

COMUNE DI
MALEGNO



RegioneLombardia

PROVINCIA DI
BRESCIA



PROGETTO ESECUTIVO

(D.Lgs 36/2023)

OPERA DI DIFESA ARGINALE SUL FIUME OGLIO

A2 – STUDIO IDRAULICO CON UTILIZZO PROCEDURA HEC-RAS

Luglio 2024

1. GENERALITA' E SCOPI DELLA MODELLAZIONE IDRAULICA

Nel presente elaborato vengono esposti i risultati ottenuti dalla modellazione idraulica effettuata utilizzando l'apposito software di calcolo "Hec-Ras", messo a punto dall'Idrologic Engineering Center.

Di seguito si riportano:

- gli schemi delle sezioni del rilievo topografico con l'indicazione della quota del pelo libero e la velocità della corrente.
- gli schemi riassuntivi dei parametri idraulici caratteristici di ogni sezione con l'indicazione della quota del pelo libero della corrente, della velocità di deflusso della corrente in piena e del numero di Froude;

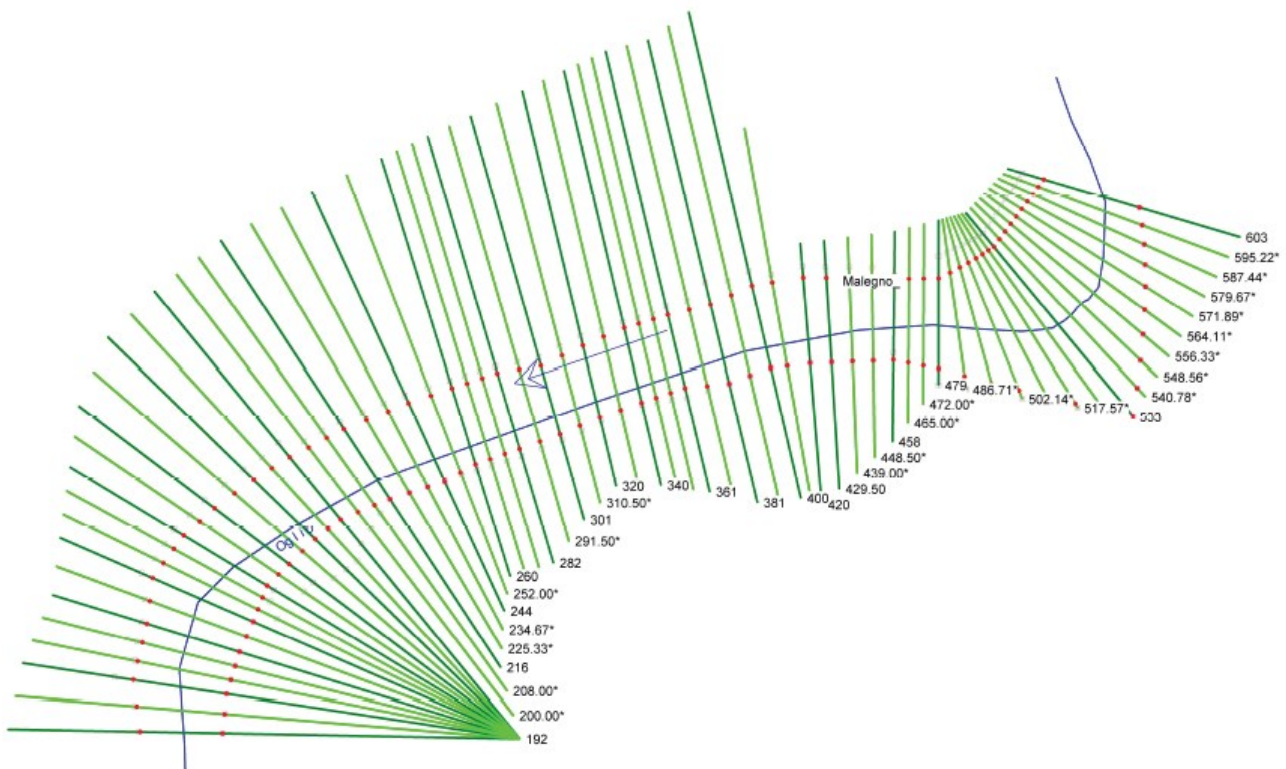


Figura 1 Planimetria con indicazione delle sezioni di calcolo

2. RISULTATI DI CALCOLO

Si riportano in forma tabellare i risultati della modellazione idraulica.

Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev
			(m3/s)	(m)	(m)	(m)	(m)
Malegno_	603	PF 6	940.00	273.46	280.43	277.81	280.83
Malegno_	533	PF 6	940.00	273.45	280.58	276.56	280.72
Malegno_	479	PF 6	940.00	272.94	279.93	277.88	280.63
Malegno_	458	PF 6	940.00	272.92	278.99	278.15	280.50
Malegno_	420	PF 6	940.00	272.77	276.55	277.67	280.01
Malegno_	400	PF 6	940.00	272.47	276.58	277.55	279.68
Malegno_	381	PF 6	940.00	272.38	278.56	277.61	279.22
Malegno_	361	PF 6	940.00	272.21	278.35	277.63	279.17
Malegno_	340	PF 6	940.00	272.21	278.29	277.42	279.13
Malegno_	320	PF 6	940.00	271.80	278.17	277.24	279.09
Malegno_	301	PF 6	940.00	271.75	277.11	277.33	278.93
Malegno_	282	PF 6	940.00	271.72	276.43	277.18	278.76
Malegno_	260	PF 6	940.00	271.70	276.61	277.12	278.48
Malegno_	244	PF 6	940.00	271.56	276.37	276.99	278.37
Malegno_	216	PF 6	940.00	271.53	276.09	276.80	278.18
Malegno_	192	PF 6	940.00	270.88	277.17	276.43	277.57
Malegno_	176	PF 6	940.00	271.35	276.63	276.63	277.50
Malegno_	158	PF 6	940.00	271.41	275.67	276.21	277.34
Malegno_	142	PF 6	940.00	271.35	275.64	276.17	277.19
Malegno_	120	PF 6	940.00	271.33	276.38	275.93	276.91
Malegno_	103	PF 6	940.00	271.18	276.37	275.97	276.88
Malegno_	79	PF 6	940.00	270.86	276.39	275.81	276.82
Malegno_	60	PF 6	940.00	270.59	275.93	275.93	276.75

Reach	River Sta	Profile	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
			(m/m)	(m/s)	(m2)	(m)	
Malegno_	603	PF 6	0.000637	2.97	366.47	88.16	0.38
Malegno_	533	PF 6	0.000210	1.65	568.94	97.35	0.22
Malegno_	479	PF 6	0.001127	3.76	265.42	55.00	0.49
Malegno_	458	PF 6	0.003169	5.45	174.17	34.43	0.76
Malegno_	420	PF 6	0.013434	8.25	115.59	52.90	1.53
Malegno_	400	PF 6	0.011041	7.82	123.98	60.05	1.40
Malegno_	381	PF 6	0.001472	3.94	292.72	95.33	0.55
Malegno_	361	PF 6	0.001821	4.35	257.18	76.89	0.61
Malegno_	340	PF 6	0.001879	4.34	248.59	66.66	0.61
Malegno_	320	PF 6	0.001839	4.49	239.10	62.98	0.61
Malegno_	301	PF 6	0.004548	6.20	169.75	55.95	0.95
Malegno_	282	PF 6	0.006847	6.87	149.35	76.64	1.13
Malegno_	260	PF 6	0.005330	6.25	175.08	88.18	1.01
Malegno_	244	PF 6	0.006274	6.42	168.81	99.60	1.08
Malegno_	216	PF 6	0.006661	6.57	169.91	124.34	1.11
Malegno_	192	PF 6	0.001118	3.30	389.14	156.24	0.48
Malegno_	176	PF 6	0.002554	4.55	276.12	158.60	0.70
Malegno_	158	PF 6	0.006600	6.12	198.93	153.71	1.09
Malegno_	142	PF 6	0.005729	5.84	205.10	151.10	1.02
Malegno_	120	PF 6	0.001610	3.58	347.48	171.79	0.57
Malegno_	103	PF 6	0.001646	3.62	350.01	165.20	0.56
Malegno_	79	PF 6	0.001273	3.36	380.63	167.62	0.51
Malegno_	60	PF 6	0.002854	4.58	284.69	157.25	0.74

3. APPENDICE A

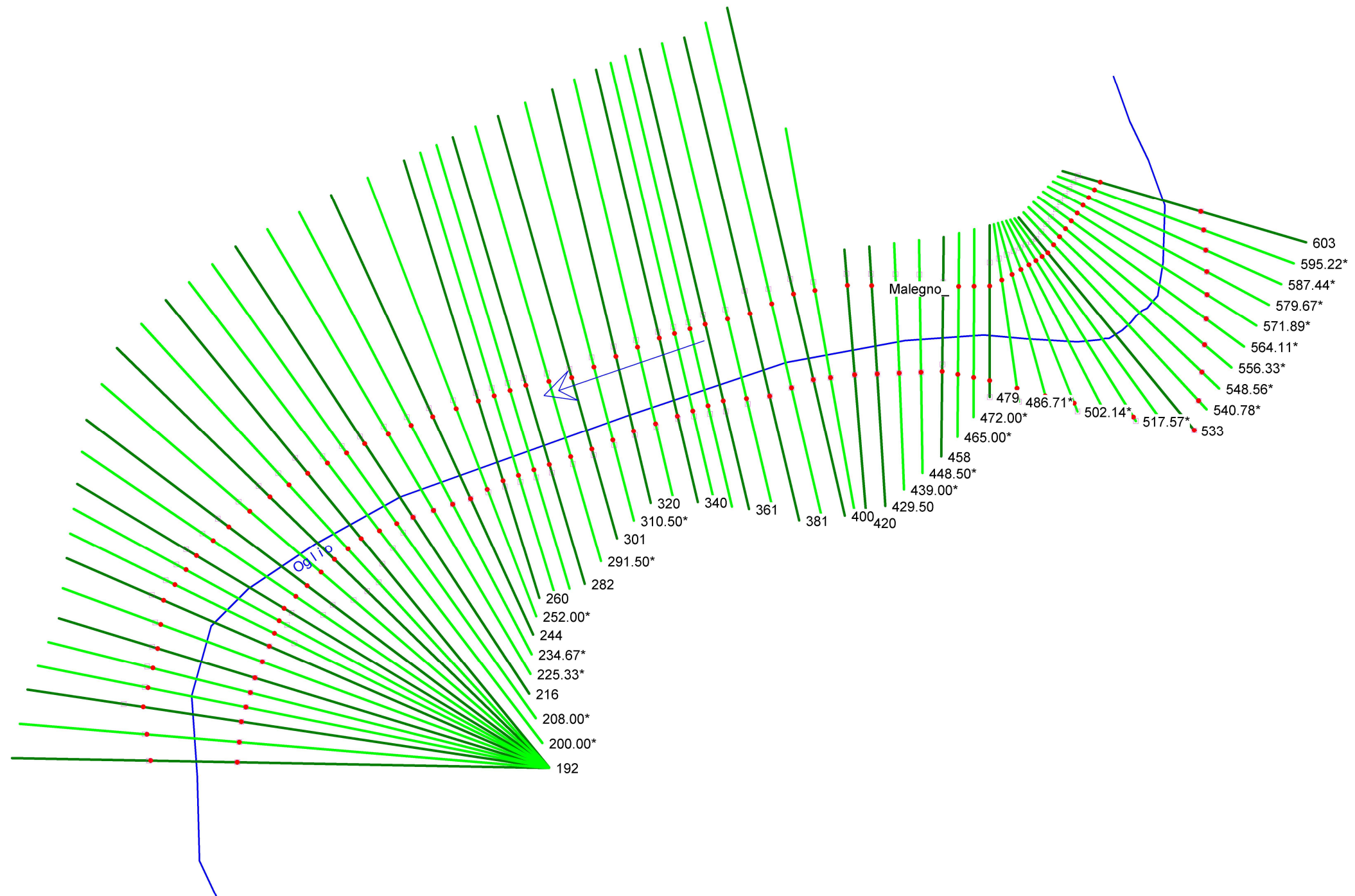
Di seguito si riporta la modellazione di ogni sezione idraulica.

