existing impervious surface coverage), the creation or addition of impervious surfaces; the expansion of a building footprint or addition or replacement of a structure; structural development including construction, installation or expansion of a building or other structure;; replacement of impervious surface that is not part of a routine maintenance activity; and land disturbing activities.

Replaced impervious surface - For structures, the removal and replacement of any exterior impervious surfaces or foundation. For other impervious surfaces, the removal down to bare soil or base course and replacement.

Site - The area defined by the legal boundaries of a parcel or parcels of land that is (are) subject to new development or redevelopment. For road projects, the length of the project site and the right-of-way boundaries define the site.

Source control BMP - A structure or operation that is intended to prevent pollutants from coming into contact with stormwater through physical separation of areas or careful management of activities that are sources of pollutants. This manual separates source control BMPs into two types. Structural Source Control BMPs are physical, structural, or mechanical devices, or facilities that are intended to prevent pollutants from entering stormwater. Operational BMPs are non-structural practices that prevent or reduce pollutants from entering stormwater. See Volume IV of the stormwater management Manual for Western Washington (2005) for details.

Threshold Discharge Area - An onsite area draining to a single natural discharge location or multiple natural discharge locations that combine within one-quarter mile downstream (as determined by the shortest flowpath). The examples in Figure 5.4 below illustrate this definition. The purpose of this definition is to clarify how the thresholds of this manual are applied to project sites with multiple discharge points.

Wetland - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may include those artificial wetlands intentionally created from non-wetland areas to mitigate the conversion of wetlands.

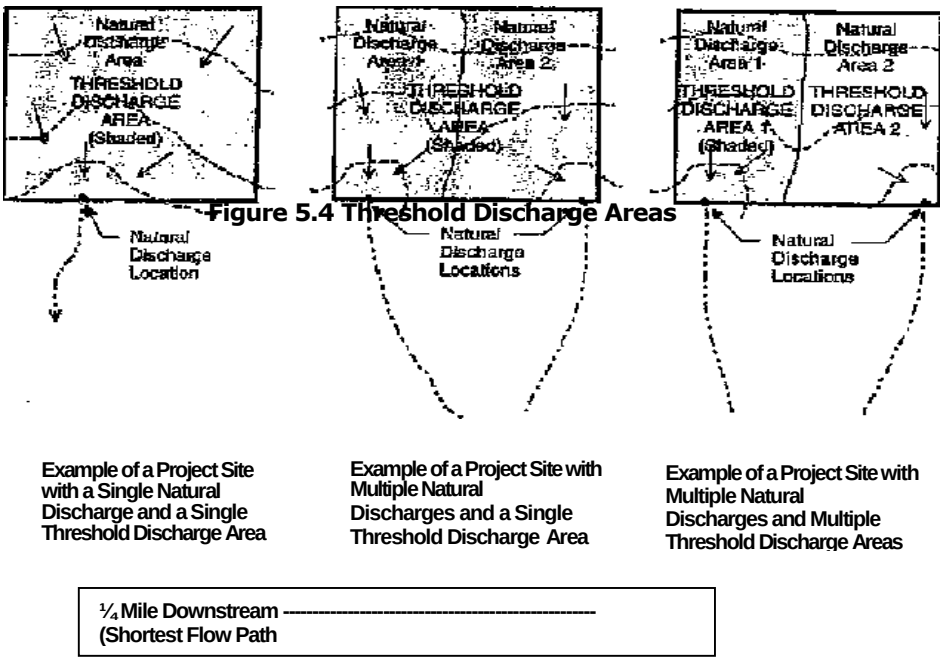


Figure 5.4 Threshold Discharge Areas

CHAPTER 5 - STORMWATER

5.05 GENERAL DESIGN CRITERIA FOR SITES THAT DISTURB LESS THAN 1 ACRE

5.05.01 Applicability

Small Project Drainage Plans (SPDP) are required for all development and redevelopment sites that disturb les than 1 acre which have drainage elements that connect either directly, or indirectly into the City's stormwater system. The City's stormwater system includes all natural and man made systems which function together or independently to collect, store, purify, discharge and convey stormwater. This plan represents a minimum requirement. The City may require the project proponent to meet the requirements of the Stormwater Site Plan and Permanent Stormwater Control Plans if it is likely that the project will have a negative impact on water quality or quantity in a local stream.

5.05.02 Requirements for Small Project Drainage Plans

Small Project Drainage Plans must be designed in accordance with PAMC 13.63.200. The plans must also meet the submittal requirements in Urban Services Standards and Guidelines Chapter 1, Appendix J (Public Improvements – Plan Review Checklist) and include the following elements, or a written explanation of why the requirement does not apply to the project:

- A temporary erosion/ sedimentation control plan if required by Chapter 6 of the Urban Services Standards and Guidelines.
- All existing and proposed drainage structures, natural or man made channels, ditches, wetlands, critical areas and natural or man made ponds, including their buffers, FEMA base flood boundaries, and Shoreline Management boundaries.
- Locations where stormwater discharges to surface waters during and upon completion of construction.
- Conveyance Systems – Show on the site map the existing and proposed conveyance features:

    a. Permanent pipe invert elevations, minimum slopes, and depth of cover.

    b. Grades, dimensions, and direction of flow in all ditches and swales, culverts, and pipes.

    c. Locations and outlets of any ditches and swales, culverts, and pipes.

- Runoff Treatment may be required if it is likely that the project will have a negative impact on water quality or quantity in a local stream, wetland or salt water body. If treatment is required, the designer must indicate the facility location and provide design and maintenance details. Design will be in accordance with Section 5.04.06 and the DOE Manual.
- Flow Control will be required for projects which drain to a storm system which is already at or over the design capacity. If flow control is required, the designer must indicate the facility location and provide design calculations and maintenance details. Design will be in accordance with Section 5.04.07 and the DOE Manual.
- Soils reports and infiltration test results, if an infiltration facility is proposed.
- If a flow control or treatment facility is specified or required, the project proponent must submit a maintenance schedule. The schedule shall set out the maintenance to be completed, the time period for completion, and who shall perform the maintenance. The schedule shall be included with the SMDP. Maintenance responsibilities and schedule of activities shall be recorded with the plat and shall be the duty of the property owner(s).

5.05.03 Incentives for Use of LID and BMPs in Small Project Drainage Plans

Low Impact Development (LID) facilities are encouraged, to improve water quality and aesthetics, as well as to reduce the size and cost of flow control and treatment facilities. LID facilities proposed in any site development shall be designed in accordance with the *2005 Low Impact Development Technical Guidance Manual for Puget Sound* and shall take into account site and soil conditions, access, and long term maintenance. If the project proponent implements any two of the following stormwater controls, the City will reduce the monthly Stormwater Utility Charge set forth in 13.63.090 by 25% for as long as the LID facility or technique continues to be maintained and to function as it was designed.

1. Roof Downspout Controls as described in Chapter 3, Volume III of the DOE Manual.
2. BMP installation to mitigate for impervious area equal to at least 10% of the site/lot. The BMPs listed below may be located anywhere on the site or lot and are subject to the limitations and design

specifications for each BMP.

- BMP T5.11 Concentrated Flow Dispersion
- BMP T5.12 Sheet Flow Dispersion
- BMP T5.20 Preserve Natural Vegetation
- LID Techniques recommended in Chapter 6 of the most recent version of the Low Impact Development Technical Guidance Manual for Puget Sound.

3. Amend the Soil as recommended in BMP T5.13 in all disturbed areas not covered by new improvements.

5.06 GENERAL DESIGN STANDARDS FOR ALL SITES

A drainage plan is required for all projects proposing new drainage facilities, or revisions to existing drainage facilities. The drainage plan will either meet the requirements for a Small Project Drainage Plan (SPDP) or will meet the requirements for a Stormwater Site Plan and Permanent Stormwater Control Plan. Thresholds at which each of these types of plans will be required are detailed in 5.03 and 5.05.

The design of storm drainage conveyance, retention/detention, infiltration systems and stormwater treatment facilities shall depend on the type of system necessary and the local site conditions. The design elements of these systems shall conform to the standards contained herein, the DOE Manual, the most recent version of the Low Impact Development Technical Guidance Manual for Puget Sound and current design practice.

5.06.01 Hydrologic Analysis

The Western Washington Hydrologic Model (WWHM) is required for the design of all flow control and runoff treatment BMPs. Rational Method or Unit Hydrograph Methods are allowed for the design of stormwater conveyance systems.

5.06.01.01 General Requirements for WWHM

Stormwater flow and duration shall be calculated using the latest version of WWHM. Guidance for the use of WWHM can be found in Appendix III-B and Appendix III-C, Volume III of the DOE Manual. Runoff credits for the use of some Low Impact Development techniques are defined in these two appendices. When submitting calculations in WWHM the designer at a minimum must:

- Provide a Small Project Drainage Plan meeting the requirements in Section 5.05.02, or prepare a Stormwater Site Plan meeting the requirements of 5.04.01.
- Provide the WWHM output and documentation files and highlight any changes made to the County's precipitation multiplication factor, to the potential evapotranspiration data (PET), or to the PERLND or IMPLND values.
- Provide a soil characterization of the site based on, at a minimum, a site visit and information from the Clallam County Soil Map.
- Document legal restrictions that protect areas that the designer wishes to model as forest or pasture in the post development condition.
- Document Runoff Credits taken in the WWHM model. BMPs on which the Runoff Credits are based must be shown in the drainage plan. BMP design details and documentation must also be provided. LID credit guidance in Appendix III-C must be documented and followed.
- Show and label on a scalable site plan areas of soil, vegetation and land use for both the predevelopment and post development of the site.
- Show any areas of flow bypass or off site inflow.

Flow Control Requirements

Stormwater discharges shall match developed discharge durations to the pre-developed durations for the range of pre-developed discharge rates from 50% of the 2-year peak flow up to the full 50-year peak flow. The predeveloped condition to be matched shall be a forested land cover unless:

- Reasonable, historic information is available that indicates the site was a prairie prior to settlement, or,
- The drainage area of the immediate stream and all subsequent downstream basins has had at least 40%

total impervious area since 1985. In this case, the predeveloped condition to be matched shall be the existing land cover condition.

Treatment Requirements

The flow rate at or below which 91% of the runoff volume, as estimated by WWHM, will be treated. Design criteria for treatment facilities are assigned to achieve the applicable performance goal at the water quality design flow rate (e.g., 80% TSS removal).

5.06.01.02 General Requirements for the Rational Method or Unit Hydrograph Methods

Conveyance systems draining less than 10 acres shall be sized to carry the peak runoff rate for the 25-year 24 hour design storm for the upstream tributary basin. Conveyance systems draining more than 10 acres shall be sized to carry the peak runoff rate for the 25-year design storm for the upstream tributary basin, as calculated using either TR55 or the SBUH. Approval of new conveyance systems is subject to the capacity of the downstream conveyance system. Additional detention will be required where the downstream conveyance system is overloaded.

Rational method calculations shall meet the requirements below:

- Only for use in predicting peak flow rates for sizing conveyance elements
- Drainage subbasin area A cannot exceed 10 acres for a single peak flow calculation
- The time of concentration T must be computed using the method described below and cannot exceed 100 minutes. It is also set equal to 6.3 minutes when computed to be less than 6.3 minutes. Note: Unlike other methods of computing times of concentration, the 6.3 minutes is not an initial collection time to be added to the total computed time of concentration.

❑ RATIONAL METHOD EQUATION

The following is the traditional Rational Method equation:

$$Q_r = CI_rA$$

where Q_r = peak flow (cfs) for a storm of return frequency R
C = estimated runoff coefficient (ratio of rainfall that becomes runoff)
I_r = peak rainfall intensity (inches/hour) for a storm of return frequency R
A = drainage subbasin area (acres)

<u>"C" Values</u>
The allowable runoff coefficients to be used in this method are shown in Table 4 below by type of land cover. The values for single family residential areas were computed as composite values (as illustrated in the following equation) based on the estimated percentage of coverage by roads, roofs, yards, and unimproved areas for each density. For drainage basins containing several land cover types, the following formula may be used to compute a composite runoff coefficient, Cc:

$$C_c = (C_1A_1 + C_2A_2 + ... + C_nA_n)/A_t$$

where A_t = total area (acres)
$A_{1,2\ldots n}$ = areas of land cover types (acres)
$C_{1,2\ldots n}$ = runoff coefficients for each area land cover type

<u>"I_r" Peak Rainfall Intensity</u>
The peak rainfall intensity I_r for the specified design storm of return frequency R is found in the Port Angeles Intensity-Duration-Frequency curves which are included in the Appendices of this Chapter.

Note: Due to the mathematical limits of the equation coefficients, values of T, less than 6.3 minutes or greater than 100 minutes cannot be used. Therefore, real values of T, less than 6.3 minutes must be assumed to be equal to 6.3 minutes, and values greater than 100 minutes must be assumed to be equal to 100 minutes.

<u>"T_c" Time of Concentration</u>
The time of concentration is defined as the time it takes runoff to travel overland (from the onset of precipitation) from the most hydraulically distant location in the drainage basin to the point of discharge.

Note: When C_c (see Equation above) of a drainage basin exceeds 0.60, it may be important to compute T_c and peak rate of flow from the impervious area separately. The computed peak rate of flow for the impervious surface alone may exceed that for the entire drainage basin using the value at T_c for the total drainage basin. The higher of the two peak flow rates shall then be used to size the conveyance element.

T_c is computed by summation of the travel times T_t of overland flow across separate flowpath segments defined by the six categories of land cover listed in Table 3 below, which were derived from a chart published by the Soil Conservation Service in 1975. The equation for time of concentration is:

$$T_c = T_1 + T_2 + ... + T_n$$

Where $T_{1,2....n}$ = travel time for consecutive flowpath segments with different land cover categories or flowpath slope

Table 3 - K_r Values for T_t Using the Rational Method

Land Cover Category	K_r
Forest with heavy ground litter and meadow	2.5
Fallow or minimum tillage cultivation	4.7
Short grass pasture and lawns	7.0
Nearly bare ground	10.1
Grassed waterway	15.0
Paved area(sheet flow) and shallow gutter flow	20.0

Travel time for each segment t is computed using the following equation: $T_t = L/60V$

where T_t = travel time (minutes) Note: T_t through an open water body (such as a pond) shall be assumed to be zero with this method

L = the distance of flow across a given segment (feet)

V = average velocity (fps) across the land cover = $k_r (s_o)^{1/2}$

where K_r = time of concentration velocity factor; see Table 4 below

s_o = slope of flowpath (feet/feet)

Table 4 - RUNOFF COEFFICIENTS – "C" VALUES FOR THE RATIONAL METHOD

General Land Covers		Single Family Residential Areas*	
Land Cover	C	Land Cover Density	C
Dense forest	0.10	0.20 DU/GA (1 unit per 5 ac.)	0.17
Light forest	0.15	0.40 DU/GA (1 unit per 2.5ac.)	0.20
Pasture	0.20	0.80 DU/GA (1 unit per 1.25ac.)	0.27
Lawns	0.25	1.00 DU/GA	0.30
Playgrounds	0.30	1.50 DU/GA	0.33
Gravel areas	0.80	2.00 DU/GA	0.36
Pavement and roofs	0.90	2.50 DU/GA	0.39
Open water (pond, lakes, wetlands)	1.00	3.00 DU/GA	0.42
		3.50 DU/GA	0.45
		4.00 DU/GA	0.48
		4.50 DU/GA	0.51
		5.00 DU/GA	0.54
		5.50 DU/GA	0.57
		6.00 DU/GA	0.60

* Based on average 2,500 square feet per lot of impervious coverage.

For combinations of land covers listed above, an area-weighted "$C_c \times A_t$" sum should be computed based on the equation $C_c \times A_t = (C_1 \times A_1) + (C_2 \times A_2) + ... + (C_n \times A_n)$, where $A_t = (A_1 + A_2 + ... + A_n)$, the total drainage basin area.

5.06.02 Infiltration Systems

1. The designer shall evaluate and design Roof Downspout Controls, Infiltration Trenches and Dry Wells in accordance with Chapter 3.1, Volume III of the DOE Manual.
2. For all other infiltration systems, the infiltration rate shall be based upon soils investigation and analysis for the proposed infiltration area. Test results shall accompany storm calculations. Such testing shall be performed by a qualified engineer or septic system designer certified by Clallam County. Design of infiltration systems shall conform to the DOE Manual, Volume III, Chapter 3, Section 3.3
3. Infiltration systems shall be at least 10 feet from any structure, property line or sensitive area (except steep slopes).
4. A geotechnical analysis and report will be required for all infiltration facilities located on slopes over 15%, within 200 feet of the top of a steep slope or landslide hazard area, or located within an Environmentally Sensitive Area.
5. All infiltration systems shall be at least 50 feet from any sensitive area steep slope. This setback may be reduced to 15 feet based on a geotechnical evaluation, but in no case shall it be less than the buffer width.
6. For sites with septic systems, infiltration systems must be down gradient of the drainfield unless site topography clearly prohibits subsurface flows from intersecting the drainfield.

5.06.03 Detention Facilities, Infiltration Ponds, Water Quality Wet Pools, Combined Detention and Wet Ponds

1. Detention Facility volume and outflow shall be designed in accordance with Minimum Requirement #7, Volume I of the DOE Manual. Restrictor orifice structure design shall be in accordance with Volume III, Section 3.2.4. Emergency overflow spillways shall be designed to pass the 100 year runoff event for the developed condition assuming a broad crested weir.
2. Maintenance for detention facilities shall be in accordance with Table 3.3, Volume III of the DOE Manual.
3. No detention facility or pond shall be located in an area that is used to satisfy an open space requirement, without prior approval. Facilities that enhance a recreational amenity or are located underground may be acceptable.
4. Commercial parking lots may be used for detention of stormwater in accordance with the provisions in Section 3.2.5, Volume III of the DOE Manual, except that the depth of ponded water may not exceed 6”.
5. An emergency overflow system is required for all detention facilities
6. Detention ponds, wet pools and infiltration facilities shall not be located in dedicated public road right-of-way areas.
7. Side slopes for earth-lined retention/detention ponds shall be no steeper than 3 horizontal to 1 vertical, unless otherwise approved. Flatter slopes are preferred.
8. The access road into the proposed detention ponds and wet pools must be no steeper than 15% to the control structure and 20% into the pond.
9. All detention ponds and wet pools not abutting a public right-of-way shall be accessible for maintenance and operation by a dedicated easement for such purpose. Detention ponds and wet pools may be required to be located on separate lots. The access shall accommodate vehicular traffic, and shall be surfaced with a 10-foot wide gravel road, located within a 20 foot wide easement for unobstructed ingress and egress between the lot and the public roadway. Gravel on the road shall be compacted to a minimum depth of 6 inches. Well-graded quarry rock may be used with a 6" maximum and 1½" minimum aggregate, or material meeting the ballast specifications in WSDOT specifications. A gate for access roads is required and shall be structurally and aesthetically acceptable for the use and location

proposed, or an acceptable alternative to control access may be submitted.

10. A vehicular access road must be provided to the bottom of the retention/detention pond when the bottom area of the pond is greater than 1500 sf, or as required by the City Engineer. The road shall be surfaced with rock as set forth above

11. All detention ponds shall have a minimum of one foot of freeboard above the maximum design water surface

12. Stormwater detention facilities or wet pools that can impound 10 acre feet (435,600 cubic feet; 3.26 million gallons) or more with the water level at the embankment crest are subject to the State's dam safety requirements, even if the water storage is intermittent and infrequent. See Volume III, Section 3.2.1 of the DOE Manual for engineering design requirements. The minimum top width of this berm shall be 15 feet with a key section, unless otherwise approved.

13. Any embankment less than 6 feet, including 1 foot of freeboard, in depth, forming one or more sides of a retention/ detention pond, shall have a minimum width of 6 feet.

14. The back slopes for all earth berms shall be no steeper than 2 horizontal and 1 vertical.

15. The preservation of natural drainage ponds is encouraged.

16. A fence may be required around a detention pond or a wet pool. If required, fences must be 6 feet in height and meet the requirements in Volume III, Section 3.2.

17. A standard manhole or Type 2 catch basin is required for a closed system when the depth exceeds 5 feet from the flowline (invert) of a culvert to the top of grade. A ladder is also required as per WSDOT specifications.

18. Adequate access to closed retention/detention facilities shall be required, i.e. that is, a manhole at each end of an underground facility.

5.06.04 Stormwater Treatment Facilities

1. For all sites with disturbance of over 1 acre, see the flow charts in Section 5.03 to determine whether Minimum Requirement #6 applies to your project. If treatment is required, treatment facilities shall be designed in accordance with Volume V of the DOE Manual.

2. For projects that disturb less than 1 acre, the City may require Oil Control, Basic or Enhanced treatment if the project is likely to affect water quality. If the City determines that treatment is required, the City will specify which types of treatment will be necessary. The facility will then be designed in accordance with Volume V of the DOE Manual.

3. All prefabricated stormwater structures for treatment, outlet control, etc. shall be installed per manufacturers' recommendations and approved plans.

5.06.05 Constructed Ditches or Channels

1. Permanent channels or ditches shall be analyzed and designed using either WWHM, the Rational Method or any Unit Hydrograph Method.

2. Drainage channel stabilization is required. Grass lining shall be used in accordance with the DOE Manual BMP C201 for channel velocities up to 5 ft/s. For velocities in excess of 5 ft/s check dams BMP 207 or channel lining BMP C202 or BMP C122 shall be installed.

3. Energy dissipation is required at the discharge point of the storm drains or culverts. Discharge velocity shall be limited to 5 ft/sec. Pipe velocity calculations and energy dissipation calculations must be submitted to the City engineer for approval.

5.06.06 Closed Conveyance Systems

1. Storm drain lines shall have a minimum depth of 5 feet to provide gravity service to as many adjoining parcels as practical, adequate head room within manholes for maintenance personnel, and vertical

clearance between water and sewer lines. Variations from this standard, if necessary, will be considered on a case by case basis by the City Engineer.

2. The crowns of culverts and/or pipes shall be matched or the 0.8 rule shall be used at all pipe intersections in catch basins and manholes, except at drop manholes, or unless otherwise approved. The 0.8 rule matches 0.8 the diameter of the culverts or pipe instead of the culvert or pipe crowns.
3. All culvert pipe must be 12” or larger in inside diameter. All culverts must be sized to provide non pressurized flow during the 25 year storm.
4. Where flow velocities in the pipe exceed 15 feet per second, special provisions such as thrust blocking, pipe anchors, and piping materials shall be made to protect against displacement by erosion and shock. The design velocities for all stormwater culverts shall be submitted to the City Engineer for review.
5. Stormwater entering a closed storm drain system shall be via catch basins for debris and silt removal.
6. WSDOT Type 2 catch basins shall be used to accommodate culvert or pipes greater than 18 inches in diameter.
7. Catch basins connecting to the storm drain main shall be 6 inch minimum diameter and sized to provide non pressurized flow during the 25 year storm.
8. Storm drain pipes shall be laid with uniform slope between manholes and catch basins. Variations from this standard, if necessary, will be considered on a case by case basis by the City Engineer.
9. Pipe shall be structurally able to handle cover and traffic design loads.
10. Driveway culverts shall be constructed in accordance with the Standard Drawing - “Non-Curbed Street Driveway and Culvert” located in the Appendix of Chapter 3 of the Urban Services Standards and Guidelines.
11. Trash racks shall be installed at the inlets of culverts that are 24 inch diameter and larger.
12. CCP, PVC, CPEP smooth-flow and corrugated metal culvert pipe may be used.
13. Where storm drains are laid on slopes of 6.0 percent or greater or where ground water may use the trench as a conduit, the City may require that seepage barriers be placed along the pipe. The spacing shall be noted on the plans.
14. Storm drains laid on 20 percent slope or greater shall be anchored securely with concrete anchors or other approved method. The concrete anchors shall conform to the WSDOT Standard Plan No. B-12 and the spacing shall be as follows:
    - 20% to 35%, not over 36 feet center to center spacing
    - 35% to 50%, not over 24 feet center to center spacing
    - 50% and over, not over 16 feet center to center spacing.
15. All structures must be at least 10 feet from a storm drain culvert and/or mainline drain.

5.06.07 Roof Drains, Foundation Drains, Building Drains and Private Parking Lot Drains

1. Parking lot drains shall be sized in accordance with Section 5.06.01.02. Stormwater runoff may require treatment before entering parking lot drains. See Section 5.06.04.
2. The minimum size pipe for building drains in the public right-of-way is 6-inch inside diameter.
3. Minimum slope on building drains shall be 2.0 percent. Foundation drains and parking lot drains must flow by gravity into the City's storm drain system, unless otherwise approved.
4. Building drain construction shall conform to the latest edition of the Uniform Plumbing Code.
5. A separate and independent building drain shall be constructed for every building, except where multiple building connections are approved by the City Engineer.

6. Maintenance of the building drain is the sole responsibility of the property owner.

7. Prior to work in right of way and connection of the building drain to the public storm drain a Stormwater Permit must be obtained from the Public Works and Utilities Department. During the permit process, the City will request additional information about the type and amount of flows anticipated in the building drain.

8. For houses on lots where the positive drainage is to the street, overflows to foundation drains and roof drain drywells may be piped underground under the sidewalk, through the curb, and into the gutter (see WSDOT Standard Plan No. B-20d or an approved modification), unless another method is approved by the City Engineer. No direct discharge of roof drains to the curb are allowed. For lots draining away from the street, foundation drains shall be piped underground to a lateral of the storm system, into an infiltration system, or other approved method. Building drains shall not be allowed to drain across the sidewalk, nor may they be piped onto adjacent property or connected to the sanitary sewer.

9. Pumped building drains must connect directly to a storm main, catch basin or manhole. Pumped outlets through the curb shall not be allowed.

5.06.08 Manholes

1. Precast manholes shall meet the requirements of WSDOT Standard Plan B-23a,b,c. Manholes constructed of other materials may be used if approved be the City Engineer. Material specifications need to be submitted for review before an alternate material will be considered.

2. Eccentric manhole cones shall be offset so as not to be located in the tire track or a traveled lane and shall be in line with the manhole steps.

3. Manhole frames and covers shall be cast iron marked "Drain" and meet the requirements of WSDOT Standard Plan B-25. Repair of defects shall not be permitted. Manhole rings and covers shall be machine-finished or ground-on seating surfaces so as to assure non-rocking fit in any position and interchangeability.

4. Where lock-type castings are called for, the casting device shall be such that the cover may be readily released from the ring and all movable parts shall be made of non-corrosive materials and otherwise arranged to avoid possible binding.

5. All casting shall be coated with bituminous coating prior to delivery to the job site.

6. Safety steps shall be fabricated of polypropylene conforming to ASTM D-4101, injection molded around a 1/2 inch ASTM A-615 grade steel reinforcing bar with anti-slip tread. Steps shall project uniformly from the inside wall of the manhole. Steps shall be installed to form a continuous vertical ladder with rungs equally spaced on 12 inch centers and installed per WSDOT Standard Plan B-24.

7. Manholes shall be located as follows, unless otherwise approved by the City Engineer: (Catch basins or inlets may be used in lieu of manholes only when approved.)

    - All main or major pipe intersections and change in grade or alignment of the pipe.
    - At all changes in size of the pipe.
    - Each intersection or junction of mainline pipes.
    - Upper ends of all lateral pipes.
    - At intervals of 400 feet, where 12 inch to 15 inch pipe is used.
    - At intervals of 500 feet, where 18 inch to 30 inch pipe is used.
    - Spacing may be increased for 36-inch pipe and larger.
    - For curved alignment there shall be a manhole within 50 feet of the downstream end.

8. Cleanouts at the end of storm drains shall not be accepted as a substitute for a manhole or catch basin.

9. Minimum slope through the manhole shall be 1/10th of one foot from the invert in to the invert out.

10. All manholes shall be located so that they are accessible by maintenance vehicles.

11. Manhole diameter sizing shall be based upon the number of pipes entering and exiting the manhole

and the ability to achieve transitions in the flow, adequate shelves, and room for maintenance and television inspections, and to maintain the strength of the manhole.

5.06.09 Catch Basins

1. Catch basin spacing and grate design shall be based upon hydraulic analysis. In no case shall the maximum spacing be greater than 300 feet, unless otherwise approved. Surface water shall remain in the street gutter and parking section and shall not be allowed to cross the crown of the roadway.
2. WSDOT Type 1 catch basins are preferred by the City for pipe systems less than 5' deep.
3. WSDOT Type 2 catch basins are preferred for pipe systems over 5' deep. Type 2 catch basins may only be used in place of manholes with the special approval of the City Engineer.
4. The City prefers WSDOT Type B-2c vaned grates at sag locations, and Type B-2b vaned grates at all other locations.
5. Parking lot catch basins shall either be per City Standard Drawing, or per WSDOT Standard Plan B-26. See Section 5.06.07 above for additional requirements.

5.06.10 Through Curb Inlets

1. The standard through curb inlet shall be per City Standard Drawing - "Through Curb Inlet Installation".
2. Through curb inlets shall be installed at sags and where the grade is less than 0.005 FT/FT (0.5%) or where the grade exceeds 0.06 FT/FT (6.0%).
3. Spacing for curb inlets and grate design shall be based upon hydraulic analysis. Curb inlets may be used in conjunction with catch basins.

5.06.11 Protective Coatings

Metal pipe, tanks and appurtenant facilities design shall take into consideration the characteristics of the soils in the area. The standard protective coating, for these pipes and structures, when required, shall be Treatment 1 per WSDOT Specifications 9-05.4(3).(asphalt or polymer)

5.07 CONSTRUCTION STANDARDS

5.07.01 Trench Excavation

1. All work in this section shall be accomplished in accordance with Section 7-08 of the most recent Standard Specifications for Road, Bridge and Municipal Construction, published by the Washington State Department of Transportation, and as contained herein.
2. Clearing and grubbing, where required, shall be performed within the easement or public right-of-way, as permitted by the City and/or governing agency. Debris resulting from the clearing and grubbing shall be disposed of by the owner or Contractor in accordance with the terms of all applicable permits.
3. Trenches shall be excavated to the line and depth designated on the approved plans. The trench sides shall be excavated vertically and the trench width shall be excavated only to such widths as are necessary for adequate working space. Exceptions to vertical walls may be made for unusual circumstances and when specifically approved by the City Engineer. The trench shall be kept free from water until jointing is complete. Surface water shall be diverted so as not to enter the trench. The developer/Contractor shall maintain sufficient pumping equipment on the job to insure that these provisions are carried out.
4. The Contractor shall perform all excavation of every description and whatever substance encountered and boulders, rocks, roots, and other obstructions shall be entirely removed or cut out to the width of the trench and to a depth of 6 inches below the storm drain grade. The trench shall be backfilled to grade with material satisfactory to the City inspector and thoroughly compacted.
5. Trenching and shoring operations shall not proceed more than 100 feet in advance of pipe laying without approval of the City and shall be in accordance with Washington Industrial Safety and Health

Administration (WISHA) Rules and the Office of Safety and Health Administration (OSHA) Safety Standards.

6. The bottom of the trench shall be finished to grade with hand tools in such a manner that the pipe will have bearing along the entire length of the barrel. The bell holes shall be excavated with hand tools to sufficient size to make up the joint.

5.07.02 Backfilling and Compaction

1. All work in this section shall be accomplished in accordance with Section 7-08 of the most recent Standard Specifications for Road, Bridge and Municipal Construction, published by the Washington State Department of Transportation, and as contained herein.
2. Native materials excavated from the trench may not be used for backfilling the trench, unless otherwise approved by the City Engineer.
3. In public paved areas, the Contractor shall use controlled density backfill per City Standard Drawing - "Controlled Density Backfill", unless another method is otherwise approved by the City Engineer.
4. In unpaved roadways and shoulders, the backfill shall be compacted to at least 95% maximum density, when using granular backfill material. If the existing material is determined by the City Engineer to be suitable for backfill, the Contractor may use the native material except that the top 8 inches of trench shall be 2-1/2 inch minus ballast.
5. Backfill compaction shall be performed in 6 inch lifts.
6. In unpaved and unimproved areas, the backfill shall be compacted to at least 85% maximum density, when using granular backfill material.

5.07.03 Street Patching and Restoration

Trench restoration shall be by a patch or patch plus overlay as required by the City Engineer. See Chapter 3 of the Urban Service Standards and Guidelines for temporary patch and trench restoration.

5.07.04 Testing

Prior to acceptance and approval of construction, the following tests shall apply:

1. Prior to acceptance of the project, the storm drain pipe shall be subject to a low pressure air test per WSDOT Standards 7-04.3(1)E or F (dependent upon pipe material. The Contractor shall furnish all equipment and personnel for conducting the test under the observation of the City's inspector. The testing equipment shall be subject to the approval of the City.
2. The Contractor shall make an air test for his own purposes prior to notifying the City to witness the test. The acceptance air test shall be made after the trench is backfilled and compacted and the roadway section is completed to subgrade.
3. All wyes, tees, and end of side drain stubs shall be plugged with flexible joint caps or acceptable alternatives and securely fastened to withstand the internal test pressures. Such plugs or caps shall be readily removable and their removal shall provide a socket suitable for making flexible jointed lateral connection or extension.
4. All storm drain mains shall be high velocity cleaned and low pressure tested in accordance with this manual, the Urban Services Standards and Guidelines and the most recent version of the WSDOT Standard Specifications prior to final paving.

5.07.05 Connections to the Existing System

1. Connections to a pipe system may only be made at a catch basin or manhole, except for building drain systems less than 8 inch in diameter with clean-outs upstream of the connection. The City Engineer may allow service connections to the storm main where the service connection is ½ the diameter of the storm main and where there are clean-outs, manholes or catch basins upstream in the service line.

2. At the connection to the existing system, all new connections shall be physically plugged until all tests have been completed and the City approves the removal of the plug.

3. Connection of new storm drain mains to existing manholes shall be accomplished by using provided knock-outs. Where knock-outs are not available, the manhole shall be core drilled for connection by the Contractor or jack-hammered by City crews. The transition of connecting channels shall be constructed so as not to interrupt existing flows.

4. Connection of a storm drain main to a system where a manhole is required shall be accomplished by pouring a concrete base and setting manhole sections. The existing pipe shall only be cut into by City crews, unless approved otherwise.

5. Taps shall not protrude into the existing main. All taps to existing mains and manholes shall be made by City crews, unless otherwise approved. If the Contractor performs the taps, he shall notify the City's inspector at least 48 hours prior to the tap. The tap shall be witnessed by the City's inspector.

5.08 CITY INSPECTIONS

1. Prior to backfilling, all storm drains and appurtenances shall be inspected and approved by the City's inspector. Approval shall not relieve the Contractor for correction of any deficiencies and/or failure as determined by subsequent testing and inspections. It shall be the Contractor's responsibility to notify the City for the required inspections. The City's inspector shall be notified a minimum or forty-eight (48) hours in advance of commencing work on any facility. Prior to final acceptance of all installations, the City may conduct an inspection of all main lines by the use of television equipment. Final acceptance of storm drain installations will not be made until tests and inspections are complete and prove satisfactory.

2. If City inspectors cannot inspect the pipe in a timely manner after notification by the Contractor or the City inspectors are concerned about the quality of the work, the Inspector may order that testing of the storm drain main shall include a television inspection by the Contractor or the City at the expense of the Contractor. Television inspection shall be done after the air test has passed and before the roadway is paved. Immediately prior to a television inspection, enough water shall be run down the line so it comes out the lower manhole. A copy of the video tape and written report shall be submitted to the City. Acceptance of the line will be made after the tape has been reviewed and approved by the inspector. Any tap to the existing system may also be required to be television inspected.

5.09 UNDERGROUND UTILITY LOCATIONS

It shall be the responsibility of the Contractor constructing the storm drain facilities to verify the exact locations of all existing utilities prior to commencing any work. The Contractor shall contact the Utilities Underground Location Center, **1-800-424-5555**, forty-eight (48) hours prior to commencing work.

5.10 RIGHTS-OF-WAY AND EASEMENTS

1. All public-maintained storm drainage systems, including collection, conveyance, treatment and flow control systems, shall be located in drainage easements or public rights-of-way to the City of Port Angeles, unless otherwise approved. All drainage easements shall be shown on construction plans and final plats.

2. Ditches and channels in property other than public property shall be provided with a drainage easement sufficient in width to accommodate a 10-foot wide access along each side of the channel when the channel top width exceeds 30 feet. When the channel top width is 30 feet or less, a 10-foot wide strip for an access road may be required only on one side.

3. All storm drain lines shall be installed in public utility easements with a minimum width of 20 feet or in public right of way. Where a storm drain is installed in a public street, the preferred location is shown in Standard Drawing - "Standard Locations for Underground Utilities". The Developer shall check with the City prior to beginning the design of the extension to determine if the City has any preference as to the location of the storm drain.

4. If it is necessary to install a storm drain within a private road, the easement shall be 20 feet wide, or the width of the traveled surface, plus one foot each side, whichever is greater.

5. If storm drains are installed within utility easements that can not be easily accessed for 24 hour maintenance by City crews, then no service connections will be permitted on the main and the pipeline within the easement area and shall have manholes placed at each end of the easement.

5.11 MAINTENANCE OF PRIVATE SYSTEMS

1. The developer must submit a stormwater facility operations and maintenance covenant for approval. The covenant shall be recorded with the Clallam County Auditor and shall be included in any instrument of conveyance of the subject property and have the following elements:

   a. The covenant must identify the person legally responsible for the continual operation, maintenance and repair of the permitted stormwater facility for the life of the development, or until responsibility for the operation and maintenance of the subject stormwater facilities is accepted by the City of Port Angeles.

   b. The covenant shall establish maintenance standards that meet or exceed the requirements of Chapter 4, Volume V of the most recent version of the Department of Ecology's Stormwater Management Manual for Western Washington.

   c. The covenant shall include a maintenance schedule for the permitted facility that meets or exceeds the following requirements:

      - Maintenance shall be performed within 1 year for all treatment and flow control facilities upon the determination that maintenance is needed.
      - Maintenance shall be performed within 6 months for catch basins and conveyance systems upon the determination that maintenance is needed.
      - Maintenance shall be performed within 2 years for facilities that require rebuilding, or new construction of less than $25,000, upon the determination that maintenance is needed.

   d. The covenant must allow the City access for annual inspections of all permitted stormwater facilities.

   e. The covenant must require the person legally responsible for the site to keep and maintain records of all inspections and maintenance performed at the site as well as records of any warning letters or notices of violations. These records must be available to be viewed at the City's request.

2. The City will inspect all private stormwater systems annually to ensure compliance with this section. The City will charge an annual inspection fee as set forth in PAMC 3.70.110 for this service. Additional fees may be charged if the inspection reveals a deficient condition, and additional follow up inspections are required.

3. The City will require a maintenance bond for all new construction as set forth in the Urban Services Standards and Guidelines, Section 1A.130.

- END OF CHAPTER 5

CHAPTER 5 - STORMWATER

APPENDICES

Filename

A. Forms and Fact Sheets

1. Stormwater Discharge Permit form
2. City of Port Angeles IDF Curves……IDF Curves.pdf

B. Standard Drawings

1. Through Curb Inlet Installation..... curbinlet.dwg
2. Parking Lot Catch Basin ..... parkinglotcb.dwg
3. Controlled Density Backfill ..... CDF.dwg

C. WSDOT Standard Plan (http://www.wsdot.wa.gov/Design/standards/Plans.htm)

1. Catch Basins, Sidewalk Drains, Manholes, Inlets Section B

PERMIT NO. _____

STORMWATER DISCHARGE PERMIT

I. PERMIT FEE CALCULATIONS

1.	Draining water from a chlorinated water source – no charge	$0.00
2.	Charity car wash – no charge	$0.00
3.	Engineering Plan Review (per PAMC 3.70.115) ($300+$25/Acre)	$ _____
4.	Additional Plan Review of changes, additions, or revisions to submitted or approved plans (per PAMC 3.70.117) ($55/hr)	$ _____
5.	**TOTAL PERMIT FEE:**	**$ _____**

II. CONDITIONS APPLIED TO PERMIT FOR DRAINING CHLORINATED WATER

1. Notify the City (417-4830) forty-eight (48) hours **before** beginning any permitted activity.

III. CONDITIONS APPLIED TO PERMIT FOR CHARITY CAR WASHES

1. "Fish Friendly" car wash signs must be picked up 24 hours before the car wash event and returned within 48 hours after completion of the event.
2. A deposit of $50.00 must be paid for the "Fish Friendly" car wash signs. The deposit will be returned with the return of the undamaged sign.

IV. CONDITIONS APPLIED TO PERMIT FOR STORMWATER DISCHARGE FROM DEVELOPMENT OR REDEVELOPMENT

1. Obtain written permission from the City prior to modifying any plans.
2. Install all erosion and sediment control measures as identified in the approved plans.
3. Maintain all road drainage systems, stormwater drainage systems, control measures, and other facilities identified in the plans.
4. Repair siltation or erosion damage to adjoining surfaces and drainage ways resulting from land developing or disturbing activities.
5. Inspect all erosion and sediment control measures at least once each week during construction, and after each rain of 0.5 inches or more (over a 24-hour period), and immediately make any needed repairs.
6. Allow the City to enter the site for the purpose of inspecting compliance with the plans or for performing any work necessary to bring the site into compliance with the plans.
7. Keep an up-to-date, approved copy of the plans on the site.
8. Ensure that all workmanship and materials are in accordance with the City of Port Angeles Urban Services Standards and Guidelines, and the current edition of Washington State Department of Transportation's Standard Specifications for Road, Bridge and Municipal Construction.
9. Contact the City Engineer (417-4803) immediately if hazardous materials or soils are encountered.

