

# REG-U-FLO<sup>®</sup> VORTEX VALVES MODELING IN MIDUSS<sup>®</sup>

June 2009

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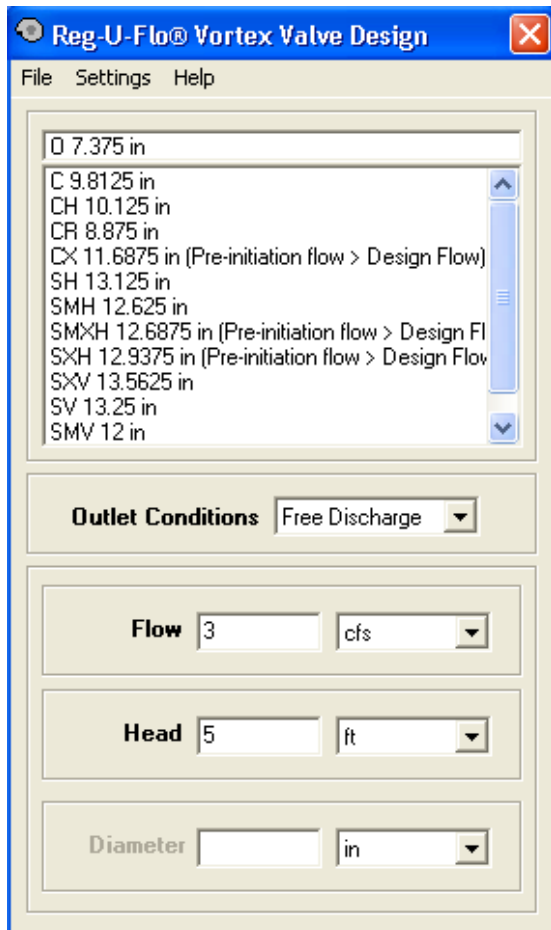
## 1.0 INTRODUCTION

The use of outlet control systems to regulate stormwater and prevent flooding and overflows of hydraulic structures downstream is crucial. Conventional control systems include weirs, orifice plates, sluice gates, etc. Due to peak runoff discharge regulations; it is common practice for hydraulic networks to incorporate these control structures.

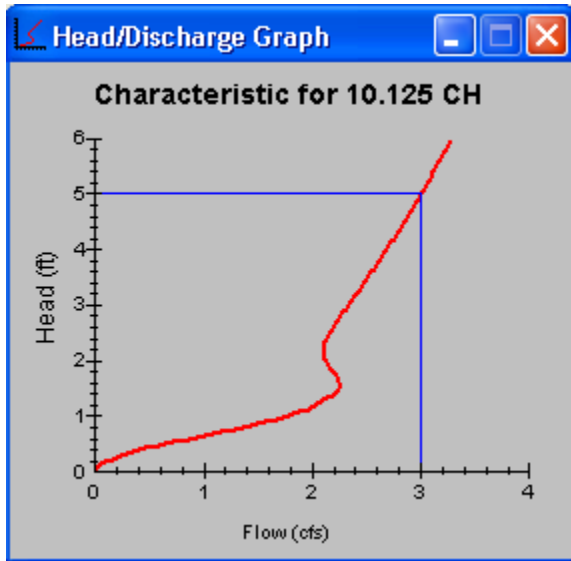
This document describes the modeling of outlet structures in MIDUSS® 2.0 using the Reg-U-Flo® Vortex Valve. The valve is a non mechanical outlet structure that has large openings compared to traditional control systems designed to pass the same amount of flow resulting in a minimized likelihood of blockage. It has the added advantage of providing storage savings, thus minimizing land uptake and requires no power, harnessing its energy from the flow.

## 2.0 REG-U-FIO® Head/Discharge Characteristics

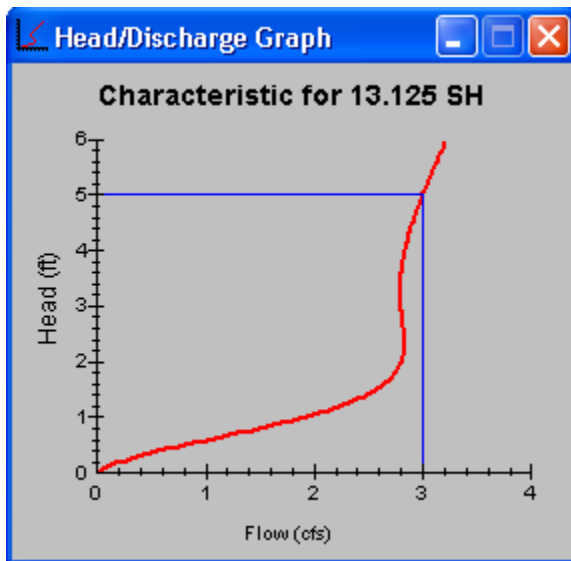
- Open the Reg-U-Flo® Vortex Valve Design program to identify the valve that is suitable for the design conditions.
- Input design flow and peak head requirements to view a list of valves that meet the parameters.



