



COMUNE DI CRESPINA LORENZANA

Provincia di PISA



Adeguamento Piano Strutturale e Regolamento Urbanistico del Comune di Crespina Lorenzana

STUDIO IDROLOGICO-IDRAULICO

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1. PREMESSA

La presente indagine idrologica ed idraulica è redatta ai fini dell'aggiornamento del quadro conoscitivo degli strumenti della pianificazione territoriale e urbanistica del Comune di Crespina-Lorenzana.

L'area presa in esame è quella corrispondente al perimetro dell'ex Comune di Lorenzana, in quanto la parte restante del territorio comunale risulta già coperta dagli studi idraulici realizzati a corredo della variante al Regolamento Urbanistico del territorio dell'ex Comune di Crespina, approvata con Deliberazione di Consiglio Comunale n° 9 del 02.03.2015.

L'indagine è redatta ai sensi del Decreto del Presidente della Giunta Regionale 25 Ottobre 2011 n.53/R "Regolamento di attuazione dell'articolo 62 della legge regionale 3 gennaio 2005, n.1 (Norme per il governo del territorio)" in materia di indagini geologiche, di seguito denominato DPGR n.53/R.

Le analisi sono state condotte per le UTOE potenzialmente interessate da previsioni insediative e infrastrutturali e riguardano essenzialmente le aree di fondo valle del torrente Tora, essendo le altre UTOE del territorio comunale poste in posizioni morfologicamente elevate, e quindi non soggette a rischio idraulico.

Sulla Tora sono presenti 2 casse di espansione in linea, i cui effetti di riduzione delle portate di piena verranno analizzati in dettaglio nel corso della presente relazione.

I corsi d'acqua oggetto di analisi in questa sede sono i seguenti:

- torrente Tora;
- torrente il Rio;

Nel seguito si procede dapprima con l'analisi idrologica dei corsi d'acqua di interesse, successivamente viene descritta la modellazione idraulica implementata per la definizione delle aree di esondazione trentennali e duecentennali.

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2. RELAZIONE IDROLOGICA

Nel presente capitolo vengono determinate le massime portate e gli idrogrammi di massima piena attesi nei tratti di interesse dei corsi d'acqua in esame. Il bacino presop in esame è quello del torrente Tora chiuso a monte della confluenza con il Rio Cascine, posto all'esterno del territorio comunale.

I tempi di ritorno assunti nell'analisi sono pari a 30 e 200 anni. La modellazione idrologica è stata effettuata con l'utilizzo del software HEC-HMS (Hydrologic Engineering Center – Hydrologic Modeling System) prodotto dal Corpo degli Ingegneri dell'esercito americano (USACE).

La seguente figura riporta la planimetria del modello semi-distribuito implementato per l'area di studio. All'interno del modello sono state inserite direttamente anche le casse in linea esistenti sulla Tora.

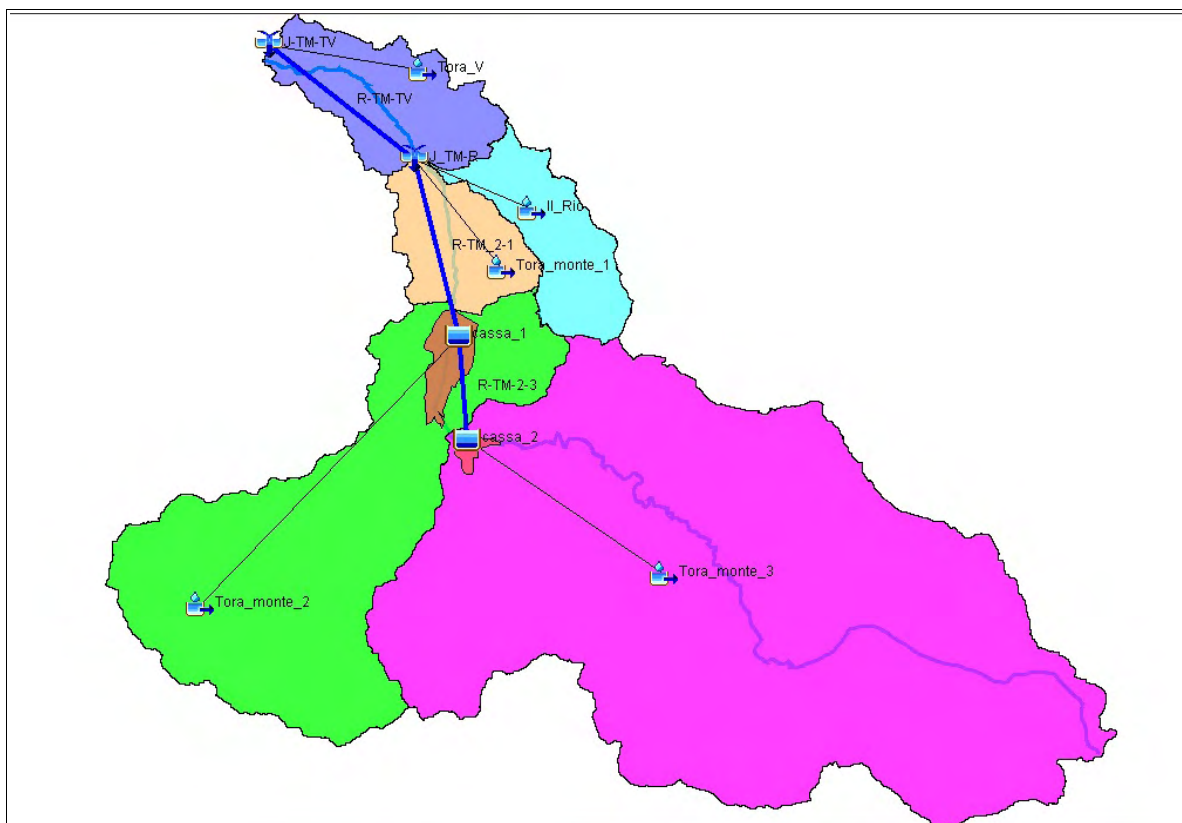


Figura 1: planimetria modello HMS

2.1. Caratteristiche geomorfologiche del bacino idrografico

Le aree dei bacini e le loro principali caratteristiche geomorfologiche sono state individuate sulla base del modello digitale del terreno (DTM) 10x10 della Regione Toscana.

La tabella seguente riporta le principali caratteristiche geomorfologiche dei bacini in studio. In

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essa A indica l'area del bacino, z_{max} la quota massima, z_{min} la quota minima, z_m la quota media, L_{max} la lunghezza del massimo percorso idraulico, L la lunghezza dell'asta principale, i_b la pendenza media di bacino ed i_a la pendenza media dell'asta principale.

	A (Kmq)	z_{max} (m.s.m.)	z_{min} (m.s.m.)	z_m (m.s.m.)	Lmax (Km)	L (Km)	i_b (-)	i_a (-)
Tora_monte_1	1.37	128.38	32.77	47.81	0.9	1.65	0.11	0.0021
Tora_monte_2	7.75	132.66	40.58	46.04	5.32	5.16	0.09	0.0072
Tora_monte_3	19.46	490.07	45.71	176.47	9.13	9.02	0.21	0.040
Il_Rio	1.53	146	34.15	55.92	3.03	2.44	0.26	0.014
Tora_valle	1.92	113.02	25.5	43.76	2.92	1.99	0.25	0.003

Tabella 1 - caratteristiche geomorfologiche dei bacini in esame

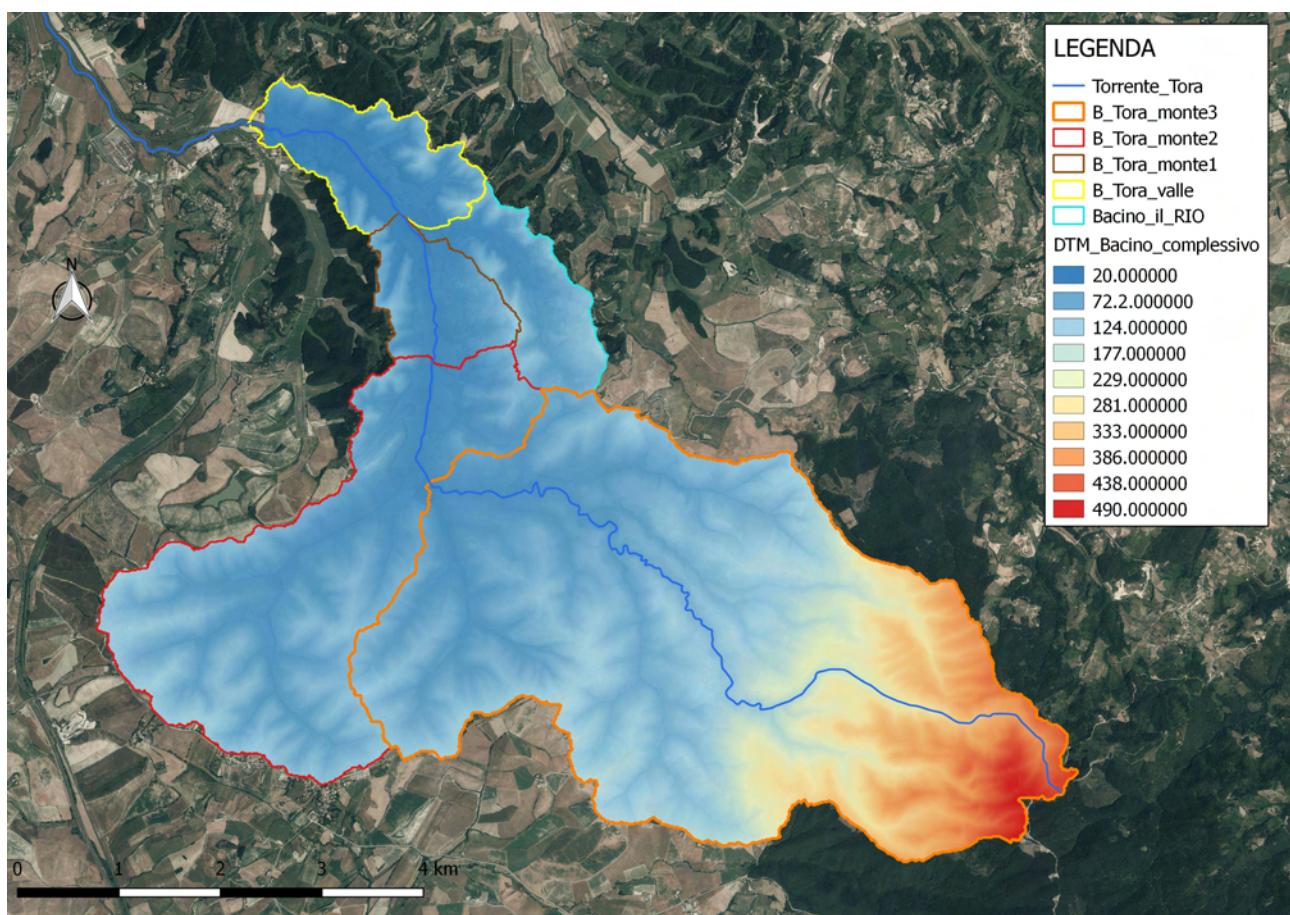


Figura 2: DTM sottobacini idrografici Tora.

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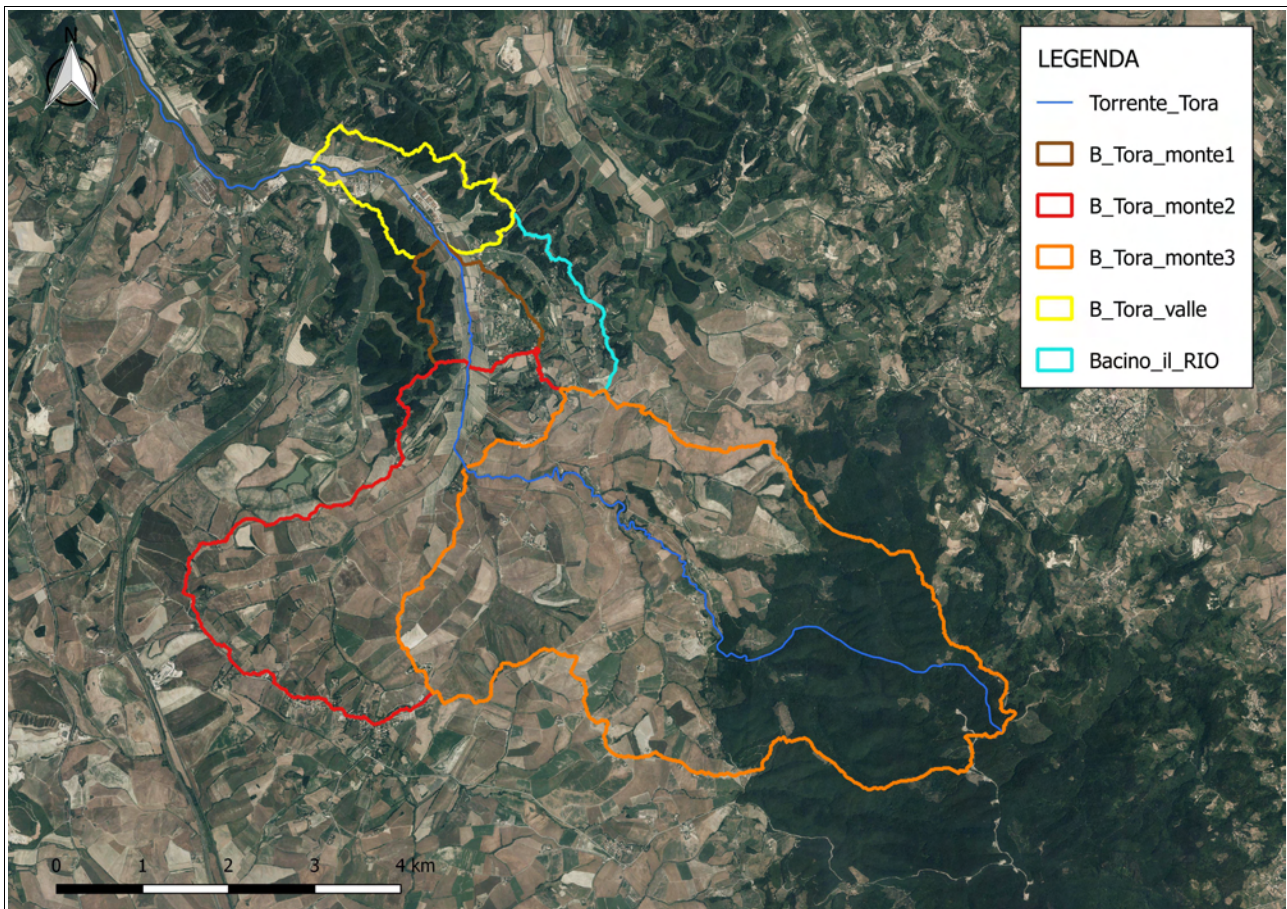


Figura 3: sottobacini idrografici della Tora

2.2. Definizione degli afflussi: curva di possibilità pluviometrica

Per la stima delle piogge intense si è fatto riferimento è stato utilizzato il modello TCEV, facendo riferimento alle curve di possibilità pluviometrica dedotte nell'ambito dell' "Accordo di Collaborazione Scientifica RT-UNIFI - Analisi di frequenza regionale delle precipitazioni estreme", di cui alla DGRT 1133/2012 e basata sulle elaborazioni dei dati di pioggia aggiornati fino al 2012.

Il modello a doppia componente TCEV interpreta gli eventi massimi annuali come il risultato di una miscela di due popolazioni distinte: la prima relativa agli eventi massimi ordinari, più frequenti ma meno intensi, e la seconda agli eventi massimi straordinari, meno frequenti e spesso catastrofici. La distribuzione TCEV ha espressione:

$$P(x) = \exp[-\lambda_1 \exp(-x/\theta_1) - \lambda_2 \exp(-x/\theta_2)],$$

dove $P(x)$ indica la probabilità di non superamento del valore x della generica variabile casuale X mentre λ_i e θ_i ($i=1,2$) sono i quattro parametri (positivi) della distribuzione.

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La forma canonica della distribuzione (1) è:

$$P(z) = \exp[-\exp(-z) - \lambda \exp(-z/\theta)], \quad z = (x - \varepsilon_1)/\theta_1;$$

$$\varepsilon_1 = \theta_1 \ln \lambda_1, \quad \theta = \theta_2/\theta_1, \quad \lambda = \lambda_2/(\lambda_1)^{1/\theta};$$

Per la stima dei parametri della distribuzione è stato seguito un approccio gerarchico di regionalizzazione.

Attraverso l'analisi di frequenza regionale sono state stimate su tutto il territorio regionale le altezze di pioggia per le durate 1, 3, 6, 12, 24 ore ed i tempi di ritorno 2, 5, 10, 20, 30, 50, 100, 150, 200, 500. Attraverso una regressione lineare sono stati calcolati i parametri delle linee segnalatrici di possibilità pluviometrica a ed n, grazie ai quali è possibile calcolare, per qualsiasi durata, in qualsiasi punto del territorio regionale l'altezza di pioggia per i tempi di ritorno 2, 5, 10, 20, 30, 50, 100, 150, 200, 500. I parametri a ed n forniti sono in formato raster, risoluzione 1kmx1km. Per la determinazione della curva di possibilità pluviometrica per i diversi bacini in esame si è provveduto al calcolo della media sull'area del bacino dei parametri a ed n, per il tempo di ritorno considerato.

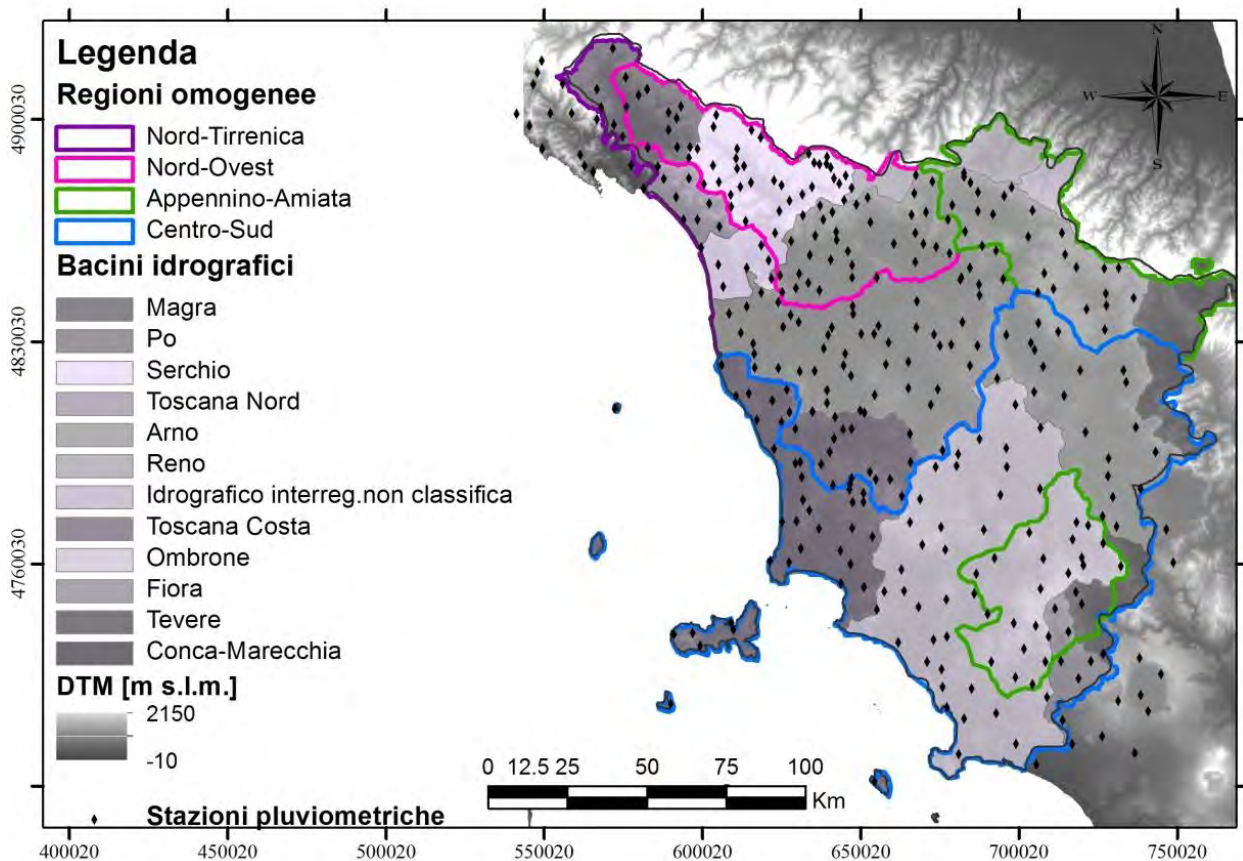


Figura 4: suddivisione dell'area di studio in regioni omogenee

Le figure seguenti riportano le griglie relative ad i parametri a ed n per l'area di interesse, per i

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tempi di ritorno di 30 e 200 anni:

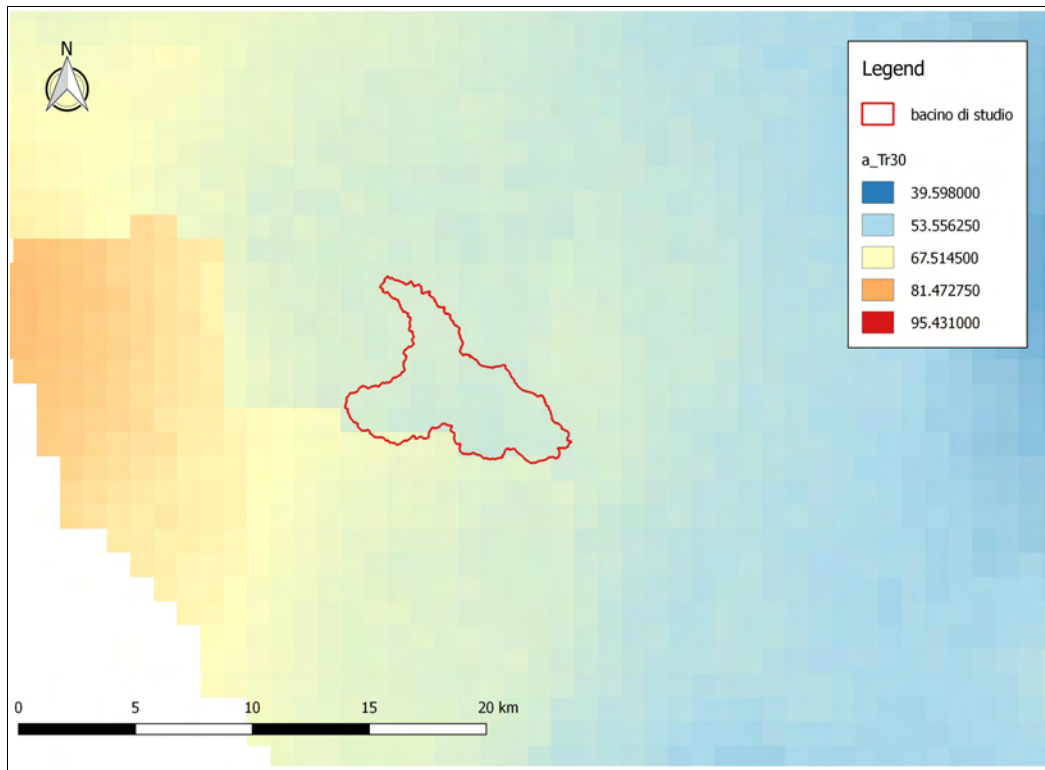


Figura 5: griglia del parametro a per Tr 30

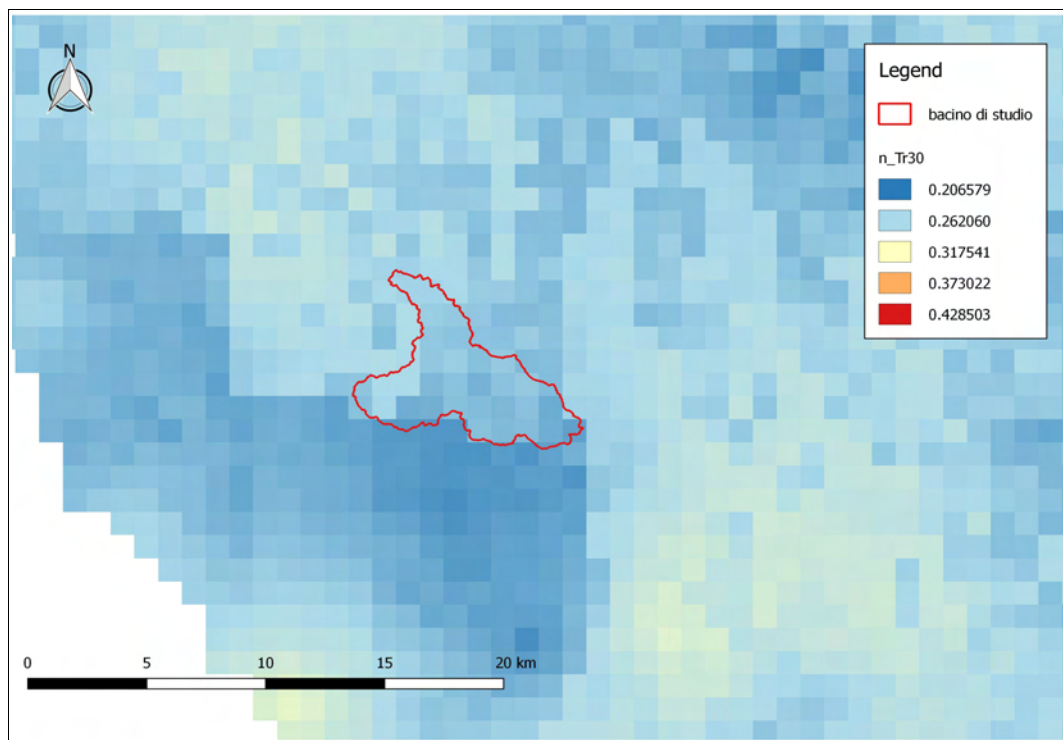


Figura 6 - griglia del parametro n per Tr 30

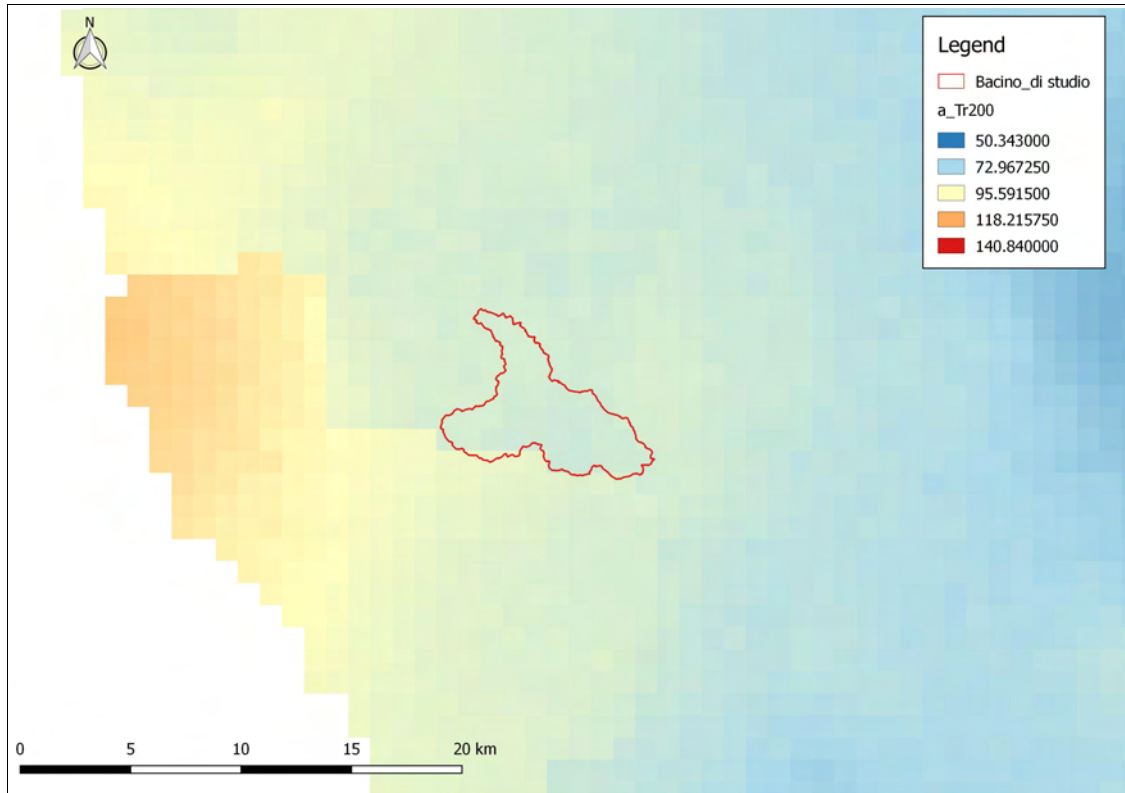


Figura 7 - griglia del parametro a per Tr200

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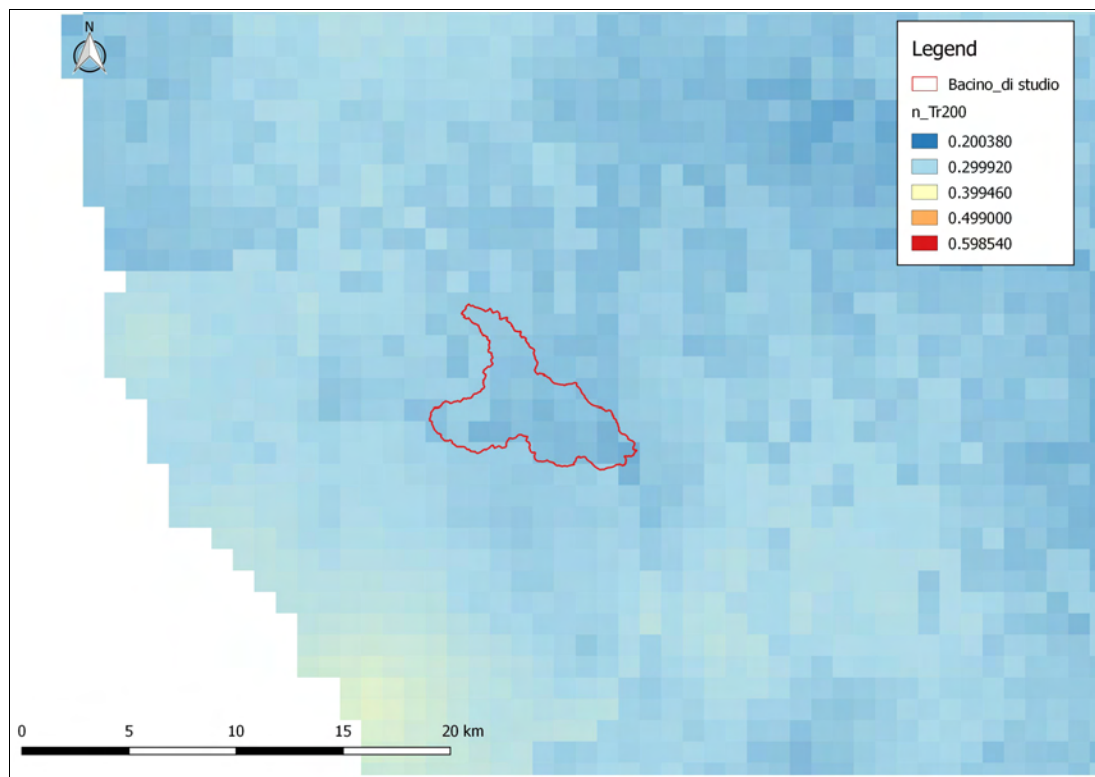


Figura 8 - griglia del parametro n per Tr200

Le curve pluviometriche di tempo di ritorno trentennale e duecentennale per il bacino in esame hanno le seguenti espressioni:

$$h_{30}=60.107t^{0.248}$$

$$h_{200}=83.594t^{0.274}$$

2.3. Definizione degli afflussi: ietogramma di progetto e fattore di ragguglio

Nelle simulazioni condotte si è fatto riferimento a ietogrammi triangolari. Date le dimensioni ridotte dei bacini in esame non si sono cautelativamente applicati fattori di ragguglio all'area delle precipitazioni.

La tabella seguente riporta i valori dell'altezza di pioggia totale degli ietogrammi considerati nell'analisi, per le durate ed i tempi di ritorno di interesse:

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Tp(h)	Tr30		Tr200	
	h(mm)	i _{max} (mm/h)	h(mm)	i _{max} (mm/h)
1	60.11	120.22	83.59	167.18
2	71.35	71.35	101.08	101.08
3	78.92	52.61	112.96	75.31
4	84.76	42.38	122.22	61.11
5	89.59	35.84	129.93	51.97
6	93.74	31.25	136.58	45.53
7	97.39	27.83	142.47	40.71
8	100.67	25.17	147.78	36.95

Tabella 2 - altezze di pioggia ed intensità massime degli ietogrammi di calcolo

Date le ridotte dimensioni dei bacini in esame non si sono cautelativamente applicati fattori di ragguglio all'area delle precipitazioni.

2.4. Le perdite di bacino: il metodo CN

Per la valutazione delle perdite di bacino si è utilizzato il metodo CN, in linea con quanto già fatto nel citato studio redatto per il Comune di Collesalveti, procedendo tuttavia ad un aggiornamento del valore del CN sulla base dei nuovi dati disponibili.

Nella stima dei dati di perdita si è fatto riferimento ai dati più aggiornati disponibili sul sito della Regione Toscana. Per l'assegnazione del parametro CN si è fatto riferimento alla specifica tabella riportata in "Macroattività B - Modellazione idrologica Attività B2: Modellazione idrologica caso pilota. Implementazione modello distribuito per la Toscana MOBIDIC. Addendum: parametrizzazione HMS" (Università di Firenze, Regione Toscana, 2014), con annesso file shp contenente i valori del parametro CN per tutta la Regione Toscana.

Si è tuttavia effettuata una correzione a tale tabella in merito ad i valori assegnati alle aree boscate (codici Corine 311, 312 e 313). Nella pubblicazione originale della Regione Toscana i valori di CN associati a tali aree risultano infatti quelli relativi all'uso del suolo "woods, fair hydrologic conditions" di cui alle tabelle del metodo CN redatte dall'USDA Natural Resources Conservation Service (Tabella 9-1, *National Engineering Handbook, part 630 Hydrology, Chapter 9: Hydrologic Soil Cover complexes*). In effetti nell'ambito della metodologia CN con il termine woods si intendono "small isolated groves of trees being raised for farm or ranch use"¹, tipologia di uso del suolo che ha un comportamento idrologico diverso rispetto a "Forest-range", di cui allo stesso Chapter 9 del citato *National Engineering Handbook, part 630 Hydrology*. Nella letteratura tecnica sono peraltro presenti più studi che evidenziano la tendenziale sovrastima dei deflussi derivante dall'applicazione del metodo CN alle aree boscate. Ad esempio il software AdBt-ToolBox, sviluppato in Italia a cura del Ministero dell'Ambiente, adotta valori del parametro CN per le aree boscate inferiori a quelli proposti dall'USDA.

Nello spirito di volersi mantenere coerenti con i valori di CN per aree boscate proposti dall'USDA (l'ente che ha sviluppato il metodo stesso del CN) si è provveduto a variare i valori adottati dalla Regione Toscana in corrispondenza delle aree boscate (codici Corine 311, 312 e 313), come da tabella seguente:

¹ "Hydrology training series. Module 104. Runoff Curve Number Computations. Study Guide". USDA, NRCS,1989.

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	Valori Regione Toscana				Valori USDA			
	A	B	C	D	A	B	C	D
Boschi di latifoglie (311)	36	60	73	79	36	48	57	63
Boschi di conifere (312)	36	60	73	79	36	48	57	63
Boschi misti di latifoglie e conifere (313)	36	60	73	79	36	48	57	63

Tabella 3: parametro CN per le aree boscate. Per la colonna A dei valori USDA si sono assunti gli stessi valori proposti dalla Regione Toscana, in assenza di indicazioni sul National Engineering Handbook, part 630 Hydrology.

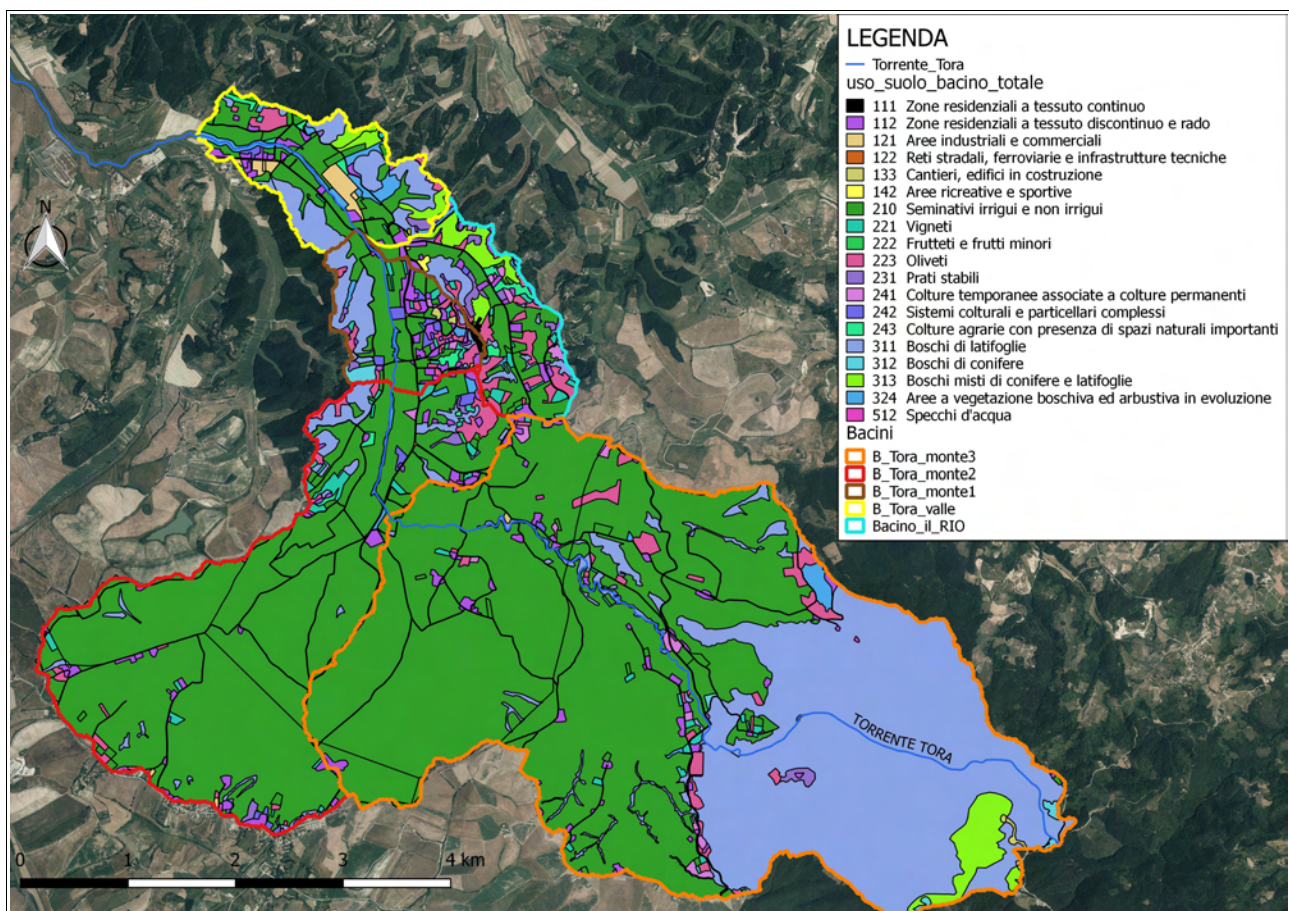


Figura 9 - carta dell'uso del suolo per il bacino in esame.

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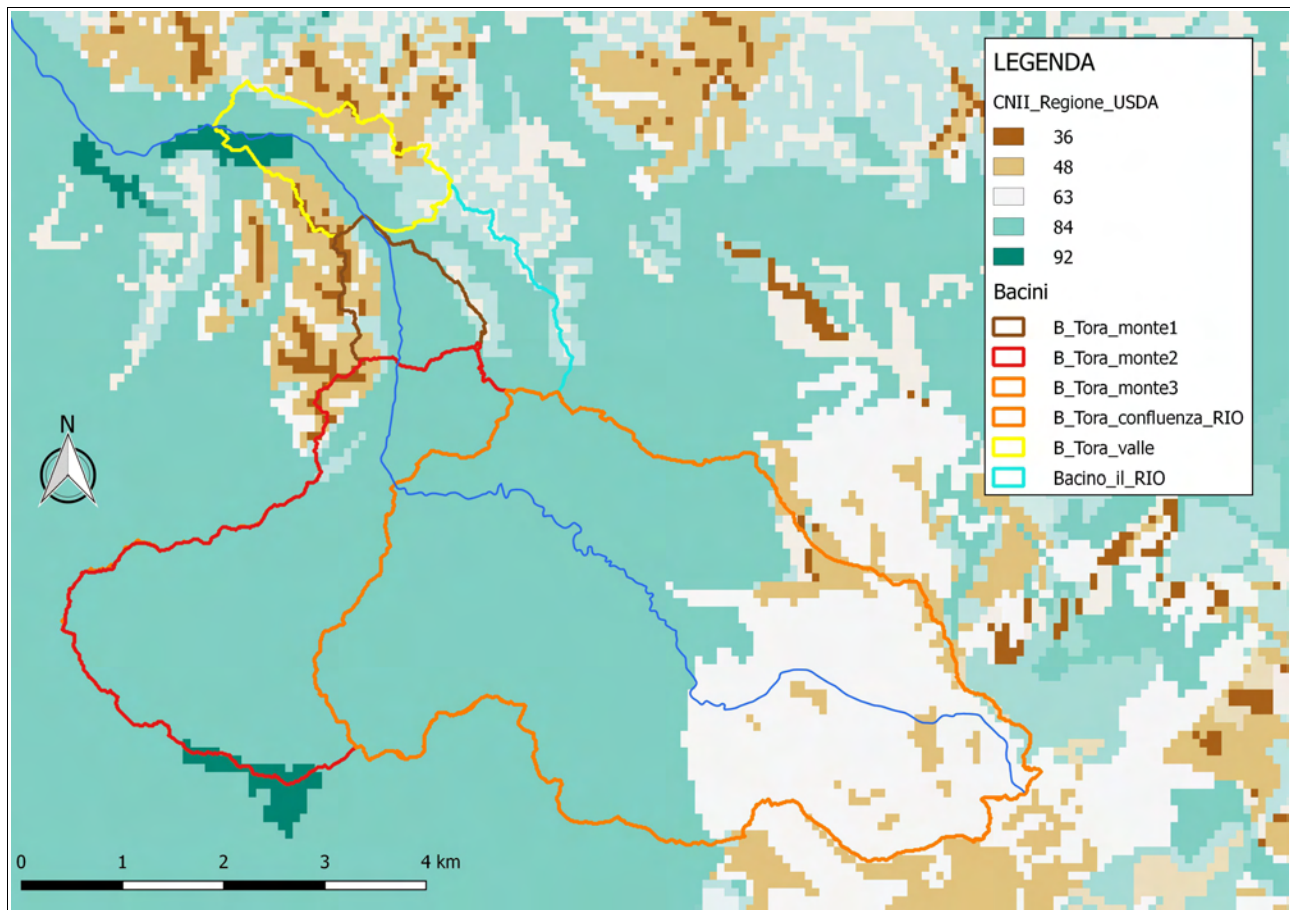


Figura 10 distribuzione del CN per il bacino in esame: valori da Regione Toscana con correzione per le aree boscate

Per la stima delle perdite iniziali I_a si può far ricorso alla seguente equazione: $I_a = 0.1 - 0.4 S$ (generalmente $I_a = 0.2 S$). La valutazione di S è ricondotta a quella dell'indice CN, secondo la seguente relazione:

$$S = 254 \cdot \left(\frac{100}{CN} - 1 \right)$$

valida per S espressa in mm.

Di seguito si riporta una tabella riassuntiva dei parametri CN assegnati ai vari sottobacini. Si riporta anche il valore del CN in condizioni di umidità 3 (suolo saturo), con cui sono stati eseguiti i calcoli.

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Sottobacini	CNII	CNIII	% area boscata (codici Corine 311,312,313).
Tora_monte_1	74.57	87.09	22.8
Tora_monte_2	82.94	91.8	4.3
Tora_monte_3	75.7	87.75	37.4
Il_Rio	78.82	89.54	12.5
Tora_valle	73.29	86.32	31.9

Tabella 4: parametri CN per i sottobacini in esame

2.5. Trasformazione afflussi netti – deflussi

2.5.1. L'idrogramma SCS

Per la trasformazione afflussi netti deflussi si è impiegato il metodo dell'idrogramma SCS. L'idrogramma del Soil Conservation Service (SCS) americano è un idrogramma adimensionale definito in base all'analisi di idrogrammi di piena in uscita dalla sezione di chiusura di numerosi bacini idrografici strumentati, di dimensioni grandi e piccole.

Per la sua definizione è necessario specificare l'area del bacino, il fattore di picco e il tempo di ritardo.

Il fattore di picco (Peaking Factor) è un coefficiente che definisce il volume di acqua nei rami crescente e decrescente dell'idrogramma. Il NOHRSC (National Operational Hydrologic Remote Sensing Center) suggerisce di impostare il fattore di picco sulla base delle caratteristiche del bacino idrografico, in particolare grado di urbanizzazione e pendenza media.

Il tempo di ritardo T_i del bacino idrografico può essere valutato a partire dal tempo di corrivazione T_c secondo la relazione: $T_i = \frac{3}{5} \cdot T_c$

Il tempo di corrivazione dei bacini idrografici è stato stimato in prima approssimazione sulla base di varie formule di letteratura, confrontando poi i valori ottenuti con i tempi di scorrimento sui versanti e nel canale lungo il massimo percorso idraulico. In particolare si sono considerate le seguenti formule:

$$T_i = 0.26L^{0.82}i_v^{-0.2}(1+S)^{0.13}$$

Rosso, Bocchiola, De Michele e Pecora

$$T_c = \frac{0.02221}{60} \left(\frac{L}{\sqrt{i}} \right)^{0.8}$$

Ferro (da dati di Kirpich-Chow-Watt-Pezzoli)

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$$T_c = 0.675A^{0.5}$$

Ferro

$$T_c = \frac{0.095 \cdot L_{max}^{0.8} \cdot \left(\frac{1000}{CN} - 9 \right)^{0.7}}{\sqrt{i_v}}$$

Formula dell' US SCS

$$T_c = 0.055 \cdot L / \sqrt{i}$$

Pezzoli

$$T_c = 6 \cdot L^{(2/3)} \cdot (H_{max} - H_0)^{-(1/3)}$$

Puglisi

con A superficie del bacino in Km², L lunghezza dell'asta principale in Km, L_{max} lunghezza del massimo percorso idraulico in km, i_v pendenza media dei versanti, CN parametro CN del metodo SCS, i pendenza media dell'asta principale, H_{max} e H₀ quote del punto più alto e più basso del bacino idrografico, T_c (T_i) espresso in ore. I valori forniti dalle diverse formule sono stati confrontati tra loro e con il valore del tempo di corrivazione stimato attraverso il calcolo del tempo di percorrenza attraverso il percorso idraulico più lungo dei diversi bacini (suddiviso in tratti omogenei di lunghezza L_i), valutando per ogni tratto la velocità V_i della corrente in condizioni di piena utilizzando la formula di Manning per il deflusso in canali e corsi d'acqua e la formula dell' *overland flow* per il moto delle particelle d'acqua sui versanti, secondo la relazione:

I tempi di corrivazione così stimati per i bacini in esame sono riportati nella seguente tabella, unitamente ai valori del fattore di picco PRF:

SOTTOBACINO	Tc(h)	PRF
Tora_monte_2	2	300
Tora_monte_3	3.1	300
il_Rio	0.9	300

Tabella 5: tempi di corrivazione e fattori di picco PRF per i sottobacini della Tora

2.5.2. Il modello Kinematic Wave

Il metodo cinematico utilizza l'equazione di continuità e l'approssimazione cinematica delle equazioni complete di De Saint Venant per trasformare la precipitazione efficace in deflusso superficiale. Il bacino viene rappresentato tramite un modello concettuale in cui possono essere definiti due piani rettangolari, percorsi dal deflusso superficiale (*overland flow planes*) e tre canali che raccolgono il deflusso proveniente dai piani rettangolari.

Il calcolo inizia a partire con l'analisi del deflusso sui piani rettangolari (*overland flow planes*). HEC-HMS calcola l'idrogramma dei deflussi relativo al primo piano ed al secondo piano. Il deflusso proveniente dai due piani rettangolari viene sommato e poi immesso nel canale principale (*main channel*) come portata laterale uniformemente distribuita lungo tutto il corso del canale.

L'equazione che modella il fenomeno di trasferimento della massa liquida sia sui versanti (*overland flow planes*) che nell'alveo del corso d'acqua è l'equazione dell'onda cinematica:

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$$\frac{\partial A}{\partial t} + \alpha mA^{(m-1)} \frac{\partial A}{\partial x} = q$$

in cui A è l'area liquida della sezione di deflusso, q la portata continua in ingresso lungo l'ascissa x del corso d'acqua, a ed m due parametri univocamente determinati dalla geometria e dalla scabrezza della sezione di deflusso, essendo per ipotesi nel metodo cinematico:

$$Q = aA^m$$

Il coefficiente di scabrezza relativo al moto sui versanti (che è diverso dal coefficiente di Manning) può essere ricavato dalla seguente tabella:

n	Surface Description
0.011	Smooth asphalt
0.012	Smooth concrete
0.013	Concrete lining
0.014	Good wood
0.014	Brick with cement mortar
0.015	Vitrified clay
0.015	Cast iron
0.024	Corrugated metal pipe
0.024	Cement rubble surface
0.050	Fallow (no residue)
	Cultivated soils
0.060	Residue cover ≤ 20%
0.170	Residue cover > 20%
0.130	Range (natural)
	Grass
0.150	Short grass prairie
0.240	Dense grasses
0.410	Bermuda grass
	Woods
0.400	Light underbrush
0.800	Dense underbrush

*When selecting n for woody underbrush, consider cover to a height of about 30 mm (0.1 ft). This is the only part of the plant cover that will obstruct sheet flow.

Subbasin	Length (M)	Slope (M/M)	Roughness	Area (%)
Tora_monte_1(Plane 1)	200	0.11	0.4	84
Tora_monte_1(Plane 2)	200	0.11	0.013	16
Tora_V(Plane 1)	290	0.24	0.4	85
Tora_V(Plane 2)	290	0.24	0.013	15

Tabella 6 Parametri modello afflussi-deflussi Kinematic Wave, per i sottobacini indicati

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Subbasin	Route Upstream	Route Method	Length (M)	Slope (M/M)	Subreaches	Shape	Manning's n	Diameter (M)	Width (M)	Side Slope (xH:1V)
Tora_monte_1	No	Kinematic Wave	415.4	0.0021	5	Trapezoid	0.045		2	1
Tora_V	No	Kinematic Wave	482.6	0.00457	5	Trapezoid	0.045		2	1

Tabella 7 Parametri modello afflussi-deflussi Kinematic Wave: dati main channel

2.6. Propagazione dei deflussi

Per la propagazione dei deflussi negli elementi reach si è adottato il metodo di Muskingum Cunge, che si basa sull'equazione di continuità e sull'approssimazione parabolica delle equazioni complete di De Saint Venant. I coefficienti del metodo di Muskingum vengono calcolati in base alle relazioni:

$$K = \Delta x / c$$

$$X = \frac{1}{2} \cdot \left(1 - \frac{Q}{BS_0 c \Delta x} \right) \quad c = \frac{dQ}{dA}$$

in cui Δx è l'intervallo di discretizzazione spaziale, Δt il passo temporale di calcolo, c la celerità di traslazione dell'onda, S_0 la pendenza di fondo ed A l'area liquida. Con tale metodo i valori dei coefficienti K ed X del metodo di Muskingum vengono calcolati in base alle caratteristiche del corso d'acqua.

