

# Comments on the City of Tacoma Draft Manual

Ed O'Brien

April 5, 2008

## Volume 1

### Chapter 2

1. The City continues to require only Basic Treatment for discharges to the Flett, Leach, and Joe's Creek systems. In Flett Creek, the City must demonstrate that discharges from land uses designated for Enhanced Treatment by Appendix 1 of the permit must receive that treatment before entering Wapato Lake, Ward's Lake, or the Flett Creek Holding Basins.
2. Table 2 indicates no flow control and only Basic Treatment for discharges to the T-Street Gulch. I do not have any record of the City answering our initial questions about the potential uses of the gulch and the necessity of doing more to stop erosion of the gulch. We will need better justification for the City's regulatory approach.
3. Please submit Figure 3 of Chapter 2.
4. The Fee-In-Lieu approach for the Flett Creek Watershed is potentially approvable pending the City's written explanation for the plan to upgrade the regional flow control basins. This would include an explanation of the flow restriction provided by the screw pumps between the Flett wetlands and the Flett Creek holding basins; and, an explanation concerning how the City determines the infiltration capacity of the gravel pit; and its ability to stay within flooding restrictions within the Flett Creek holding basins.
5. Page 21 and page 517 include references to Chapter 12.08 in which the old title of that code is used.

### Chapter 3

6. Figure 5 on page 25: The City needs to decide whether to use the assessed value or replacement value of the existing site improvements as the basis for making cost comparisons. Citing both bases will only create confusion and inconsistency in interpretation.
7. Section 3.3.4: I am not sure I have an accurate understanding of the fee-in-lieu thresholds. I will need an example. Also, the draft note needs a resolution. In any case, the City will have to also explain how they manage the fee. It should be spent on providing water quality treatment facilities for stormwater discharging to the same receiving water.

8. The "Note" on page 28 is outdated and irrelevant.
9. Section 3.4.1: Projects meeting the thresholds in Section 3.3 always need a construction SWPPP.
10. The first sentence of the "Note" on page 29 should be in bold font. It is a permit requirement, so the City should indicate it as such.
11. Section 3.4.2 and Chapter 1 of Volume II. Ecology intends that each of the statements under each element heading is mandatory unless an exemption is justified in the SWPPP. The elimination of the detailed statements from the Minimum Requirement, make the City's intentions unclear. Also, because the titles of the elements are not in bold font, they do not seem enforceable. We will need an explicit statement from the City indicating that all of the statements under each element heading are considered mandatory.
12. Section 3.4.3, Source Control of Pollution: The second paragraph under the Objective statement should fall under a separate subheading of Supplemental Guidelines. The third paragraph should be part of the minimum requirement statement because it is not really a guideline. It is a requirement of your manual.
13. Section 3.4.5: The second paragraph refers to Chapter 3 of Volume 3. Should it read Chapter 2 of Volume 3?
14. It would be useful to add a definition for "Groundwater Protection District" in the Glossary – even if it refers to a more complete definition in the code.
15. Section 3.4.6, Supplemental Guidelines: The note indicates that the section is incomplete. The City must provide its proposal before receiving Ecology's concurrence. Also, the fee-in-lieu approach needs a better explanation, and it is not consistent with the text on page 27.
16. Table 4: The table incorrectly identifies flow control facilities for TDA's with less than 10,000 sq. ft. of effective impervious area; and no facilities for TDA's with 10,000 sq. ft. or more. The table should indicate flow control facilities for TDA's with a 0.1 cfs or greater increase in the 100-year flood frequency. It would also be complete to indicate that TDA's below the thresholds still must apply on-site stormwater BMP's.
17. The 0.1 cfs increase in the 100-year frequency flow rate must be added to the first decision box in Figure 6.
18. Figure 6 indicates that flow control for discharges to a gulch is only necessary if a qualitative downstream analysis indicates it is necessary. Ecology raised concerns about this approach in its July, 2003 letter to Mr. John Stetson of the City. Those concerns must be addressed by the City. Also, the paragraph at the

top of page 42 indicates that a “quantitative” analysis is necessary for projects adding 10,000 sq. ft. or more of impervious surface and not providing detention. That conflicts with the “qualitative” in the Note of Figure 6.

