

**SETTLEMENT AGREEMENT TO RESOLVE MONITORING ISSUES RAISED
ON APPEAL BY PHASE 1 PERMITTEES UNDER SPECIAL CONDITION S8
OF THE 2007 PHASE I MUNICIPAL STORMWATER PERMIT**

This Settlement Agreement ("Agreement") is entered this ___ day of March 2008, by and between the Washington State Department of Ecology ("Ecology") and Phase 1 Permittee appellants City of Tacoma, Pierce County Public Works and Utilities Department, Snohomish County, Clark County, and the Port of Seattle, and Phase I Permittee Intervenor City of Seattle, King County, and the Port of Tacoma, (collectively "Phase I Permittees").

I. RECITALS

WHEREAS, the Phase I Permittees appealed certain specific and technical monitoring requirements imposed under Special Condition S8 of the 2007 Phase I Municipal Stormwater Permit, ("Permit"), among other conditions; and

WHEREAS, Ecology and the Phase I Permittees, (collectively "the Parties") have engaged in extensive and productive good faith discovery and discussion regarding such Special Condition S8 monitoring requirements; and

WHEREAS, as a result of this process, the Parties agree that the monitoring issues raised by the Phase I Permittees under Special Condition S8 can be settled in a manner that will provide for the efficient collection and analysis of meaningful and high quality stormwater monitoring data, which is a mutual objective of the Parties; and

WHEREAS, the Parties believe that resolving these monitoring issues by settlement prior to hearing is in the public interest because it will promote administrative economy and avoid further expenditure of public resources to litigate issues that are no longer in dispute between the Parties; and

WHEREAS, Snohomish County has appealed certain provisions of Special Condition S7; and

WHEREAS, Snohomish County and Ecology have engaged in extensive and productive good faith discovery and discussion regarding Special Condition S7 and have reached an agreement which resolves Snohomish County's appeal of such condition.

NOW THEREFORE, in consideration of the promises contained herein, the Parties agree as follows:

II. AGREEMENT

1. Subject to the terms and conditions that follow, Ecology agrees to modify the specific provisions of Special Condition S8 identified below, in the manner set forth in Attachment A, (which is a "redline" version of Special Condition S8 dated December 21, 2007):

S8.D.2.a	at pages 2 & 3 of Attachment A
S8.D.2.a.i	at page 3 of Attachment A, first and third bullets
S8.D.2.a.ii	at page 3 of Attachment A, first and third bullets
S8.D.2.b	at page 4 of Attachment A, third paragraph
S8.D.2.b.iii	at page 4 of Attachment A
S8.D.2.d	at pages 5 & 6 of Attachment A
S8.D.2.d.i	at page 6 of Attachment A, second, third and fourth bullets
S8.D.2.d.i	at pages 7 & 8 of Attachment A, first, second and fifth bullets
S8.D.2.d.ii	at pages 8 & 9 of Attachment A
S8.D.2.f.ii	at page 9 of Attachment A
S8.D.2.f.iii	at page 9 of Attachment A, first bullet
S8.D.2.g	at pages 9 & 10 of Attachment A
S8.H.1	at page 13 of Attachment A
S8.H.1.a.iii	at page 13 of Attachment A
S8.H.1.a.iv	at page 13 of Attachment A
S8.H.2	at page 14 of Attachment A

2. Subject to the terms and conditions that follow, Ecology agrees to modify the specific provisions of Special Condition S7 in the manner set forth in Attachment B.

3. Within ten (10) days following execution of this Agreement by Ecology and the Phase I Permittees, the Parties shall notify the Board of this settlement and request by Joint Motion that the Board issue a ruling in advance of hearing: (i) dismissing the Special Conditions S7 and S8 issues addressed in the Agreement; and (ii) indicating that it will remand Special Conditions S7 and S8 to Ecology for modification in accordance with this Agreement, as part of the Board's Final Order in this case, to the extent the Agreement does not conflict with the Board's final ruling, as further discussed in paragraph 5 below.

4. The Phase I permittees agree to dismiss appeal issues C1 – C6 regarding Special Condition S8, and appeal issues B1 – B2 regarding Special Condition S7, which are set forth in the Board's December 11, 2007, Third Pre-Hearing Order, without prejudice and with the following exceptions: (1) issues C1 and C3 as between Pierce County Public Works and Utilities Department, Clark County, Snohomish County, the Washington State Department of Transportation and Ecology; and (2) issue E-6, which is a port-specific legal issue.

