



DRAINAGE DESIGN MANAGEMENT SYSTEM FOR WINDOWS VERSION 5.6.0

TUTORIAL # 12 SEDIMENT YIELD ANALYSIS



KVL Consultants, Inc.

SEDIMENT YIELD ANALYSIS

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SEDIMENT YIELD ANALYSIS

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1.0 PROBLEM STATEMENT

To estimate the sediment yield for a watershed, including wash load and bed load, with the following given design parameters:

❖ The Cross Section “*STUDYREACHCROSSSECTION*”

➤ Parameters for Hydraulics and Geometry:

- Design Flow Rate (cfs): 3200
- Dominant Flow Rates (cfs): 800
- Channel Slope for Design Flow (ft/ft): 0.015
- Channel Slope for Dominant Flow (ft/ft): 0.015
- Manning’s n (Channel, LOB, ROB) for Design Flow: 0.035
- Manning’s n (Channel, LOB, ROB) for Dominant Flow: 0.030
- The geometric data (station and elevation) of the cross section:

Station (X)	Elevation (Y)	Notes
100	100	
106	98	
156	98	Left Bank Station
166	95	
191	95	
201	98	Right Bank Station
251	98	
257	100	

➤ Parameters for Sediment Yield:

Return period	Q (cfs)	Volume (ac-ft)
2 year	277	12.00
5 year	486	18.00
10 year	645	23.00
25 year	869	30.00
50 year	1046	36.00

100 year	<i>1231</i>	<i>42.00</i>
Design	<i>1231</i>	<i>42.00</i>

➤ Parameters for **Wash Load**:

- **Sediment Area (sq mi):** *0.3508*
- **D10 (mm)** for channel bed material soil sample: *0.500*
- **Slope Length (ft):** *400*
- **Slope (%):** *2.50*

➤ Parameters for **Bed Load**:

- **D16 (mm):** *0.800*
- **D50 (mm):** *1.500*
- **D84 (mm):** *10.00*

➤ Parameters for **Soils**:

Sediment Area ID	Soil ID	Area
• <i>SED1</i>	<i>6453</i>	<i>0.0508</i>
• <i>SED1</i>	<i>64590</i>	<i>0.0447</i>
• <i>SED1</i>	<i>64591</i>	<i>0.2548</i>
• <i>SED1</i>	<i>64598</i>	<i>0.0004</i>

➤ Parameters for **Land Uses**:

Sediment Area ID	Land Use Code	Area
• <i>SED1</i>	<i>120</i>	<i>0.0022</i>
• <i>SED1</i>	<i>150</i>	<i>0.1647</i>
• <i>SED1</i>	<i>160</i>	<i>0.0620</i>
• <i>SED1</i>	<i>180</i>	<i>0.0296</i>
• <i>SED1</i>	<i>230</i>	<i>0.0314</i>
• <i>SED1</i>	<i>410</i>	<i>0.0609</i>

2.0 STEP-BY-STEP PROCEDURES

Step 1: Establish a New Project and Default Set-up

Step 2: Prepare the Cross Section and Hydraulic Data

- Step 3: Import Cross Section and Hydraulic Data
- Step 4: Prepare Sediment and Relevant Data
 - Step 4.1: Set up Sediment Yield Basic Data
 - Step 4.2: Prepare Land Use and Soil Data
- Step 5: Calculate the Sediment Yield
- Step 6: Report the Results

2.1 STEP 1 - ESTABLISH A NEW PROJECT AND DEFAULT SET-UP

- (a) Click the **DDMSW** icon on the Desktop or Program menu to launch the **DDMSW**. Click **OK** to accept the software disclaimer as is shown in the following figure.



After the **DDMSW** is launched, the **SELECT PROJECT** window is automatically opened as is shown in the following figure.