19. Section 3.4.7: Standard Requirement: The second bullet must be deleted. Ecology will only accept a petition from the City for application of the 40% total impervious area exemption from the historic land cover condition criterion. The City should not allow project applicants to justify use of this exemption. Ecology has identified areas of the City that may qualify for this exemption. Ecology’s data only reaches back to 1991 conditions. The City must provide information to substantiate that these basins were likely over 40% TIA as of 1985 if it wants to qualify for this alternative flow control standard.
20. Section 3.4.7: Standard Requirement: Ecology suggests that the City should identify and gain Ecology approval for any areas of the City which it thinks should qualify for a pre-developed land cover condition of prairie. Putting a case-by-case burden of proof on applicants, which then requires a case-by-case decision by your project reviewers seems like an inefficient method that is ripe for inconsistent decision-making and possible abuse.
21. Section 3.4.7, Thresholds: If the City wishes to use a “net” impervious surface concept in regard to flow control thresholds, it must require that any removed impervious surface cannot be altered in the future, i.e., there must be a legal document (e.g., native vegetation protection easement, deed restriction) that protects the area in perpetuity. In addition, the land where the impervious surfaces are removed must meet the Soil Quality and Depth BMP, and must be replanted with native vegetation including evergreen trees.
22. Section 3.4.7, page 37: The reference to “items 1 and 2” is not an adequate description.
23. Section 3.4.7, page 37, Requirements: The text should indicate that only continuous runoff models approved by the Dept. of Ecology shall be acceptable. You may want to indicate that at the time of publication, MGS Flood is the only approved alternative software.
24. Section 3.4.7, page 38, Exemptions: The reference to exemptions for discharges for which geographic specific requirements apply seems inappropriate. First of all, the reference is not clear. Secondly, many of the geographic areas identified in Chapter 2 need the standard requirement.
25. Section 3.4.8. Wetlands Protection: The City requires maintaining hydrologic conditions and use of a continuous runoff model. But it does not reference any guidance in regard to how to define the hydrologic conditions that must be maintained. We strongly suggest that you reference Guidesheet 2B of Appendix 1D of the SMMWW. Ecology is trying to modify WWHM so that an analysis for compliance with the guidance can be done. Also, the editor’s note indicates that

you need a reference to Guidesheet 1B. It would seem helpful to project applicants to attach the Wetlands Guidance from the SMMWW, or at least the two guidesheets referenced above.

26. Section 3.4.8. Wetlands Protection, Additional Requirements: Change “ordinarily are not” to “shall not be.”
27. Section 3.4.10: Operation and Maintenance: Because of paragraph formatting, the requirement for a log of maintenance activity seems to apply only to public facilities. We suggest re-formatting to make it clear that it applies to private facilities too.
28. Section 3.5 Exceptions: The proposed section does not seem to provide an equivalent alternative to Section 6 of Appendix 1 of your NPDES permit. The section requires neither public notice of the application, nor public notice of the decision. A written finding of fact is also not required. The criteria under which an exception could be granted are not equivalent to the criteria in your permit.
29. Chapter 4, Stormwater Site Plans, Step 6 of Chapter 4 (page 47): Based on this draft manual, the reference should be to Volume 3, Chapter 3.
30. Chapter 5, BMP & Facility Selection ...: The reference to Chapter 3 of Volume 3 in the first paragraph of Step 4 on page 51 should be changed to Chapter 2 of Volume 3. The same change should be made in the 2<sup>nd</sup> paragraph of sub-step 1.

#### Appendix A: Regulatory Requirements

The first paragraph needs updating to reflect that Ecology has issued the City’s NPDES permit. The section concerning UIC Authorizations should be updated to reflect the publication of “Guidance for UIC Wells That Manage Stormwater.”

#### Appendix B:

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The Chapter 1 checklist includes “current assessed value and cost of proposed improvements (for redevelopment projects.) It would be more instructive to indicate that the project applicant should report the assessed value of the pre-project improvements on the site. The assessed value of the property should not be included in that figure.

The Chapter 3 checklist indicates that the city-specified storm event is described in Chapter 4 of Volume 3. Based on this draft, the reference should be to Chapter 3 of Volume 3.

Chapter 4: The example tables for reporting pre- and post-developed hydrology reference single-event model terminology. Table 1 requires listing the curve numbers.

Table 2a asks for SBUH outputs. Single event hydrologic methods are only acceptable for projects vested before the City's adoption of updated flow control standards (October 2002?). The City should make that more explicit in this manual. It may be wise to indicate the distinction somewhere in this checklist.