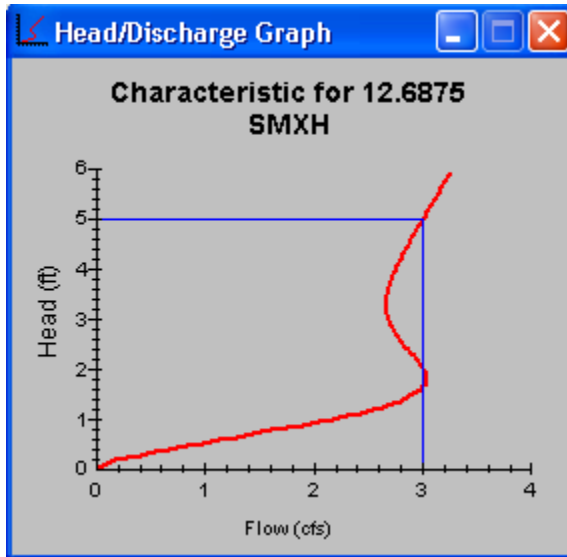
- Click on various models in the listing to view their flow vs. driving head curves.



- Select the valve with the least 'area under the curve' to minimize driving head and maximize flow until peak design flow has been reached.

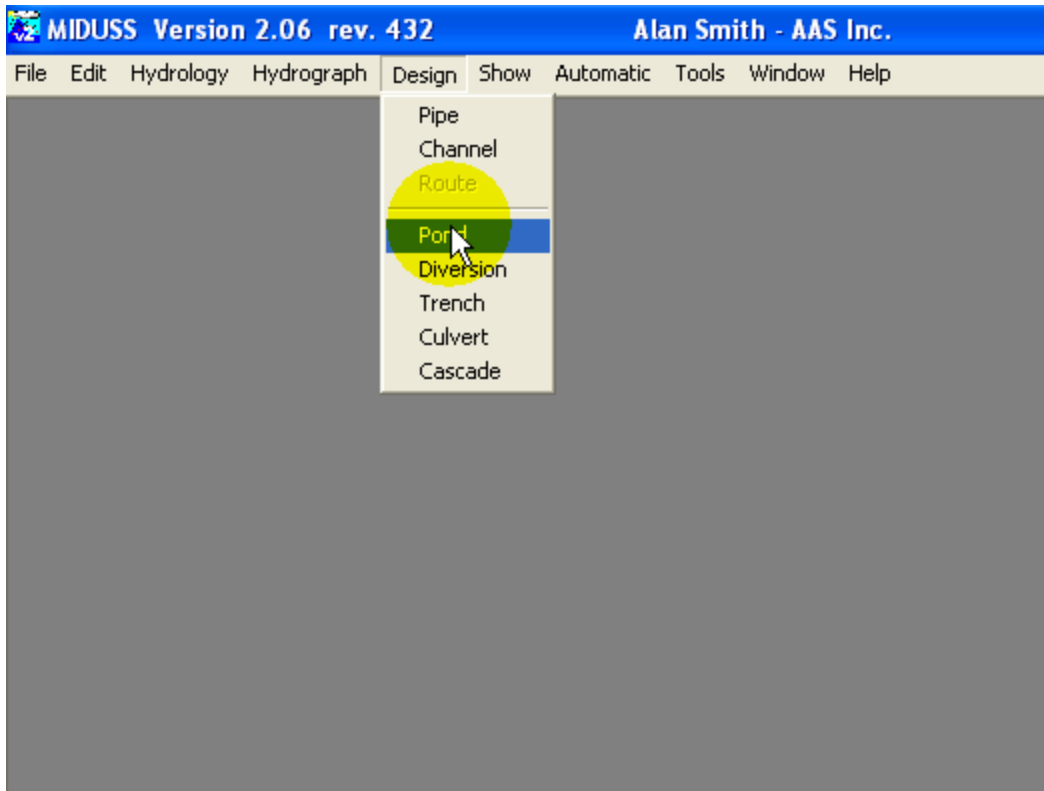


- Some valves may offer better flow characteristics yet exceed the design flow slightly during the transition to vortex flow. This is situation specific and may or may not be acceptable to use based on the application.



### 3.0 MODELING IN MIDUSS®

- Open MIDUSS® and specify your storm properties and define the pond or storage basin that the Reg-U-Flo® Vortex Valve is to be installed upon.
- Select 'Pond' from the Design Menu.



- In the pond window specify your target outflow and design water levels.