5. The Parties understand and agree that Ecology need not carry out the permit modifications specified in this Agreement until after the Board's ruling in this case is final. The Parties acknowledge that the Board's final ruling may require other modifications to the permit not specified in this Agreement or which contradict or otherwise render one or more of the modifications contemplated herein moot. In the event the Board requires modifications to the permit besides those specified in this Agreement, Ecology will carry out the Board's Order and Ecology may combine any changes required by the Board with the modifications specified in this Agreement. The Parties agree that Ecology need not carry out any modifications specified in this Agreement that are contrary to or rendered moot by the Board's final ruling; provided however, Ecology shall modify the Permit as specified in this Agreement to fullest extent possible as allowed by the Board's final ruling.

6. The Parties stipulate that Special Conditions S7 and S8 are hereby stayed, and the Phase I Permittees shall comply with Special Conditions S7 and S8 as modified in Attachments A and B to this Settlement Agreement. This stay shall remain in effect until Ecology modifies the Permit.

7. Nothing in this Agreement is intended to, nor does it, prevent Puget Soundkeeper Alliance, People for Puget Sound, or Puget Sound Energy and PacifiCorp from challenging Special Conditions S7 and S8 in accordance with the Board's restatement of those parties' S7 or S8 issues, which are included in the Board's December 11, 2007, Third Pre-Hearing Order at pages 7 & 8. Furthermore, nothing in this Agreement is intended to, nor does it, prevent Ecology and/or the Phase I Permittees from addressing or litigating legal or factual arguments or other evidence presented by Puget Soundkeeper Alliance, People for Puget Sound, or Puget Sound Energy and PacifiCorp, including but not limited to legal or factual arguments or other evidence which concern or address in any way the specific provisions of Special Conditions S7 and S8 which are specified in this Agreement. Furthermore, nothing in this Agreement is intended to, nor does it, prevent the Phase I Permittees from responding to legal or factual arguments or other evidence presented by Ecology concerning any provision or aspect of Special Conditions S7 and S8.

8. The Parties agree that, for the purpose of executing this Agreement, a facsimile signature shall be as effective and binding as an original signature.

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WASHINGTON STATE
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Water Quality Program Manager

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Title

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CLARK COUNTY

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PORT OF SEATTLE

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PHASE I PERMITTEE INTERVENORS:

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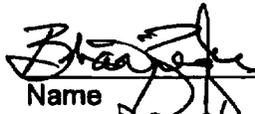
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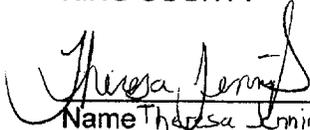
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Name Theresa Jennings (Date)

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ATTACHMENT A

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S8 – ALL CHANGES – REDLINE – 12/21/07

S8. MONITORING

- A. Except for the Port of Seattle and the Port of Tacoma, Secondary Permittees are not required to conduct water sampling or other testing during the effective term of this permit, with the following exceptions:
1. Any water quality monitoring required for compliance with TMDLs, pursuant to section S7 *Compliance with Total Maximum Daily Load Requirements* and Appendix 2 of this permit; and
 2. Any sampling or testing required for characterizing illicit discharges pursuant to section S6.D.3. of this permit.
- B. Permittees shall provide the following information in each annual report:
1. A description of any stormwater monitoring or studies conducted by the Permittee during the reporting period. If stormwater monitoring was conducted on behalf of the Permittee, or if studies or investigations conducted by other entities were reported to the Permittee, a brief description of the type of information gathered or received shall be included in the annual report(s) covering the time period(s) during which the information was received.
 2. An assessment of the appropriateness of the BMPs identified by the Permittee for each component of the SWMP; and any changes made, or anticipated to be made, to the BMPs that were previously selected to implement the SWMP, and why.
 3. Information required pursuant to S8.C.2. below.
- C. The Permittees listed in S1.B., and the Port of Seattle, and the Port of Tacoma shall develop and implement a long-term monitoring program.
1. The monitoring program shall include three components
 - a. Stormwater monitoring which is intended to characterize stormwater runoff quantity and quality at a limited number of locations in a manner that allows analysis of loadings and changes in conditions over time and generalization across the Permittees' jurisdiction. Stormwater monitoring requirements are outlined in S8.D.
 - b. Targeted stormwater management program effectiveness monitoring which is intended to improve stormwater management efforts by evaluating at least two stormwater management practices that significantly affect the success of or confidence in stormwater controls. Stormwater management program effectiveness monitoring requirements are outlined in S8.E.
 - c. BMP evaluation monitoring is intended to evaluate the effectiveness and operation and maintenance requirements of stormwater treatment and

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hydrologic management BMPs. BMP evaluation monitoring requirements are outlined in S8.F.

2. Each of the components of the monitoring program shall include a Quality Assurance Project Plan (QAPP). QAPPs shall be prepared in accordance with Ecology's QAPP guidelines, available from Ecology's website. The monitoring program shall be developed by qualified staff or contractors with experience in applying Ecology's or EPA's QAPP Guidelines.