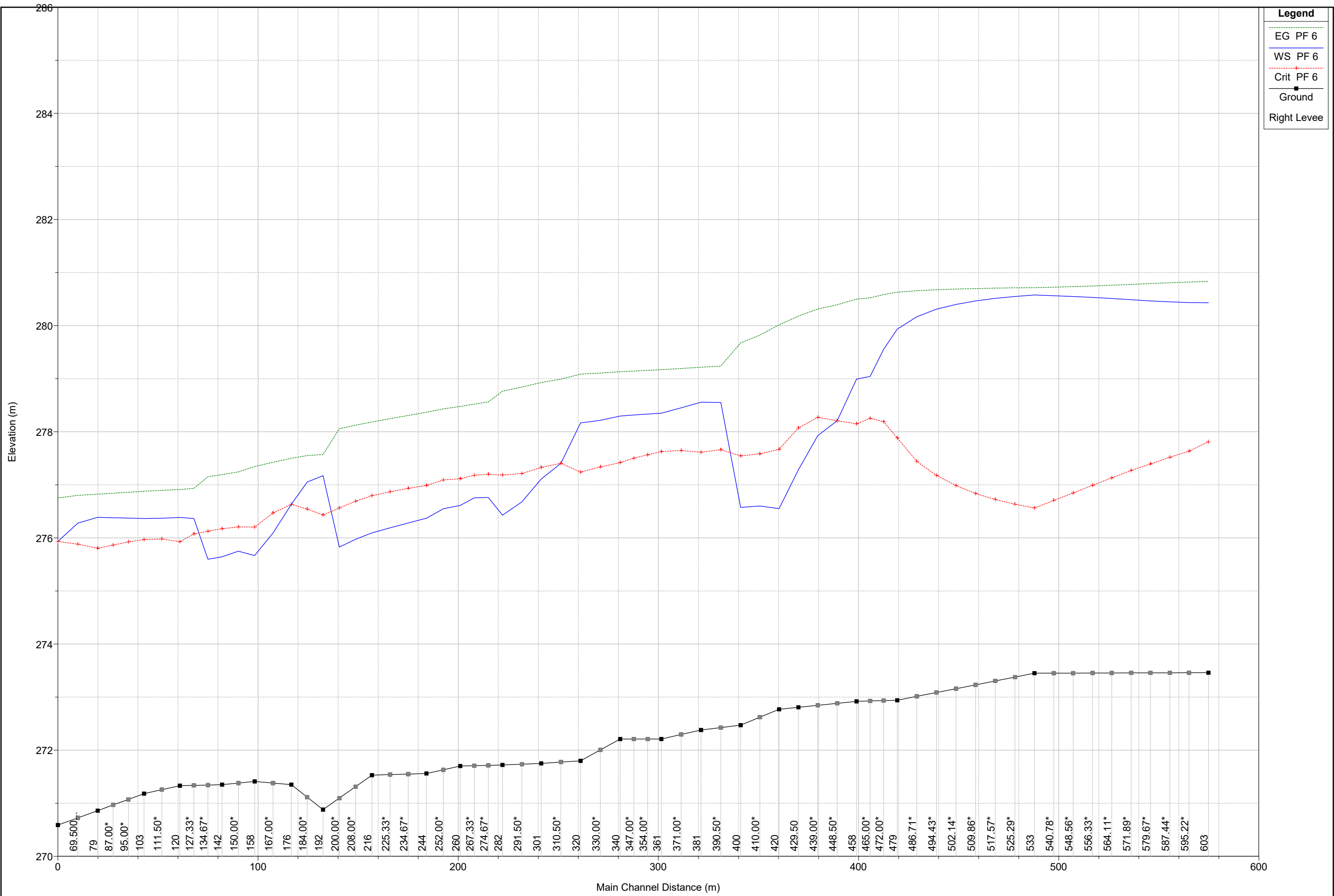
Il tecnico

Dott. Ing. Lino Locatelli

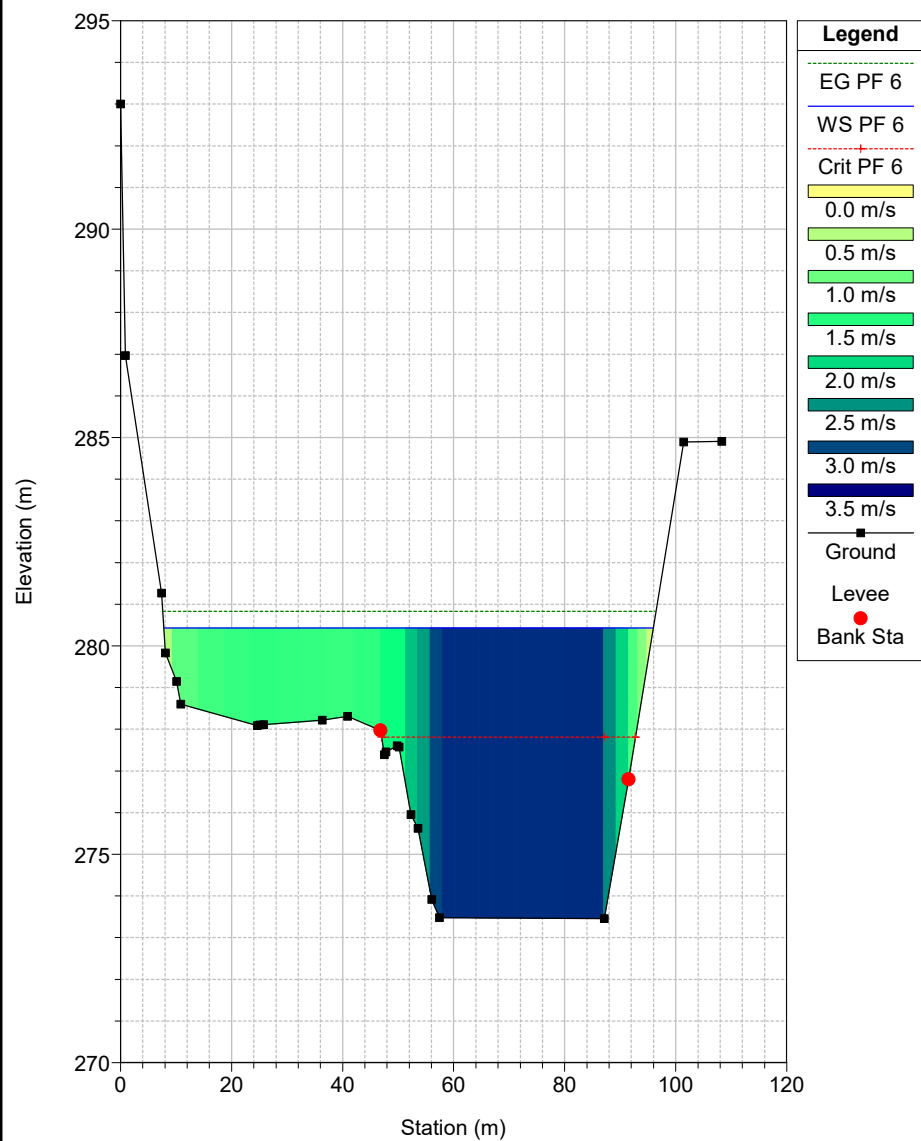


A handwritten signature in black ink, appearing to read "Lino Locatelli", written over the professional stamp.

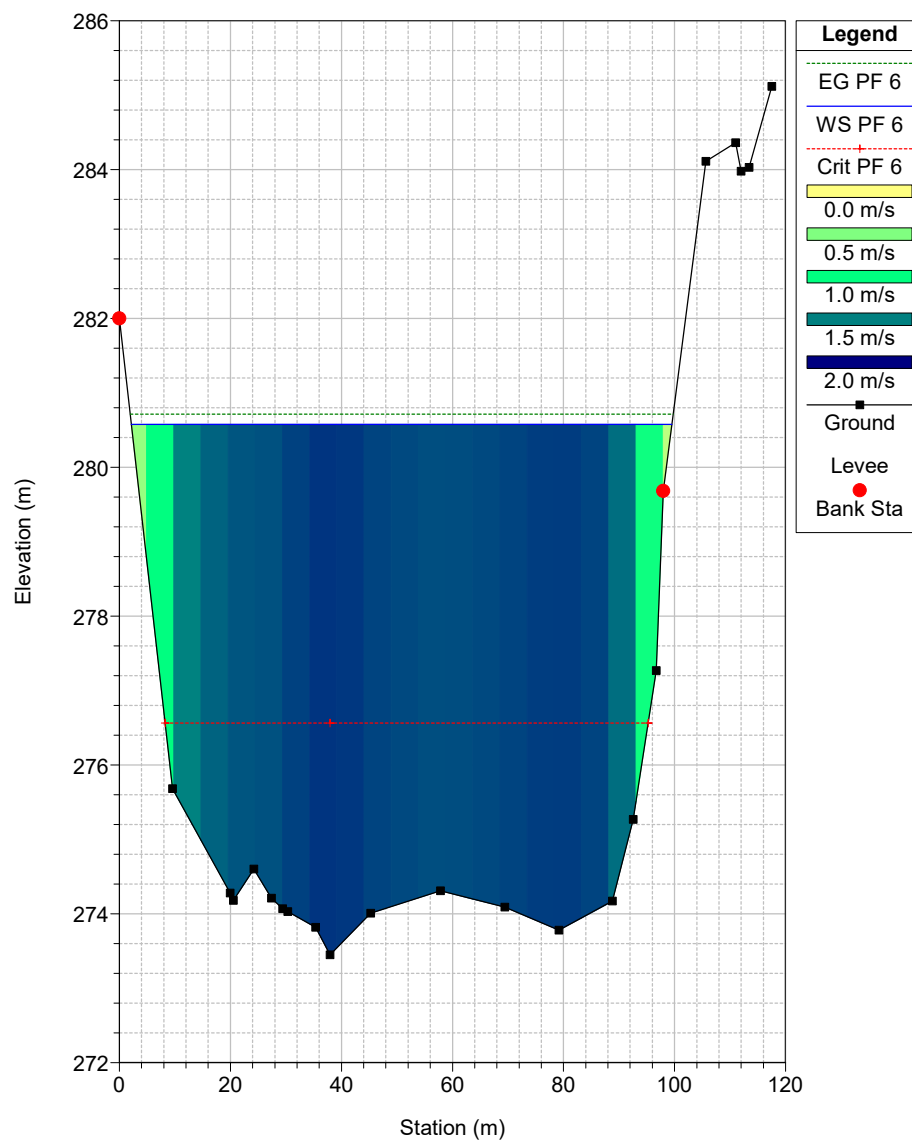




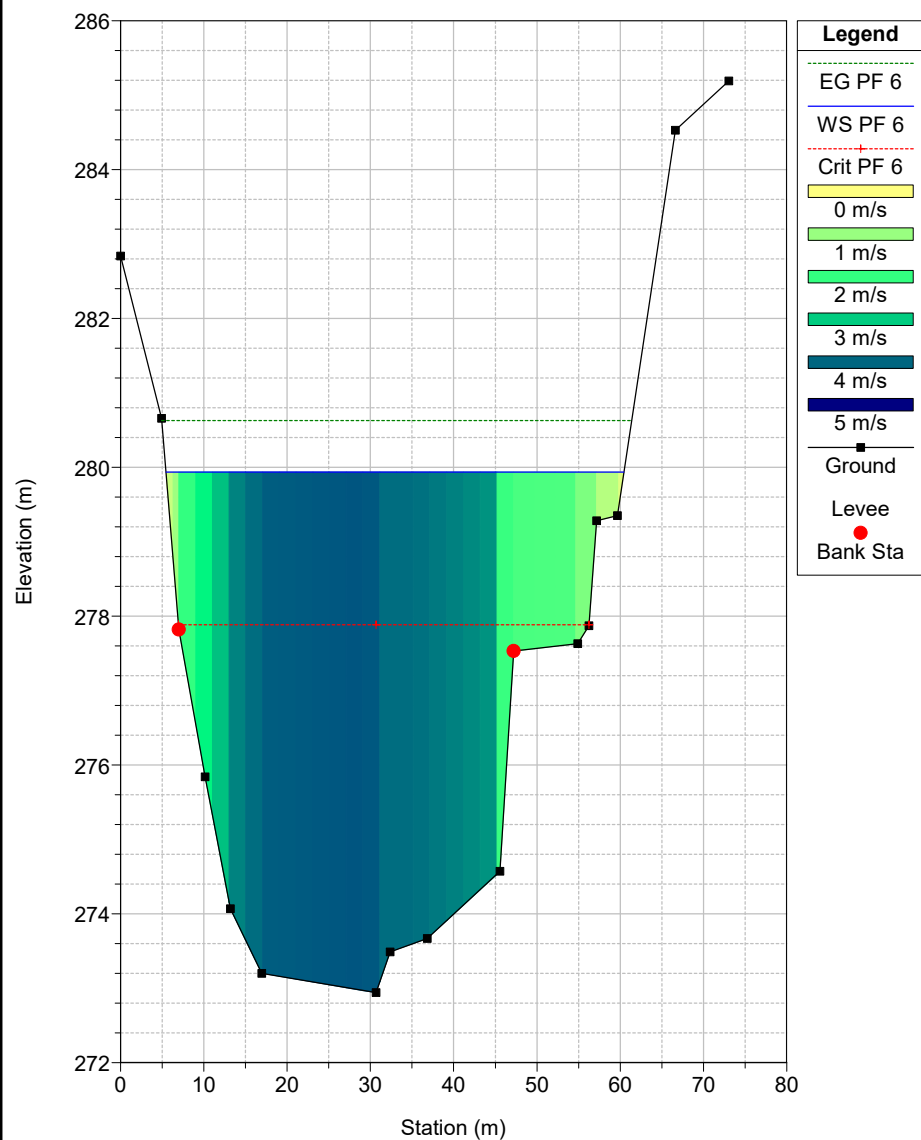
River = Oglio Reach = Malegno_ RS = 603 47