**POND DESIGN**

Peak inflow 0.184 c.m/sec

Target outflow  c.m/sec

Hydrograph volume 496.000 c.m

Required volume 140.0 c.m

Number of stages

Minimum water level  metre

Maximum water level  metre

Starting water level  metre

Results

Peak outflow 0.000 c.m/sec

Maximum level 0.000 metre

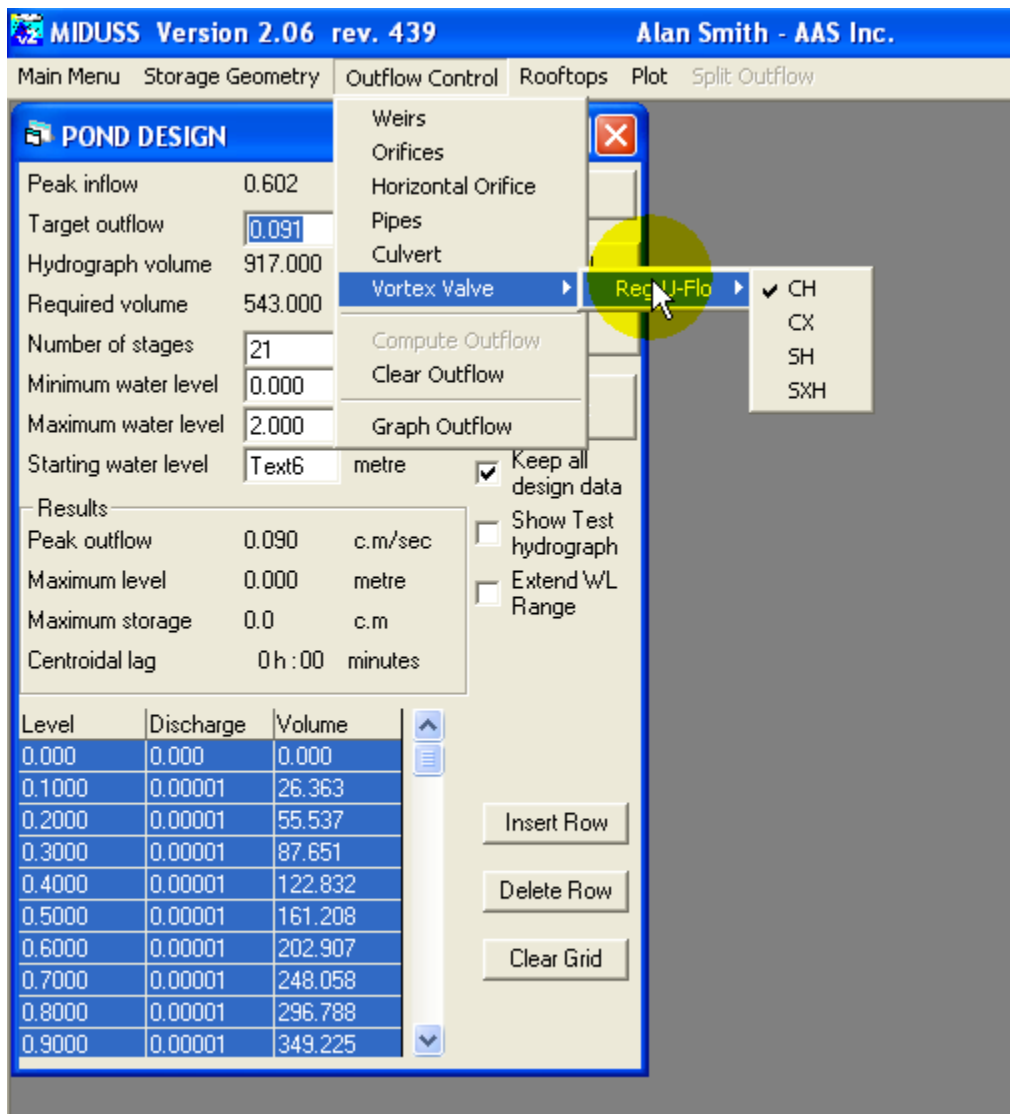
Maximum storage 0.0 c.m

Centroidal lag 0 h : 00 minutes

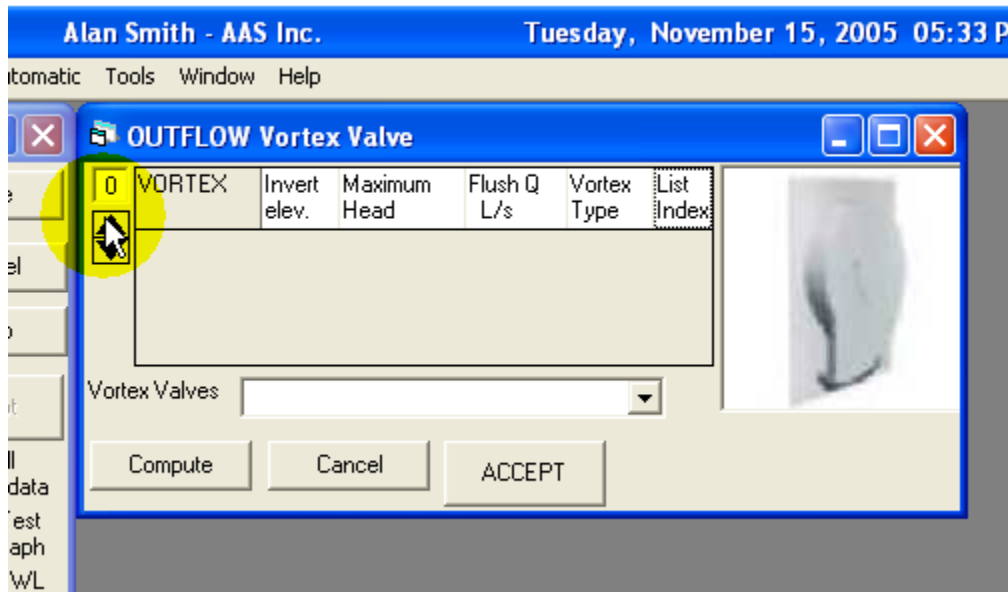
Level	Discharge	Volume
0.000	0.000	0.000