All QAPPs shall be submitted to Ecology for review, in accordance with the deadlines in S8.G. below. QAPPs for Stormwater Monitoring (S8.D.), and Stormwater Treatment and Hydrologic Management BMP Evaluation Monitoring (S8.F.) shall be reviewed and approved by Ecology prior to monitoring.

D. Stormwater Monitoring

1. Stormwater monitoring site selection

- a. Stormwater monitoring sites shall have the tributary conveyance system and drainage area mapped, and be suitable for permanent installation and operation of flow-weighted composite sampling equipment. Permittees shall document how sites are selected and the basin size based on comparison of the times of concentration with rainfall durations for typical seasonal storms.

Each site must represent a discernible type of land use, but not a single industrial or commercial complex. Ideally, to represent a particular land use, no less than 80% of the area served by the outfall or conveyance will be classified as having that land use. Permittees may move upstream in the conveyance system to achieve the desired land use.

- b. Counties shall monitor one outfall or conveyance representing each of the following land uses: Commercial, Low density residential, and High density residential.
- c. Cities shall monitor one outfall or conveyance representing each of the following land uses: Commercial, High density residential, and Industrial.
- d. The Ports of Seattle and Tacoma shall each monitor one outfall or conveyance.

2. Stormwater monitoring frequency and type of sampling

- a. Each stormwater monitoring site shall be sampled according to the following frequency unless good faith efforts with good professional practice by the Permittee do not result in collecting a successful sample for the full number of storms:

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Sixty-seven percent of the forecasted qualifying storms which result in actual qualifying storm events are required to be sampled, up to a maximum of eleven (11) storm events per water year. Qualifying storm events are defined in S8.D.2.a-i, below.

Qualifying storm event sampling must be distributed throughout the year, approximately reflecting the distribution of rainfall between the wet and dry seasons (with a goal of 60-80% of the samples collected during the wet season and a goal of 20-40% of the samples collected in the dry season).

Additionally, the Permittee shall analyze up to a maximum of 3 samples that are collected as a result of attempts to sample the eleven required storm events and do not meet the rainfall volume storm event criterion but do meet the other storm event and sample criteria. Not including the chemical sampling and analysis required by S8.D.2d., the maximum number of sampled storm events to be analyzed is fourteen (14) per year.

~~Seventy five percent of the qualifying storms, up to a maximum of 15 storm events per year, shall be sampled. Sampling must be distributed throughout the year, approximately reflecting the distribution of rainfall between the wet and dry seasons (75-85% of the samples collected during the wet season).~~

- i. The wet season is from October 1, through April 30. A qualifying wet season storm event is defined as follows:
 - Rainfall volume: 0.420" minimum, no fixed maximum
 - Rainfall duration: No fixed minimum or maximum
 - Antecedent dry period: Less than or equal to 0.02" rain in the previous 24 hours
 - Inter-event dry period: 6 hours
- ii. The dry season is from May 1 through September 30. A qualifying dry season storm event is defined as follows:
 - Rainfall volume: 0.420" minimum, no fixed maximum
 - Rainfall duration: No fixed minimum or maximum
 - Antecedent dry period: less than or equal to 0.02" rain in the previous 72 hours
 - Inter-event dry period: 6 hours
- b. Storm events shall be sampled using flow-weighted composite storm sampling. Automatic samplers shall be programmed to begin sampling as early in the runoff event as practical and to continue sampling past the longest estimated time of concentration for the tributary area.

For storm events lasting less than 24 hours, samples shall be collected for at least seventy-five percent (75%) of the storm event hydrograph. For storm events lasting longer than 24 hours, samples shall be collected for at least

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seventy-five percent 75% of the hydrograph of the first 24 hours of the storm.

Each composite sample must consist of at least 10 aliquots. Composite samples with 7 to 9 aliquots are acceptable if they meet the other sampling criteria and help achieve a representative balance of wet season/dry season events and storm sizes.

Continuous flow recording of all storm events (not just sampled storm events) is necessary for at least one year to establish a baseline rainfall/runoff relationship.

Precipitation and flow data shall be reported, and composite samples shall be analyzed and results reported for the constituents/parameters listed below. Chemicals below detection limits after two years of data analysis may be dropped from the analysis. Refer to Appendix 9 for a listing of acceptable laboratory analysis methods and target reporting limits.