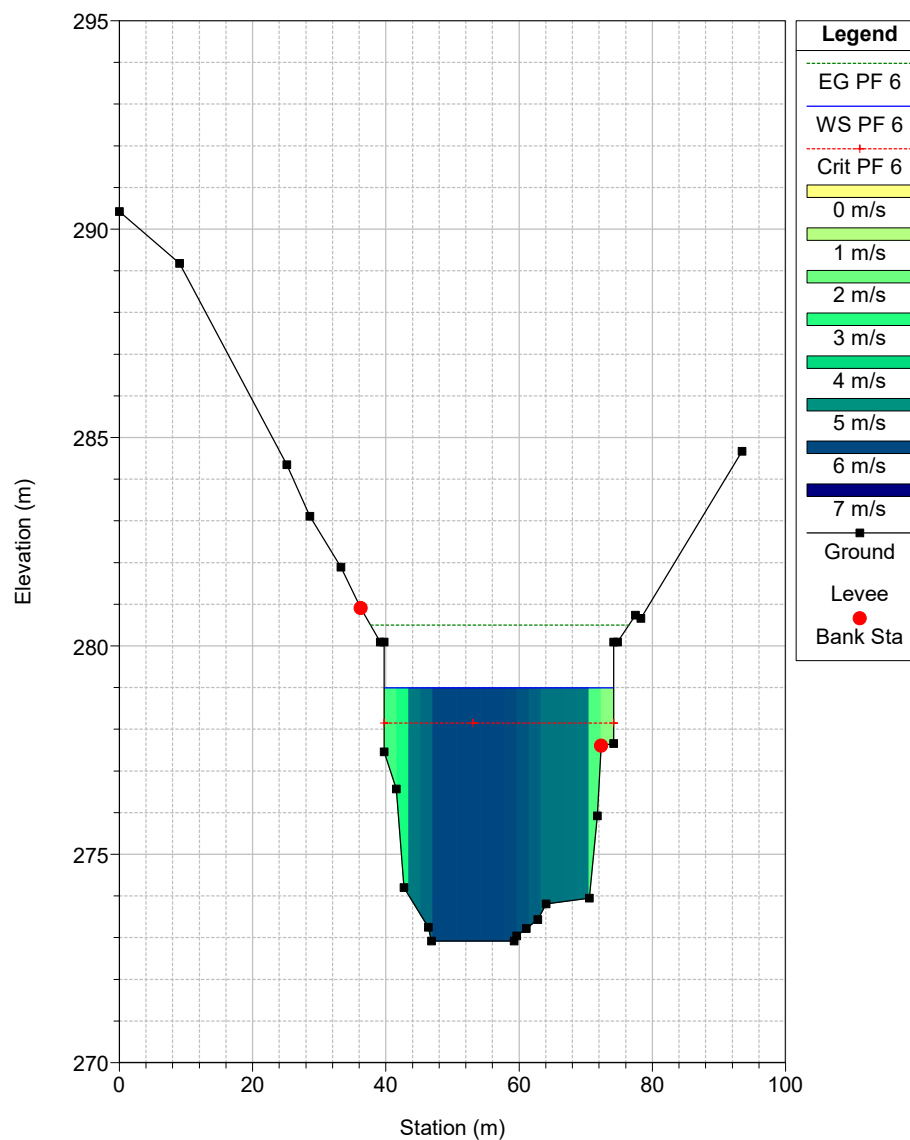
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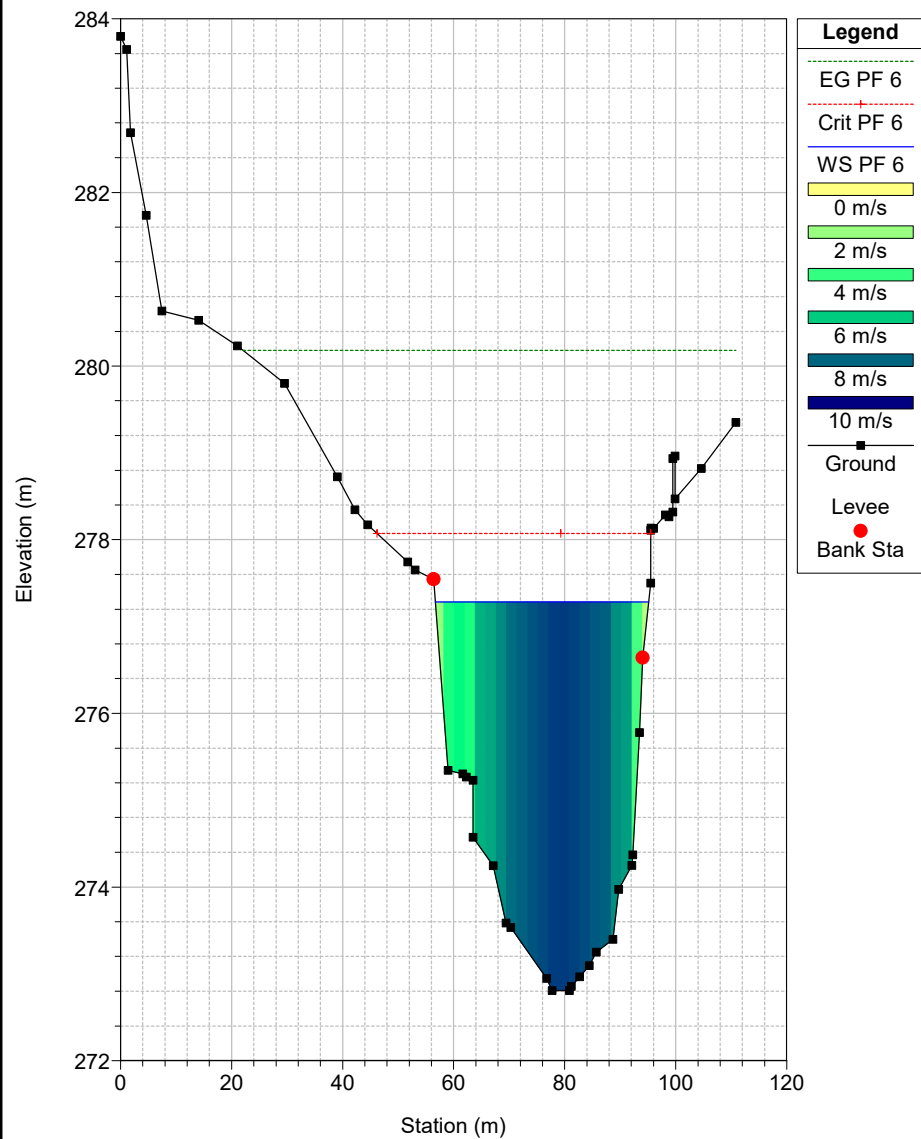
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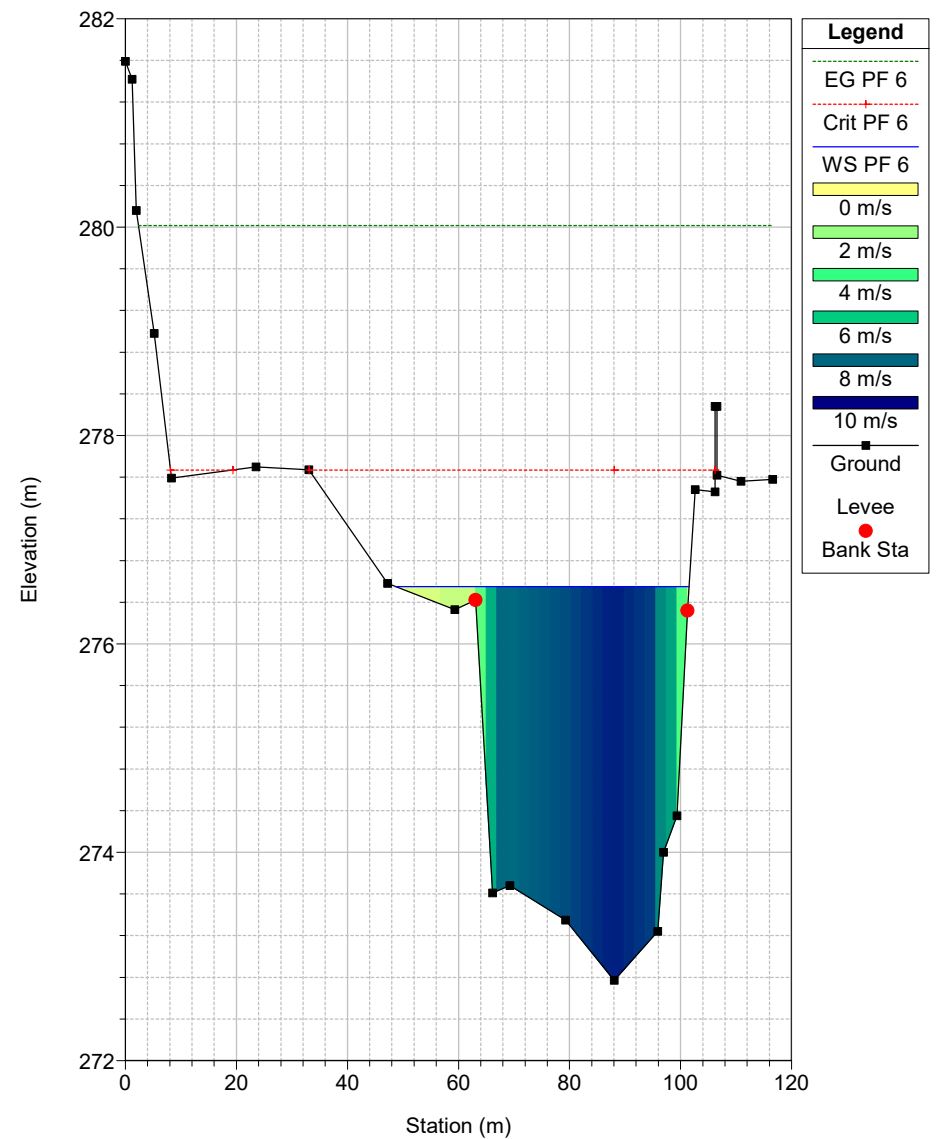
River = Oglio Reach = Malegno_ RS = 458 44