Reference	Date	ID	Title
KVLEXAMPLE2	02/29/2016	00045	Example 2 using Shape files and NOAA 14
KVLEXAMPLE3	01/01/2011	00046	Example 3 Rational Method tutorial project
KVLEXAMPLE5	02/25/2016	00047	HEC-1 Tutorial - Clark Unit Hydrograph
KVLEXAMPLE5A	03/02/2016	00061	HEC-1 Tutorial - Clark Unit Hydrograph
KVLEXAMPLE6	03/01/2016	00130	HEC-1 Tutorial - S-Graph Unit Hydrograph
KVLEXAMPLE6A	03/02/2016	00062	HEC-1 Tutorial - S-Graph Unit Hydrograph
KVLEXAMPLE7	02/25/2016	00049	Rational Method Tutorial
KVLEXAMPLE7A	03/02/2016	00096	Rational Method Tutorial
KVLEXAMPLE8	01/01/2011	00050	Street Drainage Examples
KVLEXAMPLE9	03/01/2016	00051	HEC-1 Tutorial - Custom Storm Event
LATEROSIONEXAMPLE	03/31/2014	00052	Lateral Erosion Example
LAUNCHBLERIPRAP	01/01/2012	00053	River Mechanics Example - Launchable RipRap
MCMICKENDAM - RUN 3	11/24/2015	00033	sediment yield analysis
MCMICKEN_SY_464D	11/24/2015	00034	sediment yield analysis
PROJECTXSECTIONS	02/24/2016	00058	River Mechanics Cross Section Datasets
RIPRAPIZINGFCD	01/01/2012	00054	River Mechanics Example - Riprap Sizing

- (b) Click the **Add** button on the **SELECT PROJECT** window to start a new project (A new project can also be started by clicking **File** → **New Project** under the menu bar).
- (c) On the **NEW PROJECT OPTIONS** form, select **River Mechanics** checkbox and click the **OK** button to close the form.
- (d) Type “*SEDIMENTYIELD1*” into the **Reference** textbox. This is the name of this newly created project. The users can choose the name as long as it does not exist in the **DDMSW** database.
- (e) Type into the **Title** textbox a brief descriptive title of this project. (*Optional*)
- (f) Type into the **Location** textbox the location of this project. (*Optional*)
- (g) Type into the **Agency** textbox the agency or company name. (*Optional*)
- (h) Check **River Mechanics Only** checkbox for this project.
- (i) Type a detailed description of this project into the comment area under the **Project Reference** frame. (*Optional*)
- (j) Click **Save** button to save the entered data.
- (k) Click **OK** button on the **SELECT PROJECT** window, and click **OK** button on the pop-up message box for landuse, soils data, etc. The following figure shows what the window looks like.

Note: the **Project ID 00039** in the above figure is the database records unique read-only identifier of the project, which is automatically generated by the program when a new project is created. When the users create a new project, the **Project ID** of this new project will not be the same as the **Project ID** shown in the above figure.

2.2 STEP 2 - PREPARE THE CROSS SECTION AND HYDRAULIC DATA

Only one (1) cross section data, the “*STUDYREACHCROSSSECTION*”, will be used for this tutorial. This cross section data will be imported from another project.

2.2.1 Import the Study Location Cross Section Data

- (a) To import the first cross section data (Study Location Cross Section Data), open the **IMPORT CROSS SECTIONS FROM ANOTHER PROJECT** form (**River Mechanics** ➔ **Import Cross Sections from Another Project**). Use the following data on the form.

- **Import Project Reference:** *PROJECTXSECTIONS*
- **Option:** *Specific Cross section*
- **Import Cross Section ID:** *STUDYREACHCROSSSECTION*

Import Cross Sections From Another Project

Import Project Reference: **PROJECTXSECTIONS**


Option: **Specific Cross Section**

Import Cross Section ID: **STUDYREACHCROSSSECTION**

Import **OK**

- (b) Once the specified data have been selected, click the **Import** button. Select **Yes** to proceed, and hit **OK** to close the **IMPORT CROSS SECTION FROM ANOTHER PROJECT** form.

Question

 This will import Cross Section BRIDGECROSSSECTION from PROJECTXSECTIONS to the current project.
 - Data with the same ID will be overwritten.

Do you want to continue?

Yes **No**

- (c) To check if the bridge cross section data has been successfully imported, open the **NATURAL CROSS SECTIONS** form (**River Mechanics** → **Cross Section Geometry**). For the **Cross Section ID**, select “**STUDYREACHCROSSSECTION**” by clicking the Selector button at the right side of the **ID** textbox.