- i. Precipitation event data including antecedent dry period and rainfall distribution throughout the event, flow and hydrograph data including sampled and total runoff time periods and volumes
- ii. Conventional Parameters Including: TSS, turbidity, Conductivity, Chloride, Biochemical oxygen demand (BOD₅), Hardness, and Methylene Blue Activating Substances (MBAS).
- iii. ~~Bacteria: Fecal Coliform~~ Reserved.
- iv. Nutrients: Total phosphorus, Orthophosphate, Total kjeldahl nitrogen, and Nitrate – nitrite.
- v. Metals, including, at a minimum: total and dissolved copper, zinc, cadmium, and lead; and mercury sampling in commercial and industrial land use areas.
- vi. Organics: PAHs; phthalates.
- vii. Pesticides including:
 - Herbicides: 2,4-D, MCP, Triclopyr,
 - Insecticides: Diazinon, Malathion, Chlorpyrifos, Dichlobenil, Prometon
 - Fungicides: Pentachlorophenol
- c. If the volume of stormwater sample collected from a qualifying storm is insufficient to allow analysis for all parameters listed S8.D.2.b. above, the sample shall be analyzed for as many parameters as possible in the following priority order:

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- i. All land use types: 1. TSS; 2. Conductivity; 3. MBAS; 4. Metals and hardness;
- ii. Industrial/Commercial: 5. PAH's and phthalates; 6. Pesticides; 7. Nutrients 8. BOD₅; and 9. Chlorides
- iii. Residential: 5. Nutrients; 6. Pesticides; 7. PAH's and phthalates; 8. BOD₅; and 9. Chlorides

If insufficient sample exists to run the next highest priority pollutant, that analysis should be bypassed and analyses run on lower priority pollutants in accordance with the remaining priority order to the extent possible.

- d. ~~The Permittee shall test the seasonal first-flush shall be tested for toxicity in accordance with the criteria and procedures described in this section. This toxicity testing is for screening purposes only and is not effluent characterization or compliance monitoring under WAC 173-205. One composite sample from each monitoring site shall be tested annually. A seasonal first flush storm event is an event in August or September, with at least a one week antecedent dry period. An EC₅₀ and, if possible, an EC₂₅ shall be reported for each test.~~

Toxicity storm event criteria:

- August or September, with at least a one-week antecedent dry period (or October, irrespective of antecedent dry period, if unsuccessful in August or September).

Toxicity sample criteria:

- Adequate volume to perform toxicity testing, any associated egg (includes both yolk and embryo) analysis, and the chemical analyses as described below. The total volume required for toxicity testing and associated egg analysis is in the range of 44 to 24 liters. The volume required for chemical analysis is approximately 10 liters.

The Permittee shall contact the toxicity laboratory prior to the forecasted storm event to inquire about gamete (test organism) availability. If the laboratory confirms that gametes of sufficient quantity and quality will not be available for toxicity testing, the Permittee shall not attempt to collect toxicity samples for that storm event.

If the Permittee is unsuccessful in completing a toxicity test despite good faith, documented efforts, or due to an invalid or anomalous test result, a second sampling attempt is required if sufficient time remains to meet the toxicity storm event criteria. If the second attempt is also unsuccessful, the Permittee shall document its efforts in its annual stormwater monitoring

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report and shall not be required to conduct further sampling and analysis efforts under S8.D.2.d for that water year.

- i. Sampling and Reporting Requirements for seasonal first-flush toxicity tests
- The Permittee shall submit all reports for toxicity testing in accordance with the most recent version of Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. Reports shall contain bench sheets and reference toxicant results for test methods. If the lab provides the toxicity test data in electronic format for entry into Ecology's database, then the Permittee shall send the data to Ecology along with the test report, bench sheets, and reference toxicant results.
 - The Permittee shall collect the sample for toxicity testing using flow weighted or time-weighted composite samplers or sampling methods.
 - The Permittee shall collect the sample for the associated chemical analyses at the same time and location as the toxicity testing sample. The associated chemical analyses shall be for the following parameters:
TSS, chloride, hardness, methylene blue activating substances (MBAS), metals including total and dissolved copper, zinc, cadmium, and lead (mercury in commercial or industrial land use areas only), PAHs, phthalates, and pesticides including 2,4-D, MCPP, Triclopyr, Diazinon, Malathion, Chlorpyrifos, Dichlobenil, Prometon and Pentachlorophenol.
 - Sample holding times, temperatures, and handling shall meet Ecology's guidance (WQ-R-95-80, or version current at the permit revision date). The Permittee shall conduct the toxicity testing untreated stormwater collected in accordance with section S8.D.2.b. above. The Permittee must attempt to collect sufficient sample for the toxicity test and the chemical analyses specified in S8.D.2. The Permittee must cool the samples to 0–6 degrees Celsius during collection and send them to the lab immediately upon completion. The lab must begin the toxicity testing as soon as possible but no later than 36 hours after sampling was completed.
 - The laboratory must conduct water quality measurements on all samples and test solutions for toxicity testing as specified in the most recent version of Department of Ecology publication # WQ-R-95-80,

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Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria.