0.1000	0.00000	2.181
0.2000	0.00000	5.211
0.3000	0.00000	9.216
0.4000	0.00000	14.325
0.5000	0.00000	20.667
0.6000	0.00000	28.368
0.7000	0.00000	37.557
0.8000	0.00000	48.363
0.9000	0.00000	60.912

Buttons: Route, Cancel, Undo, Accept, Keep all design data, Show Test hydrograph, Extend WL Range, Insert Row, Delete Row, Clear Grid

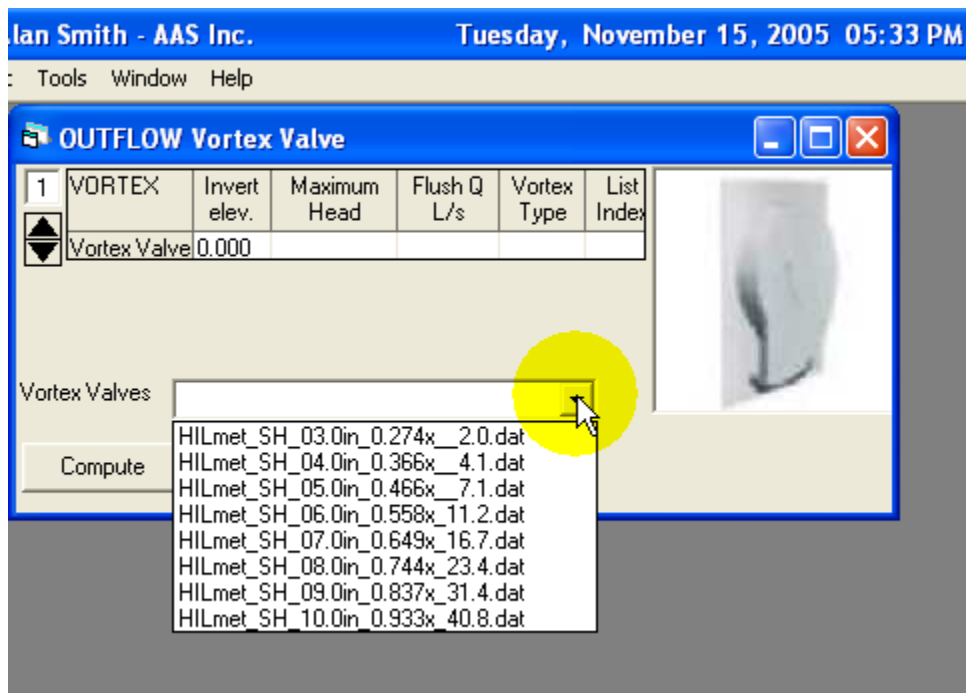
- Select the type of Vortex Valve you would like to insert from the Outflow Control menu.