Reach	Length(m)	Slope(m/m)	Manning's n	Shape	L.B. Manning's n	R.B. Manning's n
R-TM-2-3	1254	0.0036	0.035	Eight Point	0.03	0.03
R-TM-2-1	1650	0.0021	0.035	Eight Point	0.03	0.03
R-TM-TV	2187	0.0032	0.035	Eight Point	0.03	0.03

Tabella 8: parametri elementi reach

2.7. Modellazione delle casse in linea sulla Tora

Le 2 casse in linea sulla Tora presenti nell'area di studio sono state modellate su HMS come elementi reservoir. Il calcolo di tale tipo di elementi viene effettuato sulla base dell'equazione di continuità:

$$\frac{dV}{dt} = Q_i(t) - Q_u(h)$$

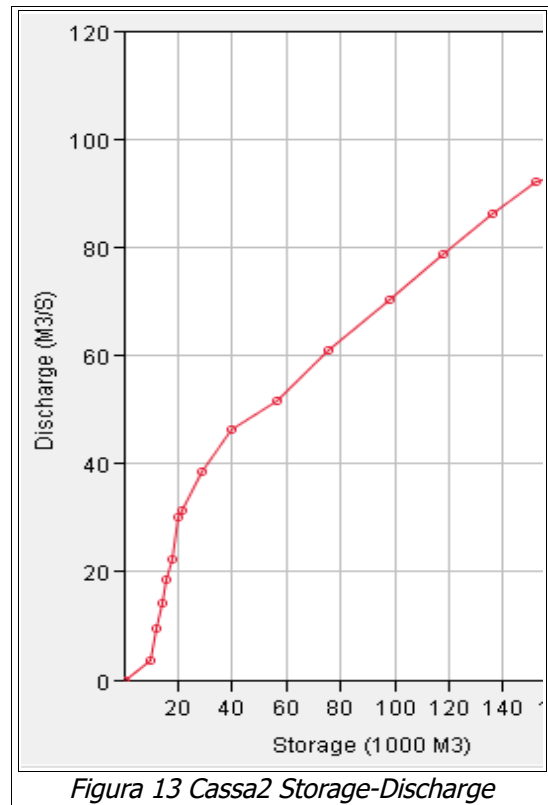
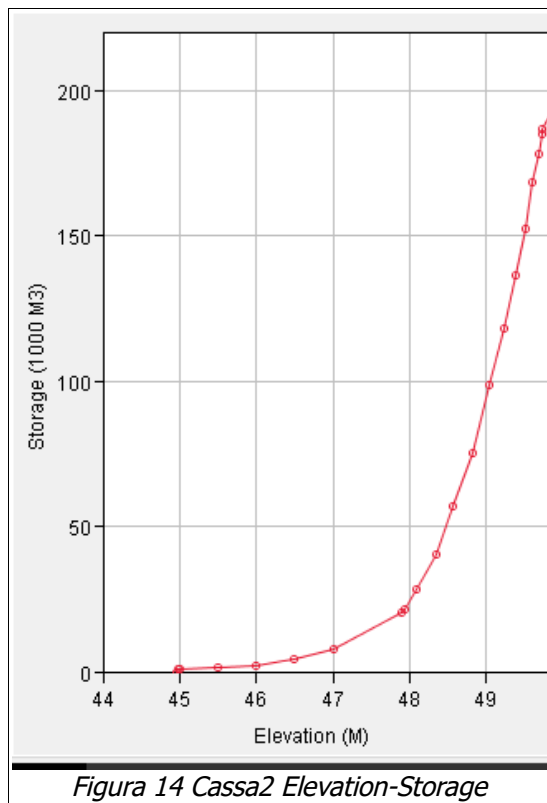
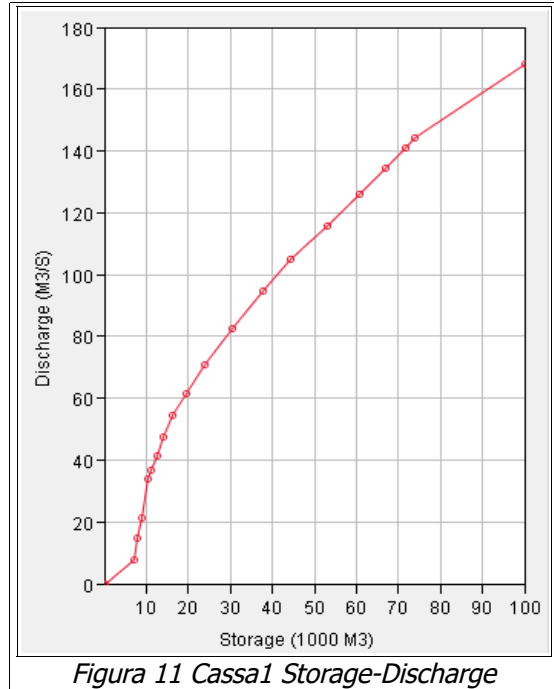
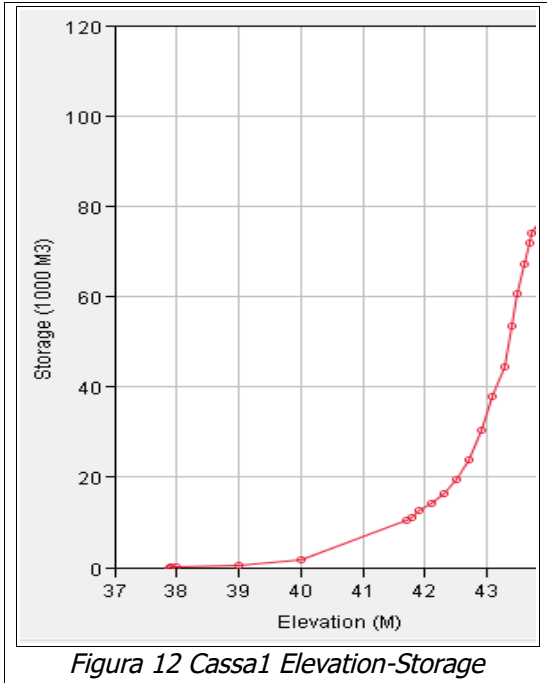
in cui dV/dt rappresenta la variazione di volume invasato nel tempo, Q_i la portata in ingresso (funzione del tempo) e Q_u la portata in uscita (funzione dell'altezza in cassa h).

Per la corretta modellazione delle casse sono state definite:

- la curva di invaso, ricavata sulla base del DTM da dati lidar dell'area a monte delle casse;
- la scala di deflusso delle portate in uscita $Q_u(h)$, ricavata dalla modellazione idraulica condotta con RAS e descritta nel seguito.

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I grafici seguenti riportano curva di invaso e scala di deflusso per le 2 casse in esame: cassa 1 (a valle) e cassa 2 (a monte).



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2.8. Risultati della modellazione idrologica: idrogrammi di piena

Sulla base di quanto sopra esposto è stato implementato il modello idrologico dell'area di studio. Sono state eseguite simulazioni per tempi di ritorno 30 e 200 anni con durata di pioggia pari a 1-2-3-4-5-6-7-8 h.

Le simulazioni idrologiche sono individuate da un codice nella forma itTrxxxTpyyyh, dove it sta ad indicare che si sono impiegati ietogrammi triangolari xxx indica il tempo di ritorno in anni ed yyy la durata di pioggia espressa in ore.

Le tabelle seguenti riportano i valori massimi di portata per tempi di ritorno di 30 e 200 anni, per i diversi scenari esaminati e per i diversi elementi di modellazione:

Tp(h)	Tora_V	Il_Rio	Tora_monte_ 1	Tora_monte_ 2	Tora_monte_ 3	J_TM-R	J_TM-TV
1	20.17	11.8	15.04	32.21	42.48	69.08	69.56
2	20.46	12.68	15.05	39.01	54.52	83.77	84.45
3	17.15	11.89	12.59	41.46	61.52	91.46	92.65
4	14.71	10.9	10.77	41.44	65.52	95.97	97.66
5	12.95	9.98	9.98	40.28	67.37	98.99	100.92
6	11.64	9.19	8.51	38.73	67.73	100.38	102.9
7	10.6	8.51	7.74	37.06	67.1	100.22	103.33
8	9.75	7.93	7.12	35.42	65.96	99.15	102.68

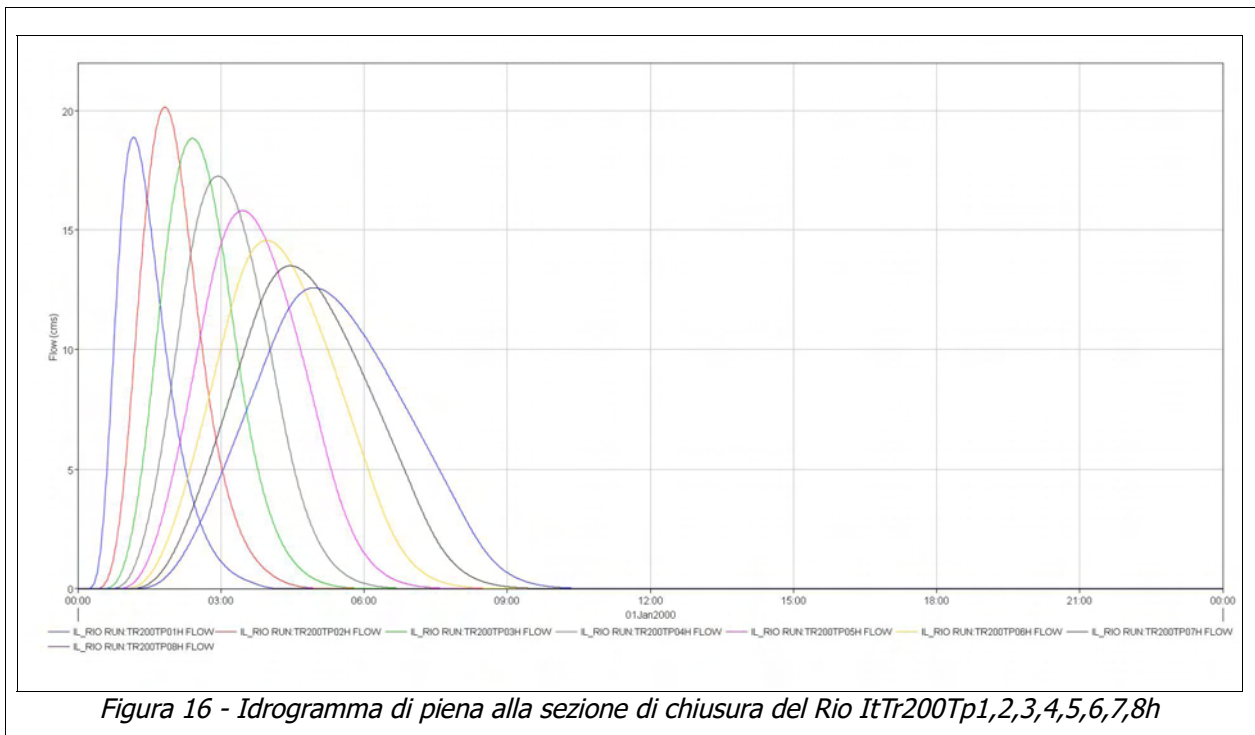
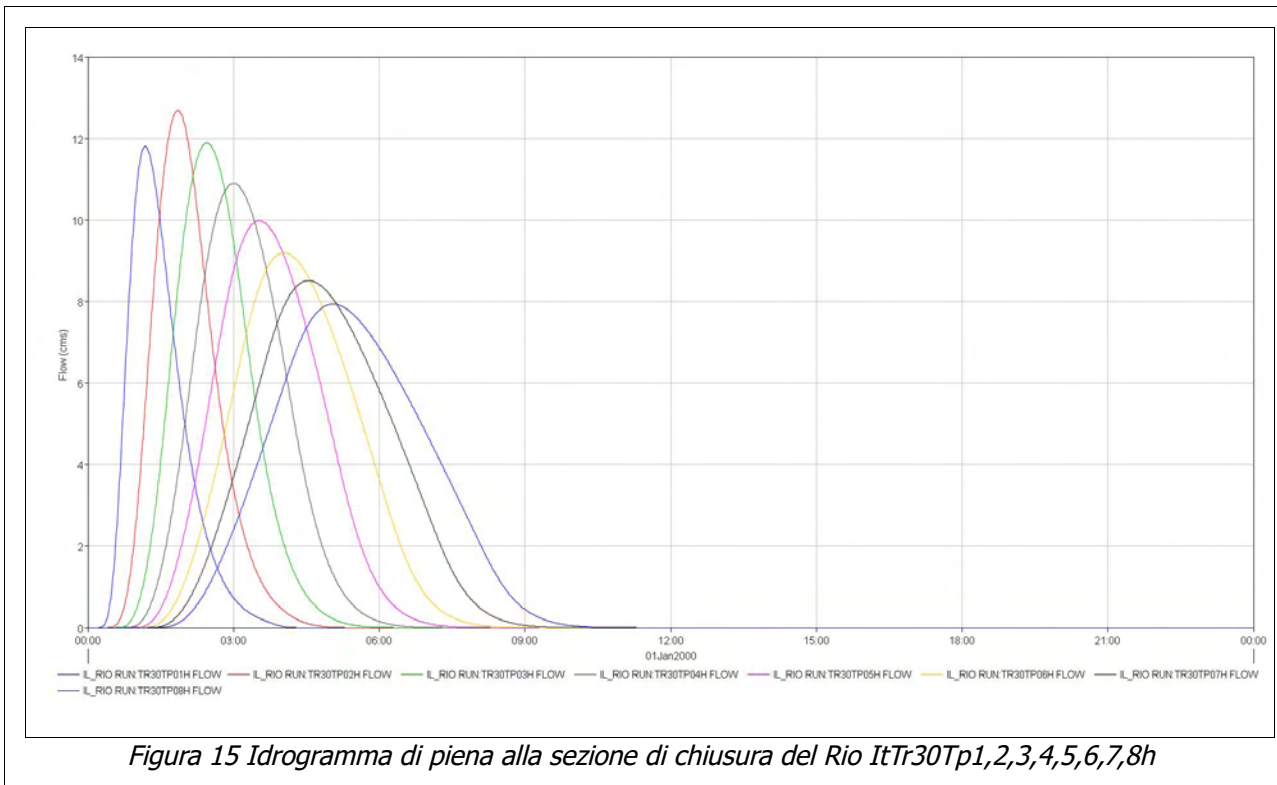
Tabella 9: portate massime Q (mc/sec) con tempo di ritorno 30 anni per i diversi elementi di modellazione

Tp(h)	Tora_V	Il_Rio	Tora_monte_ 1	Tora_monte_ 2	Tora_monte_ 3	J_TM-R	J_TM-TV
1	42.28	18.88	30.83	50.15	69.96	102.76	103.18
2	35.42	20.14	25.8	60.88	89.65	127.47	128.06
3	28.82	18.84	20.95	64.68	101.01	142.22	143.12
4	24.52	17.25	17.81	64.61	107.39	151.03	152.65
5	21.51	15.81	15.6	62.8	110.2	155.51	158.78
6	19.27	14.56	13.97	60.39	110.53	157.44	162.44
7	17.51	13.5	12.69	57.8	109.34	157.31	163.33
8	16.11	12.58	11.66	55.27	107.4	156.08	162.59

Tabella 10: portate massime Q (mc/sec) con tempo di ritorno 200 anni per i diversi elementi di modellazione

I grafici seguenti riportano gli idrogrammi in alcuni punti significativi della rete in esame: la sezione terminale del Rio, la confluenza tra Rio e Tora (J-TM-R), la sezione terminale del modello idrologico (J-TM-TV).

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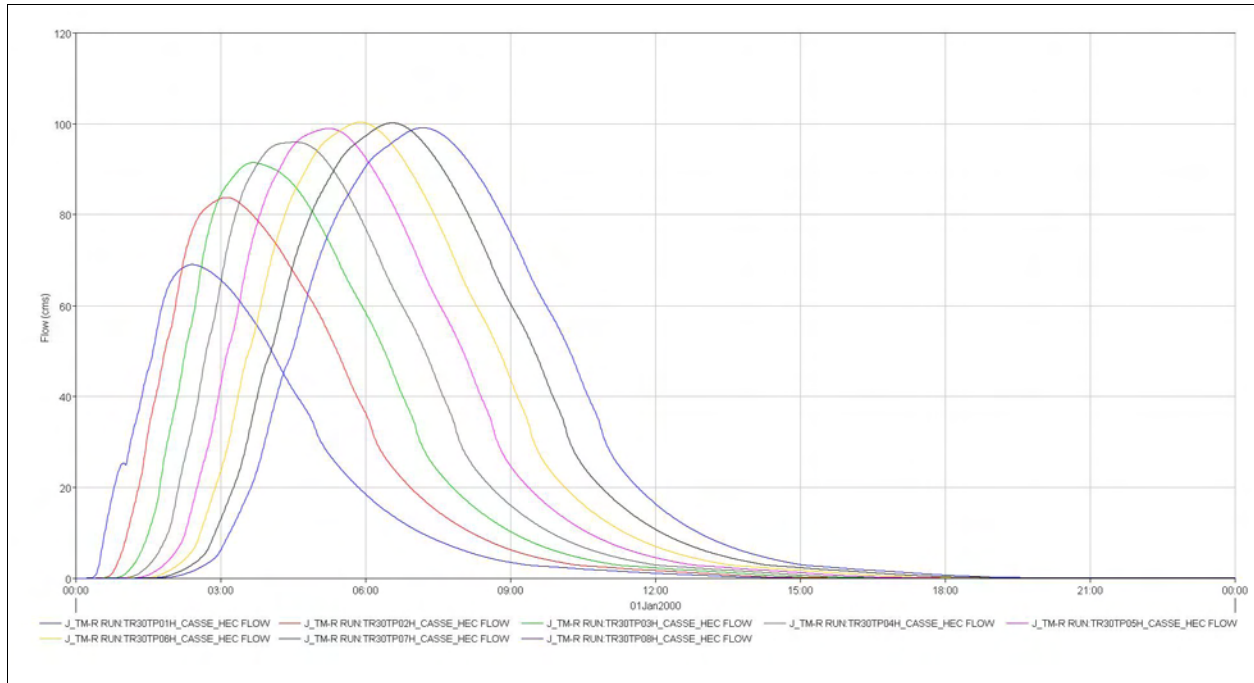


Figura 17. Idrogramma di piena per Tr30 al nodo J-TM-R per durate 1,2,3,4,5,6,7,8h

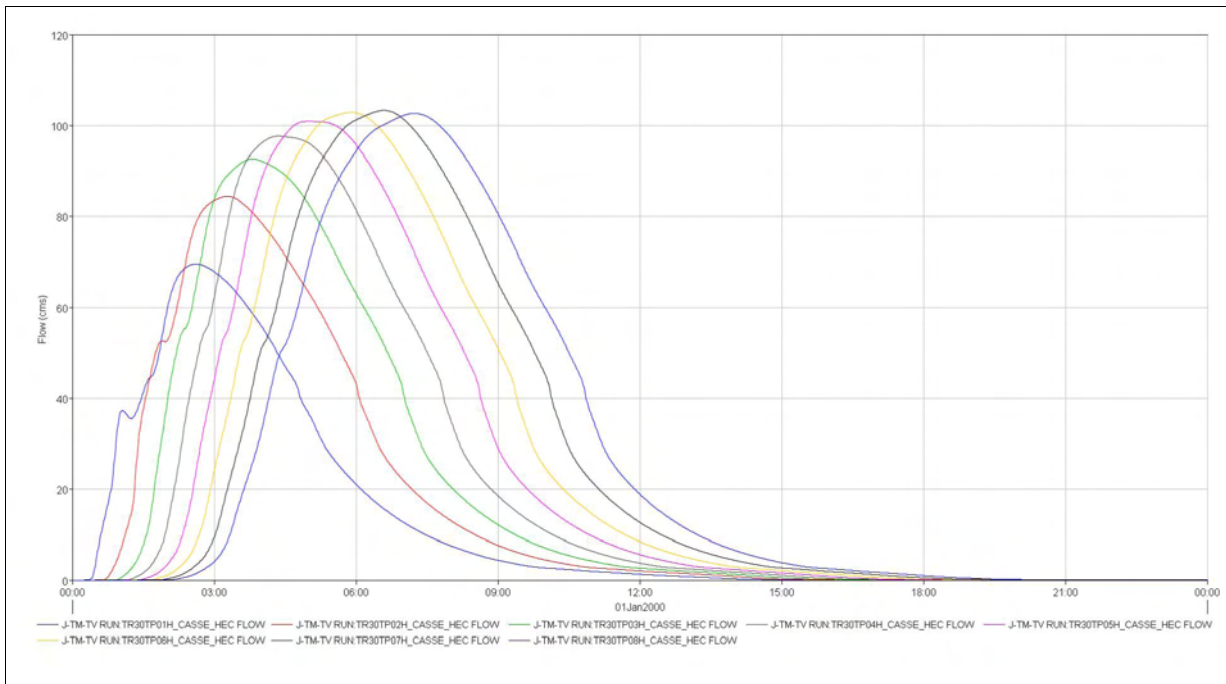


Figura 18. Idrogramma di piena per Tr30 al nodo J-TM-TV per durate 1,2,3,4,5,6,7,8h

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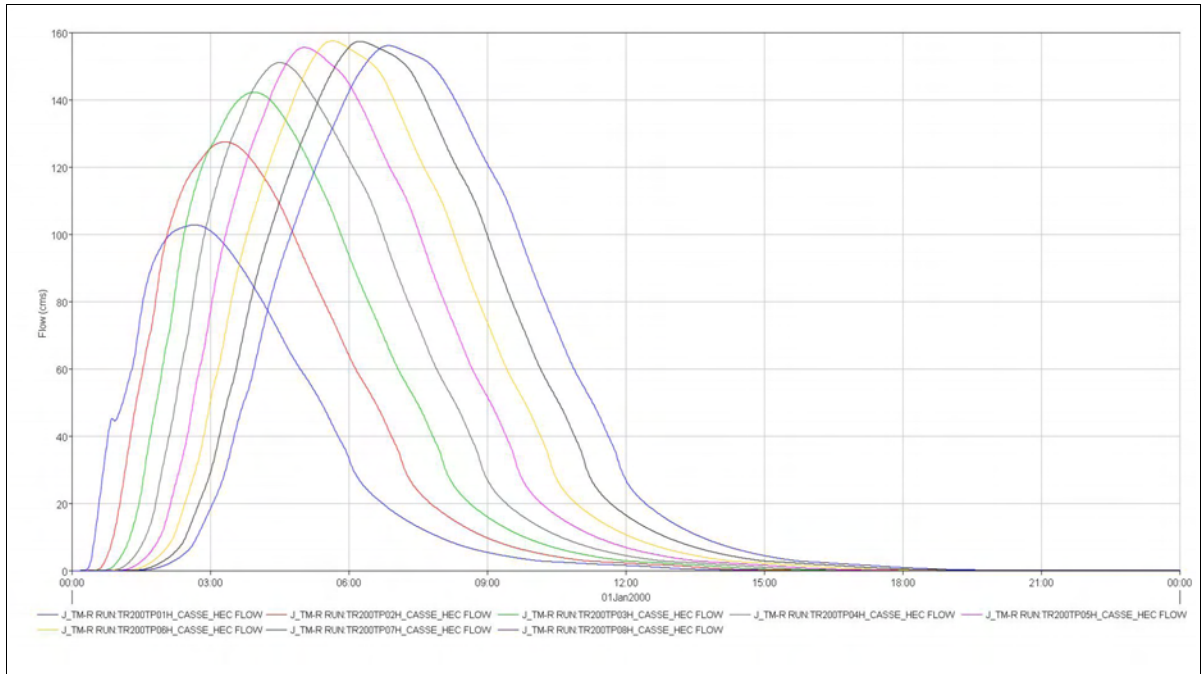


Figura 19. Idrogramma di piena per Tr200 al nodo J-TM-R per durate 1,2,3,4,5,6,7,8h

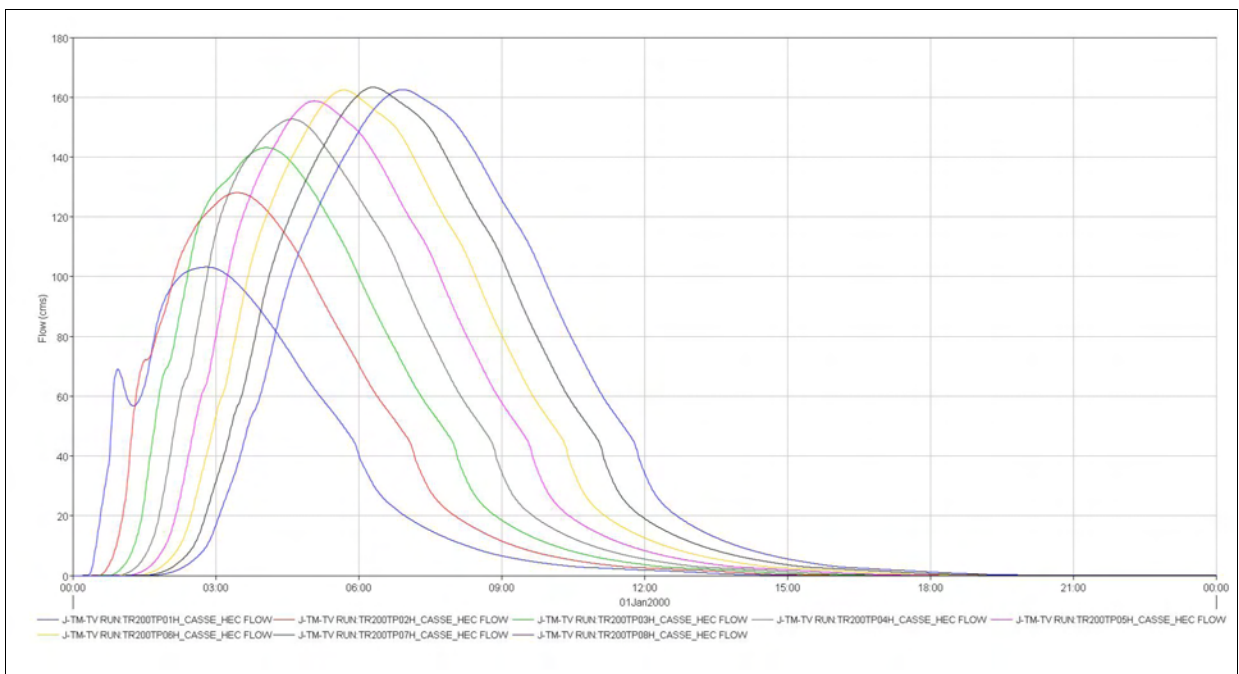


Figura 20. Idrogramma di piena per Tr200 al nodo J-TM-TV per durate 1,2,3,4,5,6,7,8h

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2.8.1. Valutazione del comportamento delle casse esistenti

A seguire si riportano i risultati relativi alle 2 casse esistenti sulla Tora. Nelle diverse simulazioni condotte si hanno i seguenti valori delle quote massime di invaso nelle casse esistenti.

Scenario	HW Elev [m s.l.m.]	
	Cassa 2	Cassa 1
ItTr30Tp1h	48.20	42.60
ItTr30Tp2h	48.50	42.90
ItTr30Tp3h	48.70	43.00
ItTr30Tp4h	48.80	43.10
ItTr30Tp5h	48.89	43.10
ItTr30Tp6h	48.91	43.11
ItTr30Tp7h	48.91	43.09
ItTr30Tp8h	48.89	43.07
ItTr200Tp1h	48.92	43.21
ItTr200Tp2h	49.32	43.49
ItTr200Tp3h	49.54	43.66
ItTr200Tp4h	49.68	43.78
ItTr200Tp5h	49.77	43.88
ItTr200Tp6h	49.83	43.89
ItTr200Tp7h	49.83	43.84
ItTr200Tp8h	49.79	43.72

Tabella 11: quote massime di invaso nelle casse di espansione esistenti

La tabella seguente riporta i valori delle quote di massimo invaso per eventi trentennali e duecentennali, confrontati con le quote dei coronamenti arginali delle singole casse. Sono riportati anche i volumi di massimo invaso.

Scenario	HW Elev [m s.l.m.]		V (mc)	
	Cassa 2	Cassa 1	Cassa 2	Cassa 1
<i>Quota pelo libero Tr30</i>	<i>48.91</i>	<i>43.11</i>	<i>67.87</i>	<i>70.69</i>
<i>Quota pelo libero Tr200</i>	<i>49.83</i>	<i>43.79</i>	<i>112.37</i>	<i>115.58</i>
<i>Quota coronamento arginature</i>	<i>50.40</i>	<i>46.40</i>	<i>-</i>	<i>-</i>

Tabella 12: quote massime del pelo libero e delle arginature delle casse.