- Testing procedures should follow: E-test (seven day), Environment Canada, Pacific Environmental Science Center, Environmental Toxicology Section, SOP ID: RBTELS11.SOP, 1999. The test procedure may take advantage of the smaller volume modification described in: Canaria, E.C., Elphick, J.R. and Bailey, H.C. 1999. A simplified procedure for conducting small scale short-term embryo toxicity tests with salmonids is found in Environ. Toxicol. 14:301-307.
- Toxicity tests must meet quality assurance criteria in the most recent versions of the Environment Canada manual EPS 1/RM/28 and the Department of Ecology Publication #WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria*. If test results are determined to be invalid ~~or anomalous by the Department,~~ testing must be repeated with freshly collected stormwater by the laboratory or the Department determines the test results are anomalous, the Department may require the Permittee to attempt to collect a second toxicity test sample if the Department believes sufficient time remains to collect a sample meeting the toxicity storm event criteria. The Permittee will be notified in writing that it is required to attempt to collect an additional sample meeting the terms of S8.D.2.d. If the Permittee is unable to collect and test a second sample, it must document its efforts in the annual stormwater monitoring report. The Permittee shall not be required to make more than two sample attempts for toxicity testing described in S8.D.2.d.
- The Permittee may sample receiving water at the same time as the stormwater and instruct the lab to measure the hardness of both and increase the hardness of the stormwater sample to match the hardness of the receiving water sample prior to beginning the toxicity test. Otherwise, the Permittee must conduct whole effluent toxicity tests on an unmodified sample of stormwater.
- Control water and dilution water must be a moderately hard reconstituted laboratory water or pristine natural water of sufficient quality for good control performance.
- The ~~EC₂₅-EC₃₀~~ must be calculated using probit analysis. If probit analysis is not appropriate for the data, then the EC₅₀ must be calculated by the trimmed Spearman-Kärber procedure. Abbott's correction may be applied to the data before deriving this ~~ese~~ point

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estimate ions. A minimum of five (5) concentrations and a control must be used in the testing

- ii. Follow-up actions-Response to Toxicity. If the EC_{25} EC_{50} from any valid and non-anomalous test is 100% stormwater or less, the Permittee must implement follow-up actions, a Toxicity Identification/Reduction Evaluation (TI/RE) plan and submit a report to Ecology as part of the Permittee's annual report. If a valid EC_{25} cannot be calculated for any test, then the EC_{50} must be calculated and used instead of the EC_{25} to determine if a TI/RE plan is required in accordance with this paragraph. The TI/RE plan must be based on the results of the chemical analyses in accordance with S8.D.2.b for the same volume of water, and a Gas Chromatograph/Mass Spectrometer analysis of the yolks from the highest test concentration (usually 100% sample). The report must explain how the Permittee's stormwater management actions are expected to reduce stormwater toxicity. Terminated organisms must be preserved for up to six months. Within sixty (60) days after final validation of the data, the Permittee shall compare the chemical analysis results for the same sample event to a library of toxicity test results compiled by the Department and identified for this purpose, using good faith efforts to determine if the presence of an analyzed contaminant is within a range reported in the literature that may adversely affect fish embryos and if so, to review the source literature.

If a possible chemical contaminant(s) of concern is determined by the library comparison and literature review, the Permittee must prepare and submit a report summarizing the toxicity and chemical analysis results, the library comparison, a review of relevant sources of literature from the Department's library, the possible chemical contaminant(s) of concern, and an explanation of how the Permittee's stormwater management actions are expected to reduce stormwater toxicity. This report will be submitted to the Department within one hundred twenty (120) days after final validation of the toxicity and chemistry data. In addition, the report will be attached as an appendix to the following year's annual stormwater monitoring report.

If a possible chemical contaminant of concern is not determined by library comparison and literature review, a Gas Chromatograph/Mass Spectrometer (GC/MS) analysis of the eggs from the highest test concentrations must be performed. The GC/MS need not be quantitative but only capable of identifying stormwater contaminants present in the eggs. Within one hundred fifty (150) days after final validation of the toxicity and chemical analysis data, the Permittee must prepare and submit a report summarizing the toxicity and chemical analysis results,

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the library comparison, a review of relevant source literature from the Department's library, the GC/MS results, and an explanation of how the Permittee's stormwater management actions are expected to reduce stormwater toxicity. In addition, the report will be attached as an appendix to the following year's annual stormwater monitoring report.