Natural Cross Sections

X	Y
100.00	100.00
106.00	98.00
156.00	98.00
166.00	95.00
191.00	95.00
201.00	98.00
251.00	98.00
257.00	100.00

Overbank

Left: **156.00**

Right: **201.00**

☒ Graph current record

☐ Lateral Erosion

Adjustments

Elevation Adjustment (ft):

Cross Section

ID: **STUDYREACHCROSSSECTION**

X (ft): **257.00**

Y (ft): **100.00**

Graph

LOB: 156.00, ROB: 201.00

Buttons: Info, Print, Delete, Add, OK

Compare the geometric data on the **NATURAL CROSS SECTIONS** form against the tabulated data listed below. Make necessary data edits or adjustments on the form, if necessary. Click **OK** to close the form.

Station (X)	Elevation (Y)	Notes
100	100	
106	98	
156	98	<i>Left Bank Station</i>
166	95	
191	95	
201	98	<i>Right Bank Station</i>
251	98	
257	100	

(d) To check if the imported hydraulic data has all the correct **Flow Rates (cfs)**, **Slopes (ft/ft)**, and **Manning's n (Channel, LOB, and ROB)** data, open the **CROSS SECTION HYDRAULICS** form (**River mechanics** → **Cross Section Hydraulics**). Make sure that the **Cross Section ID** is set to "*STUDYREACHCROSSSECTION*" and compare the data on the form and the following data:

- **Cross Section ID:** *STUDYREACHCROSSSECTION*
- **Design Flow Rate (cfs):** *3200*
- **Dominant Flow Rate (cfs):** *800*
- **Design Slope (ft/ft):** *0.015*
- **Dominant Slope (ft/ft):** *0.015*
- **Design Manning's n (Channel, LOB, and ROB):** *0.035*
- **Dominant Manning's n (Channel, LOB, and ROB):** *0.030*

Parameter	Design	Dominant
Flow Rate (cfs)	3200	800
Slope (ft/ft)	0.015000	0.015000
Manning's n Channel	0.035	0.030
Manning's n LOB	0.035	0.030
Manning's n ROB	0.035	0.030
Flow Area (sq ft)	328.86	83.81
Wetted Perimeter (ft)	155.35	42.48
Average Width (ft)	73.12	33.37
Top Width (ft)	153.98	41.74
Hydraulic Depth (ft)	2.14	2.01
Normal or Max Depth (ft)	4.50	2.51
Velocity (ft/sec)	9.73	9.55

- (e) If everything checks out, click the **Update** button to update the hydraulic analysis results.
- (f) On the **SELECT OPTION** form, select *"This Record"* and click **OK**. Hit **Yes** to continue.

Select Option

Option

This Record

All

OK Cancel

Update Cross Section Hydraulics

i This will update the hydraulic parameters for the current Cross Section.

If 'Enter Data' is selected as the Source, data will NOT BE updated.

If 'Calculate Data' is selected as the Source, the disabled fields (shown in yellow) will be updated if 'Design' and/or 'Dominant' are/is checked.

Do you want to continue?

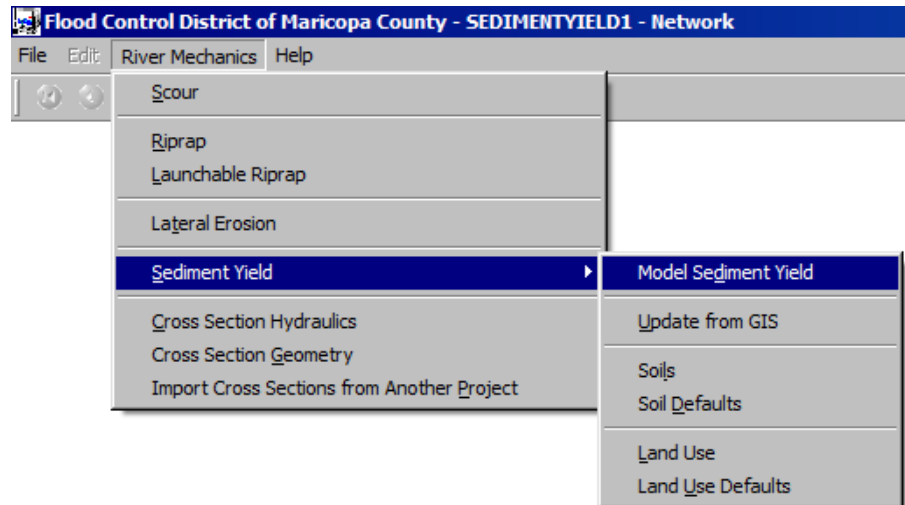
Yes No

- (g) Click **OK** to close the **RIVER MECHANICS – CROSS SECTION HYDRAULICS** form.