## Appendix C:

We appreciate the City's intent to have the applicant provide pertinent information to its design reviewers. However, the "Hydraulic Analysis Worksheets" proposed by the City are not sufficient for your design reviewers. We suggest that you expand the table for the "Developed Condition." Also, the City should require designers to submit the design project sheet outputs provided by WWHM or MGS Flood. These sheets provide documentation of input values, tables and graphics showing whether the design standard has been achieved, stormwater facility dimensions, orifice heights and sizes, and design flows and volumes for use in designing treatment facilities. In short, the documentation available through use of the WWHM or MGS Flood reports, should be sufficient for your design reviewers to check for proper design.

Also, the proposed worksheet indicates that SBUH can be used for flow control design. The City should make it explicit that use of SBUH for design of flow control facilities will only be accepted for projects that were vested before the City's adoption of updated flow control standards (2003?). You may want to add a section for submittals of SBUH-related information that is used for sizing conveyance systems.

## Volume II

### Chapter 1

#### Construction Elements:

Ecology will need confirmation that the detailed statements within each construction element are requirements unless the narrative explains why it is not applicable to the site. The purpose statement on page 69 brings into question whether the construction elements are only "guidance."

#### Element #4: Install Sediment Controls

This element does not include statement c from the corresponding section in Appendix 1 of your NPDES permit. Please add the statement or a statement you propose as equivalent.

To my knowledge, Ecology has not granted approval of a "modified pressurized sand filtration system." Please identify where you have seen approval for such a system.

#### Element #5: Stabilize Soils

The element does not include statement e. from the corresponding section of Appendix 1. Please add it.

#### Element #6: Protect Slopes

Please add the additional text from statement c. in your permit.

#### Element #7: Protect Drain Inlets

Please eliminate your second bulleted statement. It conflicts with statements under Element #2.

#### Element #8: Stabilize Channels and Outlets

Please add the additional instruction from Element 8.a. of your permit to the first bullet of your text.

#### Element #9: Control Pollutants

In the third statement, please change “noninert wastes” to “other materials that have the potential to pose a threat to human health or the environment.”

Please add the following to the 7<sup>th</sup> statement: “BMP’s shall be used to prevent or treat contamination of stormwater runoff by pH modifying sources.”

In the second-to-last bullet, please delete “with significant concrete work.”

Please add the following:

“Construction site operators must obtain written approval from the Department of Ecology prior to using chemical treatment other than CO<sub>2</sub> or dry ice to adjust pH.

#### Element #12: Manage the Project

Note that the text of element #12 in your permit is substantially different from the text of Appendix 1 of your NPDES permit. Ecology moved the statements in regard to seasonal work limitations into a “General Requirements” section. The City may choose to change this element and add a “General Requirements” section similar to those in Appendix 1.

## Chapter 2

### Section 2.1:

The first sentence of the 2<sup>nd</sup> paragraph is not worded properly. One possible fix is to delete the first four words.

### General Requirements:

Note that M.R. #2 in Appendix 1 of your NPDES permit has a different format than M.R. #2 in the Ecology manual. Ecology added a statement that the Construction SWPPP shall include a narrative and drawings. Can the City substantiate the enforceability of Section 2.3 of Volume II without a reference to it in its M.R. #2?

## Chapter 3

### BMP C240 Sediment Trap:

Because the City is requiring use of continuous runoff modeling for sizing flow control facilities and many treatment facilities, it may want to allow designers to use the continuous runoff model to size sediment traps and ponds as an alternative to using single event methods. The City may choose to add an alternative method for identifying Q2. Ecology suggests the following:

Q2 = Design inflow (cfs) based on the 2-year flow rate (1 hour time step in an approved continuous runoff model) for the developed (unmitigated) site, multiplied by a factor of 1.3. 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. Q10 is the 10-year flow rate (1 hour time step in an approved continuous simulation model) for the developed (unmitigated) site multiplied by a factor of 1.6.

### BMP C241

The definitions for Q2 and Q10 are the same as those used above for traps. If you want to allow use of continuous runoff modeling, you will have to add parallel continuous runoff terms on page 189. For example, you don't use the peak flow for the 2-year event, you use the 2-year, 15-minute flow rate predicted by a continuous runoff model.

The guidance for the Principal Spillway can have an alternative flow design when using continuous runoff modeling. We suggest adding, "If using the WWHM or MGS Flood, Q10 is the 10-year flow rate (1 hour time step) for the developed, unmitigated site multiplied by a factor of 1.6."