V. PLANNING PERMITS WHICH MAY BE REQUIRED

1. SEPA Checklist (Excavation or filling 100 cubic yards or more, or part of exempt project).
2. Environmentally Sensitive Area (ESA) Application/Approval.
3. Wetlands Permit Application/Approval.
4. Other(s)_____

VI. PLANS AND SPECIFICATIONS TO INCLUDE

A. AN ACCURATE PLAN OF THE ENTIRE SITE AS IT EXISTS AT THE TIME OF APPLICATION, WHICH MUST INCLUDE:

1. All property lines.
2. Contours over the entire site (5-foot contours are standard, but other intervals may be required).
3. The date, basis, and datum of the contours.
4. Graphic representations of all existing vegetation on the site, designated by their common names, the amount of bare ground, and the amount and type of impervious material (rock and artificial).
5. The location of all existing drainage facilities, natural and man-made.
6. The locations of any wet areas and estimated capacity of any areas which impound surface water.
7. The location and estimated discharge of all visible springs.
8. The location of all structures, utilities, and their appurtenances, including structures and utilities on

adjacent properties when such information is reasonably available.

9. Date, north arrow, and adequate scale as approved by the City Engineer on all maps and plans.
10. Identification of and mitigation measures for on-site areas which are subject to severe erosion, and off-site areas which are especially vulnerable to damage from erosion and/or sedimentation.

B. THE PROPOSED WORK SCHEDULE, WHICH DETAILS THE FOLLOWING:

1. Sequence for clearing, grading, filling, drainage alteration, and other land disturbing activities.
2. On-site soil or earth material storage locations and source of import materials, and location of the site where spoils will be disposed.
3. Schedule for installation and removal of all interim erosion and sediment control measures, including vegetative measures.
4. Schedule for construction of final improvements, if any.
5. Schedule for the installation and maintenance of required permanent erosion and sediment control devices.
6. Outline of the methods to be used in clearing vegetation and storing and disposing of the cleared vegetation.

C. AN ACCURATE FINISHED GRADE PLAN OF THE ENTIRE SITE AS IT WOULD APPEAR AFTER THE COMPLETION OF WORK COVERED BY THE PERMIT, WHICH MUST INCLUDE:

1. Finished contours achieved by grading (at the same intervals as the existing contours).
2. Boundaries of all areas to remain undisturbed with identification and the location of all other vegetation shown on the plan that will remain after the completion of all work.
3. Drainage and related facilities to be constructed with and as part of the work.
4. Boundaries of all areas where surface water runoff will be retained, detained, or infiltrated.
5. Method for discharging surface water off-site, including the provisions required to control the velocity and direction of discharge to protect downstream properties.
6. Location of building set-back lines, and approximate limits of cuts and fills, foundations, retaining walls, driveways, etc.
7. Location and dimensions of sensitive areas and any associated buffer zones and other areas to be maintained or established.
8. Location and description of proposed erosion and sedimentation control devices or structures.
9. Off-site grading shall be noted on the plans, and a dated letter of permission from the property owner(s) of the land affected shall be provided and noted on the plans.

VII. ADDITIONAL INFORMATION WHICH MAY BE REQUIRED

Note: Some development or redevelopment activities may require compliance with the City's NPDES Permit. If NPDES compliance is required, additional plans, stormwater treatment or flow control facilities may be required.

1. Hydrologic and hydraulic computations.
2. Engineering geology and soils reports.
3. Erosion and Sediment Control Plan.
4. Engineering cost estimate of drainage facilities and erosion control plan.
5. Inspection and maintenance agreement.
6. Letter(s) of permission for off-site work.
7. Copies of other required permit(s):_____
8. Other information:_____
9. Security deposit, bond, or other approved method of guaranteeing performance (circle one), in the amount of $_____.
10. Insurance required in the amounts of $_____ per occurrence and $_____
11. aggregate.

VIII. ADDITIONAL CONDITIONS

1. Additional Conditions applicable to this permit listed here and/or attached:

_____
_____
_____
_____
_____

IX. PERMIT APPROVAL

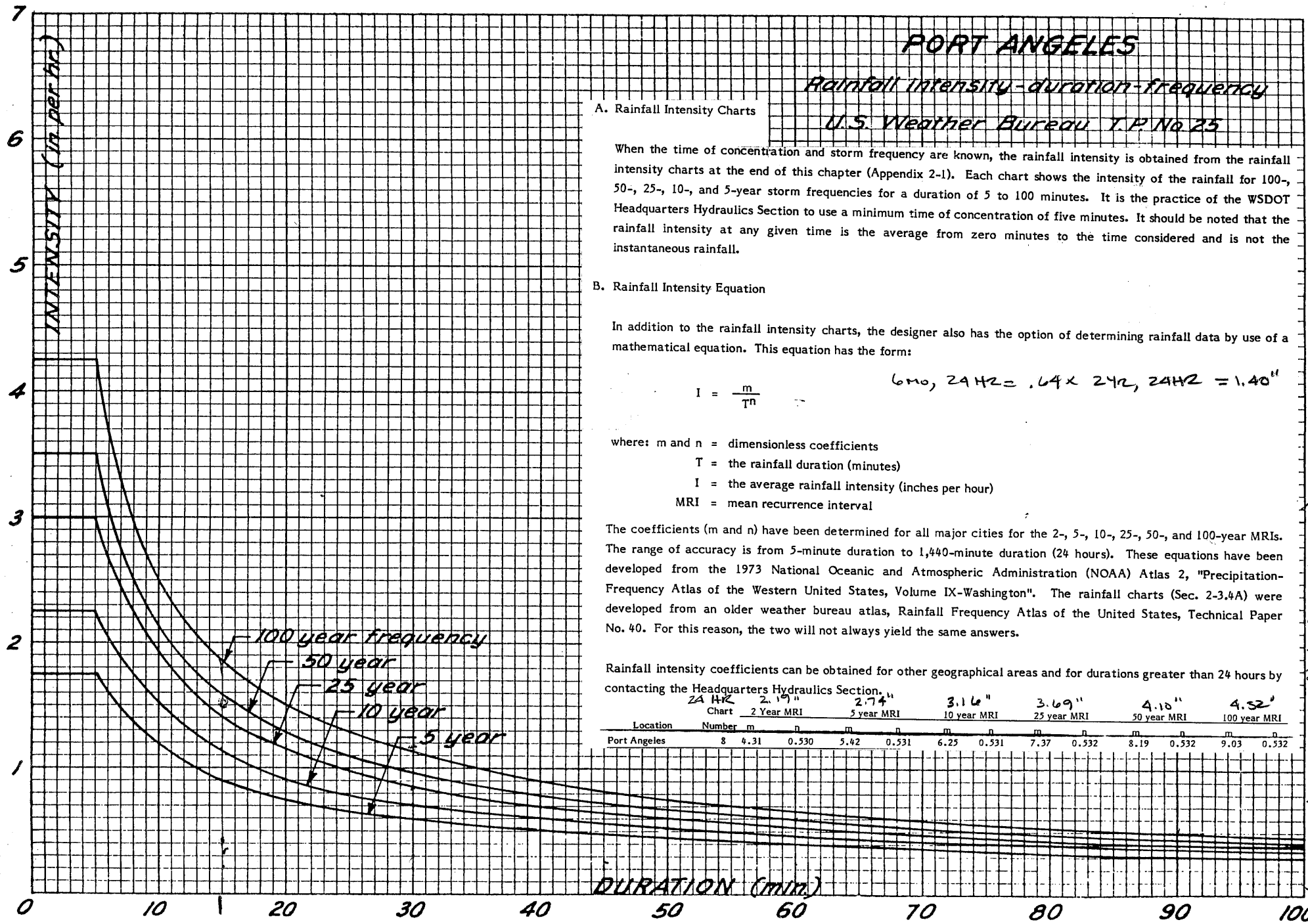
This certifies that the named applicant is granted a Stormwater Discharge Permit for the work described and the purpose shown in the application. This permit is granted subject to the terms of the agreement contained in the application, subject to the provisions of the City of Port Angeles Municipal Code and subject to any additional conditions which are attached to this permit or as noted in sections II through VI above and section VIII below. Nothing permitted hereunder shall be deemed to override the provisions of any applicable law of the City, County, State or Federal Government. This permit expires one year from the date of issuance, unless otherwise specified by the City Engineer.

City Engineer Date Dept. of Community & Economic Development Date

X. INSPECTIONS AND SIGN-OFFS

Please call 417-4831 to schedule required inspections, no later than noon of the previous business day to schedule an on-site inspection of the permitted activity(ies) checked below.

Required	No.	Description of Activity	Date Inspection Requested	Date Work Completed
	1	Installation of sediment control measures/BMP's prior to land disturbing activity.		
	2	During construction of sediment basins or stormwater management structures.		
	3	During rough grading, including hauling of materials.		
	4	Prior to removal or modification of sediment control measure.		
	5	Notice of completion received from permittee.		
	6	At completion of final grading.		
	7	Final establishment of vegetation/re-vegetation.		
	8	Completion of final erosion control measures.		
	9	As-built grading plan required.		
	10	Soils report and infiltration test required.		
	11	Geotechnical report required.		



PORT ANGELES

Rainfall intensity-duration-frequency

U.S. Weather Bureau T.P. No 25

A. Rainfall Intensity Charts

When the time of concentration and storm frequency are known, the rainfall intensity is obtained from the rainfall intensity charts at the end of this chapter (Appendix 2-1). Each chart shows the intensity of the rainfall for 100-, 50-, 25-, 10-, and 5-year storm frequencies for a duration of 5 to 100 minutes. It is the practice of the WSDOT Headquarters Hydraulics Section to use a minimum time of concentration of five minutes. It should be noted that the rainfall intensity at any given time is the average from zero minutes to the time considered and is not the instantaneous rainfall.

B. Rainfall Intensity Equation

In addition to the rainfall intensity charts, the designer also has the option of determining rainfall data by use of a mathematical equation. This equation has the form:

6mo, 24HR = .64 x 24R, 24HR = 1.40"

$$I = \frac{m}{T^n}$$

where: m and n = dimensionless coefficients
T = the rainfall duration (minutes)
I = the average rainfall intensity (inches per hour)
MRI = mean recurrence interval

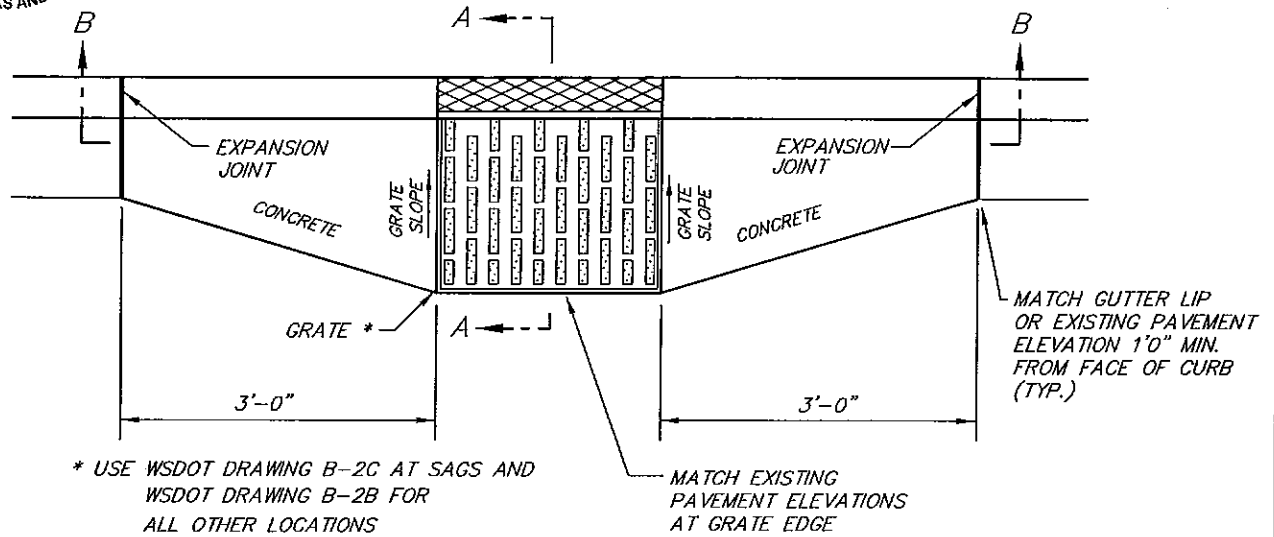
The coefficients (m and n) have been determined for all major cities for the 2-, 5-, 10-, 25-, 50-, and 100-year MRIs. The range of accuracy is from 5-minute duration to 1,440-minute duration (24 hours). These equations have been developed from the 1973 National Oceanic and Atmospheric Administration (NOAA) Atlas 2, "Precipitation-Frequency Atlas of the Western United States, Volume IX-Washington". The rainfall charts (Sec. 2-3.4A) were developed from an older weather bureau atlas, Rainfall Frequency Atlas of the United States, Technical Paper No. 40. For this reason, the two will not always yield the same answers.

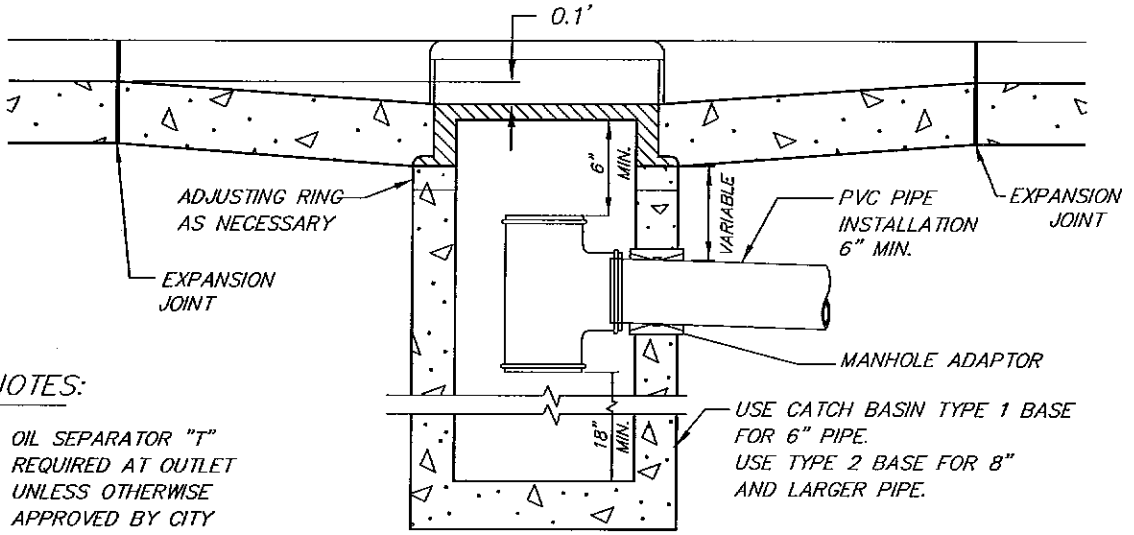
Rainfall intensity coefficients can be obtained for other geographical areas and for durations greater than 24 hours by contacting the Headquarters Hydraulics Section.

		24 HR 2.19"		2.74"		3.16"		3.69"		4.10"		4.32"	
Location	Chart Number	2 Year MRI m	n	5 year MRI m	n	10 year MRI m	n	25 year MRI m	n	50 year MRI m	n	100 year MRI m	n
Port Angeles	8	4.31	0.530	5.42	0.531	6.25	0.531	7.37	0.532	8.19	0.532	9.03	0.532

(W.S.D.O.T. HYDRAULICS MANUAL) Chart 8

STANDARD DETAIL

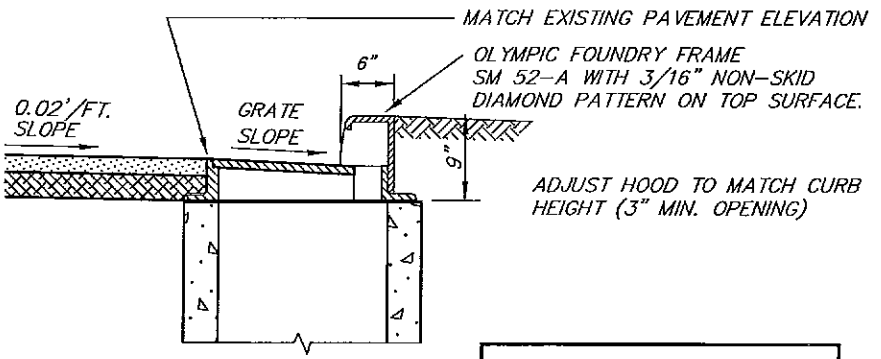




SECTION B–B

NOTES:

1. OIL SEPARATOR "T" REQUIRED AT OUTLET UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
2. CONCRETE CLASS 3000
3. CATCH BASIN BASE TO BE SET LEVEL. GRATE FRAME TO BE SHIMMED TO MATCH LONGITUDINAL SLOPE.



SECTION A–A

NOT TO SCALE

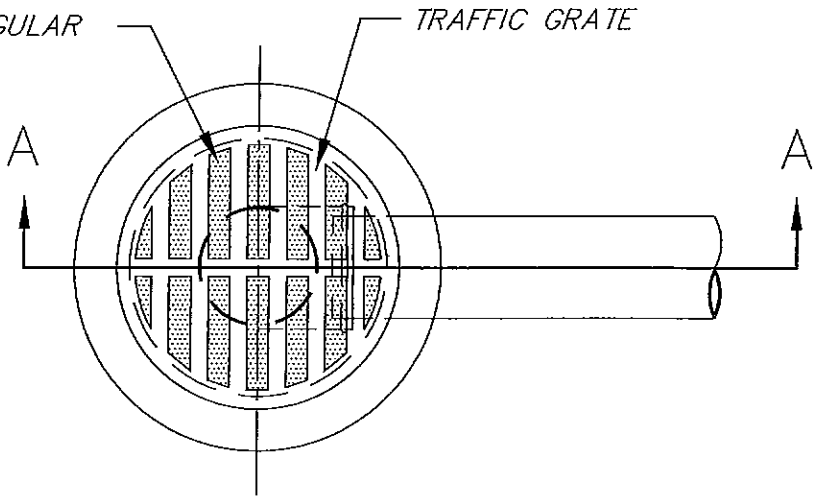
CALL FOR FORM INSPECTION BY CITY 24 HOURS PRIOR TO POURING CONCRETE.

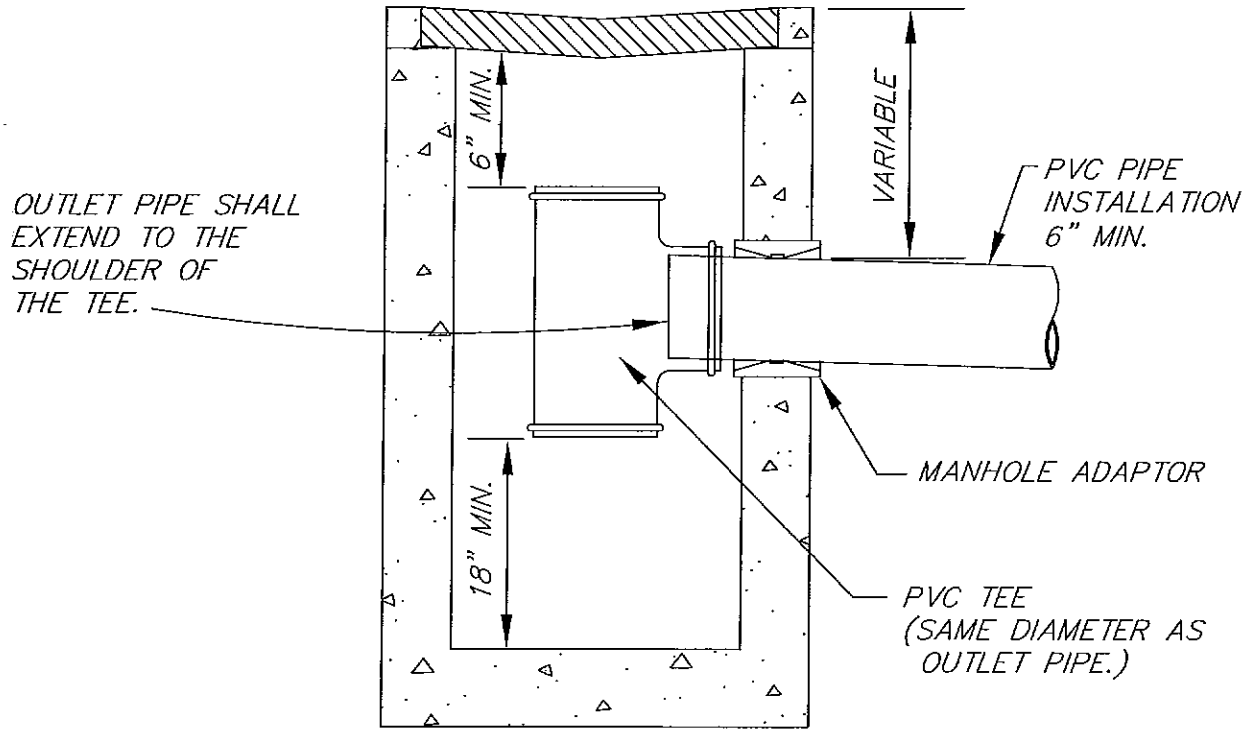
ALL WORK AND MATERIAL TO BE IN ACCORDANCE WITH THE CURRENT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION"

CALL FOR INSPECTION BY CITY 24 HOURS PRIOR TO BACKFILL.

APPROVED BY CITY ENGINEER	DATE : ~~8/22/95~~	THROUGH CURB INLET INSTALLATION
FILE NAME: CURBINLET.DWG	REVISED : 3/15/06	

STANDARD DETAIL





SECTION A–A

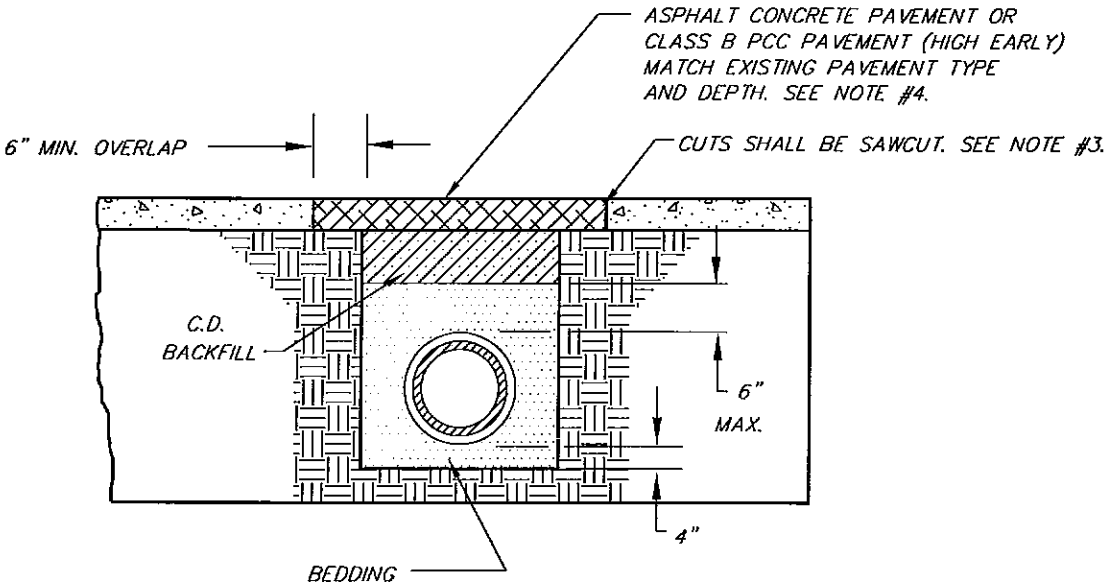
NOT TO SCALE

ALL WORK AND MATERIAL TO BE IN ACCORDANCE WITH THE CURRENT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION"

CALL FOR INSPECTION BY CITY 24 HOURS PRIOR TO BACKFILL.

APPROVED BY CITY ENGINEER	DATE : ~~8/22/95~~	PARKING LOT CATCH BASIN
FILE NAME: PARKINGLOTCB.DWG	REVISED : 3/15/06	

STANDARD DETAIL



NOT TO SCALE

C.D. BACKFILL SPECIFICATIONS

2600 LBS. OF 0.375 IN. AGGREGATE
800 LBS. OF STANDARD CONCRETE SAND
94 LBS. OF PORTLAND CEMENT
APPROX. 14 GAL. OF WATER
THE AMOUNT OF WATER IS A CRITICAL FACTOR TO SET UP TIME AND SHOULD BE ADDED AT THE SITE.

NOTES:

1. ACP PATCH SHALL BE ROLLED AND NOT VIBRATED.
2. TO BE USED FOR ALL PAVED STREETS AND ALLEYS. BACKFILL LOCATION TO 1'-0" BEHIND CURB OR EDGE OF PAVING UNLESS OTHERWISE APPROVED IN ADVANCE BY CITY ENGINEER.
3. WHERE CONCRETE PAVEMENT JOINT IS LESS THAN 4'-0" FROM SAWCUT, THE PAVEMENT SHALL BE REMOVED TO THAT JOINT.
4. TEMPORARY PATCHING WITH ASPHALT OR PLACEMENT OF STEEL PLATES IS REQUIRED WHEN TRAFFIC WILL CROSS CDF FOR MORE THAN 24 HOURS WITHOUT PERMANENT RESTORATION. STEEL PLATES SHALL HAVE COLD PATCH WEDGES ON TRAFFIC EDGES.

ALL WORK AND MATERIAL TO BE IN ACCORDANCE WITH THE CURRENT WASHINGTON STATE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION"

CALL FOR INSPECTION BY CITY 24 HOURS PRIOR TO PLACING CDF BACKFILL.

APPROVED BY CITY ENGINEER	DATE : ~~8/23/95~~	CONTROLLED DENSITY FILL (CDF)
FILE NAME: CDF.DWG	REVISED : 3/15/06	

CHAPTER 6 - CLEARING, GRADING, FILLING AND DRAINAGE

"URBAN SERVICES STANDARDS AND GUIDELINES"

CITY OF PORT ANGELES - PUBLIC WORKS & UTILITIES DEPARTMENT

6.01 GENERAL

6.01.1 APPLICABILITY

The standards and requirements contained in this chapter are promulgated pursuant to the Clearing and Grading Ordinance of the City of Port Angeles and shall be the minimum standards and requirements for the protection of vegetation and soil during any changes being made to the surface of the land through clearing, grading, filling, and/or construction or modification of natural or constructed drainage facilities in the City. Where there are conflicts or differences between these standards and City Ordinances, the City Ordinances shall apply.

6.01.2 PURPOSE

The purpose of these standards and requirements include, but are not limited to, the following:

1. To promote the public health, safety, and general welfare of the citizens and protect public and private resources of the City without preventing the reasonable use, development, and maintenance of land;
2. To avoid or minimize impacts of clearing and grading as a component of land disturbance activities to adjacent and downstream public or private property;
3. To encourage site development on public and private property, including clearing, excavation, and filling in such a manner as to minimize hazards to life, health, and property;
4. To preserve and enhance the physical and aesthetic character of the City by preventing untimely and indiscriminate removal or destruction of trees and ground cover;
5. To preserve, replace, or enhance the natural qualities of lands, watercourses, and aquatic resources, preserve and protect priority fish and wildlife habitats, minimize water quality degradation and the sedimentation of creeks, streams, ponds, lakes, wetlands, marine waters, and other water bodies, and preserve and enhance beneficial uses;
6. To minimize surface water runoff and diversion which may contribute to flooding;
7. To reduce siltation in City streams, lakes, storm sewer systems, and public roadside improvements;
8. To reduce the risk of slides and the creation of unstable building sites;
9. To promote building and site planning practices that are consistent with the City's natural topography, soils, and vegetative features while at the same time recognizing that certain factors such as disease, danger of fallings, proximity to existing and proposed structures and improvements, interference with utility services, protection of scenic views, and the realization of a reasonable enjoyment of property may require the removal of certain trees and ground cover;
10. To ensure prompt development, restoration, and replanting and effective erosion control of property after land clearing and grading;
11. To promote site development planning and building practices that provide for managing surface water runoff on-site and are consistent with the City's natural topography, vegetation cover, and hydrology;
12. To establish a City review process for land disturbing projects to ensure these regulations and goals are met.

6.01.3 AUTHORITY

1. As provided herein, the City Engineer is given authority to interpret and apply, and the responsibility to enforce, this chapter to accomplish the stated purpose.
2. The City Engineer may withhold, condition, or deny development permits or activity approvals to ensure that

the proposed action is consistent with this chapter.

6.02 CLEARING AND GRADING PERMIT

6.02.1 WHEN A PERMIT IS REQUIRED

A Clearing and Grading Permit is required prior to any of the following:

1. Any clearing, filling, excavation, or grading in a critical area or critical area buffer.
2. Land disturbance of one (1) acre or more, or is part of a larger area of contiguous properties developed under the same ownership, common plan of development, or sale.
3. Fill and/or excavation of one hundred (100) cubic yards or more, even if the excavated material is used as fill on the same site. [Quantities of fill and excavation are calculated separately and then added together to determine the total quantity for the site.]
4. Clearing or grading that will likely penetrate the ground water table, including the construction of ponds and reservoirs.
5. An excavation which is more than five (5) feet in depth or which creates a cut slope greater than five (5) feet in depth or which creates a cut slope greater than five (5) feet in height and steeper than two units horizontal in one unit vertical (2:1).
6. Any re-grading or paving on an area used for stormwater retention or detention or alteration of an existing drainage course.
7. Any proposal to cut down or top by more than one quarter any tree(s) that are required to be preserved by City code, plat condition, or other requirement.

6.02.2 EXEMPTIONS TO OBTAINING A PERMIT

The following activities do not require an approved Clearing and Grading Permit:

1. Land clearing, grading, filling, sandbagging, diking, ditching, or similar work during or after periods of extreme weather or other emergency conditions that present immediate danger to life or property.
2. Land clearing ordered by the City Council for abatement of a public nuisance.
3. Clearing performed under the direction of the City Engineer within a public right-of-way or upon an easement, for the purpose of installing and maintaining water, stormwater, sanitary sewer, power, cable, or communication lines.
4. Cemetery graves.
5. Land disturbance that is less than one acre, except those sites meeting any of the conditions listed in 6.02.1, or where an adjacent area containing disturbed areas under the same ownership or chain of ownership has been similarly exempted so that the combined area is one acre or more and final site stabilization is not complete.
6. If a building permit is issued, no additional clearing, grading, or filling permit or associated fee will be required. However, the standards established in this manual and by City ordinance shall be applied as a condition of said building permit.
7. Forest practices regulated under RCW 76.09. *Activities involving conversion of land to uses other than commercial timber production are subject to clearing and grading regulations.*
8. Refuse disposal sites controlled by other regulations.
9. Mining, quarrying, excavation, processing, or stockpiling of rock, sand, gravel, aggregate, or clay where established and provided by law provided such operations do not affect the lateral support of or increase the stresses in or pressure upon any adjacent or contiguous property.

10. Agricultural crop management of existing and ongoing farmed areas as defined per RCW 84.34.020.

11. Routine landscape maintenance of existing landscaped areas on developed lots.

12. Routine drainage maintenance of existing, constructed stormwater drainage facilities located outside of a protected area, including, but not limited to, detention/retention ponds, wetponds, sediment ponds, constructed drainage swales, water quality treatment facilities, such as filtration systems and regional storm facilities that are necessary to preserve the water quality treatment and flow control functions of the facility. *This exemption does not apply to any expansion or modification to existing excavated and constructed stormwater drainage facilities.*

13. Roadway repairs and overlays within a public street right of way for the purpose of maintaining the pavement, curbing, or sidewalk of existing paved roadways.

NOTE: Exemptions 6 and 7 do not apply in Environmentally Sensitive Areas, Critical Areas, or Buffer Zones. In addition, an exemption from a Clearing and Grading Permit does not exempt the person doing the work from meeting all applicable federal, state, and local codes, standards, guidelines, regulations, and permit requirements.

6.02.3 DURATION OF PERMIT

The Clearing and Grading Permit shall be effective for one year from the date of issuance but may, with the explicit approval of the City Engineer, be extended for an additional one year period. The fee schedule for the review of plans and the permit are as detailed in Chapter 3.70.110 of the Port Angeles Municipal Code (PAMC). While the fee schedule reflects separate review activities, only one permit for clearing, grading, filling, and drainage will be issued per applicant for a specific project. A current schedule of the fees is available upon request.

6.02.4 CONDITIONS APPLICABLE TO ALL PERMITS

Permittees shall comply with the following conditions, which shall apply to all clearing and grading permits:

1. Notify the City forty-eight (48) hours before commencing any land disturbing activity.

2. Notify the City of completion of any erosion control and or vegetation protection measures within forty-eight (48) hours after their completion.

3. Obtain approval in writing from the City for any plan changes.

4. Meet all applicable minimum standards as described below in Section 6.03.

5. Install all control measures as identified in the approved plans.

6. Maintain all road drainage systems, stormwater drainage systems, control measures, and other facilities whether or not they are identified in the plans.

7. Repair siltation or erosion damage to adjoining surfaces and drainage ways resulting from land disturbing activities.

8. Inspect, maintain, install, modify, and/or repair the erosion control measures as needed to assure the continued performance of their intended function. Inspections shall be conducted by a Certified Erosion and Sediment Control Specialist and a written record of said inspections shall be kept on site at all times. Said Specialist shall be identified in writing to the City and shall be on-site or on-call at all times.

9. Provide safe and ready access to allow the City to enter the site for the purpose of inspecting for compliance with the plans or for performing any work necessary to bring the site into compliance with the plans.

10. Keep an up-to-date copy of the approved plans on the site.

11. Ensure that all workmanship and materials are in accordance with City of Port Angeles standards and the most current edition of the State of Washington Standard Specifications for Road, Bridge and Municipal Construction.

12. Meet any and all additional conditions contained in, or referred by, the issued permit.
13. Submission and approval of a Construction Stormwater Pollution Prevention Plan meeting the requirements of Section 6.04.

6.02.5 ENVIRONMENTALLY SENSITIVE AREAS

Construction within critical areas or their buffers shall be in compliance with the appropriate Chapter(s) of the PAMC and shall be subject to the review of the Community and Economic Development Director.

Compliance with the regulations of this chapter does not constitute compliance with other federal, state, or local regulations and permit requirements. The responsibility for determining the existence and application of these requirements rests solely with the applicant; provided, that to the extent known, the City will inform the applicant of other agency requirements or permits that may apply to a site such as: Shoreline Substantial Development permits, Critical Area and Resource Lands regulations, Hydraulics Permit Act permits, Section 106 of the National Historic Preservation Act, U.S. Army Corps of Engineers Section 404 Permits, and National Pollution Discharge Elimination System permits. The applicant is responsible for complying with these requirements apart from the process established in these regulations.

6.03 MINIMUM STANDARDS

6.03.1 SILTATION AND EROSION CONTROL

The following are the minimum standards for siltation and vehicular access controls during construction on any site. For sites which require a SWPPP, see Section 6.05 and Appendix E of this chapter.

1. Construction Access Control - Provide a clean hard surface for vehicles entering the construction site to eliminate tracking soil onto the street. This surface shall be in place and maintained during the full period of construction.
2. Stabilization of Denuded Areas -
    a. All exposed and unworked soils shall be stabilized using suitable best management practices (sod, vegetation, plastic covering, mulching, etc).
    b. No land disturbing activity shall be undertaken until installation of sufficient erosion and sediment control devices to retain the sediment that may be generated by the activity is complete.
    c. Vegetation measures shall be used for erosion and sediment control wherever feasible, rather than structural measures such as pipes, structures, or other devices. Native plants shall be used in environmentally sensitive areas.
3. Protection of Adjacent Properties - Adjacent properties shall be protected from sediment deposition by appropriate use of vegetated buffer strips, sediment barriers or filters, dikes or mulching, or combinations of measures. All reasonable measures to protect all public and private property from damage shall be taken.

6.03.2 GRADING

The following are the minimum standards for grading unless otherwise modified by an approved grading plan:

1. Grading shall not contribute to or create landslides, accelerated soil creep, or settlement of soils.
2. Natural land and water features, vegetation, drainage and other natural features of the site shall be preserved to the greatest extent possible and in accordance with the approved plans.
3. Grading shall not create or contribute to flooding, erosion, increased turbidity, or siltation of a watercourse.
4. Groundcover and tree disturbance shall be minimized. Where trees are to be retained on site, a tree protection plan shall be submitted to the City and approved prior to the beginning of any on-site clearing or grading.
5. Grading operations shall be conducted and/or phased so as to expose the smallest practical area to erosion

for the least possible time.

6. Grading shall not divert existing watercourses.

6.03.3 CUTS AND FILLS

The following are the minimum standards for cutting and filling slopes; provided that some or all of these provisions may be waived by the City Engineer for grading operations of a minor nature:

1. Cut slopes shall be no steeper than is safe for the intended use. Cut slopes greater than five (5) feet in height shall be no steeper than two (2) horizontal to one (1) vertical, except where approved retaining walls are to be installed.
2. Filling should only occur where the ground surface has been prepared by removal of vegetation and other unsuitable materials or preparation of steps where natural slopes are steeper than five to one (5 to 1). Fill slopes should not be constructed on natural slopes greater than two to one (2 to 1).
3. Fill slopes shall be no steeper than is safe for the intended use. Fill slopes greater than five (5) feet in height shall be no steeper than two (2) horizontal to one (1) vertical, except where approved retaining walls are engineered and installed.
4. Steeper cut/fills may be permitted if supported by an approved geotechnical report.
5. Cut and fill slopes shall not encroach upon adjoining property without prior written approval of the adjacent property owner.
6. Cut and fill slopes shall be provided with subsurface and surface drainage provisions to approved discharge locations as necessary to retain the slope.
7. The faces of slopes shall be prepared and maintained to control erosion. Approved best management practices (BMP's) shall be initiated and/or installed as soon as possible and shall be maintained by the owner.
8. Fill materials used as structural fill shall be compacted and tested in accordance with the requirements applicable to support the planned use.

6.03.4 CRITICAL AREAS AND CRITICAL AREA BUFFERS

No land disturbing activity shall be permitted in a designated critical area or critical area buffer zone, except as otherwise allowed by applicable laws and permits.

6.03.5 CLEAN-UP

Persons and/or firms engaged in clearing, grading, and filling, or drainage activities shall be responsible for maintaining work areas free of debris or other material that may cause damage to or siltation of existing or new facilities or have the potential of creating a safety hazard.

6.03.6 CONSTRUCTION PLAN

The CONSTRUCTION PLAN - GENERAL CONDITIONS in Chapter 1 of the Urban Services Standards and Guidelines (Section 1A.085) shall apply to and be included on any plans dealing with clearing, grading, filling or drainage activities.

6.04 TEMPORARY EROSION/SEDIMENTATION CONTROL PLAN

1. A Temporary Erosion/Sedimentation Control Plan is required in conjunction with a Clearing and Grading Permit for sites that disturb less than one acre of land, unless otherwise exempted by the City Engineer. The design of temporary erosion control measures shall reflect the site's soil conditions, topographic features, hydrology, and weather during the construction period and shall comply with the standards set forth herein.
2. Prior to the initial clearing and grading of any land, provisions shall be made to intercept all potential silt-laden runoff that could result from the clearing and grading. The interception shall preclude any silt-laden

runoff from discharging from the proposed land development to downstream properties, unless approved otherwise. The interception shall cause all silt-laden runoff to be conveyed by open ditch or other means to whatever temporary facility is necessary to remove silt from the runoff prior to its discharge.

3. Details of siltation ponds and channels shall be submitted to the City prior to construction. The location and profiles of interim drainage channels may be shown by a typical cross-section and flow direction arrows. A plan example is shown in Volume 3 of the DOE Manual.

4. The maximum velocities and channel slopes shall be shown on the Temporary Erosion/Sedimentation Control Plan.

5. Check dams shall be employed or some other acceptable method to limit ditch velocities to 5 feet per second, unless an approved revetment is placed.

6. A siltation pond shall provide a minimum of 1.5 feet of storage below the pond discharge. The volume of the pond above the 1.5 foot storage shall be calculated based upon the 6-month, 24-hour storm for the area contributing runoff to the pond. (see Volume 3 of the DOE Manual, as well as the detail in the Appendices)

7. Discharge from a siltation pond shall be directed through filter fabric or some other acceptable filtering system before leaving the development.

8. A minimum of one foot of freeboard shall be provided for all siltation ponds.

9. The GENERAL CONDITIONS in Chapter 1, section 1A.085 shall be included on any plans dealing with clearing, grading, filling or drainage activities.

6.05 CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

6.05.01 GENERAL

A Construction Stormwater Pollution Prevention Plan (SWPPP) is required in conjunction with a Clearing and Grading Permit for sites that disturb one acre of land or more. Refer to Section 6.04 above for requirements for sites that disturb less than one acre of land. The SWPPP is a document that describes the potential for pollution problems on a construction project. The Construction SWPPP explains and illustrates the measures to be taken on the construction site to control those problems. The owner or lessee of the land being developed has the responsibility for Construction SWPPP preparation and submission to the City. The owner or lessee may designate a qualified individual or individuals to prepare the Construction SWPPP, but the owner or lessee retains the ultimate responsibility.

The following general principles should be applied to the development of the Construction SWPPP. Additional guidance and information related to preparation and implementation of the SWPPP and approved BMPs are available in the current edition of the Department of Ecology's Stormwater Management Manual for Western Washington.

1. The duff layer, native topsoil, and natural vegetation should be retained in an undisturbed state to the maximum extent practicable

2. Prevent pollutant release. Select source control BMPs as a first line of defense. Prevent erosion rather than treat turbid runoff.

3. Select BMPs depending on site characteristics (topography, drainage, soil type, ground cover, and critical areas) and the construction plan.