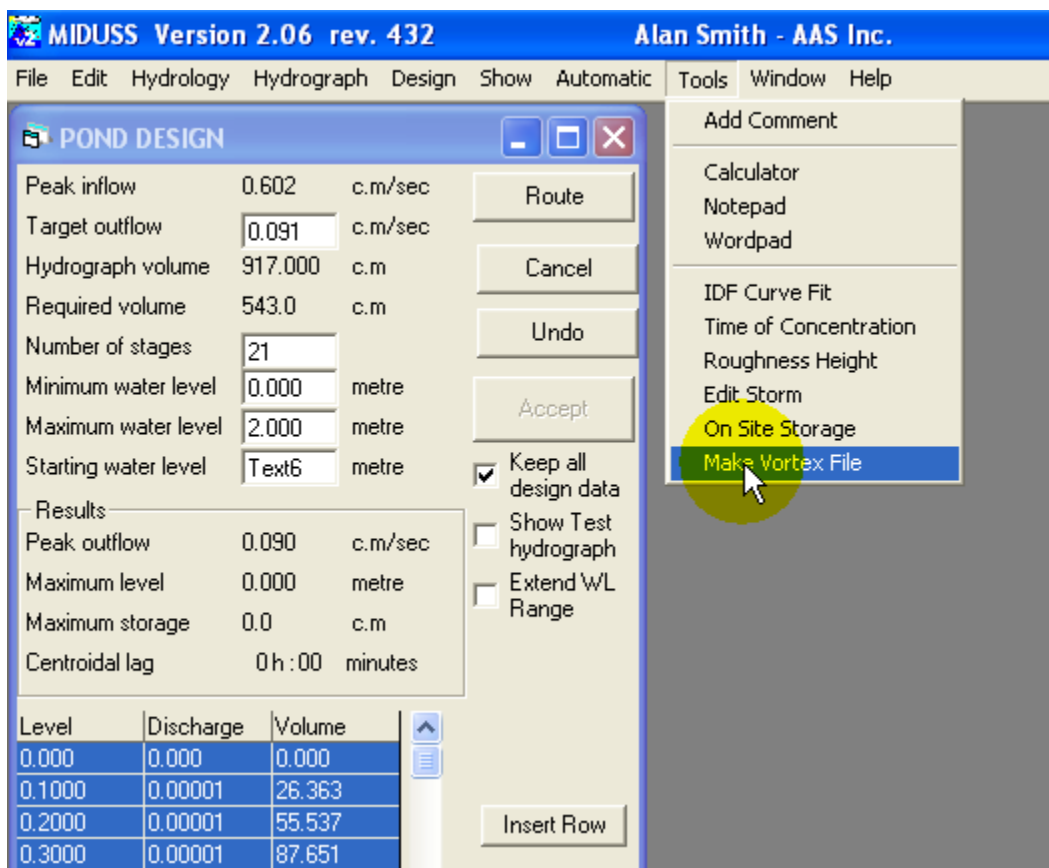
- Click the Up Arrow to install one Vortex Valve. Alternately more than one Vortex Valve can be installed if desired.



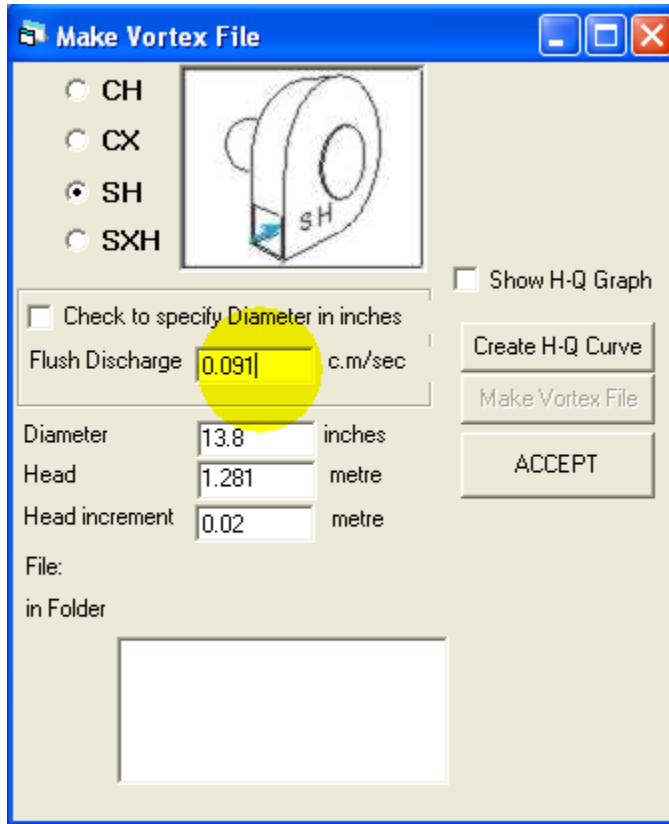
- Click the Vortex Valves pull-down menu and select the desired valve from the list.