For the Emergency Spillway, also note that the 100-year peak flow identified by the approved runoff models is a 1-hour flow rate. If you want to estimate a flow rate appropriate for a 15-minute time step (single event methods use a 6 or 10 minute time step), we suggest multiplying the 1-hour rate by 1.6.

Ecology has published an update to BMP C250 which we would encourage you to use rather than the text published in 2005. Ecology has also published two additional BMP's at its website that should also be specified by the County:

BMP C252: pH Neutralization (CO<sub>2</sub>)

BMP C253: pH Control

## Appendix D: Construction SWPPP Short Form

The concept of having a short format for the sizes and types of projects indicated is approvable. But we will need improvements to the short form as drafted. Your NPDES permit indicates that all projects must consider all 12 construction elements. Therefore, the "Guidelines" beginning on page 215 need to be re-titled as "Requirements." In

addition, the text needs to be expanded so that required measures and guidance for each element are included. Our review indicates the following additions are necessary:

Add a section for “Mark Clearing Limits.” A short paragraph text, with reference to appropriate BMP’s (102, 103, and 104) for additional guidance, and inclusion of a standard drawing (e.g. stake and wire fence).

A. Construction Entrance: Add a reference to where the details can be found (i.e., BMP C105 on page 96 of the manual).

B. In the Sediment Barriers section, add references for where additional details for each BMP can be found. Consider adding Vegetated Strip and Triangular Silt Dike to the text. Those are not high tech options.

C. Catch Basin Protection: Refer the reader to BMP 220 on page 165 for additional details.

D.1. The text on sediment traps must reference the BMP guidance concerning sizing. If it isn’t referenced, the reader has no concept concerning how to size such a trap. Although you are trying to minimize involvement of an engineer, you also don’t want someone to specify a grossly undersized trap as an alternative to the other sediment control techniques. And, if a concentrated discharge in a swale or ditch is going to occur, a trap should be used and should be sized properly. So, tell the reader that if a concentrated discharge in a swale or ditch will occur, that they must have an engineer size a trap for the site.

D.2. It is necessary to provide more information in regard to drainage swales and channels. The text should reference BMP’s 201, 202, and 207.

E. Soil Erosion Protection: The text is good. Add the references and page numbers for the BMP’s in Chapter 3.

Add a new section F for Slope Protection, including a standard drawing and text that references the appropriate BMP’s such as pipe slope drains.

Add a new section G in regard to controlling pollutants other than sediments.

Add a new section H. in regard to Dewatering.

Add a new section I in regard to maintaining the BMP’s.

## Volume III

### Chapter 2

Section 2.1: The note on page 248 indicates that other roof downspout BMP's may be used. The intent of the note is unclear. Using "other innovative" BMP's in lieu of the standard dispersion or infiltration techniques described in the text is not approvable. Other BMP's could be approvable if they provide a similar benefit to the standard BMP's. A 55 gallon rain barrel, for instance, does not provide a similar benefit as the infiltration or dispersion techniques that are detailed in the text. Other BMP's are approvable in the context of using it in addition to a standard BMP.

### Section 2.2: Infiltration Facilities for Stormwater Quantity and Flow Control

The editor's note indicates that the City will use the Pierce County infiltration guidelines. Ecology's comments on the draft Pierce County manual include the following in regard to infiltration facilities:

#### Section 3.3.4 Verification of Performance:

The County requires testing and monitoring of an infiltration facility before accepting the facility. However, a test method is not specified. Specifying a method would seem in the County's best interest. I have attached a document that explains the method King County uses.



INFILTRATION\_RAT  
E\_TESTING.doc

The last paragraph on page 3-56 "recommends" verification testing on all facilities, not just those that the County is being asked to accept responsibility for. The paragraph is modeled after a statement in the Ecology manual. That statement was intended for local governments, i.e., it was encouraging them to adopt a requirement for verification testing. We suggest that the County require such verification testing for all infiltration facilities, even those it is not accepting responsibility for. Given the vagaries and difficulties in predicting large scale infiltration rates, it seems wise to verify performance. That could also help establish a feedback loop for revising the standard design procedures.

### Appendix III-A

#### Correction Factor:

Pierce County has proposed the same safety factor equation as is proposed in King County. I recently sent correspondence to King County urging them to revise their guidance in regard to a correction factor for plugging. I have copied that correspondence below with a couple minor changes for context.

Your safety factor equation includes a number of correction factors. The last factor explained is the factor for plugging. A correction factor of 1.0 (in other words, no correction) is listed for "coarse sands or cobbles, *or any soil type in an infiltration facility preceded by a water quality facility.*" It is that last phrase that concerns me.