2.3 STEP 3 - PREPARE SEDIMENT AND RELEVANT DATA

2.2.2 Set up Sediment Yield Basic Data

- (a) From the menu bar of main application window, click **River Mechanics** → **Sediment Yield** → **Model Sediment Yield** to open the **RIVER MECHANICS – SEDIMENT YIELD - MB: 01** window.



- (b) Click **Add** button to activate the necessary data entry fields.
- (c) Type “*DAM1*” into the **ID** textbox, a unique **ID** for the location on the water course.
- (d) Check the **Wash Load** and **Bed Load** checkboxes in the **Calculate** frame.
- (e) Click the browse button beside the **Return Periods for Analysis** textbox in the **Calculate** frame to select “*All*” for the return periods.
- (f) Check all the checkboxes in the **Sediment Yield Parameters** frame to activate all the discharges and volumes textboxes. Enter the following discharge and volume values for the sediment yield parameters

<u>Return Period</u>	<u>Q (cfs)</u>	<u>Volume (ac-ft)</u>
2 year	<i>277</i>	<i>12.00</i>
5 year	<i>486</i>	<i>18.00</i>
10 year	<i>645</i>	<i>23.00</i>
25 year	<i>869</i>	<i>30.00</i>
50 year	<i>1046</i>	<i>36.00</i>
100 year	<i>1231</i>	<i>42.00</i>
Design	<i>1231</i>	<i>42.00</i>

- (g) Click the **Save** button to save the entered data. After the data entry, the window should look like the following figure.

River Mechanics - Sediment Yield - MB: 01

ID
 Major Basin ID:
 ID:

Calculate
 Wash Load: ☒
 Bed Load: ☒
 Return Periods for Analysis:

Sediment Yield Parameters

Include	Q (cfs)	Volume (ac-ft)
2 Year <input checked="" type="checkbox"/>	277	12.00
5 Year <input checked="" type="checkbox"/>	486	18.00
10 Year <input checked="" type="checkbox"/>	645	23.00
25 Year <input checked="" type="checkbox"/>	869	30.00
50 Year <input checked="" type="checkbox"/>	1046	36.00
100 Year <input checked="" type="checkbox"/>	1231	42.00
Design <input checked="" type="checkbox"/>	1231	42.00
Annual <input checked="" type="checkbox"/>		


Sediment Yield (ac-ft)

	Wash Load	Bed Load	Total Yield
2 Year	0.002	0.003	
5 Year	0.003	0.006	
10 Year	0.004	0.009	
25 Year	0.006	0.014	
50 Year	0.008	0.018	
100 Year	0.009	0.022	
Design	0.009	0.022	
Annual	0.002	0.004	

Required Sediment Basin Volume (ac-ft)
 Cleanout Years:

Annual Sediment Yield Per Square Mile (ac-ft)

- (h) Click the **Wash Load** tab.
- (i) Enter "SED1" into the **Sediment Area ID** textbox (**Sediment Area ID** is the unique ID for the drainage area that contributes sediment to the study location. This ID is used when land use and soil data are used to compute the wash load).
- (j) Enter "0.3508" in the **Area (sq mi)** textbox.
- (k) Select "Channel Bed Material Soil Sample" as the **Specific Weight Method**.
- (l) Enter "0.50" into the **Bed Material Soil Sample D10 (mm)** textbox.
- (m) Enter "400" into the **Slope Length (ft)** textbox in the **Wash Load Parameters** frame.
- (n) Enter "2.50" into the **Slope (%)** textbox in the **Wash Load Parameters** frame.
- (o) Click the **Save** button to save data entry. The **RIVER MECHANICS – SEDIMENT YIELD** form should look like the following figure.

