



DRAINAGE DESIGN MANAGEMENT SYSTEM FOR WINDOWS VERSION 6.8.0

TUTORIAL # 5

IMPORTING HEC-1 STAND ALONE INPUT FILE



KVL Consultants, Inc.

IMPORTING AND RUNNING HEC-1 STAND ALONE INPUT FILE

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IMPORTING AND RUNNING HEC-1 STAND ALONE INPUT FILE

DATE UPDATED: MAY 7, 2024

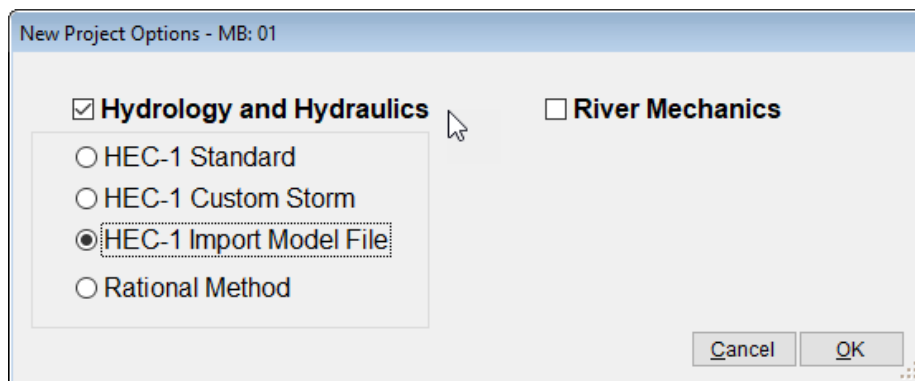
TUTORIAL TIME: 30 MINUTES

1.0 INTRODUCTION

This tutorial outlines the approach for importing an existing **HEC-1** model input file with the goal to use the reporting and graphing features of the **DDMSW** program without the supporting land use, soils, sub-basin and network datasets. What is needed in this tutorial is the **HEC-1** model input data file in ASCII format. This tutorial was developed using **DDMSW 6.0.5**.

2.0 CREATE A NEW PROJECT

After launching the **DDMSW** program, create a new project (**File** → **New Project**). Use a short name for the project in the '**Reference**' field. Please note that the '**Reference**' field can accept letters and numbers (no space) and can hold 20 characters.



On the **SELECT PROJECT** form, enter '**IMPORTHEC1**' on the '**Reference**' textbox field and check the '**Imported HEC-1 File**' checkbox. Enter your notes or comments (Optional) in the provided Comment Box. Set your model creation date in the '**Modification Date**' textbox field using the current date.

Select Project

List Details

Project Reference

Project ID 00155 Reference IMPORTHEC1

Title

Location

Agency Flood Control District of Maricopa County

☒ Hydrology and Hydraulics Only ☐ Custom Storm Event

☐ River Mechanics Only ☒ Imported HEC-1 File

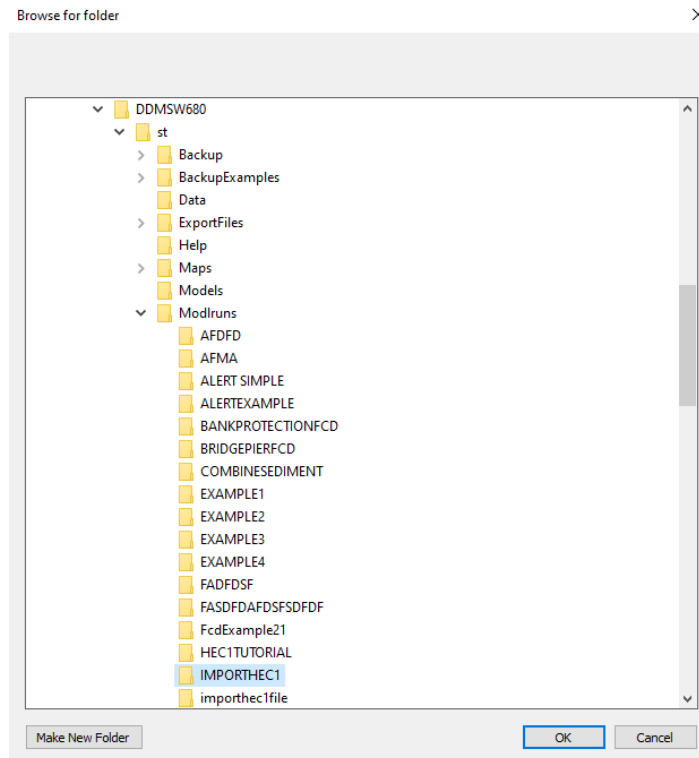
Date 05/07/2024 Update Defaults Default Versions Info Print... Delete Add OK