4. Divert runoff away from exposed areas wherever possible. Keep clean water clean.

5. Limit the extent of clearing and phase construction operations.

6. Before reseeding a disturbed soil area, amend all soils with compost wherever topsoil has been removed.

7. Incorporate natural drainage features whenever possible, using adequate buffers and protecting areas where flow enters the drainage system.

8. Minimize slope length and steepness.
9. Reduce runoff velocities to prevent channel erosion.
10. Prevent the tracking of sediment off-site.
11. Select appropriate BMPs for the control of pollutants other than sediment.

6.05.02 REQUIRED ELEMENTS

Each of the 12 elements listed below must be considered and included in the Construction SWPPP unless site conditions render the element unnecessary and the exemption is clearly justified in the narrative of the SWPPP:

Refer to Appendix E for the requirements of each SWPPP element.

1. Mark Clearing Limits
2. Establish Construction Access
3. Control Flow Rates
4. Install Sediment Controls
5. Stabilize Soils
6. Protect Slopes
7. Protect Drain Inlets
8. Stabilize Channels and Inlets
9. Control Pollutants
10. Control Dewatering
11. Maintain BMPs
12. Manage the Project

6.05.03 NARRATIVE

The Construction SWPPP shall consist of two parts, a narrative (Section 6.05.03) and drawings (Section 6.05.04). All narrative items must be addressed in the SWPPP. A checklist is provided in the Appendix of this chapter that can be used as a quick reference to determine if all the major items are included in the Construction SWPPP.

1. Twelve (12) Elements – Describe how the Construction SWPPP addresses each of the 12 required elements. Include the type and location of BMPs used to satisfy the required element. If an element is not applicable to a project, provide a written justification for why it is not necessary.
2. Project Description – Describe the nature and purpose of the construction project. Include the total size of the area, any increase in existing impervious area; the total area expected to be disturbed by clearing, grading, excavation, or other construction activities, including off-site borrow and fill areas; and the volumes of grading cut and fill that are proposed.
3. Existing Site Conditions – Describe the existing topography, vegetation, and drainage. Include a description of any structures or development on the parcel including the area of existing impervious surfaces.
4. Adjacent Areas – Describe adjacent areas, including streams, lakes, wetlands, residential areas, and roads that might be affected by the construction project. Provide a description of the downstream drainage leading from the site to the receiving body of water.
5. Critical Areas – Describe areas on or adjacent to the site that are classified as critical areas. Critical areas that receive runoff from the site shall be described up to ¼ mile away. The distance may be increased at

the discretion of the City. Describe special requirements for working near or within these areas.

6. Soil – Describe the soil on the site, giving such information as soil names, mapping unit, erodibility, settleability, permeability, depth, texture, and soil structure.
7. Potential Erosion Problem Areas – Describe areas on the site that have potential erosion problems.
8. Construction Phasing – Describe the intended sequence and timing of construction activities and any proposed construction phasing.
9. Construction Schedule – Describe the construction schedule. If the schedule extends into the wet season, describe what activities will continue during the wet season and how the transport of sediment from the construction site to receiving waters will be prevented.
10. Financial/Ownership Responsibilities – Describe ownership and obligations for the project. Include bond forms and other evidence of financial responsibility for environmental liabilities associated with construction.
11. Engineering Calculations – Attach any calculations made for the design of such items as sediment ponds, diversions, and waterways, as well as calculations for runoff and stormwater detention design (if applicable). Engineering calculations must bear the signature and stamp of an engineer licensed in the state of Washington.
12. Erosion Control Specialist – A responsible, certified erosion control specialist shall be identified. Contact information shall be included.

6.05.04 DRAWINGS

The following is a list of items that need to be shown or otherwise addressed in the drawings.

1. Vicinity Map – Provide a map with enough detail to identify the location of the construction site; adjacent roads; and receiving waters.
2. Site Map – Provide a site map(s) showing the following features. The site map requirements may be met using multiple plan sheets for ease of legibility.
    a. A legal description of the property boundaries or an illustration of property lines (including distances) in the drawing(s).
    b. The direction of north in relation to the site.
    c. Existing structures and roads, if present.
    d. The boundaries and labels for the different soil types.
    e. Areas of potential erosion problems.
    f. Any on-site and adjacent surface waters, critical area, their buffers, FEMA base flood boundaries, and Shoreline Management boundaries.
    g. Existing contours and drainage basins and the direction of flow for the different drainage areas.
    h. Final and interim grade contours as appropriate, drainage basins, and the direction of stormwater flow during and upon completion of construction.
    i. Areas of soil disturbance, including all areas affected by clearing, grading, and excavation.
    j. Locations where stormwater discharges to surface waters during and upon completion of construction.
    k. Existing unique or valuable vegetation and the vegetation that is to be preserved.
    l. Cut and fill slopes indicating top and bottom of slope catch lines.
    m. Stockpile, waste storage, and vehicle storage/maintenance areas.

n. Total cut and fill quantities and the method of disposal for excess material.

3. Conveyance Systems – Show on the site map the following temporary and permanent conveyance features:

   a. Locations for swales, interceptor trenches, or ditches.

   b. Drainage pipes, ditches, or cut-off trenches associated with erosion and sediment control and stormwater management.

   c. Temporary and permanent pipe invert elevations, minimum slopes, and depth of cover.

   d. Grades, dimensions, and direction of flow in all ditches and swales, culverts, and pipes.

   e. Details for bypassing off-site runoff round disturbed areas.

   f. Locations and outlets of any dewatering systems.

5. Location of Detention BMPs – Show on the site map the locations of stormwater detention BMPs.

6. Erosion and Sediment Control (ESC) BMPs – Show on the site map all major structural an nonstructural ESC BMPs including:

   a. The location of sediment pond(s), pipes, and structures.

   b. Dimension pond berm widths and inside and outside pond slopes.

   c. The trap/pond storage required and the depth, length, and width dimensions.

   d. Typical section views through pond and outlet structure.

   e. Typical details of gravel cone and standpipe, and/or other filtering devices.

   f. Stabilization technique details for inlets and outlets.

   g. Control/restrictor device location and details.

   h. Stabilization practices for berms, slopes, and disturbed areas.

   i. Rock specifications and detail for rock check dam, if used.

   j. Spacing for rock check dams as required.

   k. Front and side sections of typical rock check dams.

   l. The location, detail, and specification for silt fence.

   m. The construction entrance and location.

7. Detailed Drawings – Any structural practices used that are not referenced in State or City manuals should be explained and illustrated with detailed drawings.

8. Other Pollutant BMPs – Indicate on the site map the location of BMPs to be used for the control of pollutants other than sediment.

9. Monitoring Locations – Indicate on the site map the water quality sampling locations, if required by the City or the Department of Ecology. Sampling stations shall be located in accordance with applicable permit requirements.

10. Notes addressing construction phasing and scheduling shall be included on the drawings.

6.06 MAINTENANCE SCHEDULE

The Permittee may be required to provide a maintenance schedule for constructed temporary private facilities shall be developed to ensure the continuing intended function for the life of any such temporary private facilities

and shall state the type of maintenance and inspection to be completed, the time period for completion, and indicate the party or parties responsible for the maintenance and inspection. This schedule shall be prepared by a Professional Engineer licensed to practice in the State of Washington and shall be included with all required plans and permits. The schedule shall be recorded with the County Auditor by the owner of the private facilities and a copy of the recorded document shall be provided to the City. See Chapter 5 for maintenance requirements for permanent facilities.

6.07 SECURITY

Per PAMC 15.28.140, the City Engineer may require the applicant to furnish security in the form of a bond, cash escrow account, an irrevocable letter of credit, or other security which may be acceptable to the City in its sole discretion, in an amount determined by the City Engineer to be sufficient to reimburse the City if it should become necessary for the City to enter the property to correct conditions relating to soil instability, erosion, or environmental damage caused by lack of or improper completion of the work. When a bond is required, an engineer's estimate will be required to determine the amount of the bond. The amount of the bond will be a minimum of 150% of the approved engineer's estimate.

6.08 INSURANCE

The applicant shall comply with the insurance provisions of the Clearing and Grading Ordinance as contained in PAMC 15.28.150.

6.09 PRE-CONSTRUCTION MEETING

Prior to any clearing, grading, filling, and/or drainage facility construction, the Contractor may be required to conduct a pre-construction conference with City Staff to coordinate the project.

6.10 INSPECTIONS

1. All projects which include clearing, grading, filling or drainage shall be subject to inspection by the City Engineer or his designee, who shall be granted reasonable right of entry to the work site by the permittee. When required by the City Engineer, special inspection of the grading operations and special testing shall be performed by qualified professionals employed by the permittee. Inspections in conjunction with Hydraulic Project Approvals may also be enforced by the Washington State Department of Fisheries or Wildlife.

2. Each permitted site must be inspected as necessary to ensure that the sediment control measures are installed and effectively maintained in compliance with the approved Construction SWPPP. Where applicable, the permittee must obtain inspection by the City at the following stages:

    a. Following the installation of sediment control measures or practices and prior to any other land disturbing activity;

    b. Following the establishment of any tree protection zone(s) and prior to any other land disturbing activity.

    c. During the construction of sediment basins or stormwater management structures;

    d. During rough grading, including hauling of imported or wasted materials;

    e. Prior to the removal or modification of any sediment control measure or facility; and

    f. Upon completion of final grading, including establishment of ground covers and planting, installation of all vegetative measures, and all other work in accordance with the approved plan and/or permit.

3. The permittee may secure the services of an engineer, subject to the approval of the City Engineer, to inspect the construction of the facilities and provide the City with a fully documented certification that all construction is in accordance with the provisions of the approved plan, applicable rules, regulations, permit conditions and specifications. If inspection certification is provided to the City, then the normal inspections performed by the City for the permit may be waived. In these cases the City shall be notified at the required inspection points and may make spot inspections. The engineer shall use the "Engineer's Construction Inspection Report" form attached for certification of the construction or other similar form approved by the City Engineer.

6.11 COMPLETION OF THE WORK

1. Construction Changes - Whenever changes must be made to the approved plan, the changes shall be submitted in writing to and approved by the City Engineer in advance of the construction of those changes.

2. Final reports - Upon completion of the rough grading and at the final completion of the work, the City Engineer may require the following reports, drawings, and supplements thereto to be prepared and submitted by the owner and/or an appropriate qualified professional approved by the City Engineer:

   a. An as-built grading plan, including original ground surface elevations, final surface elevations, lot drainage patterns, and locations and elevations of all surface and subsurface drainage facilities.

   b. A soils grading and/or geologic grading report, including locations and elevations of field density tests and geologic features, summaries of field and other laboratory tests, and other substantiating data and comments or any other changes made during grading and their effect on the recommendations made in the approved grading plan.

3. Notification of completion - The permittee or his/her agent shall notify the City Engineer when the grading operation is ready for final inspection. Final approval shall not be given until all work has been completed in accordance with the approved Construction SWPPP and other approved plans, and the required reports have been submitted and accepted.

- END OF CHAPTER 6

CHAPTER 6 - CLEARING, GRADING, FILLING AND DRAINAGE

APPENDICES

	Filename
A. Clearing and Grading Permit Application	c&g application.doc
B. Clearing and Grading Permit	c&g permit.doc
C. Engineer's Construction Inspection Report for Clearing, Grading, Filling, and Drainage	construction report.doc
D. Construction Stormwater Pollution Prevention Plan (SWPPP) Checklist	
E. Requirements for Each SWPPP Element	
F. Selected Standard Details from the Department of Ecology Stormwater Management Manual	
1. Stabilized Construction Entrance	BMP C105
2. Mulching	BMP C121
3. Surface Roughening	BMP C130
4. Temporary Channel Liners	BMP C202
5. Rock Check Dams	BMP C207
6. Storm Drain Inlet Protection	BMP C220
7. Straw Bale Barrier	BMP C230
8. Silt Fence	BMP C233
9. Sediment Trap	BMP C240
10. Temporary Sediment Pond	BMP C241

(A complete listing of approved BMPs can be found in Chapter 4, Volume II of the DOE Manual)

Application No. _____

CLEARING AND GRADING PERMIT APPLICATION

(Applicant must complete Page 1 of Application. Page 2 will be completed by the City.)

Name of Applicant: _____
Applicant's Mailing Address: _____
_____
Applicant's Phone Number: _____

Plan Preparer (Architect/Engineer):_____
Preparer's Mailing Address: _____
_____
Preparer's Phone Number: _____

Location of Proposed Activity: _____
(Street address or lot and block number)_____

Owner of Property: _____
(If not applicant, attach letter of authorization from property owner)

Description of Proposed Activity (Also attach plans, sketches or other important information which would assist in our initial review)**:**

_____
_____
_____
_____
_____

Estimated Amount of Material, in cubic yards, to be excavated, imported, or exported:_____

If the answer to any of the following three questions is yes, an Environmentally Sensitive Area (ESA) application with a SEPA checklist and associated fees are required to be submitted with this application and will be processed according to the City's consolidated permitting process.

1. Is the excavation or fill associated with the development of a parking lot for more than 20 vehicles? _____(yes or no)

2. Is the total amount of excavation or fill expected to exceed 100 cubic yards? _____(yes or no)

3. Will any portion of the grading, excavating or filling occur within 200 feet of any of the following? [If the answer is yes, please check the appropriate condition(s):]
   _____Shoreline _____Stream/Creek _____40% or greater slope.

The applicant hereby affirms and commits that the information submitted for this permit is accurate and that the applicant will comply with the terms and conditions of this permit and the City of Port Angeles Clearing and Grading Ordinance.

_____
Signature of Applicant or authorized representative Date

CLEARING AND GRADING PERMIT APPLICATION

☐ **1. THE PROPOSED ACTION HAS BEEN DETERMINED TO BE EXEMPT FROM A CLEARING AND GRADING PERMIT, BASED UPON THE INFORMATION PROVIDED BY THE APPLICANT. THE BASIS FOR THIS EXEMPTION IS AS CHECKED BELOW:**

☐ A. Land clearing, grading, filling, sandbagging, diking, ditching, or similar work during or after periods of extreme weather or other emergency conditions which have created situations such as flooding or high fire danger that present immediate danger to life or property, as authorized by the City Engineer.
☐ B. Land clearing necessitated by order of the City Council related to the abatement of a public nuisance, where the work is administered by the City.
☐ C. Removal of dead, diseased, or damaged trees which constitute an imminent hazard to life or property.
☐ D. Clearing performed under the direction of the City Engineer within a public right-of-way or upon an easement, for the purpose of installing and maintaining water, storm, sewer, power, cable or communication lines.
☐ E. Cemetery graves.
☐ F. Non-destructive vegetation trimming with proper removal and disposal of debris.

EXEMPTIONS "G" THROUGH "L" SHALL NOT APPLY IN SITUATIONS WHERE THE PROPERTY INCLUDES AN ENVIRONMENTALLY SENSITIVE AREA:

☐ G. Land that is less than one acre, except where an adjacent area containing disturbed areas under the same ownership or chain of ownership has been similarly exempted so that the combined area is greater than one acre and final site stabilization is not complete.
☐ H. If a building permit is issued, no additional clearing, grading, or filling permit or associated fee will be required; provided that the standards established in the City's Urban Services Standards and Guidelines shall be applied as a condition of said building permit.
☐ I. Routine maintenance of existing stormwater drainage facilities located outside of a critical area (as defined by PAMC 15.20.030), including, but not limited to, detention/retention ponds, wetponds, sediment ponds, constructed drainage swales, water quality treatment facilities, such as filtration systems and regional storm facilities that are necessary to preserve the water quality treatment and flow control functions of the facility. *This exemption does not apply to any expansion and/or modification to any existing stormwater drainage facilities.*
☐ J. Roadway repairs and overlays within a public street right of way for the purpose of maintaining the pavement, curbing, or sidewalk on existing paved roadways.
☐ K. Forest practices regulated under RCW 76.09. *Activities involving conversion of land to uses other than commercial timber production are subject to clearing and grading regulations*
☐ L. Other reason as indicated hereon:_____

An exemption from a Clearing and Grading Permit does not exempt the person doing the work from meeting all applicable federal, state, and local codes, standards, guidelines, and regulations, including obtaining and meeting the conditions of all applicable permits.

☐ **2. THE PROPOSED ACTION IS NOT EXEMPT: C&G PERMIT REQUIRED**

_____ _____
Dept.of Comm. & Economic Development Date City Engineer Date

PERMIT NO. _____

CLEARING AND GRADING PERMIT

I. PERMIT FEE CALCULATIONS

1. Grading and filling - plan review and permit fee (per PAMC 3.70.110D)
   - 0-250 cubic yards (CY) and < 4' of cut/fill ($40.00) $_____
   - 251 - 1,000 CY ($75.00) $_____
   - 1,001 - 10,000 CY ($110.00) $_____
   - 10,000+ CY ($35.00 + $15.00 per 10,000 CY) $_____
2. Clearing and drainage - plan review and permit fee (per PAMC 3.70.110D)
   - Less than one acre ($40.00) $_____
   - One acre to 5 acres ($75.00) $_____
   - Over 5 acres ($15.00 per acre) $_____
3. Inspection Fees (per PAMC 3.70.110.E)($55/hr) $_____
4. Engineering Plan Review (per PAMC 3.70.115)
   - Water ($0.50/LF) $_____
   - Sanitary Sewer ($0.50/LF) $_____
   - Storm Sewer ($0.50/LF) $_____
   - Street/Alley/Parking Lot ($0.50/linear feet of centerline) $_____
5. Additional Plan Review of changes, additions, or revisions to submitted or approved plans (per PAMC 3.70.117) ($55/hr) $_____
6. Environmental Checklist (SEPA Review) (per PAMC 3.70.070G)($125) $_____
7. **TOTAL PERMIT FEE: $_____**

II. CONDITIONS APPLIED TO *ALL* PERMITS

1. Notify the City (417-4831) forty-eight (48) hours **before** beginning any land-disturbing activity.
2. Notify the City (417-4831) within 48 hours of completion of any erosion and sediment control measures.
3. Obtain written permission from the City prior to modifying any plans.
4. Install all erosion and sediment control measures as identified in the approved plans.
5. Maintain all road drainage systems, stormwater drainage systems, control measures, and other facilities identified in the plans.
6. Repair siltation or erosion damage to adjoining surfaces and drainage ways resulting from land developing or disturbing activities.
7. Inspect all erosion and sediment control measures at least once each week during construction, and after each rain of 0.5 inches or more (over a 24-hour period), and immediately make any needed repairs.
8. Allow the City to enter the site for the purpose of inspecting compliance with the plans or for performing any work necessary to bring the site into compliance with the plans.
9. Keep an up-to-date, approved copy of the plans on the site.
10. Ensure that all workmanship and materials are in accordance with the City of Port Angeles Urban Services Standards and Guidelines, and the current edition of Washington State Department of Transportation's Standard Specifications for Road, Bridge and Municipal Construction.
11. Contact the City Engineer (417-4803) immediately if hazardous materials or soils are encountered.

III. PLANNING PERMITS REQUIRED

1. SEPA Checklist (Excavation or filling 100 cubic yards or more, or part of exempt project).
2. Environmentally Sensitive Area (ESA) Application/Approval.
3. Wetlands Permit Application/Approval.
4. Other(s)_____
   _____

IV. PLANS AND SPECIFICATIONS TO INCLUDE

A. AN ACCURATE PLAN OF THE ENTIRE SITE AS IT EXISTS AT THE TIME OF APPLICATION, WHICH MUST INCLUDE:

1. All property lines.
2. Contours over the entire site (5-foot contours are standard, but other intervals may be required).

3. The date, basis, and datum of the contours.
4. Graphic representations of all existing vegetation on the site, designated by their common names, the amount of bare ground, and the amount and type of impervious material (rock and artificial).
5. The location of all existing drainage facilities, natural and man-made.
6. The locations of any wet areas and estimated capacity of any areas which impound surface water.
7. The location and estimated discharge of all visible springs.
8. The location of all structures, utilities, and their appurtenances, including structures and utilities on adjacent properties when such information is reasonably available.
9. Date, north arrow, and adequate scale as approved by the City Engineer on all maps and plans.
10. Identification of and mitigation measures for on-site areas which are subject to severe erosion, and off-site areas which are especially vulnerable to damage from erosion and/or sedimentation.

B. THE PROPOSED WORK SCHEDULE, WHICH DETAILS THE FOLLOWING:

1. Sequence for clearing, grading, filling, drainage alteration, and other land disturbing activities.
2. On-site soil or earth material storage locations and source of import materials, and location of the site where spoils will be disposed.
3. Schedule for installation and removal of all interim erosion and sediment control measures, including vegetative measures.
4. Schedule for construction of final improvements, if any.
5. Schedule for the installation and maintenance of required permanent erosion and sediment control devices.
6. Outline of the methods to be used in clearing vegetation and storing and disposing of the cleared vegetation.

C. AN ACCURATE FINISHED GRADE PLAN OF THE ENTIRE SITE AS IT WOULD APPEAR AFTER THE COMPLETION OF WORK COVERED BY THE PERMIT, WHICH MUST INCLUDE:

1. Finished contours achieved by grading (at the same intervals as the existing contours).
2. Boundaries of all areas to remain undisturbed with identification and the location of all other vegetation shown on the plan that will remain after the completion of all work.
3. Drainage and related facilities to be constructed with and as part of the work.
4. Boundaries of all areas where surface water runoff will be retained, detained, or infiltrated.
5. Method for discharging surface water off-site, including the provisions required to control the velocity and direction of discharge to protect downstream properties.
6. Location of building set-back lines, and approximate limits of cuts and fills, foundations, retaining walls, driveways, etc.
7. Location and dimensions of sensitive areas and any associated buffer zones and other areas to be maintained or established.
8. Location and description of proposed erosion and sedimentation control devices or structures.
9. Off-site grading shall be noted on the plans, and a dated letter of permission from the property owner(s) of the land effected shall be provided and noted on the plans.

V. ADDITIONAL INFORMATION REQUIRED

1. Hydrologic and hydraulic computations.
2. Engineering geology and soils reports.
3. Erosion and Sediment Control Plan.
4. Engineering cost estimate of drainage facilities and erosion control plan.
5. Inspection and maintenance agreement.
6. Letter(s) of permission for off-site work.
7. Copies of other required permit(s):_____
8. Other information:_____
   _____
   _____
9. Security deposit, bond, or other approved method of guaranteeing performance (circle one), in the amount of $_____.
10. Insurance required in the amounts of $_____ per occurrence and $_____ aggregate.

VI. ADDITIONAL CONDITIONS

1. Additional Conditions applicable to this permit listed here and/or attached:

_____
_____
_____
_____
_____

VII. PERMIT APPROVAL

This certifies that the named applicant is granted a Clearing And Grading Permit for the work described and the purpose shown in the application. This permit is granted subject to the terms of the agreement contained in the application, subject to the provisions of the City of Port Angeles Municipal Code and subject to any additional conditions which are attached to this permit or as noted in sections II through VI above and section VIII below. Nothing permitted hereunder shall be deemed to override the provisions of any applicable law of the City, County, State or Federal Government. This permit expires one year from the date of issuance, unless otherwise specified by the City Engineer.

_____ _____

City Engineer Date Dept. of Community & Economic Development Date

VIII. INSPECTIONS AND SIGN-OFFS

Please call 417-4831 to schedule required inspections, no later than noon of the previous business day to schedule an on-site inspection of the permitted activity(ies) checked below.

Required	No.	Description of Activity	Date Inspection Requested	Date Work Completed
	1	Installation of sediment control measures/BMPs prior to land disturbing activity.		
	2	During construction of sediment basins or stormwater management structures.		
	3	During rough grading, including hauling of materials.		
	4	Prior to removal or modification of sediment control measure.		
	5	Notice of completion received from permittee.		
	6	At completion of final grading.		
	7	Final establishment of vegetation/re-vegetation.		
	8	Completion of final erosion control measures.		
	9	As-built grading plan required.		
	10	Soils grading report required.		
	11	Geologic grading report required.		

ENGINEER'S CONSTRUCTION INSPECTION REPORT
FOR
CLEARING, GRADING, FILLING, AND DRAINAGE

TO: CITY ENGINEER **DATE:_____**

Project Name:_____Project Number:_____
Location (address, or other)_____
_____

POND INFORMATION:

1. Type:_____
_____
2. Adequately protected from silting and compaction of infiltration surfaces during construction:_____
3. Outlet Type:_____
4. Outlet works at correct elevation(s), filter fabric installed properly (if needed), etc.:_____
_____
5. Spillway at correct elevation, slope, adequately armored, etc.:_____

CONVEYANCES:

1. Channels properly graded, sloped, planted, etc.:_____
_____
2. Storm drains at proper grade, inlets as designed, trenches as designed, pipe bedding properly prepared, backfilling procedures correct, materials as specified, etc._____
_____
3. Roof leaders and footing drains: Do drains go to infiltration trenches as designed, pipe bedding properly prepared, backfilling procedures correct, materials as specified, etc.:_____
_____

EROSION CONTROL INFORMATION:

1. Erosion facilities in place at the time specified relative to other construction:_____
2. Construction entrance pad in place as specified._____
3. Did facilities keep sediment, mud etc, out of water bodies, wetlands, and from crowding the property boundary?:_____
4. Are permanent erosion control measures in place and as designed:_____

AS-BUILT DRAWINGS ATTACHED:

As a professional engineer licensed by the State of Washington, I have personal knowledge of the construction inspection of the above named project, and I do hereby report that the project was built according to the approved plans and specifications, except as noted above or on the "as-built construction drawings".

_____
Signature, seal and date:_____

Seal

Construction Stormwater Pollution Prevention Plan Checklist

Project Name: _____
City Reference No. _____
Review Date: _____
On-site Inspection Review Date: _____
Construction SWPPP Reviewer: _____

Section I – Construction SWPPP Narrative

1. Construction Stormwater Pollution Prevention Elements

___ a. Describe how each of the Construction Stormwater Pollution Prevention Elements has been addressed though the Construction SWPPP.
___ b. Identify the type and location of BMPs used to satisfy the required element.
___ c. Written justification identifying the reason an element is not applicable to the proposal.

12 Required Elements - Construction Stormwater Pollution Prevention Plan

___ 1. Mark Clearing Limits.
___ 2. Establish Construction Access.
___ 3. Control Flow Rates.
___ 4. Install Sediment Controls.
___ 5. Stabilize Soils.
___ 6. Protect Slopes.
___ 7. Protect Drain Inlets.
___ 8. Stabilize Channels and Outlets.
___ 9. Control Pollutants.
___ 10. Control De-Watering.
___ 11. Maintain BMPs
___ 12. Manage the Project.

2. Project Description

___ a. Total project area.
___ b. Total proposed impervious area.
___ c. Total proposed area to be disturbed, including off-site borrow and fill areas.
___ d. Total volumes of proposed cut and fill.

3. Existing Site Conditions

___ a. Description of the existing topography.
___ b. Description of the existing vegetation.
___ c. Description of the existing drainage.

Construction Stormwater Pollution Prevention Plan Checklist

Project Name: _____
City Reference No. _____

4. Adjacent Areas

___ I. Description of adjacent areas which may be affected by site disturbance

___ a. Streams
___ b. Lakes
___ c. Wetlands
___ d. Residential Areas
___ e. Roads
___ f. Other

___ II. Description of the downstream drainage path leading from the site to the receiving body of water. (Minimum distance of 400 yards.)

5. Critical Areas

___ a. Description of critical areas that are on or adjacent to the site.
___ b. Description of special requirements for working in or near critical areas.

6. Soils

___ Description of on-site soils.
___ a. Soil name(s)
___ b. Soil mapping unit
___ c. Erodibility
___ d. Settleability
___ e. Permeability
___ f. Depth
___ g. Texture
___ h. Soil Structure

7. Erosion Problem Areas

___ Description of potential erosion problems on site.

8. Construction Phasing

___ a. Construction sequence
___ b. Construction phasing (if proposed)

Construction Stormwater Pollution Prevention Plan Checklist

Project Name: _____
City Reference No. _____

9. Construction Schedule

___ I. Provide a proposed construction schedule.

___ II. Wet Season Construction Activities
- ___ a. Proposed wet season construction activities.
- ___ b. Proposed wet season construction restraints for environmentally sensitive/critical areas.

10. Financial/Ownership Responsibilities

___ a. Identify the property owner responsible for the initiation of bonds and/or other financial securities.

___ b. Describe bonds and/or other evidence of financial responsibility for liability associated with erosion and sedimentation impacts.

11. Engineering Calculations

___ 1. Provide Design Calculations.
- ___ a. Sediment Ponds/Traps
- ___ b. Diversions
- ___ c. Waterways
- ___ d. Runoff/Stormwater Detention Calculations

Construction Stormwater Pollution Prevention Plan Checklist

Project Name: _____
City Reference No. _____

Section II - Erosion and Sediment Control Plans

1. General

___ a. Vicinity Map
___ b. City of _____ Clearing and Grading Approval Block
___ c. Erosion and Sediment Control Notes

2. Site Plan

___ a. Legal description of subject property.
___ b. North Arrow
___ c. Indicate boundaries of existing vegetation, e.g. tree lines, pasture areas, etc.
___ d. Identify and label areas of potential erosion problems.
___ e. Identify any on-site or adjacent surface waters, critical areas and associated buffers.
___ f. Identify FEMA base flood boundaries and Shoreline Management boundaries (if applicable)
___ g. Show existing and proposed contours.
___ h. Indicate drainage basins and direction of flow for individual drainage areas.
___ i. Label final grade contours and identify developed condition drainage basins.
___ j. Delineate areas that are to be cleared and graded.
___ k. Show all cut and fill slopes indicating top and bottom of slope catch lines.

3. Conveyance Systems

___ a. Designate locations for swales, interceptor trenches, or ditches.
___ b. Show all temporary and permanent drainage pipes, ditches, or cut-off trenches required for erosion and sediment control.
___ c. Provide minimum slope and cover for all temporary pipes or call out pipe inverts.
___ d. Show grades, dimensions, and direction of flow in all ditches, swales, culverts and pipes.
___ e. Provide details for bypassing off-site runoff around disturbed areas.
___ f. Indicate locations and outlets of any dewatering systems.

4. Location of Detention BMPs

___ a. Identify location of detention BMPs.

Construction Stormwater Pollution Prevention Plan Checklist

Project Name: _____
City Reference No. _____

5. Erosion and Sediment Control Facilities

___ a. Show the locations of sediment trap(s), pond(s), pipes and structures.
___ b. Dimension pond berm widths and inside and outside pond slopes.
___ c. Indicate the trap/pond storage required and the depth, length, and width dimensions.
___ d. Provide typical section views through pond and outlet structure.
___ e. Provide typical details of gravel cone and standpipe, and/or other filtering devices.
___ f. Detail stabilization techniques for outlet/inlet.
___ g. Detail control/restrictor device location and details.
___ h. Specify mulch and/or recommended cover of berms and slopes.
___ i. Provide rock specifications and detail for rock check dam(s), if applicable.
___ j. Specify spacing for rock check dams as required.
___ k. Provide front and side sections of typical rock check dams.
___ l. Indicate the locations and provide details and specifications for silt fabric.
___ m. Locate the construction entrance and provide a detail.

6. Detailed Drawings

___ a. Any structural practices used that are not referenced in the Ecology Manual should be explained and illustrated with detailed drawings.

7. Other Pollutant BMPs

___ a. Indicate on the site plan the location of BMPs to be used for the control of pollutants other than sediment, e.g. concrete wash water.

8. Monitoring Locations

___ a. Indicate on the site plan the water quality sampling locations to be used for monitoring water quality on the construction site, if applicable.

Appendix E – Requirements for Each SWPPP Element

1. Preserve Vegetation/Mark Clearing Limits:

    a. Prior to beginning land disturbing activities, including clearing and grading, clearly mark all clearing limits, sensitive areas and their buffers, and trees that are to be preserved within the construction area.

    b. The duff layer, native top soil, and natural vegetation shall be retained in an undisturbed state to the maximum degree practicable.

2. Establish Construction Access:

    a. Construction vehicle access and exit shall be limited to one route, if possible.

    b. Access points shall be stabilized with quarry spalls, crushed rock or other equivalent BMP to minimize the tracking of sediment onto public roads.

    c. Wheel wash or tire baths shall be located on site, if the stabilized constructions entrance is not effective in preventing sediment from being tracked onto public roads.

    d. If sediment is tracked off site, roads shall be cleaned thoroughly at the end of each day, or more frequently during wet weather. Sediment shall be removed from roads by shoveling or pickup sweeping and shall be transported to a controlled sediment disposal area.

    e. Street washing is allowed only after sediment is removed in accordance with 2.d, above. Street wash wastewater shall be controlled by pumping back on site or otherwise be prevented from discharging into systems tributary to waters of the state.

3. Control Flow Rates:

    a. Properties and waterways downstream from development sites shall be protected from erosion due to increases in the velocity and peak volumetric flow rate of stormwater runoff from the project site.

    b. Where necessary to comply with 3.a, above, stormwater retention or detention facilities shall be constructed as one of the first steps in grading. Detention facilities shall be functional prior to construction of site improvements (e.g., impervious surfaces).

c. If permanent infiltration ponds are used for flow control during construction, these facilities should be protected from siltation during the construction phase.

4. Install Sediment Controls:

a. Stormwater runoff from disturbed areas shall pass through a sediment pond, or other appropriate sediment removal BMP, prior to leaving a construction site or prior to discharge to an infiltratibn facility. Runoff from fully stabilized areas may be discharged without a sediment removal BMP, but shall meet the flow control performance standard of 3.a, above.

b. Sediment control BMPs (sediment ponds, traps, filters, etc.) shall be constructed as one of the first steps in grading. These BMPs shall be functional before other land disturbing activities take place.

c. BMPs intended to trap sediment on site shall be located in a manner to avoid interference with the movement of juvenile salmonids attempting to enter off-channel areas or drainages.

5. Stabilize Soils:

a. Exposed and unworked soils shall be stabilized by application of effective BMPs that prevent erosion.

b. No soils should remain exposed and unworked for more than the time periods set forth below to prevent erosion:

c. During the dry season (May 1 — September 30): 7 days

d. During the wet season (October 1 — April 30): 2 days

e. The time period may be adjusted by the Permittee, if the Permittee can show that local precipitation data justify a different standard.

f. Soils shall be stabilized at the end of the shift before a holiday or weekend if needed based on the weather forecast.

g. Soil stockpiles must be stabilized from erosion, protected with sediment trapping measures, and where possible, be located away from storm drain inlets, waterways and drainage channels.

6. Protect Slopes:

a. Design and construct cut and fill slopes in a manner that will minimize erosion.

b. Off-site stormwater (run-on) or groundwater shall be diverted away from slopes and undisturbed areas with interceptor dikes, pipes and/or swales. Off-site stormwater should be managed separately from stormwater generated on the site.

c. At the top of slopes, collect drainage in pipe slope drains or protected channels to prevent erosion. Temporary pipe slope drains shall handle the expected peak 10-minute flow velocity from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis shall use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis shall use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western Washington Hydrology Model to predict flows, bare soil areas should be modeled as "landscaped area."

d. Excavated material shall be placed on the uphill side of trenches, consistent with safety and space considerations.

e. Check dams shall be placed at regular intervals within constructed channels that are cut down a slope.

7. Protect Drain Inlets:

a. Storm drain inlets made operable during construction shall be protected so that stormwater runoff does not enter the conveyance system without first being filtered or treated to remove sediment.

b. Inlet protection devices shall be cleaned or removed and replaced when sediment has filled one-third of the available storage (unless a different standard is specified by the product manufacturer).

8. Stabilize Channels and Outlets:

a. All temporary on-site conveyance channels shall be designed, constructed, and stabilized to prevent erosion from the following expected peak flows. Channels shall handle the expected peak 10-minute flow velocity from a Type 1A, 10-year, 24-hour frequency storm for the developed condition. Alternatively, the 10-year, 1-hour flow rate predicted by an approved continuous runoff model, increased by a factor of 1.6, may be used. The hydrologic analysis shall use the existing land cover condition for predicting flow rates from tributary areas outside the project limits. For tributary areas on the project site, the analysis shall use the temporary or permanent project land cover condition, whichever will produce the highest flow rates. If using the Western

Washington Hydrology Model to predict flows, bare soil areas should be modeled as "landscaped area."

b. Stabilization, including armoring material, adequate to prevent erosion of outlets, adjacent stream banks, slopes, and downstream reaches shall be provided at the outlets of all conveyance systems.

9. Control Pollutants:

a. All pollutants, including waste materials and demolition debris, that occur onsite shall be handled and disposed of in a manner that does not cause contamination of stormwater.

b. Cover, containment, and protection from vandalism shall be provided for all chemicals, liquid products, petroleum products, and other materials that have the potential to pose a threat to human health or the environment. On-site fueling tanks shall include secondary containment.

c. Maintenance, fueling and repair of heavy equipment and vehicles shall be conducted using spill prevention and control measures. Contaminated surfaces shall be cleaned immediately following any spill incident.

d. Wheel wash or tire bath wastewater shall be discharged to a separate on-site treatment system or to the sanitary sewer with local sewer district approval.

e. Application of fertilizers and pesticides shall be conducted in a manner and at application rates that will not result in loss of chemical to stormwater runoff. Manufacturers' label requirements for application rates and procedures shall be followed.

f. BMPs shall be used to prevent or treat contamination of stormwater runoff by pH modifying sources. These sources include, but are not limited to: bulk cement, cement kiln dust, fly ash, new concrete washing and curing waters, waste streams generated from concrete grinding and sawing, exposed aggregate processes, dewatering concrete vaults, concrete pumping and mixer washout waters. Permittees shall require construction site operators to adjust the pH of stormwater if necessary to prevent violations of water quality standards.

g. Construction site operators must obtain written approval from the Department of Ecology prior to using chemical treatment other than CO_2 or dry ice to adjust pH.

10. Control De-Watering:

a. Foundation, vault, and trench de-watering water, which have similar characteristics to stormwater runoff at the site, shall be discharged into a controlled conveyance system prior to discharge to a sediment trap or sediment pond.

b. Clean, non-turbid de-watering water, such as well-point ground water, can be discharged to systems tributary to, or directly into surface waters of the state, as specified in 8, above, provided the de-watering flow does not cause erosion or flooding of receiving waters. Clean de-watering water should not be routed through stormwater sediment ponds.

c. Other de-watering disposal options may include: (i) infiltration; (ii) transport offsite in vehicle, such as a vacuum flush truck, for legal disposal in a manner that does not pollute state waters; (iii) on-site chemical treatment or other suitable treatment technologies approved by the City; (iv) sanitary sewer discharge with local sewer district approval, if there is no other option; or (v) use of a sedimentation bag with outfall to a ditch or swale for small volumes of localized de-watering.

d. Highly turbid or contaminated dewatering water shall be handled separately from stormwater.

11. Maintain BMPs:

a. All temporary and permanent erosion and sediment control BMPs shall be inspected, maintained and repaired as needed to assure continued performance of their intended function in accordance with BMP specifications.

b. All temporary erosion and sediment control BMPs shall be removed within 30 days after final site stabilization is achieved or after the temporary BMPs are no longer needed.

12. Manage the Project:

a. Development projects shall be phased to the maximum degree practicable and shall take into account seasonal work limitations.

b. The Permittee must require construction site operators to maintain, and repair as needed, all sediment and erosion control BMPs to assure continued performance of their intended function.

c. Construction site operators must periodically inspect their sites. Site inspections shall be conducted by a Certified Erosion and Sediment Control Lead who shall be identified in the SWPPP and shall be present on-site or on-call at all times.

d. Construction site operators must maintain, update and implement their SWPPP. SWPPPs must be modified whenever there is a change in design, construction, operation, or maintenance at the construction site that has, or could have, a significant effect on the discharge of pollutants to waters of the state.

BMP C105: Stabilized Construction Entrance

Purpose

Construction entrances are stabilized to reduce the amount of sediment transported onto paved roads by vehicles or equipment by constructing a stabilized pad of quarry spalls at entrances to construction sites.

Conditions of Use

Construction entrances shall be stabilized wherever traffic will be leaving a construction site and traveling on paved roads or other paved areas within 1,000 feet of the site.

On large commercial, highway, and road projects, the designer should include enough extra materials in the contract to allow for additional stabilized entrances not shown in the initial Construction SWPPP. It is difficult to determine exactly where access to these projects will take place; additional materials will enable the contractor to install them where needed.

Design and Installation Specifications

- See Figure 4.2 for details. Note: the 100' minimum length of the entrance shall be reduced to the maximum practicable size when the size or configuration of the site does not allow the full length (100').
- A separation geotextile shall be placed under the spalls to prevent fine sediment from pumping up into the rock pad. The geotextile shall meet the following standards:

Grab Tensile Strength (ASTM D4751)	200 psi min.
Grab Tensile Elongation (ASTM D4632)	30% max.
Mullen Burst Strength (ASTM D3786-80a)	400 psi min.
AOS (ASTM D4751)	20-45 (U.S. standard sieve size)

- Consider early installation of the first lift of asphalt in areas that will paved; this can be used as a stabilized entrance. Also consider the installation of excess concrete as a stabilized entrance. During large concrete pours, excess concrete is often available for this purpose.
- Hog fuel (wood-based mulch) may be substituted for or combined with quarry spalls in areas that will not be used for permanent roads. Hog fuel is generally less effective at stabilizing construction entrances and should be used only at sites where the amount of traffic is very limited. Hog fuel is not recommended for entrance stabilization in urban areas. The effectiveness of hog fuel is highly variable and it generally requires more maintenance than quarry spalls. The inspector may at any time require the use of quarry spalls if the hog fuel is not preventing sediment from being tracked onto pavement or if the hog fuel is being carried onto pavement. Hog fuel is prohibited in permanent roadbeds because organics in the subgrade soils cause degradation of the subgrade support over time.
- Fencing (see BMPs C103 and C104) shall be installed as necessary to restrict traffic to the construction entrance.