La tabella seguente riporta infine i valori massimi di portata in ingresso ed in uscita dalle casse per le diverse simulazioni condotte.

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Scenario	Cassa 2		Cassa 1		Rendimento (%)	
	Qi(m ³ /s)	Qu(m ³ /s)	Qi(m ³ /s)	Qu(m ³ /s)	Cassa2	Cassa1
ItTr30Tp1h	42.483	41.347	67.147	66.618	2.7	0.8
ItTr30Tp2h	54.521	50.968	81.617	80.923	6.5	0.9
ItTr30Tp3h	61.518	57.944	87.905	87.688	5.8	0.2
ItTr30Tp4h	65.523	61.881	93.020	92.601	5.6	0.5
ItTr30Tp5h	67.374	63.838	95.310	94.810	5.2	0.5
ItTr30Tp6h	67.729	64.627	95.528	95.086	4.6	0.5
ItTr30Tp7h	67.099	64.488	94.508	94.162	3.9	0.4
ItTr30Tp8h	65.965	63.785	92.922	92.628	3.3	0.3
ItTr200Tp1h	69.958	65.193	101.147	100.548	6.8	0.6
ItTr200Tp2h	89.650	82.794	125.572	124.620	7.6	0.8
ItTr200Tp3h	101.011	92.511	139.572	138.461	8.4	0.8
ItTr200Tp4h	107.387	96.517	147.159	145.372	10.1	1.2
ItTr200Tp5h	110.191	101.654	149.619	147.340	7.7	1.5
ItTr200Tp6h	110.531	103.934	148.985	147.466	6.0	1.0
ItTr200Tp7h	109.337	103.811	147.125	146.557	5.1	0.4
ItTr200Tp8h	107.398	102.314	144.860	144.349	4.7	0.4

Tabella 13: portate massime in ingresso Qi e in uscita Qu dalle casse con i relativi rendimenti.

L'abbattimento dei picchi di piena si presenta piuttosto basso, particolarmente per la cassa di valle. D'altra parte le casse in linea hanno solitamente rendimenti piuttosto ridotti nella riduzione dei picchi di piena, se non dotate di volumi significativi. Inoltre nel caso di più casse realizzate in sequenza su uno stesso corso d'acqua i rendimenti di laminazione vanno a diminuire procedendo dalle casse poste più a monte a quelle più a valle a causa del progressivo "allungarsi" dell'onda di piena, effetto che si osserva anche in questo caso.

Da notare comunque che le casse in linea producono un allungamento dei tempi di corrivazione del bacino, riducendo quindi comunque i picchi di portata di piena ed allungando la durata della pioggia critica. Cancellando dal modello di HMS implementato per la presente analisi le casse 1 e 2 ed effettuando nuovamente le simulazioni idrologiche si ottengono in corrispondenza della sezione di chiusura del sottobacino della Tora in esame (chiuso a monte della confluenza con il Rio Cascine) i valori di portata di picco riportati in Tabella 14.

Dal confronto con gli analoghi valori relativi allo scenario con casse (già riportati nelle precedenti tabelle 9 e 10) si nota una riduzione dei picchi di piena ed un allungamento della durata di pioggia critica, pari a 5-6 ore senza casse di espansione ed a 7 ore in presenza delle due casse 1 e 2.

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TP(h)	NO CASSE		CON CASSE	
	Tr200	Tr30	Tr200	Tr30
1	120.45	74.57	103.18	69.56
2	153.16	94.44	128.06	84.45
3	171.59	105.91	143.12	92.65
4	182.33	112.32	152.65	97.66
5	186.84	115.3	158.78	100.92
6	186.86	115.54	162.44	102.9
7	184.37	114.13	163.33	103.33
8	180.71	111.93	162.59	102.68
MAX	186.86	115.54	163.33	103.33

Tabella 14 - portate massime alla sezione di chiusura della Tora (elemento HMS: J-TM-TV): simulazione con casse e senza casse.

Per finire si confrontano i risultati relativi alla Tora trovati nella presente sede con quanto riportato nello "Studio Idrologico Idraulico a supporto del Regolamento Urbanistico del Comune di Collesalveti", redatto da Prima Ingegneria nel 2015. In tale studio non sono riportati i valori di portata relativi alla sezione della Tora presa in esame (Tora chiusa a monte della confluenza con il Rio Cascine). Inoltre non vengono considerati gli effetti delle casse 1 e 2.

Nello studio del Comune di Collesalveti per la sezione terminale della Tora (che sottende un bacino di area pari a 88.71 Km²) si ha una portata duecentennale pari a 473.5 mc/s ed una portata trentennale pari a 270.7 mc/s. Assumendo lo stesso contributo unitario di piena su tutto il bacino e considerando l'area del bacino della Tora chiuso a monte della confluenza con il Rio Cascine (pari a 32.03 Km²) si avrebbe alla sezione suddetta una portata trentennale pari a 97.7 mc/s ed una portata duecentennale pari a 170.9 mc/s. Tali valori risultano in linea con quanto trovato in questa sede con un'analisi di maggior dettaglio.

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3. RELAZIONE IDRAULICA

La modellazione idraulica dei tratti fluviali di interesse per la determinazione delle condizioni di pericolosità idraulica è stata condotta mediante il software HEC-RAS 5.0 (Hydrologic Engineering Center – River Analysis System) prodotto anch'esso dal Corpo degli Ingegneri dell'esercito americano (USACE).

Le simulazioni sono state eseguite in regime di moto vario mono e bidimensionale e sono descritte in dettaglio nel seguito. In particolare si è proceduto ad implementare un'analisi monodimensionale in alveo e bidimensionale al di fuori dell'alveo inciso.

Per la definizione delle condizioni di pericolosità dell'area sono state effettuate più simulazioni, corrispondenti alle durate di pioggia critiche per i corsi d'acqua in esame: 2 e 3 ore per il Rio; 6, 7 ed 8 ore per il Tora.

Il tratto oggetto di studio si estende ben oltre il territorio comunale, sia per quel che riguarda la modellazione monodimensionale che per quel che riguarda la modellazione bidimensionale, al fine di evitare effetti al contorno. I risultati trovati sono comunque da ritenersi validi solamente nell'ambito del territorio comunale di Crespina Lorenzana.

3.1. Modello di calcolo a moto vario monodimensionale

La forma delle equazioni del moto vario (o equazioni di De Saint Venant) utilizzate in HEC-RAS è la seguente:

Equazione di continuità:

$$\frac{(\partial A)}{(\partial t)} + \frac{(\partial(\Phi \cdot Q))}{(\partial x_c)} + \frac{(\partial[(1-\Phi) \cdot Q])}{(\partial x_f)} = 0$$

Equazione di conservazione della quantità di moto:

$$\frac{(\partial Q)}{(\partial t)} + \frac{(\partial(\Phi^2 Q^2 / A_c))}{(\partial x_c)} + \frac{(\partial((1-\Phi)^2 Q^2 / A_f))}{(\partial x_f)} + g A_c \left[\frac{(\partial Z)}{(\partial x_c)} + S_{fc} \right] + g A_f \left[\frac{(\partial Z)}{(\partial x_f)} + S_{ff} \right] = 0$$

con:

$$Q_c = \Phi \cdot Q ; \quad \Phi = (K_c) / (K_c + K_f)$$

I pedici c ed f si riferiscono rispettivamente al *main channel* (alveo centrale) ed alle *floodplain* (aree golenali), Q rappresenta la portata, g l'accelerazione di gravità, x l'ascissa, t il tempo, K la *conveyance* (o fattore di trasporto) della sezione, Z la quota del pelo libero (somma della quota di fondo z e dell'altezza liquida y), A l'area liquida, S_r la pendenza della linea dell'energia.

HEC-RAS utilizza generalmente il modello completo delle equazioni di De Saint Venant. Nelle analisi in moto vario le tecniche di soluzione numerica delle equazioni del moto assumono un'importanza maggiore rispetto alle analisi a moto permanente. La soluzione numerica di tali equazioni in regime di corrente lenta è basata su un metodo alle differenze finite di tipo implicito a quattro punti, noto in letteratura come *box scheme*. Dalla discretizzazione alle differenze finite

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delle equazioni del moto applicate ad un tratto di corso d'acqua, e dall'applicazione delle condizioni al contorno, risulta un sistema lineare di N equazioni in N incognite, con N pari a 2 volte il numero di sezioni in cui è stato suddiviso il corso d'acqua meno le sezioni in cui sono state assegnate le condizioni al contorno. Tale sistema deve essere risolto ad ogni successivo istante di calcolo. Il sistema di equazioni lineari viene risolto con metodo iterativo, utilizzando l'algoritmo *skyline*, specificatamente pensato per la soluzione dei problemi di moto vario nelle reti a pelo libero.

Nel caso di corrente mista lenta o veloce HEC-RAS utilizza la tecnica LPI "*Local Partial Inertia*", mediante la quale si passa gradualmente dalla soluzione delle equazioni complete del moto alla soluzione del modello parabolico delle equazioni del moto vario. Il modello parabolico viene applicato dal programma soltanto nei tratti di corso d'acqua in cui si ha un numero di Froude maggiore di un valore soglia definibile dall'utente (generalmente si assume $Fr=1$, corrispondente al passaggio della corrente attraverso lo stato critico). Il modello matematico riesce così a garantire una buona stabilità di calcolo anche nei tratti interessati da corrente veloce o mista, pur mantenendo un'adeguata accuratezza di calcolo.

Per ulteriori dettagli sulle equazioni e gli algoritmi di calcolo si rimanda alla manualistica di HEC-RAS ed in particolare all'*Hydraulic Reference Manual*.

3.1. Modello di calcolo a moto vario bidimensionale

Il modello matematico bidimensionale utilizza le equazioni di conservazione della massa e della quantità di moto, che vengono risolte con uno schema ai volumi finiti.

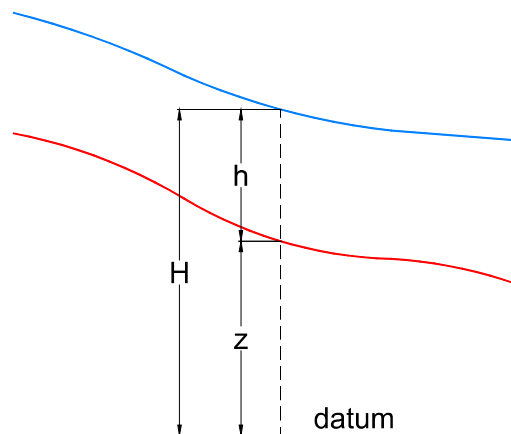


Figura 21: sistema di riferimento di Hec-Ras 2D: la quota del terreno è indicata con $z(x,y)$ l'altezza idrica con $h(x,y,t)$; la quota del pelo libero con $H(x,y,t) = z(x,y) + h(x,y,t)$

Conservazione della massa: assumendo il fluido incomprimibile, l'equazione differenziale della conservazione della massa (continuità) in moto vario è:

$$\frac{\partial H}{\partial t} + \frac{\partial (h \cdot u)}{\partial x} + \frac{\partial (h \cdot v)}{\partial y} + q = 0$$

in cui t è il tempo, u e v sono rispettivamente le componenti di velocità lungo le direzioni x ed y e q è la portata in ingresso ed in uscita dovuta a immissioni od uscite di acqua.

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Conservazione della quantità di moto: quando la dimensione orizzontale caratteristica dell'area di studio è molto maggiore della dimensione verticale, gli effetti legati alla componente verticale della velocità possono essere trascurati e si può assumere una distribuzione idrostatica delle pressioni, a partire dalle equazioni di Navier-Stokes. In tali ipotesi e nell'ipotesi di densità del fluido costante, l'equazione di conservazione della quantità di moto assume la seguente forma:

$$\frac{\partial u}{\partial t} + u \cdot \frac{\partial u}{\partial x} + v \cdot \frac{\partial v}{\partial y} = -g \cdot \frac{\partial H}{\partial x} + \nu_t \left(\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} \right) - c_f \cdot u + f \cdot v$$

$$\frac{\partial v}{\partial t} + u \cdot \frac{\partial v}{\partial x} + v \cdot \frac{\partial v}{\partial y} = -g \cdot \frac{\partial H}{\partial y} + \nu_t \left(\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2} \right) - c_f \cdot v - fu$$

in cui oltre ai simboli già illustrati, g è l'accelerazione di gravità, ν_t è il coefficiente di viscosità turbolenta, c_f è il coefficiente di attrito al fondo, ed f è il coefficiente di Coriolis.

Utilizzando la formula di Chézy il coefficiente di scabrezza sul fondo è dato da:

$$c_f = \frac{g \cdot |V|}{C^2 \cdot R}$$

in cui g è l'accelerazione di gravità, $|V|$ è il modulo del vettore velocità, C è il coefficiente di Chézy ed R è il raggio idraulico. Utilizzando la formula di Manning $C = R^{1/6} / n$, in cui n è il coefficiente di scabrezza di Manning, pertanto si ha:

$$c_f = \frac{n^2 \cdot g \cdot |V|}{R^{4/3}}$$

Per la modellazione del campo di moto HEC-RAS utilizza l'approccio batimetrico sub-grid sviluppato da Casulli. Con tale approccio si riesce a sfruttare informazioni topografiche ad alta risoluzione (ad esempio dati Lidar con passo della griglia pari ad 1m) pur utilizzando celle di calcolo a dimensione caratteristica maggiore rispetto alla risoluzione dei dati in ingresso. Per ogni singola cella di calcolo infatti in fase di preprocessione viene ricavata la legge di variazione con la quota del pelo libero delle grandezze idrauliche caratteristiche, basandosi sui dati topografici ad alta risoluzione relativi alla cella stessa. Vengono così determinate: curva di vaso della cella, area, contorno bagnato e raggio idraulico su ogni bordo della cella. Tale schema di risoluzione consente di sfruttare al massimo il dettaglio dei dati in ingresso.

3.2. Caratteristiche geometriche del modello idraulico e parametri di scabrezza

La geometria del modello (riportata in allegato) è stata implementata utilizzando sia rilievi topografici diretti commissionati dall'Amministrazione Comunale e redatti a cura del Geom. E. Storti, che i dati lidar disponibili per l'area in esame. Sono stati inoltre utilizzati i rilievi dell'asta della Tora forniti dal Consorzio di Bonifica 4 Basso Valdarno. Si è implementato un modello idraulico unico per la Tora ed il Rio, affluente di destra della Tora. Il tratto simulato della Tora giunge fino alla sezione a monte della confluenza con il Rio Cascine. In particolare:

- per la modellazione dell'alveo inciso si è fatto riferimento alle sezioni di rilievo topografico. L'ubicazione planimetrica delle sezioni di calcolo è riportata in allegato. Per una più corretta definizione della geometria di progetto sono state utilizzate anche delle sezioni interpolate,

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generate da HEC-RAS a partire dalle sezioni rilevate e ricostruite anche sulla base dei dati LIDAR disponibili.

- le caratteristiche topografiche della rete di calcolo 2D sono state desunte dal DTM generato dai dati LIDAR della Regione Toscana disponibili per l'area di studio, verificando la congruenza tra i rilievi disponibili ed i dati LIDAR. La rete di calcolo bidimensionale interessa le aree esterne all'alveo inciso ed è stata definita utilizzando le opzioni di discretizzazione automatica del dominio di calcolo presenti in RAS, definendo opportune break lines in corrispondenza di elementi morfologicamente ed idraulicamente significativi, quali strade, corsi d'acqua, rilevati, etc.

La rete bidimensionale è collegata al modello monodimensionale tramite delle lateral structure da cui si ha lo scambio di acqua (bidirezionale) tra modello monodimensionale e modello bidimensionale. La geometria delle lateral structure è ripresa dai dati dei rilievi topografici eseguiti, integrata ove necessario dai dati LIDAR.

3.3. Parametri di scabrezza e coefficienti di perdita concentrata

I coefficienti di scabrezza n di Manning sono stati fissati avvalendosi del confronto tra le caratteristiche dei tratti in esame ed altri corsi d'acqua di caratteristiche di scabrezza simili, per cui si hanno a disposizione misure di taratura di n . I valori adottati sono riportati nelle sezioni RAS in allegato.

Per l'alveo si è adottato un valore pari a 0.045, mentre per le aree golenali si è considerato un valore pari a 0.07, considerando anche la possibilità che la piena possa avvenire in condizioni di non perfetta manutenzione del corso d'acqua.

Sono stati inoltre assegnati coefficienti di perdita concentrata per contrazione/espansione variabili tra 0.1/0.3 e 0.6/0.8 a seconda delle caratteristiche di variazione della sezione.

Il coefficiente di scabrezza delle celle bidimensionali è stato assegnato a partire dall'uso del suolo derivato dal progetto Corine, secondo la seguente tabella di corrispondenza (ripresa da R. Pestana et al., 2013, *Calibration of 2d hydraulic inundation models in the floodplain region of the lower Tagus river*, ESA Living Planet Symposium 2013):

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Code	Designation	n
111	Continuous urban fabric	0.230
112	Discontinuous urban fabric	0.115
121	Industrial or commercial units	0.230
122	Roads and rail networks and associated land	0.038
124	Airports	0.230
131	Mineral extraction sites	0.104
132	Dump sites	0.115
133	Construction sites	0.115
142	Sport and leisure facilities	0.023
211	Non-irrigated arable land	0.043
212	Permanently irrigated land	0.043
213	Rice fields	0.023
221	Vineyards	0.043
222	Fruit trees and berry plantations	0.043
223	Olive groves	0.043
231	Pastures	0.298
241	Annual crops associated w/permanent crops	0.043
242	Complex cultivation patterns	0.023
243	Agriculture, w/significant natural vegetation	0.058
244	Agro-forestry areas	0.058
311	Broad-leaved forest	0.230
312	Coniferous forest	0.127
313	Mixed forest	0.230
321	Natural grasslands	0.039
322	Moors and heathland	0.058
323	Sclerophyllous vegetation	0.058
324	Transitional woodland-shrub	0.058
331	Beaches, dunes, sands	0.138
332	Bare rocks	0.104
333	Sparsely vegetated areas	0.104
334	Burnt areas	0.104
411	Inland marshes	0.115
511	Water courses	0.035
512	Water bodies	0.035

Tabella 15: valori del coefficiente di scabrezza sulle aree 2D (R. Pestana et al., 2014).

3.4. Condizioni al contorno ed idrogrammi di piena

Gli scenari simulati hanno tempo di ritorno pari a 30 e 200 anni.

Le condizioni al contorno di monte sono date dagli idrogrammi determinati in sede di analisi idrologica e precedentemente riportati.

Come condizione al contorno di valle della Tora si è assunta una pendenza della linea dell'energia pari a 0.001. Da notare che la propagazione verso monte degli eventuali effetti di valle risulta smorzata dalla presenza della briglia posta circa 215 m a valle dell'attraversamento della SP n.21 del Piano della Tora.

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3.5. Scenari simulati

Le simulazioni effettuate sono individuate da un codice analogo a quello utilizzato nella corrispondente simulazione idrologica, nella forma itTrxxxTpyyyh, dove it sta ad indicare che si sono impiegati ietogrammi triangolari xxx indica il tempo di ritorno in anni ed yyy la durata di pioggia espressa in ore.

Per ogni scenario di simulazione è stato implementato un diverso plan su RAS. La geometria considerata è la stessa in ogni plan.

Le durate prese in esame sono quelle relative ad idrogrammi generati da piogge di durata 2 e 3 ore (critiche per il Rio) e 6, 7 ed 8 ore (critiche per la Tora).

4. ANALISI DEI RISULTATI

I risultati dettagliati delle simulazioni RAS effettuate sono riportati in allegato alla presente relazione.

Per la visualizzazione delle condizioni di pericolosità delle aree di studio, in termini di altezze e velocità di esondazione si rimanda alle tavole grafiche allegate. Le aree di esondazione riportate costituiscono l'involuppo dei risultati delle diverse simulazioni condotte.

In particolare si ha:

- **Tavola 01. Planimetria generale di modellazione idraulica.**
- **Tavola 02. Planimetria aree di esondazione Tora e Rio per Tr 200 e 30 anni.**
- **Tavola 03. Altezze di esondazione per Tr 200 anni.**
- **Tavola 04. Velocità massima di esondazione per Tr 200 anni.**
- **Tavola 05. Pericolosità idraulica da PGRA.**

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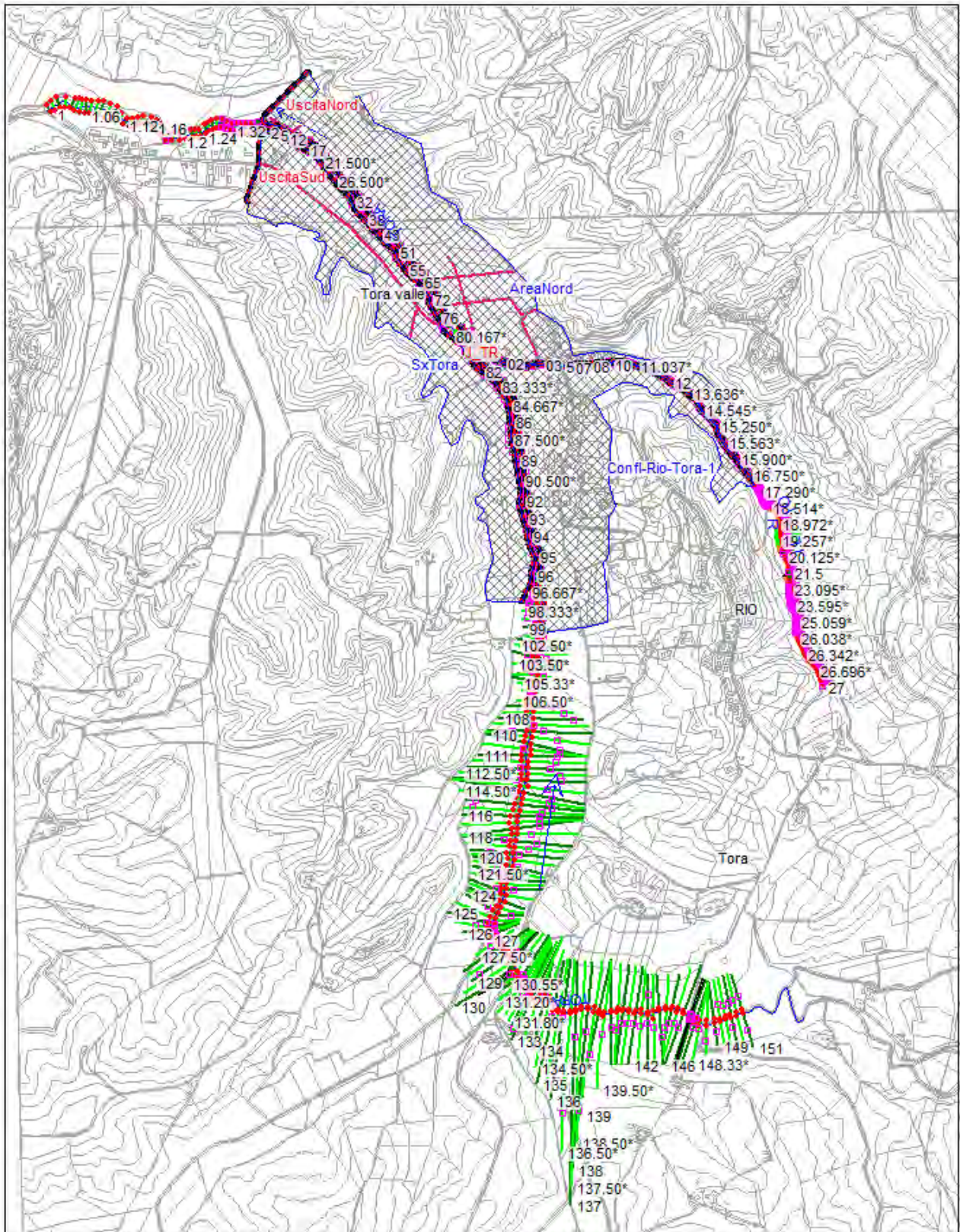
5. ALLEGATI

Si riportano nel seguito i risultati delle simulazioni eseguite:

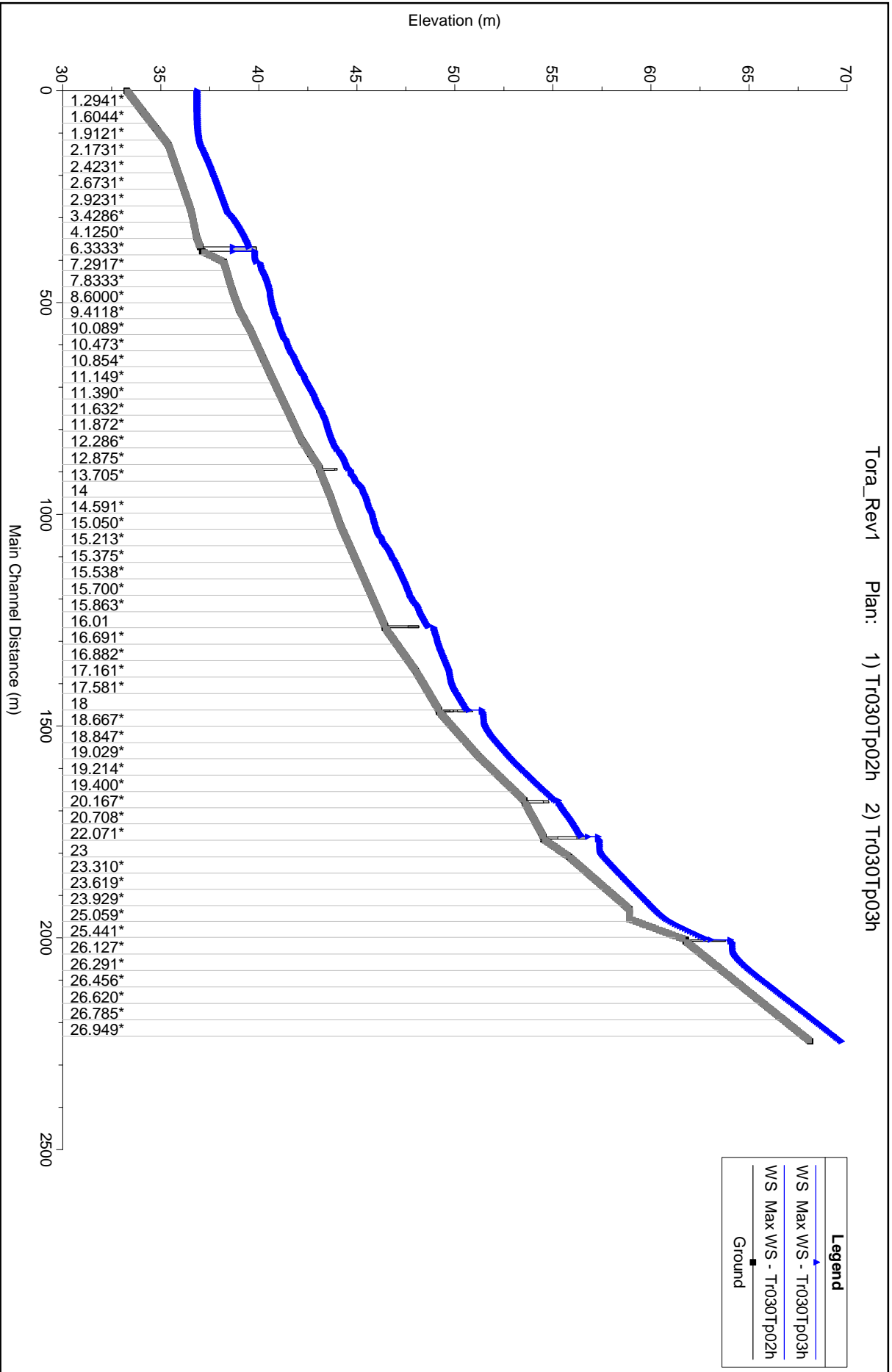
Allegati analisi idraulica:

1. Planimetria di modellazione;
2. Risultati modello RAS per Tr 30: planimetria scenari di esondazione, profili e tabelle;
3. Risultati modello RAS per Tr 200: planimetria scenari di esondazione, profili e tabelle;
4. Sezioni di calcolo RAS.