Press the **'Save'** button to save the new project information. Press the **'OK'** button to close the **SELECT PROJECT** form.

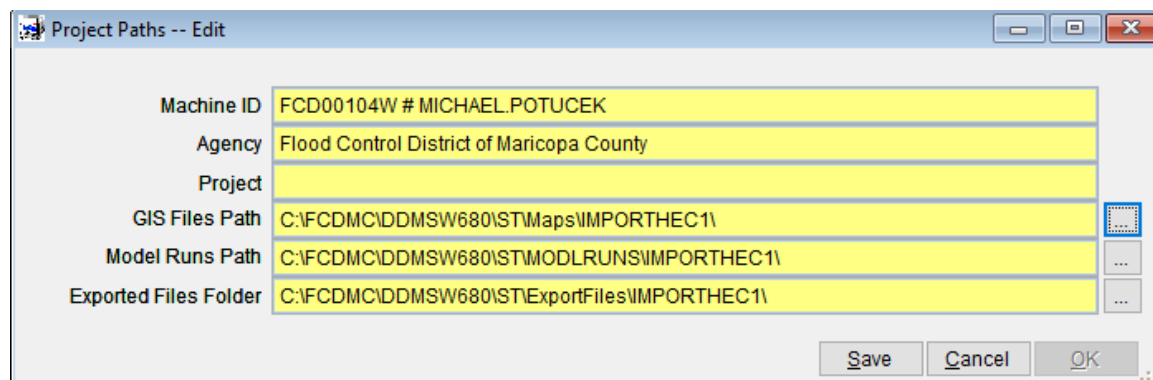
3.0 DEFINE THE MODEL RUNS PATH

On the **PROJECT PATHS** form (**File → Project Paths**), set the **'Model Runs Path'** by clicking the ellipse (...) button on the right side of the **'Model Runs Path'** textbox field.

On the **BROWSE FOR FOLDER** form, select the folder location to store and run your project models. If the preferred folder is not found, press the **'Make New Folder'** to create a new folder. Rename the new folder to **'IMPORTHEC1'**.



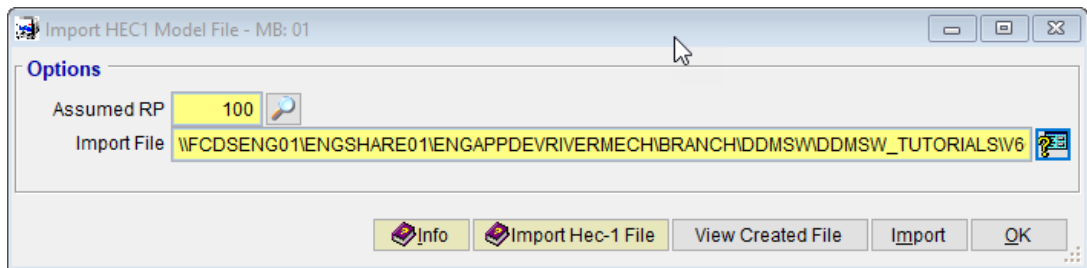
Press **'OK'** when it is done.



