Aquaterra
by CGS Labs

EXPORT AND IMPORT TO HEC-RAS

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Aquaterra: Export and import to HEC-RAS Tutorial

Title: **Aquaterra: Export and import to HEC-RAS Tutorial**

Document date: 10. 08. 2021

Version: 1.0.

Printing: CGS Labs d.o.o.

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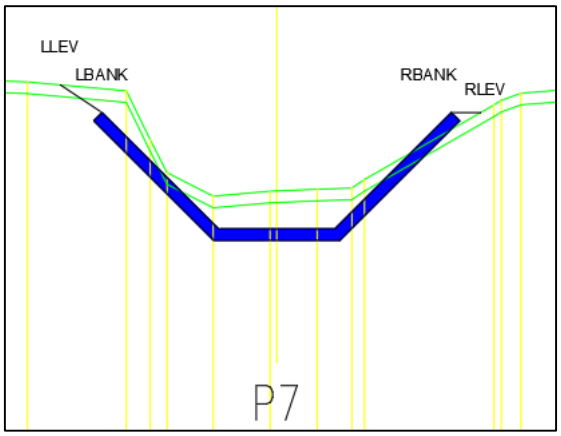
Aquaterra: Export and import to HEC-RAS Tutorial

This step-by-step instruction will lead you through the workflow procedure in order to get familiar with the software environment. "Aquaterra Export to HEC-RAS.dwg" file should be used. You will learn how to define banks and levee points in Aquaterra and assemble a new terrain from previously defined TCS elements. Next step shows how to export a river axis and cross sections from Aquaterra model and import it to HEC-RAS where you can use it for the hydraulic analysis. In the last step, you will learn how to import the 1D flow analysis results back to Aquaterra and insert the water table in the layout, profile and cross sections.

Define projection points in Aquaterra

1. Open the drawing “Aquaterra Export to HEC-RAS.dwg”
2. On CGS Labs tab, click on Aquaterra icon  . Aquaterra ribbon opens.
3. On Cross Sections tab, go to Label panel and click Define Projection Points  .
4. In Define Intersection points dialog box, define:
    - Definition method: Right levee

    And click on the upper side of the right embankment.
5. Run the same command again. Definition method: Right levee. Select the end point of the right dyke.
6. Select the Draw element only in profiles where it does not exist option and confirm with OK.
7. Repeat the procedure for the left levee and the right, left bank.



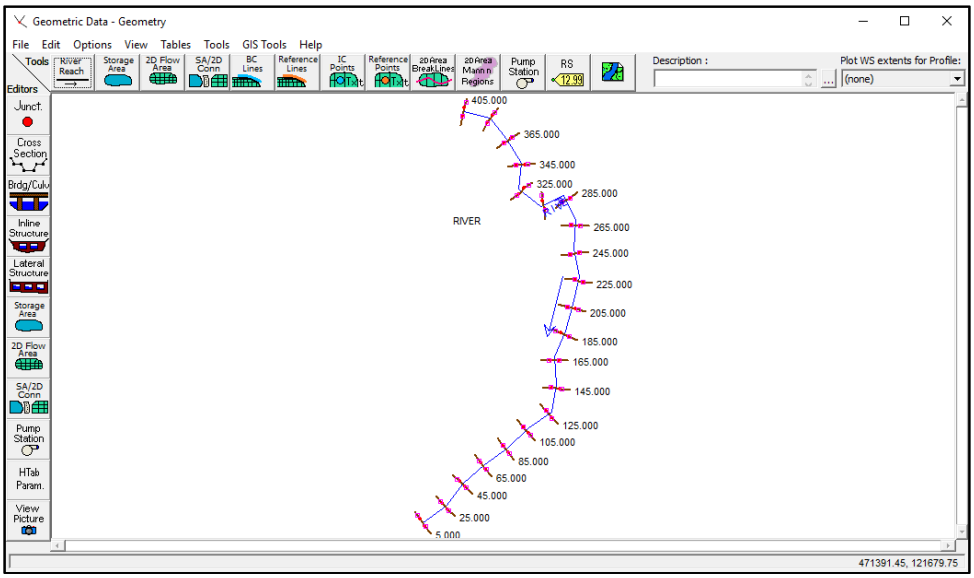
8. Click on Assemble terrain line  . Use  to select elements from which the new terrain will be assembled. Select left and right banks, dykes and the channel. Press Enter to check the list of the elements.
9. Name the new terrain line.
10. Check Make current option. Confirm with OK.