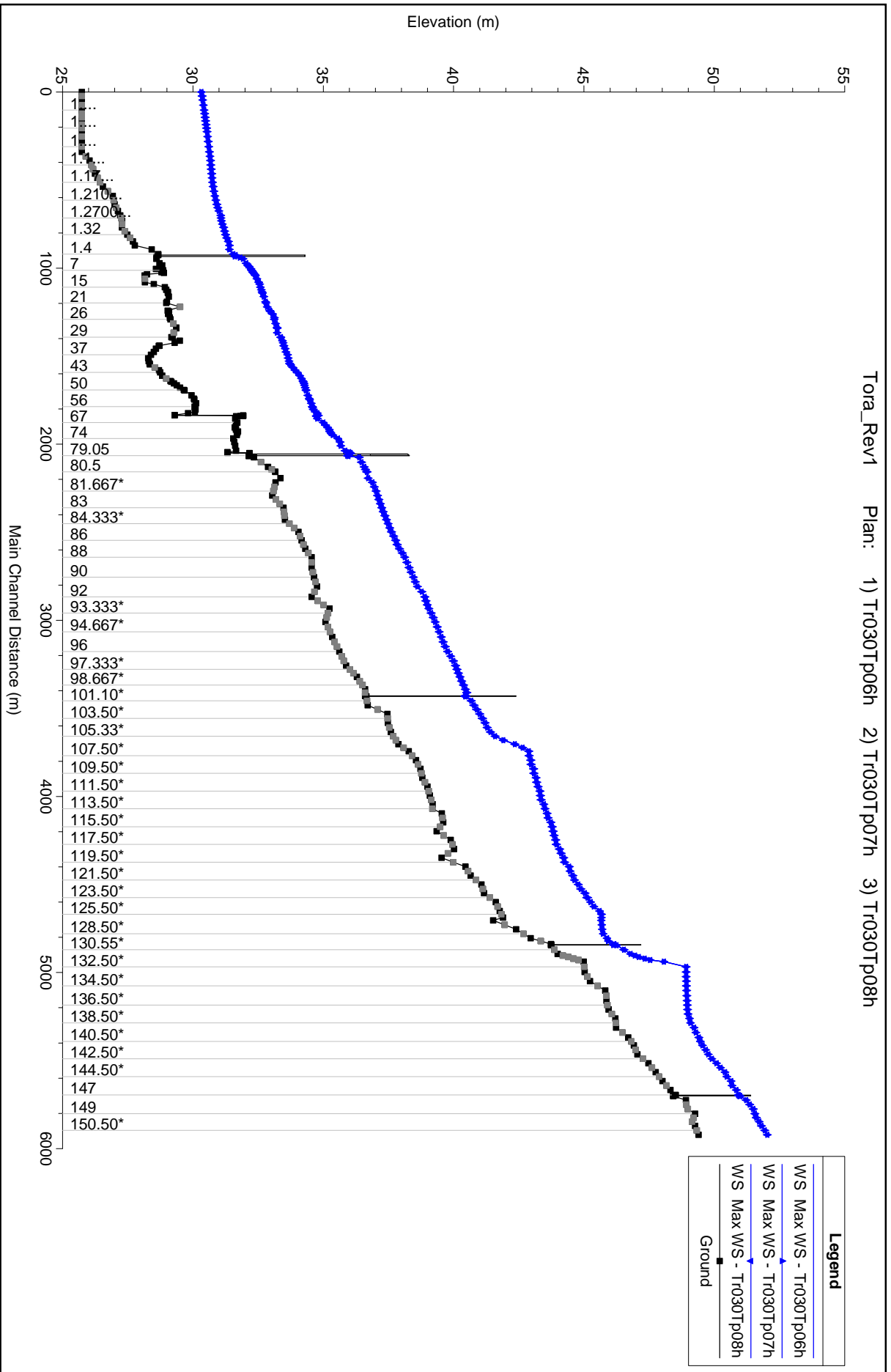
Allegato 1 - planimetria di modellazione



Allegato 2 - Risultati modello RAS per Tr 30



Tora_Rev1 Plan: 1) Tr030Tp06h 2) Tr030Tp07h 3) Tr030Tp08h



HEC-RAS Profile: Max WS

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	151	Tr030Tp02h	54.52	49.40	51.88		51.96	0.002851	1.50	57.72	76.64	0.39
TORA	Tora	151	Tr030Tp03h	61.51	49.40	51.97		52.05	0.002738	1.53	64.97	79.93	0.39
TORA	Tora	151	Tr030Tp06h	67.72	49.40	52.05		52.13	0.002636	1.55	71.44	82.64	0.38
TORA	Tora	151	Tr030Tp07h	67.10	49.40	52.04		52.13	0.002648	1.55	70.79	82.46	0.38
TORA	Tora	151	Tr030Tp08h	65.96	49.40	52.03		52.11	0.002669	1.55	69.61	82.15	0.38
TORA	Tora	150	Tr030Tp02h	54.51	49.26	51.66		51.80	0.004174	1.90	41.90	44.13	0.48
TORA	Tora	150	Tr030Tp03h	61.51	49.26	51.75		51.89	0.004220	1.98	45.85	46.00	0.48
TORA	Tora	150	Tr030Tp06h	67.72	49.26	51.82		51.98	0.004232	2.04	49.35	46.97	0.49
TORA	Tora	150	Tr030Tp07h	67.09	49.26	51.81		51.97	0.004233	2.04	49.00	46.87	0.49
TORA	Tora	150	Tr030Tp08h	65.96	49.26	51.80		51.95	0.004232	2.03	48.35	46.69	0.49
TORA	Tora	149	Tr030Tp02h	54.50	49.26	51.39		51.47	0.003774	1.53	61.34	100.03	0.44
TORA	Tora	149	Tr030Tp03h	61.49	49.26	51.49		51.56	0.003335	1.51	71.27	106.40	0.42
TORA	Tora	149	Tr030Tp06h	67.71	49.26	51.57		51.64	0.002982	1.49	80.26	109.96	0.40
TORA	Tora	149	Tr030Tp07h	67.08	49.26	51.56		51.63	0.003016	1.49	79.36	109.68	0.40
TORA	Tora	149	Tr030Tp08h	65.95	49.26	51.55		51.62	0.003079	1.49	77.69	109.08	0.40
TORA	Tora	148	Tr030Tp02h	54.50	48.91	51.00		51.21	0.006368	2.15	34.33	50.38	0.58
TORA	Tora	148	Tr030Tp03h	61.49	48.91	51.13		51.32	0.005680	2.11	41.18	55.55	0.55
TORA	Tora	148	Tr030Tp06h	67.71	48.91	51.24		51.42	0.005067	2.05	47.63	58.36	0.53
TORA	Tora	148	Tr030Tp07h	67.08	48.91	51.23		51.41	0.005131	2.06	46.97	58.26	0.53
TORA	Tora	148	Tr030Tp08h	65.95	48.91	51.21		51.39	0.005198	2.06	45.82	58.04	0.53
TORA	Tora	147.2	Tr030Tp02h	54.50	48.43	50.86		51.06	0.004417	2.02	26.99	13.37	0.45
TORA	Tora	147.2	Tr030Tp03h	61.49	48.43	50.93		51.18	0.005027	2.20	28.01	13.39	0.48
TORA	Tora	147.2	Tr030Tp06h	67.71	48.43	51.00		51.28	0.005547	2.34	28.90	13.40	0.51
TORA	Tora	147.2	Tr030Tp07h	67.08	48.43	50.99		51.27	0.005491	2.33	28.82	13.40	0.51
TORA	Tora	147.2	Tr030Tp08h	65.95	48.43	50.98		51.25	0.005396	2.30	28.66	13.39	0.50
TORA	Tora	147.1	Tr030Tp02h	54.50	48.43	50.85	50.02	51.06	0.004027	2.03	26.79	13.37	0.46
TORA	Tora	147.1	Tr030Tp03h	61.49	48.43	50.93	50.12	51.18	0.004545	2.21	27.77	13.38	0.49
TORA	Tora	147.1	Tr030Tp06h	67.71	48.43	50.99	50.21	51.28	0.004981	2.37	28.63	13.40	0.51
TORA	Tora	147.1	Tr030Tp07h	67.08	48.43	50.98	50.20	51.27	0.004935	2.35	28.55	13.40	0.51
TORA	Tora	147.1	Tr030Tp08h	65.95	48.43	50.97	50.18	51.25	0.004854	2.32	28.40	13.39	0.50
TORA	Tora	147.05 BR U	Tr030Tp02h	54.50	48.43	50.84	50.03	51.06	0.004745	2.07	26.31	12.95	0.43
TORA	Tora	147.05 BR U	Tr030Tp03h	61.49	48.43	50.91	50.13	51.17	0.005455	2.26	27.21	12.95	0.46
TORA	Tora	147.05 BR U	Tr030Tp06h	67.71	48.43	50.97	50.21	51.27	0.006079	2.42	27.99	12.95	0.48
TORA	Tora	147.05 BR U	Tr030Tp07h	67.08	48.43	50.96	50.20	51.26	0.006011	2.40	27.92	12.95	0.48
TORA	Tora	147.05 BR U	Tr030Tp08h	65.95	48.43	50.95	50.19	51.24	0.005889	2.37	27.79	12.95	0.48
TORA	Tora	147.05 BR D	Tr030Tp02h	54.50	48.51	50.81	50.01	51.03	0.004719	2.08	26.18	12.95	0.44
TORA	Tora	147.05 BR D	Tr030Tp03h	61.49	48.51	50.88	50.11	51.14	0.005462	2.28	27.02	12.95	0.47
TORA	Tora	147.05 BR D	Tr030Tp06h	67.71	48.51	50.93	50.20	51.23	0.006130	2.44	27.72	12.95	0.50
TORA	Tora	147.05 BR D	Tr030Tp07h	67.08	48.51	50.93	50.19	51.23	0.006062	2.43	27.66	12.95	0.50
TORA	Tora	147.05 BR D	Tr030Tp08h	65.95	48.51	50.92	50.17	51.21	0.005939	2.40	27.53	12.95	0.49
TORA	Tora	147	Tr030Tp02h	54.50	48.51	50.81		51.03	0.003697	2.06	26.48	13.63	0.46
TORA	Tora	147	Tr030Tp03h	61.49	48.51	50.88		51.14	0.004232	2.25	27.34	13.65	0.50
TORA	Tora	147	Tr030Tp06h	67.71	48.51	50.93		51.23	0.004707	2.41	28.05	13.68	0.53
TORA	Tora	147	Tr030Tp07h	67.08	48.51	50.93		51.22	0.004655	2.40	27.99	13.67	0.52
TORA	Tora	147	Tr030Tp08h	65.95	48.51	50.92		51.20	0.004567	2.37	27.87	13.67	0.52
TORA	Tora	146	Tr030Tp02h	54.50	48.32	50.73		50.89	0.003644	1.96	42.89	61.88	0.46
TORA	Tora	146	Tr030Tp03h	61.49	48.32	50.80		50.97	0.003862	2.07	47.28	65.11	0.47
TORA	Tora	146	Tr030Tp06h	67.70	48.32	50.86		51.04	0.004017	2.15	51.21	67.87	0.49
TORA	Tora	146	Tr030Tp07h	67.08	48.32	50.85		51.04	0.003999	2.15	50.84	67.61	0.48
TORA	Tora	146	Tr030Tp08h	65.95	48.32	50.84		51.02	0.003973	2.13	50.12	67.11	0.48
TORA	Tora	145	Tr030Tp02h	54.49	48.01	50.51		50.57	0.001645	1.37	73.53	86.30	0.31
TORA	Tora	145	Tr030Tp03h	61.48	48.01	50.59		50.65	0.001700	1.42	80.43	89.83	0.32
TORA	Tora	145	Tr030Tp06h	67.70	48.01	50.66		50.72	0.001731	1.47	86.66	92.91	0.32
TORA	Tora	145	Tr030Tp07h	67.08	48.01	50.65		50.72	0.001728	1.46	86.04	92.60	0.32
TORA	Tora	145	Tr030Tp08h	65.94	48.01	50.64		50.70	0.001723	1.46	84.92	92.05	0.32
TORA	Tora	144	Tr030Tp02h	54.49	47.75	50.28		50.38	0.002389	1.62	57.85	72.51	0.37
TORA	Tora	144	Tr030Tp03h	61.48	47.75	50.36		50.46	0.002508	1.70	63.38	78.53	0.38
TORA	Tora	144	Tr030Tp06h	67.70	47.75	50.42		50.53	0.002587	1.77	68.82	86.19	0.39
TORA	Tora	144	Tr030Tp07h	67.07	47.75	50.42		50.52	0.002575	1.76	68.27	85.15	0.39
TORA	Tora	144	Tr030Tp08h	65.94	47.75	50.40		50.51	0.002552	1.75	67.29	83.26	0.39
TORA	Tora	143	Tr030Tp02h	54.48	47.47	49.96		50.14	0.003926	1.99	40.63	66.55	0.47
TORA	Tora	143	Tr030Tp03h	61.46	47.47	50.03		50.22	0.004119	2.09	45.56	71.75	0.49
TORA	Tora	143	Tr030Tp06h	67.69	47.47	50.10		50.29	0.004172	2.16	50.56	76.66	0.49
TORA	Tora	143	Tr030Tp07h	67.07	47.47	50.09		50.29	0.004169	2.15	50.05	76.17	0.49
TORA	Tora	143	Tr030Tp08h	65.93	47.47	50.08		50.27	0.004163	2.14	49.12	75.28	0.49
TORA	Tora	142	Tr030Tp02h	54.47	47.04	49.64		49.81	0.004685	2.11	43.27	64.65	0.50
TORA	Tora	142	Tr030Tp03h	61.42	47.04	49.72		49.89	0.004786	2.20	48.37	69.81	0.51
TORA	Tora	142	Tr030Tp06h	67.67	47.04	49.78		49.96	0.004841	2.26	53.02	74.21	0.51
TORA	Tora	142	Tr030Tp07h	67.04	47.04	49.78		49.96	0.004826	2.25	52.62	73.83	0.51
TORA	Tora	142	Tr030Tp08h	65.91	47.04	49.77		49.94	0.004810	2.24	51.81	73.09	0.51
TORA	Tora	141	Tr030Tp02h	54.46	46.91	49.40		49.57	0.004776	2.17	46.63	73.35	0.51
TORA	Tora	141	Tr030Tp03h	61.19	46.91	49.48		49.65	0.004689	2.21	52.74	77.90	0.51
TORA	Tora	141	Tr030Tp06h	67.58	46.91	49.55		49.72	0.004626	2.26	58.82	84.35	0.51
TORA	Tora	141	Tr030Tp07h	66.97	46.91	49.55		49.72	0.004607	2.25	58.38	83.84	0.51
TORA	Tora	141	Tr030Tp08h	65.83	46.91	49.54		49.70	0.004587	2.23	57.47	82.76	0.51
TORA	Tora	140	Tr030Tp02h	54.44	46.70	49.26		49.35	0.002578	1.67	63.24	89.58	0.38
TORA	Tora	140	Tr030Tp03h	60.91	46.70	49.34		49.43	0.002599	1.72	70.80	99.10	0.39
TORA	Tora	140	Tr030Tp06h	67.45	46.70	49.41		49.51	0.002537	1.74	82.27	122.24	0.38
TORA	Tora	140	Tr030Tp07h	66.84	46.70	49.41		49.50	0.002526	1.74	81.75	122.06	0.38

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	140	Tr030Tp08h	65.80	46.70	49.40		49.49	0.002533	1.73	80.48	121.63	0.38
TORA	Tora	139	Tr030Tp02h	54.36	46.23	49.06		49.16	0.002894	1.67	57.67	95.81	0.40
TORA	Tora	139	Tr030Tp03h	60.20	46.23	49.15		49.24	0.002678	1.66	67.13	110.97	0.39
TORA	Tora	139	Tr030Tp06h	66.81	46.23	49.23		49.32	0.002589	1.68	76.76	126.06	0.38
TORA	Tora	139	Tr030Tp07h	66.30	46.23	49.23		49.32	0.002573	1.67	76.38	125.61	0.38
TORA	Tora	139	Tr030Tp08h	65.30	46.23	49.22		49.31	0.002574	1.67	75.12	124.12	0.38
TORA	Tora	138	Tr030Tp02h	52.68	46.20	48.82		48.90	0.002298	1.61	66.05	100.83	0.36
TORA	Tora	138	Tr030Tp03h	58.76	46.20	48.95		49.02	0.001854	1.51	80.66	109.68	0.33
TORA	Tora	138	Tr030Tp06h	65.03	46.20	49.06		49.12	0.001702	1.49	92.16	117.84	0.32
TORA	Tora	138	Tr030Tp07h	64.78	46.20	49.05		49.12	0.001697	1.49	91.95	117.64	0.32
TORA	Tora	138	Tr030Tp08h	64.11	46.20	49.04		49.11	0.001718	1.49	90.45	116.24	0.32
TORA	Tora	137	Tr030Tp02h	50.84	45.94	48.69		48.74	0.001438	1.31	78.66	111.37	0.29
TORA	Tora	137	Tr030Tp03h	57.95	45.94	48.85		48.90	0.001237	1.27	99.65	144.41	0.27
TORA	Tora	137	Tr030Tp06h	64.33	45.94	48.98		49.00	0.000697	0.99	194.23	399.35	0.21
TORA	Tora	137	Tr030Tp07h	64.23	45.94	48.98		49.00	0.000702	1.00	193.26	397.95	0.21
TORA	Tora	137	Tr030Tp08h	63.41	45.94	48.96		48.99	0.000725	1.01	187.15	389.25	0.21
TORA	Tora	136	Tr030Tp02h	50.61	45.86	48.66		48.67	0.000257	0.58	243.34	360.55	0.12
TORA	Tora	136	Tr030Tp03h	57.83	45.86	48.84		48.84	0.000179	0.51	307.32	379.09	0.10
TORA	Tora	136	Tr030Tp06h	64.27	45.86	48.97		48.97	0.000147	0.48	358.23	398.23	0.10
TORA	Tora	136	Tr030Tp07h	64.16	45.86	48.96		48.97	0.000148	0.48	357.26	397.86	0.10
TORA	Tora	136	Tr030Tp08h	63.38	45.86	48.95		48.95	0.000151	0.48	350.86	395.39	0.10
TORA	Tora	135	Tr030Tp02h	50.49	45.81	48.61		48.64	0.000676	0.90	93.73	107.18	0.20
TORA	Tora	135	Tr030Tp03h	57.74	45.81	48.80		48.83	0.000575	0.88	114.71	123.60	0.19
TORA	Tora	135	Tr030Tp06h	64.22	45.81	48.95		48.96	0.000277	0.64	233.69	297.63	0.13
TORA	Tora	135	Tr030Tp07h	64.11	45.81	48.95		48.96	0.000278	0.64	233.06	297.47	0.13
TORA	Tora	135	Tr030Tp08h	63.35	45.81	48.93		48.94	0.000286	0.65	227.99	295.78	0.13
TORA	Tora	134	Tr030Tp02h	50.46	45.24	48.60		48.60	0.000203	0.57	235.39	295.43	0.11
TORA	Tora	134	Tr030Tp03h	57.71	45.24	48.79		48.79	0.000149	0.51	292.64	310.79	0.10
TORA	Tora	134	Tr030Tp06h	64.20	45.24	48.94		48.94	0.000123	0.48	339.47	315.66	0.09
TORA	Tora	134	Tr030Tp07h	64.09	45.24	48.93		48.94	0.000123	0.48	338.70	315.65	0.09
TORA	Tora	134	Tr030Tp08h	63.34	45.24	48.92		48.92	0.000126	0.48	333.31	315.57	0.09
TORA	Tora	133	Tr030Tp02h	50.45	45.02	48.59		48.59	0.000122	0.37	296.80	294.56	0.07
TORA	Tora	133	Tr030Tp03h	57.70	45.02	48.78		48.78	0.000099	0.35	354.89	311.73	0.06
TORA	Tora	133	Tr030Tp06h	64.19	45.02	48.93		48.93	0.000085	0.33	402.18	316.56	0.06
TORA	Tora	133	Tr030Tp07h	64.09	45.02	48.93		48.93	0.000085	0.33	401.41	316.54	0.06
TORA	Tora	133	Tr030Tp08h	63.34	45.02	48.91		48.91	0.000087	0.33	395.91	316.40	0.06
TORA	Tora	132	Tr030Tp02h	50.44	44.99	47.80	47.96	48.91	0.045826	4.67	10.80	6.23	1.13
TORA	Tora	132	Tr030Tp03h	57.68	44.99	47.93	48.13	49.19	0.048257	4.96	11.63	6.28	1.16
TORA	Tora	132	Tr030Tp06h	64.19	44.99	48.07	48.29	49.42	0.048552	5.13	12.50	6.33	1.17
TORA	Tora	132	Tr030Tp07h	64.09	44.99	48.07	48.29	49.41	0.048566	5.13	12.49	6.33	1.17
TORA	Tora	132	Tr030Tp08h	63.33	44.99	48.05	48.28	49.39	0.048520	5.11	12.39	6.32	1.17
TORA	Tora	131	Tr030Tp02h	50.44	43.99	46.66	46.13	47.04	0.008216	2.75	19.83	26.88	0.64
TORA	Tora	131	Tr030Tp03h	57.26	43.99	46.67	46.28	47.16	0.010349	3.09	20.13	26.92	0.72
TORA	Tora	131	Tr030Tp06h	64.19	43.99	46.80	46.43	47.30	0.009979	3.17	23.58	27.38	0.72
TORA	Tora	131	Tr030Tp07h	64.09	43.99	46.80	46.42	47.29	0.009991	3.17	23.52	27.37	0.72
TORA	Tora	131	Tr030Tp08h	63.33	43.99	46.78	46.41	47.28	0.010072	3.17	23.10	27.32	0.72
TORA	Tora	130.1	Tr030Tp02h	50.43	43.74	45.92	45.48	46.45	0.010654	3.24	15.55	11.95	0.71
TORA	Tora	130.1	Tr030Tp03h	56.07	43.74	46.12	45.61	46.67	0.009935	3.28	17.08	12.43	0.69
TORA	Tora	130.1	Tr030Tp06h	64.19	43.74	46.26	45.78	46.90	0.010912	3.54	18.11	12.76	0.72
TORA	Tora	130.1	Tr030Tp07h	64.09	43.74	46.26	45.78	46.90	0.010919	3.54	18.09	12.75	0.73
TORA	Tora	130.1	Tr030Tp08h	63.15	43.74	46.24	45.76	46.87	0.010846	3.52	17.95	12.71	0.72
TORA	Tora	130.05 BR U	Tr030Tp02h	50.43	43.74	45.72	45.52	46.41	0.020073	3.69	13.68	7.11	0.84
TORA	Tora	130.05 BR U	Tr030Tp03h	56.07	43.74	46.03	45.65	46.66	0.016280	3.53	15.87	7.15	0.75
TORA	Tora	130.05 BR U	Tr030Tp06h	64.19	43.74	46.13	45.82	46.89	0.018746	3.86	16.62	7.16	0.80
TORA	Tora	130.05 BR U	Tr030Tp07h	64.09	43.74	46.13	45.82	46.89	0.018721	3.86	16.61	7.16	0.80
TORA	Tora	130.05 BR U	Tr030Tp08h	63.15	43.74	46.12	45.80	46.87	0.018312	3.81	16.57	7.16	0.79
TORA	Tora	130.05 BR D	Tr030Tp02h	50.43	43.74	45.76	45.42	46.34	0.016222	3.38	14.91	7.33	0.76
TORA	Tora	130.05 BR D	Tr030Tp03h	56.07	43.74	46.06	45.54	46.61	0.013593	3.28	17.10	7.31	0.69
TORA	Tora	130.05 BR D	Tr030Tp06h	64.19	43.74	46.17	45.71	46.83	0.015604	3.58	17.93	7.30	0.73
TORA	Tora	130.05 BR D	Tr030Tp07h	64.09	43.74	46.17	45.71	46.82	0.015585	3.58	17.92	7.30	0.73
TORA	Tora	130.05 BR D	Tr030Tp08h	63.15	43.74	46.16	45.69	46.80	0.015262	3.54	17.86	7.30	0.72
TORA	Tora	130	Tr030Tp02h	47.68	43.74	45.72		46.22	0.008047	3.12	15.27	15.41	0.71
TORA	Tora	130	Tr030Tp03h	56.07	43.74	46.04		46.55	0.006775	3.16	17.72	16.72	0.67
TORA	Tora	130	Tr030Tp06h	63.80	43.74	46.15		46.75	0.007479	3.43	18.59	17.18	0.71
TORA	Tora	130	Tr030Tp07h	63.70	43.74	46.15		46.75	0.007471	3.43	18.58	17.18	0.71
TORA	Tora	130	Tr030Tp08h	63.16	43.74	46.14		46.74	0.007417	3.41	18.53	17.15	0.70
TORA	Tora	129	Tr030Tp02h	47.53	42.95	45.77		45.90	0.003214	1.62	29.72	21.68	0.41
TORA	Tora	129	Tr030Tp03h	53.08	42.95	45.84		45.99	0.003508	1.72	31.31	23.16	0.43
TORA	Tora	129	Tr030Tp06h	63.76	42.95	45.88		46.09	0.004690	2.02	32.28	23.83	0.50
TORA	Tora	129	Tr030Tp07h	63.66	42.95	45.88		46.08	0.004680	2.01	32.27	23.82	0.50
TORA	Tora	129	Tr030Tp08h	63.11	42.95	45.87		46.08	0.004628	2.00	32.19	23.77	0.50
TORA	Tora	128	Tr030Tp02h	47.57	42.40	45.66		45.74	0.001564	1.25	38.43	22.67	0.30
TORA	Tora	128	Tr030Tp03h	52.46	42.40	45.71		45.81	0.001755	1.34	39.62	24.63	0.31
TORA	Tora	128	Tr030Tp06h	47.45	42.40	45.70		45.78	0.001463	1.22	39.32	23.04	0.29
TORA	Tora	128	Tr030Tp07h	49.13	42.40	45.70		45.78	0.001568	1.26	39.33	23.04	0.30
TORA	Tora	128	Tr030Tp08h	51.17	42.40	45.70		45.79	0.001701	1.31	39.32	23.04	0.31
TORA	Tora	127	Tr030Tp02h	47.58	41.51	45.62		45.68	0.000968	1.06	44.91	21.65	0.23
TORA	Tora	127	Tr030Tp03h	50.69	41.51	45.66		45.72	0.001037	1.11	45.84	21.83	0.24