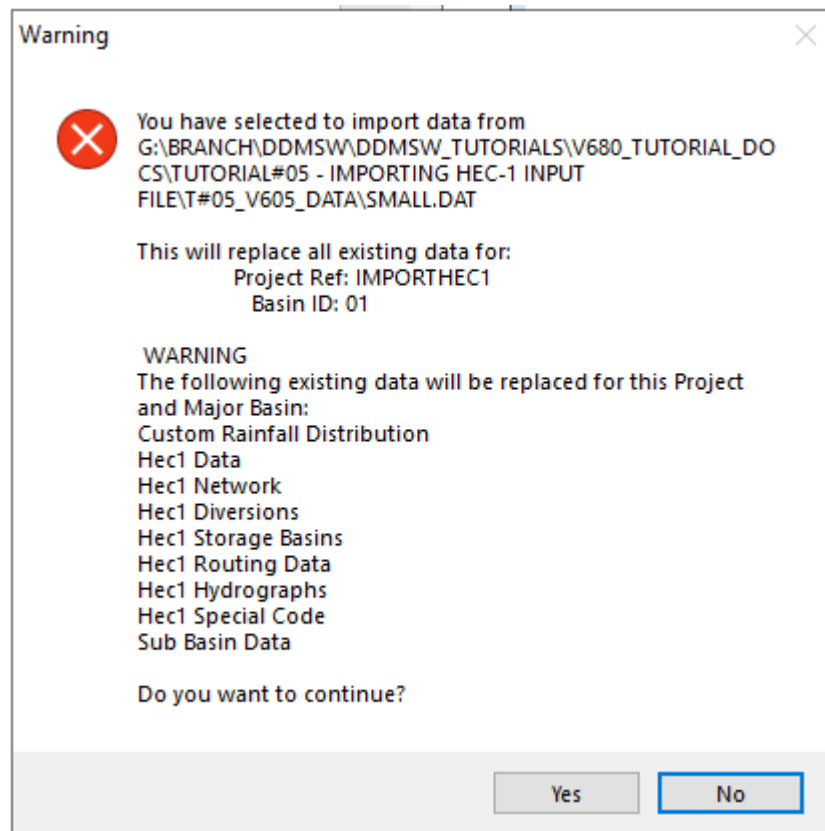
Press **'Save'** to accept the folder settings identified for **'Model Runs Path'**. Press **'OK'** to close the **PROJECT PATHS** form.

4.0 IMPORT THE MODEL INPUT FILE

On the **IMPORT HEC1 MODEL FILE** form (**'Hydrology → HEC-1 → Import HEC-1 File'**), click the button on the right of the **'Import File'** textbox field to locate the location of the HEC-1 Model Input File to be used by the program. Find the HEC-1 model file **SMALL.dat**, select it, and press **'OK'**. Press the **'Import'** button to import the selected file.



DDMSW will warn you that the program will replace all existing data with the current project data. Press **'Yes'** to continue.



After the Import process is complete, press **'OK'** to continue. On the **IMPORT HEC-1 MODEL FILE** form, press **'OK'** to close the form.

5.0 VALIDATE THE IMPORTED MODEL FILE

On the **HEC-1 DATA** form (**'Hydrology → HEC-1 → Data'**), review / validate the imported model to ensure that it is the right model. Make necessary modifications if necessary. Press the **'OK'** button to close the **HEC-1 DATA** form.

HEC-1 Data - MB: 01

List

Details

FindNext

F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Sort	Special Code ID
ID		Flood Co	ntrol Di	strict o	f Marico	pa Count	y				10	
ID		EXAMPLE2	- S-Gra	ph, Gree	n-Ampt,	Single,	24 Hour				20	
ID		100 YEAR									30	
ID		24 Hour	Storm								40	
ID		Unit Hyd	rograph:	S-Graph							50	
ID		04/09/20	13								60	
IT	3	1JAN99	1200	2000							70	
IN	15										80	
IO	1										90	
*D	IAGRAM										100	
*											110	
*											120	
KK	1A	BASIN									130	
BA	6.690										140	
PB	3.831										150	
PC	0.000	0.002	0.005	0.008	0.011	0.014	0.017	0.020	0.023	0.026	160	

Info

Export

ReSort

Print...