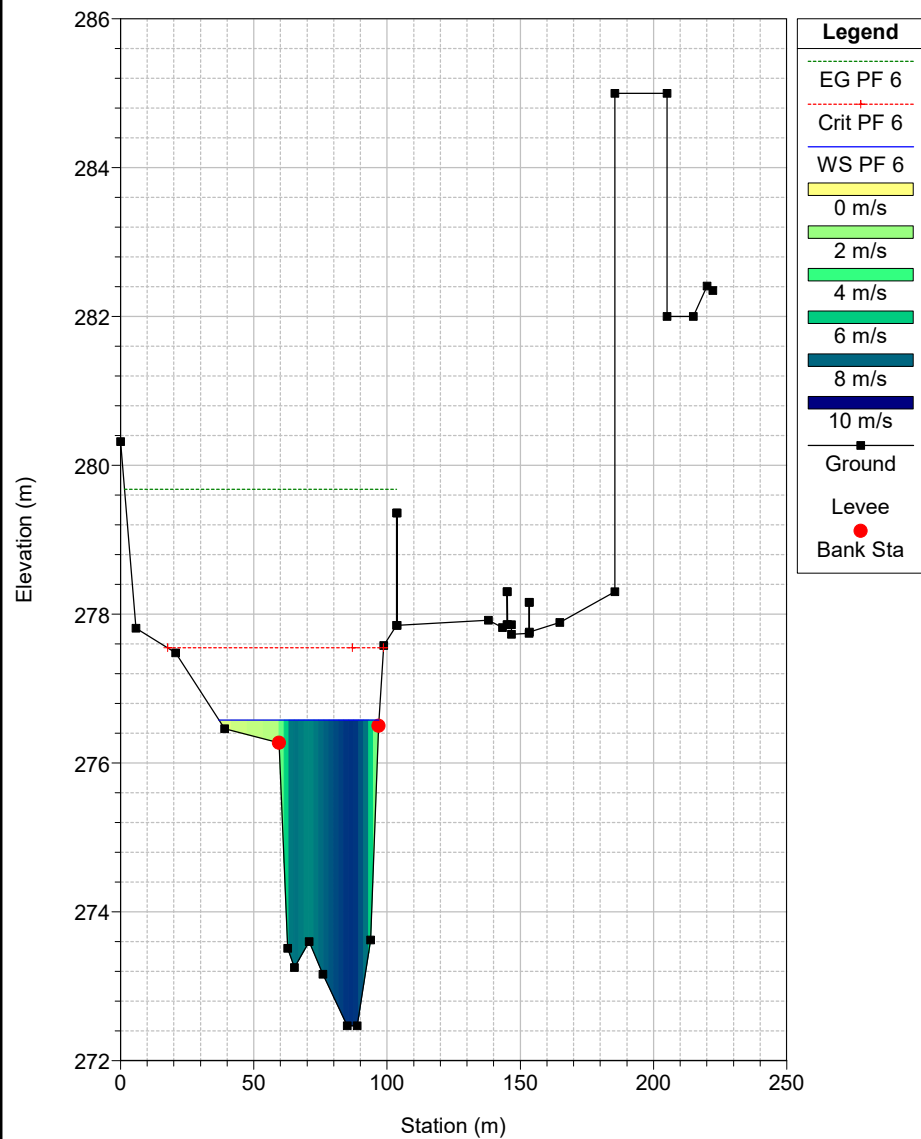
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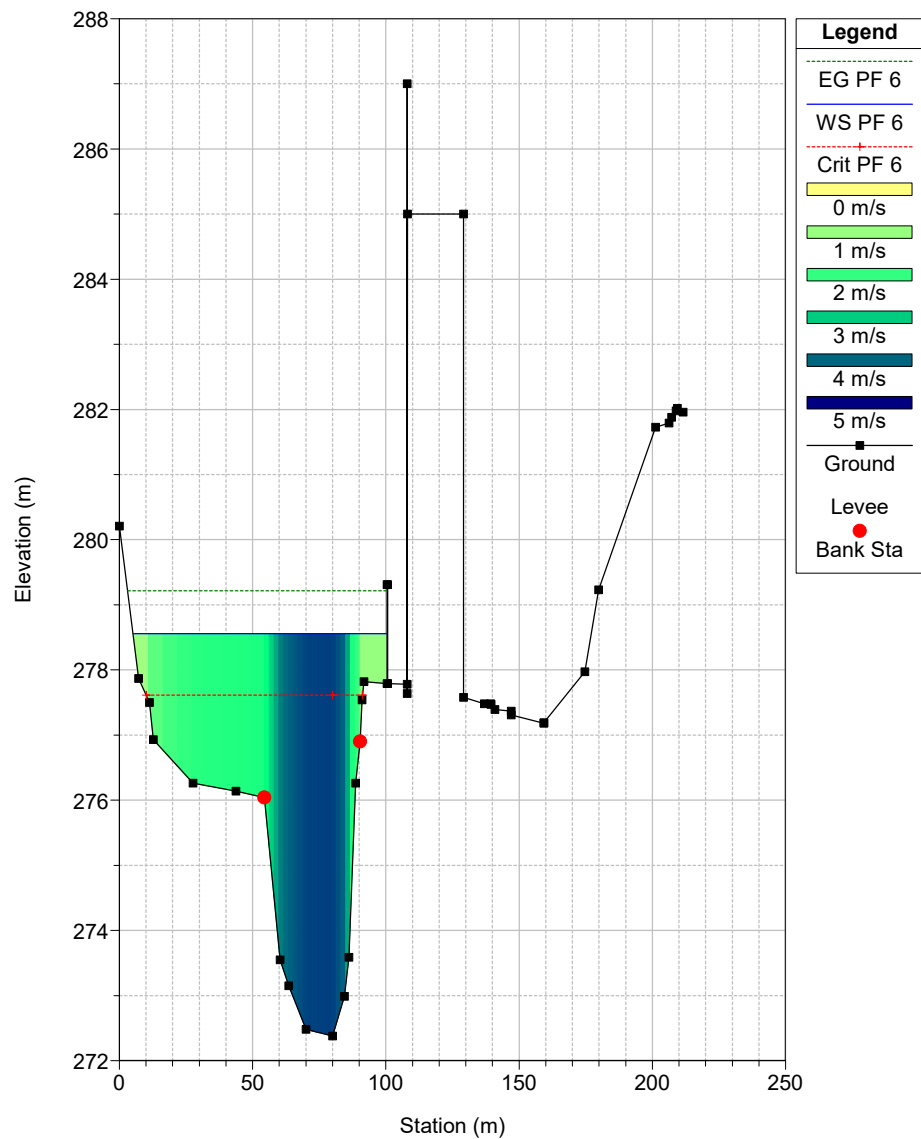
River = Oglio Reach = Malegno_ RS = 420 42



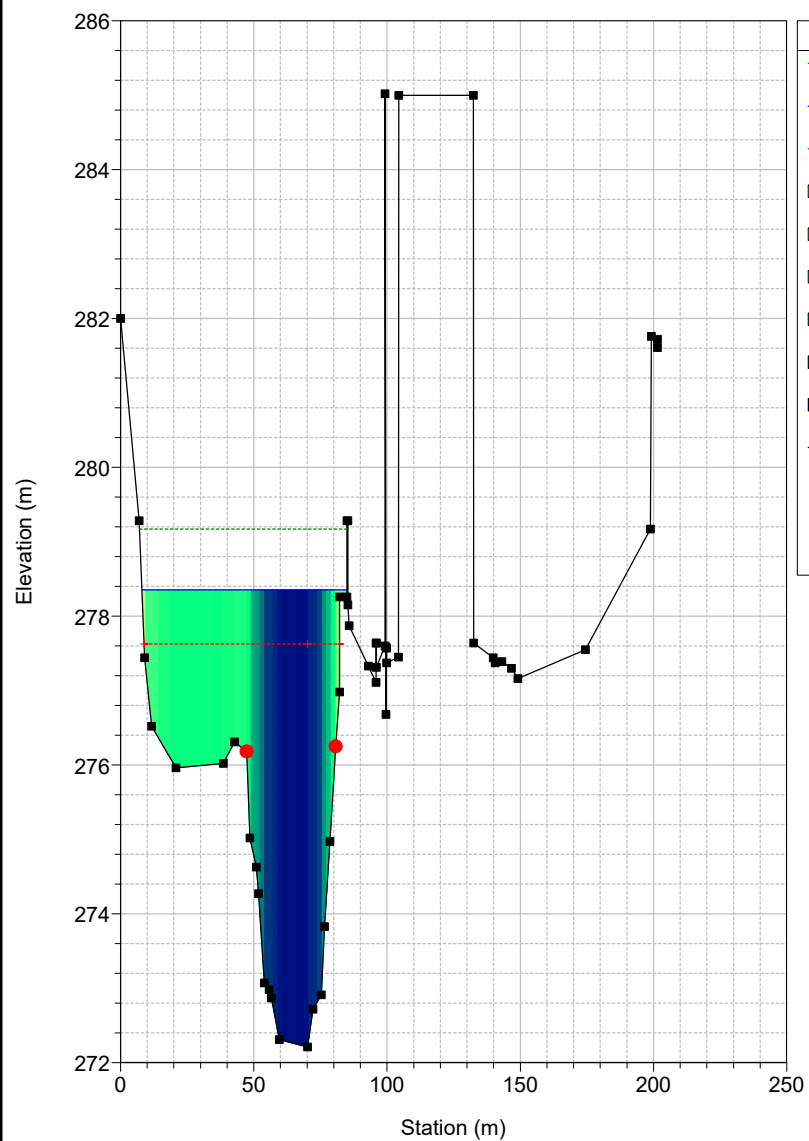
River = Oglio Reach = Malegno_ RS = 400 41



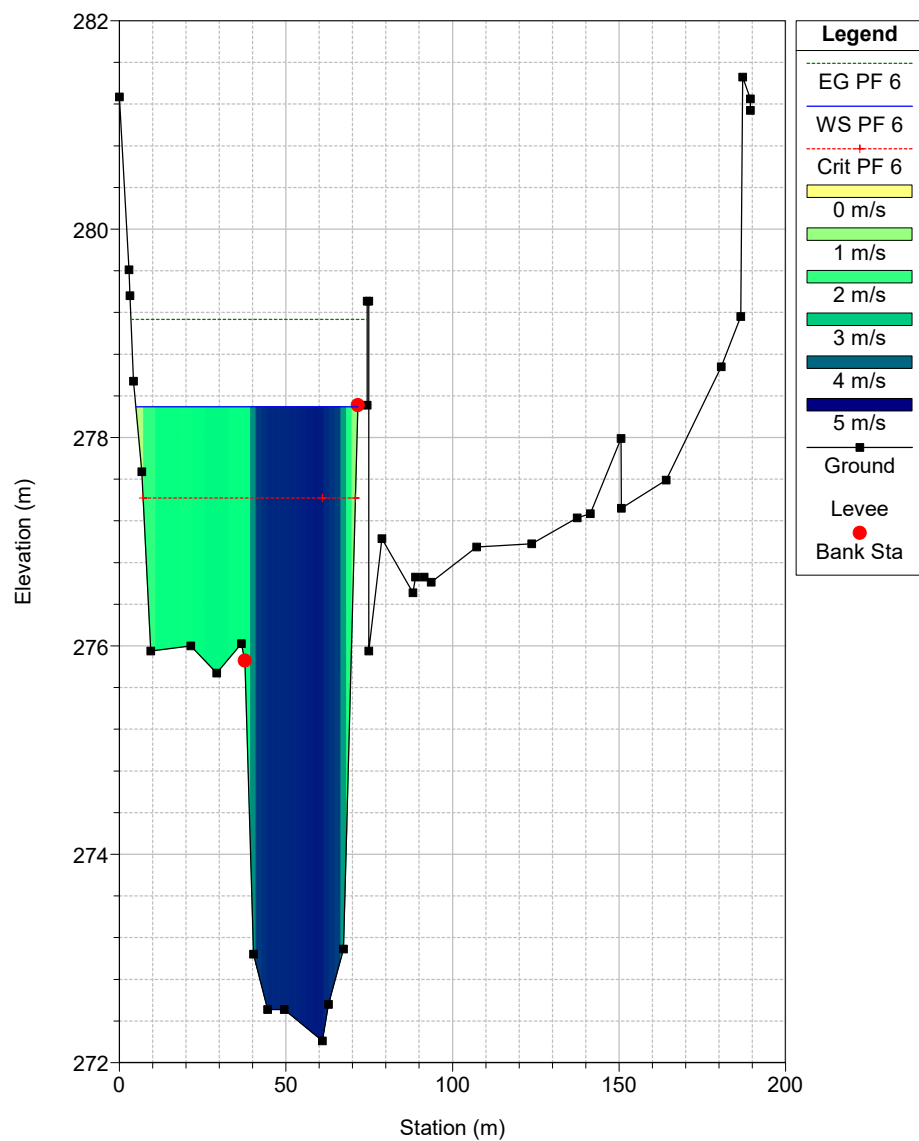
River = Oglio Reach = Malegno_ RS = 381 40