Adjustment factors for infiltration facilities is not a hard science. There's plenty of room for "best professional judgment" involved. But I thought I should let you know my thoughts on the matter.

Does the term "water quality facility" in the above phrase mean a facility that listed in the Basic Treatment Menu, at a minimum? Or, does it include use of a "presettling" device as described on page 5-60 of the KCSWDM? In either case, I think it is not a good basis for exempting a facility from a correction factor for plugging. There just is no way that our standard treatment devices remove all of the suspended sediment in runoff. Our goal of 80% removal or 20 mg/l acknowledges that. And even if the facility is "maintained" through occasional tilling. The soil will still generally have a build-up of this fine material that will reduce the average infiltration rate. The finer the native material in and below the basin, the more plugging will be a factor. So, I think the larger correction factors for finer soils are appropriate in your manual. But not using those correction factors when a "water quality facility" precedes the basin is, in my opinion, not a good idea.

So, my pitch to you is to delete the phrase "or any soil type in an infiltration facility preceded by a water quality facility" from your manual. I understand that you have a post-construction testing requirement that acts as a bit of a backstop. But, I think the phrase sets us all up for an increased chance of long-term failures that will be headaches to get corrected.

Section 2.3.4: In equation 8 on page 285, the square root symbol should not extend over the quantity  $(h-a/3)$ . This is a mistake in the Ecology manual.

## Appendix B

At the bottom of page 380, for option a. "without underlying perforated drain pipes," the modeling guidance should say 50% grass, 50% impervious.

On page 385, the parenthetical that includes reference to a figure not in the Tacoma manual can be omitted. The statement should read as follows: "A  $D_{10}$  size (10% passing the size listed) greater than 0.06 mm for the finest soil within a three foot depth." The same editing can be done for the top of page 386.

At the bottom of page 393, the reference to Figure 3.26a is an error. It should read, Figure 3.28. However, this is the figure that Tacoma has not included. Tacoma would either have to include the figure in this section, or delete Method 2.

At the bottom of the paragraph which your editor inserted, the reference is to the Pilot Infiltration Test. You have that as Appendix C which immediately follows Appendix B.

## **Volume IV**

### **Chapter 1**

Section 1.4: The text indicates that businesses are exempt if they have an NPDES permit from Ecology. The sentence does not say what the business might be exempt from. Also, the reference to requirement R.2 in Chapter 6 needs to be changed to Section 6.2.3.

Special Condition S5.C.7 of the City's NPDES permit requires the City to apply and implement a source control program "at all applicable sites, including sites that are covered by other stormwater permits issued by Ecology." Therefore, this proposed exemption is inconsistent with the City's permit. The City shall not indicate that any sites are exempt from the city's source control requirements. The permit is clear that the City has responsibilities to apply and enforce its own source control requirements at 1) "pollution-generating sources associated with existing land uses and activities (See Appendix 8 to identify pollutant generating sources)," and 2) at all new and redevelopment project sites that trigger minimum requirement #3 in Appendix 1 of the municipal stormwater permit.

In regard to existing sites, the NPDES permit (special condition S5.C.7.b.ii) indicates that the City must require operational source control BMP's for all pollutant generating sources. Structural source control BMP's must be required by the City if the operational BMP's do not prevent illicit discharges or violations of water quality standards. In regard to new development and redevelopment sites, the City must require use of all applicable operational and structural source control BMP's.

### **Chapter 3**

#### **Section 3.1 Automobile Washing**

The third bulleted statement in this section clearly indicates that wash water can discharge to the storm drain. That is expressly not allowed by the County's NPDES permit. The County should re-write this section to expressly indicate that car wash water is prohibited from entering the MS4.

## **Volume V**

### Chapter 2

Step 4 (or is it Step 17?) refers to “Basic Treatment Receiving Waters.” The text should identify where the reader can find a list of those waters (Appendix A?), or they should be added here.

The City needs to decide how to address the issue identified in the draft notes on page 543.

Ecology no longer recommends the inclusion of the note at the top of page 552.

The Ecology Embankment has now been approved for General Use as a basic, enhanced, and phosphorus treatment option. Your text should be updated to indicate that.

Tacoma should review the TAPE website and add any technologies to the appropriate menu that have received a general use designation. Tacoma should also consider putting a statement into this chapter concerning the use of technologies that have received Conditional Use and Pilot Use designations. Since this is where the designers will go to make their BMP selection, it seems appropriate to let them know about those other options and the restrictions on use of those options.