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	127	Tr030Tp06h	46.86	41.51	45.66		45.71	0.000890	1.02	45.78	21.82	0.23
TORA	Tora	127	Tr030Tp07h	48.23	41.51	45.66		45.72	0.000935	1.05	45.92	21.84	0.23
TORA	Tora	127	Tr030Tp08h	50.51	41.51	45.66		45.72	0.001028	1.10	45.87	21.83	0.24
TORA	Tora	126	Tr030Tp02h	47.58	41.89	45.63		45.65	0.000466	0.74	78.32	42.86	0.17
TORA	Tora	126	Tr030Tp03h	43.02	41.89	45.67		45.69	0.000357	0.65	80.24	43.43	0.15
TORA	Tora	126	Tr030Tp06h	45.19	41.89	45.67		45.69	0.000395	0.69	80.16	43.41	0.15
TORA	Tora	126	Tr030Tp07h	46.44	41.89	45.68		45.70	0.000413	0.70	80.44	43.49	0.16
TORA	Tora	126	Tr030Tp08h	48.92	41.89	45.67		45.69	0.000461	0.74	80.26	43.44	0.17
TORA	Tora	125	Tr030Tp02h	46.23	41.77	45.57		45.62	0.000732	0.96	52.56	48.50	0.21
TORA	Tora	125	Tr030Tp03h	44.12	41.77	45.61		45.65	0.000628	0.90	54.37	49.58	0.19
TORA	Tora	125	Tr030Tp06h	46.06	41.77	45.60		45.65	0.000694	0.94	53.96	49.49	0.20
TORA	Tora	125	Tr030Tp07h	48.50	41.77	45.60		45.65	0.000767	0.99	54.05	49.51	0.21
TORA	Tora	125	Tr030Tp08h	50.73	41.77	45.60		45.65	0.000850	1.04	53.65	49.25	0.23
TORA	Tora	124	Tr030Tp02h	81.59	41.61	45.12		45.28	0.003052	1.85	50.55	49.49	0.42
TORA	Tora	124	Tr030Tp03h	91.95	41.61	45.21		45.40	0.003225	1.96	55.86	57.33	0.43
TORA	Tora	124	Tr030Tp06h	95.74	41.61	45.26		45.45	0.003177	1.98	58.81	60.28	0.43
TORA	Tora	124	Tr030Tp07h	94.21	41.61	45.26		45.44	0.003099	1.95	58.59	60.16	0.43
TORA	Tora	124	Tr030Tp08h	92.77	41.61	45.25		45.43	0.003060	1.93	58.04	59.88	0.42
TORA	Tora	123	Tr030Tp02h	81.58	41.17	44.87		45.05	0.003145	1.88	45.47	36.68	0.43
TORA	Tora	123	Tr030Tp03h	91.26	41.17	44.98		45.18	0.003241	1.98	50.18	46.19	0.44
TORA	Tora	123	Tr030Tp06h	94.41	41.17	45.06		45.25	0.003035	1.96	53.70	48.05	0.42
TORA	Tora	123	Tr030Tp07h	93.14	41.17	45.05		45.24	0.003019	1.95	53.11	47.74	0.42
TORA	Tora	123	Tr030Tp08h	92.17	41.17	45.02		45.21	0.003088	1.96	51.95	47.12	0.43
TORA	Tora	122	Tr030Tp02h	81.57	41.07	44.63		44.83	0.003809	2.00	41.00	26.55	0.46
TORA	Tora	122	Tr030Tp03h	90.26	41.07	44.73		44.95	0.003932	2.10	44.07	36.62	0.47
TORA	Tora	122	Tr030Tp06h	94.45	41.07	44.79		45.02	0.003874	2.13	46.50	42.95	0.47
TORA	Tora	122	Tr030Tp07h	93.31	41.07	44.79		45.01	0.003798	2.10	46.40	42.69	0.47
TORA	Tora	122	Tr030Tp08h	92.05	41.07	44.77		44.99	0.003787	2.09	45.81	41.24	0.47
TORA	Tora	121	Tr030Tp02h	81.55	40.66	44.41		44.58	0.002876	1.80	47.63	49.44	0.41
TORA	Tora	121	Tr030Tp03h	89.57	40.66	44.51		44.68	0.002934	1.86	52.48	50.68	0.41
TORA	Tora	121	Tr030Tp06h	94.73	40.66	44.60		44.77	0.002835	1.87	56.92	53.26	0.41
TORA	Tora	121	Tr030Tp07h	93.62	40.66	44.58		44.76	0.002827	1.87	56.27	53.10	0.41
TORA	Tora	121	Tr030Tp08h	91.80	40.66	44.56		44.73	0.002833	1.86	54.97	51.63	0.41
TORA	Tora	120	Tr030Tp02h	81.53	40.45	44.28		44.40	0.001997	1.57	57.58	51.19	0.34
TORA	Tora	120	Tr030Tp03h	89.23	40.45	44.37		44.50	0.002029	1.63	62.38	53.88	0.35
TORA	Tora	120	Tr030Tp06h	94.47	40.45	44.46		44.59	0.001967	1.64	67.01	57.29	0.35
TORA	Tora	120	Tr030Tp07h	93.51	40.45	44.45		44.58	0.001965	1.63	66.36	56.82	0.35
TORA	Tora	120	Tr030Tp08h	91.72	40.45	44.42		44.55	0.001972	1.63	65.01	55.81	0.35
TORA	Tora	119	Tr030Tp02h	81.51	39.54	44.05		44.16	0.002276	1.48	57.27	47.98	0.36
TORA	Tora	119	Tr030Tp03h	87.92	39.54	44.15		44.26	0.002174	1.50	62.36	53.14	0.35
TORA	Tora	119	Tr030Tp06h	94.40	39.54	44.25		44.36	0.002074	1.52	67.94	58.66	0.35
TORA	Tora	119	Tr030Tp07h	93.47	39.54	44.24		44.35	0.002079	1.51	67.25	58.00	0.35
TORA	Tora	119	Tr030Tp08h	91.69	39.54	44.21		44.32	0.002102	1.51	65.75	56.55	0.35
TORA	Tora	118	Tr030Tp02h	81.31	40.02	43.87		44.02	0.002269	1.77	55.98	54.15	0.37
TORA	Tora	118	Tr030Tp03h	87.84	40.02	43.98		44.13	0.002173	1.78	63.24	63.05	0.37
TORA	Tora	118	Tr030Tp06h	94.34	40.02	44.09		44.24	0.002053	1.79	70.42	67.17	0.36
TORA	Tora	118	Tr030Tp07h	93.36	40.02	44.07		44.22	0.002056	1.78	69.58	66.60	0.36
TORA	Tora	118	Tr030Tp08h	91.64	40.02	44.05		44.19	0.002085	1.78	67.69	65.27	0.36
TORA	Tora	117	Tr030Tp02h	81.29	39.88	43.73		43.85	0.001842	1.56	58.31	56.58	0.33
TORA	Tora	117	Tr030Tp03h	87.71	39.88	43.83		43.96	0.001799	1.59	64.60	64.68	0.33
TORA	Tora	117	Tr030Tp06h	94.14	39.88	43.94		44.07	0.001720	1.60	72.20	74.47	0.33
TORA	Tora	117	Tr030Tp07h	93.32	39.88	43.93		44.05	0.001726	1.60	71.30	73.14	0.33
TORA	Tora	117	Tr030Tp08h	91.55	39.88	43.90		44.03	0.001741	1.60	69.29	70.07	0.33
TORA	Tora	116	Tr030Tp02h	81.28	39.35	43.63		43.74	0.001557	1.49	60.40	48.56	0.31
TORA	Tora	116	Tr030Tp03h	87.63	39.35	43.73		43.85	0.001556	1.53	65.59	60.77	0.31
TORA	Tora	116	Tr030Tp06h	94.13	39.35	43.83		43.96	0.001546	1.57	73.43	88.56	0.31
TORA	Tora	116	Tr030Tp07h	93.29	39.35	43.82		43.94	0.001526	1.55	72.44	86.79	0.31
TORA	Tora	116	Tr030Tp08h	91.44	39.35	43.80		43.91	0.001527	1.54	70.30	80.38	0.31
TORA	Tora	115	Tr030Tp02h	81.25	39.60	43.55		43.66	0.001470	1.46	61.77	55.72	0.30
TORA	Tora	115	Tr030Tp03h	87.57	39.60	43.65		43.76	0.001473	1.50	67.89	73.91	0.30
TORA	Tora	115	Tr030Tp06h	94.11	39.60	43.75		43.87	0.001441	1.52	76.84	99.05	0.30
TORA	Tora	115	Tr030Tp07h	93.26	39.60	43.74		43.85	0.001441	1.52	75.77	96.29	0.30
TORA	Tora	115	Tr030Tp08h	91.45	39.60	43.72		43.83	0.001443	1.51	73.41	90.06	0.30
TORA	Tora	114	Tr030Tp02h	81.23	39.55	43.41		43.53	0.001750	1.52	63.88	75.78	0.32
TORA	Tora	114	Tr030Tp03h	87.40	39.55	43.50		43.62	0.001716	1.55	71.38	89.22	0.32
TORA	Tora	114	Tr030Tp06h	94.02	39.55	43.61		43.72	0.001638	1.56	81.66	110.34	0.32
TORA	Tora	114	Tr030Tp07h	93.23	39.55	43.60		43.71	0.001642	1.56	80.53	107.82	0.32
TORA	Tora	114	Tr030Tp08h	91.42	39.55	43.57		43.69	0.001654	1.55	77.93	102.79	0.32
TORA	Tora	113	Tr030Tp02h	81.17	39.19	43.29		43.41	0.001701	1.55	65.60	83.45	0.32
TORA	Tora	113	Tr030Tp03h	87.36	39.19	43.38		43.50	0.001678	1.58	73.24	93.70	0.32
TORA	Tora	113	Tr030Tp06h	94.01	39.19	43.48		43.60	0.001604	1.59	83.44	106.96	0.32
TORA	Tora	113	Tr030Tp07h	93.19	39.19	43.47		43.59	0.001607	1.58	82.37	105.60	0.32
TORA	Tora	113	Tr030Tp08h	91.41	39.19	43.45		43.56	0.001617	1.58	79.90	102.38	0.32
TORA	Tora	112	Tr030Tp02h	81.06	39.09	43.16		43.27	0.001658	1.50	72.90	123.39	0.32
TORA	Tora	112	Tr030Tp03h	87.31	39.09	43.25		43.35	0.001622	1.51	83.58	142.90	0.31
TORA	Tora	112	Tr030Tp06h	93.96	39.09	43.35		43.45	0.001486	1.49	99.63	160.59	0.30
TORA	Tora	112	Tr030Tp07h	93.15	39.09	43.34		43.44	0.001498	1.49	97.88	159.48	0.30
TORA	Tora	112	Tr030Tp08h	91.38	39.09	43.31		43.42	0.001525	1.50	94.02	157.03	0.31

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	111	Tr030Tp02h	81.03	38.99	43.07		43.18	0.001715	1.47	68.05	80.92	0.32
TORA	Tora	111	Tr030Tp03h	87.26	38.99	43.16		43.26	0.001729	1.50	74.84	87.33	0.32
TORA	Tora	111	Tr030Tp06h	93.94	38.99	43.26		43.37	0.001684	1.50	85.19	106.92	0.32
TORA	Tora	111	Tr030Tp07h	93.12	38.99	43.25		43.36	0.001680	1.50	84.06	104.59	0.32
TORA	Tora	111	Tr030Tp08h	91.38	38.99	43.23		43.33	0.001677	1.50	81.54	99.25	0.32
TORA	Tora	110	Tr030Tp02h	80.91	38.80	43.00		43.08	0.001383	1.31	85.38	103.86	0.28
TORA	Tora	110	Tr030Tp03h	87.20	38.80	43.08		43.16	0.001400	1.33	93.67	122.24	0.29
TORA	Tora	110	Tr030Tp06h	93.90	38.80	43.18		43.26	0.001343	1.34	108.20	144.67	0.28
TORA	Tora	110	Tr030Tp07h	93.12	38.80	43.17		43.25	0.001351	1.34	106.67	143.17	0.28
TORA	Tora	110	Tr030Tp08h	91.37	38.80	43.15		43.23	0.001368	1.34	103.22	139.96	0.28
TORA	Tora	109	Tr030Tp02h	80.79	38.73	42.90		42.97	0.001168	1.27	97.34	140.19	0.26
TORA	Tora	109	Tr030Tp03h	87.11	38.73	42.97		43.05	0.001150	1.29	108.72	152.23	0.26
TORA	Tora	109	Tr030Tp06h	93.89	38.73	43.09		43.15	0.001033	1.25	127.20	166.75	0.25
TORA	Tora	109	Tr030Tp07h	93.11	38.73	43.08		43.14	0.001042	1.25	125.28	165.05	0.25
TORA	Tora	109	Tr030Tp08h	91.37	38.73	43.05		43.12	0.001062	1.26	121.09	162.08	0.25
TORA	Tora	108	Tr030Tp02h	80.06	38.55	42.80		42.87	0.001087	1.23	102.21	149.91	0.25
TORA	Tora	108	Tr030Tp03h	87.01	38.55	42.87		42.94	0.001095	1.25	112.95	152.35	0.26
TORA	Tora	108	Tr030Tp06h	93.88	38.55	42.99		43.05	0.000991	1.21	131.13	159.04	0.25
TORA	Tora	108	Tr030Tp07h	93.10	38.55	42.98		43.04	0.000999	1.22	129.29	158.29	0.25
TORA	Tora	108	Tr030Tp08h	91.36	38.55	42.95		43.01	0.001015	1.22	125.31	156.65	0.25
TORA	Tora	107	Tr030Tp02h	80.07	38.27	42.71		42.78	0.001044	1.21	97.65	111.81	0.25
TORA	Tora	107	Tr030Tp03h	86.92	38.27	42.78		42.85	0.001076	1.25	105.61	116.01	0.25
TORA	Tora	107	Tr030Tp06h	93.88	38.27	42.91		42.97	0.000967	1.22	120.52	119.84	0.24
TORA	Tora	107	Tr030Tp07h	93.09	38.27	42.90		42.96	0.000975	1.22	119.09	119.69	0.24
TORA	Tora	107	Tr030Tp08h	91.36	38.27	42.87		42.93	0.000993	1.22	115.92	119.40	0.25
TORA	Tora	106	Tr030Tp02h	82.90	37.88	42.10		42.87	0.021062	3.90	21.28	8.86	0.80
TORA	Tora	106	Tr030Tp03h	86.92	37.88	42.25		43.00	0.019260	3.84	22.66	8.90	0.77
TORA	Tora	106	Tr030Tp06h	93.88	37.88	42.38		43.17	0.019518	3.95	23.79	8.94	0.77
TORA	Tora	106	Tr030Tp07h	93.09	37.88	42.36		43.15	0.019484	3.93	23.66	8.93	0.77
TORA	Tora	106	Tr030Tp08h	91.36	37.88	42.33		43.11	0.019399	3.91	23.39	8.92	0.77
TORA	Tora	105	Tr030Tp02h	81.45	37.59	41.23		41.53	0.007430	2.41	33.75	21.03	0.61
TORA	Tora	105	Tr030Tp03h	86.91	37.59	41.32		41.63	0.007177	2.43	35.71	21.42	0.60
TORA	Tora	105	Tr030Tp06h	93.87	37.59	41.44		41.75	0.006899	2.46	38.20	22.52	0.59
TORA	Tora	105	Tr030Tp07h	93.09	37.59	41.43		41.73	0.006920	2.46	37.93	22.45	0.60
TORA	Tora	105	Tr030Tp08h	91.36	37.59	41.40		41.70	0.006982	2.45	37.31	22.18	0.60
TORA	Tora	104	Tr030Tp02h	81.37	37.48	41.01		41.21	0.003898	2.01	40.46	21.39	0.47
TORA	Tora	104	Tr030Tp03h	86.91	37.48	41.11		41.32	0.003828	2.04	42.62	21.74	0.47
TORA	Tora	104	Tr030Tp06h	93.87	37.48	41.23		41.45	0.003744	2.07	45.36	22.92	0.46
TORA	Tora	104	Tr030Tp07h	93.09	37.48	41.22		41.44	0.003748	2.07	45.07	22.83	0.46
TORA	Tora	104	Tr030Tp08h	91.36	37.48	41.19		41.40	0.003764	2.06	44.40	22.62	0.46
TORA	Tora	103	Tr030Tp02h	81.27	37.46	40.79		41.01	0.004304	2.07	39.34	21.75	0.49
TORA	Tora	103	Tr030Tp03h	86.89	37.46	40.90		41.12	0.004149	2.08	41.76	22.87	0.48
TORA	Tora	103	Tr030Tp06h	93.87	37.46	41.03		41.25	0.003963	2.10	44.87	23.83	0.48
TORA	Tora	103	Tr030Tp07h	93.09	37.46	41.02		41.24	0.003973	2.10	44.55	23.74	0.48
TORA	Tora	103	Tr030Tp08h	91.36	37.46	40.98		41.21	0.004013	2.09	43.80	23.51	0.48
TORA	Tora	102	Tr030Tp02h	81.18	36.71	40.55		40.78	0.004435	2.14	37.97	19.58	0.49
TORA	Tora	102	Tr030Tp03h	86.89	36.71	40.67		40.90	0.004300	2.16	40.23	19.94	0.49
TORA	Tora	102	Tr030Tp06h	93.87	36.71	40.81		41.05	0.004124	2.18	43.07	20.39	0.48
TORA	Tora	102	Tr030Tp07h	93.09	36.71	40.79		41.03	0.004130	2.18	42.79	20.34	0.48
TORA	Tora	102	Tr030Tp08h	91.36	36.71	40.76		41.00	0.004163	2.17	42.12	20.24	0.48
TORA	Tora	100.2	Tr030Tp02h	81.11	36.65	40.28	38.92	40.60	0.002803	2.48	32.67	13.44	0.44
TORA	Tora	100.2	Tr030Tp03h	86.88	36.65	40.37	39.01	40.72	0.002930	2.59	33.59	13.56	0.45
TORA	Tora	100.2	Tr030Tp06h	93.87	36.65	40.49	39.11	40.86	0.003065	2.70	34.72	13.71	0.47
TORA	Tora	100.2	Tr030Tp07h	93.09	36.65	40.48	39.10	40.85	0.003042	2.69	34.62	13.70	0.46
TORA	Tora	100.2	Tr030Tp08h	91.35	36.65	40.45	39.07	40.81	0.003003	2.66	34.36	13.66	0.46
TORA	Tora	100.1 BR U	Tr030Tp02h	81.11	36.65	40.27	38.93	40.61	0.005335	2.57	31.51	8.70	0.43
TORA	Tora	100.1 BR U	Tr030Tp03h	86.88	36.65	40.36	39.02	40.73	0.005772	2.69	32.25	8.56	0.45
TORA	Tora	100.1 BR U	Tr030Tp06h	93.87	36.65	40.46	39.12	40.87	0.006301	2.83	33.12	8.39	0.46
TORA	Tora	100.1 BR U	Tr030Tp07h	93.09	36.65	40.45	39.11	40.86	0.006229	2.82	33.05	8.40	0.46
TORA	Tora	100.1 BR U	Tr030Tp08h	91.35	36.65	40.43	39.08	40.82	0.006088	2.78	32.86	8.44	0.46
TORA	Tora	100.1 BR D	Tr030Tp02h	81.11	36.60	40.27	38.82	40.59	0.005090	2.51	32.31	8.70	0.42
TORA	Tora	100.1 BR D	Tr030Tp03h	86.88	36.60	40.36	38.91	40.71	0.005515	2.63	33.05	8.56	0.43
TORA	Tora	100.1 BR D	Tr030Tp06h	93.87	36.60	40.46	39.02	40.85	0.006030	2.77	33.93	8.39	0.45
TORA	Tora	100.1 BR D	Tr030Tp07h	93.09	36.60	40.45	39.00	40.84	0.005960	2.75	33.86	8.40	0.45
TORA	Tora	100.1 BR D	Tr030Tp08h	91.35	36.60	40.43	38.98	40.81	0.005823	2.71	33.66	8.44	0.44
TORA	Tora	100	Tr030Tp02h	81.13	36.60	40.29		40.59	0.003319	2.40	33.77	11.52	0.42
TORA	Tora	100	Tr030Tp03h	86.89	36.60	40.38		40.70	0.003486	2.51	34.67	11.59	0.43
TORA	Tora	100	Tr030Tp06h	93.87	36.60	40.49		40.84	0.003671	2.62	35.76	11.67	0.45
TORA	Tora	100	Tr030Tp07h	93.09	36.60	40.48		40.83	0.003640	2.61	35.67	11.66	0.44
TORA	Tora	100	Tr030Tp08h	91.35	36.60	40.46		40.79	0.003587	2.58	35.43	11.64	0.44
TORA	Tora	99.99		Lat Struct									
TORA	Tora	99	Tr030Tp02h	81.12	36.61	40.25		40.44	0.003250	1.92	42.34	20.60	0.43
TORA	Tora	99	Tr030Tp03h	86.88	36.61	40.35		40.55	0.003250	1.96	44.39	20.89	0.43
TORA	Tora	99	Tr030Tp06h	93.87	36.61	40.47		40.68	0.003235	2.00	46.91	21.24	0.43
TORA	Tora	99	Tr030Tp07h	93.09	36.61	40.46		40.67	0.003222	1.99	46.70	21.22	0.43
TORA	Tora	99	Tr030Tp08h	91.35	36.61	40.44		40.64	0.003214	1.98	46.14	21.14	0.43
TORA	Tora	98	Tr030Tp02h	81.07	36.29	40.04		40.21	0.003167	1.84	44.14	22.68	0.42
TORA	Tora	98	Tr030Tp03h	86.87	36.29	40.14		40.32	0.003129	1.87	46.46	23.00	0.42