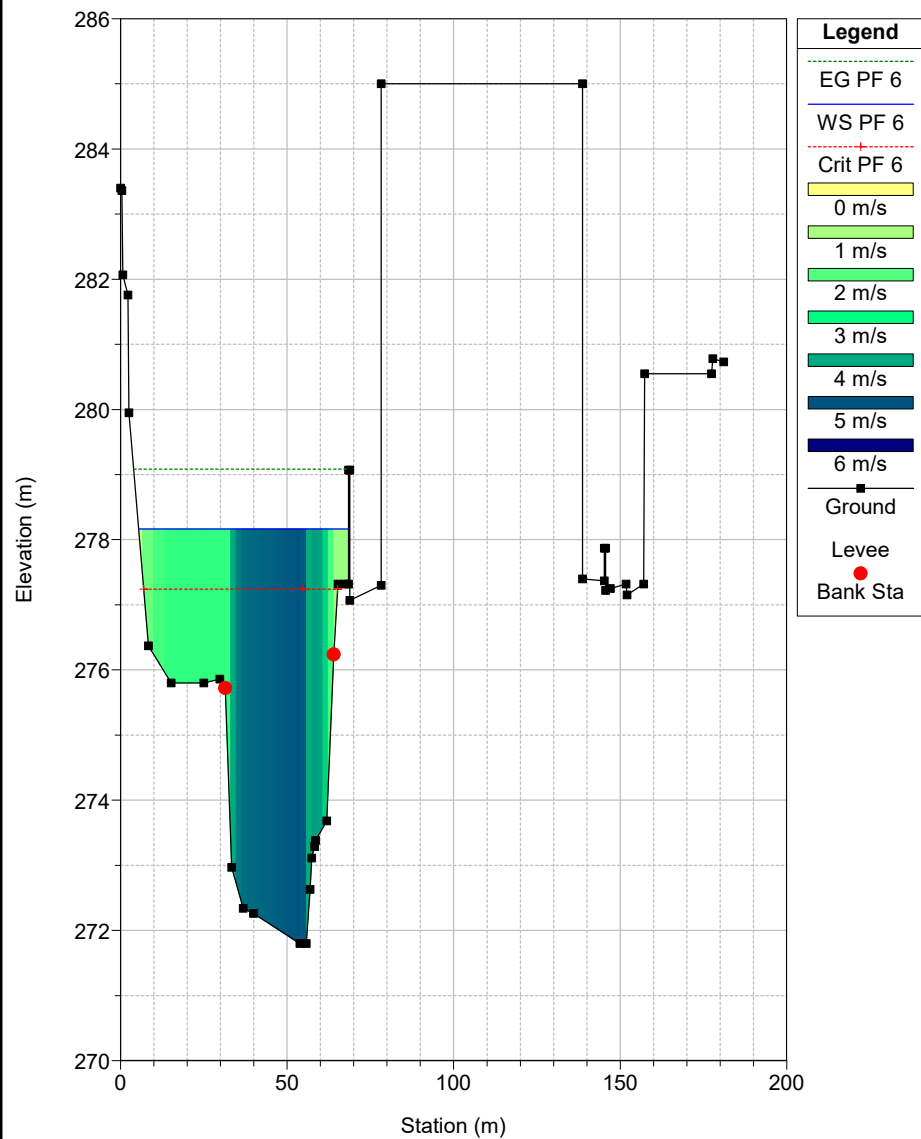
River = Oglio Reach = Malegno_ RS = 361 39



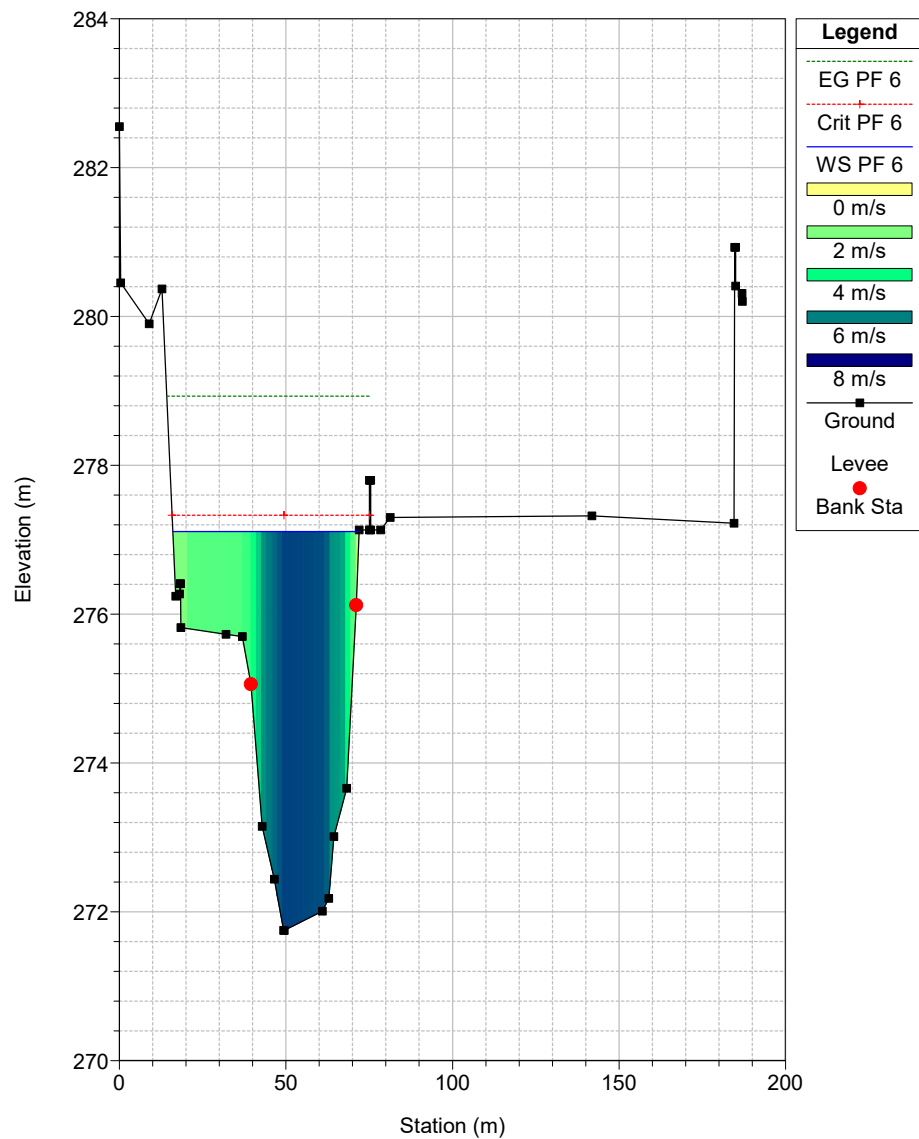
River = Oglio Reach = Malegno_ RS = 340 38



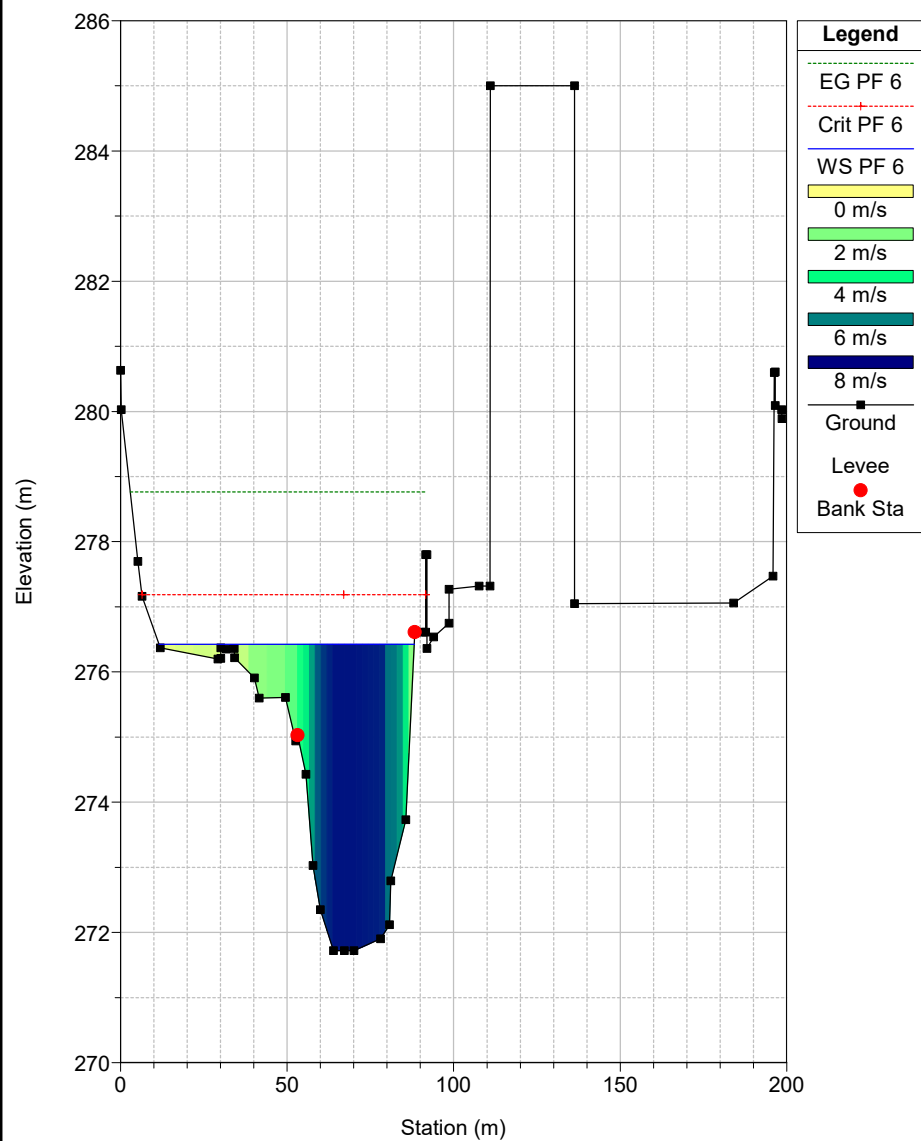
River = Oglio Reach = Malegno_ RS = 320 37