- e. Each storm event shall be sampled using grab samples for the following constituents/parameters:
 - i. Total Petroleum Hydrocarbons (TPH) using NWTPH-Gx and NWTPH-Dx. (sample must be collected early in the storm event and skimmed from the surface), and
 - ii. Fecal coliform bacteria.
- f. Annual sediment monitoring. Sediments samples shall be collected at each stormwater monitoring site, or in the vicinity of each stormwater monitoring site. Use of in-line sediment traps or similar collection system is preferred. Sampling of receiving water sediment deposits is an alternative where approved by Ecology.
 - i. Sediment samples shall be analyzed for: total solids, grain size, total organic carbon, copper, zinc, cadmium, lead, and mercury (mercury not necessary for residential land use sites), PAHs, phthalates, phenolics, PCBs (not necessary for residential sites), and pesticides.
 - ii. Parameters that are below detection limits after two years of data may be dropped from the analysis. A minimum of one ~~independent~~ sample per year shall be collected.
 - iii. If the volume of sediment sample is insufficient to analyze for all of the parameters listed above, the sample shall be analyzed for as many parameters as possible in the following priority order:
 - All land use types: 1) Grain size (if enough sample is available for all parameters, use grain size method in Appendix 9; otherwise characterize grain size qualitatively); 2) Total organic carbon; 3) ~~Hardness and m~~ Metals;
 - Industrial/Commercial: 4) PAH's and Phthalates; 5) Phenolics; 6) PCB's; and 7) Pesticides.
 - Residential: 4) Pesticides; 5) PAH's and Phthalates; and 6) Phenolics
- g. For each stormwater monitoring site calculate the Event Mean Concentrations (EMCs), total annual pollutant load and the seasonal pollutant load for the wet and dry seasons based on the water year. The loadings shall be expressed as total pounds and as pounds per acre, and must

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take into account potential pollutant load from base flow. Reporting shall be in accordance with S8.H.

- E. Targeted Stormwater Management Program Effectiveness Monitoring
1. Each Permittee shall conduct monitoring designed to determine the effectiveness of the Permittee's SWMP at controlling a stormwater related problem directly addressable by targeted actions in the SWMP. The stormwater management program effectiveness monitoring component shall be designed to answer one of each type of the following questions:
 - a. The effectiveness of a targeted action (or narrow suite of actions), and
 - b. The effectiveness of achieving a targeted environmental outcome.
 2. The monitoring shall at a minimum include stormwater, sediment or receiving water monitoring of physical, chemical and/or biological characteristics. The monitoring may also include data collection and analysis of other programmatic measures of effectiveness such as surveys and polls. Monitoring to identify sub-basin-specific water quality problems and characterize discharges for planning purposes may also be included.
 3. For each of the two questions selected for monitoring, Permittees shall develop a monitoring program containing the following elements:
 - a. Description of the targeted action/targeted environmental outcome and a explanation of why it is significant to the Permittee, and if the problem is significant to other stormwater managers;
 - b. Specific hypotheses about the targeted action/targeted environmental outcome that will be tested by the monitoring problem;
 - c. Specific parameters of attributes to be measured; and
 - d. Expected modifications to management actions depending on the outcome of hypotheses testing.
- F. Stormwater Treatment and Hydrologic Management Best Management Practice (BMP) Evaluation Monitoring
1. Each Permittee listed in S1.B. and the Ports of Seattle and Tacoma shall conduct full scale field monitoring to evaluate the effectiveness and operation and maintenance requirements of stormwater treatment and hydrologic management BMPs applied in their jurisdiction. A QAPP is required for each BMP and flow reduction strategy being monitored.
 2. Each Permittee listed in S1.B. shall monitor at least two treatment BMPs, at no less than two sites per BMP. The Port of Seattle and the Port of Tacoma shall each monitor at least one treatment BMP, at no less than two sites.

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To ensure a range of BMP types are monitored, Ecology will restrict the total number of monitoring sites for a BMP category to no more than four. BMPs shall be selected from the following list:

- a. Basic Treatment Category: Biofiltration swale, Filter strip, Basic wetpond, Treatment wetland, and Sand filter.
 - b. Metals/Phosphorus Treatment Category: Amended sand filter, Two facility treatment train, Compost amended filter strips, Bioretention, and Large wetpond.
 - c. Oil Control Category: Linear sand filter, and Catch basin insert.
3. BMPs shall be designed in accordance with the 2005 *Stormwater Management Manual for Western Washington* unless Ecology approves of an alternate design in the QAPP review. Permittees may also petition Ecology to monitor a BMP that is not on the above list.
 4. Permittees must use appropriate sections of Ecology's guidance for "Evaluation of Emerging Stormwater Treatment Technologies" (available on Ecology's website) for preparing, implementing, and reporting on the results of the BMP evaluation program.

The statistical goal is to determine mean effluent concentrations and mean percent removals for each BMP type with 90 - 95% confidence and 75 - 80% power.

Permittees must use USEPA publication number 821-B-02-001, "Urban Stormwater BMP Performance Monitoring," as additional guidance for preparing the BMP evaluation monitoring, and must collect information pertinent to fulfilling the "National Stormwater BMP Data Base Requirements" in section 3.4.3. of that document.