Delete

Add

MB

Update

OK

6.0 RUN THE MODEL

After the model file has been imported into a new project in **DDMSW**, the model can now be run. On the **RUN HEC-1 MODEL** form (**Hydrology → HEC-1 → Model**), check the **Delete Prior Results** check box and uncheck the **Select Custom Folder** and **Update Conveyance Flows** check boxes. Execute the model by pressing the **Run Model** button.

Run HEC-1 Model - Imported Hec-1 File

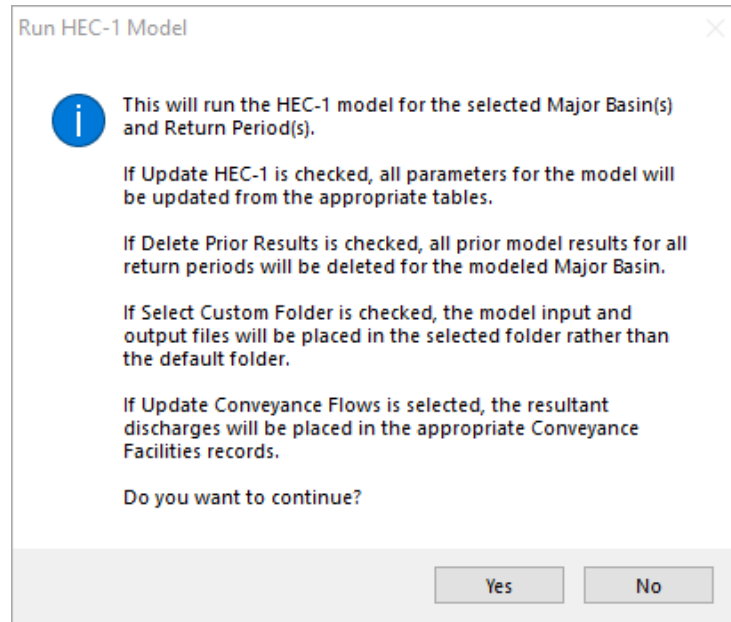
Options

Major Basin **01**

☒ Delete Prior Results
☐ Select Custom Folder
☐ Update Conveyance Flows

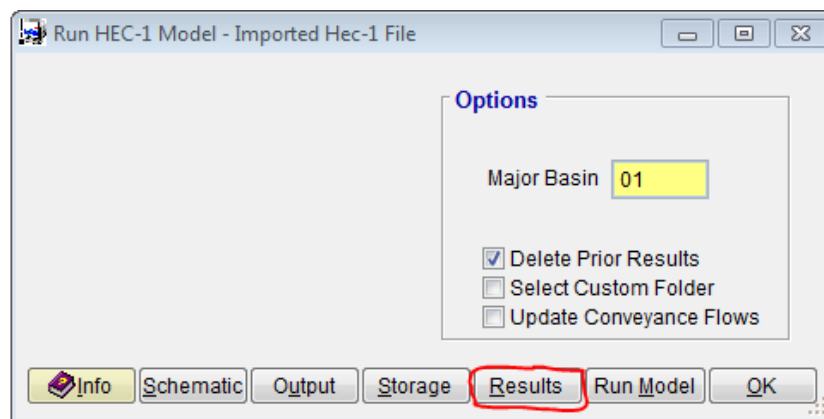
Info Schematic Output Storage Results Run Model OK

Click **Yes** to continue.



If the model run is successful, DDMSW will display the message, ***'Model run complete!'***. **7.0 VIEW MODEL RESULTS**

After the model is successfully executed by the program, model results can be viewed by clicking on the ***'Results'*** button on the **RUN HEC-1 MODEL** form.