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	98	Tr030Tp06h	93.87	36.29	40.26		40.45	0.003089	1.90	49.29	23.50	0.42
TORA	Tora	98	Tr030Tp07h	93.08	36.29	40.25		40.44	0.003073	1.90	49.09	23.46	0.42
TORA	Tora	98	Tr030Tp08h	91.33	36.29	40.23		40.41	0.003066	1.88	48.47	23.35	0.42
TORA	Tora	97.98		Lat Struct									
TORA	Tora	97	Tr030Tp02h	81.16	35.88	39.87		40.02	0.002554	1.71	47.49	23.31	0.38
TORA	Tora	97	Tr030Tp03h	86.98	35.88	39.97		40.13	0.002529	1.74	49.93	23.60	0.38
TORA	Tora	97	Tr030Tp06h	94.04	35.88	40.10		40.26	0.002498	1.78	52.88	23.96	0.38
TORA	Tora	97	Tr030Tp07h	93.31	35.88	40.09		40.25	0.002486	1.77	52.69	23.94	0.38
TORA	Tora	97	Tr030Tp08h	91.59	35.88	40.06		40.22	0.002477	1.76	52.07	23.85	0.38
TORA	Tora	96	Tr030Tp02h	81.27	35.61	39.57		39.77	0.003574	1.99	40.76	19.74	0.44
TORA	Tora	96	Tr030Tp03h	87.11	35.61	39.67		39.88	0.003767	2.03	42.85	21.06	0.46
TORA	Tora	96	Tr030Tp06h	94.25	35.61	39.79		40.01	0.003931	2.07	45.43	22.46	0.47
TORA	Tora	96	Tr030Tp07h	93.60	35.61	39.78		40.00	0.003913	2.07	45.29	22.44	0.46
TORA	Tora	96	Tr030Tp08h	91.92	35.61	39.76		39.97	0.003698	2.05	44.77	21.37	0.45
TORA	Tora	95	Tr030Tp02h	81.39	35.35	39.32		39.47	0.002876	1.74	46.73	24.09	0.40
TORA	Tora	95	Tr030Tp03h	87.25	35.35	39.42		39.58	0.002835	1.77	49.20	24.39	0.40
TORA	Tora	95	Tr030Tp06h	94.48	35.35	39.54		39.71	0.002783	1.81	52.23	24.74	0.40
TORA	Tora	95	Tr030Tp07h	93.90	35.35	39.54		39.70	0.002770	1.80	52.09	24.73	0.40
TORA	Tora	95	Tr030Tp08h	92.27	35.35	39.52		39.68	0.002763	1.79	51.53	24.66	0.40
TORA	Tora	94	Tr030Tp02h	81.52	35.08	39.08		39.24	0.002590	1.76	46.39	21.85	0.39
TORA	Tora	94	Tr030Tp03h	87.39	35.08	39.19		39.35	0.002581	1.80	48.66	22.07	0.39
TORA	Tora	94	Tr030Tp06h	94.72	35.08	39.31		39.48	0.002578	1.84	51.38	22.32	0.39
TORA	Tora	94	Tr030Tp07h	94.22	35.08	39.30		39.48	0.002567	1.84	51.27	22.31	0.39
TORA	Tora	94	Tr030Tp08h	92.64	35.08	39.28		39.45	0.002554	1.82	50.78	22.26	0.39
TORA	Tora	93	Tr030Tp02h	81.64	35.24	38.84		39.02	0.003244	1.88	43.37	21.94	0.43
TORA	Tora	93	Tr030Tp03h	87.52	35.24	38.94		39.13	0.003200	1.92	45.68	22.22	0.43
TORA	Tora	93	Tr030Tp06h	94.93	35.24	39.07		39.26	0.003182	1.96	48.41	22.62	0.43
TORA	Tora	93	Tr030Tp07h	94.49	35.24	39.06		39.26	0.003172	1.96	48.31	22.61	0.43
TORA	Tora	93	Tr030Tp08h	92.97	35.24	39.04		39.23	0.003161	1.94	47.82	22.53	0.43
TORA	Tora	92	Tr030Tp02h	81.75	34.56	38.68		38.83	0.002264	1.67	48.99	22.00	0.36
TORA	Tora	92	Tr030Tp03h	87.63	34.56	38.79		38.94	0.002338	1.71	51.36	24.17	0.36
TORA	Tora	92	Tr030Tp06h	95.12	34.56	38.91		39.07	0.002346	1.76	54.43	28.12	0.37
TORA	Tora	92	Tr030Tp07h	94.74	34.56	38.90		39.06	0.002340	1.75	54.31	28.11	0.37
TORA	Tora	92	Tr030Tp08h	93.27	34.56	38.88		39.04	0.002328	1.74	53.75	27.67	0.37
TORA	Tora	91	Tr030Tp02h	81.82	34.76	38.41		38.63	0.004356	2.09	39.06	20.83	0.49
TORA	Tora	91	Tr030Tp03h	87.73	34.76	38.51		38.74	0.004317	2.13	41.16	21.52	0.49
TORA	Tora	91	Tr030Tp06h	95.28	34.76	38.62		38.87	0.004371	2.18	43.81	24.59	0.49
TORA	Tora	91	Tr030Tp07h	94.95	34.76	38.62		38.86	0.004365	2.18	43.70	24.42	0.49
TORA	Tora	91	Tr030Tp08h	93.53	34.76	38.60		38.84	0.004346	2.17	43.24	23.12	0.49
TORA	Tora	90	Tr030Tp02h	81.92	34.64	38.25		38.42	0.003158	1.80	45.52	24.32	0.42
TORA	Tora	90	Tr030Tp03h	87.81	34.64	38.35		38.52	0.003130	1.83	48.22	28.32	0.42
TORA	Tora	90	Tr030Tp06h	95.42	34.64	38.47		38.65	0.003053	1.87	51.73	30.91	0.42
TORA	Tora	90	Tr030Tp07h	95.14	34.64	38.47		38.64	0.003058	1.87	51.58	30.70	0.42
TORA	Tora	90	Tr030Tp08h	93.76	34.64	38.45		38.62	0.003072	1.86	50.93	30.01	0.42
TORA	Tora	89	Tr030Tp02h	81.92	34.55	38.08		38.25	0.003062	1.80	45.63	25.18	0.41
TORA	Tora	89	Tr030Tp03h	87.81	34.55	38.19		38.36	0.002961	1.83	48.32	26.06	0.41
TORA	Tora	89	Tr030Tp06h	95.39	34.55	38.31		38.49	0.002887	1.87	51.69	29.03	0.41
TORA	Tora	89	Tr030Tp07h	95.11	34.55	38.30		38.48	0.002894	1.87	51.53	29.03	0.41
TORA	Tora	89	Tr030Tp08h	93.76	34.55	38.28		38.46	0.002909	1.86	50.90	28.49	0.41
TORA	Tora	88	Tr030Tp02h	81.92	34.55	37.90		38.07	0.002992	1.83	45.50	27.67	0.42
TORA	Tora	88	Tr030Tp03h	87.81	34.55	38.01		38.19	0.002873	1.85	48.72	29.60	0.41
TORA	Tora	88	Tr030Tp06h	95.26	34.55	38.14		38.32	0.002767	1.88	52.70	30.99	0.41
TORA	Tora	88	Tr030Tp07h	94.98	34.55	38.14		38.32	0.002776	1.88	52.52	30.98	0.41
TORA	Tora	88	Tr030Tp08h	93.68	34.55	38.11		38.29	0.002801	1.88	51.78	30.94	0.41
TORA	Tora	87	Tr030Tp02h	81.91	34.31	37.69		37.92	0.003369	2.17	41.69	23.39	0.45
TORA	Tora	87	Tr030Tp03h	87.81	34.31	37.81		38.05	0.003263	2.20	44.56	25.15	0.44
TORA	Tora	87	Tr030Tp06h	95.42	34.31	37.94		38.19	0.003214	2.26	47.89	26.75	0.44
TORA	Tora	87	Tr030Tp07h	95.12	34.31	37.93		38.18	0.003221	2.26	47.73	26.64	0.44
TORA	Tora	87	Tr030Tp08h	93.75	34.31	37.91		38.15	0.003231	2.25	47.11	26.23	0.44
TORA	Tora	86	Tr030Tp02h	81.91	34.16	37.55		37.77	0.002594	2.14	45.00	22.15	0.40
TORA	Tora	86	Tr030Tp03h	87.81	34.16	37.67		37.90	0.002615	2.20	47.73	24.85	0.40
TORA	Tora	86	Tr030Tp06h	95.42	34.16	37.79		38.04	0.002659	2.28	51.01	27.15	0.41
TORA	Tora	86	Tr030Tp07h	95.12	34.16	37.79		38.03	0.002663	2.28	50.83	27.06	0.41
TORA	Tora	86	Tr030Tp08h	93.75	34.16	37.76		38.01	0.002661	2.27	50.21	26.71	0.41
TORA	Tora	85	Tr030Tp02h	81.91	34.05	37.39		37.64	0.003138	2.32	43.45	23.17	0.44
TORA	Tora	85	Tr030Tp03h	87.79	34.05	37.51		37.77	0.003127	2.38	46.33	25.54	0.45
TORA	Tora	85	Tr030Tp06h	95.42	34.05	37.63		37.91	0.003149	2.46	49.59	27.00	0.45
TORA	Tora	85	Tr030Tp07h	95.12	34.05	37.63		37.90	0.003155	2.46	49.42	26.92	0.45
TORA	Tora	85	Tr030Tp08h	93.75	34.05	37.60		37.87	0.003157	2.45	48.80	26.65	0.45
TORA	Tora	84	Tr030Tp02h	81.84	33.53	37.21		37.42	0.002520	2.15	47.61	23.37	0.40
TORA	Tora	84	Tr030Tp03h	87.72	33.53	37.34		37.55	0.002545	2.22	50.64	26.03	0.40
TORA	Tora	84	Tr030Tp06h	95.40	33.53	37.44		37.69	0.002782	2.37	53.68	33.34	0.42
TORA	Tora	84	Tr030Tp07h	95.11	33.53	37.43		37.69	0.002787	2.37	53.49	33.31	0.42
TORA	Tora	84	Tr030Tp08h	93.75	33.53	37.41		37.65	0.002681	2.31	52.85	33.06	0.42
TORA	Tora	83	Tr030Tp02h	81.70	33.47	37.04		37.25	0.002574	2.15	47.52	27.88	0.41
TORA	Tora	83	Tr030Tp03h	87.58	33.47	37.16		37.38	0.002514	2.19	51.10	29.60	0.41
TORA	Tora	83	Tr030Tp06h	95.38	33.47	37.26		37.50	0.002670	2.30	54.27	33.59	0.42
TORA	Tora	83	Tr030Tp07h	95.10	33.47	37.25		37.50	0.002678	2.30	54.04	33.52	0.42

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	83	Tr030Tp08h	93.74	33.47	37.23		37.47	0.002670	2.29	53.39	33.19	0.42
TORA	Tora	82	Tr030Tp02h	81.21	33.05	36.86		37.07	0.002474	2.16	48.34	25.71	0.40
TORA	Tora	82	Tr030Tp03h	86.84	33.05	37.00		37.21	0.002376	2.18	51.84	26.27	0.40
TORA	Tora	82	Tr030Tp06h	94.21	33.05	37.10		37.32	0.002475	2.28	54.46	26.75	0.41
TORA	Tora	82	Tr030Tp07h	93.99	33.05	37.09		37.32	0.002485	2.28	54.26	26.71	0.41
TORA	Tora	82	Tr030Tp08h	92.74	33.05	37.07		37.29	0.002481	2.27	53.72	26.60	0.41
TORA	Tora	81	Tr030Tp02h	80.45	33.16	36.63		36.86	0.002910	2.19	42.33	33.00	0.43
TORA	Tora	81	Tr030Tp03h	86.84	33.16	36.79		37.02	0.002662	2.18	47.80	33.38	0.41
TORA	Tora	81	Tr030Tp06h	93.14	33.16	36.90		37.14	0.002611	2.21	51.55	33.63	0.41
TORA	Tora	81	Tr030Tp07h	92.89	33.16	36.89		37.13	0.002631	2.21	51.24	33.61	0.41
TORA	Tora	81	Tr030Tp08h	91.82	33.16	36.87		37.11	0.002656	2.21	50.46	33.56	0.41
TORA	Tora	80.6	Tr030Tp02h	80.68	33.36	36.53		36.76	0.004210	2.15	39.54	25.61	0.49
TORA	Tora	80.6	Tr030Tp03h	90.03	33.36	36.66		36.91	0.004154	2.23	42.99	26.45	0.50
TORA	Tora	80.6	Tr030Tp06h	98.41	33.36	36.74		37.01	0.004343	2.34	45.10	26.67	0.51
TORA	Tora	80.6	Tr030Tp07h	98.07	33.36	36.73		37.00	0.004368	2.34	44.90	26.65	0.51
TORA	Tora	80.6	Tr030Tp08h	96.66	33.36	36.71		36.98	0.004369	2.32	44.43	26.60	0.51
TORA	Tora valle	80.5	Tr030Tp02h	87.24	33.16	36.44		36.60	0.003740	1.74	50.15	33.15	0.45
TORA	Tora valle	80.5	Tr030Tp03h	94.95	33.16	36.59		36.74	0.003763	1.71	55.54	38.02	0.45
TORA	Tora valle	80.5	Tr030Tp06h	100.23	33.16	36.69		36.84	0.003501	1.69	59.37	39.26	0.44
TORA	Tora valle	80.5	Tr030Tp07h	99.70	33.16	36.68		36.83	0.003520	1.69	59.05	39.19	0.44
TORA	Tora valle	80.5	Tr030Tp08h	98.48	33.16	36.66		36.81	0.003576	1.69	58.23	39.01	0.44
TORA	Tora valle	80.49		Lat Struct									
TORA	Tora valle	80.38		Lat Struct									
TORA	Tora valle	80.333	Tr030Tp02h	87.24	32.88	36.33		36.49	0.004028	1.79	48.74	32.70	0.47
TORA	Tora valle	80.333	Tr030Tp03h	94.95	32.88	36.48		36.64	0.003801	1.76	53.93	35.61	0.46
TORA	Tora valle	80.333	Tr030Tp06h	100.23	32.88	36.59		36.74	0.003502	1.73	57.87	36.85	0.44
TORA	Tora valle	80.333	Tr030Tp07h	99.70	32.88	36.58		36.73	0.003520	1.73	57.55	36.76	0.44
TORA	Tora valle	80.333	Tr030Tp08h	98.48	32.88	36.55		36.71	0.003575	1.74	56.72	36.54	0.45
TORA	Tora valle	80	Tr030Tp02h	87.24	32.34	36.09		36.26	0.004133	1.81	48.15	31.01	0.46
TORA	Tora valle	80	Tr030Tp03h	94.95	32.34	36.27		36.43	0.003563	1.76	53.80	32.29	0.44
TORA	Tora valle	80	Tr030Tp06h	100.23	32.34	36.40		36.55	0.003189	1.73	57.99	33.06	0.42
TORA	Tora valle	80	Tr030Tp07h	99.69	32.34	36.39		36.54	0.003205	1.73	57.68	33.00	0.42
TORA	Tora valle	80	Tr030Tp08h	98.48	32.34	36.36		36.52	0.003262	1.73	56.84	32.85	0.42
TORA	Tora valle	79.1	Tr030Tp02h	87.23	32.14	35.75	34.94	36.12	0.005501	2.70	32.35	24.99	0.56
TORA	Tora valle	79.1	Tr030Tp03h	94.95	32.14	35.88	35.05	36.27	0.005452	2.78	34.13	25.44	0.56
TORA	Tora valle	79.1	Tr030Tp06h	100.18	32.14	35.98	35.11	36.39	0.005303	2.82	35.54	25.79	0.55
TORA	Tora valle	79.1	Tr030Tp07h	99.69	32.14	35.98	35.10	36.38	0.005289	2.81	35.47	25.77	0.55
TORA	Tora valle	79.1	Tr030Tp08h	98.47	32.14	35.96	35.09	36.36	0.005282	2.80	35.22	25.71	0.55
TORA	Tora valle	79.05 BR U	Tr030Tp02h	87.23	32.14	35.75	34.88	36.20	0.009280	2.98	29.31	8.47	0.50
TORA	Tora valle	79.05 BR U	Tr030Tp03h	94.95	32.14	35.85	34.97	36.36	0.010364	3.15	30.14	8.06	0.52
TORA	Tora valle	79.05 BR U	Tr030Tp06h	100.18	32.14	35.93	35.04	36.47	0.011077	3.26	30.74	7.74	0.53
TORA	Tora valle	79.05 BR U	Tr030Tp07h	99.69	32.14	35.93	35.03	36.46	0.010987	3.25	30.72	7.75	0.53
TORA	Tora valle	79.05 BR U	Tr030Tp08h	98.47	32.14	35.91	35.01	36.44	0.010791	3.22	30.62	7.80	0.53
TORA	Tora valle	79.05 BR D	Tr030Tp02h	87.23	32.17	35.82	34.29	36.09	0.004626	2.32	37.58	8.20	0.39
TORA	Tora valle	79.05 BR D	Tr030Tp03h	94.95	32.17	35.92	34.39	36.23	0.005259	2.47	38.42	7.76	0.41
TORA	Tora valle	79.05 BR D	Tr030Tp06h	100.18	32.17	36.00	34.45	36.34	0.005698	2.57	39.02	7.42	0.42
TORA	Tora valle	79.05 BR D	Tr030Tp07h	99.69	32.17	36.00	34.44	36.33	0.005649	2.56	38.99	7.44	0.42
TORA	Tora valle	79.05 BR D	Tr030Tp08h	98.47	32.17	35.98	34.43	36.31	0.005535	2.53	38.89	7.50	0.41
TORA	Tora valle	79	Tr030Tp02h	87.23	32.17	35.85		36.06	0.002178	2.01	43.44	20.08	0.37
TORA	Tora valle	79	Tr030Tp03h	94.95	32.17	35.97		36.19	0.002280	2.11	45.08	21.74	0.38
TORA	Tora valle	79	Tr030Tp06h	100.19	32.17	36.06		36.29	0.002319	2.16	46.33	22.62	0.38
TORA	Tora valle	79	Tr030Tp07h	99.69	32.17	36.05		36.29	0.002306	2.15	46.26	22.60	0.38
TORA	Tora valle	79	Tr030Tp08h	98.47	32.17	36.04		36.27	0.002286	2.14	46.04	22.51	0.38
TORA	Tora valle	78.9	Tr030Tp02h	87.24	32.17	35.85	34.31	36.06	0.002184	2.01	43.41	20.06	0.37
TORA	Tora valle	78.9	Tr030Tp03h	94.95	32.17	35.97	34.41	36.19	0.002286	2.11	45.05	21.68	0.38
TORA	Tora valle	78.9	Tr030Tp06h	100.19	32.17	36.05	34.48	36.29	0.002325	2.16	46.29	22.61	0.38
TORA	Tora valle	78.9	Tr030Tp07h	99.69	32.17	36.05	34.48	36.29	0.002313	2.16	46.22	22.58	0.38
TORA	Tora valle	78.9	Tr030Tp08h	98.47	32.17	36.03	34.46	36.27	0.002293	2.14	46.01	22.49	0.38
TORA	Tora valle	78.5		Inl Struct									
TORA	Tora valle	78	Tr030Tp02h	87.24	31.32	35.80		35.92	0.001840	1.54	56.57	24.64	0.33
TORA	Tora valle	78	Tr030Tp03h	94.95	31.32	35.91		36.04	0.001878	1.60	59.51	24.99	0.33
TORA	Tora valle	78	Tr030Tp06h	100.19	31.32	36.00		36.14	0.002531	1.62	61.99	32.71	0.37
TORA	Tora valle	78	Tr030Tp07h	99.69	31.32	36.00		36.13	0.002506	1.61	61.82	32.47	0.37
TORA	Tora valle	78	Tr030Tp08h	98.47	31.32	35.98		36.11	0.002301	1.61	61.33	30.22	0.36
TORA	Tora valle	77	Tr030Tp02h	87.23	31.66	35.64		35.88	0.004955	2.16	40.43	22.59	0.51
TORA	Tora valle	77	Tr030Tp03h	94.95	31.66	35.76		36.01	0.004850	2.20	43.09	22.92	0.51
TORA	Tora valle	77	Tr030Tp06h	100.17	31.66	35.85		36.10	0.004708	2.22	45.11	23.16	0.51
TORA	Tora valle	77	Tr030Tp07h	99.68	31.66	35.85		36.10	0.004691	2.21	45.01	23.15	0.51
TORA	Tora valle	77	Tr030Tp08h	98.47	31.66	35.83		36.08	0.004678	2.20	44.69	23.11	0.51
TORA	Tora valle	76.99		Lat Struct									
TORA	Tora valle	76.98		Lat Struct									
TORA	Tora valle	76	Tr030Tp02h	87.23	31.62	35.47		35.73	0.005347	2.27	38.50	21.12	0.54
TORA	Tora valle	76	Tr030Tp03h	94.95	31.62	35.59		35.86	0.005260	2.32	41.01	21.50	0.54
TORA	Tora valle	76	Tr030Tp06h	100.13	31.62	35.68		35.96	0.005083	2.33	43.02	21.79	0.53
TORA	Tora valle	76	Tr030Tp07h	99.65	31.62	35.68		35.95	0.005058	2.32	42.96	21.78	0.53

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	76	Tr030Tp08h	98.46	31.62	35.67		35.94	0.005032	2.31	42.68	21.74	0.53
TORA	Tora valle	75	Tr030Tp02h	87.23	31.58	35.44		35.61	0.003441	1.86	46.96	25.51	0.44
TORA	Tora valle	75	Tr030Tp03h	94.94	31.58	35.56		35.74	0.003385	1.89	50.12	26.12	0.44
TORA	Tora valle	75	Tr030Tp06h	100.11	31.58	35.66		35.84	0.003266	1.90	52.68	26.60	0.43
TORA	Tora valle	75	Tr030Tp07h	99.64	31.58	35.65		35.84	0.003250	1.89	52.60	26.58	0.43
TORA	Tora valle	75	Tr030Tp08h	98.45	31.58	35.64		35.82	0.003233	1.88	52.26	26.52	0.43
TORA	Tora valle	74	Tr030Tp02h	87.23	31.55	35.33		35.53	0.004665	1.99	43.73	26.97	0.50
TORA	Tora valle	74	Tr030Tp03h	94.94	31.55	35.46		35.67	0.004340	2.01	47.28	27.25	0.49
TORA	Tora valle	74	Tr030Tp06h	100.05	31.55	35.57		35.77	0.004013	1.99	50.16	27.47	0.47
TORA	Tora valle	74	Tr030Tp07h	99.57	31.55	35.56		35.76	0.003988	1.99	50.10	27.46	0.47
TORA	Tora valle	74	Tr030Tp08h	98.43	31.55	35.55		35.75	0.003984	1.98	49.75	27.44	0.47
TORA	Tora valle	73	Tr030Tp02h	87.38	31.68	35.12		35.41	0.006558	2.39	36.51	21.89	0.59
TORA	Tora valle	73	Tr030Tp03h	95.13	31.68	35.25		35.54	0.006935	2.40	39.56	24.62	0.61
TORA	Tora valle	73	Tr030Tp06h	98.89	31.68	35.37		35.65	0.006528	2.31	42.74	26.99	0.59
TORA	Tora valle	73	Tr030Tp07h	99.95	31.68	35.37		35.65	0.006700	2.34	42.68	26.98	0.59
TORA	Tora valle	73	Tr030Tp08h	98.85	31.68	35.36		35.63	0.006727	2.34	42.32	26.96	0.60
TORA	Tora valle	72	Tr030Tp02h	87.45	31.70	35.06		35.34	0.006021	2.35	37.27	21.72	0.57
TORA	Tora valle	72	Tr030Tp03h	95.24	31.70	35.18		35.47	0.006364	2.38	40.01	23.84	0.59
TORA	Tora valle	72	Tr030Tp06h	99.09	31.70	35.30		35.57	0.006550	2.29	43.29	28.12	0.59
TORA	Tora valle	72	Tr030Tp07h	100.16	31.70	35.30		35.58	0.006737	2.32	43.20	28.11	0.60
TORA	Tora valle	72	Tr030Tp08h	99.08	31.70	35.29		35.56	0.006772	2.31	42.83	28.09	0.60
TORA	Tora valle	71	Tr030Tp02h	87.53	31.73	35.02		35.28	0.005253	2.25	38.95	21.91	0.54
TORA	Tora valle	71	Tr030Tp03h	95.33	31.73	35.14		35.41	0.005298	2.29	41.57	22.84	0.54
TORA	Tora valle	71	Tr030Tp06h	99.35	31.73	35.25		35.51	0.005866	2.23	44.50	27.80	0.56
TORA	Tora valle	71	Tr030Tp07h	100.34	31.73	35.25		35.51	0.006025	2.26	44.39	27.77	0.57
TORA	Tora valle	71	Tr030Tp08h	99.29	31.73	35.24		35.50	0.006024	2.25	44.06	27.69	0.57
TORA	Tora valle	70	Tr030Tp02h	87.62	31.65	35.02		35.21	0.003644	1.93	45.31	24.59	0.45
TORA	Tora valle	70	Tr030Tp03h	95.46	31.65	35.14		35.34	0.003587	1.98	48.27	24.99	0.45
TORA	Tora valle	70	Tr030Tp06h	99.75	31.65	35.24		35.44	0.003621	1.96	50.95	27.06	0.46
TORA	Tora valle	70	Tr030Tp07h	100.62	31.65	35.24		35.44	0.003690	1.98	50.86	26.97	0.46
TORA	Tora valle	70	Tr030Tp08h	99.60	31.65	35.23		35.42	0.003637	1.97	50.56	26.68	0.46
TORA	Tora valle	69	Tr030Tp02h	87.70	31.60	34.95		35.16	0.004060	2.03	43.31	23.61	0.48
TORA	Tora valle	69	Tr030Tp03h	95.56	31.60	35.07		35.29	0.003995	2.07	46.13	23.97	0.48
TORA	Tora valle	69	Tr030Tp06h	100.07	31.60	35.18		35.39	0.003908	2.06	48.61	25.12	0.47
TORA	Tora valle	69	Tr030Tp07h	100.84	31.60	35.17		35.39	0.003980	2.08	48.52	25.05	0.48
TORA	Tora valle	69	Tr030Tp08h	99.85	31.60	35.16		35.38	0.003935	2.07	48.25	24.85	0.47
TORA	Tora valle	68	Tr030Tp02h	87.81	31.64	34.87		35.10	0.004538	2.12	41.41	22.81	0.50
TORA	Tora valle	68	Tr030Tp03h	95.70	31.64	34.99		35.23	0.004466	2.17	44.14	23.20	0.50
TORA	Tora valle	68	Tr030Tp06h	100.47	31.64	35.09		35.33	0.004215	2.16	46.53	23.53	0.49
TORA	Tora valle	68	Tr030Tp07h	101.11	31.64	35.09		35.33	0.004294	2.18	46.44	23.52	0.49
TORA	Tora valle	68	Tr030Tp08h	100.16	31.64	35.08		35.32	0.004279	2.17	46.20	23.49	0.49
TORA	Tora valle	67	Tr030Tp02h	88.00	31.70	34.79		35.03	0.004716	2.17	40.62	22.11	0.51
TORA	Tora valle	67	Tr030Tp03h	96.13	31.70	34.91		35.16	0.004687	2.23	43.16	22.32	0.51
TORA	Tora valle	67	Tr030Tp06h	101.59	31.70	35.00		35.26	0.004519	2.24	45.33	22.50	0.50
TORA	Tora valle	67	Tr030Tp07h	102.07	31.70	35.00		35.26	0.004587	2.26	45.24	22.49	0.51
TORA	Tora valle	67	Tr030Tp08h	101.11	31.70	34.99		35.25	0.004565	2.25	45.03	22.48	0.51
TORA	Tora valle	66	Tr030Tp02h	88.07	31.62	34.53		34.87	0.008151	2.60	33.87	21.45	0.66
TORA	Tora valle	66	Tr030Tp03h	96.05	31.62	34.67		35.02	0.007466	2.60	37.01	21.98	0.64
TORA	Tora valle	66	Tr030Tp06h	101.57	31.62	34.79		35.12	0.006906	2.57	39.49	22.39	0.62
TORA	Tora valle	66	Tr030Tp07h	101.86	31.62	34.78		35.12	0.007002	2.59	39.38	22.38	0.62
TORA	Tora valle	66	Tr030Tp08h	101.01	31.62	34.77		35.11	0.007009	2.58	39.14	22.34	0.62
TORA	Tora valle	65	Tr030Tp02h	88.16	31.66	34.48		34.76	0.006747	2.36	37.43	23.42	0.59
TORA	Tora valle	65	Tr030Tp03h	96.17	31.66	34.63		34.91	0.006082	2.35	40.97	23.68	0.57
TORA	Tora valle	65	Tr030Tp06h	101.95	31.66	34.75		35.02	0.005584	2.33	43.77	23.89	0.55
TORA	Tora valle	65	Tr030Tp07h	102.11	31.66	34.74		35.02	0.005641	2.34	43.66	23.88	0.55
TORA	Tora valle	65	Tr030Tp08h	101.29	31.66	34.73		35.01	0.005660	2.33	43.39	23.86	0.55
TORA	Tora valle	64	Tr030Tp02h	88.17	31.83	34.47		34.75	0.007023	2.35	37.47	24.30	0.61
TORA	Tora valle	64	Tr030Tp03h	96.18	31.83	34.62		34.90	0.006255	2.33	41.22	24.68	0.58
TORA	Tora valle	64	Tr030Tp06h	101.99	31.83	34.74		35.01	0.005724	2.31	44.19	25.07	0.56
TORA	Tora valle	64	Tr030Tp07h	102.14	31.83	34.74		35.01	0.005781	2.32	44.08	25.05	0.56
TORA	Tora valle	64	Tr030Tp08h	101.32	31.83	34.73		35.00	0.005800	2.31	43.78	25.00	0.56
TORA	Tora valle	63	Tr030Tp02h	88.17	31.93	34.48		34.74	0.006529	2.25	39.15	24.63	0.57
TORA	Tora valle	63	Tr030Tp03h	96.19	31.93	34.63		34.89	0.005811	2.24	42.91	24.63	0.54
TORA	Tora valle	63	Tr030Tp06h	102.02	31.93	34.75		35.00	0.005310	2.23	45.82	24.64	0.52
TORA	Tora valle	63	Tr030Tp07h	102.16	31.93	34.75		35.00	0.005360	2.23	45.72	24.64	0.52
TORA	Tora valle	63	Tr030Tp08h	101.35	31.93	34.73		34.99	0.005384	2.23	45.43	24.64	0.52
TORA	Tora valle	62	Tr030Tp02h	88.19	31.93	34.55	33.41	34.69	0.002164	1.63	54.18	23.98	0.35
TORA	Tora valle	62	Tr030Tp03h	96.21	31.93	34.70	33.47	34.84	0.002116	1.67	57.72	23.99	0.34
TORA	Tora valle	62	Tr030Tp06h	102.08	31.93	34.81	33.52	34.96	0.002063	1.69	60.46	23.99	0.34
TORA	Tora valle	62	Tr030Tp07h	102.20	31.93	34.81	33.52	34.96	0.002077	1.69	60.37	23.99	0.34
TORA	Tora valle	62	Tr030Tp08h	101.40	31.93	34.80	33.51	34.94	0.002074	1.69	60.09	23.99	0.34
TORA	Tora valle	61.2		Inl Struct									
TORA	Tora valle	61	Tr030Tp02h	88.19	29.30	34.52		34.57	0.000448	0.97	91.18	26.70	0.17
TORA	Tora valle	61	Tr030Tp03h	96.21	29.30	34.67		34.72	0.000471	1.01	95.04	26.87	0.17
TORA	Tora valle	61	Tr030Tp06h	102.08	29.30	34.78		34.83	0.000484	1.04	98.04	26.99	0.17
TORA	Tora valle	61	Tr030Tp07h	102.20	29.30	34.78		34.83	0.000487	1.04	97.96	26.99	0.17
TORA	Tora valle	61	Tr030Tp08h	101.40	29.30	34.76		34.82	0.000483	1.04	97.65	26.98	0.17