5. The parameters to be monitored in whole water at each test site include:
 - a. For Basic, Enhanced, or Phosphorus treatment BMPs: Total suspended solids, Particle size distribution, pH, Total and ortho-phosphorus, Hardness, and Total and dissolved copper and zinc.
 - b. For Oil Control BMPs: Total suspended solids, Particle size distribution, pH, NWTPH-Dx and -Gx, and Oil sheen
6. Parameters to be monitored in accumulated sediment at each test site for Basic, Enhanced, Phosphorus treatment, or Oil Control BMPs include: Percent total solids, Grain size, Total volatile solids, NWTPH-Dx, Total phosphorous, and Total cadmium, copper, lead, and zinc.
7. Each Permittee listed in S1.B. shall monitor the effectiveness of one flow reduction strategy that is in use or planned for installation in their jurisdiction.

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Monitoring of a flow reduction strategy shall include continuous rainfall and surface runoff monitoring. Flow reduction strategies shall be monitored through either a paired site study or against a predicted outcome.

G. Monitoring Program Development

Permittees may choose to develop one, two or all of the components of the monitoring program, conduct the monitoring, and report results through an integrated, long-term, water quality monitoring program in collaboration with other municipal stormwater Permittees; or they may independently develop one, two, or all of the components of the monitoring program, conduct the monitoring, and report results.

Collaborative monitoring programs may be developed by a third party (or parties) that are not a Permittee, provided that the Permittee complies with the provisions of Special Condition S3.B (relying on another entity to meet permit requirements).

The schedule for the development of monitoring programs is as follows:

1. Collaboratively developed monitoring programs.
 - a. Permittees that intend to meet all or part of the monitoring requirements through a collaborative process shall submit a statement to Ecology explaining their commitment to the collaborative process no later than 6 months after the effective date of this permit
 - b. The summary description of the monitoring program and QAPPs, as required, shall be submitted to Ecology no later than 1.5 years after the effective date of this permit. The monitoring program shall be submitted in both paper and electronic form.
 - c. Approved or final QAPPs shall be completed no later than 2 years after the effective date of this permit, provided that this deadline will be extended by the number of days by which Ecology exceeds 90 days for QAPP review.
 - d. Full implementation of the monitoring program shall begin no later than 2.5 years after the effective date of this permit. The third party or parties selected to develop the monitoring plan may continue to be utilized to collect and analyze the data and to write the subsequent reports required under this permit.
 - e. Final reports, including data and analysis for S8.F. Stormwater Treatment and Hydrologic Management BMP Evaluation Monitoring Program that are completed during the permit term shall be submitted to Ecology no later than the fourth year annual report. The fourth year annual report shall also describe Stormwater Treatment and Hydrologic Management BMP Evaluation Monitoring programs that are still in progress at the end of the reporting period, and the expected date for submittal of the final reports.

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2. Independently developed monitoring programs.
 - a. A summary description of the monitoring program and QAPPs, as required, shall be submitted to Ecology no later than 1 year after the effective date of this permit. The monitoring program shall be submitted in both paper and electronic form.
 - b. Approved or final QAPPs shall be completed no later than 1.5 years after the effective date of this permit, provided that this deadline shall be extended by the number of days by which Ecology exceeds 90 days for QAPP review.
 - c. Full implementation of the monitoring program shall begin no later than 2 years after the effective date of this permit.
 - d. Final reports, including data and analysis for S8.F. Stormwater Treatment and Hydrologic Management BMP Evaluation Monitoring Program completed during the permit term shall be submitted to Ecology no later than the fourth year annual report. The fourth year annual report shall also describe Stormwater Treatment and Hydrologic Management BMP Evaluation Monitoring programs that are still in progress at the end of the reporting period, and the expected date for submittal of the final reports.

H. Monitoring Program Reporting Requirements

1. The stormwater monitoring report shall be submitted with the annual report each year, beginning in 2009 for independent monitoring, and 2010 for collaborative monitoring. Each report shall include all monitoring data collected during the preceding ~~period from January 1 through December 31~~ water year (October 1 – September 30), provided the first annual monitoring report submitted will include data from a partial water year. Each report shall also integrate data from earlier years into the analysis of results, as appropriate. Permittees that choose to participate in an integrated water quality monitoring program shall submit a single integrated monitoring report. Reports shall be submitted in both paper and electronic form and shall include:
 - a. Stormwater Monitoring Reporting
 - i. A summary including the location, land use, drainage area size, and hydrology for each site,
 - ii. A comprehensive data and QA/QC report for each component of the monitoring program, with an explanation and discussion of the results of each monitoring project,
 - iii. The annual pollutant load based on water year for each site expressed in total pounds, and pounds/acre, and
 - iv. The wet and dry season pollutant loads based on water year, expressed in total pounds, and pounds/acre.