- Whenever possible, the entrance shall be constructed on a firm, compacted subgrade. This can substantially increase the effectiveness of the pad and reduce the need for maintenance.

Maintenance Standards

- Quarry spalls (or hog fuel) shall be added if the pad is no longer in accordance with the specifications.
- If the entrance is not preventing sediment from being tracked onto pavement, then alternative measures to keep the streets free of sediment shall be used. This may include street sweeping, an increase in the dimensions of the entrance, or the installation of a wheel wash.
- Any sediment that is tracked onto pavement shall be removed by shoveling or street sweeping. The sediment collected by sweeping shall be removed or stabilized on site. The pavement shall not be cleaned by washing down the street, except when sweeping is ineffective and there is a threat to public safety. If it is necessary to wash the streets, the construction of a small sump shall be considered. The sediment would then be washed into the sump where it can be controlled.
- Any quarry spalls that are loosened from the pad, which end up on the roadway shall be removed immediately.
- If vehicles are entering or exiting the site at points other than the construction entrance(s), fencing (see BMPs C103 and C104) shall be installed to control traffic.
- Upon project completion and site stabilization, all construction accesses intended as permanent access for maintenance shall be permanently stabilized.

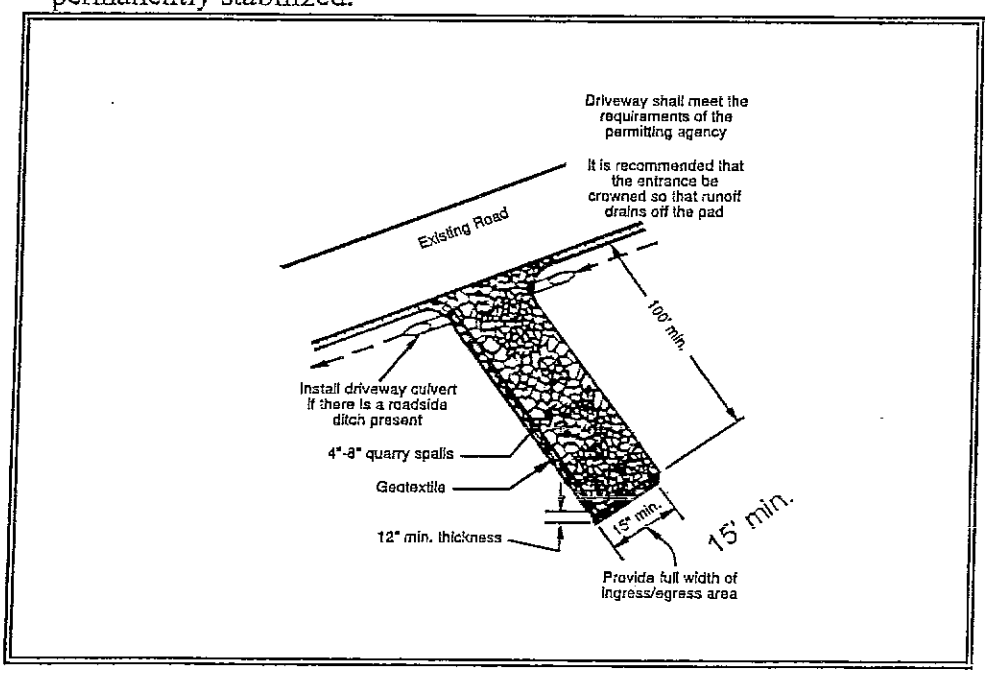


Figure 4.2 – Stabilized Construction Entrance

BMP C121: Mulching

Purpose

The purpose of mulching soils is to provide immediate temporary protection from erosion. Mulch also enhances plant establishment by conserving moisture, holding fertilizer, seed, and topsoil in place, and moderating soil temperatures. There is an enormous variety of mulches that can be used. Only the most common types are discussed in this section.

Conditions of Use

As a temporary cover measure, mulch should be used:

- On disturbed areas that require cover measures for less than 30 days.
- As a cover for seed during the wet season and during the hot summer months.
- During the wet season on slopes steeper than 3H:1V with more than 10 feet of vertical relief.
- Mulch may be applied at any time of the year and must be refreshed periodically.

Design and Installation Specifications

For mulch materials, application rates, and specifications, see Table 4.7. Note: Thicknesses may be increased for disturbed areas in or near sensitive areas or other areas highly susceptible to erosion.

Mulch used within the ordinary high-water mark of surface waters should be selected to minimize potential flotation of organic matter. Composted organic materials have higher specific gravities (densities) than straw, wood, or chipped material.

Maintenance Standards

- The thickness of the cover must be maintained.
- Any areas that experience erosion shall be remulched and/or protected with a net or blanket. If the erosion problem is drainage related, then the problem shall be fixed and the eroded area remulched.

Table 4.7 Mulch Standards and Guidelines			
Mulch Material	**Quality Standards**	**Application Rates**	**Remarks**
Straw	Air-dried; free from undesirable seed and coarse material.	2"-3" thick; 5 bales per 1000 sf or 2-3 tons per acre	Cost-effective protection when applied with adequate thickness. Hand-application generally requires greater thickness than blown straw. The thickness of straw may be reduced by half when used in conjunction with seeding. In windy areas straw must be held in place by crimping, using a tackifier, or covering with netting. Blown straw always has to be held in place with a tackifier as even light winds will blow it away. Straw, however, has several deficiencies that should be considered when selecting mulch materials. It often introduces and/or encourages the propagation of weed species and it has no significant long-term benefits. Straw should be used only if mulches with long-term benefits are unavailable locally. It should also not be used within the ordinary high-water elevation of surface waters (due to flotation).
Hydromulch	No growth inhibiting factors.	Approx. 25-30 lbs per 1000 sf or 1500 - 2000 lbs per acre	Shall be applied with hydromulcher. Shall not be used without seed and tackifier unless the application rate is at least doubled. Fibers longer than about ¾-1 inch clog hydromulch equipment. Fibers should be kept to less than ¾ inch.
Composted Mulch and Compost	No visible water or dust during handling. Must be purchased from supplier with Solid Waste Handling Permit (unless exempt).	2" thick min.; approx. 100 tons per acre (approx. 800 lbs per yard)	More effective control can be obtained by increasing thickness to 3". Excellent mulch for protecting final grades until landscaping because it can be directly seeded or tilled into soil as an amendment. Composted mulch has a coarser size gradation than compost. It is more stable and practical to use in wet areas and during rainy weather conditions.
Chipped Site Vegetation	Average size shall be several inches. Gradations from fines to 6 inches in length for texture, variation, and interlocking properties.	2" minimum thickness	This is a cost-effective way to dispose of debris from clearing and grubbing, and it eliminates the problems associated with burning. Generally, it should not be used on slopes above approx. 10% because of its tendency to be transported by runoff. It is not recommended within 200 feet of surface waters. If seeding is expected shortly after mulch, the decomposition of the chipped vegetation may tie up nutrients important to grass establishment.
Wood-based Mulch	No visible water or dust during handling. Must be purchased from a supplier with a Solid Waste Handling Permit or one exempt from solid waste regulations.	2" thick; approx. 100 tons per acre (approx. 800 lbs. per cubic yard)	This material is often called "hog or hogged fuel." It is usable as a material for Stabilized Construction Entrances (BMP C105) and as a mulch. The use of mulch ultimately improves the organic matter in the soil. Special caution is advised regarding the source and composition of wood-based mulches. Its preparation typically does not provide any weed seed control, so evidence of residual vegetation in its composition or known inclusion of weed plants or seeds should be monitored and prevented (or minimized).

BMP C130: Surface Roughening

Purpose

Surface roughening aids in the establishment of vegetative cover, reduces runoff velocity, increases infiltration, and provides for sediment trapping through the provision of a rough soil surface. Horizontal depressions are created by operating a tiller or other suitable equipment on the contour or by leaving slopes in a roughened condition by not fine grading them.

Conditions for Use

- All slopes steeper than 3:1 and greater than 5 vertical feet require surface roughening.
- Areas with grades steeper than 3:1 should be roughened to a depth of 2 to 4 inches prior to seeding.
- Areas that will not be stabilized immediately may be roughened to reduce runoff velocity until seeding takes place.
- Slopes with a stable rock face do not require roughening.
- Slopes where mowing is planned should not be excessively roughened.

Design and Installation Specifications

There are different methods for achieving a roughened soil surface on a slope, and the selection of an appropriate method depends upon the type of slope. Roughening methods include stair-step grading, grooving, contour furrows, and tracking. See Figure 4.6 for tracking and contour furrows. Factors to be considered in choosing a method are slope steepness, mowing requirements, and whether the slope is formed by cutting or filling.

- Disturbed areas that will not require mowing may be stair-step graded, grooved, or left rough after filling.
- Stair-step grading is particularly appropriate in soils containing large amounts of soft rock. Each "step" catches material that sloughs from above, and provides a level site where vegetation can become established. Stairs should be wide enough to work with standard earth moving equipment. Stair steps must be on contour or gullies will form on the slope.
- Areas that will be mowed (these areas should have slopes less steep than 3:1) may have small furrows left by disking, harrowing, raking, or seed-planting machinery operated on the contour.
- Graded areas with slopes greater than 3:1 but less than 2:1 should be roughened before seeding. This can be accomplished in a variety of ways, including "track walking," or driving a crawler tractor up and down the slope, leaving a pattern of cleat imprints parallel to slope contours.
- Tracking is done by operating equipment up and down the slope to leave horizontal depressions in the soil.

Maintenance Standards

- Areas that are graded in this manner should be seeded as quickly as possible.
- Regular inspections should be made of the area. If rills appear, they should be re-graded and re-seeded immediately.

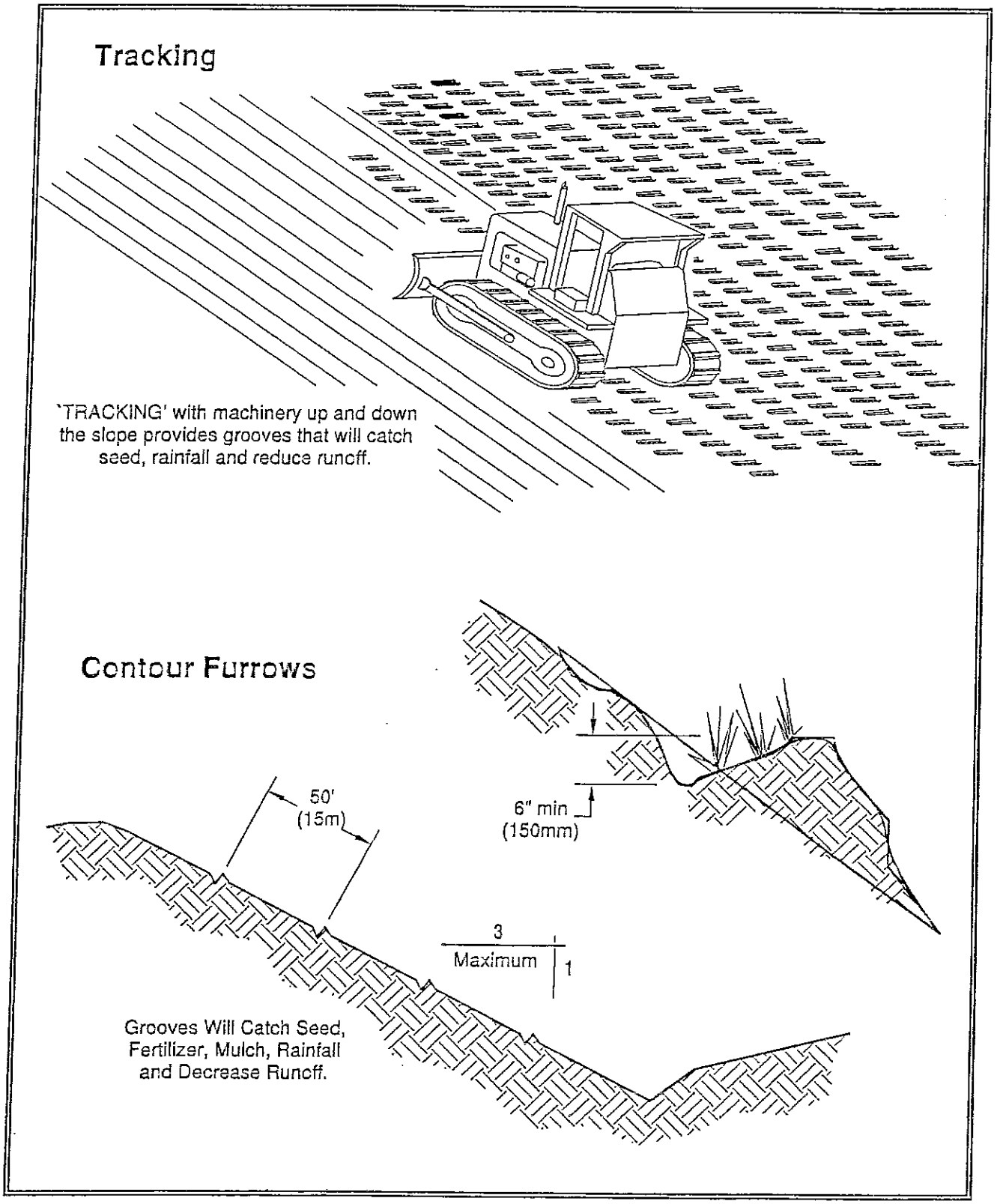


Figure 4.6 – Surface Roughening by Tracking and Contour Furrows

BMP C202: Channel Lining

Purpose

To protect erodible channels by providing a channel liner using either blankets or riprap.

Conditions of Use

When natural soils or vegetated stabilized soils in a channel are not adequat to prevent channel erosion.

- When a permanent ditch or pipe system is to be installed and a temporary measure is needed.
- In almost all cases, synthetic and organic coconut blankets are more effective than riprap for protecting channels from erosion. Blankets can be used with and without vegetation. Blanketed channels can be designed to handle any expected flow and longevity requirement. Some synthetic blankets have a predicted life span of 50 years or more, even in sunlight.
- Other reasons why blankets are better than rock include the availability of blankets over rock. In many areas of the state, rock is not easily obtainable or is very expensive to haul to a site. Blankets can be delivered anywhere. Rock requires the use of dump trucks to haul and heavy equipment to place. Blankets usually only require laborers with hand tools, and sometimes a backhoe.
- The Federal Highway Administration recommends not using flexible liners whenever the slope exceeds 10 percent or the shear stress exceeds 8 lbs/ft^2.

Design and Installation Specifications

See BMP C122 for information on blankets.

Since riprap is used where erosion potential is high, construction must be sequenced so that the riprap is put in place with the minimum possible delay.

- Disturbance of areas where riprap is to be placed should be undertaken only when final preparation and placement of the riprap can follow immediately behind the initial disturbance. Where riprap is used for outlet protection, the riprap should be placed before or in conjunction with the construction of the pipe or channel so that it is in place when the pipe or channel begins to operate.
- The designer, after determining the riprap size that will be stable under the flow conditions, shall consider that size to be a minimum size and then, based on riprap gradations actually available in the area, select the size or sizes that equal or exceed the minimum size. The possibility of drainage structure damage by children shall be considered in selecting a riprap size, especially if there is nearby water or a gully in which to toss the stones.
- Stone for riprap shall consist of field stone or quarry stone of approximately rectangular shape. The stone shall be hard and angular and of such quality that it will not disintegrate on exposure to water or

weathering and it shall be suitable in all respects for the purpose intended.

- Rubble concrete may be used provided it has a density of at least 150 pounds per cubic foot, and otherwise meets the requirement of this standard and specification.
- A lining of engineering filter fabric (geotextile) shall be placed between the riprap and the underlying soil surface to prevent soil movement into or through the riprap. The geotextile should be keyed in at the top of the bank.
- Filter fabric shall not be used on slopes greater than 1-1/2:1 as slippage may occur. It should be used in conjunction with a layer of coarse aggregate (granular filter blanket) when the riprap to be placed is 12 inches and larger.

BMP C207: Check Dams

Purpose

Construction of small dams across a swale or ditch reduces the velocity of concentrated flow and dissipates energy at the check dam.

Conditions of Use

Where temporary channels or permanent channels are not yet vegetated, channel lining is infeasible, and velocity checks are required.

- Check dams may not be placed in streams unless approved by the State Department of Fish and Wildlife. Check dams may not be placed in wetlands without approval from a permitting agency.
- Check dams shall not be placed below the expected backwater from any salmonid bearing water between October 1 and May 31 to ensure that there is no loss of high flow refuge habitat for overwintering juvenile salmonids and emergent salmonid fry.

Design and Installation Specifications

Whatever material is used, the dam should form a triangle when viewed from the side. This prevents undercutting as water flows over the face of the dam rather than falling directly onto the ditch bottom.

Check dams in association with sumps work more effectively at slowing flow and retaining sediment than just a check dam alone. A deep sump should be provided immediately upstream of the check dam.

- In some cases, if carefully located and designed, check dams can remain as permanent installations with very minor regrading. They may be left as either spillways, in which case accumulated sediment would be graded and seeded, or as check dams to prevent further sediment from leaving the site.
- Check dams can be constructed of either rock or pea-gravel filled bags. Numerous new products are also available for this purpose. They tend to be re-usable, quick and easy to install, effective, and cost efficient.
- Check dams should be placed perpendicular to the flow of water.
- The maximum spacing between the dams shall be such that the toe of the upstream dam is at the same elevation as the top of the downstream dam.
- Keep the maximum height at 2 feet at the center of the dam.
- Keep the center of the check dam at least 12 inches lower than the outer edges at natural ground elevation.
- Keep the side slopes of the check dam at 2:1 or flatter.
- Key the stone into the ditch banks and extend it beyond the abutments a minimum of 18 inches to avoid washouts from overflow around the dam.

- Use filter fabric foundation under a rock or sand bag check dam. If a blanket ditch liner is used, this is not necessary. A piece of organic or synthetic blanket cut to fit will also work for this purpose.
- Rock check dams shall be constructed of appropriately sized rock. The rock must be placed by hand or by mechanical means (no dumping of rock to form dam) to achieve complete coverage of the ditch or swale and to ensure that the center of the dam is lower than the edges. The rock used must be large enough to stay in place given the expected design flow through the channel.
- In the case of grass-lined ditches and swales, all check dams and accumulated sediment shall be removed when the grass has matured sufficiently to protect the ditch or swale - unless the slope of the swale is greater than 4 percent. The area beneath the check dams shall be seeded and mulched immediately after dam removal.
- Ensure that channel appurtenances, such as culvert entrances below check dams, are not subject to damage or blockage from displaced stones. Figure 4.13 depicts a typical rock check dam.

Maintenance Standards

Check dams shall be monitored for performance and sediment accumulation during and after each runoff producing rainfall. Sediment shall be removed when it reaches one half the sump depth.

- Anticipate submergence and deposition above the check dam and erosion from high flows around the edges of the dam.
- If significant erosion occurs between dams, install a protective riprap liner in that portion of the channel.

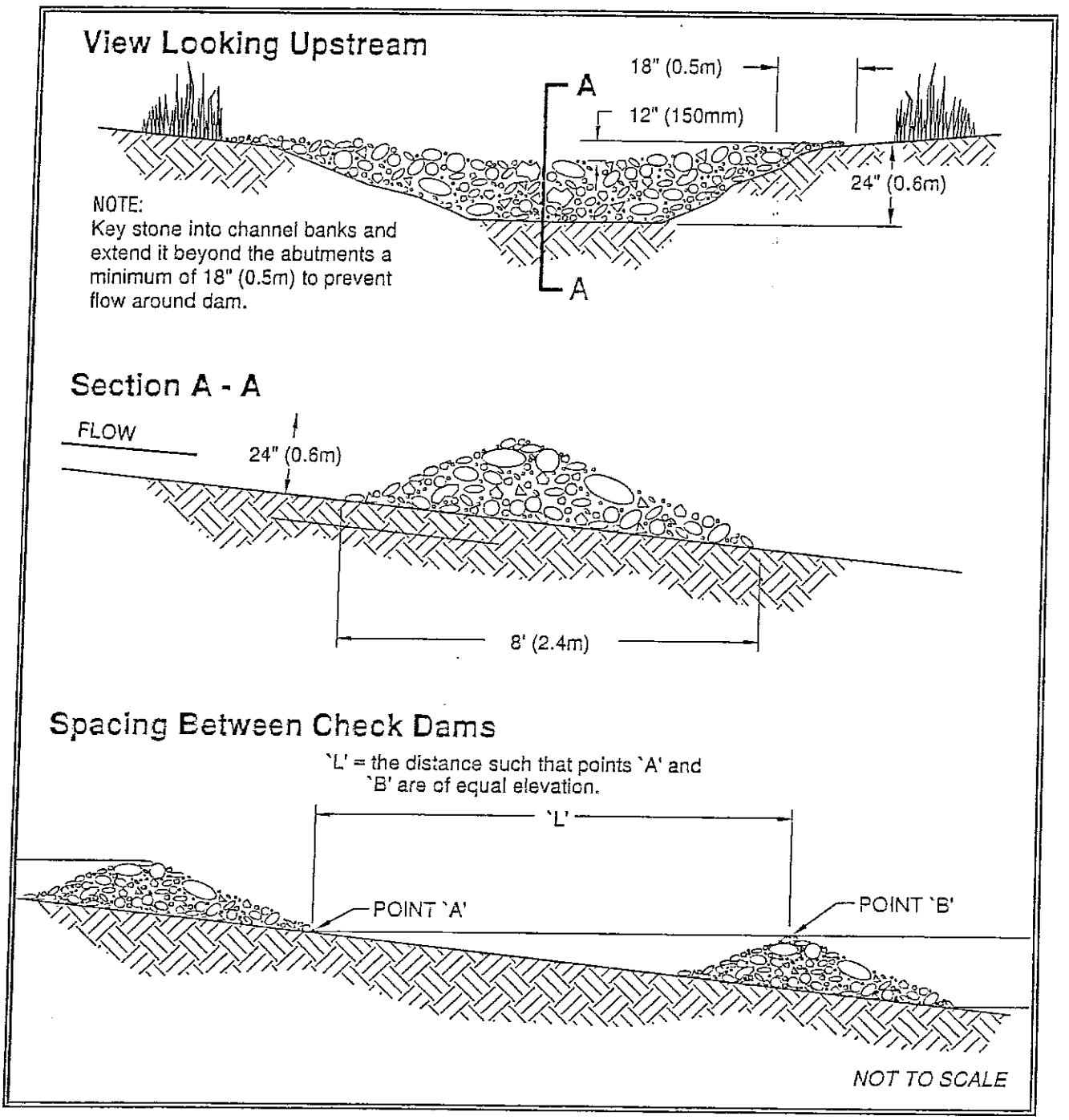


Figure 4.13 – Check Dams

BMP C220: Storm Drain Inlet Protection

Purpose To prevent coarse sediment from entering drainage systems prior to permanent stabilization of the disturbed area.

Conditions of Use Where storm drain inlets are to be made operational before permanent stabilization of the disturbed drainage area. Protection should be provided for all storm drain inlets downslope and within 500 feet of a disturbed or construction area, unless the runoff that enters the catch basin will be conveyed to a sediment pond or trap. Inlet protection may be used anywhere to protect the drainage system. It is likely that the drainage system will still require cleaning.

Table 4.9 lists several options for inlet protection. All of the methods for storm drain inlet protection are prone to plugging and require a high frequency of maintenance. Drainage areas should be limited to 1 acre or less. Emergency overflows may be required where stormwater ponding would cause a hazard. If an emergency overflow is provided, additional end-of-pipe treatment may be required.

Table 4.9
Storm Drain Inlet Protetion

Type of Inlet Protection	Emergency Overflow	Applicable for Paved/ Earthen Surfaces	Conditions of Use
Drop Inlet Protection			
Excavated drop inlet protection	Yes, temporary flooding will occur	Earthen	Applicable for heavy flows. Easy to maintain. Large area Requirement: 30' X 30'/acre
Block and gravel drop inlet protection	Yes	Paved or Earthen	Applicable for heavy concentrated flows. Will not pond.
Gravel and wire drop inlet protection	No		Applicable for heavy concentrated flows. Will pond. Can withstand traffic.
Catch basin filters	Yes	Paved or Earthen	Frequent maintenance required.
Curb Inlet Protection			
Curb inlet protection with a wooden weir	Small capacity overflow	Paved	Used for sturdy, more compact installation.
Block and gravel curb inlet protection	Yes	Paved	Sturdy, but limited filtration.
Culvert Inlet Protection			
Culvert inlet sediment trap			18 month expected life.

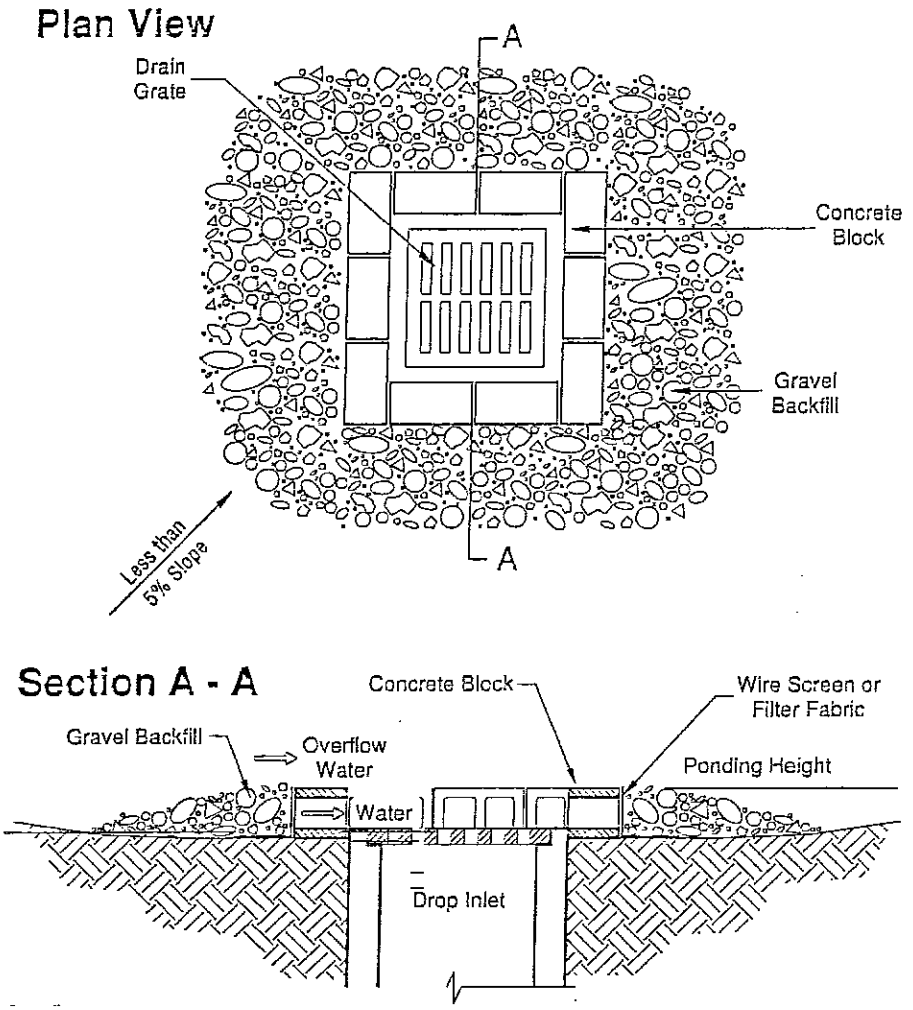
Design and Installation Specifications

Excavated Drop Inlet Protection - An excavated impoundment around the storm drain. Sediment settles out of the stormwater prior to entering the storm drain.

- Depth 1-2 ft as measured from the crest of the inlet structure.
- Side Slopes of excavation no steeper than 2:1.
- Minimum volume of excavation 35 cubic yards.
- Shape basin to fit site with longest dimension oriented toward the longest inflow area.
- Install provisions for draining to prevent standing water problems.
- Clear the area of all debris.
- Grade the approach to the inlet uniformly.
- Drill weep holes into the side of the inlet.
- Protect weep holes with screen wire and washed aggregate.
- Seal weep holes when removing structure and stabilizing area.
- It may be necessary to build a temporary dike to the down slope side of the structure to prevent bypass flow.

Block and Gravel Filter - A barrier formed around the storm drain inlet with standard concrete blocks and gravel. See Figure 4.14.

- Height 1 to 2 feet above inlet.
- Recess the first row 2 inches into the ground for stability.
- Support subsequent courses by placing a 2x4 through the block opening.
- Do not use mortar.
- Lay some blocks in the bottom row on their side for dewatering the pool.
- Place hardware cloth or comparable wire mesh with ½-inch openings over all block openings.
- Place gravel just below the top of blocks on slopes of 2:1 or flatter.
- An alternative design is a gravel donut.
- Inlet slope of 3:1.
- Outlet slope of 2:1.
- 1-foot wide level stone area between the structure and the inlet.
- Inlet slope stones 3 inches in diameter or larger.
- Outlet slope use gravel ½- to ¾-inch at a minimum thickness of 1-foot.



Notes:
1. Drop inlet sediment barriers are to be used for small, nearly level drainage areas. (less than 5%)
2. Excavate a basin of sufficient size adjacent to the drop inlet.
3. The top of the structure (ponding height) must be well below the ground elevation downslope to prevent runoff from bypassing the inlet. A temporary dike may be necessary on the dowslope side of the structure.

Figure 4.14 – Block and Gravel Filter

Gravel and Wire Mesh Filter - A gravel barrier placed over the top of the inlet. This structure does not provide an overflow.

- Hardware cloth or comparable wire mesh with ½-inch openings.
- Coarse aggregate.
- Height 1-foot or more, 18 inches wider than inlet on all sides.
- Place wire mesh over the drop inlet so that the wire extends a minimum of 1-foot beyond each side of the inlet structure.
- If more than one strip of mesh is necessary, overlap the strips.
- Place coarse aggregate over the wire mesh.
- The depth of the gravel should be at least 12 inches over the entire inlet opening and extend at least 18 inches on all sides.

Catchbasin Filters - Inserts should be designed by the manufacturer for use at construction sites. The limited sediment storage capacity increases the amount of inspection and maintenance required, which may be daily for heavy sediment loads. The maintenance requirements can be reduced by combining a catchbasin filter with another type of inlet protection. This type of inlet protection provides flow bypass without overflow and therefore may be a better method for inlets located along active rights-of-way.

- 5 cubic feet of storage.
- Dewatering provisions.
- High-flow bypass that will not clog under normal use at a construction site.
- The catchbasin filter is inserted in the catchbasin just below the grating.

Curb Inlet Protection with Wooden Weir – Barrier formed around a curb inlet with a wooden frame and gravel.

- Wire mesh with ½-inch openings.
- Extra strength filter cloth.
- Construct a frame.
- Attach the wire and filter fabric to the frame.
- Pile coarse washed aggregate against wire/fabric.
- Place weight on frame anchors.

Block and Gravel Curb Inlet Protection – Barrier formed around an inlet with concrete blocks and gravel. See Figure 4.14.

- Wire mesh with ½-inch openings.
- Place two concrete blocks on their sides abutting the curb at either side of the inlet opening. These are spacer blocks.
- Place a 2x4 stud through the outer holes of each spacer block to align the front blocks.
- Place blocks on their sides across the front of the inlet and abutting the spacer blocks.
- Place wire mesh over the outside vertical face.
- Pile coarse aggregate against the wire to the top of the barrier.

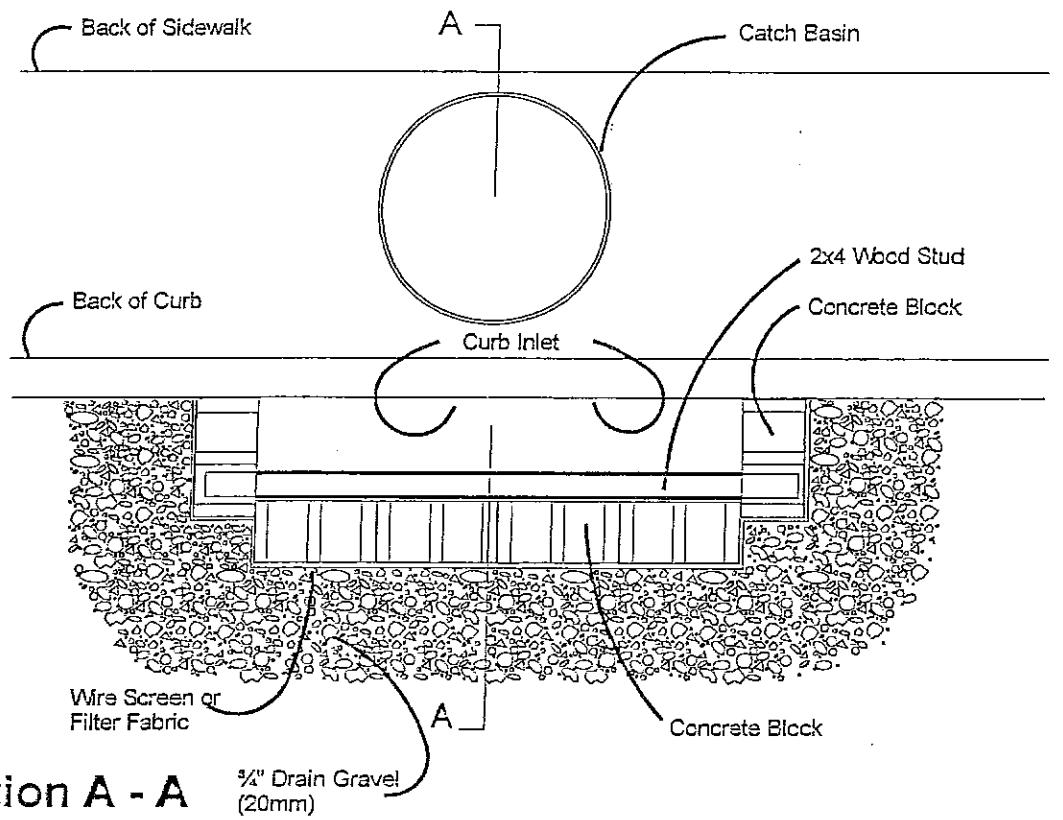
Curb and Gutter Sediment Barrier – Sandbag or rock berm (riprap and aggregate) 3 feet high and 3 feet wide in a horseshoe shape. See Figure 4.16.

- Construct a horseshoe shaped berm, faced with coarse aggregate if using riprap, 3 feet high and 3 feet wide, at least 2 feet from the inlet.
- Construct a horseshoe shaped sedimentation trap on the outside of the berm sized to sediment trap standards for protecting a culvert inlet.

Maintenance Standards

- Catch basin filters should be inspected frequently, especially after storm events. If the insert becomes clogged, it should be cleaned or replaced.
- For systems using stone filters: If the stone filter becomes clogged with sediment, the stones must be pulled away from the inlet and cleaned or replaced. Since cleaning of gravel at a construction site may be difficult, an alternative approach would be to use the clogged stone as fill and put fresh stone around the inlet.
- Do not wash sediment into storm drains while cleaning. Spread all excavated material evenly over the surrounding land area or stockpile and stabilize as appropriate.

Plan View



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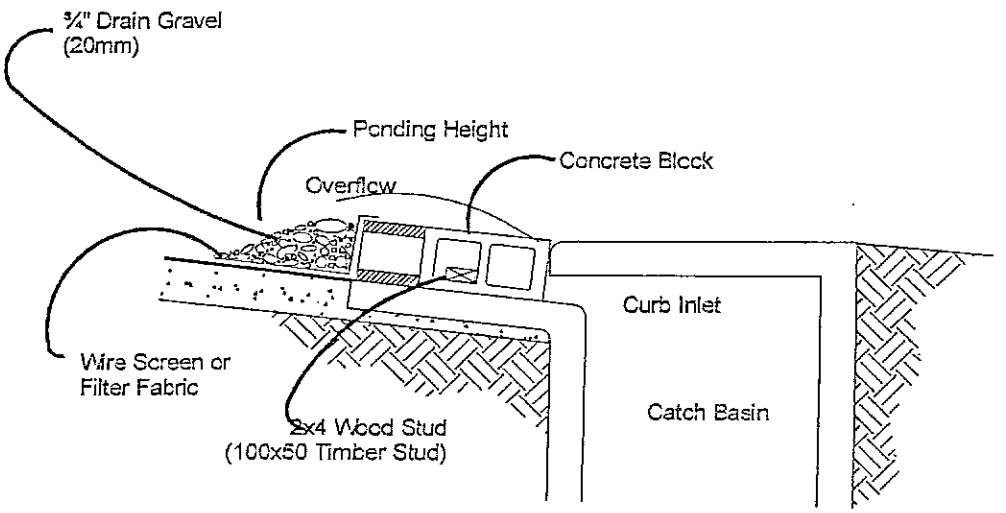
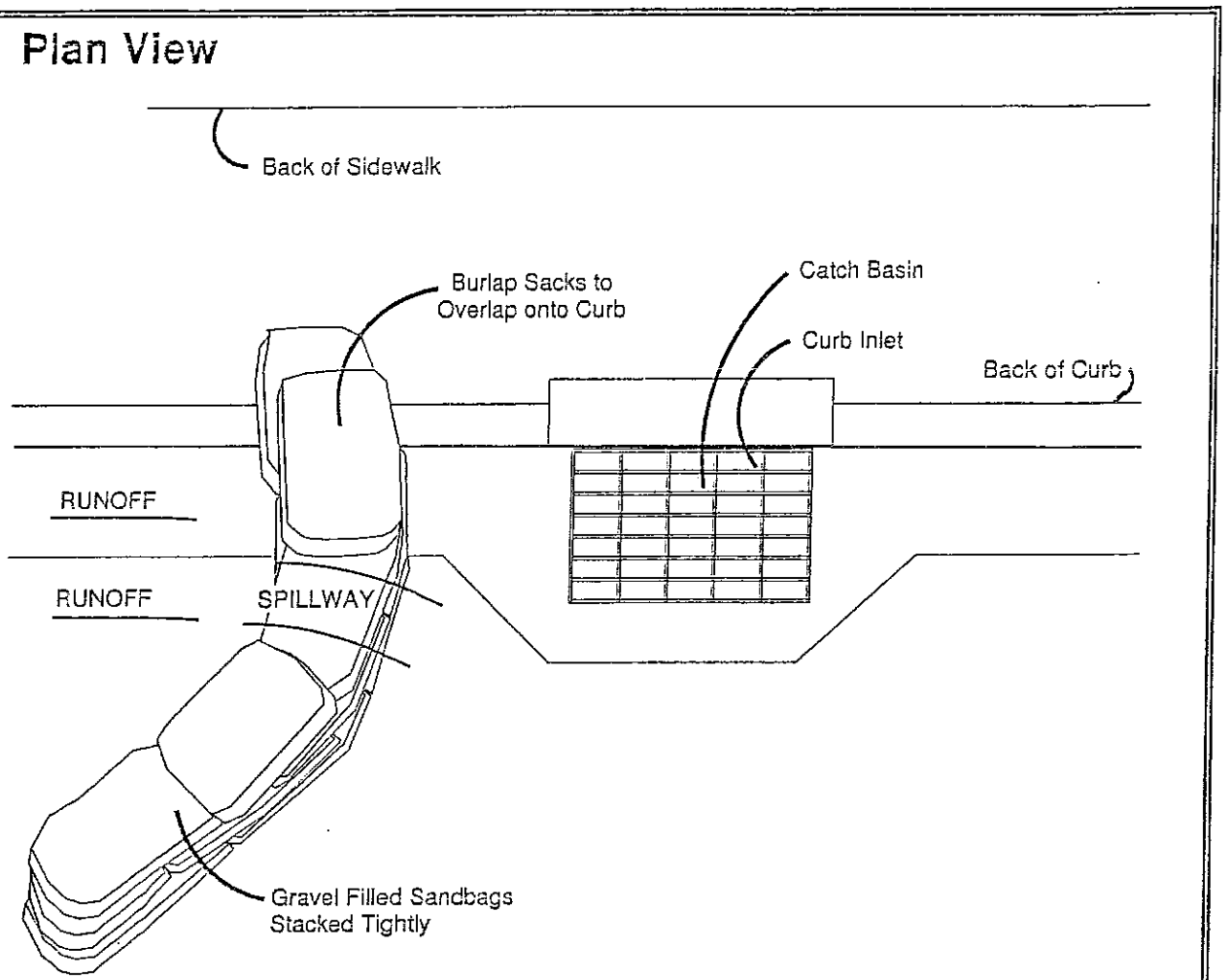


NOTES:
1. Use block and gravel type sediment barrier when curb inlet is located in gently sloping street segment, where water can pond and allow sediment to separate from runoff.
2. Barrier shall allow for overflow from severe storm event.
3. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

Figure 4.15 – Block and Gravel Curb Inlet Protection



NOTES:
1. Place curb type sediment barriers on gently sloping street segments, where water can pond and allow sediment to separate from runoff.
2. Sandbags of either burlap or woven 'geotextile' fabric, are filled with gravel, layered and packed tightly.
3. Leave a one sandbag gap in the top row to provide a spillway for overflow.
4. Inspect barriers and remove sediment after each storm event. Sediment and gravel must be removed from the traveled way immediately.

Figure 4.16 – Curb and Gutter Barrier

BMP C230: Straw Bale Barrier

Purpose

To decrease the velocity of sheet flows and intercept and detain small amounts of sediment from disturbed areas of limited extent, preventing sediment from leaving the site. See Figure 4.17 for details on straw bale barriers.

Conditions of Use

Below disturbed areas subject to sheet and rill erosion.

- Straw bales are among the most used and **least effective BMPs**. The best use of a straw bale is hand spread on the site.
- Where the size of the drainage area is no greater than 1/4 acre per 100 feet of barrier length; the maximum slope length behind the barrier is 100 feet; and the maximum slope gradient behind the barrier is 2:1.
- Where effectiveness is required for less than three months.
- **Under no circumstances should straw bale barriers be constructed in streams, channels, or ditches.**
- Straw bale barriers should not be used where rock or hard surfaces prevent the full and uniform anchoring of the barrier.

