User Inputs

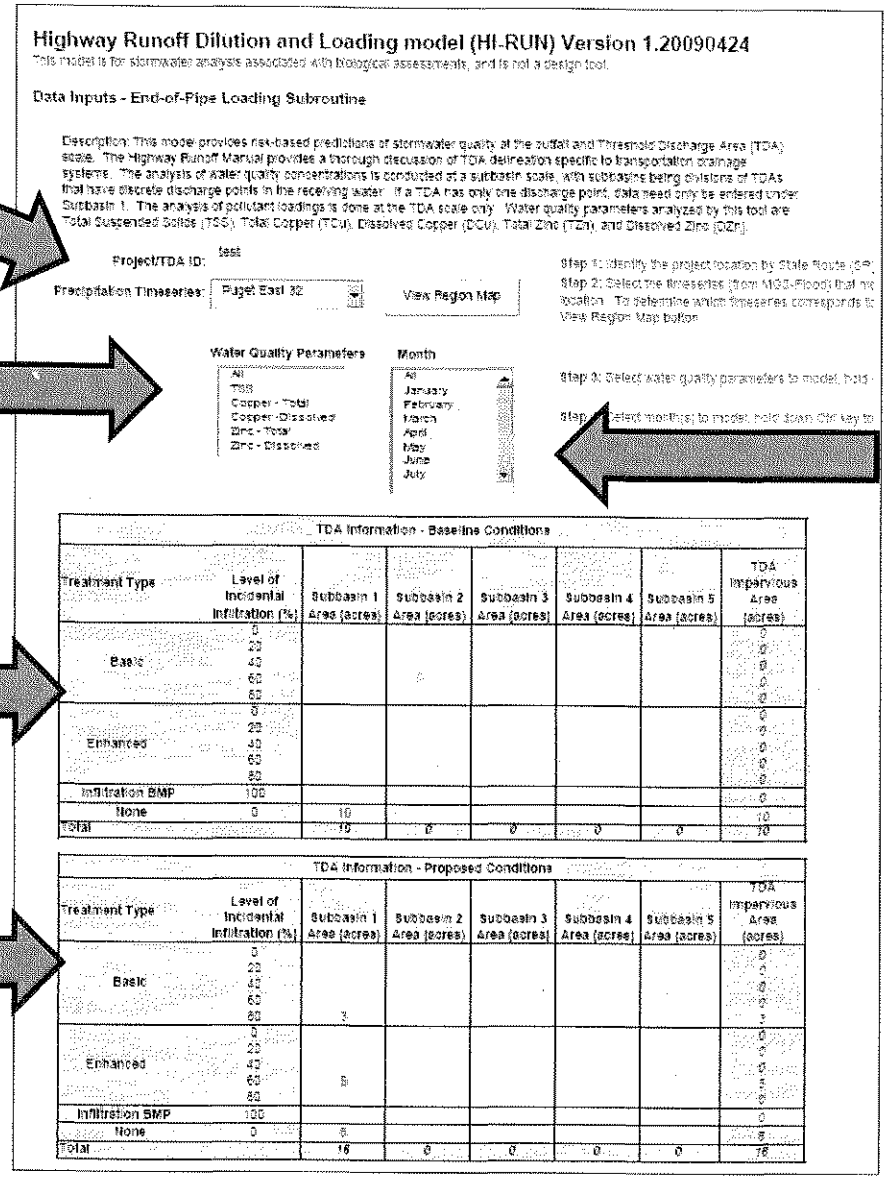
Project/TDA ID and Precip.

WQ Parameters

Baseline Conditions

Proposed Conditions

Months



Highway Runoff Dilution and Loading model (HI-RUN) Version 1.20090424

This model is for stormwater analysis associated with biological assessments, and is not a design tool.

Data Inputs - End-of-Pipe Loading Subroutine

Description: This model provides risk-based predictions of stormwater quality at the outfall and Threshold Discharge Area (TDA) scale. The Highway Runoff Manual provides a thorough discussion of TDA delineation specific to transportation drainage systems. The analysis of water quality concentrations is conducted at a subbasin scale, with subbasins being divisions of TDAs that have discrete discharge points in the receiving water. If a TDA has only one discharge point, data need only be entered under Subbasin 1. The analysis of pollutant loadings is done at the TDA scale only. Water quality parameters analyzed by this tool are Total Suspended Solids (TSS), Total Copper (TCu), Dissolved Copper (DCu), Total Zinc (TZn), and Dissolved Zinc (DZn).

Project/TDA ID: test

Precipitation Timeseries: Puget East 32 | View Region Map

Step 1: Identify the project location by State Route (SR)

Step 2: Select the timeseries (from MGS-Flood) that m location. To determine which timeseries corresponds t View Region Map button

Water Quality Parameters: All, TSS, Copper - Total, Copper - Dissolved, Zinc - Total, Zinc - Dissolved

Month: All, January, February, March, April, May, June, July

Step 3: Select water quality parameters to model, hold

Step 4: Select month(s) to model, hold down Ctrl key to

TDA Information - Baseline Conditions

Treatment Type	Level of Incidental Infiltration (%)	Subbasin 1 Area (acres)	Subbasin 2 Area (acres)	Subbasin 3 Area (acres)	Subbasin 4 Area (acres)	Subbasin 5 Area (acres)	TDA Impervious Area (acres)
Basic	0						0
	20						0
	40						0
	60						0
	80						0
Enhanced	0						0
	20						0
	40						0
	60						0
	80						0
Infiltration BMP	100						0
None	0	10					10
Total		10	0	0	0	0	10