On the **HEC-1 FLOW SUMMARY** form, model results in tabulated format can be viewed.

HEC-1 Flow Summary - FLOWS - MB: 01

Look for

ID	Sort ^	Type	Area	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr	
1A	10	Hydrograph	6.69						10881	
R1-2	20	Routed	6.69						7080	
1B	30	Hydrograph	5.70						8510	
C2	40	Combined	12.39						13430	
R2-4	50	Routed	12.39						9178	
1C	60	Hydrograph	0.81						1504	
R3-4	70	Routed	0.81						512	
1D	80	Hydrograph	3.27						5592	
C4	90	Combined	16.47						11471	
R4-7	100	Routed	16.47						10275	
1E	110	Hydrograph	1.11						2183	
R5-7	120	Routed	1.11						1461	
1F	130	Hydrograph	3.08						3870	
R6-7	140	Routed	3.08						3142	
1G	150	Hydrograph	2.58						4955	
C7	160	Combined	23.24						14837	
ST1	170	Routed	23.24						2162	
DIV1	180	Diversion	23.24						499	

Info Export Print... More Results MB OK

To view model results other than the peak flows, click the ***'More Results'*** button on the form and on the **MODEL VIEW** form, users can select from *'Volumes (IN)'*, *'Volumes (AF)'*, and *'Attenuation/Velocity'*.

Model View

View Option

View

Option

Info OK

HEC-1 Flow Summary - VOLUMES (AC-FT) - MB: 01

Look for

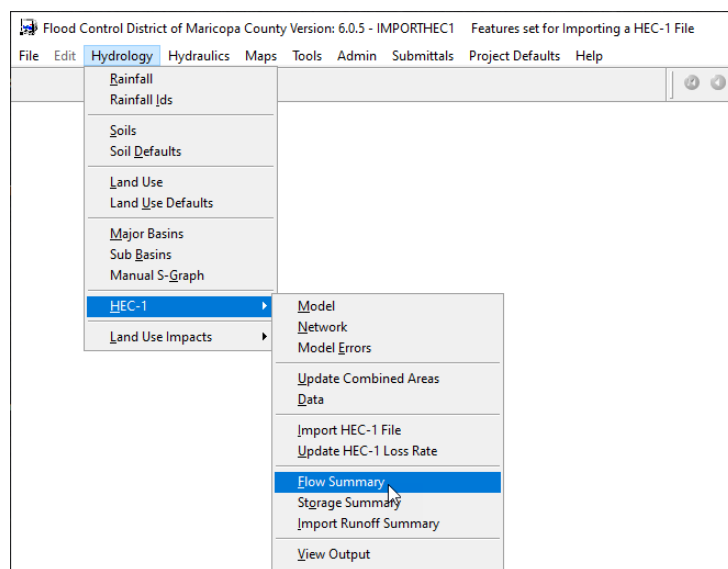
ID	Sort	Type	Area	2 Yr	5 Yr	10 Yr	25 Yr	50 Yr	100 Yr
1A	10	Hydrograph	6.69						814.41
R1-2	20	Routed	6.69						814.41
1B	30	Hydrograph	5.70						854.79
C2	40	Combined	12.39						1669.19
R2-4	50	Routed	12.39						1669.19
1C	60	Hydrograph	0.81						109.37
R3-4	70	Routed	0.81						109.37
1D	80	Hydrograph	3.27						530.45
C4	90	Combined	16.47						2309.01
R4-7	100	Routed	16.47						2309.01
1E	110	Hydrograph	1.11						151.17
R5-7	120	Routed	1.11						151.17
1F	130	Hydrograph	3.08						273.86
R6-7	140	Routed	3.08						273.86
1G	150	Hydrograph	2.58						418.77
C7	160	Combined	23.24						3152.81
ST1	170	Routed	23.24						3150.24
DIV1	180	Diversion	23.24						2020.07

Info Export Print... More Results MB OK

Also, users can select which model elements ('All', 'Hydrograph', 'Routed', 'Combined', and 'Storage') to view by pressing the Selector button on the right of the '**Option**' textbox field.