Export cross sections

11. On Edit TCS Elements, click Save terrain to file -> CRO  to save cross sections in the file.
12. Specify the file path and file name. Confirm with Save.
13. Select terrain line: River. Confirm with OK.
14. Click on Save Projection points -> IL  to save levee and banks.
15. Specify the file path and file name. Confirm with Save.
16. Select Save al intersection lines and confirm with OK.
17. To export cross axes, go to Layout and click on Sample lines  drop-down menu.
18. Select Sample lines report  . Specify the file path and file name. Press Enter.
19. On Utility tab, click HEC-RAS  drop-down menu and select Export to HEC-RAS  .
20. Define a title, click on  to define file path and file name. Press Convert. A *.G00 file with containing axis data will be created.

HEC-RAS analysis

21. Open HEC-RAS.
22. Open your HEC-RAS Project.
23. Go to File -> New Project -> define the project title and confirm.
24. Go to Edit -> Geometry data
25. In the geometry window, select File -> Import Geometry data -> HEC-RAS Format… -> Select the River.G00 file from Aquaterra, to import the river geometry. Select SI (metric) units, click “Next” to review the River Reach Stream Lines and Cross sections and select “Finished – Import Data”.



26. Save the geometry data. File -> Save geometry data.

27. Set the rest of the model and run the analysis.
28. To export the results, select View -> Profile Summary Table. Select File -> Write to text file… and save it.

Profile Output Table - Standard Table 1

File Options Std. Tables Locations Help

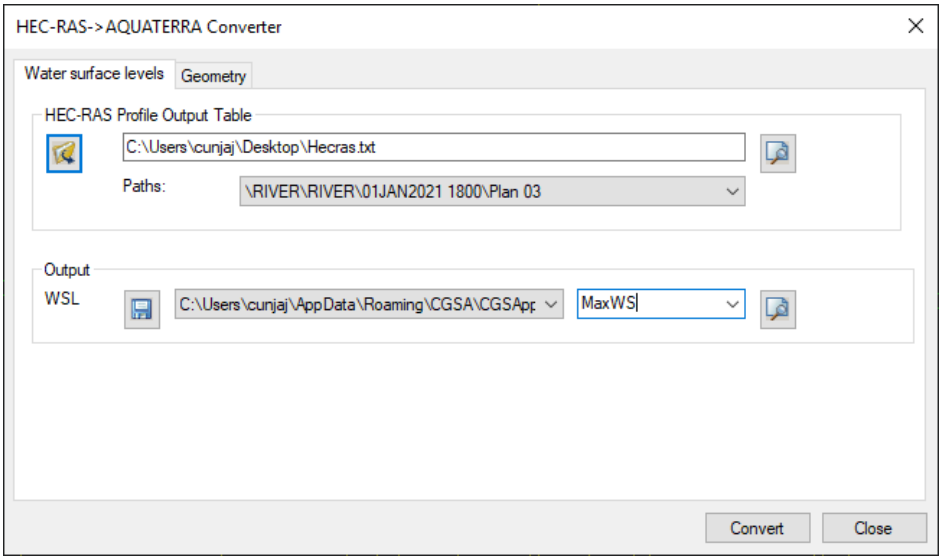
HEC-RAS Plan: Plan01 River: RIVER Reach: RIVER Profile: Max WS