Design and Installation Specifications

Bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another.

All bales shall be either wire-bound or string-tied. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings.

- The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. The trench must be deep enough to remove all grass and other material that might allow underflow. After the bales are staked and chinked (filled by wedging), the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier.
- Each bale shall be securely anchored by at least two stakes or re-bars driven through the bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or re-bars shall be driven deep enough into the ground to securely anchor the bales. Stakes should not extend above the bales but instead should be driven in flush with the top of the bale for safety reasons.
- The gaps between the bales shall be chinked (filled by wedging) with straw to prevent water from escaping between the bales. Loose straw scattered over the area immediately uphill from a straw bale barrier tends to increase barrier efficiency. Wedging must be done carefully in order not to separate the bales.

Maintenance Standards

- Straw bale barriers shall be inspected immediately after each runoff-producing rainfall and at least daily during prolonged rainfall.
- Close attention shall be paid to the repair of damaged bales, end runs, and undercutting beneath bales.
- Necessary repairs to barriers or replacement of bales shall be accomplished promptly.
- Sediment deposits should be removed after each runoff-producing rainfall. They must be removed when the level of deposition reaches approximately one-half the height of the barrier.
- Any sediment deposits remaining in place after the straw bale barrier is no longer required shall be dressed to conform to the existing grade, prepared and seeded.
- Straw bales used as a temporary straw bale barrier shall be removed after project completion and stabilization to prevent sprouting of unwanted vegetation.

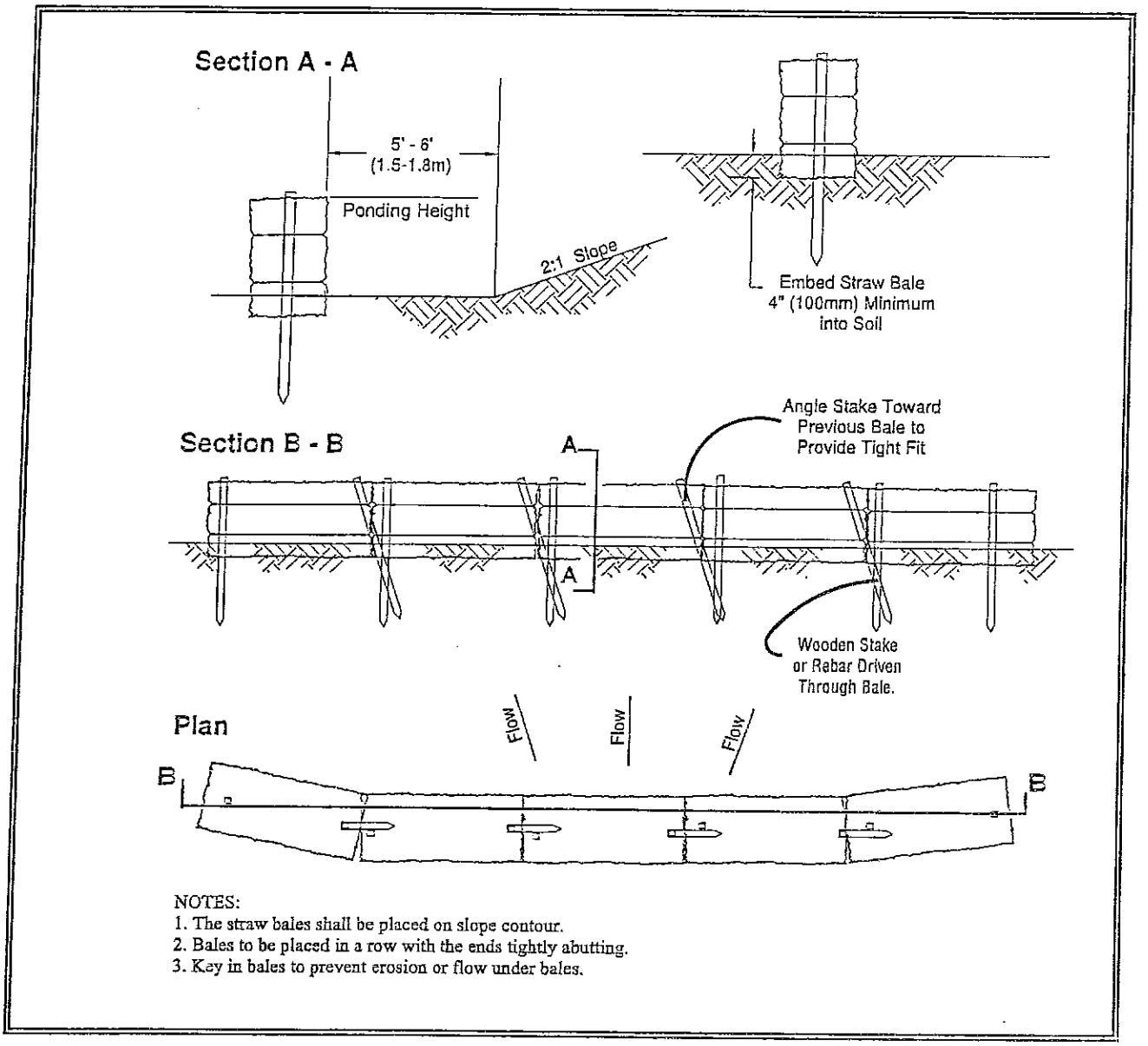


Figure 4.17 Straw Bale Barrier

BMP C233: Silt Fence

Purpose

Use of a silt fence reduces the transport of coarse sediment from a construction site by providing a temporary physical barrier to sediment and reducing the runoff velocities of overland flow. See Figure 4.19 for details on silt fence construction.

Conditions of Use

Silt fence may be used downslope of all disturbed areas.

- Silt fence is not intended to treat concentrated flows, nor is it intended to treat substantial amounts of overland flow.. Any concentrated flows must be conveyed through the drainage system to a sediment pond. The only circumstance in which overland flow can be treated solely by a silt fence, rather than by a sediment pond, is when the area draining to the fence is one acre or less and flow rates are less than 0.5 cfs.
- Silt fences should not be constructed in streams or used in V-shaped ditches. They are not an adequate method of silt control for anything deeper than sheet or overland flow.

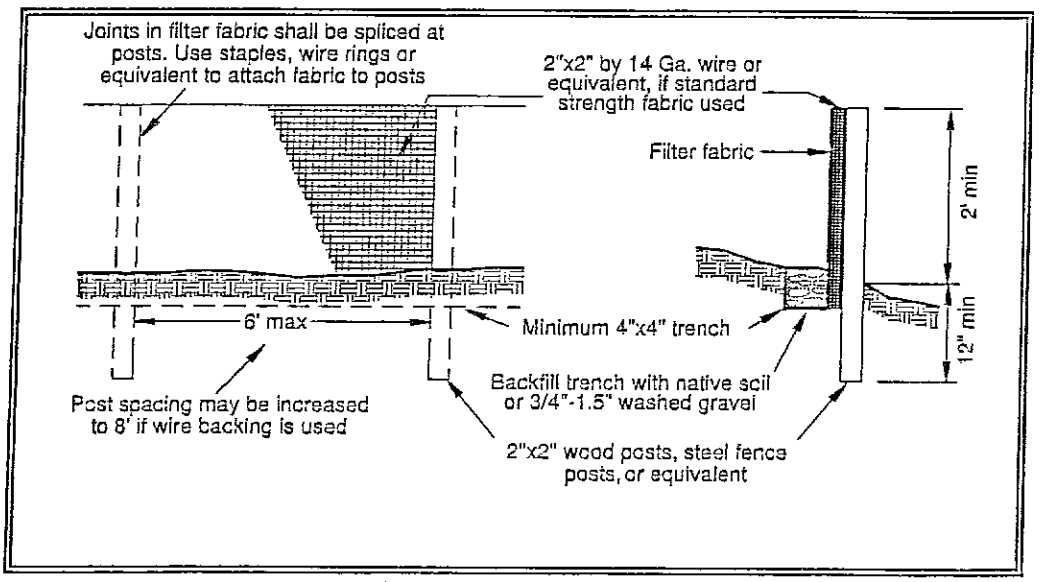


Figure 4.19 – Silt Fence

Design and Installation Specifications

- Drainage area of 1 acre or less or in combination with sediment basin in a larger site.
- Maximum slope steepness (normal (perpendicular) to fence line) 1:1.
- Maximum sheet or overland flow path length to the fence of 100 feet.
- No flows greater than 0.5 cfs.
- The geotextile used shall meet the following standards. All geotextile properties listed below are minimum average roll values (i.e., the test result for any sampled roll in a lot shall meet or exceed the values shown in Table 4.10):

Table 4.10 Geotextile Standards	
Polymeric Mesh AOS (ASTM D4751)	0.60 mm maximum for slit film wovens (#30 sieve). 0.30 mm maximum for all other geotextile types (#50 sieve). 0.15 mm minimum for all fabric types (#100 sieve).
Water Permittivity (ASTM D4491)	0.02 sec^{-1} minimum
Grab Tensile Strength (ASTM D4632)	180 lbs. Minimum for extra strength fabric. 100 lbs minimum for standard strength fabric.
Grab Tensile Strength (ASTM D4632)	30% maximum
Ultraviolet Resistance (ASTM D4355)	70% minimum

- Standard strength fabrics shall be supported with wire mesh, chicken wire, 2-inch x 2-inch wire, safety fence, or jute mesh to increase the strength of the fabric. Silt fence materials are available that have synthetic mesh backing attached.
- Filter fabric material shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0°F. to 120°F.
- 100 percent biodegradable silt fence is available that is strong, long lasting, and can be left in place after the project is completed, if permitted by local regulations.
- Standard Notes for construction plans and specifications follow. Refer to Figure 4.19 for standard silt fence details.

  The contractor shall install and maintain temporary silt fences at the locations shown in the Plans. The silt fences shall be constructed in the areas of clearing, grading, or drainage prior to starting those activities. A silt fence shall not be considered temporary if the silt fence must function beyond the life of the contract. The silt fence shall prevent soil carried by runoff water from going beneath, through, or over the top of the silt fence, but shall allow the water to pass through the fence.

  The minimum height of the top of silt fence shall be 2 feet and the maximum height shall be 2½ feet above the original ground surface.

  The geotextile shall be sewn together at the point of manufacture, or at an approved location as determined by the Engineer, to form geotextile lengths as required. All sewn seams shall be located at a support post. Alternatively, two sections of silt fence can be overlapped, provided the Contractor can demonstrate, to the satisfaction of the Engineer, that the overlap is long enough and that the adjacent fence sections are close enough together to prevent silt laden water from escaping through the fence at the overlap.

The geotextile shall be attached on the up-slope side of the posts and support system with staples, wire, or in accordance with the manufacturer's recommendations. The geotextile shall be attached to the posts in a manner that reduces the potential for geotextile tearing at the staples, wire, or other connection device. Silt fence back-up support for the geotextile in the form of a wire or plastic mesh is dependent on the properties of the geotextile selected for use. If wire or plastic back-up mesh is used, the mesh shall be fastened securely to the up-slope of the posts with the geotextile being up-slope of the mesh back-up support.

The geotextile at the bottom of the fence shall be buried in a trench to a minimum depth of 4 inches below the ground surface. The trench shall be backfilled and the soil tamped in place over the buried portion of the geotextile, such that no flow can pass beneath the fence and scouring can not occur. When wire or polymeric back-up support mesh is used, the wire or polymeric mesh shall extend into the trench a minimum of 3 inches.

The fence posts shall be placed or driven a minimum of 18 inches. A minimum depth of 12 inches is allowed if topsoil or other soft subgrade soil is not present and a minimum depth of 18 inches cannot be reached. Fence post depths shall be increased by 6 inches if the fence is located on slopes of 3:1 or steeper and the slope is perpendicular to the fence. If required post depths cannot be obtained, the posts shall be adequately secured by bracing or guying to prevent overturning of the fence due to sediment loading.

Silt fences shall be located on contour as much as possible, except at the ends of the fence, where the fence shall be turned uphill such that the silt fence captures the runoff water and prevents water from flowing around the end of the fence.

If the fence must cross contours, with the exception of the ends of the fence, gravel check dams placed perpendicular to the back of the fence shall be used to minimize concentrated flow and erosion along the back of the fence. The gravel check dams shall be approximately 1-foot deep at the back of the fence. It shall be continued perpendicular to the fence at the same elevation until the top of the check dam intercepts the ground surface behind the fence. The gravel check dams shall consist of crushed surfacing base course, gravel backfill for walls, or shoulder ballast. The gravel check dams shall be located every 10 feet along the fence where the fence must cross contours. The slope of the fence line where contours must be crossed shall not be steeper than 3:1.

Wood, steel or equivalent posts shall be used. Wood posts shall have minimum dimensions of 2 inches by 2 inches by 3 feet minimum length, and shall be free of defects such as knots, splits, or gouges.

Steel posts shall consist of either size No. 6 rebar or larger, ASTM A 120 steel pipe with a minimum diameter of 1-inch, U, T, L, or C shape steel posts with a minimum weight of 1.35 lbs./ft. or other steel posts having equivalent strength and bending resistance to the post sizes listed. The spacing of the support posts shall be a maximum of 6 feet.

Fence back-up support, if used, shall consist of steel wire with a maximum mesh spacing of 2 inches, or a prefabricated polymeric mesh. The strength of the wire or polymeric mesh shall be equivalent to or greater than 180 lbs. grab tensile strength. The polymeric mesh must be as resistant to ultraviolet radiation as the geotextile it supports.

- Silt fence installation using the slicing method specification details follow. Refer to Figure 4.20 for slicing method details.

  The base of both end posts must be at least 2 to 4 inches above the top of the silt fence fabric on the middle posts for ditch checks to drain properly. Use a hand level or string level, if necessary, to mark base points before installation.

  Install posts 3 to 4 feet apart in critical retention areas and 6 to 7 feet apart in standard applications.

  Install posts 24 inches deep on the downstream side of the silt fence, and as close as possible to the fabric, enabling posts to support the fabric from upstream water pressure.

  Install posts with the nipples facing away from the silt fence fabric.

  Attach the fabric to each post with three ties, all spaced within the top 8 inches of the fabric. Attach each tie diagonally 45 degrees through the fabric, with each puncture at least 1 inch vertically apart. In addition, each tie should be positioned to hang on a post nipple when tightening to prevent sagging.

  Wrap approximately 6 inches of fabric around the end posts and secure with 3 ties.

  No more than 24 inches of a 36-inch fabric is allowed above ground level.

  The rope lock system must be used in all ditch check applications.

  The installation should be checked and corrected for any deviation before compaction. Use a flat-bladed shovel to tuck fabric deeper into the ground if necessary.

  Compaction is vitally important for effective results. Compact the soil immediately next to the silt fence fabric with the front wheel of the tractor, skid steer, or roller exerting at least 60 pounds per square inch. Compact the upstream side first and then each side twice for a total of four trips.

Maintenance Standards

- Any damage shall be repaired immediately.
- If concentrated flows are evident uphill of the fence, they must be intercepted and conveyed to a sediment pond.
- It is important to check the uphill side of the fence for signs of the fence clogging and acting as a barrier to flow and then causing channelization of flows parallel to the fence. If this occurs, replace the fence or remove the trapped sediment.
- Sediment deposits shall either be removed when the deposit reaches approximately one-third the height of the silt fence, or a second silt fence shall be installed.
- If the filter fabric (geotextile) has deteriorated due to ultraviolet breakdown, it shall be replaced.

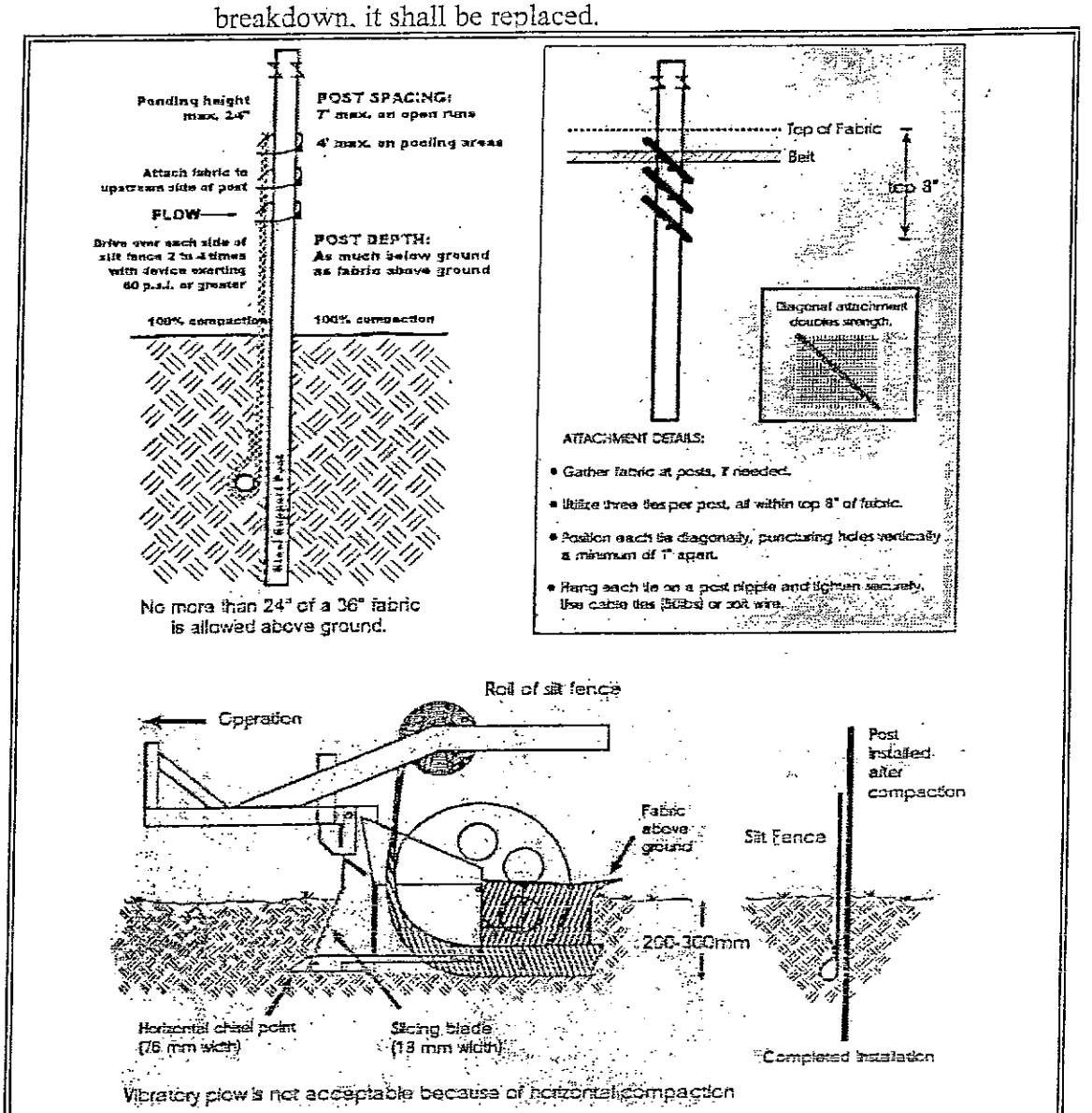


Figure 4.20 – Silt Fence Installation by Slicing Method

BMP C240: Sediment Trap

Purpose

A sediment trap is a small temporary ponding area with a gravel outlet used to collect and store sediment from sites cleared and/or graded during construction. Sediment traps, along with other perimeter controls, shall be installed before any land disturbance takes place in the drainage area.

Conditions of Use

Prior to leaving a construction site, stormwater runoff must pass through a sediment pond or trap or other appropriate sediment removal best management practice. Non-engineered sediment traps may be used on-site prior to an engineered sediment trap or sediment pond to provide additional sediment removal capacity.

It is intended for use on sites where the tributary drainage area is less than 3 acres, with no unusual drainage features, and a projected build-out time of six months or less. The sediment trap is a temporary measure (with a design life of approximately 6 months) and shall be maintained until the site area is permanently protected against erosion by vegetation and/or structures.

Sediment traps and ponds are only effective in removing sediment down to about the medium silt size fraction. Runoff with sediment of finer grades (fine silt and clay) will pass through untreated, emphasizing the need to control erosion to the maximum extent first.

Whenever possible, sediment-laden water shall be discharged into onsite, relatively level, vegetated areas (see BMP C234 – Vegetated Strip). This is the only way to effectively remove fine particles from runoff unless chemical treatment or filtration is used. This can be particularly useful after initial treatment in a sediment trap or pond. The areas of release must be evaluated on a site-by-site basis in order to determine appropriate locations for and methods of releasing runoff. Vegetated wetlands shall not be used for this purpose. Frequently, it may be possible to pump water from the collection point at the downhill end of the site to an upslope vegetated area. Pumping shall only augment the treatment system, not replace it, because of the possibility of pump failure or runoff volume in excess of pump capacity.

All projects that are constructing permanent facilities for runoff quantity control should use the rough-graded or final-graded permanent facilities for traps and ponds. This includes combined facilities and infiltration facilities. When permanent facilities are used as temporary sedimentation facilities, the surface area requirement of a sediment trap or pond must be met. If the surface area requirements are larger than the surface area of the permanent facility, then the trap or pond shall be enlarged to comply with the surface area requirement. The permanent pond shall also be divided into two cells as required for sediment ponds.

Either a permanent control structure or the temporary control structure (described in BMP C241, Temporary Sediment Pond) can be used. If a permanent control structure is used, it may be advisable to partially restrict the lower orifice with gravel to increase residence time while still allowing dewatering of the pond. A shut-off valve may be added to the control structure to allow complete retention of stormwater in emergency situations. In this case, an emergency overflow weir must be added.

A skimmer may be used for the sediment trap outlet if approved by the Local Permitting Authority.

Design and Installation Specifications

- See Figures 4.22 and 4.23 for details.
- If permanent runoff control facilities are part of the project, they should be used for sediment retention.
- To determine the sediment trap geometry, first calculate the design surface area (SA) of the trap, measured at the invert of the weir. Use the following equation:

  $SA = FS(Q_2/V_S)$

  where

  Q_2 = Design inflow based on the peak discharge from the developed 2-year runoff event from the contributing drainage area as computed in the hydrologic analysis. The 10-year peak flow shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. If no hydrologic analysis is required, the Rational Method may be used.

  V_S = The settling velocity of the soil particle of interest. The 0.02 mm (medium silt) particle with an assumed density of 2.65 g/cm^3 has been selected as the particle of interest and has a settling velocity (V_S) of 0.00096 ft/sec.

  FS = A safety factor of 2 to account for non-ideal settling.

  Therefore, the equation for computing surface area becomes:

  $SA = 2 \times Q_2/0.00096$ or

  2080 square feet per cfs of inflow

  Note: Even if permanent facilities are used, they must still have a surface area that is at least as large as that derived from the above formula. If they do not, the pond must be enlarged.
- To aid in determining sediment depth, all sediment traps shall have a staff gauge with a prominent mark 1-foot above the bottom of the trap.

- Sediment traps may not be feasible on utility projects due to the limited work space or the short-term nature of the work. Portable tanks may be used in place of sediment traps for utility projects.

Maintenance Standards

- Sediment shall be removed from the trap when it reaches 1-foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

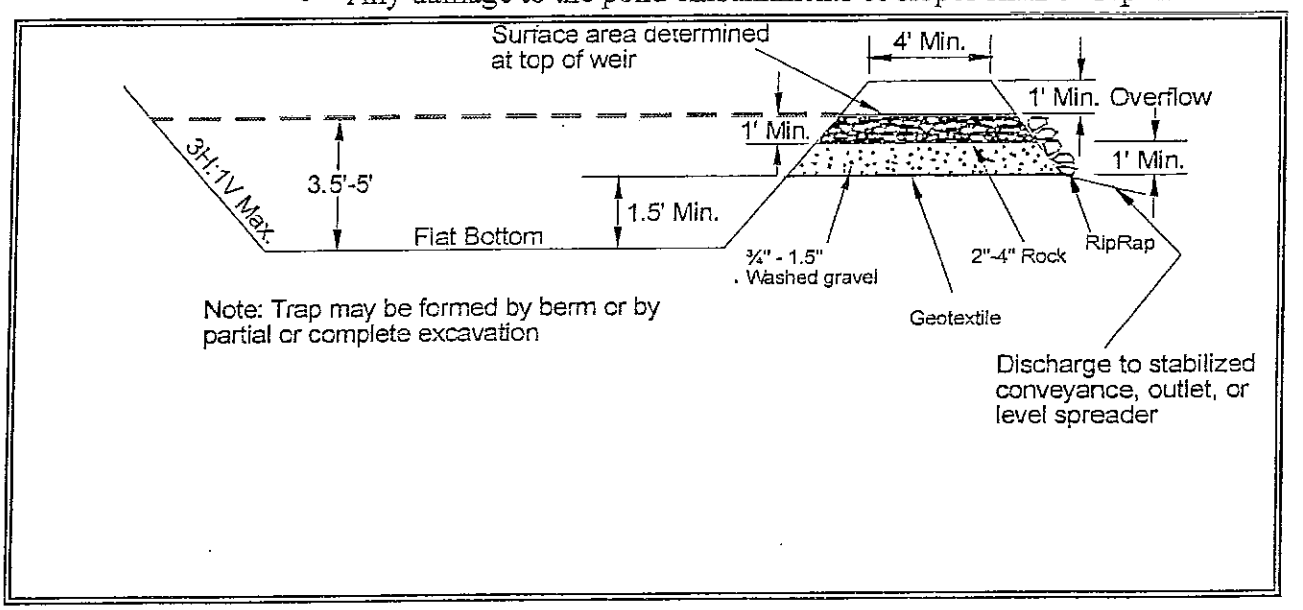


Figure 4.22 Cross Section of Sediment Trap

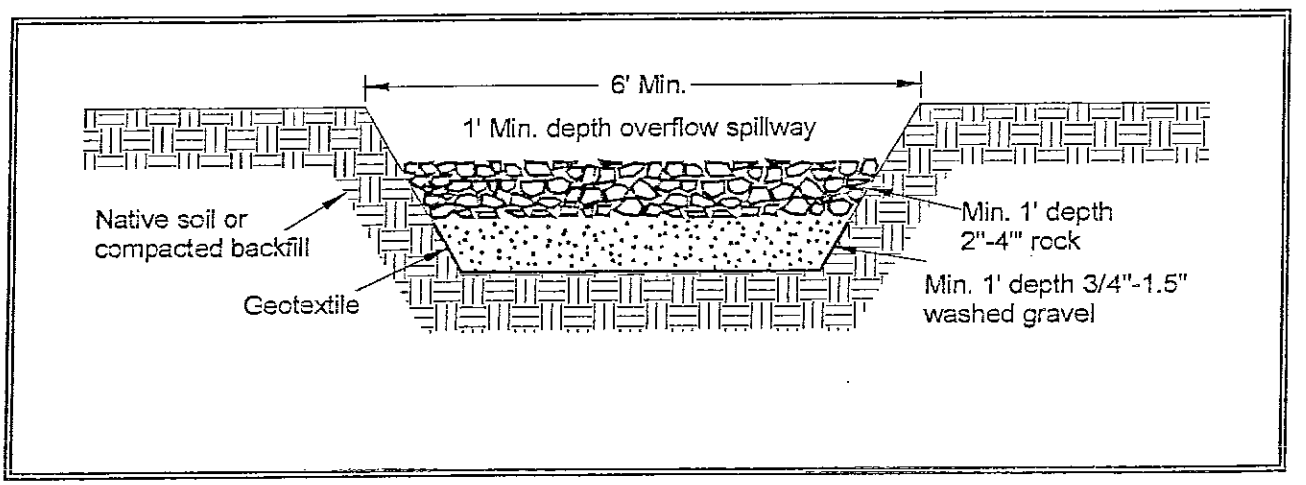


Figure 4.23 Sediment Trap Outlet

BMP C241: Temporary Sediment Pond

Purpose

Sediment ponds remove sediment from runoff originating from disturbed areas of the site. Sediment ponds are typically designed to remove sediment no smaller than medium silt (0.02 mm). Consequently, they usually reduce turbidity only slightly.

Conditions of Use

Prior to leaving a construction site, stormwater runoff must pass through a sediment pond or other appropriate sediment removal best management practice.

A sediment pond shall be used where the contributing drainage area is 3 acres or more. Ponds must be used in conjunction with erosion control practices to reduce the amount of sediment flowing into the basin.

Design and Installation Specifications

- Sediment basins must be installed only on sites where failure of the structure would not result in loss of life, damage to homes or buildings, or interruption of use or service of public roads or utilities. Also, sediment traps and ponds are attractive to children and can be very dangerous. Compliance with local ordinances regarding health and safety must be addressed. If fencing of the pond is required, the type of fence and its location shall be shown on the ESC plan.
- Structures having a maximum storage capacity at the top of the dam of 10 acre-ft (435,600 ft^3) or more are subject to the Washington Dam Safety Regulations (Chapter 173-175 WAC).
- See Figure 4.24, Figure 4.25, and Figure 4.26 for details.
- If permanent runoff control facilities are part of the project, they should be used for sediment retention. The surface area requirements of the sediment basin must be met. This may require enlarging the permanent basin to comply with the surface area requirements. If a permanent control structure is used, it may be advisable to partially restrict the lower orifice with gravel to increase residence time while still allowing dewatering of the basin.
- Use of infiltration facilities for sedimentation basins during construction tends to clog the soils and reduce their capacity to infiltrate. If infiltration facilities are to be used, the sides and bottom of the facility must only be rough excavated to a minimum of 2 feet above final grade. Final grading of the infiltration facility shall occur only when all contributing drainage areas are fully stabilized. The infiltration pretreatment facility should be fully constructed and used with the sedimentation basin to help prevent clogging.
- Determining Pond Geometry

  Obtain the discharge from the hydrologic calculations of the peak flow for the 2-year runoff event (Q_2). The 10-year peak flow shall be used if the project size, expected timing and duration of construction, or downstream conditions warrant a higher level of protection. If no hydrologic analysis is required, the Rational Method may be used.

Determine the required surface area at the top of the riser pipe with the equation:

$SA = 2 \times Q_2/0.00096$ or
2080 square feet per cfs of inflow

See BMP C240 for more information on the derivation of the surface area calculation.

The basic geometry of the pond can now be determined using the following design criteria:

- Required surface area SA (from Step 2 above) at top of riser.
- Minimum 3.5-foot depth from top of riser to bottom of pond.
- Maximum 3:1 interior side slopes and maximum 2:1 exterior slopes. The interior slopes can be increased to a maximum of 2:1 if fencing is provided at or above the maximum water surface.
- One foot of freeboard between the top of the riser and the crest of the emergency spillway.
- Flat bottom.
- Minimum 1-foot deep spillway.
- Length-to-width ratio between 3:1 and 6:1.
- Sizing of Discharge Mechanisms.

The outlet for the basin consists of a combination of principal and emergency spillways. These outlets must pass the peak runoff expected from the contributing drainage area for a 100-year storm. If, due to site conditions and basin geometry, a separate emergency spill-way is not feasible, the principal spillway must pass the entire peak runoff expected from the 100-year storm. However, an attempt to provide a separate emergency spillway should always be made. The runoff calculations should be based on the site conditions during construction. The flow through the dewatering orifice cannot be utilized when calculating the 100-year storm elevation because of its potential to become clogged; therefore, available spillway storage must begin at the principal spillway riser crest.

The principal spillway designed by the procedures contained in this standard will result in some reduction in the peak rate of runoff. However, the riser outlet design will not adequately control the basin discharge to the predevelopment discharge limitations as stated in Minimum Requirement #7: Flow Control. However, if the basin for a permanent stormwater detention pond is used for a temporary sedimentation basin, the control structure for the permanent pond can be used to maintain predevelopment discharge limitations. The size of the basin, the expected life of the construction project, the anticipated downstream effects and the anticipated weather conditions during construction, should be considered to determine the need of additional discharge control. See Figure 4.28 for riser inflow curves.

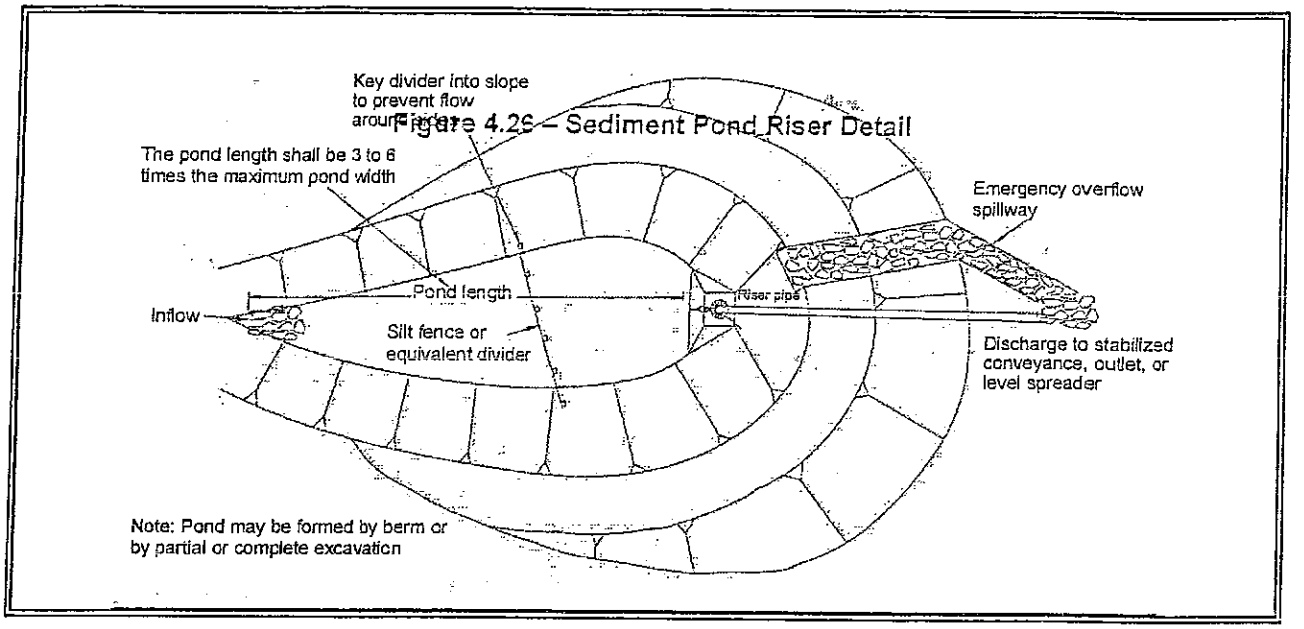


Figure 4.26 – Sediment Pond Riser Detail

Figure 4.24 – Sediment Pond Plan View

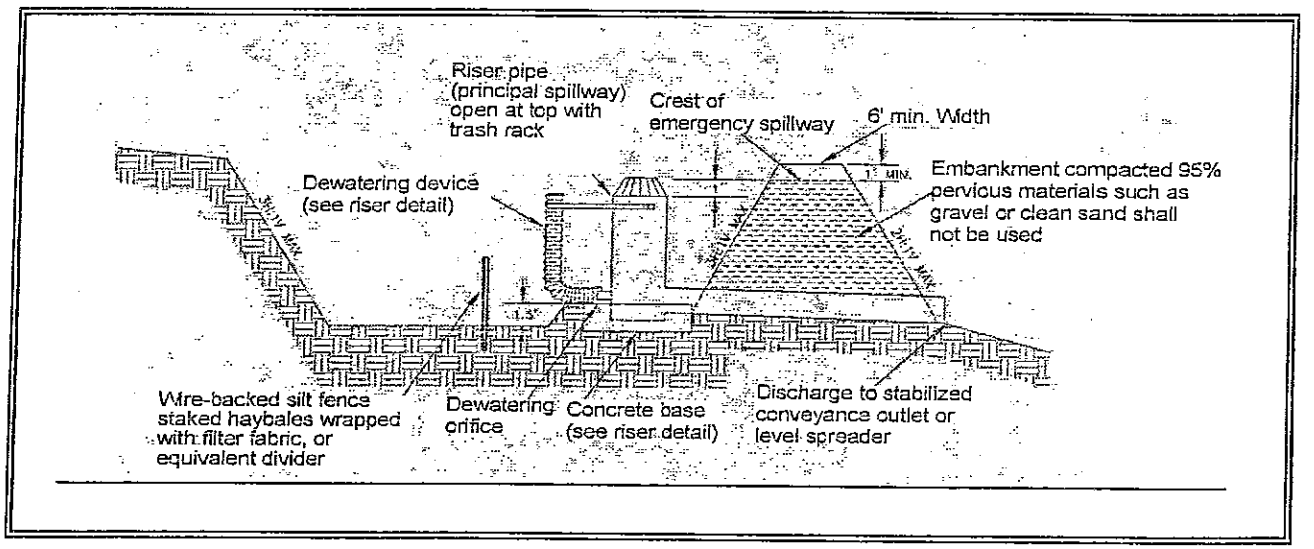


Figure 4.25 – Sediment Pond Cross Section

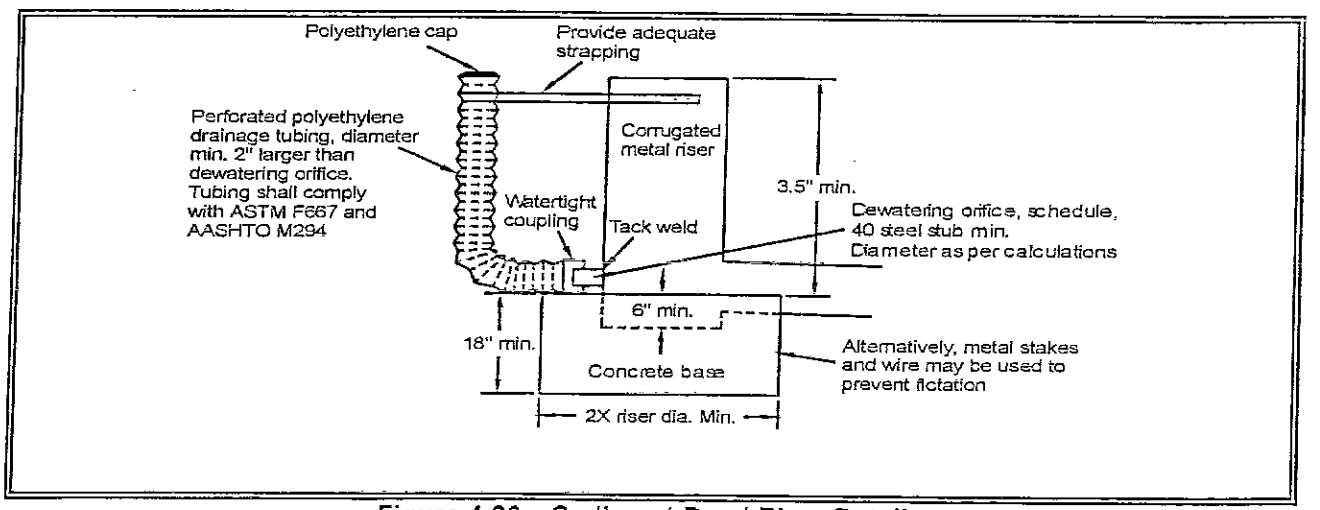


Figure 4.26 – Sediment Pond Riser Detail

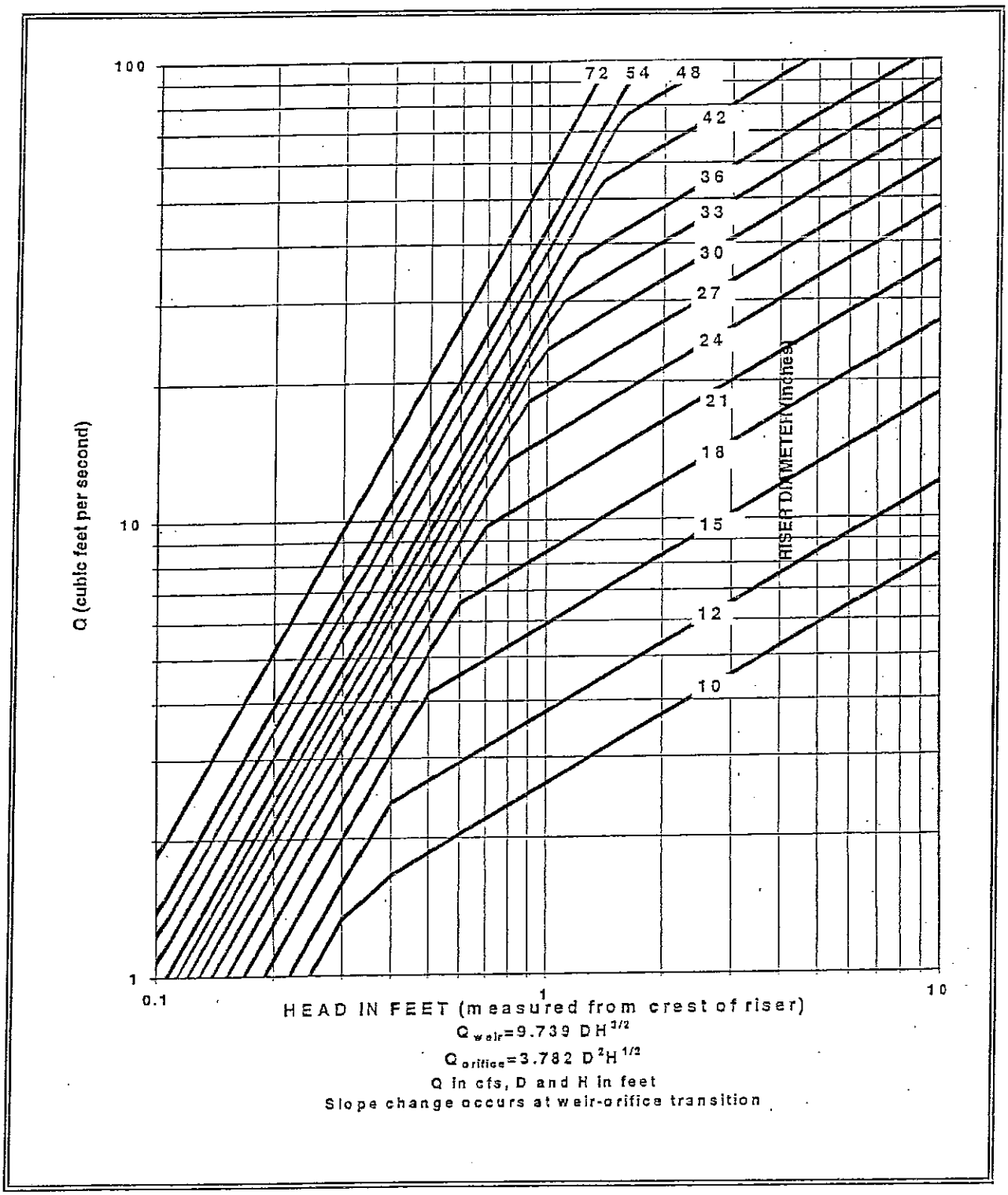


Figure 4.27 – Riser Inflow Curves

Principal Spillway: Determine the required diameter for the principal spillway (riser pipe). The diameter shall be the minimum necessary to pass the pre-developed 10-year peak flow (Q_{10}). Use Figure 4.28 to determine this diameter (h = 1-foot). *Note: A permanent control structure may be used instead of a temporary riser.*

Emergency Overflow Spillway: Determine the required size and design of the emergency overflow spillway for the developed 100-year peak flow using the method contained in Volume III.

