APPENDIX 11 – Structural Stormwater Controls Project List

The annual reporting requirement described in S5.C.6.c must follow the format and instructions provided in this appendix. Once placed on the list, projects must remain on the list throughout the permit cycle even if the project is cancelled.

Project Name	Type[1]	Start Year	Status[2]	End Year	Cost Estimate[3]	Funding (%) Local	Funding (%) State	Funding (%) Federal	WQ Benefit (Est. TSS or TS reduction lbs/yr)[4]	Hydro Benefit (Est. Avg. % flow reduction)[5]	Hydro Benefit Option #	Retrofit Incentive[6]	Other benefit	Monitoring Planned (yes/no)	Lat / Long (X,Y)	Receiving water body name	Comments
XYZ Pond	*2*	*2013*	*4*	*2015*	*$75K*	50	*25*	*25*	*0.1*	*75%*	*1*	*0.345*	*Demo project*	*yes*	*47/-122*	*Wet Creek*	*EXAMPLE ONLY*

[1]**Type**

1. New flow control facility, including Low Impact Development (LID) Best Management Practices (BMPs)
2. New treatment facility (or treatment and flow control facility), including LID BMPs
3. Retrofit of existing treatment and/or flow control facility
4. Property acquisition for water quality and/or flow control benefits (not associated with future facility)
5. Maintenance with capital construction costs ≥ $25,000
6. Property acquisition for riparian habitat
7. Restoration of forest cover
8. Restoration of riparian buffer
9. Floodplain reconnection projects on water bodies that are not flow control exempt per Appendix 1
10. Capital projects related to the MS4 which implement an Ecology-approved basin or watershed plan
11. Other actions to address stormwater runoff into or from the MS4 not otherwise required in S5.C

[2]**Status** (as of December 31st of the reporting year)

1. Planning
2. Design and permitting
3. Construction
4. Complete/Maintenance
5. Project Cancelled
6. Property acquisition

[3]**Cost Estimate** – Costs must be updated to reflect final costs when Status 4 or 6 is reached.

[4]**WQ Benefit** – See Water Quality Benefit Calculation on page 3.

[5]**Hydro Benefit** – See Hydro Benefit Calculation on pages 3, 4.

[6]**Retrofit Incentive** – Select the appropriate project achievement category from the table on page 2 based on your project type and the specifics of the project. Calculate the incentive points as shown in the Retrofit Incentive Table and example on page 2.

Retrofit Incentive Table

Project Achievement	Incentive Points
Water Quality: Better than Existing	100 (as % of impervious area served by the project)
Water Quality: Better than Existing in known water quality problem area	150 (as % of impervious area served by the project)
Water Quality: Basic Treatment	150 (as % of impervious area served by the project)
Water Quality: Enhanced Treatment	175 (as % of impervious area served by the project)
Water Quality: Meets WQ standards for target pollutant (assumed to be > level of treatment than enhanced)	200 (as % of impervious area served by the project)
Flow Control: Better than Existing	100 (as % of impervious area served by the project)
Flow Control: Meets duration standard for Pasture	125 (as % of impervious area served by the project)
Flow Control: Meets duration standard for Forest	150 (as % of impervious area served by the project)
Flow Control: Protects habitat or prevents erosion and scour in a known flow control problem area.	150 (as % of impervious area served by the project)
Flow Control: Meets LID Performance Standard	200 (as % of impervious area served by the project)
Maintenance with capital construction costs ≥ $25,000 or other maintenance actions per S5.C.6.a.ii.(5).	25 (as a % of the area served by the maintenance activity)
Riparian Habitat Acquisition	50 (as % of acres acquired)
Restoration of Forest Cover	25 (as % of acres restored)
Restoration of Riparian Buffer	25 (as % of acres restored)

Retrofit Incentive Formula: Retrofit Inventive = Incentive Points (as decimal) x applicable area (in acres)

Example: WQ retrofit project (XYZ Pond) is designed to provide better than existing WQ treatment and flow control to meet standard for forest and serves 0.23 acres: 1.5 x 0.23 = 0.345 (Example provides both treatment and flow control with greater multiplier used).

Water Quality Benefit Calculation

Overview:

The general process for estimating TSS reduction involves calculating three items:

1. Acres of commercial, industrial, low density residential and/or high density residential land uses addressed by the structural control.
2. Median annual TSS unit area loading rate associated with each land use (derived from data collected under S8.D requirements of the 2007 and 2012 Phase I permits).
3. The percent TSS removal efficiency of the facility as designed.

Ecology may approve other methods of calculating an estimated TSS reduction if the Permittee justifies the method is appropriate for the relevant project type.

Estimated TSS Reduction Formula:

Calculate pre-project TSS loading by using the *Estimated TSS Reduction Formula:

Land use category area contributing to project (acres)	***x***	***Median TSS Unit Area Loading Rate (lbs/acre/year)***	***x***	***Stormwater treatment removal efficiency for TSS (%)***	***=***	***Estimated TSS Reduction (lbs/year)***

*For maintenance projects involving solids removal, estimated reduction is the estimated dry weight of total solids (TS) removed in pounds.

Enter the Estimated TSS (or TS) Reduction number in the Appendix 11 reporting table under "WQ Benefit (Est. TSS or TS reduction lbs/yr)".

Hydro Benefit Calculation

Select the appropriate Hydro Benefit option and enter the corresponding number under the Hydro Benefit Option # in the table:

Option #1 - Standard Flow Control Requirement: Enter the hydro benefit number in the reporting table under "Hydro Benefit (Est. Avg. % flow reduction)" equal to the project's volume ratio, up to 100%. Refer to *Volume Ratio Calculation*.

Option #2 – LID Performance Standard: Enter the hydro benefit number in the reporting table under "Hydro Benefit (Est. Avg. % flow reduction)" according to the following:

- 100% if the project meets the LID Performance Standard in Appendix 1, Section 4.5.
- 100% if the project uses Full Dispersion functionally equivalent to BMP T 5.30 in Chapter 5 of Volume V of the *Stormwater Management Manual for Western Washington*.
- Equal to the project's volume ratio, up to 100%. Refer to *Volume Ratio Calculation*.

Volume Ratio Calculation:

The general process involves calculating two volumes:

- **Actual storage volume provided by the project:** This is the total volume of a detention/retention storage facility regardless of whether the volume was created through construction of a new facility or through expansion on an existing facility.

- **Volume required if the project had to meet the Standard Flow Control Requirement or LID Performance Standard:** Determine using the Western Washington Hydrology Model (WWHM) (or other approved models or other approved pond sizing methodologies providing comparable data) and assuming a forested pre-developed condition[1] the amount of detention/retention storage required to match developed discharge durations to pre-developed durations for the range of pre-developed discharge rates from either:
    - **Option #1:** 50% of the 2-year peak flow up to the full 50-year peak flow.
    - **Option #2:** 8% of the 2-year peak flow up to 50% of the 2-year peak flow.

The calculation compares the new or increased storage volume created by the project to the detention/retention storage volume that would be required under the Standard Flow Control Requirement or LID Performance Standard:

$$\frac{\textit{Actual volume provided by the project}}{\textit{Volume required if the project had to meet the Standard Flow Control Requirement or LID Performance Standard}} \times 100 = \textit{Volume Ratio}$$

[1] Use forested land cover as the pre-developed condition unless one of the following applies:

- Reasonable, historic information is available that indicates the site was prairie prior to settlement (modeled as "pasture" in the WWHM).
- 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.