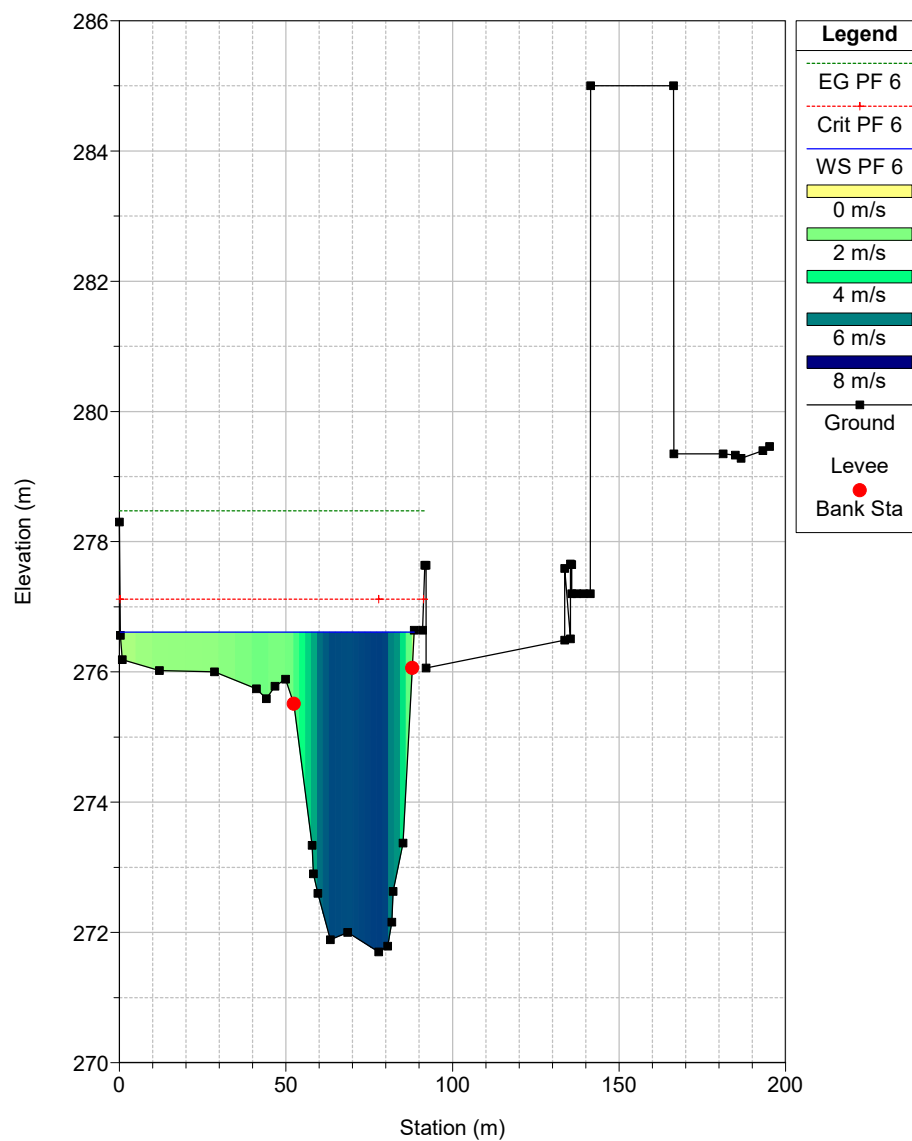
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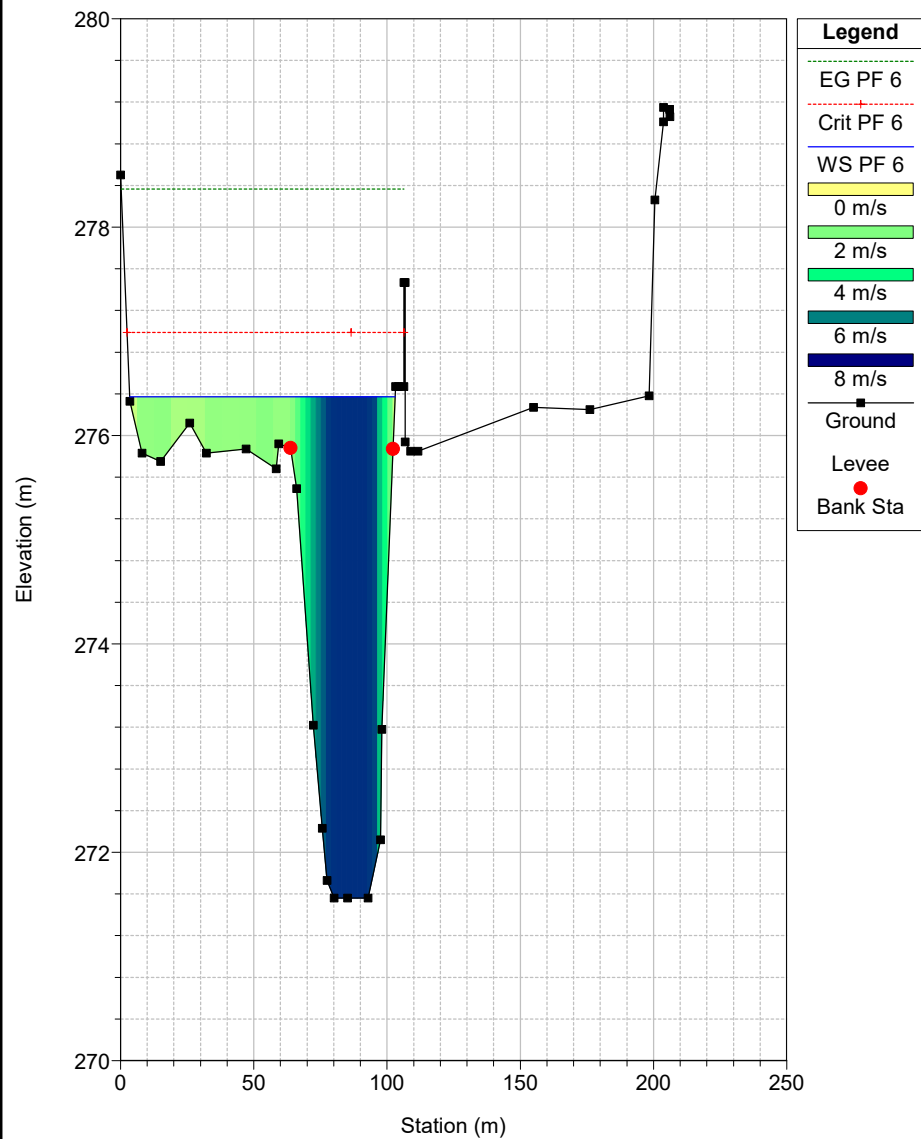
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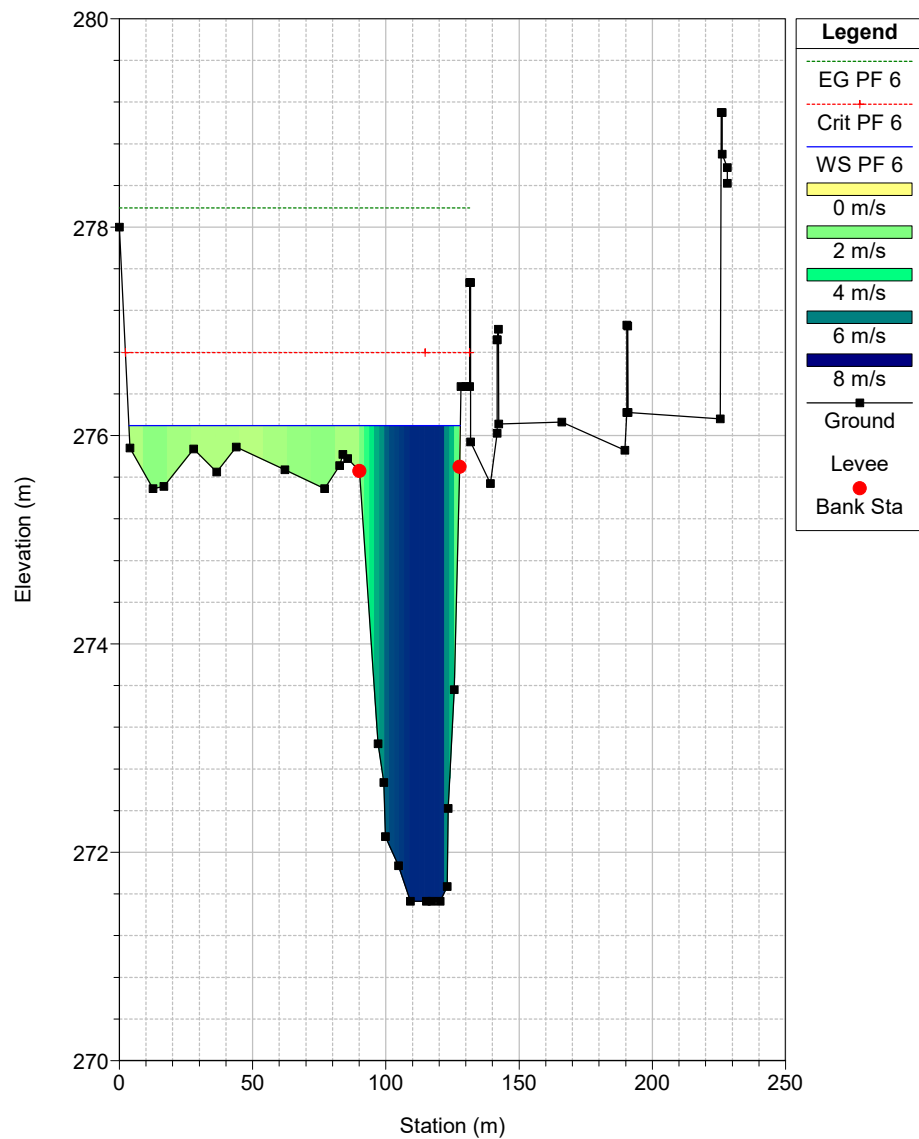
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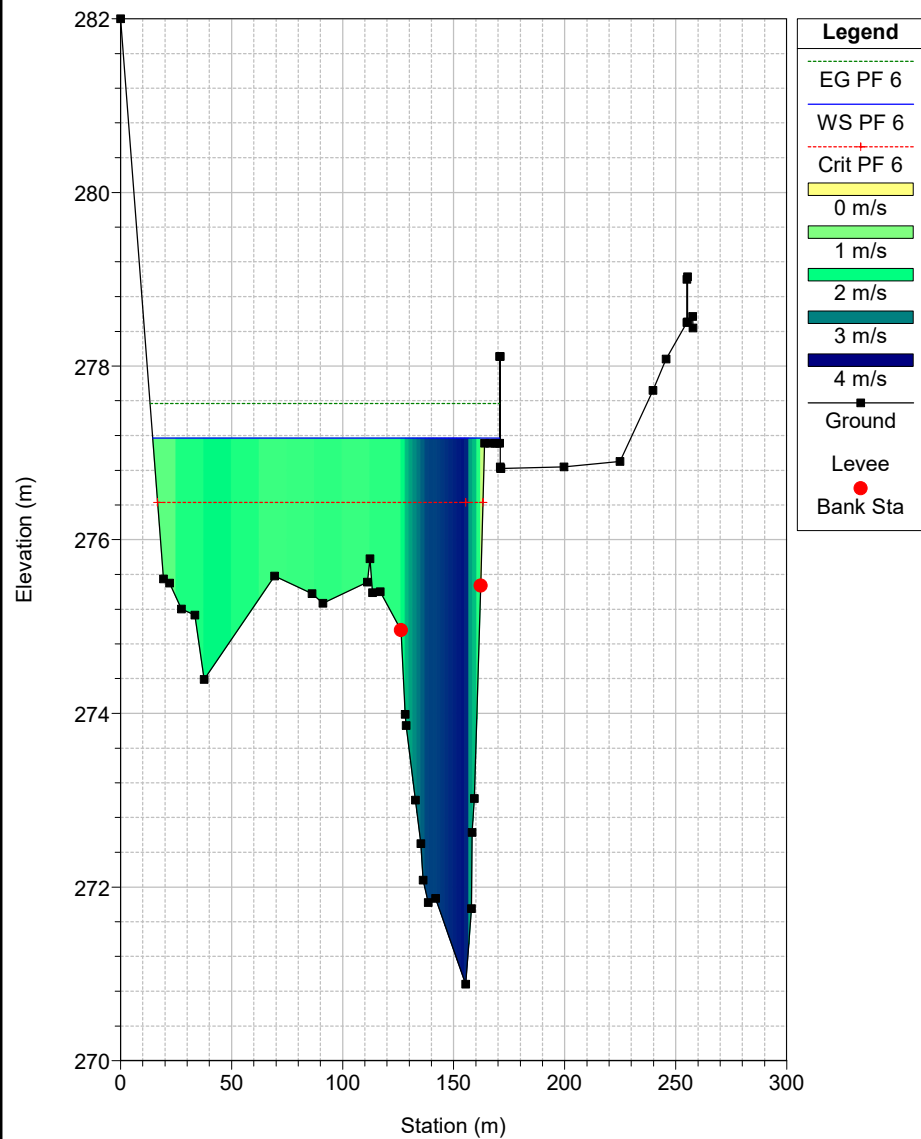
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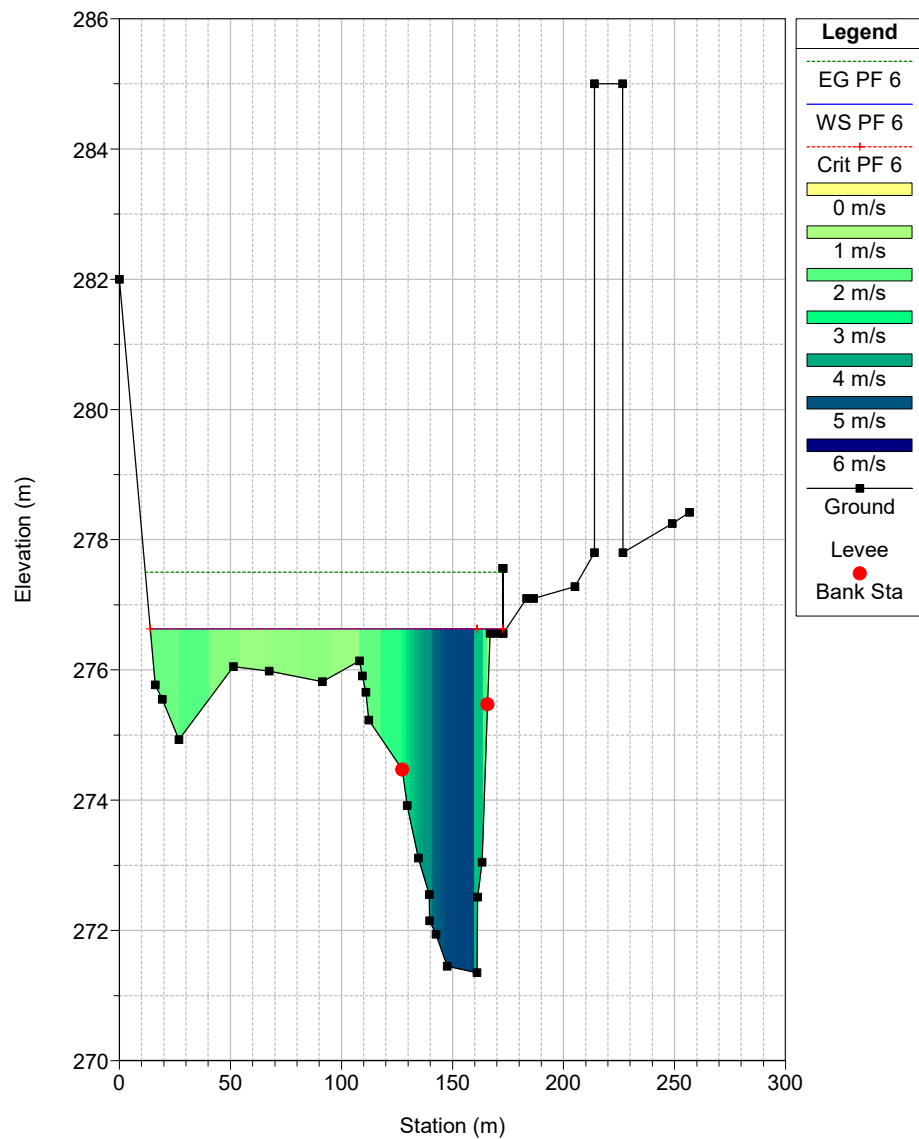
River = Oglio Reach = Malegno_ RS = 216 32