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m3/s)	(m)	(m)	(m)	(m)	(m/m)	(m/s)	(m2)	(m)	
RIVER	405.000	Max WS	69.94	386.78	389.95		390.35	0.004349	3.13	26.94	17.43	0.63
RIVER	385.000	Max WS	70.00	386.70	389.96		390.31	0.003734	2.97	29.42	20.00	0.59
RIVER	365.000	Max WS	69.98	386.62	389.96	389.94	390.56	0.005496	3.68	23.30	18.12	0.72
RIVER	345.000	Max WS	69.94	386.54	389.74		390.16	0.004601	3.24	26.99	20.00	0.65
RIVER	325.000	Max WS	69.94	386.45	389.68		390.11	0.004377	3.19	26.67	20.00	0.64
RIVER	305.000	Max WS	69.90	386.37	389.64		389.95	0.003306	2.80	30.98	20.00	0.55
RIVER	285.000	Max WS	69.90	386.29	389.64		390.00	0.003603	2.99	29.46	20.00	0.58
RIVER	265.000	Max WS	69.86	386.21	389.56		389.98	0.004073	3.17	26.54	16.67	0.62
RIVER	245.000	Max WS	69.87	386.13	389.42		389.86	0.004435	3.26	26.19	17.83	0.64
RIVER	225.000	Max WS	69.87	386.05	389.31		389.81	0.005020	3.44	24.55	16.62	0.68
RIVER	205.000	Max WS	69.84	385.96	389.17		389.63	0.004942	3.37	25.91	19.55	0.68
RIVER	185.000	Max WS	69.85	385.88	389.08		389.53	0.004643	3.27	25.55	16.77	0.65
RIVER	165.000	Max WS	69.85	385.80	388.99	389.05	389.62	0.006263	3.78	23.06	20.00	0.76
RIVER	145.000	Max WS	69.83	385.65	388.81	389.00	389.60	0.007608	4.13	20.17	17.11	0.84
RIVER	125.000	Max WS	69.83	385.50	388.53	388.69	389.29	0.008230	4.15	20.81	19.56	0.86
RIVER	105.000	Max WS	69.81	385.35	388.33	388.57	389.26	0.009878	4.47	18.02	14.95	0.94
RIVER	85.000	Max WS	69.82	385.20	388.05	388.43	389.23	0.013103	4.96	15.68	12.40	1.07
RIVER	65.000	Max WS	69.82	384.75	387.56	387.76	388.86	0.014403	5.15	14.56	9.45	1.12
RIVER	45.000	Max WS	69.82	384.31	387.06	387.51	388.55	0.016920	5.46	13.45	9.06	1.21
RIVER	25.000	Max WS	69.82	383.86	386.52	386.95	388.07	0.018844	5.60	13.19	8.49	1.27
RIVER	5.000	Max WS	69.82	383.41	386.00	386.56	387.76	0.022025	5.92	12.25	8.06	1.36

Import HEC-RAS results to Aquaterra

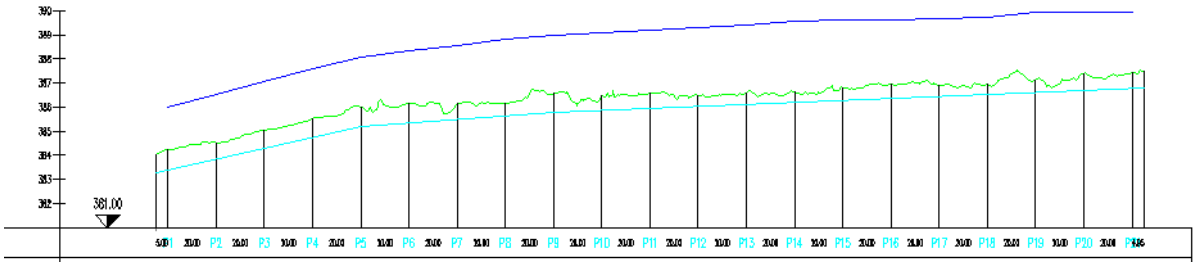
29. Open Aquaterra program and from Utility tab, click Import from HEC-RAS  .
30. In dialog box, define
    - the TXT file where results of 1D flow analysis from HEC-RAS are saved.
    - The path of HEC-RAS results
    - The path for the output file
    - Name the set: “MaxWS”

    Click Convert.



Insert the water surface in the longitudinal profile and cross sections

31. On Profile tab, click on Water surface levels .
32. In Insert water level dialog box, select *.wsl file and confirm.



33. On Cross sections tab, go to Draw TCS Elements panel and click on Insert water surface .
34. In Read water surface level dialog box, select *.wsl file and confirm.