Dewatering Orifice: Determine the size of the dewatering orifice(s) (minimum 1-inch diameter) using a modified version of the discharge equation for a vertical orifice and a basic equation for the area of a circular orifice. Determine the required area of the orifice with the following equation:

$$A_o = \frac{A_s(2h)^{0.5}}{0.6\text{x}3600Tg^{0.5}}$$

where	A_O	=	orifice area (square feet)
	A_S	=	pond surface area (square feet)
	h	=	head of water above orifice (height of riser in feet)
	T	=	dewatering time (24 hours)
	g	=	acceleration of gravity (32.2 feet/second^2)

Convert the required surface area to the required diameter D of the orifice:

$$D = 24\text{x}\sqrt{\frac{A_o}{\pi}} = 13.54\text{x}\sqrt{A_o}$$

The vertical, perforated tubing connected to the dewatering orifice must be at least 2 inches larger in diameter than the orifice to improve flow characteristics. The size and number of perforations in the tubing should be large enough so that the tubing does not restrict flow. The orifice should control the flow rate.

- Additional Design Specifications

  The **pond shall be divided** into two roughly equal volume cells by a permeable divider that will reduce turbulence while allowing movement of water between cells. The divider shall be at least one-half the height of the riser and a minimum of one foot below the top of the riser. Wire-backed, 2- to 3-foot high, extra strength filter fabric supported by treated 4"x4"s can be used as a divider. Alternatively, staked straw bales wrapped with filter fabric (geotextile) may be used. If the pond is more than 6 feet deep, a different mechanism must be proposed. A riprap embankment is one acceptable method of separation for deeper ponds. Other designs that satisfy the intent of

this provision are allowed as long as the divider is permeable, structurally sound, and designed to prevent erosion under or around the barrier.

To aid in determining sediment depth, **one-foot intervals** shall be prominently marked on the riser.

If an **embankment** of more than 6 feet is proposed, the pond must comply with the criteria contained in Volume III regarding dam safety for detention BMPs.

- The most common structural failure of sedimentation basins is caused by piping. Piping refers to two phenomena: (1) water seeping through fine-grained soil, eroding the soil grain by grain and forming pipes or tunnels; and, (2) water under pressure flowing upward through a granular soil with a head of sufficient magnitude to cause soil grains to lose contact and capability for support.

  The most critical construction sequences to prevent piping will be:

  1. Tight connections between riser and barrel and other pipe connections.
  2. Adequate anchoring of riser.
  3. Proper soil compaction of the embankment and riser footing.
  4. Proper construction of anti-seep devices.

Maintenance Standards

- Sediment shall be removed from the pond when it reaches 1–foot in depth.
- Any damage to the pond embankments or slopes shall be repaired.

Attachment L

Summary of Fecal Coliform Sampling Data

Project Name	WRIA	WDFW Stream Reach	Primary Name	Descriptive Name	Total Fecal Coliform	Tour Date	Tour Comments	Site Comments	Total Fecal Coliform Qualifier
SK_fecal	18	232	Lees 0.1	Lees d/s of E. Hidden Way	2	10/13/2009	No precipation in prior week.		
SK_fecal	18	232	Lees 0.1	Lees d/s of E. Hidden Way	46	1/29/2009			
SK_fecal	18	232	Lees 0.1	Lees d/s of E. Hidden Way	216	8/27/2009	No Recent Rain		
SK_fecal	18	232	Lees 0.1	Lees d/s of E. Hidden Way	2	5/4/2009			
PA_fecal	18	232	Lees 0.6	Lees d/s of Hwy 101	40	8/27/2009	No Recent Rain		
PA_fecal	18	232	Lees 0.6	Lees d/s of Hwy 101	26	10/13/2009	No precipation in prior week.		
PA_fecal	18	232	Lees 0.6	Lees d/s of Hwy 101	14	5/4/2009			
PA_fecal	18	232	Lees 0.8	Lees d/s of Leighland Av	22	10/13/2009	No precipation in prior week.	Clear; some watercress and duckweed and reed canary grass.	
PA_fecal	18	232	Lees 0.8	Lees d/s of Leighland Av	40	8/27/2009	No Recent Rain		
PA_fecal	18	232	Lees 0.8	Lees d/s of Leighland Av	14	5/4/2009			
PA_fecal	18	232	Lees 0.8	Lees d/s of Leighland Av	14	1/29/2009			
SK_fecal	18	232	Lees 1.1	Lees d/s of Marsden Rd, d/s of outfall pool	4	5/4/2009			
SK_fecal	18	232	Lees 1.1	Lees d/s of Marsden Rd, d/s of outfall pool	50	8/27/2009	No Recent Rain		
SK_fecal	18	232	Lees 1.1	Lees d/s of Marsden Rd, d/s of outfall pool	110	10/13/2009	No precipation in prior week.		
SK_fecal	18	232	Lees 1.1	Lees d/s of Marsden Rd, d/s of outfall pool	4	1/29/2009			
SK_fecal	18	232	Lees 3.3	Lees d/s of Monroe Rd culvert	4	5/4/2009			
SK_fecal	18	232	Lees 3.3	Lees d/s of Monroe Rd culvert		8/27/2009	No Recent Rain	Dry	
SK_fecal	18	232	Lees 3.3	Lees d/s of Monroe Rd culvert	2	1/29/2009			
PA_fecal	18	233	Lees EF 0.4	Lees EF u/s of Pearce Rd culvert	8	8/27/2009	No Recent Rain		
PA_fecal	18	233	Lees EF 0.4	Lees EF u/s of Pearce Rd culvert	14	1/29/2009			
PA_fecal	18	233	Lees EF 0.4	Lees EF u/s of Pearce Rd culvert	72	10/13/2009	No precipation in prior week.		
PA_fecal	18	233	Lees EF 0.4	Lees EF u/s of Pearce Rd culvert	18	5/4/2009			
PA_fecal	18	233	Lees EF 1.2	Lees E Fork u/s of Garling Rd	42	8/27/2009	No Recent Rain		
PA_fecal	18	233	Lees EF 1.2	Lees E Fork u/s of Garling Rd	10	5/4/2009			
PA_fecal	18	233	Lees EF 1.2	Lees E Fork u/s of Garling Rd	52	10/13/2009	No precipation in prior week.		
SK_fecal	18	233	Lees EF 2.6	Lees EF u/s of 506 Draper Rd	1302	5/4/2009		Downstream of cow pasture.	G
SK_fecal	18	233	Lees EF 2.6	Lees EF u/s of 506 Draper Rd	720	8/27/2009	No Recent Rain		
SK_fecal	18	233	Lees EF 2.6	Lees EF u/s of 506 Draper Rd	102	1/29/2009			
SK_fecal	18	234	Ennis 0.1	Ennis @ PA treatment plant	312	8/11/2009	Recent Rain Prior Day		
SK_fecal	18	234	Ennis 0.1	Ennis @ PA treatment plant	8	1/26/2009		Cold & clear	
SK_fecal	18	234	Ennis 0.1	Ennis @ PA treatment plant	12	10/28/2009	~1" rain 2 days before		
SK_fecal	18	234	Ennis 0.1	Ennis @ PA treatment plant	78	5/4/2009		Creek has been dammed. Sample taken 50' upstream.	
PA_fecal	18	234	Ennis 0.4	Ennis just u/s of White Cr. Mouth	144	8/11/2009	Recent Rain Prior Day		
PA_fecal	18	234	Ennis 0.4	Ennis just u/s of White Cr. Mouth	10	5/4/2009			
PA_fecal	18	234	Ennis 0.4	Ennis just u/s of White Cr. Mouth	6	10/28/2009	Approximately 1" of rain two days before.	Saw coho redd.	
PA_fecal	18	234	Ennis 0.4	Ennis just u/s of White Cr. Mouth	2	1/26/2009		Cold & clear	
PA_fecal	18	234	Ennis 1.0	Ennis ~150' u/s of Hwy 101 culvert	38	8/11/2009	Recent Rain Prior Day		
PA_fecal	18	234	Ennis 1.0	Ennis ~150' u/s of Hwy 101 culvert	4	10/28/2009	Approximately 1" of rain two days before.		
PA_fecal	18	234	Ennis 1.0	Ennis ~150' u/s of Hwy 101 culvert	2	5/4/2009			
PA_fecal	18	234	Ennis 1.0	Ennis ~150' u/s of Hwy 101 culvert	2	1/26/2009		Cold & clear	U
PA_fecal	18	234	Ennis 1.7	Ennis ~400ft d/s of powerline clearing	34	8/11/2009	Recent Rain Prior Day		
PA_fecal	18	234	Ennis 1.7	Ennis ~400ft d/s of powerline clearing	2	5/4/2009			
PA_fecal	18	234	Ennis 1.7	Ennis ~400ft d/s of powerline clearing	6	10/28/2009	Approximately 1" of rain two days before.		
PA_fecal	18	234	Ennis 1.7	Ennis ~400ft d/s of powerline clearing	2	1/26/2009		Cold & clear	U
PA_fecal	18	235	White 0.0	White (Ennis) near mouth	46	8/11/2009	Recent Rain Prior Day		
PA_fecal	18	235	White 0.0	White (Ennis) near mouth	6	5/4/2009			
PA_fecal	18	235	White 0.0	White (Ennis) near mouth	40	10/28/2009	Approximately 1" of rain two days before.		
PA_fecal	18	235	White 0.0	White (Ennis) near mouth	8	1/26/2009		Cold & clear	
PA_fecal	18	235	White 0.3	White (Ennis) u/s of 101	12	10/28/2009	Approximately 1" of rain two days before.	Doe and fawn u/s of sample site.	
PA_fecal	18	235	White 0.3	White (Ennis) u/s of 101	2	1/26/2009		Cold & clear; white foam in pool u/s; orange tannin-colored water.	
PA_fecal	18	235	White 0.3	White (Ennis) u/s of 101	208	8/11/2009	Recent Rain Prior Day	Open sardine can about 3 ft upstreamof sample site. (Empty?)	
PA_fecal	18	235	White 0.3	White (Ennis) u/s of 101	8	5/4/2009			
PA_fecal	18	235	White 0.8	White (Ennis) @ college trail	42	8/11/2009	Recent Rain Prior Day		
PA_fecal	18	235	White 0.8	White (Ennis) @ college trail	16	10/28/2009	Approximately 1" of rain two days before.		
PA_fecal	18	235	White 0.8	White (Ennis) @ college trail	6	5/4/2009			
PA_fecal	18	235	White 0.8	White (Ennis) @ college trail	34	1/26/2009		Cold & clear; white foam near on rocks.	
SK_fecal	18	245	Peabody 0.0	Peabody @ mouth	392	8/11/2009	Recent Rain Prior Day	Low tide - no tidal influence	
SK_fecal	18	245	Peabody 0.0	Peabody @ mouth	50	5/4/2009			
SK_fecal	18	245	Peabody 0.2	Peabody @ 2nd St, above final culvert	28	5/4/2009			
SK_fecal	18	245	Peabody 0.2	Peabody @ 2nd St, above final culvert	2	1/26/2009		Cold & clear	
SK_fecal	18	245	Peabody 0.2	Peabody @ 2nd St, above final culvert	32	10/28/2009	~1" rain 2 days before	water clear, leaf material present	
SK_fecal	18	245	Peabody 0.2	Peabody @ 2nd St, above final culvert	352	8/11/2009	Recent Rain Prior Day	Several little fish in pool	
PA_fecal	18	245	Peabody 0.2a	Peabody input - storm pipe d/s of RV park office	236	8/11/2009	Recent Rain Prior Day		
PA_fecal	18	245	Peabody 0.2a	Peabody input - storm pipe d/s of RV park office	60	1/26/2009		Cold & clear	
PA_fecal	18	245	Peabody 0.2a	Peabody input - storm pipe d/s of RV park office	45	5/4/2009			
PA_fecal	18	245	Peabody 0.2a	Peabody input - storm pipe d/s of RV park office	80	10/28/2009	before.		
PA_fecal	18	245	Peabody 0.3	Peabody d/s of trailer park laundry	16	1/26/2009		Cold & clear	
PA_fecal	18	245	Peabody 0.3	Peabody d/s of trailer park laundry	680	8/11/2009	Recent Rain Prior Day	Several little fish in pool	G
PA_fecal	18	245	Peabody 0.8	Peabody d/s of trailer park laundry	52	5/4/2009			
PA_fecal	18	245	Peabody 0.3	Peabody d/s of trailer park laundry	60	10/28/2009	Approximately 1" of rain two days before.		
PA_fecal	18	245	Peabody 0.4	Peabody @u/s end of Peabody St culvert	12	5/4/2009			
PA_fecal	18	245	Peabody 0.4	Peabody @u/s end of Peabody St culvert	8	1/26/2009		Cold & clear	

PA_fecal	18	245	Peabody 0.4	Peabody @u/s end of Peabody St culvert	488	8/11/2009	Recent Rain Prior Day		
PA_fecal	18	245	Peabody 0.4	Peabody @u/s end of Peabody St culvert	40	10/28/2009	Approximately 1" of rain two days before.		
PA_fecal	18	245	Peabody 0.4a	Peabody St.	10	1/26/2009		Cold & clear	
PA_fecal	18	245	Peabody 0.4a	Peabody St.	2244	8/11/2009	Recent Rain Prior Day	Saw two small trout	G
PA_fecal	18	245	Peabody 0.4a	Peabody St.	712	5/4/2009			G
PA_fecal	18	245	Peabody 0.4a	Peabody input - storm pipe inside culvert @ Peabody St.	50	10/28/2009	Approximately 1" of rain two days before.		
PA_fecal	18	245	Peabody 1.2a	Peabody input - storm pipe u/s of Lauridsen Blvd	560	8/27/2009	No recent rain	Low flow under pipe, none in pipe	
PA_fecal	18	245	Peabody 1.2a	Peabody input - storm pipe u/s of Lauridsen Blvd	8	1/26/2009		Cold & clear; water comes out underneath pipe.	
PA_fecal	18	245	Peabody 1.2a	Peabody input - storm pipe u/s of Lauridsen Blvd	322	10/28/2009	~1" rain two days before.		
PA_fecal	18	245	Peabody 1.2a	Peabody input - storm pipe u/s of Lauridsen Blvd	420	5/4/2009		Water from pipe very muddy. Upstream is clear; downstream is cloudy.	
PA_fecal	18	245	Peabody 1.4	Peabody @ ONP Visitor Ctr	6	10/28/2009	~1" rain two days before.		
PA_fecal	18	245	Peabody 1.4	Peabody @ ONP Visitor Ctr	14	8/27/2009	No recent rain	Clear and low; cutthroat fry	
PA_fecal	18	245	Peabody 1.4	Peabody @ ONP Visitor Ctr	2	1/26/2009		Cold & clear	U
PA_fecal	18	245	Peabody 1.4	Peabody @ ONP Visitor Ctr	2	5/4/2009		Clear and low.	
PA_fecal	18	245	Peabody 2.9	Peabody 10' u/s of Coyote Run Ln	2	1/26/2009		Cold & clear	U
PA_fecal	18	245	Peabody 2.9	Peabody 10' u/s of Coyote Run Ln	2	5/3/2009			
PA_fecal	18	245	Peabody 2.9	Peabody 10' u/s of Coyote Run Ln	2	10/28/2009	~1" rain two days before		
PA_fecal	18	245	Peabody 3.0	Peabody 20' u/s of WDFW #0246	2	1/26/2009		Cold & clear	
PA_fecal	18	245	Peabody 3.0	Peabody 20' u/s of WDFW #0246	4	10/28/2009	~1" rain two days before		
PA_fecal	18	245	Peabody 3.0	Peabody 20' u/s of WDFW #0246	2	5/3/2009			U
SK_fecal	18	249	Valley 0.0	Valley @ estuary pedestrian bridge	18	1/26/2009		Cold & clear	
SK_fecal	18	249	Valley 0.0	Valley @ estuary pedestrian bridge	10	5/4/2009		Low water, clear. Cutthroat redds.	
SK_fecal	18	249	Valley 0.0	Valley @ estuary pedestrian bridge	12	10/28/2009	Approximately 1" rain two days before.		
SK_fecal	18	249	Valley 0.0	Valley @ estuary pedestrian bridge	320	8/27/2009	No recent rain	Confluent Growth	J
PA_fecal	18	249	Valley 0.4	Valley @ 6th St, u/s of final culvert 220ft	8	1/26/2009		Cold & clear	
SK_fecal	18	249	Valley 0.4	Valley @ 6th St, u/s of final culvert 220ft	156	8/27/2009	No recent rain		
SK_fecal	18	249	Valley 0.4	Valley @ 6th St, u/s of final culvert 220ft	6	5/4/2009			
SK_fecal	18	249	Valley 0.4	Valley @ 6th St, u/s of final culvert 220ft	2	10/28/2009	Approximately 1" rain two days before.		
PA_fecal	18	249	Valley 1.0	Valley @ "flatbed" bridge @ 14th St	10	1/26/2009		Cold & clear	
PA_fecal	18	249	Valley 1.0	Valley @ "flatbed" bridge @ 14th St	6	10/28/2009	~1" rain two days before.	Site looks cleared. About 50 beer cans spread out	
PA_fecal	18	249	Valley 1.0	Valley @ "flatbed" bridge @ 14th St	8	5/4/2009			
PA_fecal	18	249	Valley 1.0	Valley @ "flatbed" bridge @ 14th St	20	8/27/2009	No recent rain		
PA_fecal	18	249	Valley 1.4	stream	10	5/4/2009			
PA_fecal	18	249	Valley 1.4	stream	10	10/28/2009	~1" rain two days before.		
PA_fecal	18	249	Valley 1.4	stream	16	8/27/2009	No recent rain		
PA_fecal	18	249	Valley 1.4	stream	2	1/26/2009		Cold & clear	U
PA_fecal	18	256	Tumwater 0.0	Tumwater d/s of Marine Dr	6	5/4/2009		Low water and clear	
PA_fecal	18	256	Tumwater 0.0	Tumwater d/s of Marine Dr	2	1/26/2009		Cold & clear	U
PA_fecal	18	256	Tumwater 0.0	Tumwater d/s of Marine Dr	24	10/28/2009	~1" rain two days before.	Sample taken closer to harbor with no tidal influence (75 yds d/s of regular site because of no trespassing barbed wire at regular site).	
PA_fecal	18	256	Tumwater 0.0	Tumwater d/s of Marine Dr	302	8/27/2009	No recent rain		
SK_fecal	18	256	Tumwater 0.1	drain input	272	8/27/2009	No recent rain		
SK_fecal	18	256	Tumwater 0.1	Tumwater u/s of Marine Dr, d/s of LB stormwater drain input	22	10/28/2009	Approximately 1" rain two days before.		
SK_fecal	18	256	Tumwater 0.1	drain input	12	1/26/2009		Cold & clear	
SK_fecal	18	256	Tumwater 0.1	drain input	18	5/4/2009			
PA_fecal	18	256	Tumwater 0.7a	0.8	2	5/4/2009			U
PA_fecal	18	256	Tumwater 0.7a	0.8	2	10/28/2009	~1" rain two days before.		U
PA_fecal	18	256	Tumwater 0.7a	0.8	2	1/26/2009		Cold & clear	U
PA_fecal	18	256	Tumwater 0.7a	0.8	2	8/27/2009	No recent rain		U
PA_fecal	18	256	Tumwater 0.8	channel	4	1/26/2009		Cold & clear	
PA_fecal	18	256	Tumwater 0.8	channel	8	5/4/2009			
PA_fecal	18	256	Tumwater 0.8	channel	6	10/28/2009	~1" rain two days before.		
PA_fecal	18	256	Tumwater 0.8	channel	50	8/27/2009	No recent rain		
PA_fecal	18	256	Tumwater 0.8c	Tumwater input - pool below storm pipe @ 11 St.	12	8/27/2009	No recent rain	Moderately cloudy	
PA_fecal	18	256	Tumwater 0.8c	Tumwater input - pool below storm pipe @ 11 St.	192	1/26/2009		Cold & clear	
PA_fecal	18	256	Tumwater 0.8c	Tumwater input - pool below storm pipe @ 11 St.	336	5/4/2009			G
PA_fecal	18	256	Tumwater 0.8c	Tumwater input - pool below storm pipe @ 11 St.	40	10/28/2009	~1" rain two days before.		
PA_fecal	18	256	Tumwater 0.8d	St.	980	1/26/2009		Cold & clear	G
PA_fecal	18	256	Tumwater 0.8d	St.	16	10/28/2009	~1" rain two days before.		
PA_fecal	18	256	Tumwater 0.8d	St.	320	5/4/2009			
PA_fecal	18	256	Tumwater 0.8d	St.	8	8/27/2009	No recent rain	Low flow	
PA_fecal	18	256	Tumwater 0.8e	Tumwater u/s of 11 St. storm outfall	30	8/27/2009	No recent rain		
PA_fecal	18	256	Tumwater 0.8e	Tumwater u/s of 11 St. storm outfall	16	1/26/2009		Cold & clear	
PA_fecal	18	256	Tumwater 0.8e	Tumwater u/s of 11 St. storm outfall	8	5/4/2009			
PA_fecal	18	256	Tumwater 0.8e	Tumwater u/s of 11 St. storm outfall	10	10/28/2009	~1" rain two days before.		
PA_fecal	18	256	Tumwater 1.5	Tumwater creek u/s of HWY 101 culvert	2	5/4/2009			U
PA_fecal	18	256	Tumwater 1.5	Tumwater creek u/s of HWY 101 culvert	30	8/27/2009	No recent rain	Creek cutting around L. 8. culvert; frog	
PA_fecal	18	256	Tumwater 1.5	Tumwater creek u/s of HWY 101 culvert	16	10/28/2009	~1" rain two days before.		
PA_fecal	18	256	Tumwater 1.5	Tumwater creek u/s of HWY 101 culvert	10	1/26/2009		Cold & clear	
PA_fecal	18	256	Tumwater 4.4	Tumwater u/s of 3142 Black Diamond Rd	16	8/27/2009	No recent rain	Mint growing into stream	
PA_fecal	18	256	Tumwater 4.4	Tumwater u/s of 3142 Black Diamond Rd	2	10/28/2009	~1" rain two days before.		
PA_fecal	18	256	Tumwater 4.4	Tumwater u/s of 3142 Black Diamond Rd	2	1/26/2009		Cold & clear	U
PA_fecal	18	256	Tumwater 4.4	Tumwater u/s of 3142 Black Diamond Rd	4	5/4/2009		Cutthroat redds.	
SK_fecal	18	265	Dry 0.0a	Dry Cr input - Transfer station outfall nr mouth	2	1/26/2009		Cold & clear	U

SK_fecal	18	265	Dry 0.0a	Dry Cr input - Transfer station outfall nr mouth		5/4/2009	Subsamples 6830 & 6831 (Dry 0.8 sample & field rep) exceeded allowable variance and have been flagged. All other rep/sample pairs on this date passed, so this sample/rep pair were the only samples flagged on this date. EAC 5/28/09	No water. See site visit #8314.	
SK_fecal	18	265	Dry 0.0a	Dry Cr input - Transfer station outfall nr mouth	748	10/21/2009	0.02" rain at Fairchild Airport in prior two days.		
SK_fecal	18	265	Dry 0.0a	Dry Cr input - Transfer station outfall nr mouth		8/27/2009	No Recent Rain	No Water - Dry. Regular monitoring site visit #8358	
SK_fecal	18	265	Dry 0.1	Dry Cr @ d/s end of Transfer Station	2	1/26/2009		Cold & clear	
SK_fecal	18	265	Dry 0.1	Dry Cr @ d/s end of Transfer Station		10/21/2009	0.02" rain at Fairchild Airport in prior two days.	No water above ground	
SK_fecal	18	265	Dry 0.8	Dry Cr d/s of fork at Kacee Way, u/s of falls	22	8/27/2009	No Recent Rain		
SK_fecal	18	265	Dry 0.8	Dry Cr d/s of fork at Kacee Way, u/s of falls	10	1/26/2009		Cold & clear	
SK_fecal	18	265	Dry 0.8	Dry Cr d/s of fork at Kacee Way, u/s of falls	4	5/4/2009	Subsamples 6830 & 6831 (Dry 0.8 sample & field rep) exceeded allowable variance and have been flagged. All other rep/sample pairs on this date passed, so this sample/rep pair were the only samples flagged on this date. EAC 5/28/09	Good water flow; sample/rep variance exceeds control limits.	J
SK_fecal	18	265	Dry 0.8	Dry Cr d/s of fork at Kacee Way, u/s of falls	22	10/21/2009	0.02" rain at Fairchild Airport in prior two days.		
PA_fecal	18	265	Dry 2.2	Dry Cr @ 2844 W. Edgewood Dr.	28	8/27/2009	No Recent Rain		
PA_fecal	18	265	Dry 2.2	Dry Cr @ 2844 W. Edgewood Dr.	46	1/26/2009		Cold & clear	
PA_fecal	18	265	Dry 2.2	Dry Cr @ 2844 W. Edgewood Dr.	2	5/4/2009			
PA_fecal	18	265	Dry 2.2	Dry Cr @ 2844 W. Edgewood Dr.	34	10/21/2009	0.02" rain at Fairchild Airport in prior two days.		
SK_fecal	18	267	Dry WF 1.2	Dry W Fork @2830 W. Edgewood Dr	10	1/26/2009		Cold & clear	
SK_fecal	18	267	Dry WF 1.2	Dry W Fork @2830 W. Edgewood Dr	40	10/21/2009	0.02" rain at Fairchild Airport in prior two days.	Slow moving water	
SK_fecal	18	267	Dry WF 1.2	Dry W Fork @2830 W. Edgewood Dr		8/27/2009	No Recent Rain	No Water - Dry. Regular monitorig site visit #8359	
SK_fecal	18	267	Dry WF 1.2	Dry W Fork @2830 W. Edgewood Dr	250	5/4/2009	0.8 sample & field rep) exceeded		

Attachment M

Summary of B-IBI Sampling Data

Benthic Index of Biological Integrity

Date of report: *3/22/2010*

NOTE: DATA ARE PROVISIONAL, SUBJECT TO FINAL CHECKS AND FINAL DECISIONS ON TAXA ECOLOGICAL ATTRIBUTES UNDERLYING THE B-IBI METRICS

Scores and ratings are for the genus-level B-IBI for Puget Sound Lowland Streams, a multimetric index of ecological integrity based on population samples of benthic macroinvertebrates (underwater spineless creatures visible to the naked eye) taken in the fall. For more information, see http://www.clallam.net/streamkeepers and http://www.cbr.washington.edu/salmonweb/

B-IBI score ratings and definitions:

50-46: Healthy—Supporting the full range of biological diversity expected for that site.
44-36: Compromised—Many of the most sensitive species no longer present. Impacts expected to one or more salmon life-stages.
34-28: Impaired—Notable loss of biodiversity and key species (mayflies, stoneflies, && caddisflies). Not likely to support self-sustaining salmon populations.
26-18: Highly impaired—Substantial loss of once-native life-forms, with taxa richness reduced by about half. Highly adverse conditions for salmon.
16-10: Critically impaired—Increasingly dominated by species adapted to disturbed environments.

Notes regarding replicates and QC ratings:

*REPLICATE COUNTS: Samples ideally consist of three replicates, each with at least 250 specimens. If any replicates have < 250 specimens, some replicates may be combined or discarded, yielding "revised replicates," which are reflected below in the replicate counts. For further details, see "Level III Macroinvertebrate Analysis" on Streamkeepers' website. * indicates that the replicate was subsampled due to its containing >550*
QC COLUMN: "A" denotes "Acceptable" data; "Q" denotes "Questionable" data, meaning that QA procedures were not completely followed or documented, or specimen counts were below QA targets, but that program managers believe the data to be reasonably accurate nonetheless. Unacceptable data not reported.

Site/Date	VisitID	Score	QC	Replicate Counts			Rating	Project	
Alckee 0.1				**Alckee near mouth**					
9/1/1998	7572	48	A	571	461	538	Healthy	Quileute Tribe B-IBI Sampling	
Bagley 0.0				**Bagley ~200' u/s of mouth**					
10/7/2005	6123	40	A	533*	505*	504*	Compromised	SK_suite	
Bagley 0.1				**Bagley ~400' u/s of mouth**					
10/9/1999	337	34	A	927	409	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
Bagley 0.7				**Bagley d/s of Discovery Trail bridge**					
10/11/2000	78	30	A	509	523	297	Impaired	SK_suite	
10/13/2001	286	30	A	556*	1273	626*	Impaired	SK_suite	
10/15/2002	1129	32	A	260	583*	595	Impaired	SK_suite	
10/8/2003	3933	36	A	755	1063	700	Compromised	SK_suite	
10/9/2006	7200	40	A	506*	449	502*	Compromised	SK_suite	
9/25/2008	8227	44	A	505*	507*	337	Compromised	SK_suite	
Bagley 1.2				**Bagley d/s of Hwy 101**					
10/9/1999	338	32	A	1197	991	507	Impaired	SK_suite	
10/11/2000	79	30	A	718	446	489	Impaired	SK_suite	
10/13/2001	287	32	A	653	1403	950	Impaired	SK_suite	
Bagley 1.8				**Bagley nr. S. Bagley Creek Rd**					
10/9/1999	342	32	A	875	668	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
10/11/2000	80	30	A	615	935	819	Impaired	SK_suite	
Bagley 4.6				**Bagley @ Merrill Estates**					
10/14/2001	298	42	A	1027	1250	1545	Compromised	SK_suite	
10/15/2002	1121	38	A	647	944	535	Compromised	SK_suite	
10/15/2007	7530	34	A	692*	768*	561*	Impaired	SK_suite	
Bagley 6.2				**Bagley @Township Line Rd**					
10/10/2005	6125	38	A	454	383	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250
Barnes 0.0				**Barnes Creek mouth**					
10/6/2001	1722	38	A	510	447	--	Compromised	OPI Biomon	Caution:1 or 2 original rep counts <250
9/21/2002	1614	32	Q	454	250	458	Impaired	OPI Biomon	
10/10/2003	4643	34	A	268	396	335	Impaired	OPI Biomon	

Barnes 0.1					***Barnes ~350' u/s from mouth***			
10/10/2005	6096	36	A	504*	503*	505*	Compromised	OPI Biomon
Barnes 0.9					***Barnes u/s of Marymere trail bridge***			
10/11/2005	6091	42	A	502*	509*	511*	Compromised	OPI Biomon
Bear (Salt) 0.0					***Bear @ confluence w/Salt Cr.***			
10/3/2005	6115	42	A	520*	526*	506	Compromised	SK_suite
Bear (Sol Duc) 0.1					***Bear u/s of Hwy 101***			
9/19/2000	60	44	A	828	907	760	Compromised	SK_suite
9/16/2001	314	46	A	945	1049	788	Healthy	SK_suite
10/13/2002	1289	46	A	906	759	951	Healthy	SK_suite
Bear (Sol Duc) 2.5					***Bear @ Misty Creek Lane***			
9/19/2000	61	42	A	1909	1573	2015	Compromised	SK_suite
9/16/2001	303	44	A	2203	1223	2761	Compromised	SK_suite
Bear (Sol Duc) 4.8					***Bear @~200ft u/s of confluence w/Bear SF***			
9/1/1998	7577	46	A	565	568	646	Healthy	Quileute Tribe B-IBI Sampling
Bear (Sol Duc) 5.1					***Bear @powerlines on West Twin Rd***			
9/20/2000	64	44	A	613*	676*	845*	Compromised	SK_suite
9/15/2001	316	42	A	1251	1330	2199	Compromised	SK_suite
10/12/2002	1293	46	A	1992	668*	703*	Healthy	SK_suite
10/16/2006	7241	44	A	523	511	545	Compromised	SK_suite
Bear (Sol Duc) SF 0.2					***Bear SF d/s of West Twin Rd***			
9/20/2000	63	44	A	612*	588*	665*	Compromised	SK_suite
9/15/2001	315	48	A	1804	1412	1268	Healthy	SK_suite
10/12/2002	1290	48	A	866	1218	1293	Healthy	SK_suite
Bear (Sol Duc) SF 0.2a					***Bear SF 100ft u/s of West Twin Rd bridge***			
9/1/1998	7576	48	A	507	532	657	Healthy	Quileute Tribe B-IBI Sampling
Bell 0.1					***Bell ~320 ft. d/s of Schmuck Rd***			
10/10/1999	461	22	A	1487	854	1320	Highly impaired	SK_suite
10/1/2000	44	18	A	255	437	482	Highly impaired	SK_suite
9/30/2001	312	16	Q	551	354	463	Critically impaired	SK_suite
10/11/2005	6127	14	A	344	537*	460	Critically impaired	SK_suite
Bell 0.5					***Bell @ Sequim treatment plant***			
10/10/1999	223	30	A	1521	564	1910	Impaired	SK_suite
Bell 0.8					***Bell @ Spath DOT site***			
10/26/2002	1303	18	A	563*	705	736*	Highly impaired	SK_suite
10/17/2003	3948	14	A	5132	352	4534	Critically impaired	SK_suite
Bell 1.0					***0.3 mile d/s of Rhodefer Rd, u/s of WSDOT restoration***			
9/30/2008	8239	16	A	503*	503*	502*	Critically impaired	SK_suite
Bell 1.8					***Bell u/s of Brown Rd***			
10/4/2000	45	22	A	682	1063	987	Highly impaired	SK_suite

Cassalery 0.5							***Cassalery 300' d/s of Jamestown Rd***			
10/10/1999	462	22	A	325	488	346	Highly impaired	SK_suite		
9/22/2000	81	18	A	425	570	667	Highly impaired	SK_suite		
9/22/2001	305	24	A	455	--	--	Highly impaired	SK_suite	Caution:1 or 2 original rep counts	<250
Cassalery 0.6							***Cassalery @ Jamestown Rd.***			
10/1/2002	1312	18	A	500	345	--	Highly impaired	SK_suite	Caution:1 or 2 original rep counts	<250
10/9/2008	8209	22	A	506*	508*	500*	Highly impaired	SK_suite		
Cassalery 1.1							***Cassalery u/s of Taylor Ranch Rd***			
9/25/1999	276	16	A	491	400	--	Critically impaired	SK_suite	Caution:1 or 2 original rep counts	<250
9/22/2000	82	20	A	440	2994	1121	Highly impaired	SK_suite		
10/1/2002	1314	20	A	278	448	501	Highly impaired	SK_suite		
Cassalery 1.6							***Cassalery @ Clary Lane***			
9/25/1999	277	16	A	479	618	--	Critically impaired	SK_suite	Caution:1 or 2 original rep counts	<250
10/13/2000	83	26	A	696	1243	1272	Highly impaired	SK_suite		
9/22/2001	306	14	Q	944	--	--	Critically impaired	SK_suite	Caution:1 or 2 original rep counts	<250
10/1/2002	1313	16	A	619	523	--	Critically impaired	SK_suite	Caution:1 or 2 original rep counts	<250
10/9/2008	8203	22	A	506*	504*	507*	Highly impaired	SK_suite		
Clallam 2.4							***Clallam R @ 390 Weel Rd***			
10/5/2004	6215	34	A	543*	582*	577*	Impaired	WRIA 19 B-IBI Sampling 2004		
9/27/2007	7496	36	A	1383	356	974	Compromised	SK_suite		
Clallam 5.4							***Upper Clallam Bugs 2004***			
10/5/2004	6298	44	A	564*	569*	569*	Compromised	WRIA 19 B-IBI Sampling 2004		
Deep 0.9							***Lower Deep Bugs 2004***			
10/11/2004	6304	40	A	317	284	571*	Compromised	WRIA 19 B-IBI Sampling 2004		
Deep 1.5							***Upper Deep Bugs 2004***			
10/13/2004	6312	46	A	524	582*	388	Healthy	WRIA 19 B-IBI Sampling 2004		
Dry 0.8							***Dry Cr d/s of fork at Kacee Way, u/s of falls***			
10/3/2007	7512	20	A	536*	550*	575*	Highly impaired	SK_suite		
Dry 2.2							***Dry Cr @ 2844 W. Edgewood Dr.***			
9/25/2005	6141	44	A	515*	510*	514*	Compromised	SK_suite		
Dungeness 0.7							***Dungeness d/s of Schoolhouse Bridge near WDFW traps on Rivers End Rd***			
10/12/2004	4916	36	A	1860	3009	1081*	Compromised	SK_suite		
9/27/2006	7227	24	A	518*	569*	513*	Highly impaired	SK_suite		
Dungeness 03.0							***Dungeness @ Mary Wheeler County Park S. off Ward Rd. d/s of Woodcock Bridge***			
9/26/2007	7518	42	A	1275*	776*	678*	Compromised	SK_suite		
Dungeness 05.9							***Dungeness @ RR bridge***			
9/27/2005	6116	42	A	412	505*	--	Compromised	SK_suite	Caution:1 or 2 original rep counts	<250
9/27/2006	7228	38	A	509*	505*	512*	Compromised	SK_suite		
9/27/2007	7511	36	A	588*	659*	735*	Compromised	SK_suite		
9/25/2008	8230	38	A	501*	501*	503*	Compromised	SK_suite		

Dungeness 06.6a ***Dungeness rb side-channel u/s of Hwy 101***

10/14/2004	4917	34	A	271	262	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
9/27/2007	7509	34	A	508	525*	552*	Impaired	SK_suite	

Dungeness 07.8 ***Dungeness @ #364 Meadows Development***

9/27/2005	6131	40	Q	635	531	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250

Dungeness 11.6 ***Dungeness 0.2 mi d/s of USGS gage***

10/14/2004	4915	34	A	323	288	664	Impaired	SK_suite

Dungeness 15.7 ***Dungeness d/s of Gray Wolf***

9/30/2005	6143	42	A	504*	528*	511*	Compromised	SK_suite

E. Twin R 1.2a ***Lower E. Twin R Bugs 2004***

10/12/2004	6305	46	A	508	581	--*	Healthy	WRIA 19 B-IBI Sampling 2004	Caution:1 or 2 original rep counts <250

E. Twin R 1.9a ***Upper E. Twin R Bugs 2004***

10/12/2004	6306	40	A	635*	458	549*	Compromised	WRIA 19 B-IBI Sampling 2004

Elk 1.9 ***Elk Cr. @ Stagecoach Pass (lower end of purchase)***

10/16/2005	6051	48	A	533*	479	503*	Healthy	SK_suite

Elk 2.9 ***Elk Creek trail d/s of Stringer Creek***

10/17/2006	7240	42	A	511*	559*	544*	Compromised	SK_suite

Ennis 0.1 ***Ennis @ PA treatment plant***

9/19/2000	73	32	A	314	278	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
9/16/2001	308	30	A	453	--	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
10/4/2002	1365	28	A	109	46	61	Impaired	SK_suite	Caution: All 3 rep counts <250
10/5/2003	3672	26	A	49	102	40	Highly impaired	SK_suite	Caution: All 3 rep counts <250
10/6/2007	7516	32	A	431	611	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250

Ennis 1.4 ***Ennis @ Del Guzzi Dr.***

9/19/2000	74	32	A	355	528	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
9/16/2001	309	34	A	155	94	168	Impaired	SK_suite	Caution: All 3 rep counts <250
10/3/2002	1320	30	A	78	190	172	Impaired	SK_suite	Caution: All 3 rep counts <250
10/5/2003	3671	30	Q	110	47	18	Impaired	SK_suite	Caution: All 3 rep counts <250
10/17/2004	4929	36	A	842	513	410	Compromised	SK_suite	
10/6/2007	7519	38	A	515	641	860	Compromised	SK_suite	

Ennis 1.7 ***Ennis ~400ft d/s of powerline clearing***

10/18/2004	4934	32	A	507	867	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
10/6/2005	6099	32	A	115	84	212	Impaired	SK_suite	Caution: All 3 rep counts <250
9/22/2008	8211	40	A	503*	506*	504*	Compromised	SK_suite	