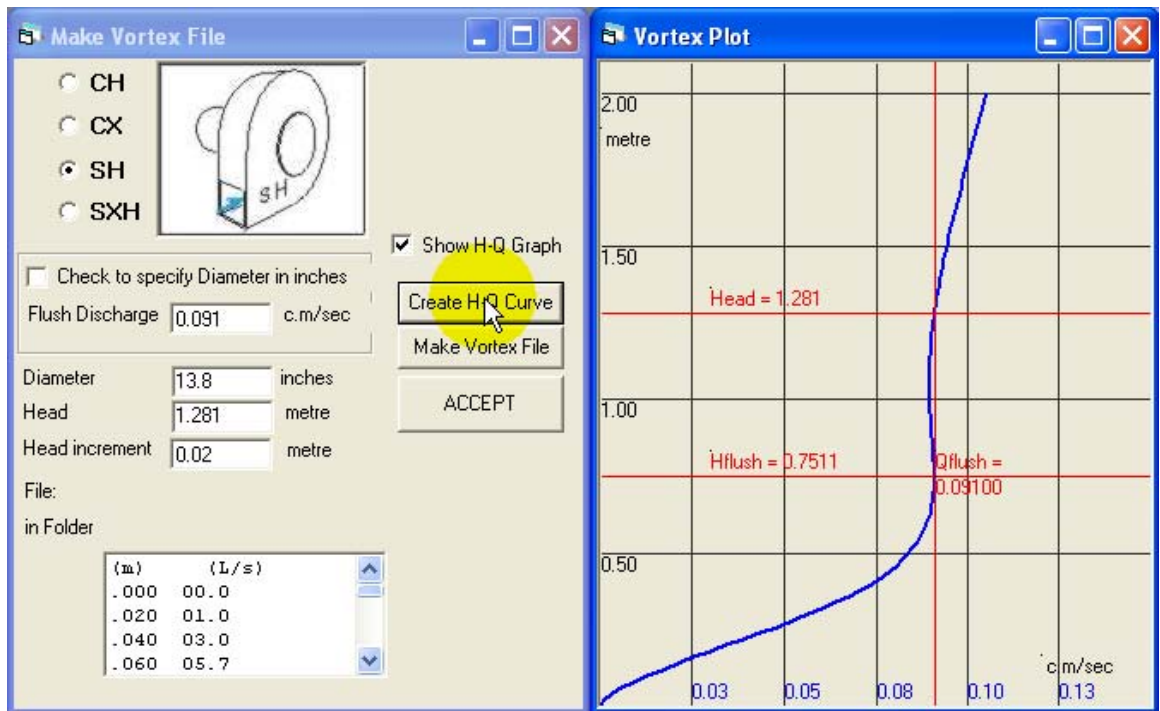
- If the desired valve is not in the list then an option to create your own Vortex Valve file exists to meet the desired criteria.
- Click on any window that is not a pond design window and select 'Make Vortex File' from the Tools menu.



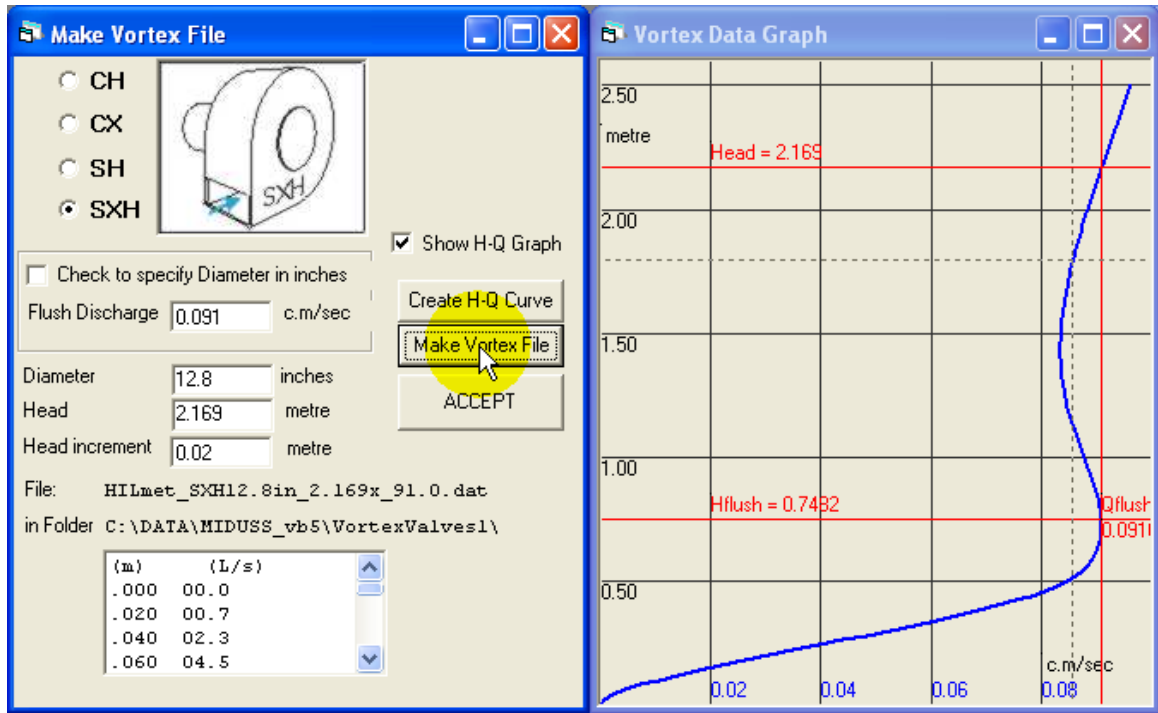
- Specify the desired outflow in cubic meters per second in the 'Flush Discharge' field and the results will appear in the fields below. Alternatively, you may check the box labeled 'Check to specify Diameter in inches' to input your own values from the Reg-U-Flo® Vortex Valve Design program.