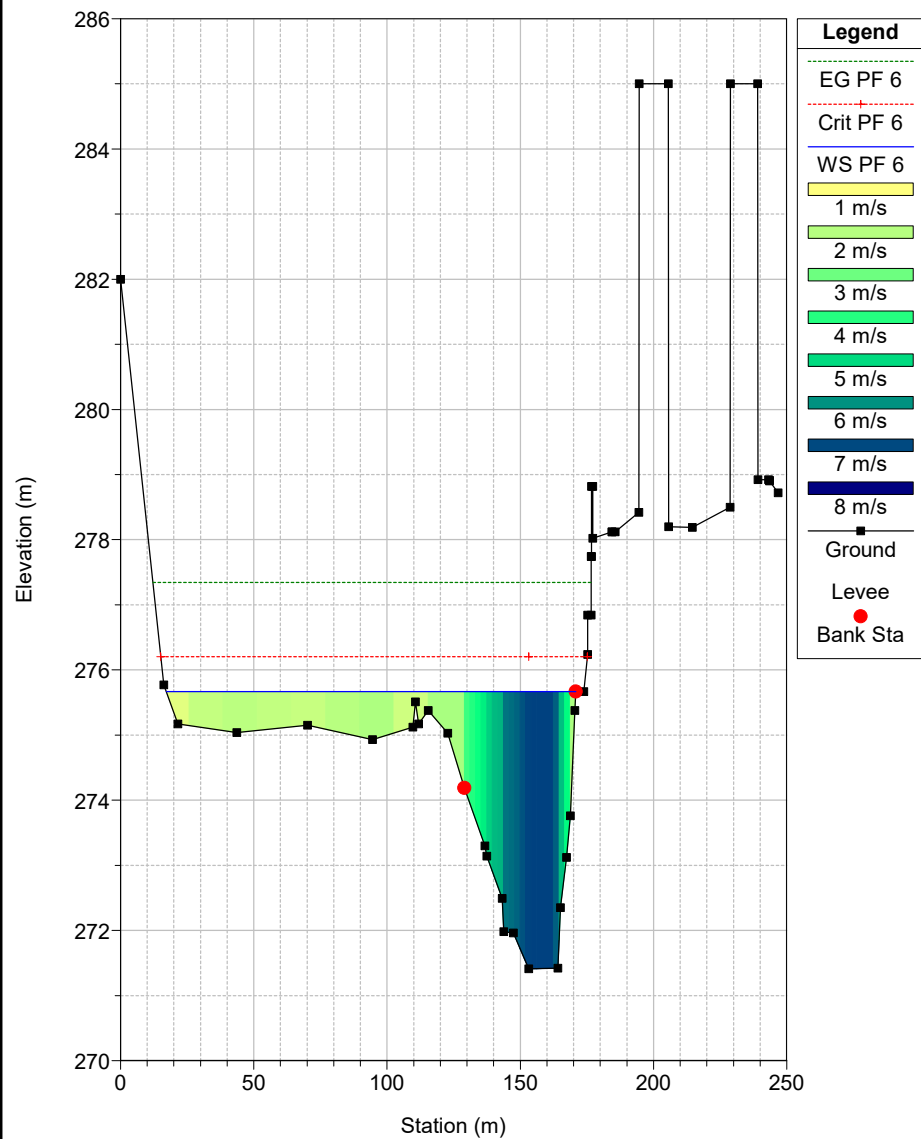
River = Oglio Reach = Malegno_ RS = 192 31



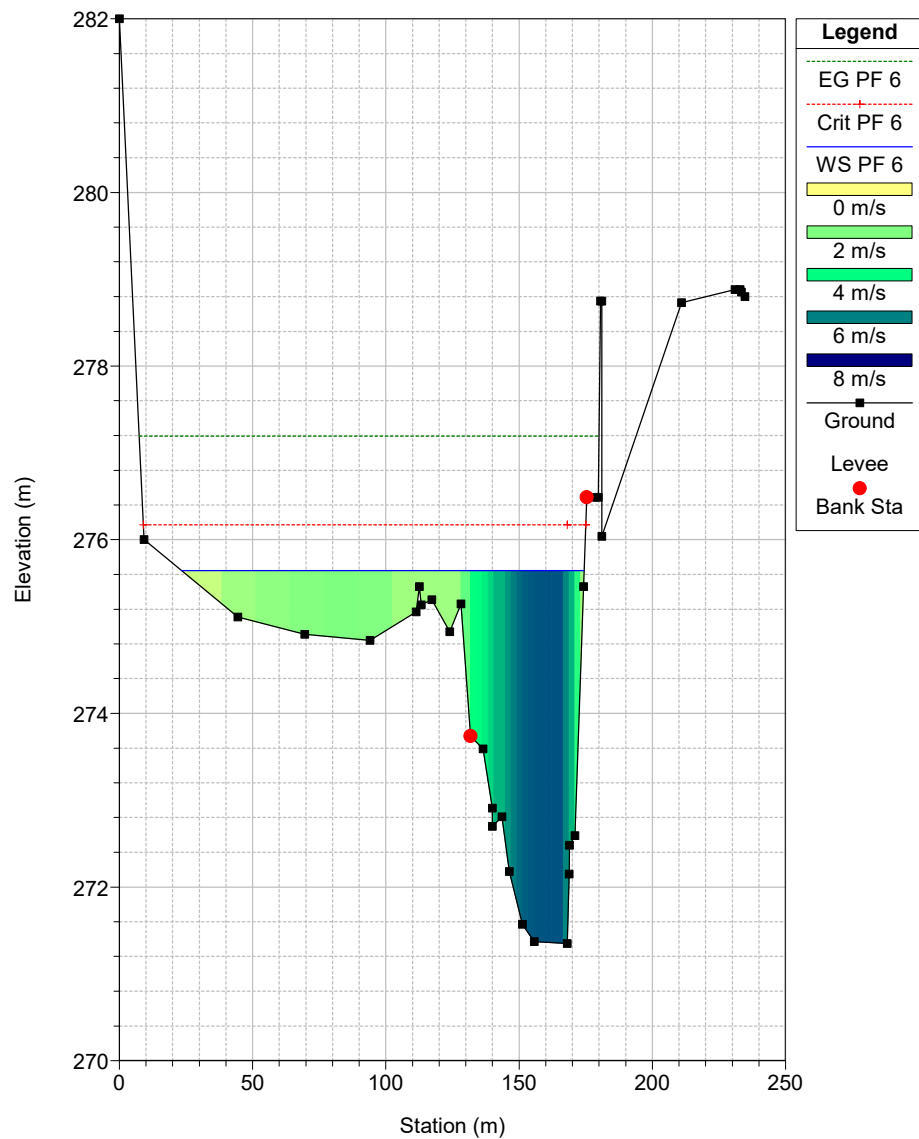
River = Oglio Reach = Malegno_ RS = 176 30