- (p) Click the **Bed Load** tab and click browse button  beside the **Cross Section ID** textbox in the **Cross Section** frame to select “*STUDYREACHCROSSSECTION*” as the cross section ID. Click **OK** to exit the **SELECT CROSS SECTION ID** form.
- (q) On the **Bed Load Parameters** frame in the **Bed Load** tab, enter the following data:
- **D16 (mm):** *0.80*
 - **D50 (mm):** *1.50*
 - **D84 (mm):** *10.00*
- (r) Click the **Save** button to save the data entry. The **RIVER MECHANICS – SEDIMENT YIELD form** should look like the following figure.

	Q (cfs)	Avg Vel (ft/s)	Area (sf)	Top Width (ft)	Normal Depth (ft)	Bed Load (cfs)
2 Year	277	2.46	8.93	27.28	0.34	0.046
5 Year	486	2.93	11.93	28.00	0.45	0.091
10 Year	645	3.40	15.30	28.79	0.57	0.163
25 Year	869	3.86	19.15	29.67	0.70	0.273
50 Year	1046	4.18	22.01	30.31	0.80	0.373
100 Year	1231	4.45	24.70	30.89	0.88	0.483
Design	1231	4.45	24.70	30.89	0.88	0.483

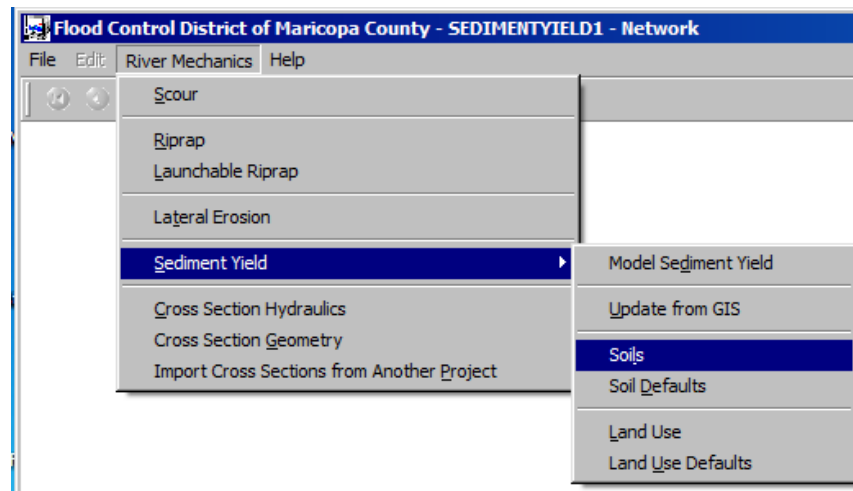
(s) Click **OK** to close the window.

2.2.3 Prepare Land Use and Soil Data

In this section, procedures will be provided on how to prepare the landuse and soil data for the project area.



(A)How to Prepare Soil Data

- (a) Click **River Mechanics** → **Sediment Yield** → **Soils** from the menu bar on the main application window as is shown in the following figure and a blank **RIVER MECHANICS – SOILS** window opens.



- (b) Click the **Add** button on the **RIVER MECHANICS – SOILS** window to activate the data entry.

[illegible]

- (c) On the **Details** tab of the **RIVER MECHANICS – SOILS** window, click the browse  button beside the **Sediment Area ID** textbox in the **Sediment Area** frame. On the **SELECT ID** window, highlight “*SED1*” and click **OK** to close the window.
- (d) Click the browse  button beside the **Soil ID** textbox in the **Sediment Area** frame. On the **SELECT ID** window, highlight **Soil ID “6453”** and click **OK** to close the window.
- (e) Enter “0.0508” into the **Area (sq mi)** textbox in the **Sediment Area** frame.
- (f) Click the **Save** button to save the data just entered. The window should look like the following figure.