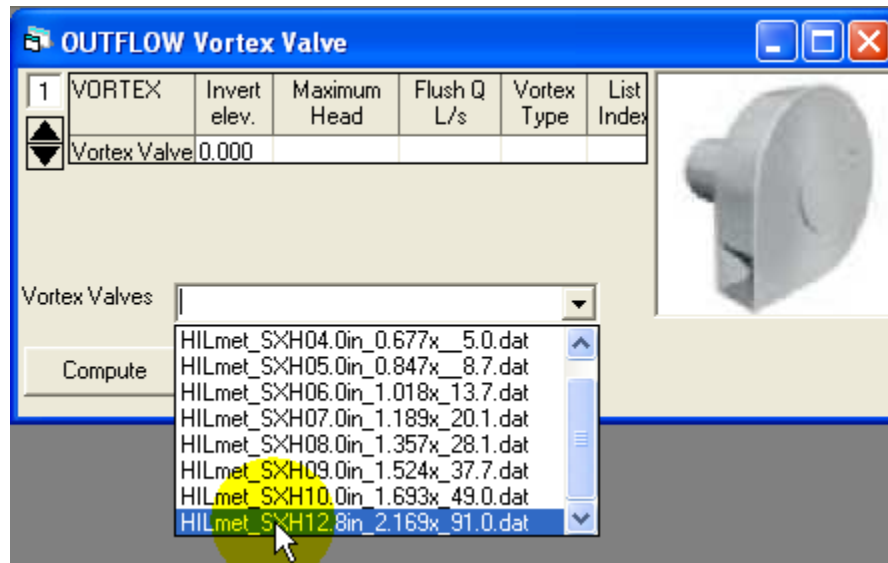
- Check the 'Show H-Q Graph' box and click 'Create H-Q Curve' to view the Head vs. Flow graph for the specified valve.



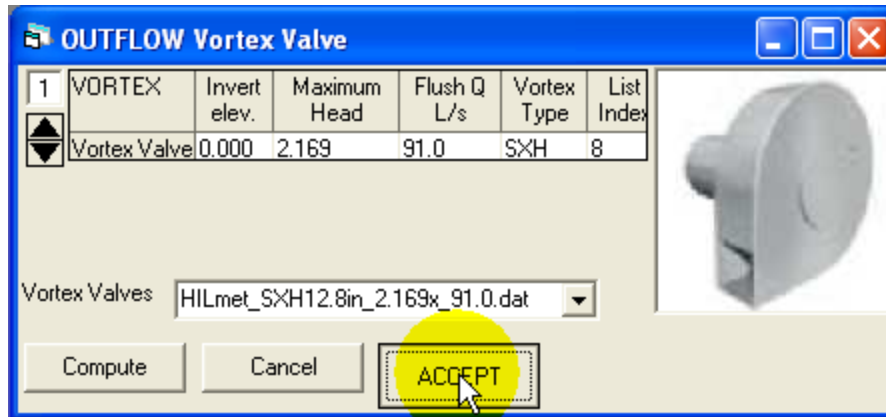
- You may change valve types or discharge flow rates and click 'Create H-Q Curve' again to view graphs for additional valves.
- When satisfied with the choice of valve, click 'Make Vortex File' and the file name and directory of the newly created valve file will be displayed.