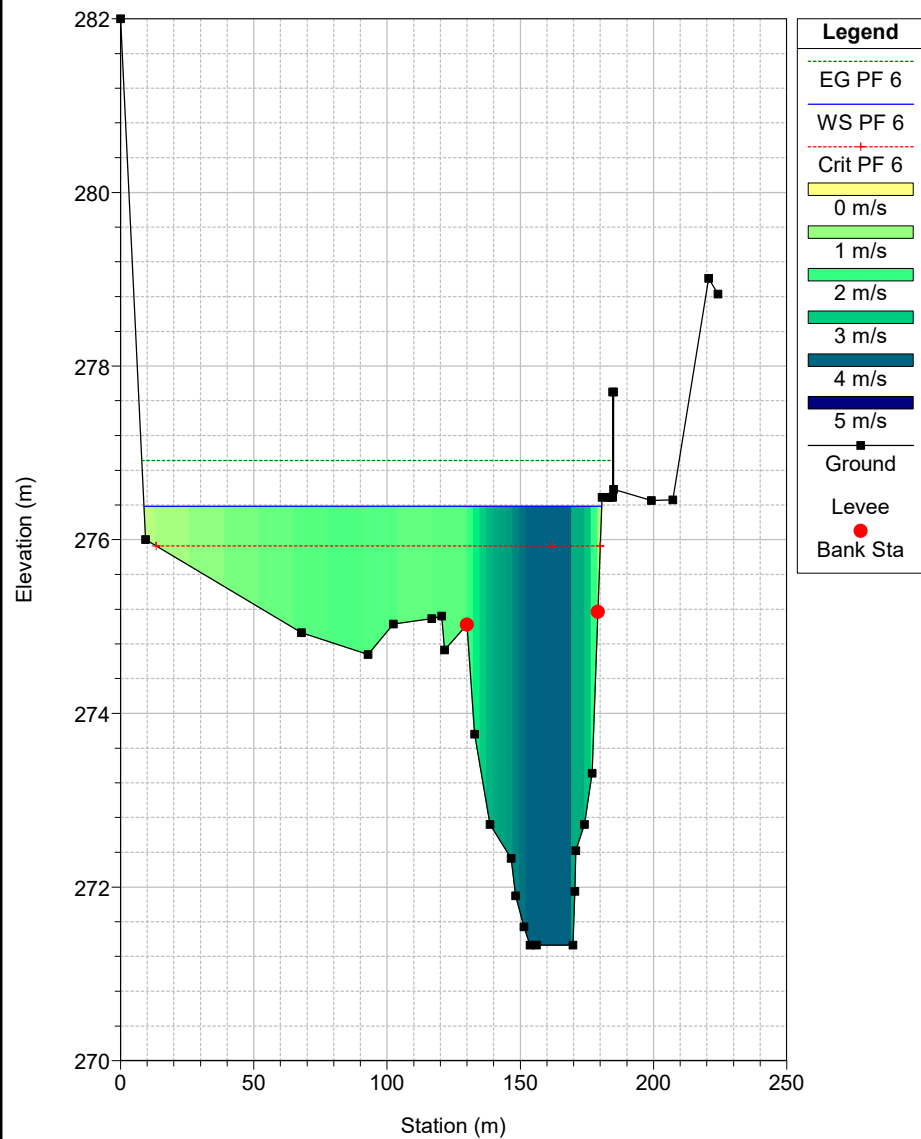
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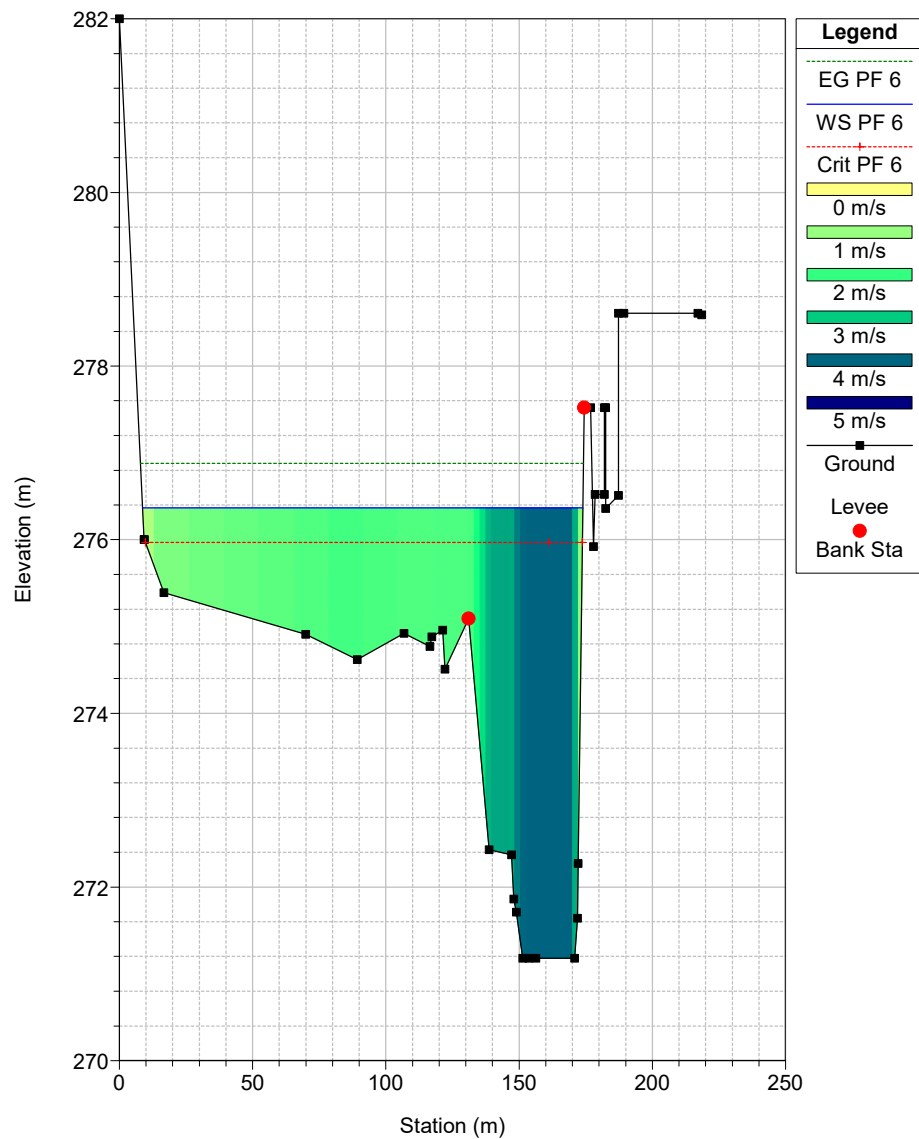
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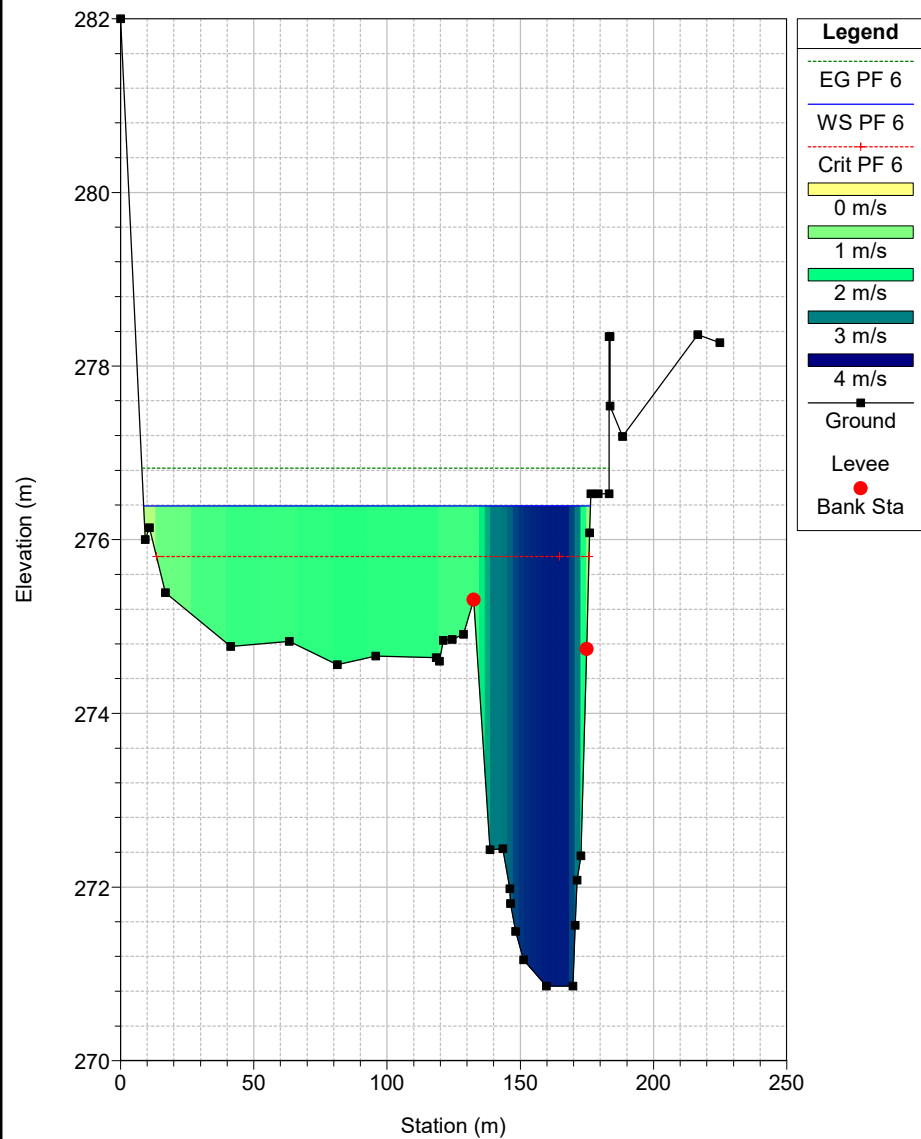
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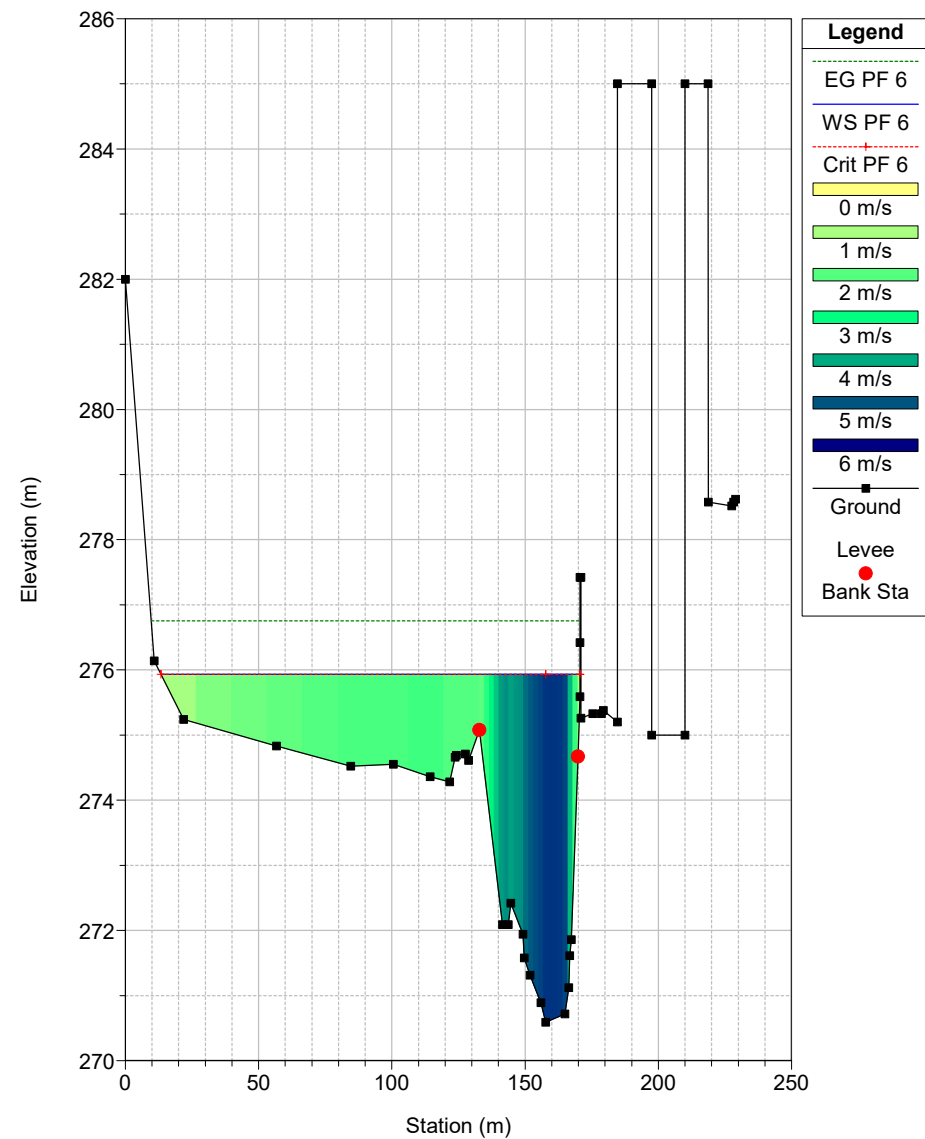
River = Oglio Reach = Malegno_ RS = 103 26



River = Oglio Reach = Malegno_ RS = 79 25



River = Oglio Reach = Malegno_ RS = 60 24



HEC-RAS Plan: Plan 10 River: Oglio Reach: Malegno Profile: PF 6

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)	
Malegno_	603	PF 6	940.00	273.46	280.43	277.81	280.83	0.000637	2.97	366.47	88.16	0.38
Malegno_	533	PF 6	940.00	273.45	280.58	276.56	280.72	0.000210	1.65	568.94	97.35	0.22
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Malegno_	458	PF 6	940.00	272.92	278.99	278.15	280.50	0.003169	5.45	174.17	34.43	0.76
Malegno_	420	PF 6	940.00	272.77	276.55	277.67	280.01	0.013434	8.25	115.59	52.90	1.53
Malegno_	400	PF 6	940.00	272.47	276.58	277.55	279.68	0.011041	7.82	123.98	60.05	1.40
Malegno_	381	PF 6	940.00	272.38	278.56	277.61	279.22	0.001472	3.94	292.72	95.33	0.55
Malegno_	361	PF 6	940.00	272.21	278.35	277.63	279.17	0.001821	4.35	257.18	76.89	0.61
Malegno_	340	PF 6	940.00	272.21	278.29	277.42	279.13	0.001879	4.34	248.59	66.66	0.61
Malegno_	320	PF 6	940.00	271.80	278.17	277.24	279.09	0.001839	4.49	239.10	62.98	0.61
Malegno_	301	PF 6	940.00	271.75	277.11	277.33	278.93	0.004548	6.20	169.75	55.95	0.95
Malegno_	282	PF 6	940.00	271.72	276.43	277.18	278.76	0.006847	6.87	149.35	76.64	1.13
Malegno_	260	PF 6	940.00	271.70	276.61	277.12	278.48	0.005330	6.25	175.08	88.18	1.01
Malegno_	244	PF 6	940.00	271.56	276.37	276.99	278.37	0.006274	6.42	168.81	99.60	1.08
Malegno_	216	PF 6	940.00	271.53	276.09	276.80	278.18	0.006661	6.57	169.91	124.34	1.11
Malegno_	192	PF 6	940.00	270.88	277.17	276.43	277.57	0.001118	3.30	389.14	156.24	0.48
Malegno_	176	PF 6	940.00	271.35	276.63	276.63	277.50	0.002554	4.55	276.12	158.60	0.70
Malegno_	158	PF 6	940.00	271.41	275.67	276.21	277.34	0.006600	6.12	198.93	153.71	1.09
Malegno_	142	PF 6	940.00	271.35	275.64	276.17	277.19	0.005729	5.84	205.10	151.10	1.02
Malegno_	120	PF 6	940.00	271.33	276.38	275.93	276.91	0.001610	3.58	347.48	171.79	0.57
Malegno_	103	PF 6	940.00	271.18	276.37	275.97	276.88	0.001646	3.62	350.01	165.20	0.56
Malegno_	79	PF 6	940.00	270.86	276.39	275.81	276.82	0.001273	3.36	380.63	167.62	0.51
Malegno_	60	PF 6	940.00	270.59	275.93	275.93	276.75	0.002854	4.58	284.69	157.25	0.74