After exploring all possible options in viewing model results, click '**OK**' to close the **RUN HEC-1 MODEL** form

Alternatively, model results can be viewed by selecting '**Hydrology** → **HEC-1** → **Flow Summary**'.



8.0 VIEW THE HYDROGRAPHS

To be able to view the hydrograph plot of any hydrologic element in the model, it is essential that model output levels (**'IO'**) be specified at either **'1'** or **'2'** to instruct the program to print detailed results of the model. Using output levels of **'3'**, **'4'**, or **'5'** will not print the hydrographs in the model output and thus, the graphing tool will not be able to plot any hydrographs. To determine the **'IO'** parameter used by the model, the model data settings needs to be checked. This could be done by accessing the **'List'** tab of the **HEC-1 DATA** form (**'Hydrology → HEC-1 → Data'**).

List												Details	
F0	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	Sort	Special Code ID	
ID		Flood Co	ntrol Di	strict o	f Marico	pa Count	y				10		
ID		EXAMPLE2	- S-Gra	ph, Gree	n-Ampt,	Single,	24 Hour				20		
ID		100 YEAR									30		
ID		24 Hour	Storm								40		
ID		Unit Hyd	rograph:	S-Graph							50		
ID		04/09/20	13								60		
IT	3	1JAN99	1200	2000							70		
IN	15										80		
IO	1										90		
*D	IAGRAM										100		
*											110		
*											120		
KK	1A	BASIN									130		
BA	6.690										140		
PB	3.831										150		
PC	0.000	0.002	0.005	0.008	0.011	0.014	0.017	0.020	0.023	0.026	160		

After selecting the **'IO'** card on the **'List'** tab of the **HEC-1 DATA** form, press the **'Details'** tab. On the **'F1'** textbox field, replace any values greater than **'2'** (e.g., **'3'**, **'4'**, or **'5'**) with either **'1'** or **'2'**.

HEC-1 Data - MB: 01

List Details

Major Basin ID: 01

Sort: 90

Special Code ID:

F0	IO
F1	1
F2	
F3	
F4	
F5	
F6	
F7	
F8	
F9	
F10	

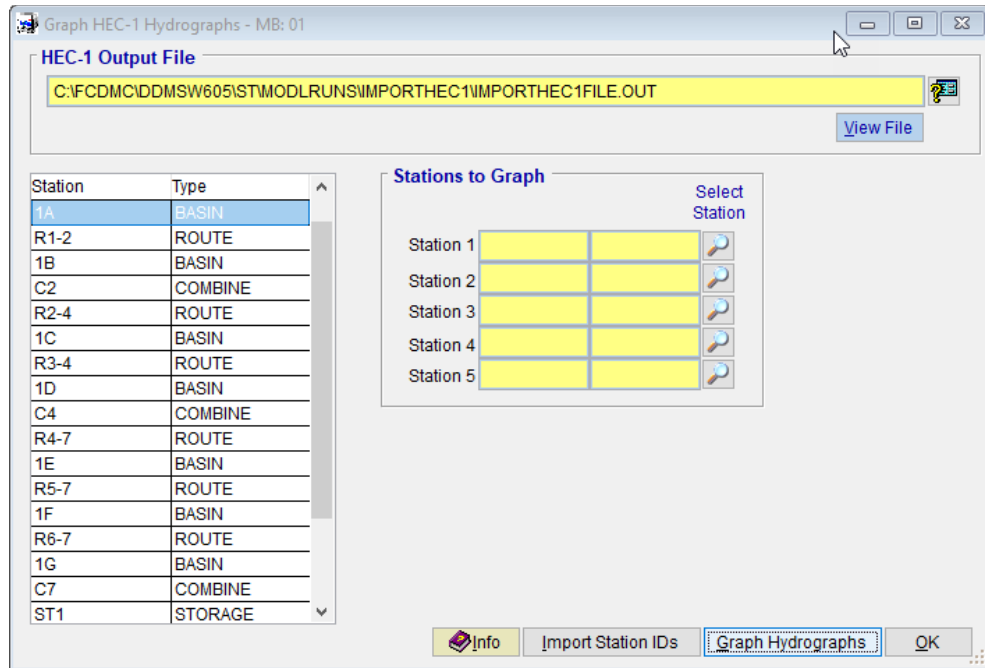
Info Export ReSort Print... Delete Add MB Update OK