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- b. Stormwater Management Program Effectiveness Monitoring Reporting
 - i. A summary of the purpose, design, and methods of the monitoring program,
 - ii. The status of implementing the monitoring program,
 - iii. A comprehensive data and QA/QC report for each part of the monitoring program, with an explanation and discussion of the results of each monitoring project,
 - iv. An analysis of the results of each part of the monitoring program, including any identified water quality problems or improvements or other trends in stormwater or receiving water quality, and
 - v. Recommended future actions based on the findings.
 - c. Stormwater Treatment and Hydrologic Management Best Management Practice (BMP) Evaluation Monitoring Reporting
 - i. A summary including the BMP type location, land use, drainage area size, and hydrology for each site.
 - ii. The status of implementing the monitoring program,
 - iii. A comprehensive data and QA/QC report for each part of the monitoring program, with an explanation and discussion of the results of each monitoring project,
 - iv. Performance data or flow reduction performance. Performance data for treatment BMPs shall be reported consistent with:
 - The guidelines in appropriate sections of Ecology's guidance for "Evaluation of Emerging Stormwater Treatment Technologies", and
 - USEPA publication number 821-B-02-00, "Urban Stormwater BMP Performance Monitoring," including information pertinent to fulfilling the "National Stormwater BMP Data Base Requirements" in section 3.4.3. of that document.
2. If the Permittee monitors any pollutant more frequently at monitoring stations associated with the monitoring programs described in Section S8.D., S8.E., and S8.F. during the preceding water year, then the results of this monitoring shall be included in the annual monitoring report. If the Permittee conducts any other stormwater monitoring in addition to that required in the required monitoring program, then it must provide a description of the additional monitoring in the annual report.

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November 28, 2007

Revised: December 6, 2007

Proposed changes to section S7 of the Permit –

Delete last sentence in first paragraph of S7: ~~“All Permittees shall be in compliance with the requirements of all applicable TMDLs.”~~

Proposed changes to Appendix 2 of the Permit

1. Replace paragraphs in Appendix 2 that begin “The Illicit Discharge Detection and Elimination program...” These paragraphs are found in the following TMDLs:
Snohomish River Tributaries (Page 2 of 14)
North Creek (Page 6 of 14)
Swamp Creek (Page 9 of 14)

The replacement paragraph for the Snohomish River TMDL language and the North Creek TMDL language would read:

“The ordinance or other regulatory mechanism (developed or updated pursuant to S5) that effectively prohibits non-stormwater, illegal discharges, and/or dumping into the Permittees MS4 also prohibits non-stormwater discharges from commercial animal handling areas and commercial composting facilities. *Commercial animal handling areas* are associated with Standard Industrial Code (SIC) 074 and 075 and include veterinary and pet care/boarding services, animal slaughtering, and support activities for animal production. Facilities where the degradation and transformation of organic solid waste takes place under controlled conditions designed to promote aerobic decomposition are considered *commercial composting facilities* (definition in accordance with Chapter 173-350 WAC).”

The replacement paragraph for the Swamp Creek TMDL language would read:

“The ordinance or other regulatory mechanism (developed or updated pursuant to S5) that effectively prohibits non-stormwater, illegal discharges, and/or dumping into the Permittees MS4 also prohibits non-stormwater discharges from commercial animal handling areas and commercial composting facilities. *Commercial animal handling areas* are associated with Standard Industrial Code (SIC) 074 and 075 and include veterinary and pet care/boarding services, animal slaughtering, and support activities for animal production. Facilities where the degradation and transformation of organic solid waste takes place under controlled conditions designed to promote aerobic decomposition are considered *commercial composting facilities* (definition in accordance with Chapter 173-350 WAC). Permittees shall require source control BMPs equivalent to those in the 2005 Western Washington Stormwater Manual Volume IV, pages 2-10, through 2-12 for these facility types.”

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2. Where the term “all upstream tributaries” is used in Appendix 2 replace with “all upstream tributaries within the jurisdiction of the Permittee and within the geographic area covered by this permit”
3. Where the term “CAO” is used in Appendix 2, replace with “critical areas ordinance”.
4. Revise last full paragraph on page 10 of Appendix 2 as follows:

“To meet ~~the Swamp Creek TMDL water quality monitoring requirements and~~ ensure constancy with the county-wide TMDL monitoring program, Phase I permittee Snohomish County has the option of following monitoring timelines and dates for submitting their QAPP, BPRP, and Early Action Plan (if applicable) following the timelines set forth in the North Creek and Snohomish Tributaries TMDL ~~Detailed Implementation Plans requirements in this Appendix.~~”