TDA Information - Proposed Conditions

Treatment Type	Level of Incidental Infiltration (%)	Subbasin 1 Area (acres)	Subbasin 2 Area (acres)	Subbasin 3 Area (acres)	Subbasin 4 Area (acres)	Subbasin 5 Area (acres)	TDA Impervious Area (acres)
Basic	0						0
	20						0
	40						0
	60						0
	80	3					3
Enhanced	0						0
	20						0
	40						0
	60	5					5
	80						0
Infiltration BMP	100						0
None	0	8					8
Total		16	0	0	0	0	16

End-of-pipe Loading Analysis - Output

Highway Runoff Dilution and Loading model (HI-RUN) Version 1.0 (

End of Pipe Loading Subroutine Report

This model is for stormwater analysis associated with biological assessments, and is not a design tool.

Date/Time of Run: 10/3/08 10:19
Outfall ID: SR13/TDA3
Rain Gauge: Puget West 48

Input summary

Baseline Conditions
No Treatment
0% Infiltration - 18.5 acres
Basic Treatment
0% Infiltration - 2 acres

Proposed Conditions
Basic Treatment
0% Infiltration - 10.5 acres
Enhanced Treatment
60% Infiltration - 15 acres

Load Analysis

Loading Output

	Dissolved Zinc Load (lb/yr)	
	Baseline	Proposed
Max	198	20
75th Percentile	9.16	2.9
Median	4.87	1.9
25th Percentile	2.71	1.3
Min	0.247	0.21
P (exceed)		0.193

P(exceed)

Concentration Analysis

Subbasin 1	Dissolved Zinc Conc (mg/L)	
	Baseline	Proposed
Max	0.723	0.12
75th Percentile	0.049	0.024
Median	0.026	0.017
25th Percentile	0.015	0.012
Min	0.001	0.003
P (exceed)		0.332

User Inputs

Background Concentration

Inputs for Receiving Water Dilution Calculation

Subbasin 1

Background Concentration	Value (mg/l)
Copper -Dissolved	0.002
Zinc - Dissolved	0.004

Enter short description of simulation

Receiving Water Characteristics Downstream From Waste Input

	August	September
Stream Depth (ft)	1.5	1.5
Stream Velocity (fps)	0.5	0.5
Channel Width (ft)	10	10
Slope	0.004	0.004
Discharge Distance From Nearest Shoreline (ft)	0	0
Distance Downstream to Point of Interest (ft) (iterate value to determine downstream mixing distance)	15	15

Receiving Water Characteristics

Receiving Water Dilution Analysis - Output

Input Summary

Concentration Analysis Report - Subbasin 1

This model is for stormwater analysis associated with biological assessments, and is not a design tool.

Date/Time of Run:	8/25/08 13:23
Outfall ID:	Case Study 2
Rain Gauge:	Montesano
Description:	

Baseline Condition

No Treatment
- 0% Infiltration - 4 acres
- 0% Infiltration - 20 acres

Proposed Condition

No Treatment
- 0% Infiltration - 21 acres

Basic Treatment
- 0% Infiltration - 7 acres

Enhanced Treatment
- 60% Infiltration - 3 acres

Dissolved Copper - August - Probability of Occurrence

Baseline Conditions

Conc. (l)	0 - 3	3 - 6	6 - 12	12 - 24	24 - 48	48 - 96	96 - 192	>192
> 0.004	0.008	0	0.001	0.003	0.002	0.001	0	0	0
0.002 - 0.004	0.992	0.038	0.159	0.305	0.299	0.15	0.036	0.004	0.001
0 - 0.002	0	0	0	0	0	0	0	0	0
		0.038	0.16	0.308	0.301	0.151	0.036	0.004	0.001

Proposed Conditions

Conc. (l)	0 - 3	3 - 6	6 - 12	12 - 24	24 - 48	48 - 96	96 - 192	>192
> 0.004	0.008	0	0.001	0.003	0.002	0.001	0	0	0
0.002 - 0.004	0.992	0.037	0.163	0.313	0.289	0.149	0.036	0.005	0
0 - 0.002	0	0	0	0	0	0	0	0	0
		0.038	0.164	0.316	0.292	0.15	0.036	0.005	0

Discharge Duration (hrs)

Baseline Results

Proposed Results

Above biological effects threshold.
Baseline to biological effects threshold.
Zero to baseline.

Probability that biological effects threshold will be exceeded in receiving waterbody 10 feet downstream of outfall. Is this > or < than the 5% risk limit?

Dissolve

Conc. (

	Baseline Conditions						
> 0.013	0.023	0.001	0.005	0.008	0.006	0.002	0
0.007 - 0.013	0.976	0.049	0.202	0.335	0.267	0.103	0.019
0 - 0.007	0.001	0	0	0	0	0	0
		0.05	0.207	0.343	0.273	0.105	0.02
		0 - 3	3 - 6	6 - 12	12 - 24	24 - 48	48 - 96

Probability that a storm event will be a given duration.