Press **'Save'** to save the entered data and select the **'List'** tab to verify if the entered **'IO'** value is reflected on the modified form. Press **'OK'** to close the **HEC-1 DATA** form.

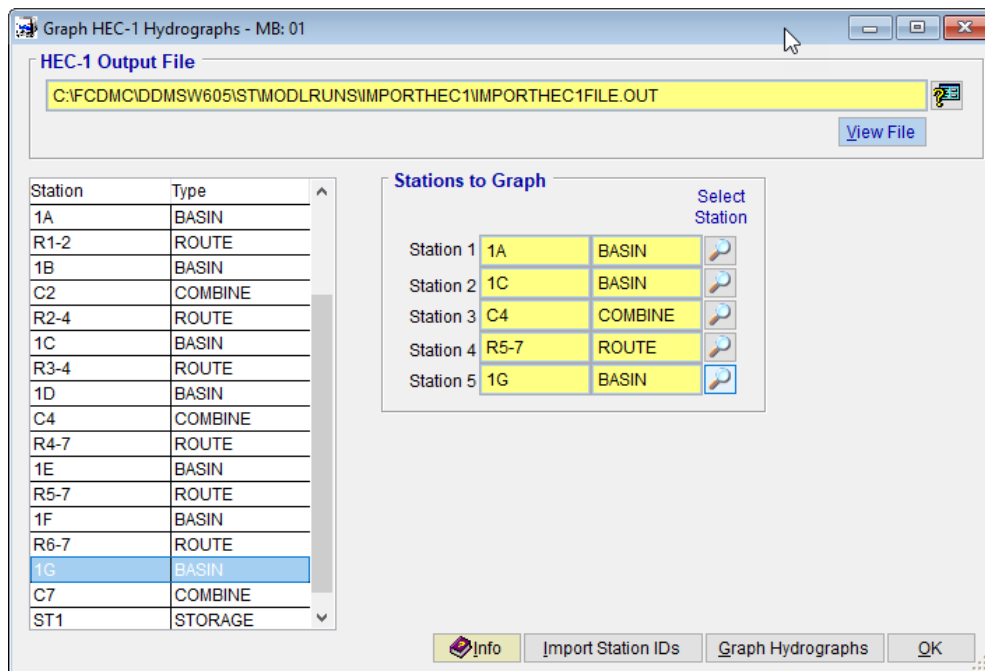
Run the new model with the updated IO data card (**'Hydrology → HEC-1 → Model → Run Model'**).

To view the graphics, open the **GRAPH HEC-1 HYDROGRAPHS** form (**'Hydrology → HEC-1 → Graph Hydrographs'**) and click the button on the right of the **'HEC-1 Output File'** textbox field to select the output file named "ImportHEC1file.out" created by DDMSW after "Run model" and located in the modruns directory.