Ennis 2.2 ***Ennis @1603/5 Golf Course Rd***

10/9/2007	7517	42	A	352	620	351	Compromised	SK_suite

Ennis 6.6 ***Ennis @ Heart of the Hills Campground off Loop A***

10/21/2005	6092	42	A	511*	528*	298	Compromised	SK_suite

Gray Wolf 0.9 ***Gray Wolf 728' d/s of bridge***

10/1/2007	7510	44	A	555*	597*	535*	Compromised	SK_suite

Gray Wolf 1.0 ***Gray Wolf @ bridge 1 mi. u/s of Dung Forks***

10/10/2004	4923	40	A	892	886	1043	Compromised	SK_suite

Gunderson WF 0.6 ***Gunderson WF ~1250' N of DNR rd***

9/1/1998	7580	48	A	499	693	516	Healthy	Quileute Tribe B-IBI Sampling	

Hoh Trib WDFW 20-0509 0.1 ***Hoh Trib LB ~1 mi. u/s of Twin Cr, ~300' from mouth***

9/1/1998	7583	44	A	459	480	518	Compromised	Quileute Tribe B-IBI Sampling	

Hoko 03.2 ***Hoko just d/s of confluence w/Little Hoko***

9/11/2009	8404	38	A	545	476	513*	Compromised	SK_suite	

Hoko 03.2a ***Lower Hoko Bugs 2004***

10/4/2004	6302	30	A	602*	337	521	Impaired	WRIA 19 B-IBI Sampling 2004	

Hoko 09.5 ***Hoko d/s of Makah Hatchery***

10/5/2004	6311	38	A	594*	574*	624*	Compromised	WRIA 19 B-IBI Sampling 2004	

Hoko 18.0 ***Upper Hoko2 Bugs 2004***

10/7/2004	6310	38	A	619*	577*	590*	Compromised	WRIA 19 B-IBI Sampling 2004	

Hughes 0.0 ***Hughes Creek 150' u/s of mouth***

10/3/2006	7190	44	A	526*	527*	552*	Compromised	SK_suite	

Indian 0.3 ***Indian 23' u/s of depth gauge @ Lk Aldwell Rd bridge***

10/11/2006	7206	46	A	508*	535*	519*	Healthy	SK_suite	

Indian 4.5 ***Indian Cr u/s of Joyce Access Rd Bridge***

9/26/2007	7490	38	A	862*	648*	540*	Compromised	SK_suite	

Indian 4.9 ***Indian Cr d/s of 101 bridge nr S. Shore Rd.***

10/11/2006	7209	34	A	514*	546*	541*	Impaired	SK_suite	
9/26/2007	7491	24	A	759*	623*	615*	Highly impaired	SK_suite	

Jackson 0.1 ***Jackson Cr ~400' from mouth***

9/1/1998	7584	48	A	466	514	528	Healthy	Quileute Tribe B-IBI Sampling	

Jimmycomelately 0.1 ***JCL upstream of Old Blyn Hwy; old site pre 2004***

9/30/2000	42	34	Q	1450	--	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
9/29/2001	313	38	A	561	2637	1658	Compromised	SK_suite	
10/10/2002	1285	42	A	557*	534*	551*	Compromised	SK_suite	
10/5/2003	3669	36	Q	971	1618	3082	Compromised	SK_suite	

Jimmycomelately 0.2 ***JCL u/s of Hwy 101; old site pre 2004***

10/5/2000	43	34	A	454	568	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
10/10/2002	1286	38	A	564*	542*	543*	Compromised	SK_suite	

Jimmycomelately 0.2a ***JCL u/s of Hwy 101 - restored channel***

9/25/2004	4898	14	A	596	257	289	Critically impaired	SK_suite	
9/25/2005	6047	18	A	136	69	41	Highly impaired	SK_suite	Caution: All 3 rep counts <250
10/4/2006	7229	36	A	547*	506*	540*	Compromised	SK_suite	
10/7/2007	7524	32	A	276	271	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
9/4/2009	8398	34	A	474	502	--*	Impaired	SK_suite	Caution:1 or 2 original rep counts <250

Jimmycomelately 0.4 ***JCL d/s of E spur rd. @ end of Correa Rd.***

10/22/2004	4952	24	A	75	9	83	Highly impaired	SK_suite	Caution: All 3 rep counts <250
9/25/2005	6134	34	A	476	393	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
10/4/2006	7231	40	A	523*	508*	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250

Jimmycomelately 0.6 ***JCL @Corriea Rd***

10/1/2001	307	36	Q	466	285	290	Compromised	SK_suite	
10/11/2002	1287	32	Q	368	305	622	Impaired	SK_suite	
10/5/2003	3670	48	A	688	1234	1680	Healthy	SK_suite	
10/16/2004	4914	42	A	1262	1582	1267	Compromised	SK_suite	
9/4/2009	8399	46	A	519*	506*	523*	Healthy	SK_suite	

Jimmycomelately 0.8 ***JCL @ Woods Rd***

10/11/2002	1288	38	A	1025	1168	944	Compromised	SK_suite	
10/3/2005	6130	42	A	289	370	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250
10/10/2007	7525	42	A	727*	656*	683*	Compromised	SK_suite	

Johnson 0.0 ***Johnson u/s of Marina***

10/9/1999	283	40	A	487*	534	1186	Compromised	SK_suite

Johnson 0.6 ***Johnson d/s of Hwy 101 @ ODT bridge***

10/9/1999	284	40	A	733	651	707	Compromised	SK_suite

Johnson 2.0 ***Johnson u/s of Smith Lake trib WDFW #0302***

10/10/2007	7526	44	A	585*	625*	664*	Compromised	SK_suite

Lake 0.6 ***Lake ~300' u/s of Hwy 101***

9/18/2000	58	16	Q	14	30	28	Critically impaired	SK_suite	Caution: All 3 rep counts <250
9/19/2001	317	22	A	619	533	--	Highly impaired	SK_suite	Caution:1 or 2 original rep counts <250

Lake 4.5 ***Lake Creek ~0.2 mi u/s of Lake Pleasant***

9/1/1998	7571	42	A	614	498	570	Compromised	Quileute Tribe B-IBI Sampling

Lake 5.5 ***Lake Creek ~1 mi u/s of L Pleasant***

10/5/2007	7513	40	A	542*	557*	486	Compromised	SK_suite

Lake trib WDFW 20-0318 RM 0.9 ***Lake (trib) u/s of Lake Pleasant***

9/19/2000	120	48	A	1331	1046	1684	Healthy	SK_suite
9/15/2001	302	48	A	1785	2102	564	Healthy	SK_suite
10/13/2002	1296	46	A	536	980	339	Healthy	SK_suite

Lees 0.1 ***Lees d/s of E. Hidden Way***

10/7/2000	55	30	A	518	974	631	Impaired	SK_suite	
9/21/2002	1310	34	A	428	337	--	Impaired	SK_suite	Caution:1 or 2 original rep counts <250
9/29/2006	7191	38	A	489	540*	545*	Compromised	SK_suite	

Lees 0.6 ***Lees d/s of Hwy 101***

10/14/1999	220	38	A	319	255	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250
10/11/2000	56	42	A	388	1000	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250
10/6/2001	239	42	A	308	367	500	Compromised	SK_suite	
9/20/2003	3663	46	A	1840	2287	2318	Healthy	SK_suite	
10/10/2006	7195	38	A	387	511*	534*	Compromised	SK_suite	

Lees 0.7 ***Lees @end of S. Bay View Ave d/s of private bridge***

10/15/2007	7515	38	A	676	576*	550*	Compromised	SK_suite

Lees 0.8					***Lees d/s of Leighland Av***				
10/14/1999	221	36	A	609	703	639	Compromised	SK_suite	
10/12/2000	57	36	A	1650	1147*	949	Compromised	SK_suite	
10/6/2001	240	40	A	2503	1559	2435	Compromised	SK_suite	
9/21/2002	1311	34	A	635	966	635	Impaired	SK_suite	
Lost 0.0					***Lost Cr ~250' from mouth***				
9/1/1998	7582	46	A	601	528	580	Healthy	Quileute Tribe B-IBI Sampling	
Lyre 0.8					***Lyre @ end of E. Lyre River Rd***				
10/11/2004	6309	32	A	517*	568*	583*	Impaired	WRIA 19 B-IBI Sampling 2004	
9/27/2007	7495	30	A	770*	713*	536*	Impaired	SK_suite	
Lyre 4.2					***Lyre ~3/4 mi d/s of Lk Crescent***				
10/13/2004	6307	32	A	448	585*	594*	Impaired	WRIA 19 B-IBI Sampling 2004	
10/15/2008	8240	38	A	511*	506*	508*	Compromised	SK_suite	
McDonald 01.4					***McDonald ~0.3 mi d/s of Old Olympic Hwy***				
10/15/2009	8419	40	A	502*	505*	501*	Compromised	SK_suite	
McDonald 03.1					***McDonald u/s of Hwy 101***				
10/3/2008	8236	42	A	501*	505*	503*	Compromised	SK_suite	
McDonald 10.2					***McDonald off old Slab Camp trail from High Country Drive***				
10/3/2008	8237	48	A	504*	358	--	Healthy	SK_suite	Caution:1 or 2 original rep counts <250
Meadowbrook 2.0					***Meadowbrook d/s of culvert to Cole property, 4495 Sequim Dungeness Way***				
9/30/2008	8238	16	Q	506*	506*	502*	Critically impaired	SK_suite	
Mill 2.1					***Mill Creek d/s of Russell Rd***				
10/9/2008	8232	42	A	407	427	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250
Mill 3.6					***Mill @ Sportsman's Club Rd, ~60' past gate***				
10/9/2008	8231	40	A	287	344	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250
Mink Lake Cr. 0.0					***Mink Lake Creek jab Lovers Lane Trail Bridge ~150' u/s of Mouth @ Sol Duc***				
10/3/2006	7189	34	A	514*	509*	527*	Impaired	SK_suite	
Morse 0.3					***Morse @ 4 Seasons Ranch***				
10/1/1999	259	30	A	694	913	1116	Impaired	SK_suite	
9/15/2000	71	36	A	716*	621*	5445	Compromised	SK_suite	
9/15/2001	311	28	A	3176	671	880	Impaired	SK_suite	
9/28/2002	1321	40	A	627*	561*	628*	Compromised	SK_suite	
10/4/2003	3941	34	Q	119	126	85	Impaired	SK_suite	Caution: All 3 rep counts <250
Morse 1.1					***Morse u/s of Discovery Trail bridge***				
10/13/1998	6017	30	A	640	306	264	Impaired	Eight Streams Project	
10/1/1999	280	36	A	1455	525	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250
9/28/2002	1366	34	A	823	517	658	Impaired	SK_suite	
10/5/2007	7522	40	A	521*	720*	669*	Compromised	SK_suite	
Morse 1.5					***Morse @ N. end of 4 Seasons Park***				
10/11/2005	6093	38	A	543*	515*	533*	Compromised	SK_suite	
Morse 1.7					***Morse approx 500' d/s of 1.8***				
10/7/2006	7212	38	A	532*	512*	526*	Compromised	SK_suite	

Morse 1.8							***Morse @ 4 Seasons Park***			
10/3/1999	281	34	A	437	402	342	Impaired	SK_suite		
9/18/2000	72	32	A	2355	1036	1214	Impaired	SK_suite		
9/15/2001	310	40	A	784	463	--	Compromised	SK_suite	Caution:1 or 2 original rep counts	<250
Morse 4.0							***Morse @ power plant***			
10/11/2005	6094	36	A	523*	510	--	Compromised	SK_suite	Caution:1 or 2 original rep counts	<250
Morse 5.6							***Morse 100 ft d/s of PUD bridge***			
10/16/2004	4928	40	A	3971	605*	546*	Compromised	SK_suite		
Morse 5.6a							***Morse 100 ft u/s of PUD bridge***			
10/6/2006	7226	38	A	529*	510*	336	Compromised	SK_suite		
Peabody 0.2							***Peabody @ 2nd St, above final culvert***			
9/24/1998	6019	14	A	478	986	336	Critically impaired	Eight Streams Project		
10/17/1999	279	14	A	402	482	651	Critically impaired	SK_suite		
9/19/2009	8387	16	A	503*	545	535	Critically impaired	SK_suite		
Peabody 0.5							***Peabody u/s of Peabody St***			
9/24/1998	6020	16	A	465	--	--	Critically impaired	Eight Streams Project	Caution:1 or 2 original rep counts	<250
9/15/1999	225	20	A	384	593	814	Highly impaired	SK_suite		
Peabody 1.0							***Peabody @ 9th St***			
9/28/1998	6021	14	A	359	413	--	Critically impaired	Eight Streams Project	Caution:1 or 2 original rep counts	<250
10/17/1999	278	18	A	426	472	--	Highly impaired	SK_suite	Caution:1 or 2 original rep counts	<250
9/19/2009	8386	18	A	471	501*	301	Highly impaired	SK_suite		
Peabody 1.4							***Peabody @ ONP Visitor Ctr***			
11/1/2000	39	48	A	577	656	--	Healthy	SK_suite	Caution:1 or 2 original rep counts	<250
9/27/2008	8152	40	A	505*	503*	433	Compromised	SK_suite		
Pysht 4.2							***Lower Pysht2 Bugs 2004***			
10/6/2004	6317	32	A	221	203	161	Impaired	WRIA 19 B-IBI Sampling 2004	Caution: All 3 rep counts	<250
Pysht 6.5							***Pysht @25293 Hwy 112***			
10/6/2004	6313	32	A	586*	567*	567*	Impaired	WRIA 19 B-IBI Sampling 2004		
10/12/2008	8234	40	A	508*	509*	506*	Compromised	SK_suite		
Pysht 9.5							***Upper Pysht Bugs 2004***			
10/6/2004	6314	42	A	559*	563*	633*	Compromised	WRIA 19 B-IBI Sampling 2004		
Salt 1.5							***Salt @ upper junction of Camp Hayden Rd & CHPark Rd***			
10/2/2002	1319	38	A	574	750	794	Compromised	SK_suite		
10/3/2003	3930	38	A	1671	824	1359	Compromised	SK_suite		
10/2/2004	4906	36	A	1790	1859	1024	Compromised	SK_suite		
10/8/2006	7216	38	A	536*	548*	536*	Compromised	SK_suite		
Salt 4.2							***Salt ~150' d/s of WDFW #19-0010***			
10/2/2002	1317	38	A	600*	605*	718	Compromised	SK_suite		
10/3/2003	3931	48	A	1915	2231	1589	Healthy	SK_suite		
10/1/2004	4908	44	A	725	1776	1598	Compromised	SK_suite		
10/8/2006	7217	38	A	533*	543*	517*	Compromised	SK_suite		
10/11/2008	8151	46	A	509*	505*	511*	Healthy	SK_suite		

Salt 5.4							***Salt @ end of Salt Creek Rd., d/s of WDFW #19-0014***			
10/2/2002	1318	38	A	832	346	545*	Compromised	SK_suite		
10/3/2005	6118	44	A	547*	436	--	Compromised	SK_suite	Caution:1 or 2 original rep counts	<250
Salt 6.4							***Salt 750' below 585 Wasankari Rd***			
10/3/2004	4905	48	A	1477	1843	1323	Healthy	SK_suite		
Sekiu 2.5							***Lower Sekiu Bugs 2004***			
10/7/2004	6301	40	A	494	484	--	Compromised	WRIA 19 B-IBI Sampling 2004	Caution:1 or 2 original rep counts	<250
Sekiu 6.9							***Upper Sekiu Bugs 2004***			
10/6/2004	6303	42	A	556*	578*	569*	Compromised	WRIA 19 B-IBI Sampling 2004		
Shuwah 0.1							***Shuwah ~500' from mouth***			
9/1/1998	7581	46	A	565	606	--	Healthy	Quileute Tribe B-IBI Sampling	Caution:1 or 2 original rep counts	<250
Siebert 0.6							***Siebert @ 225 Gehrke Rd***			
10/16/2000	40	38	A	580	957	998	Compromised	SK_suite		
9/27/2001	241	32	A	1311	580	2165	Impaired	SK_suite		
10/7/2002	1122	40	A	707	1107	561*	Compromised	SK_suite		
10/8/2003	3942	40	A	1437	603	1199	Compromised	SK_suite		
10/1/2004	4910	38	A	1193	783	1219	Compromised	SK_suite		
10/7/2005	6121	36	A	520*	512*	506*	Compromised	SK_suite		
10/9/2006	7218	34	A	434	509*	554*	Impaired	SK_suite		
9/30/2007	7487	40	A	784*	1042*	851*	Compromised	SK_suite		
9/25/2008	8229	40	A	507*	504*	506*	Compromised	SK_suite		
Siebert 3.0							***Siebert @ Miletich Lane***			
10/16/2000	41	38	A	982	639	845	Compromised	SK_suite		
9/27/2001	243	36	A	980	1101	411	Compromised	SK_suite		
10/7/2002	1123	36	A	703	1053	584	Compromised	SK_suite		
10/15/2003	3943	42	A	1548	1385	759	Compromised	SK_suite		
Siebert 3.8							***Siebert @ Conner Road***			
9/24/2001	244	40	A	584	726	444	Compromised	SK_suite		
10/17/2002	1128	42	A	919	861	1041	Compromised	SK_suite		
10/9/2003	3927	46	A	412	490	1282	Healthy	SK_suite		
Siebert WF 2.3							***Siebert WF just inside ONP***			
10/8/2002	1124	46	A	547	297	519	Healthy	SK_suite		
10/13/2005	6107	48	A	456	354	425	Healthy	SK_suite		
Sitkum 0.0							***Sitkum u/s of mouth***			
9/1/1998	7575	40	A	588	554	670	Compromised	Quileute Tribe B-IBI Sampling		
9/24/2009	8402	42	A	505*	510*	509*	Compromised	SK_suite		
Skunk 0.1							***Skunk ~500ft u/s of confluence with E. Fork Dickey***			
9/1/1998	7578	32	A	505	438	767	Impaired	Quileute Tribe B-IBI Sampling		
Sol Duc SF 0.0							***Sol Duc S. Fork @ mouth***			
9/1/1998	7573	44	A	552	522	517	Compromised	Quileute Tribe B-IBI Sampling		

Thunder 0.8					***Thunder creek ~100ft u/s of logging rd bridge crossing***				
9/1/1998	7579	40	A	519	486	587	Compromised	Quileute Tribe B-IBI Sampling	
Tom 0.0					***Tom @ mouth***				
9/1/1998	7574	46	A	509	403	346	Healthy	Quileute Tribe B-IBI Sampling	
Tumwater 0.1a					***Tumwater @ 3rd St. u/s of LB storm drain input***				
9/11/2004	4882	28	Q	127	134	81	Impaired	SK_suite	Caution: All 3 rep counts <250
9/22/2007	7485	36	A	557*	387	657*	Compromised	SK_suite	
Tumwater 4.4					***Tumwater u/s of 3142 Black Diamond Rd***				
9/22/2007	7486	46	A	698	636	667	Healthy	SK_suite	
Twin (Hoh) 0.1					***Twin Cr u/s of Hoh Valley Rd***				
9/1/1998	7586	46	A	467	594	522	Healthy	Quileute Tribe B-IBI Sampling	
Valley 0.4					***Valley @ 6th St, u/s of final culvert 220ft***				
10/15/2000	48	28	Q	1037	1732	2273	Impaired	SK_suite	
10/14/2001	246	34	A	1204	988	1171	Impaired	SK_suite	
10/6/2002	1315	36	Q	611	306	561	Compromised	SK_suite	
Valley 0.7					***Valley @ 12th St***				
10/2/1999	343	38	A	791	515	--	Compromised	SK_suite	Caution:1 or 2 original rep counts <250
Valley 1.0					***Valley @ "flatbed" bridge @ 14th St***				
10/12/2003	3944	42	A	4126	1081*	557*	Compromised	SK_suite	
10/10/2004	4922	40	A	846*	827*	734*	Compromised	SK_suite	
10/9/2005	6137	38	A	514*	514*	511*	Compromised	SK_suite	
10/7/2007	7501	40	A	943*	645*	638*	Compromised	SK_suite	
Valley 1.2					***Valley d/s of Hwy 101***				
10/2/1999	344	44	A	318	1686	1403	Compromised	SK_suite	
Valley 2.2					***Valley d/s of E Valley (Mill Cr) mouth***				
10/19/2000	50	46	A	1507	854	1302	Healthy	SK_suite	
10/14/2001	249	42	A	738	986	498	Compromised	SK_suite	
10/5/2002	1316	42	A	339	938	621*	Compromised	SK_suite	
10/14/2006	7205	42	A	516*	510*	542*	Compromised	SK_suite	
Valley 2.2a					***Valley Cr u/s of E Valley (Mill Cr) @trail Xing***				
10/9/2005	6140	46	A	533*	543*	543*	Healthy	SK_suite	
Valley EF 0.2					***Valley EF approx. 900ft d/s of Laurel***				
10/4/2008	8196	42	A	501*	300	343	Compromised	SK_suite	
W. Twin R 0.1					***W. Twin R above Hwy 112 bridge***				
10/20/2009	8465	42	A	335	466	410	Compromised	SK_suite	
W. Twin R 0.3					***Lower W. Twin R Bugs 2004***				
10/13/2004	6299	38	A	373	531	622*	Compromised	WRIA 19 B-IBI Sampling 2004	
W. Twin R 1.0					***Upper W. Twin R Bugs 2004***				
10/12/2004	6300	46	A	590*	352	441	Healthy	WRIA 19 B-IBI Sampling 2004	

Attachment N

City of Port Angeles Public Works and Utilities Maintenance Facility
("Corp Yard")
Stormwater Pollution Prevention Plan (SWPPP)

Effective 8/20/2007

CITY OF PORT ANGELES PUBLIC WORKS AND UTILITIES MAINTENANCE FACILITY ("CORP YARD") STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

August 2007

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QUICK REFERENCE GUIDE

This Stormwater Pollution Prevention Plan (SWPPP) contains detailed information needed to perform and maintain best management practices (BMPs) to prevent stormwater pollution. The following table summarizes the primary action items that the users of the plan will perform on a recurring basis.

Frequency	Action
Per Event (daily)	P2 team and other facility personnel note spills, leaks, and other possible pollutants to stormwater system. Note: part of the facility's surface water drainage connects to the sanitary sewer as shown on the site map (Figure 2-3). • Notify P2 team leader of problems. • Note changes to facility that could affect stormwater quality and notify P2 team leader.
Dry Season July – Sept	• Conduct one dry-weather inspection during the period July-September after 7 days dry weather (complete Form 1) • Prior to start of the wet season, remove accumulated sediments in catch basins and other BMPs; clean up debris, old equipment, and other materials exposed to rainfall
Wet Season Oct – June	• Conduct quarterly wet weather monitoring once per quarter in each of three quarters during the period October-June (complete Form 2)
Quarterly	• Inspect all material storage areas, areas of industrial activity and BMPs, perform maintenance as needed once per quarter (complete Form 3)
Annual	• Conduct employee training (complete Form 4) • Update SWPPP

1. INTRODUCTION

1.1. BACKGROUND

This Stormwater Pollution Prevention Plan (SWPPP) applies to the City of Port Angeles Public Works and Utilities Maintenance and Operations Facility (also known as the "Corp yard"), located at 1703 South B Street, Port Angeles, WA 98362. This SWPPP provides a facility assessment which includes a site map, an identification of activities and materials; and identifies the related maintenance, monitoring and inspection of stormwater best management practices (BMPs).

There are no applicable National Pollution Discharge Elimination System (NPDES) stormwater permits for this facility or for the City of Port Angeles in place at the time this SWPPP was prepared. The facility is not owned or operated by a private entity that would be potentially subject to an NPDES Industrial Stormwater General Permit (ISGP).

The City is currently covered under the NPDES Municipal Separate Storm Sewer System (MS4) Phase II permit.

Because portions of the facility encompass certain activities that could potentially be considered "industrial", this SWPPP has been prepared to be consistent with the ISGP requirements and guidelines for a SWPPP where appropriate (WDOE, 2004 and 2005).

Flow controls (detention/retention) are not currently required for this facility or vicinity. However, if significant facility redevelopment occurs, or a local basin plan becomes effective, an appropriate level of flow control would need to be determined.

1.2. GOALS AND OBJECTIVES

This SWPPP is intended to satisfy the following goals:

1. To implement and maintain Best Management Practices (BMPs) that identify, reduce, eliminate, and/or prevent the discharge of stormwater pollutants;
2. To prevent violations of surface water quality, ground water quality, or sediment management standards; and.
3. To eliminate the discharges of unpermitted process wastewater, domestic wastewater, non-contact cooling water, and other illicit discharges to stormwater drainage systems.

Given these goals, the plan provides for satisfying the following objectives:

1. Identify potential sources of stormwater pollution that may affect the quality of stormwater discharges associated with the City's Public Works and Utilities Department maintenance facility operations;
2. Evaluate the potential for stormwater contamination from these sources;
3. Identify the stormwater BMPs that will be used at the facility for the prevention and control of pollutants in stormwater discharges; and
4. Identify operation, maintenance, inspections, monitoring and record keeping needed for these BMPs.

The SWPPP will be reviewed by the pollution prevention (P2) team annually to ensure that the elements of the plan are effective. Modifications to the SWPPP will be made as needed to reflect changing conditions at the facility, such as new or differing operations, facility modifications, and BMPs.

1.3. PLAN ORGANIZATION

The SWPPP has been prepared to follow the general requirements as appropriate in the Guidance Manual for Preparing/Updating a Stormwater Pollution Prevention Plan for Industrial Facilities issued by the WA Department of Ecology (WDOE, 2004). While this guidance manual applies to certain facilities covered under the ISGP, the Corp Yard facility is not covered by the ISGP. The facility map, tables of information and inspection forms are based on the format of the worksheets in the ISGP SWPPP guidance manual. Blank copies of inspection and record keeping forms are contained in the Appendix.

1.4. POLLUTION PREVENTION (P2) TEAM

An important part of this SWPPP and a principal BMP is the stormwater pollution prevention (P2) team, which is identified in Table 1-1 below. These Public Works staffers have certain responsibilities in implementing this SWPPP as outlined in the table. This table should be updated when roles and responsibilities change.

1.5. REVISIONS

This SWPPP should be revised for significant updates that affect BMPs, the facility (activities, materials, and drainage) or other reasons that could significantly affect stormwater quality. Revisions for typographical errors in the SWPPP or improving the quality of the map or other changes that are more administrative in function would not require a revision to the SWPPP. Facility information that could be subject to change is contained in summary tables and a site map (Figure 2-3) that can be readily updated as needed in the future and attached to the SWPPP as amendments.

Table 1-1 Pollution Prevention Team

POLLUTION PREVENTION TEAM	**CITY OF PORT ANGELES MAINTENANCE FACILITY**	Completed By: M. Puntenney Title: _____ Date: November 2006
Position	**Phone**	**Responsibilities**
Deputy Director of Public Works and Utilities, Operations	360-417-4802	Leader, overall coordination (Facility Manager).
Fleet Manager, Equipment Services Division	360-565-3860	1. Performs SWPPP inspections, visual monitoring, SWPPP updates and keeps the SWPPP file. 2. Performs/Updates BMPs for Automotive maintenance shop, fueling, used fluid management.
Superintendent, Streets & Parks Maintenance Division	360-417-4825	Performs/Updates BMPs for maintenance, sweeping, and aggregate stockpile control.
Superintendent, Water and Wastewater Collection Division	360-417-4855	Performs/Updates BMPs for oil-water separator (OWS) cleaning and, sewer/storm lines and catch-basins.
Superintendent, Solid Waste Division	360-417-4872	Performs/Updates BMPs for vehicle wash area.
Manager, Light Operations Division	360-417-4731	Performs/Updates BMPs for Transformer yard management, SPCC. implementation
Superintendent, Waste Water Treatment Plant	360-417-4845	Permitting issues.

2. FACILITY ASSESSMENT

This section provides an overview of the facility, the existing operations, industrial activities, general drainage pathways, materials stored or used onsite, and potential pollutant sources.

2.1. OVERVIEW OF FACILITY AND OPERATIONS

This approximately six-acre site is located in the southwest portion of the City of Port Angeles, Washington. See Figure 2-1. The facility is bounded by A and B streets on the West and East sides, and 16th Street and Lauridsen Blvd on the North and South sides, respectively. See Figure 2-2.

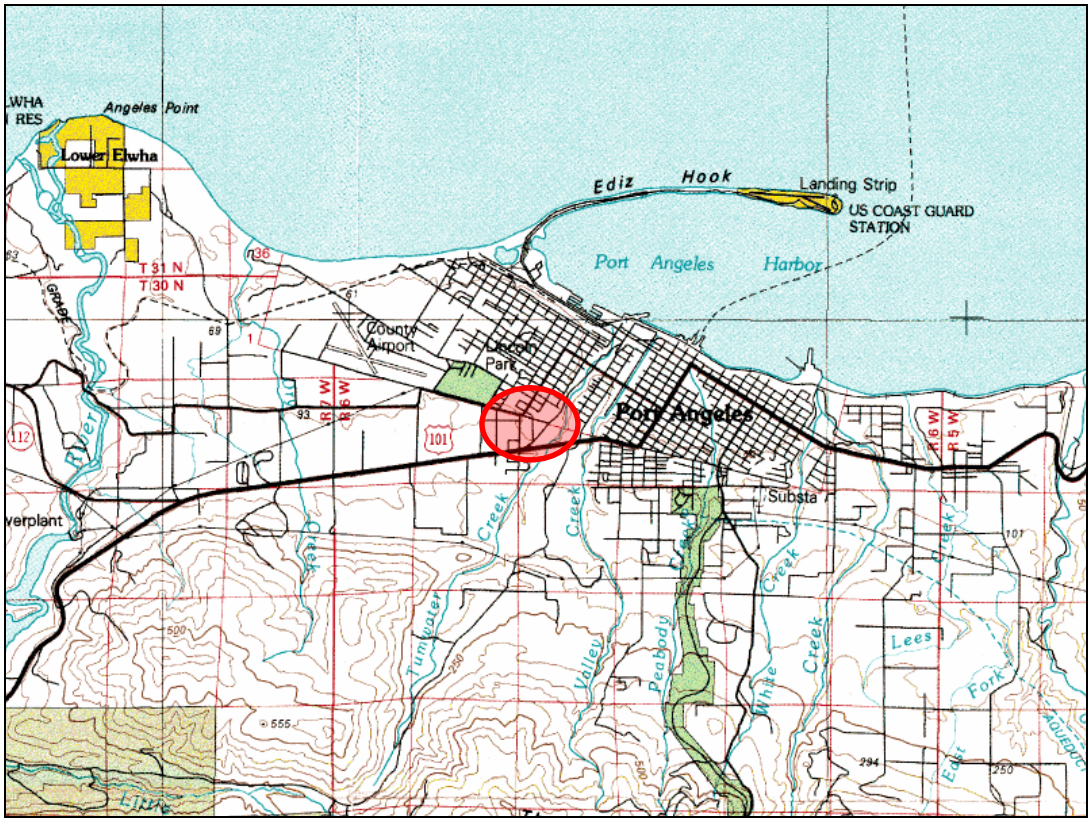


Figure 2-1 Area Map

This facility serves multiple functions for the City's Public Works and Utilities Department including:

- Fleet vehicle maintenance (public works, solid waste trucks, fire trucks, etc)
- Road maintenance (storage and distribution of repair materials, aggregate, and debris)
- Winter Road Safety (traction sand and deicer storage and distribution)

- Utilities (storage and servicing of transformers, utility poles and miscellaneous power and water utility equipment)
- Drainage maintenance (catch basin sediment, street sweepings, other debris)
- Landscape and Park maintenance (landscaping chemical storage, mowers)
- Parking of private and public works vehicles in buildings and paved areas (cars, trucks, sweepers, eductor ("vactor") trucks)

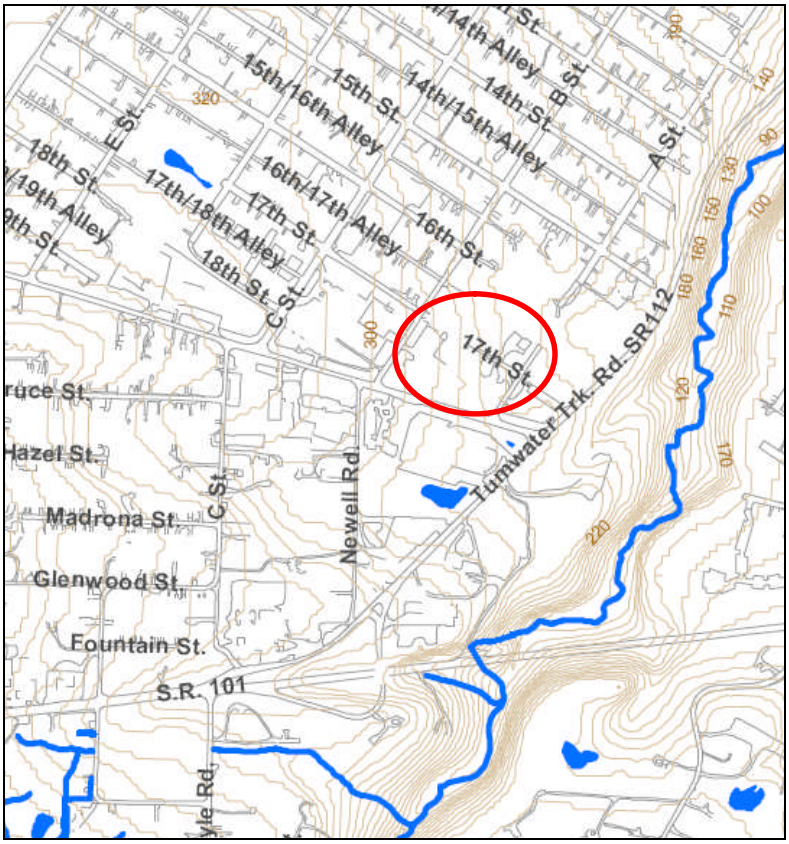


Figure 2-2 Vicinity Map

2.2. FACILITY DRAINAGE

Approximately one half of the paved areas and some rooftop areas drain to the local sanitary (combined) sewer, while the remainder of the paved areas and rooftops drain to a separate storm drainage system. The five material storage areas do not have constructed drainage systems, and only one is paved (the others are gravel surfaced). The approximate drainage areas of the buildings, paved areas, and material storage areas are shown on the site map. See Figure 2-3, where storm drainage catch basins are indicated by "CB", while sanitary sewer drains/inlets are indicated by "SS". The site map is based on site visits and a compilation of existing maps provided by the City and flow/dye testing performed by City Public Works staff in 2006. This map should be updated as needed for significant facility or operational changes.

The storm drainage leaves the site in two principal pathways as indicated in Figure 2-3:

1. Via the drainage lines along A street, and
2. Via sheetflow from the transformer storage yard's northeast corner.

The facility does not have direct storm drainage outfalls to a receiving water. However, storm drainage from the facility enters other drainage systems down gradient that eventually appear to discharge to Tumwater Creek. Though this eventual drainage to the creek is indicated on City maps, it has not been field verified. It appears that drainage from other entities in addition to this facility combine in this system before discharging at an outfall. As shown on Figure 2-3, the principal storm drain line that crosses the facility contains drainage from up gradient entities not related to this facility (such as the WSDOT maintenance facility immediately to the west). Thus, the apparent outfall to Tumwater creek would be expected to convey runoff from multiple sources, properties and jurisdictions.

Tumwater creek is approximately 5 miles in length and is one of several relatively small creeks that drain north from the foothills through the City to the Port Angeles Harbor in this portion of WRIA 18. The last 1.5 mile (approximate) of the creek passes through the City limits and flows in a wooded ravine adjacent to the South Tumwater Access Road (Sate Route 117). The facility covered by this SWPPP is approximately adjacent to river mile 1.3 of Tumwater Creek, just north of the Highway 101 crossing. This creek was placed in a Category 5 status for fecal coliform bacteria on the 2004 §303(d) list.[1]

Industrial activities take place mostly in areas draining to the sanitary sewer as outlined in Section 2.4 (eight drain inlets SS1-SS8). However, some industrial activities may occur intermittently on or adjacent to paved areas that drain to the storm drainage system in a portion of the main paved area of the facility (two catch basins CB1 and CB3).

The transformer storage and dispositioning operations take place in a separate portion of the facility (storage yard #1/building "M" on the site map, see Figure 2-3). At this location, new transformers are temporarily stored until installation, and used transformers are temporarily stored after oil is removed in building M (oil is disposed offsite by a contractor). These activities have an existing spill prevention, control and countermeasure (SPCC) plan that is cross-referenced in this SWPPP (Parametrix, 2003). This area is partially paved and has a building used for the transformer storage and oil removal operations. The building has two roof gutter downspouts that do not connect to the drainage system, but are apparently connected to a French drain. The

[1] A category 5 listing in the WA State Water Quality Assessment places a water body on the §303(d) list of the Clean Water Act. A category 5 listing indicates that Ecology has data showing that the water quality standards have been exceeded for one or more pollutants, and there is no TMDL (total maximum daily load, also known as a "water clean up plan") or pollution control plan already in place. TMDLs will eventually be required for the water bodies in this category. In the case of Tumwater Creek, the 2004 Category 5 listing is based on third party data that indicate periodic exceedances of fecal coliform criteria, though much of the data appear to indicate relatively low levels that meet the criteria. Other similar creeks in the vicinity also have various categories of listing for fecal coliforms, a common situation for urban and rural streams but not necessarily indicative of a direct public health risk.

paved surfaces in this area do not have a constructed drainage system. Minor sheetflow from this paved area drains to the northeast corner where it appears to infiltrate. Excess flows would pass under the fence to an area with good grass cover along the adjacent road (Tumwater Truck Rd, SR 117). There is no evidence of gullying or erosion related to this minor discharge.

2.3. MATERIALS INVENTORY

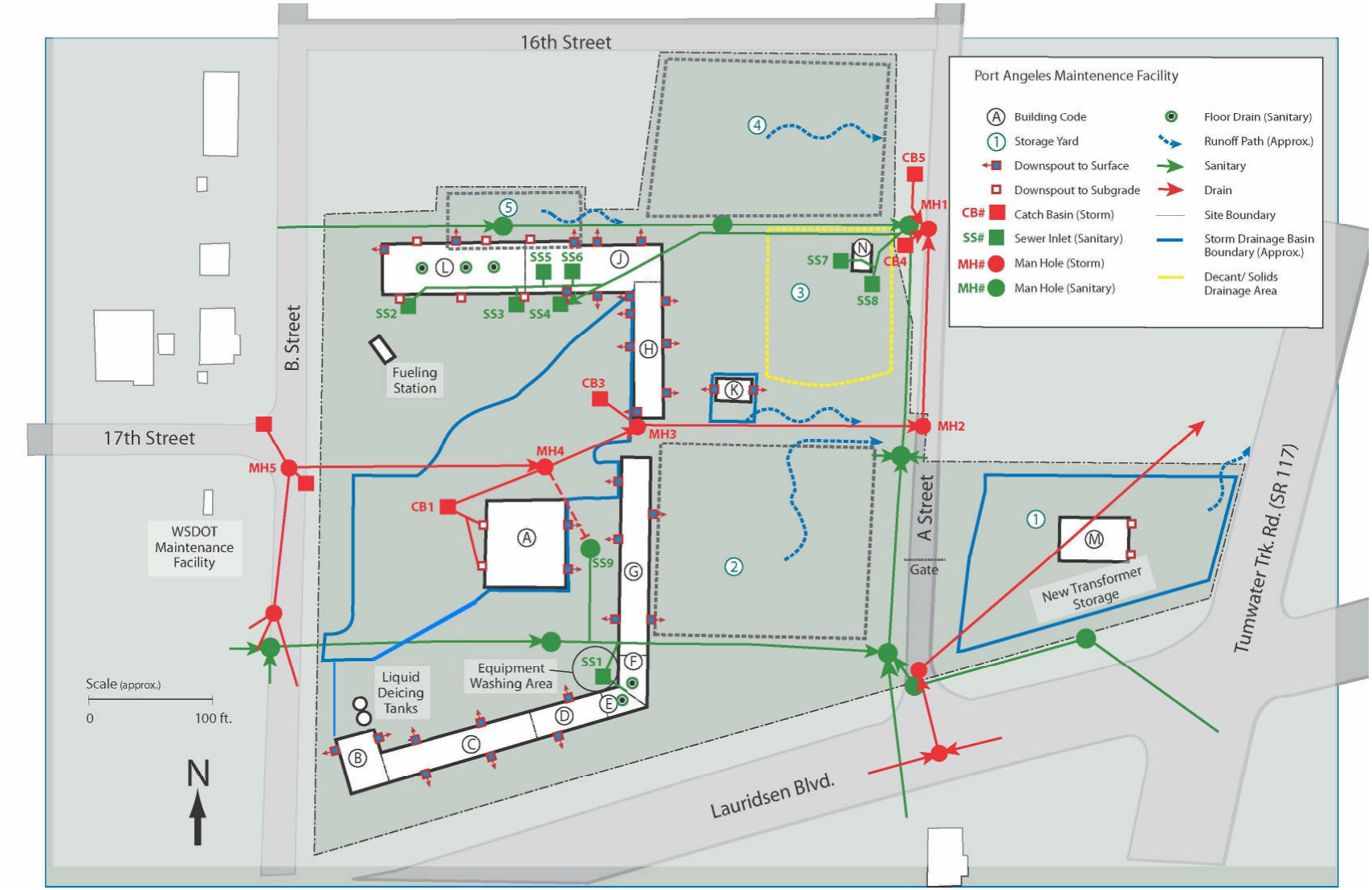
An inventory of significant materials that are stored or handled at this facility such that they are, or could be exposed to rainfall and/or runoff is outlined in Table 2-1. Most of these materials[2] are bulk resources for road maintenance, including aggregate and traction sand. There are five principal areas of outside material storage as shown in Figure 2-3 where the corresponding locations are listed in Table 2-1.