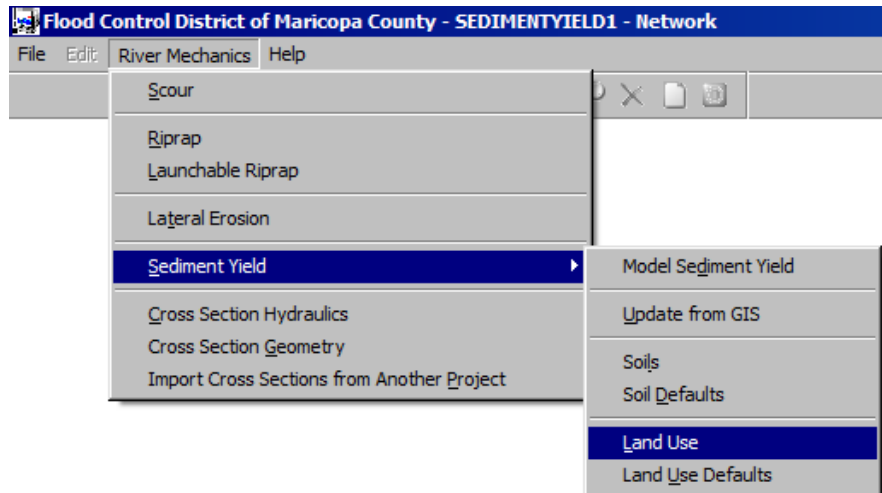
Repeat the above five steps to enter the rest of the soils data for this sediment area.



<u>Sediment Area ID</u>	<u>Soil ID</u>	<u>Area (sq mi)</u>
SED1	64590	0.0447
SED1	64591	0.2548
SED1	64598	0.0004

(g) After the data entry, click **OK** to close the window.

(B) How to Prepare Land Use Data

- (a) Click **River Mechanics** → **Sediment** → **Land Use** from the menu bar on the main application window as is shown in the following figure and the blank **RIVER MECHANICS – LAND USE** window opens.



- (b) Click the **Add** button to activate the data entry.
- (c) Click the browse  button beside the **Sediment Area ID** textbox in the **Sediment Area** frame to open the **SELECT ID** window. Highlight “*SED1*” and click **OK** to select and close the window.
- (d) Click the browse  button beside the **Land Use Code** textbox in the **Sediment Area** frame to open the **SELECT ID** window. Highlight code “*120*” and click **OK** to select and close the window.
- (e) Enter “*0.0022*” into the **Area (sq mi)** textbox in the **Sediment Area** frame of the **RIVER MECHANICS – LAND USE** window.
- (f) Click the **Save** button. The window should look like the following figure.

(g) Repeat the above five steps to enter the rest of the land use data for this sediment area.

<u>Sediment Area ID</u>	<u>Land Use Code</u>	<u>Area (sq mi)</u>
<i>SED1</i>	<i>150</i>	<i>0.1647</i>
<i>SED1</i>	<i>160</i>	<i>0.0620</i>
<i>SED1</i>	<i>180</i>	<i>0.0296</i>
<i>SED1</i>	<i>230</i>	<i>0.0314</i>
<i>SED1</i>	<i>410</i>	<i>0.0609</i>

(h) After the data entry, click **OK** to close the window.

2.4 STEP 4 - CALCULATE THE SEDIMENT YIELD

In this section, a step-by-step instruction will be provided how to calculate the sediment yield. Open the **RIVER MECHANICS – SEDIMENT YIELD** form from the menu bar (**River Mechanics** ➔ **Sediment Yield** ➔ **Model Sediment Yield** and click the **Total** tab.

River Mechanics - Sediment - MB: 01

Calculate

Wash Load ☒
 Bed Load ☒
 Return Periods for Analysis: All

Sediment Yield Parameters

	Include	Q (cfs)	Volume (ac-ft)
2 Year	<input checked="" type="checkbox"/>	277	12.00
5 Year	<input checked="" type="checkbox"/>	486	18.00
10 Year	<input checked="" type="checkbox"/>	645	23.00
25 Year	<input checked="" type="checkbox"/>	869	30.00
50 Year	<input checked="" type="checkbox"/>	1046	36.00
100 Year	<input checked="" type="checkbox"/>	1231	42.00
Design	<input checked="" type="checkbox"/>	1231	42.00
Annual	<input checked="" type="checkbox"/>		

Sediment Yield (ac-ft)

	Wash Load	Bed Load	Total Yield
2 Year			
5 Year			
10 Year			
25 Year			
50 Year			
100 Year			
Design			
Annual			

Annual Sediment Yield Per Square Mile (ac-ft)

Help Info Print... Delete Add Graph MB Update OK

- (a) Click the **Update** button on the **RIVER MECHANICS – SEDIMENT YIELD** form to compute the sediment yield. A new window **SELECT OPTION** opens, select “*This Major Basin*”, and click **OK** to close it.