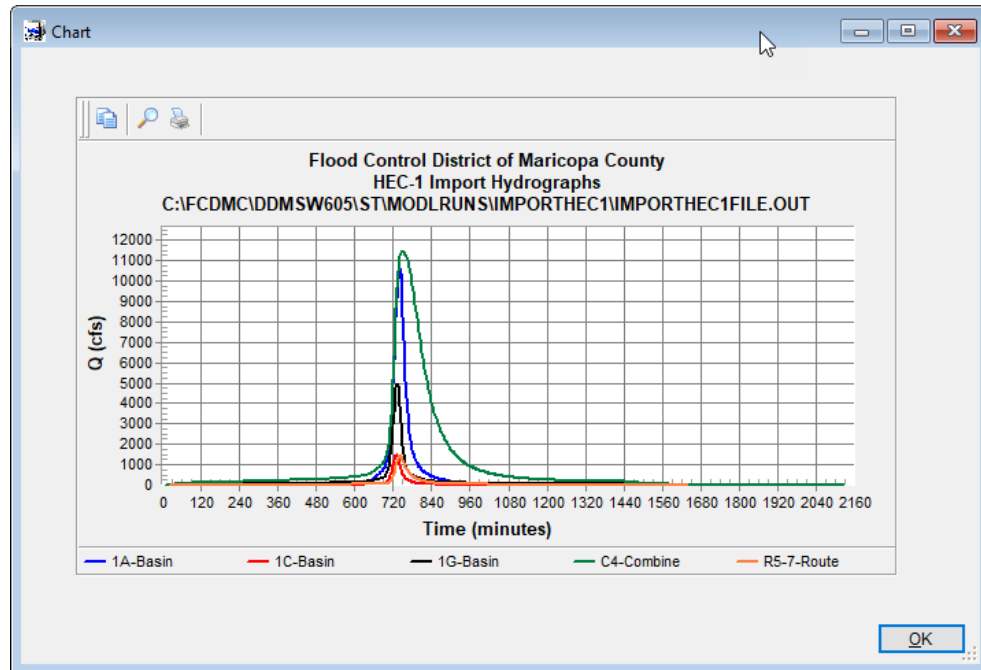
Once the model output file is identified and selected, press the **'Import Station IDs'** button to list all the Stations in the program. As shown, a maximum of five (5) station plots can be drawn and viewed at any time.



To select the Stations to be plotted, highlight any Station on the left and press the Selector buttons on the right. This action will list the selected stations to be plotted by the program.



To show the hydrograph plots of the selected stations, press the '**Graph Hydrographs**' button. Press '**OK**' to continue.



Press **'OK'** to close the **CHART** form. Press **'OK'** to close the **GRAPH HEC-1 HYDROGRAPHS** form.

9.0 NOTES

To perform modifications or changes on HEC-1 model, open the **HEC-1 DATA** form (**'Hydrology → HEC-1 → Data'**). Highlight the line to change by clicking on it. Use the **'Find'** and **'Next'** buttons to search for a specific line. Press the **'Find'** button. A **FIND VALUE** pop-up window will appear. Since the **'Find'** function looks only in the **'F1'** column, only type in a value such as a basin name (**'1A'**), a routing channel name (**'R1-2'**), or a specific number like the **IA** value for a Green-Ampt Parameter (**'0.28'**). Press the **'Save'** button and then **'OK'** to perform the search. The **'Next'** button looks for the next line that contains the same **'F1'** content. When specific line to change is found, click the **'Details'** tab (or double-click on the line). Edit the HEC-1 field(s) by typing into the appropriate column(s) labeled by **'F1'** to **'F10'**. Press the **'Save'** button to save your changes. You can get back to the line-by-line view of the data by clicking the **'List'** tab. When you are finished making changes, press the **'OK'** button to exit or close the **HEC-1 DATA** form.

10.0 MODELING UPDATE OPTIONS

Because the imported HEC-1 Model Input File does not have other datasets (i.e., Network, Rainfall, Sub Basins, Routing, Storage, and Diversions) to recalculate model parameters, the model cannot be updated. The only dataset that can be updated without impacting the results of the HEC-1 model is the Major Basin data (***Hydrology → Major Basin → Update***).

If the user desires to update the HEC-1 Model, it would be necessary to develop the **DDMSW** data for the Sub Basins, Land Use, and Soils. Please refer to another Tutorial document for this process.