Runoff from these materials could enter stormwater discharges primarily through loading/unloading of the bulk materials, or dispensation during use. These materials, associated activities and actual or potential runoff drainage pathways are outlined below.

- Bulk material piles of road maintenance materials and drainage system wastes from eductor ("vactor") and sweeping truck operations are segregated by concrete blocks and stored in area #3 which drains to the sanitary sewer (SS7, SS8). Limited material could be tracked to other areas served by storm drains.
- Miscellaneous equipment removed from service and utility poles (new and used) are stored in unpaved (gravel) portions of areas #1, #2, and #4 which do not have constructed drainage systems. Site grades and gravel surfacing materials do not appear to generate frequent runoff generation from these areas.
- Fuel spills from the fuel island area would drain to a nearby sanitary sewer drain inlet (SS2).
- Transformers retired from service are stored inside a building in area #1 constructed in 2003 specifically for this activity. Potentially leaking transformer oil would be captured inside the building. Transformer oil is removed from old units and transferred into drums inside this building. The building floor slopes to the center, has no drain and was designed specifically to provide secondary containment for potential spills. An SPCC plan covers this facility and provides for training and BMPs during bulk oil transfer to tanker trucks outside on the paved apron (Parametrix, 2003). There are no direct drainage connections from this building (M) or from the paved area around it. The storm drainage line shown on the site map (Figure 2-3) crosses under the Building M vicinity, but does not receive any drainage from this area.

[2] Also includes road and drainage maintenance waste materials that are typically stored outside, such as catch basin sediments and street sweepings.

Figure 2-3 Site Map



- Bulk roadway deicing fluid (magnesium chloride) is stored outside in two above ground 5,000 gallon tanks located in the southwest corner of the facility, near building B. Even in the event of catastrophic rupture of the tanks, it is highly unlikely that this material could leak or spill and drain to the storm system. Releases could occur when these tanks are filled or when the liquid is dispensed to trucks for application in winter conditions or for dust control. Vehicle barriers have been added to protect the tanks. Releases from these tanks would follow site pavement grades and would enter the SS9 sanitary sewer drain.
- Vehicle lubricants are stored outside of building L in area #5 in approximately six to ten drums. These drums have secondary containment sumps and are stored on covered racks to prevent rainfall exposure and are therefore not listed in Table 2-1. However, small spills during handling could potentially occur on the adjacent paved area, which drains by sheetflow under the fence to a grassed area.
- One to two drums of new vehicle oil are stored inside Building E. One to two drums of cold-flow asphalt product are stored inside Building F. The paved areas adjacent to Buildings E and F drain to the sanitary sewer (at the SS1 inlet).
- Landscape control materials are stored inside building K.

2.4. AREAS ASSOCIATED WITH INDUSTRIAL ACTIVITY

Areas of industrial activity are listed in Table 2-2 with locations depicted on the site map (Figure 2-3). The industrial activities covered by this SWPPP include those defined in the ISGP as **Stormwater Associated with Industrial Activity**. Industrial activity at this facility is associated with transportation facility vehicle maintenance shops, bulk material storage and transfer, and management of street/drainage system waste solids. The majority of the Corp Yard's paved areas drain to the sanitary sewer. See Figure 2-3. According to facility managers, there have been no spills or leaks in the past 5 years.

Table 2-1 Significant Materials Exposed or Potentially Exposed to Rainfall/Runoff

DESCRIPTION OF SIGNIFICANT MATERIAL EXPOSED TO RAINFALL **CITY OF PORT ANGELES MAINTENANCE FACILITY**	Completed By: Brown and Caldwell Title: _____ Date: July 2006

List of Exposed Significant Materials	Period of Exposure	Quantity Exposed	Locations (see site map)	Method of storage, handling, treatment, or disposal
New transformers	continuous	varies up to approx. 200	1	Stored outside building M, no direct drain inlets
Used transformers	Loading, unloading	varies up to approx. 50	1	Stored inside building M per SPCC, no direct drain inlets
Transformer oil	Loading, unloading	varies up to approx 300 gal.	1	Stored inside building M per SPCC, no direct drain inlets. New oil stored inside, used oil transferred offsite per SPCC plan.
Utility poles: wood, concrete, metal	continuous	varies	2	new and used poles stored outside in unpaved areas with no direct storm drainage system
Sand, gravel	continuous	approx. 30 yd^3	3	Traction sand and road base course gravel stored in bulk piles in unpaved areas that could drain to adjacent area served by sanitary sewer system (SS7, SS8)
miscellaneous drainage and utility equipment	continuous	Varies	4, 5	Uncovered storage for equipment taken out of service, stored outside in unpaved areas with no direct storm drainage system
Liquid roadway deicer (mag. chloride)	Loading, unloading, dispensing	Two 5,000 gal tanks	SW corner	Bulk liquid deicer stored in above ground plastic tanks and dispensed on site, potential for spills and drips during loading and dispensing, area drains to sanitary sewer (SS9)

DESCRIPTION OF SIGNIFICANT MATERIAL EXPOSED TO RAINFALL **CITY OF PORT ANGELES MAINTENANCE FACILITY**	Completed By: Brown and Caldwell Title: _____ Date: July 2006

List of Exposed Significant Materials	Period of Exposure	Quantity Exposed	Locations (see site map)	Method of storage, handling, treatment, or disposal
Vehicle fuel	Loading, unloading, dispensing	None (in UST)	NW corner	Bulk fuel (gasoline and diesel) stored in USTs; fuel spills, leaks or drips would drain to SS2 inlet about 50 feet to the northeast, spill kit onsite
Catch basin sediments	Continuous	Varies up to ~30 yd^3	When maintenance waste material piles moved offsite to new location, they can be deleted from this list 3	Pile of typically wet waste materials contained between concrete blocks, drains to sanitary sewer (SS7, SS8)
Street sweepings	Continuous	Varies up to ~30 yd^3	3	Pile of dry waste materials contained between concrete blocks, drains to sanitary sewer (SS7, SS8)
Maintenance debris	Continuous	Varies up to ~30 yd^3	3	Pile contained between concrete blocks, drains to sanitary sewer (SS7, SS8)
Sewer line sediments	Continuous	Varies up to ~30 yd^3	3	Pile contained between concrete blocks, drains to sanitary sewer (SS7, SS8)
Incidental vehicle sources	Periodic	varies	Paved parking areas	Incidental leaks and drips of lubricants, coolant, and other emissions from personal and fleet vehicles parked onsite. Much of the paved parking areas drain to the sanitary sewer via inlets SS1-SS4 and SS9, some parking drains to CB1, and CB3.

Table 2-2 Industrial Activities

AREAS ASSOCIATED WITH INDUSTRIAL ACTIVITY **CITY OF PORT ANGELES MAINTENANCE FACILITY**	Completed By: Brown and Caldwell Title: _____ Date: July 2006

List areas and activities, not included on Worksheets 2, 2A, and 3, which may be sources of pollution. Discuss the potential of these areas and activities as potential pollutant sources and identify any pollutant that may be generated by that activity..

Industrial Activity	Potential Location of Drainage of Stormwater	Likelihood and Reason for Pollutants Being Present in a Stormwater Discharge
Street and drainage maintenance solids storage and liquid decant	Storage area 3	Not likely: work area drains to sanitary SS7, SS8, but vault can overflow to grass swale to storm drain CB4
Road maintenance material bulk piles (sand, aggregate), uncovered	Storage area 3	Not likely: work area drains to sanitary SS7, SS8, but vault can overflow to grass swale to storm drain CB4
Outside vehicle/equipment washing	Storage area 3	Not likely: work area drains to sanitary SS7, SS8, but vault can overflow to grass swale to storm drain CB4
Outside vehicle/equipment washing	Bldg E	Not likely: drains to sanitary at SS1, unlikely to drain or be tracked to adjacent storm drainage area due to steep grading in the area around the wash station
Bulk liquid deicer storage and transfer, two 5,000 gal tanks	Bldg B	Not likely: leaks or spills would drain to sanitary sewer (SS9)
Transformer storage	Bldg M	Not likely, old units stored inside; covered by SPCC plan; no direct drain inlets.
Fleet vehicle fueling	Fuel Island near Bldg L	Not likely: work area drains to sanitary at SS2

AREAS ASSOCIATED WITH INDUSTRIAL ACTIVITY **CITY OF PORT ANGELES MAINTENANCE FACILITY**	Completed By: Brown and Caldwell Title: _____ Date: July 2006

List areas and activities, not included on Worksheets 2, 2A, and 3, which may be sources of pollution. Discuss the potential of these areas and activities as potential pollutant sources and identify any pollutant that may be generated by that activity..

Industrial Activity	Potential Location of Drainage of Stormwater	Likelihood and Reason for Pollutants Being Present in a Stormwater Discharge
Fleet vehicle maintenance	Inside Bldg L and high bay	Not likely: inside work area drains to sanitary floor drains inside building, high bay to SS5, SS6
Outside vehicle service and washing	Possible throughout	Mostly to sanitary at SS1-SS4 and SS9, possible also to storm at CB1 and CB3
Outside material and vehicle fluid storage	Bldg L north side (area #5)	Uncovered miscellaneous small equipment and metal resources. Cover and secondary containment provided for vehicle lubricant drums. Offsite sheetflow to grass, no direct drain inlets
Outside material and equipment storage	Area 2, Area 4	Not likely, storage areas unpaved, nearest drain inlets, CB4 and CB5 do not drain the areas.

3. MONITORING PLAN

There are no permits or other conditions that prescribe or require stormwater sampling for this facility. Therefore, the monitoring for this facility will rely upon quarterly visual inspections of discharge quality to indicate obvious or potential problems. Coupled with the other BMPs for this facility such as housekeeping, maintenance, and dry weather inspections (see Section 4), this approach should be well suited to minimize the potential for adverse conditions in stormwater quality. Furthermore, there are no direct outfalls from the facility to receiving waters and outfalls in the vicinity appear to receive drainage from multiple sources in addition to this facility[3]. Based on drainage maps and visual inspections, site storm drainage leaves the site by one of 5 catch basins connected to the A-street pipe, or via the sheetflow from the Transformer yard (bldg M). See Figure 2-3.

The monitoring plan outlined below identifies the resources, locations, frequency, visual indicators and recording to be used in monitoring the facility.

1. Monitoring will be performed during the wet season at least once-quarterly by a designated member of the P2 team (see Table 1-1).
2. Monitoring will be conducted during significant rainfall resulting in visible stormwater runoff and discharges from the site. This rainfall should be approximately 0.1" or more in a 24-hour period, but site conditions and local rainfall patterns should be taken into account so that monitoring can begin soon after significant runoff begins.
3. The monitoring is not required to be conducted outside of regular business hours or during unsafe conditions.
4. The locations to be monitored include the following (see Figure 2-3):
    a. All storm drain catch basins in the main paved area (CB1, and CB3).
    b. The two storm drain catch basins near the decant facility (CB4 and CB5).
    c. The sheetflow discharge from the Transformer yard (Bldg M lot, East corner).
    d. Sheetflow, if present, draining from material storage areas 2, 4 and 5 (area 3 drains to sanitary, but potential overflow would be indicated when inspecting CB4).
5. Monitoring methods consist of making observations of the visual characteristics of flows entering the storm drain catch basins and sheetflows leaving the locations above. These observations include recording the absence or presence and degree of the indicators outlined below. For more information, consult chapter 11 of the Illicit Discharge Detection and Elimination Guidance Manual (Center for Watershed Protection, 2004).
    a. Floatables-indicate if very obvious trash or other controllable debris, such as landscaping material, leaf litter, etc.

[3] Sampling an outfall that receives multiple discharges typically does not allow attribution of results to any one entity.

b. Foam due to soap/detergent/cleaning product. Stormwater often can be slightly foamy from pollen and other natural organic material. Indicate if very obvious and persistent foam is present that could indicate a potential soap/detergent/cleaning agent which may also be accompanied by a fragrant odor. Suds that break up quickly may be due to turbulence and/or natural conditions and not necessarily have an illicit origin.
c. Sheen-a rainbow hue on the water surface commonly indicative of petroleum products, often present in parking lot runoff.
d. Turbidity-and indication of light penetration or relative cloudiness, indicate as “very obvious” if the water looks like coffee with cream.
e. Sediment-coarse material such as sand, gravel
f. Odor: describe odor such as rotten eggs, solvent, fuel/oil, cleaning agent, etc. Make sure the odor is not related to other sources beyond the runoff being inspected. If gasoline or a flammable solvent is suspected, leave the immediate area, notify facility management immediately and take action to prevent fire or explosion.
g. Discoloration other than turbidity: indicate general color. Stormwater is typically yellowish. A red/orange color can indicate rust from iron pipes or iron bacteria. Other colors such as white could indicate paint or cleaning agent emulsions.

6. The observations above and other information will be recorded on the wet weather monitoring Form #2 (see Appendix). The rainfall during the prior day and during the period of monitoring will be indicated on the data form. Consult local rainfall data and indicate the source used on the form. The National Weather Service has a gage at Fairchild airport nearby, see http://www.wrh.noaa.gov/mesowest/getobext.php?wfo=sew&sid=CLM&num=48
7. The monitoring results on Form #2 will be reviewed quarterly and signed by the P2 team leader. The P2 team leader will note any follow up actions indicated by the visual monitoring.
8. Records of monitoring results will be maintained for up to five years in the SWPPP file.

4. ILLICIT DISCHARGES AND DRY WEATHER INSPECTIONS

This SWPPP provides two means of assessing illicit and non-stormwater discharges: an initial drainage confirmation and ongoing annual dry-weather inspections. The initial drainage confirmation using dye/flow testing was performed in June 2006 by City Public Works staff. This testing confirmed that the sanitary and storm drains are separated at this facility, and verified the drainage configuration shown in the site map (Figure 2-3).

Dry-weather inspections will be performed at least once annually during the three month period from July through September after a period of at least seven consecutive days of dry weather. The inspection results will be recorded in the form supplied in the Appendix (Form #1). These completed forms will be kept in the SWPPP file. The dry season inspection provides visual inspections for non-stormwater discharges such as domestic wastewater, process wastewater (including leachate), and vehicle wash water (non-contact cooling water is not present onsite).

Because there are no direct outfalls from the facility, the dry-weather inspection locations focus on four storm drain manholes indicated as MH1-MH4 on the site map (Figure 2-3). If no discharge is present at MH1, then the inspection can be determined complete (because MH2-MH4 are upgradient in this drain line). If a discharge is present in MH1, then each of the upgradient manholes (MH2-MH4) will also be inspected and discharge characteristics noted on the inspection form. See Section 3 for description of presence/absence/magnitude of discharge characteristics. If flow is present, the approximate discharge rate will be indicated on the inspection form (i.e. < 10 gpm or >10 gpm).

If needed, the furthest upgradient location, MH5, located to the west of the facility on B Street, may be inspected to determine if dry-weather flows may be originating from offsite areas. If this is the case, make note on the inspection form and indicate whether these flows appear to be contaminated.

Each of the above locations will be inspected during dry-weather for odors, discolorations, abnormal flows or other suspect conditions that could indicate an illicit, non-stormwater discharge. As a general rule, the pipes entering and leaving these manholes should be dry during dry weather. However, dry-weather flows could be attributable to groundwater infiltrating the system. An absence of significant visual indications as outlined below will presume this is the case.

The dry-weather inspections will rely on visual observations to discern the potential for dry-weather discharges to be associated with facility operations or from groundwater. If there are visible flows, the inspection results will indicate the potential location where the flows originate and associated visual indicators. If dry-weather flow is obviously contaminated as indicated by foam, sediment, sheen, odor, debris, etc, then the P2 team leader will be notified immediately and steps will be taken to identify the source and cease the activity. If the source of the contamination is from offsite (i.e. present in

MH5), then the P2 team leader will notify the potential offsite entity(s) responsible, where possible.

Potential dry-weather discharges to the storm drain system that could occur from te Corp Yard include the following:

1. Outside vehicle washing in paved storm drainage areas near buildings A, G and H (vehicle washing should be restricted to areas draining to sanitary sewer, i.e. SS1-SS8, for routine operations or as approved by the facility manager).
2. Overflow of vault in decant area to storm drain CB4. The work area is near building N, served by sanitary sewer line to SS7 and SS8.
3. Utility vault dewatering for the vault near the northwest corner of Building A and CB1
4. Fire hydrant flushing may occur, but would most likely drain to the sanitary sewer or be captured by a tank truck.

5. STORMWATER BMPS

This section describes the existing source control and treatment BMPs, maintenance needs and training.

5.1. GENERAL

Stormwater BMPs include a number of different types of structures, activities, or practices that will help prevent or reduce stormwater pollution. These BMPs fall into three general categories: source controls (operational and structural), treatment, and erosion and sediment control as outlined below and described for this facility in Sections 5.4- through 5.12.

Operational source control BMPs include activities and practices that can be implemented to prevent stormwater pollution, which include the following items:

1. Pollution Prevention (P2) Team (see Section 1.4)
2. Good housekeeping
3. Preventive maintenance
4. Spill prevention, control and cleanup
5. Employee training
6. Inspections and monitoring
7. Reporting and record keeping

Structural source control BMPs prevent the contact of rainfall with potential pollutants by eliminating or reducing the exposure of materials or activities. Common structural source control BMPs include covered areas for vehicle parking, fueling and equipment storage; and berms or curbs to prevent runoff from entering certain areas.

Treatment BMPs include a wide array of installations that remove pollutants passively from stormwater. These range from simple “public domain” items to more complex proprietary units that provide the following types of treatment or combinations thereof:

- Sedimentation (gravitational)-using catch basins with sumps, wet vaults, detention pond forebays, etc.
- Sedimentation (hydrodynamic)-typically proprietary devices
- Filtration- such as sand filters or proprietary media filters
- Biofiltration-such as swales, filter strips and constructed wetlands
- Infiltration to the soil column

Erosion and sediment control (ESC) BMPs prevent or control erosion and sedimentation and are typically the focus of construction sites. Examples include preservation of natural vegetation, phasing, seeding, mulching, plastic covering, filter fences, and sedimentation structures such as sedimentation traps, boxes, and ponds. Most of these ESC BMPs apply to construction sites, but certain erosion prevention

practices may be useful to prevent the exposure of open soils at operational (i.e. industrial) facilities.

5.2. CURRENT STORMWATER BMPS

Table 5-1 summarizes the current BMPs that are being implemented at this facility, which are described in Sections 5.4- through 5.12.

Table 5-1 Current BMPs

Type	BMP	Frequency of Performance
Operational	Housekeeping	ongoing
Operational	Pollution prevention (P2) team-See Table 1-1	ongoing
Operational	Preventive maintenance	see 5.5
Operational	Sweeping	As needed
SC	Sanitary drainage for most industrial activity	permanent
SC	Covered parking for maintenance vehicles	permanent
SC	Covered storage for pesticide/herbicide materials	permanent
SC	Covered storage for transformer oil and used transformers	permanent
SC	Painted roofing-most bldgs. appear to have factory painted metal roofing	permanent
SC	Covered or bermed bulk material storage	as needed
SC	Drip pans for certain equip. parked outside	as needed
SC	CB sump cleaning	annually
SC	CB stenciling	renew stenciling as needed
Treatment	Vegetated ditch along A street	ongoing
Treatment	Catch basins with sumps	permanent
Treatment	Catch basin outlets with oil retention elbows	permanent elbows installed
Treatment	Oil/water separator (baffle type) for sanitary drainage to and from decant station	permanent
ESC	Monitor wet-weather runoff and inspect gravel surfaced areas (See Section 3).	quarterly

5.3. ADDITIONAL BMPS NEEDED

Table 5-2 outlines additional BMPs needed. A schedule for implementation of additional BMPs will be determined by the Pollution Prevention team. BMPs that require capital improvements should be completed as soon as possible given sufficient resources and the relative importance of the actions needed.

Note: Capital improvements are supposed to be completed within 6 months of identifying the need. Non-capital (i.e. operational) BMPs are supposed to be completed with 2 weeks of determining the need.

Table 5-2 Additional BMPs Needed

ADDITIONAL BMP IDENTIFICATION **CITY OF PORT ANGELES MAINTENANCE FACILITY**	Completed By: Brown and Caldwell Title: _____ Date: November 2006
Describe any treatment and innovative BMPs that are required to address existing and potential pollutant sources These are BMPs needed to prevent the discharge of significant amounts of pollutants despite implementation of operational and source control BMPs.	

BMPs	Brief Description of Activities or Improvements
Housekeeping	Ongoing: use covers or berms for bulk material piles as needed to prevent erosion and raveling when not in use.
Preventive maintenance	Clean decant station vault and improve outlet to prevent overflows to the nearby storm drain (CB 4) (Note: decant station being considered for relocation offsite).
Training	Implement annual SWPPP training; implement training identified in SPCC plan for transformer yard operations.
Inspections/record keeping	Collect all existing records and create a SWPPP file onsite
Source Control	Complete catch basin stenciling
Source Control	Add sign prohibiting washing near building J/H for area draining to CB3

5.4. GOOD HOUSEKEEPING

Good housekeeping involves "common sense" activities that are used to keep a clean and orderly workplace. Good housekeeping techniques help prevent rainfall from contacting materials and waste and potentially contaminating stormwater. In addition, a clean workplace helps prevent accidental spills and promotes a safer work environment. Good housekeeping practices that are utilized at the facility are listed in Table 5-3.

Table 5-3 Good Housekeeping

Activity	Frequency
Routine sweeping of paved surfaces	As needed
Periodic cleanup of debris and old equipment	quarterly
Regular removal of trash and garbage	As needed
Routine inspection for leaks or spills	Daily
Waste and material minimization programs	Annually
Prevent bulk material piles from erosion and raveling, use covers or berms when piles not in use	After use

5.5. PREVENTIVE MAINTENANCE

Preventive maintenance promotes effective stormwater BMPs and minimizes the potential for facility operations to impact stormwater. Inspections help determine if the BMPs are working as intended. The preventive maintenance program consists of inspection, cleaning, and repair activities.

Personnel responsible for implementing the inspection program are identified in Table 1-1. These quarterly inspections will cover the following items using Form 3 (in Appendix):

- all material storage areas (Table 2-1)
- all areas of industrial activity (Table 2-2)
- source control and treatment BMPs (Table 5-1)

Particular attention is given to all equipment, pipes, valves, and tanks where spills or leaks are possible (see Section 5.6). Vehicles and material transfer equipment are included in the inspections. Hoses and seals from this type of equipment frequently leak fuel, lubricants, coolants or hydraulic fluids.

Debris and trapped sediment will be removed from all catch basins with sumps once annually or more or less frequently as needed based on inspections. When possible during the wet weather season, brief inspections should also occur during and after heavy rainfall to confirm proper drainage and operation of the various BMPs.

5.6. SPILL PREVENTION AND EMERGENCY CLEANUP

The locations of potential spills would most likely be limited to the following areas and activities:

- Liquid deicer tank loading and dispensation (area drains to sanitary sewer (SS9)
- Vehicle fueling station-a spill cleanup kit is onsite, the area drains to the sanitary sewer
- Vehicle maintenance shop-the area drains to the sanitary sewer
- Transformer yard- old transformers are stored inside a building designed for spill control and used oil is removed inside the building, stored in drums that are transferred to a disposal truck using secondary containment as covered under an SPCC (Parametrix, 2003).
- Vehicle parking area incidental leaks or spills of fleet or private vehicle fluids. Some parking areas drain to sanitary sewer. All parking areas inspected for significant leaks and spills and a spill cleanup kit is onsite

5.7. EMPLOYEE TRAINING

Employee training should familiarize all employees with the intent and components of the SWPPP. Training will be provided for all existing employees on an annual basis and for all new employees when they begin work at the facility. In addition, personnel are to be reminded of the objectives and specifics of the SWPPP requirements during the monthly safety training sessions. A worksheet (Form 4) is provided in the Appendix to help keep records of the employees who have completed the training program. This form will be completed annually and kept in the SWPPP file.

For all personnel, topics to be included in the training session include:

- Overview of SWPPP
- Review of facility map and drainage
- Importance of preventing stormwater pollution
- Good housekeeping procedures
- Spill prevention and response procedures
- Materials-handling and storage procedures

Employees with maintenance, materials-handling, or environmental compliance responsibilities shall also be trained in the following areas:

- Spill cleanup procedures
- Preventive maintenance procedures
- Inspection procedures

5.8. INSPECTION AND RECORD KEEPING

Inspections

Personnel responsible for implementing the Preventive Maintenance (PM) Inspections and keeping records are identified in Section 1.4, with inspection areas and frequencies identified in Section 5.5. Use Form 3 for recording these quarterly PM inspections.

In addition to the quarterly PM inspections, two other types of inspections will be implemented. Wet season monitoring will be conducted once each quarter during the three wet season quarters (October-June). A dry season inspection will be conducted once each year for the purpose of identifying non- stormwater discharges. See Sections 3 and 4 for instructions on conducting these inspections associated forms 1 and 2 (see Appendix).

Recordkeeping

All records of inspections and training and other information will be maintained for a 5-year period, including:

- Annual dry weather non-stormwater inspection (Form 1, one per year)
- Annual wet weather inspections (Form 2, three per year)
- Preventive maintenance inspections (Form 3, four per year)
- Training (Form 4, one per year)
- Spills
- Modifications to the facility that require changes to the SWPPP
- Changes to the SWPPP

All records shall include the following information:

- Date and name of individual recording the information
- Areas and/or activities affected
- Problems found
- Corrective actions taken

5.9. SOURCE-SPECIFIC STRUCTURAL SOURCE CONTROL BMPS

Vehicle and equipment washing will be restricted to areas draining to the sanitary sewer as indicated in Figure 2-3. Vehicles or equipment should not be washed in the paved areas draining to CB1 and CB3.

Covered areas (buildings) are provided for parking various vehicles and equipment and conducting the transformer servicing.

Covered storage with secondary containment is provided for vehicle lubricant drums outside of Building L.

Covered storage is provided for landscape management chemicals in building K.

5.10. TREATMENT BMPS

This facility has several conventional treatment BMP as listed in the table below. Each of these will be inspected twice annually. Catch basin sumps will be cleaned annually unless inspections indicate a higher or lower frequency of maintenance for certain areas.

Table 4 Treatment BMPs

Type	Location
Catch basins with sumps (Type 1)	CB1-CB5
Catch basin outlets with oil retention elbows	All CBs
Oil Water Separators (in sanitary sewer line)	1 in sanitary line upgradient of decant station, 1 in vault for decant station
Vegetated ditch	along A street between MH1-MH2

5.11. EROSION AND SEDIMENT CONTROL BMPS

Exposed soils are minimal and grass, tree and shrub cover is sufficient to prevent significant erosion. Therefore, no ESC BMPs are needed. However, there is some erosion potential related to the gravel surfaced areas 1-5 (these areas are shown in Figure 2-3). The once quarterly wet-weather monitoring and inspections (covered in Section 3) will determine if improvements are needed to minimize turbid runoff. Covers or berms will be used as needed to prevent erosion and raveling of bulk material piles.

5.12. SOLID AND LIQUID WASTE MANAGEMENT

Solid wastes handled at this facility include street sweepings, general road maintenance debris, and eductor truck wastes from storm and sanitary sewers (as described in Section 2). These wastes are stored onsite temporarily (to passively dewater) before being sent to the landfill. All leachate is collected in the work area by sanitary sewer inlets SS7 and SS8 and passed through a vault with a baffle type oil water separator. Drainage associated with tracking in this area would also drain to the sanitary sewer. ***(NOTE: DELETE THIS SECTION WHEN THIS ACTIVITY IS MOVED OFFSIT****E).*

6. REFERENCES

Center for Watershed Protection, 2004. Illicit Discharge Detection and Elimination: A Guidance Manual for Program Development and technical Assessments. R. Pitt and other authors. Center for Watershed Protection, Ellicott City MD. October 2004.

Parametrix, 2003. Spill Prevention, Control and Countermeasure Plan. Parametrix Consultants. November 2003.

WDOE 2004. Guidance Manual for Preparing/Updating a Stormwater Pollution Prevention Plan for Industrial Facilities. WA Department of Ecology Publication Number 04-10-030 April 2004

WDOE 2005. The Industrial Stormwater General Permit. A National Pollutant Discharge Elimination System and State Waste Discharge General Permit for Stormwater Discharges Associated with Industrial Activities. WA Department of Ecology. Issued August 21, 2002, Modified December 1, 2004, Effective January 14, 2005, Expires September 20, 2007.

7. APPENDIX

LIST OF DEFINITIONS

The following definitions are used in this SWPPP, with indications of whether the citations are from Ecology (WDOE) or from EPA.

Best Management Practices (BMPs) means schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the state. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. (WDOE). BMPs generally fall into three categories: source controls (operational and structural), treatment practices, and erosion and sediment control. Typical source controls include operating procedures, good housekeeping, sweeping, spill controls, etc. Typical treatment BMPs include catch basins, sumps, oil water separators and bioswales. Erosion and sediment control BMPs generally apply to construction sites, but may be applicable to industrial sites if significant soils are exposed or erosion potential exists.

Capital Improvements means the following improvements which will require capital expenditures (WDOE):

1. Treatment BMPs, including but not limited to: biofiltration systems including constructed wetlands; settling basins, oil/water separation equipment, and detention and retention basins.
2. Manufacturing modifications, including process changes for source reduction, if capital expenditures for such modifications are incurred.
3. Concrete pads and dikes and appropriate pumping for collection of stormwater and transfer to control systems, from manufacturing areas such as loading, unloading, outside processing, fueling and storage of chemicals, equipment, and wastes.
4. Roofs and appropriate covers for manufacturing areas.

Combined Sewer means a sewer which has been designed to serve as a sanitary sewer and a storm sewer, and into which inflow is allowed by local ordinance. (WDOE).

Domestic Wastewater means water carrying human wastes, including kitchen, bath, and laundry wastes from residences, buildings, industrial establishments, or other places, together with such ground water infiltration or surface waters as may be present. (WDOE)

Erosion and Sediment Control BMPs means BMPs that are intended to prevent erosion and sedimentation, such as preserving natural vegetation, seeding, mulching and matting, plastic covering, filter fences, and sediment traps and ponds. Erosion and

sediment control BMPs are synonymous with stabilization and structural BMPs. (WDOE)

General Permit means a permit that covers multiple dischargers of a point source category within a designated geographical area, in lieu of individual permits being issued to each discharger. (WDOE)

Illicit Discharge means any discharge that is not composed entirely of stormwater except discharges pursuant to a separate NPDES permit and discharges resulting from fire fighting activities. (WDOE). See also **Non-Stormwater Discharges.**

ISGP means the NPDES Industrial Stormwater General Permit, issued by Ecology for stormwater discharges associated with industrial activities (Issued 2002, modified 2004, effective January 2005).

Leachate means water or other liquid that has percolated through raw material, product, or waste and contains substances in solution or suspension as a result of the contact with these materials. (WDOE)

National Pollutant Discharge Elimination System (NPDES) means the national program for issuing, modifying, revoking, and reissuing, terminating, monitoring, and enforcing permits, and imposing and enforcing pretreatment requirements, under Sections 307, 402, 318, and 405 of the Federal Clean Water Act, for the discharge of pollutants to surface waters on the state from point sources. These permits are referred to as NPDES permits and, in Washington State, are administered by the Washington Department of Ecology. (WDOE)

Non-Stormwater Discharges are discharges of process wastewaters, vehicle wash waters, cooling waters, or any other wastewaters associated with the facility into the stormwater collection system. Other discharges must be addressed in a separate NPDES permit. (EPA) See also **Illicit Discharges**. Certain non-stormwater discharges are conditionally approved under the ISGP but are subject to specific provisions, including identifying the location, flow volumes, quality, potential for water quality issues and ability to apply appropriate BMPs. Examples of conditionally approved non-stormwater discharges under an ISGP include:

- Discharges from fire fighting activities;
- Fire protection system flushing, testing, and maintenance;
- Discharges of potable water including water line flushing, provided that water line flushing must be de-chlorinated prior to discharge;
- Uncontaminated air conditioning or compressor condensate;
- Irrigation drainage;
- Uncontaminated ground water or spring water;
- Discharges associated with dewatering of foundations, footing drains, or utility vaults where flows are not contaminated with process materials such as solvents;

- Incidental windblown mist from cooling towers that collects on rooftops or areas adjacent to the cooling tower. This does not include intentional discharges from cooling towers such as piped cooling tower blow down or drains.

Operational (Source Control) BMPs means a schedule of activities, prohibition of practices, maintenance procedures, employee training, good housekeeping, and other managerial practices to prevent or reduce the pollution of waters of the state. Not included are BMPs that require construction of pollution control devices (structural source control or treatment BMPs). (WDOE)

Point Source means any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, and container from which pollutants are or may be discharged to surface waters of the state. This term does not include return flows from irrigated agriculture. (WDOE)

Pollutant means the discharge of any of the following to waters of the state: dredged soil; solid waste; incinerator residue; filter backwash; sewage; garbage; sewage sludge; munitions; chemical wastes; biological materials; radioactive materials; heat-wrecked or discarded equipment; rock; sand; cellar dirt; and industrial, municipal, and agricultural waste. This term does not include sewage from vessels within the meaning of Section 312 of the FWPCA, nor does it include dredged or fill material discharged in accordance with a permit issued under Section 404 of the FWPCA. (WDOE)

Pollution means contamination or other alteration of the physical, chemical, or biological properties of waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters; or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety, or welfare; or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses; or to livestock, wild animals, birds, fish, or other aquatic life. (WDOE)

Process Wastewater means any water which, during manufacturing or processing, comes into direct contact or results from the production or use of any raw material, intermediate product, finished product, byproduct, or waste product. (WDOE)

Regular Business Hours means those time frames when the facility is engaged in its primary production process, but does not include additional shifts or weekends when partial staffing is at the site primarily for maintenance and incidental production activities. Regular business hours do not include periods of time that the facility is inactive and unstaffed. (EPA)

Significant Amounts means an amount of a pollutant in a discharge that is amenable to available and reasonable methods of prevention or treatment; or an amount of a pollutant that has a reasonable potential to cause a violation of surface or ground water quality or sediment management standards. (WDOE)

Significant Material includes, but is not limited to, raw materials; fuels; materials such as solvents, detergents, and plastic pellets; finished materials such as metallic products; raw materials used in food processing or production; hazardous substances designated under Section 101 (14) of CERCLA; any chemical the facility is required to report pursuant to Section 313 of Title III of SARA; fertilizers; pesticides; and waste products such as ashes, slag, and sludge that have the potential to be released with stormwater discharges. (WDOE)

Source Control BMPs means physical, structural, or mechanical devices or facilities that are intended to prevent pollutants from entering stormwater. A few examples of source control BMPs are erosion control practices, maintenance of stormwater facilities, constructing roofs over storage and working areas, and directing wash water and similar discharges to the sanitary sewer or a dead-end sump. (WDOE)

Stormwater is the runoff from a storm event, snowmelt runoff, and surface runoff and drainage. It does not include infiltration and runoff from agricultural land. (EPA)

Stormwater Associated with Industrial Activity means the discharge from any conveyance that is used for collecting and conveying stormwater and that is directly related to manufacturing, processing, or raw materials storage areas at an industrial plant. It may also, on a case-by-case basis, include stormwater from any portion of an industrial site subject to pollutants of a significant amount (WDOE). The term does not include discharges from facilities or activities excluded from the NPDES program. The term includes, but is not limited to, stormwater discharges from industrial plant yards; immediate access roads and rail lines used or traveled by carriers of raw materials, manufactured products, waste material, or by-products used or created by the facility; material-handling sites; refuse sites; sites used for the application or disposal of process waste waters (as defined at 40 CFR 401); sites used for the storage and maintenance of material-handling equipment; sites used for residual treatment, storage, or disposal; shipping and receiving areas; manufacturing buildings; storage areas (including tank farms) for raw materials and intermediate and finished products; and areas where industrial activity has taken place in the past and significant materials remain and are exposed to stormwater. The term also includes stormwater discharges from all areas listed in the previous sentence (except access roads) where material-handling equipment or activities, raw materials, intermediate product, final products, waste materials, by-products, or industrial machinery <u>are exposed to stormwater</u>. Material-handling activities include the following: storage, loading and unloading, transportation, or conveyance of any raw material, intermediate product, finished product, by-product, or waste product. The term excludes areas located on plant lands separate from the plant's industrial activities, such as office buildings and accompanying parking lots, as long as the drainage from the excluded areas is not mixed with stormwater drained from the above-described areas. Industrial facilities (including industrial facilities that are federally, state, or municipally owned or operated that meet the description of the facilities listed in this paragraph) include those facilities designated under 40 CFR 122.26(a)(1)(v). (EPA)

Surface Waters of the State includes lakes, rivers, ponds, streams, inland waters, salt waters, and all other surface waters and water courses within the jurisdiction of the State of Washington. (WDOE)

Treatment BMPs means BMPs that are intended to remove pollutants from stormwater. A few examples of treatment BMPs are detention ponds, oil/water separators, biofiltration, media filtration, and constructed wetlands. (WDOE)

Water Quality means the chemical, physical, and biological characteristics of water, usually with respect to its suitability for a particular purpose. (WDOE)

Waters of the State includes those waters as defined as “waters of the United States” in 40 CFR Subpart 122.2 within the geographic boundaries of Washington state and “waters of the state” as defined in Chapter 90.48 RCW, which include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and water courses within the jurisdiction of the State of Washington. (WDOE)

WDOE means the state of Washington Department of Ecology.

Form 1 Dry-Weather Inspection

Dry Weather Visual Monitoring (during period July-September)
for City of Port Angeles Public Works Maintenance Facility ("Corp Yard") SWPPP
(7) Conducted on:_____by _____
(8) Rainfall amount in prior 7 day period: _____(inches) Source of rainfall data:_____

			(4) discharge present?										
(1) location	(2) time	(3) no discharge?	< 10 gpm	>10 gpm	Sediment	Turbidity	Color	Sheen	Odor	Foam	Floatables	other	(6) Remarks (describe presence and degree)
MH1													
MH2													
MH3													
MH4													
MH5 (if needed)													

Instructions (areas numbered in form above):
1. Remove manhole lids and visually inspect for presence of flow in pipes, use SWPPP facility map Figure 2-3
2. Record time of each observation using 24 hour clock (military) time notation
3. If pipes are dry, indicate by checking the "no discharge" column.
4. If flow is present, indicate by checking approximate discharge range column. A residential hose fully open would be about 1-5 gpm
5. where flow is present, indicate each characterisitc as either absent (0), or present with relative magnitude in each box: 1 = slightly observable, 2=very obvious
6. If one or more characteristics are present, describe visual observation
7. Record date of inspections and name of who conducted the work
8. Record the approximate rainfall occurring in the 7-day period before the inspections
9. P2 Team leader must review and sign this form and indicate any follow up actions needed
10. Save original and a copy of this completed form in the SWPPP file

Other observations/comments:

Results reviewed by: _____(name)_____(signature)
Follow up actions needed:

Form 2 Wet Weather Monitoring

Wet Weather Visual Monitoring
for City of Port Angeles Public Works Maintenance Facility ("Corp Yard") SWPPP
(5) Conducted on:_____by _____
(6) Rainfall amount in prior day:_____(inches) Rainfall during monitoring period:_____(inches) Source of rainfall data:_____

(1) location	(2) time	Sediment	Turbidity	Color	Sheen	Odor	Foam	Floatables	other	**(4) Remarks (describe presence and degree)**
CB1										
CB3										
CB4										
CB5										
Transformer yard										
Material storage #2										
Material storage #4										
Material storage #5										

Instructions:

1. Visually inspect surface sheetflows to drainage locations indicated, use SWPPP facility map Figure 2-3
2. Record time of each observation using 24 hour clock (military) time notation
3. Record absence (0), or presence and magnitude in each box: 1 = slightly observable, 2=very obvious
4. If present, describe visual observation
5. Record date of inspections and name of who conducted the work
6. Record the approximate rainfall occurring in the day before and during the inspections
7. P2 Team leader must review and sign this form and indicate any follow up actions needed
8. Save original and a copy of this completed form in the SWPPP file

Other observations:

Location	time									**remarks**

Results reviewed by: _____(name)_____(signature)
Follow up actions needed:

Form 3 Quarterly BMP Inspections

BMP IMPLEMENTATION **CITY OF PORT ANGELES MAINTENANCE FACILITY**	Completed By: _____ Title: _____ Date: _____

BMPs	Inspection Item	Satisfactory?	Action Needed
Good Housekeeping	1.remove and dispose trash, unnecessary items		
	2.sweeping		
	3.		
Preventive Maintenance	1.catch basin sump cleaning (once annually)		
	2.fleet vehicle parking areas-leaks indicate need for PM		
	3.		
Spill Prevention and Cleanup	1.liquid deicer tanks-check for leaks, drips veh. barriers		
	2.secondary containment for vehicle lubricant, bldg L		
	3.drip pans for fleet vehicles as needed		
	4.parking areas		
	5.fueling station		
Source Control BMPs	1. covers or berms for bulk material piles		
	2.vehcile washing only in sanitary drain areas		
	3.used transformers stored inside building M		
	4.catch basin stenciling		
Treatment BMPs	1.grass ditch along A street between MH1-MH2, mow as needed		
	2.oil control elbows in catch basins (look for oil)		

Form 4 Training Log

EMPLOYEE TRAINING **CITY OF PORT ANGELES MAINTENANCE FACILITY**	Completed By: _____ Title: _____ Date: _____

Describe the annual training of employees on the SWPPP, addressing spill response, good housekeeping, and material management practices.

Training Topics	Brief Description of Training Program/Materials (e.g., film, newsletter, course)	Schedule for Training (list dates)	Attendees
1). Line Workers			
Spill Prevention and Response			
Good Housekeeping			
Material Management Practices			
2). P2 Team			
SWPPP Implementation			
Monitoring Procedures			