Select Option

Option

- This Record
- This Major Basin**
- All

OK Cancel

Calculate Total Sediment Load

Information icon: This will calculate the Total Sediment Load for the selected Return Periods for the current record and will include:

- Wash Load
- Bed Load

Do you want to continue?

Yes No

- (b) On the **CALCULATE TOTAL SEDIMENT LOAD** dialog box, click **Yes** to continue.

The following three figures show the results in the **Total**, **Wash Load** and **Bed Load** tabs when the “*Channel Bed Material Soil Sample*” method is used in **Wash Load**.

River Mechanics - Sediment Yield - MB: 01

List Total Wash Load Bed Load Post to GIS

ID
Major Basin ID: 01
ID: DAM1

Calculate
Wash Load ☒
Bed Load ☒
Return Periods for Analysis: All

Sediment Yield Parameters

	Q (cfs)	Volume (ac-ft)
2 Year	277	12.00
5 Year	486	18.00
10 Year	645	23.00
25 Year	869	30.00
50 Year	1046	36.00
100 Year	1231	42.00
Design	1231	42.00
Annual		

Import

Sediment Yield (ac-ft)

	Wash Load	Bed Load	Total Yield
2 Year	0.013	0.077	0.090
5 Year	0.022	0.141	0.163
10 Year	0.029	0.199	0.228
25 Year	0.040	0.286	0.326
50 Year	0.049	0.368	0.417
100 Year	0.059	0.450	0.509
Design	0.059	0.450	0.509
Annual	0.015	0.099	0.114

Required Sediment Basin Volume (ac-ft)
Cleanout Years: 3
0.85

Annual Sediment Yield Per Square Mile (ac-ft)
0.325

Help Info Print... Delete Add Graph MB Update OK

River Mechanics - Sediment Yield - MB: 01

List Total Wash Load Bed Load Post to GIS

Wash Load
Sediment Area ID: SED1
Area (sq mi): 0.3508
SDR (%): 67.8

Specific Weight Method
Method: Channel Bed Material Soil Sample
Bed Material Soil Sample D10 (mm): 0.500

Wash Load Parameters

Soil and Erosion Factors

	Value	Default	Custom
Soil Erodibility Factor (K)	0.12	0.12	<input type="checkbox"/>
Erosion Control Factor (P)	1.0	1.0	<input type="checkbox"/>
Specific Weight (lb/cu ft)	94.35	94.35	<input type="checkbox"/>

Land Use Factors

	Value	Default	Custom
Effects of Canopy Cover (Ci)	0.69	0.69	<input type="checkbox"/>
Effects of Vegetation (Cii)	0.85	0.85	<input type="checkbox"/>
Effects of Tillage (Ciii)	0.31	0.31	<input type="checkbox"/>
Cover Management Factor (C)	0.18	0.18	<input type="checkbox"/>
Percent Impervious	46	46	<input type="checkbox"/>

Topographic Factors

	Value	Default	Custom
Slope Length (ft)	400		<input type="checkbox"/>
Slope (%)	2.50		<input type="checkbox"/>
Topographic Factor (LS)	0.37	0.37	<input type="checkbox"/>

Help Info Print... Delete Add Graph MB Update OK

River Mechanics - Sediment Yield - MB: 01

List Total Wash Load Bed Load Post to GIS

Cross Section
Cross Section ID: STUDYLOCATIONCROSSSECTION

Bed Load Parameters

	Value	Default	Custom
Slope (ft/ft)	0.01500		<input type="checkbox"/>
Man's n Channel	0.035		<input type="checkbox"/>
Man's n LOB	0.035		<input type="checkbox"/>
Man's n ROB	0.035		<input type="checkbox"/>