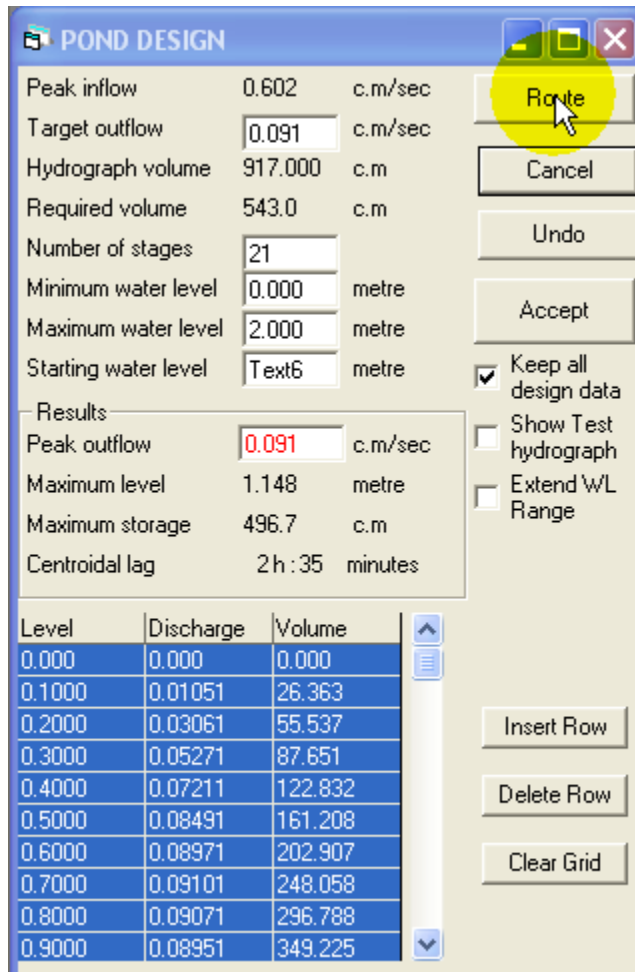
- Return to the pond design window and select the type of vortex valve from the outflow control menu as previously described.
- After clicking the Up Arrow to add a vortex valve you will see that your newly created Vortex Valve file now appears in the drop-down menu.

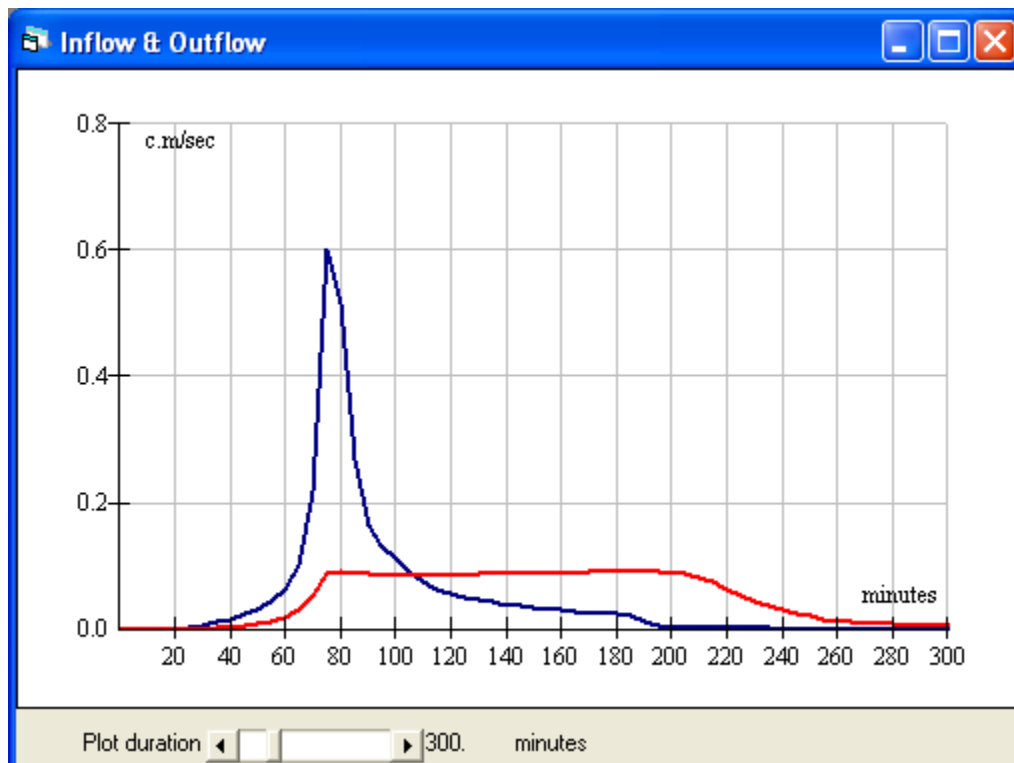


- Click 'Compute' and then 'Accept'



- You may now go back to the pond design window and click 'Route' to display the graphs of inflow and outflow.





- The Vortex Valve is now installed and you may continue on with your project

## 4.0 SUPPORT

For additional information, contact Hydro International at (1) 207 756 6200 or email our Engineering Design Team at [stormwaterinquiry@hil-tech.com](mailto:stormwaterinquiry@hil-tech.com).

Additional information is also available of the MIDUSS® homepage through online tutorials.