### Chapter 4

Tacoma may want to consult the draft Pierce County manual for adding maintenance tables for additional treatment facility types.

### Chapter 5

Page 604:

The text under “Planning/Permitting/Inspection/Verification Guidelines and Procedures” does not belong in the manual. Tacoma must decide how they will implement the Soil Quality and Depth requirement. Ecology suggests that they use the referenced document. Tacoma could refer the reader to the document. Also, Tacoma could require submittal of documents suggested by that guidance so that its plan reviewers and inspectors can easily check for compliance.

Section 5.2.3.

Ecology recommends that the City delete everything after sub-section 5.2.3.1 BMP T5-30 Full Dispersion. The City should refer readers to the LID Technical Guidance Manual for additional low impact development techniques.

## Chapter 7: Infiltration

Sections 7.4.1 through 7.4.3 are not completed. The note indicates that text may come from the Pierce County manual. Note that the Pierce County manual includes a section within Chapter 6 concerning soil suitability.

## Chapter 8: Sand Filtration

We suggest that the City add a required design hydraulic conductivity of 1 inch per hour. This design criterion does not expressly appear in the Ecology manual. It is listed under the maintenance section as the rate at which maintenance is required. The implication is that if the facility falls below that rate, it is not treating an adequate volume of water. However, it would facilitate consistent design to add this to your manual as the rate which should be entered into an approved continuous runoff model to determine filter sizing. That rate should be used for all filters that use the sand specification indicated in the chapter.

## Chapter 9: Biofiltration

The City has eliminated the generic step-by-step instructions for design and guidance concerning off-line and on-line design. This results in an inadequate presentation of the design process. Most importantly, the City has not acknowledged the change in the design equations that are necessary when using the water quality design flow rate indicated by an approved continuous runoff model. Although the City has included an example of using the step-by-step approach, the example does not provide the designer with a more complete understanding of the design process and the design options. The example also does not use the amended design equations of the '05 Stormwater Management Manual for Western Washington.

In Table 71 on page 670, we suggest that you delete St. John's Wort from the list of ground covers. It is listed as a noxious weed in Washington State.

The texts for the wet and continuous swales, and the filter strip indicate that the figures identifying the correction factor for flows will be added. Those figures are also applicable to the basic biofiltration swale design.

## Chapter 10: Wetpool facilities

Section 10.2.1: On page 682, the last bullet under "Wetpool Geometry" should direct the reader to comply with the liner requirements in Section 4.4. We acknowledge that the Ecology text uses the permissive "may" at this location. However, that permissive

language conflicts with the mandatory requirements of Chapter 4 and is inconsistent with the pretreatment/treatment requirements prior to infiltration.

Section 10.2.2: Wet Vaults: Please add sizing procedure text to the design criteria.

## Chapter 12: Emerging Technologies

The text of section 12.4 should be expanded to include a description of Pilot Use Designation.

This chapter should be updated to represent the current situation. At a minimum, it could give the web address for the listing of technologies that have received various levels of approval.

The City should decide how they want to allow use of technologies in different levels of approval. You may want to view the proposed Pierce County manual, chapter 11, for an example.

We suggest deleting the proposed text of section 12.5. That text was written by Ecology in 2001. The status of emerging technologies has changed significantly since then. If you want to have text and figures about emerging technologies, we suggest that you take information directly from the Ecology TAPE website for those technologies.

## Glossary

Maintenance: The reference added to the end of this definition should be to Section 3.2 of Chapter 3 of Volume 1.

CESCL: Please change the definition to be consistent with the definition in Appendix 1 of your permit. Note that the first C in CESCL stands for Certified, not Contractor.

Effective Impervious Surface: We suggest that you delete the last sentence. Not all impervious surfaces that are infiltrated are considered ineffective. For instance, the casual reader would assume that pervious pavements would not be effective area if they are designed in accordance with the manual. That would be an incorrect conclusion. There are separate instructions to model such surfaces as effective pervious surfaces; or as a combination of effective impervious and pervious surfaces; or as an infiltration basin with a surface discharge.

## Status of July 15, 2003 Letter

As we indicated in our meeting on March 17<sup>th</sup>, Ecology will need written documentation of Tacoma's changes in response to comments 1, 4, 5, 7.b, and 8 in the attachment to the July 15, 2003 letter.