Total Section

	Q (cfs)	Avg Vel (ft/s)	Area (sf)	Top Width (ft)	Normal Depth (ft)	Bed Load (cfs)
2 Year	277	6.12	45.28	35.05	1.51	1.768
5 Year	486	7.34	66.17	38.82	2.07	3.809
10 Year	645	8.03	80.34	41.19	2.43	5.572
25 Year	869	8.80	98.78	44.07	2.86	8.282
50 Year	1046	8.55	122.38	145.72	3.12	10.705
100 Year	1231	8.27	148.85	146.80	3.30	13.180
Design	1231	8.27	148.85	146.80	3.30	13.180

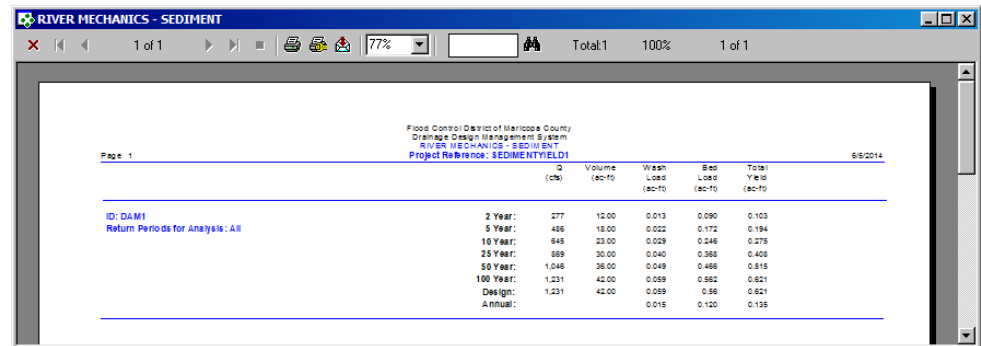
☒ Total Section
☐ Channel
☐ LOB
☐ ROB

Help Info Print... Delete Add Graph MB Update OK

2.5 STEP 5 - REPORT AND DOCUMENT THE RESULTS



In this section, the instruction will be given on how to view, print, and export the calculation results of the sediment yield.

- (a) Report the results for Total Sediment Yield: Click the **Print ...** button on the **Total** tab of the **RIVER MECHANICS – SEDIMENT – MB: 01** window to generate a report like the following figure.



The screenshot shows the 'RIVER MECHANICS - SEDIMENT' window. The title bar includes the software name and standard window controls. The menu bar contains 'File', 'Edit', 'View', 'Tools', 'Help', and 'About'. The toolbar includes buttons for 'Print', 'Export', and 'Help'. The status bar shows 'Total: 1', '100%', and '1 of 1'. The main content area displays a report for 'Flood Control District of Maricopa County Drainage Design Management System'. The report title is 'RIVER MECHANICS - SEDIMENT' and the project reference is 'SEDIMENTYIELD1'. The report is dated 8/5/2014. The report content includes a table with columns for 'Q (cfs)', 'Volume (ac-ft)', 'Wash Load (ac-ft)', 'Bed Load (ac-ft)', and 'Total Yield (ac-ft)'. The table data is as follows:

	Q (cfs)	Volume (ac-ft)	Wash Load (ac-ft)	Bed Load (ac-ft)	Total Yield (ac-ft)
2 Year:	277	12.00	0.013	0.090	0.103
5 Year:	486	19.00	0.022	0.172	0.194
10 Year:	646	23.00	0.029	0.246	0.275
25 Year:	869	30.00	0.040	0.368	0.408
50 Year:	1,046	36.00	0.049	0.466	0.515
100 Year:	1,231	42.00	0.059	0.562	0.621
Design:	1,231	42.00	0.059	0.562	0.621
Annual:			0.015	0.120	0.135

- (b) To print the results, click the printer symbol ().
- (c) To export the results in PDF format or other formats, click the export symbol ().
- (d) More detailed information for wash load, bed load, and **Cross Section Hydraulics** can also be viewed, printed, and exported by clicking the **Print...** button under **Wash Load**, **Bed Load** and **Cross Section Hydraulics** menu.

This concludes this tutorial for sediment yield analysis.