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	60.49		Lat Struct									
TORA	Tora valle	60	Tr030Tp02h	88.27	29.81	34.52		34.56	0.000381	0.90	98.75	33.43	0.16
TORA	Tora valle	60	Tr030Tp03h	96.32	29.81	34.67		34.71	0.000396	0.94	103.72	35.28	0.16
TORA	Tora valle	60	Tr030Tp06h	102.39	29.81	34.78		34.83	0.000405	0.96	107.73	36.69	0.17
TORA	Tora valle	60	Tr030Tp07h	102.42	29.81	34.78		34.82	0.000406	0.96	107.61	36.65	0.17
TORA	Tora valle	60	Tr030Tp08h	101.64	29.81	34.76		34.81	0.000404	0.96	107.19	36.50	0.17
TORA	Tora valle	59	Tr030Tp02h	88.33	30.08	34.46		34.55	0.001312	1.38	64.06	26.46	0.28
TORA	Tora valle	59	Tr030Tp03h	96.39	30.08	34.60		34.70	0.001325	1.42	67.85	26.95	0.29
TORA	Tora valle	59	Tr030Tp06h	102.62	30.08	34.71		34.82	0.001317	1.45	70.91	29.20	0.29
TORA	Tora valle	59	Tr030Tp07h	102.58	30.08	34.71		34.81	0.001320	1.45	70.83	29.14	0.29
TORA	Tora valle	59	Tr030Tp08h	101.82	30.08	34.69		34.80	0.001319	1.45	70.49	28.88	0.29
TORA	Tora valle	58	Tr030Tp02h	88.41	30.10	34.38		34.53	0.002204	1.71	51.77	22.36	0.36
TORA	Tora valle	58	Tr030Tp03h	96.51	30.10	34.52		34.67	0.002219	1.76	54.90	22.79	0.36
TORA	Tora valle	58	Tr030Tp06h	102.98	30.10	34.62		34.79	0.002232	1.80	57.33	23.11	0.36
TORA	Tora valle	58	Tr030Tp07h	102.83	30.10	34.62		34.78	0.002232	1.80	57.27	23.10	0.36
TORA	Tora valle	58	Tr030Tp08h	102.11	30.10	34.61		34.77	0.002230	1.79	57.01	23.07	0.36
TORA	Tora valle	57	Tr030Tp02h	88.41	30.08	34.35		34.50	0.002151	1.70	51.96	22.05	0.35
TORA	Tora valle	57	Tr030Tp03h	96.51	30.08	34.49		34.65	0.002175	1.75	55.04	22.48	0.36
TORA	Tora valle	57	Tr030Tp06h	102.98	30.08	34.60		34.76	0.002195	1.79	57.42	22.81	0.36
TORA	Tora valle	57	Tr030Tp07h	102.83	30.08	34.60		34.76	0.002194	1.79	57.37	22.81	0.36
TORA	Tora valle	57	Tr030Tp08h	102.11	30.08	34.58		34.75	0.002191	1.79	57.11	22.77	0.36
TORA	Tora valle	56	Tr030Tp02h	88.41	30.06	34.34		34.49	0.002120	1.69	52.37	22.40	0.35
TORA	Tora valle	56	Tr030Tp03h	96.51	30.06	34.48		34.64	0.002140	1.74	55.49	22.83	0.36
TORA	Tora valle	56	Tr030Tp06h	102.98	30.06	34.59		34.75	0.002152	1.78	57.92	23.68	0.36
TORA	Tora valle	56	Tr030Tp07h	102.83	30.06	34.59		34.75	0.002152	1.78	57.86	23.62	0.36
TORA	Tora valle	56	Tr030Tp08h	102.11	30.06	34.57		34.73	0.002152	1.77	57.60	23.33	0.36
TORA	Tora valle	55	Tr030Tp02h	88.41	30.12	34.31		34.45	0.002081	1.69	52.28	21.96	0.35
TORA	Tora valle	55	Tr030Tp03h	96.51	30.12	34.44		34.60	0.002106	1.74	55.33	22.74	0.35
TORA	Tora valle	55	Tr030Tp06h	102.98	30.12	34.55		34.71	0.002108	1.78	57.81	24.44	0.36
TORA	Tora valle	55	Tr030Tp07h	102.83	30.12	34.55		34.71	0.002109	1.78	57.75	24.40	0.36
TORA	Tora valle	55	Tr030Tp08h	102.11	30.12	34.53		34.70	0.002108	1.78	57.48	24.21	0.36
TORA	Tora valle	54	Tr030Tp02h	88.41	30.05	34.24		34.40	0.002334	1.77	49.87	20.89	0.37
TORA	Tora valle	54	Tr030Tp03h	96.51	30.05	34.38		34.55	0.002375	1.83	52.73	21.30	0.37
TORA	Tora valle	54	Tr030Tp06h	102.98	30.05	34.48		34.66	0.002406	1.87	54.94	21.62	0.38
TORA	Tora valle	54	Tr030Tp07h	102.83	30.05	34.48		34.66	0.002405	1.87	54.90	21.61	0.38
TORA	Tora valle	54	Tr030Tp08h	102.11	30.05	34.47		34.65	0.002401	1.87	54.66	21.58	0.37
TORA	Tora valle	53	Tr030Tp02h	88.41	30.03	34.23		34.39	0.002343	1.78	49.62	20.82	0.37
TORA	Tora valle	53	Tr030Tp03h	96.51	30.03	34.36		34.54	0.002385	1.84	52.46	21.23	0.37
TORA	Tora valle	53	Tr030Tp06h	102.98	30.03	34.47		34.65	0.002418	1.88	54.66	21.54	0.38
TORA	Tora valle	53	Tr030Tp07h	102.83	30.03	34.47		34.65	0.002416	1.88	54.62	21.53	0.38
TORA	Tora valle	53	Tr030Tp08h	102.11	30.03	34.45		34.63	0.002412	1.88	54.38	21.50	0.38
TORA	Tora valle	52	Tr030Tp02h	88.41	29.95	34.18		34.34	0.002397	1.79	49.33	20.84	0.37
TORA	Tora valle	52	Tr030Tp03h	96.51	29.95	34.31		34.49	0.002439	1.85	52.15	21.24	0.38
TORA	Tora valle	52	Tr030Tp06h	102.98	29.95	34.42		34.60	0.002463	1.89	54.35	22.05	0.38
TORA	Tora valle	52	Tr030Tp07h	102.83	29.95	34.42		34.60	0.002463	1.89	54.31	22.01	0.38
TORA	Tora valle	52	Tr030Tp08h	102.11	29.95	34.40		34.59	0.002462	1.89	54.06	21.78	0.38
TORA	Tora valle	51	Tr030Tp02h	88.41	29.67	34.11		34.28	0.002432	1.79	49.28	21.04	0.37
TORA	Tora valle	51	Tr030Tp03h	96.50	29.67	34.25		34.42	0.002476	1.85	52.11	21.47	0.38
TORA	Tora valle	51	Tr030Tp06h	102.97	29.67	34.35		34.53	0.002508	1.90	54.31	21.79	0.38
TORA	Tora valle	51	Tr030Tp07h	102.83	29.67	34.35		34.53	0.002507	1.89	54.26	21.78	0.38
TORA	Tora valle	51	Tr030Tp08h	102.11	29.67	34.34		34.52	0.002503	1.89	54.03	21.75	0.38
TORA	Tora valle	50	Tr030Tp02h	88.41	29.65	34.10		34.27	0.002463	1.81	48.97	20.85	0.38
TORA	Tora valle	50	Tr030Tp03h	96.50	29.65	34.24		34.41	0.002507	1.86	51.76	21.25	0.38
TORA	Tora valle	50	Tr030Tp06h	102.97	29.65	34.34		34.52	0.002539	1.91	53.93	21.62	0.39
TORA	Tora valle	50	Tr030Tp07h	102.83	29.65	34.34		34.52	0.002539	1.91	53.89	21.58	0.39
TORA	Tora valle	50	Tr030Tp08h	102.11	29.65	34.33		34.51	0.002535	1.90	53.65	21.52	0.38
TORA	Tora valle	49	Tr030Tp02h	88.41	29.51	34.08		34.24	0.002304	1.75	50.57	21.54	0.36
TORA	Tora valle	49	Tr030Tp03h	96.50	29.51	34.21		34.38	0.002344	1.81	53.45	21.94	0.37
TORA	Tora valle	49	Tr030Tp06h	102.97	29.51	34.31		34.49	0.002358	1.85	55.73	23.32	0.37
TORA	Tora valle	49	Tr030Tp07h	102.83	29.51	34.31		34.49	0.002358	1.85	55.68	23.27	0.37
TORA	Tora valle	49	Tr030Tp08h	102.11	29.51	34.30		34.47	0.002356	1.84	55.43	23.06	0.37
TORA	Tora valle	48	Tr030Tp02h	88.40	29.38	34.05		34.21	0.002225	1.73	51.19	21.58	0.36
TORA	Tora valle	48	Tr030Tp03h	96.50	29.38	34.19		34.35	0.002267	1.79	54.06	22.32	0.36
TORA	Tora valle	48	Tr030Tp06h	102.97	29.38	34.29		34.46	0.002276	1.83	56.44	24.61	0.37
TORA	Tora valle	48	Tr030Tp07h	102.83	29.38	34.29		34.46	0.002276	1.83	56.39	24.56	0.37
TORA	Tora valle	48	Tr030Tp08h	102.11	29.38	34.27		34.44	0.002274	1.82	56.12	24.31	0.37
TORA	Tora valle	47	Tr030Tp02h	88.40	29.27	34.03		34.18	0.002091	1.69	52.29	23.19	0.35
TORA	Tora valle	47	Tr030Tp03h	96.50	29.27	34.17		34.32	0.002110	1.75	55.45	24.32	0.35
TORA	Tora valle	47	Tr030Tp06h	102.84	29.27	34.27		34.43	0.002115	1.79	57.94	24.47	0.35
TORA	Tora valle	47	Tr030Tp07h	102.69	29.27	34.27		34.43	0.002115	1.79	57.88	24.47	0.35
TORA	Tora valle	47	Tr030Tp08h	101.99	29.27	34.26		34.42	0.002114	1.79	57.62	24.45	0.35
TORA	Tora valle	46	Tr030Tp02h	88.40	29.17	34.01		34.16	0.002234	1.73	51.18	23.34	0.36
TORA	Tora valle	46	Tr030Tp03h	96.50	29.17	34.14		34.30	0.002251	1.79	54.38	25.61	0.36
TORA	Tora valle	46	Tr030Tp06h	102.95	29.17	34.24		34.41	0.002259	1.83	57.07	27.36	0.36
TORA	Tora valle	46	Tr030Tp07h	102.81	29.17	34.24		34.41	0.002259	1.83	57.01	27.32	0.36
TORA	Tora valle	46	Tr030Tp08h	102.10	29.17	34.23		34.40	0.002258	1.83	56.71	27.13	0.36
TORA	Tora valle	45	Tr030Tp02h	88.40	29.14	33.99		34.15	0.002322	1.76	50.33	23.02	0.36
TORA	Tora valle	45	Tr030Tp03h	96.50	29.14	34.12		34.29	0.002343	1.82	53.48	25.28	0.37

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	45	Tr030Tp06h	102.95	29.14	34.23		34.40	0.002352	1.86	56.13	26.61	0.37
TORA	Tora valle	45	Tr030Tp07h	102.81	29.14	34.22		34.40	0.002353	1.86	56.06	26.60	0.37
TORA	Tora valle	45	Tr030Tp08h	102.10	29.14	34.21		34.39	0.002352	1.86	55.77	26.59	0.37
TORA	Tora valle	44	Tr030Tp02h	88.40	28.82	33.88		34.07	0.002988	1.93	45.92	20.91	0.41
TORA	Tora valle	44	Tr030Tp03h	96.50	28.82	34.01		34.21	0.003012	1.99	48.76	23.59	0.41
TORA	Tora valle	44	Tr030Tp06h	102.97	28.82	34.11		34.32	0.003006	2.04	51.24	26.71	0.41
TORA	Tora valle	44	Tr030Tp07h	102.83	28.82	34.10		34.32	0.003006	2.04	51.19	26.61	0.41
TORA	Tora valle	44	Tr030Tp08h	102.11	28.82	34.09		34.30	0.003008	2.03	50.91	26.09	0.41
TORA	Tora valle	43	Tr030Tp02h	88.40	28.74	33.78		34.00	0.003707	2.08	42.56	19.14	0.44
TORA	Tora valle	43	Tr030Tp03h	96.50	28.74	33.90		34.14	0.003776	2.15	44.97	19.52	0.45
TORA	Tora valle	43	Tr030Tp06h	102.97	28.74	34.00		34.25	0.003806	2.20	46.98	23.74	0.46
TORA	Tora valle	43	Tr030Tp07h	102.82	28.74	34.00		34.25	0.003806	2.19	46.93	23.65	0.46
TORA	Tora valle	43	Tr030Tp08h	102.11	28.74	33.99		34.23	0.003805	2.19	46.68	23.23	0.45
TORA	Tora valle	42	Tr030Tp02h	88.40	28.70	33.71		33.95	0.004243	2.19	40.41	18.48	0.47
TORA	Tora valle	42	Tr030Tp03h	96.50	28.70	33.83		34.09	0.004323	2.26	42.67	18.82	0.48
TORA	Tora valle	42	Tr030Tp06h	102.97	28.70	33.92		34.20	0.004370	2.31	44.48	19.08	0.48
TORA	Tora valle	42	Tr030Tp07h	102.82	28.70	33.92		34.20	0.004368	2.31	44.45	19.08	0.48
TORA	Tora valle	42	Tr030Tp08h	102.10	28.70	33.91		34.18	0.004362	2.31	44.25	19.05	0.48
TORA	Tora valle	41	Tr030Tp02h	88.39	28.35	33.53		33.80	0.005027	2.28	38.81	18.59	0.50
TORA	Tora valle	41	Tr030Tp03h	96.49	28.35	33.65		33.93	0.005104	2.35	41.03	18.94	0.51
TORA	Tora valle	41	Tr030Tp06h	102.96	28.35	33.74		34.04	0.005138	2.40	42.82	19.21	0.51
TORA	Tora valle	41	Tr030Tp07h	102.82	28.35	33.74		34.04	0.005138	2.40	42.78	19.21	0.51
TORA	Tora valle	41	Tr030Tp08h	102.10	28.35	33.73		34.03	0.005133	2.40	42.58	19.18	0.51
TORA	Tora valle	40	Tr030Tp02h	88.39	28.33	33.50		33.77	0.005180	2.29	38.56	18.75	0.51
TORA	Tora valle	40	Tr030Tp03h	96.49	28.33	33.62		33.90	0.005249	2.37	40.79	19.10	0.52
TORA	Tora valle	40	Tr030Tp06h	102.96	28.33	33.71		34.01	0.005272	2.42	42.60	19.38	0.52
TORA	Tora valle	40	Tr030Tp07h	102.82	28.33	33.71		34.01	0.005272	2.42	42.56	19.37	0.52
TORA	Tora valle	40	Tr030Tp08h	102.10	28.33	33.70		34.00	0.005268	2.41	42.36	19.34	0.52
TORA	Tora valle	39	Tr030Tp02h	88.39	28.30	33.48		33.69	0.003404	2.03	43.49	18.67	0.43
TORA	Tora valle	39	Tr030Tp03h	96.49	28.30	33.60		33.83	0.003532	2.11	45.69	19.04	0.44
TORA	Tora valle	39	Tr030Tp06h	102.96	28.30	33.69		33.93	0.003610	2.17	47.49	19.33	0.44
TORA	Tora valle	39	Tr030Tp07h	102.82	28.30	33.69		33.93	0.003608	2.17	47.45	19.33	0.44
TORA	Tora valle	39	Tr030Tp08h	102.10	28.30	33.68		33.92	0.003598	2.16	47.26	19.29	0.44
TORA	Tora valle	38	Tr030Tp02h	88.38	28.28	33.45		33.63	0.002694	1.88	47.79	23.28	0.39
TORA	Tora valle	38	Tr030Tp03h	96.49	28.28	33.57		33.76	0.002763	1.95	50.54	23.67	0.40
TORA	Tora valle	38	Tr030Tp06h	102.96	28.28	33.66		33.86	0.002799	2.00	52.78	24.72	0.40
TORA	Tora valle	38	Tr030Tp07h	102.82	28.28	33.66		33.86	0.002797	2.00	52.73	24.58	0.40
TORA	Tora valle	38	Tr030Tp08h	102.10	28.28	33.65		33.85	0.002793	2.00	52.49	23.95	0.40
TORA	Tora valle	37	Tr030Tp02h	88.38	28.39	33.43		33.57	0.002275	1.67	52.77	23.68	0.36
TORA	Tora valle	37	Tr030Tp03h	96.49	28.39	33.55		33.70	0.002332	1.74	55.60	24.08	0.36
TORA	Tora valle	37	Tr030Tp06h	102.96	28.39	33.64		33.80	0.002351	1.78	57.99	26.74	0.37
TORA	Tora valle	37	Tr030Tp07h	102.81	28.39	33.64		33.80	0.002351	1.78	57.93	26.68	0.37
TORA	Tora valle	37	Tr030Tp08h	102.10	28.39	33.63		33.79	0.002349	1.77	57.67	26.43	0.37
TORA	Tora valle	36	Tr030Tp02h	88.38	28.50	33.37		33.53	0.002724	1.79	49.24	22.75	0.39
TORA	Tora valle	36	Tr030Tp03h	96.48	28.50	33.48		33.66	0.002793	1.86	51.90	23.16	0.40
TORA	Tora valle	36	Tr030Tp06h	102.96	28.50	33.58		33.76	0.002827	1.90	54.08	23.50	0.40
TORA	Tora valle	36	Tr030Tp07h	102.81	28.50	33.58		33.76	0.002827	1.90	54.03	23.49	0.40
TORA	Tora valle	36	Tr030Tp08h	102.10	28.50	33.57		33.75	0.002822	1.90	53.80	23.46	0.40
TORA	Tora valle	35	Tr030Tp02h	88.38	28.58	33.34		33.48	0.002225	1.63	54.22	25.65	0.36
TORA	Tora valle	35	Tr030Tp03h	96.48	28.58	33.46		33.60	0.002333	1.69	57.25	26.74	0.37
TORA	Tora valle	35	Tr030Tp06h	102.96	28.58	33.55		33.70	0.002394	1.72	59.81	27.64	0.37
TORA	Tora valle	35	Tr030Tp07h	102.81	28.58	33.55		33.70	0.002392	1.72	59.76	27.62	0.37
TORA	Tora valle	35	Tr030Tp08h	102.10	28.58	33.54		33.69	0.002385	1.72	59.48	27.52	0.37
TORA	Tora valle	34	Tr030Tp02h	88.38	28.69	33.29		33.44	0.002307	1.69	52.35	23.93	0.36
TORA	Tora valle	34	Tr030Tp03h	96.48	28.69	33.41		33.56	0.002376	1.75	55.06	24.31	0.37
TORA	Tora valle	34	Tr030Tp06h	102.95	28.69	33.50		33.66	0.002411	1.80	57.29	24.61	0.38
TORA	Tora valle	34	Tr030Tp07h	102.81	28.69	33.50		33.66	0.002411	1.80	57.24	24.61	0.38
TORA	Tora valle	34	Tr030Tp08h	102.10	28.69	33.49		33.65	0.002406	1.79	57.01	24.57	0.38
TORA	Tora valle	33	Tr030Tp02h	88.38	28.71	33.29		33.43	0.002172	1.66	53.24	23.86	0.35
TORA	Tora valle	33	Tr030Tp03h	96.48	28.71	33.41		33.56	0.002243	1.73	55.93	24.21	0.36
TORA	Tora valle	33	Tr030Tp06h	102.95	28.71	33.50		33.66	0.002280	1.77	58.16	24.50	0.37
TORA	Tora valle	33	Tr030Tp07h	102.81	28.71	33.50		33.66	0.002280	1.77	58.11	24.49	0.37
TORA	Tora valle	33	Tr030Tp08h	102.10	28.71	33.49		33.64	0.002274	1.76	57.87	24.46	0.37
TORA	Tora valle	32	Tr030Tp02h	88.37	29.30	33.27		33.40	0.002052	1.63	54.22	24.06	0.35
TORA	Tora valle	32	Tr030Tp03h	96.48	29.30	33.38		33.52	0.002125	1.69	56.92	24.41	0.35
TORA	Tora valle	32	Tr030Tp06h	102.95	29.30	33.47		33.62	0.002165	1.74	59.15	24.70	0.36
TORA	Tora valle	32	Tr030Tp07h	102.81	29.30	33.47		33.62	0.002164	1.74	59.10	24.70	0.36
TORA	Tora valle	32	Tr030Tp08h	102.09	29.30	33.46		33.61	0.002159	1.73	58.87	24.67	0.36
TORA	Tora valle	31	Tr030Tp02h	88.37	29.50	33.24		33.38	0.002072	1.63	54.33	24.87	0.35
TORA	Tora valle	31	Tr030Tp03h	96.48	29.50	33.35		33.50	0.002121	1.69	57.22	27.50	0.35
TORA	Tora valle	31	Tr030Tp06h	102.88	29.50	33.44		33.60	0.002137	1.73	59.72	27.65	0.36
TORA	Tora valle	31	Tr030Tp07h	102.74	29.50	33.44		33.59	0.002137	1.73	59.66	27.64	0.36
TORA	Tora valle	31	Tr030Tp08h	102.07	29.50	33.43		33.58	0.002136	1.73	59.40	27.63	0.36
TORA	Tora valle	30	Tr030Tp02h	88.37	29.22	33.18		33.33	0.002372	1.71	51.77	23.89	0.37
TORA	Tora valle	30	Tr030Tp03h	96.48	29.22	33.29		33.45	0.002452	1.77	54.36	24.22	0.38
TORA	Tora valle	30	Tr030Tp06h	102.95	29.22	33.38		33.55	0.002489	1.82	56.53	24.77	0.38
TORA	Tora valle	30	Tr030Tp07h	102.80	29.22	33.38		33.55	0.002490	1.82	56.48	24.69	0.38
TORA	Tora valle	30	Tr030Tp08h	102.09	29.22	33.37		33.54	0.002485	1.81	56.25	24.46	0.38

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	29	Tr030Tp02h	88.37	29.17	33.18		33.33	0.002342	1.70	52.06	23.90	0.37
TORA	Tora valle	29	Tr030Tp03h	96.48	29.17	33.29		33.45	0.002422	1.77	54.65	24.24	0.38
TORA	Tora valle	29	Tr030Tp06h	102.95	29.17	33.38		33.54	0.002458	1.81	56.82	25.63	0.38
TORA	Tora valle	29	Tr030Tp07h	102.80	29.17	33.37		33.54	0.002457	1.81	56.78	25.55	0.38
TORA	Tora valle	29	Tr030Tp08h	102.09	29.17	33.37		33.53	0.002453	1.81	56.55	25.16	0.38
TORA	Tora valle	28	Tr030Tp02h	88.36	29.36	33.05		33.19	0.002250	1.66	53.20	26.27	0.36
TORA	Tora valle	28	Tr030Tp03h	96.38	29.36	33.15		33.31	0.002313	1.73	55.91	26.69	0.37
TORA	Tora valle	28	Tr030Tp06h	102.73	29.36	33.24		33.40	0.002330	1.77	58.25	26.85	0.37
TORA	Tora valle	28	Tr030Tp07h	102.59	29.36	33.24		33.40	0.002329	1.77	58.20	26.84	0.37
TORA	Tora valle	28	Tr030Tp08h	101.89	29.36	33.23		33.39	0.002325	1.77	57.96	26.83	0.37
TORA	Tora valle	27	Tr030Tp02h	88.33	29.36	33.04		33.18	0.002245	1.66	53.42	27.49	0.36
TORA	Tora valle	27	Tr030Tp03h	96.17	29.36	33.15		33.30	0.002293	1.73	56.27	27.68	0.37
TORA	Tora valle	27	Tr030Tp06h	102.33	29.36	33.23		33.39	0.002296	1.76	58.72	27.84	0.37
TORA	Tora valle	27	Tr030Tp07h	102.19	29.36	33.23		33.39	0.002296	1.76	58.67	27.83	0.37
TORA	Tora valle	27	Tr030Tp08h	101.51	29.36	33.22		33.38	0.002294	1.76	58.41	27.82	0.37
TORA	Tora valle	26	Tr030Tp02h	87.97	29.14	32.93		33.07	0.002326	1.71	55.09	32.12	0.37
TORA	Tora valle	26	Tr030Tp03h	95.76	29.14	33.03		33.18	0.002356	1.77	58.45	32.32	0.38
TORA	Tora valle	26	Tr030Tp06h	101.92	29.14	33.12		33.28	0.002336	1.80	61.43	32.49	0.38
TORA	Tora valle	26	Tr030Tp07h	101.79	29.14	33.12		33.28	0.002337	1.80	61.36	32.49	0.38
TORA	Tora valle	26	Tr030Tp08h	101.11	29.14	33.11		33.27	0.002337	1.79	61.06	32.47	0.38
TORA	Tora valle	25	Tr030Tp02h	87.88	29.11	32.94		33.04	0.001712	1.44	67.78	38.61	0.32
TORA	Tora valle	25	Tr030Tp03h	95.50	29.11	33.04		33.15	0.001704	1.48	71.93	38.82	0.32
TORA	Tora valle	25	Tr030Tp06h	101.93	29.11	33.14		33.24	0.001686	1.51	75.53	38.99	0.32
TORA	Tora valle	25	Tr030Tp07h	101.78	29.11	33.13		33.24	0.001686	1.50	75.44	38.99	0.32
TORA	Tora valle	25	Tr030Tp08h	101.04	29.11	33.12		33.23	0.001685	1.50	75.09	38.97	0.32
TORA	Tora valle	24	Tr030Tp02h	88.19	29.04	32.86		32.99	0.002337	1.65	58.51	37.47	0.37
TORA	Tora valle	24	Tr030Tp03h	96.01	29.04	32.96		33.10	0.002329	1.70	62.50	37.67	0.37
TORA	Tora valle	24	Tr030Tp06h	102.15	29.04	33.06		33.20	0.002271	1.72	66.09	37.85	0.37
TORA	Tora valle	24	Tr030Tp07h	102.01	29.04	33.06		33.20	0.002274	1.72	66.00	37.85	0.37
TORA	Tora valle	24	Tr030Tp08h	101.34	29.04	33.05		33.19	0.002276	1.71	65.65	37.83	0.37
TORA	Tora valle	23	Tr030Tp02h	88.35	29.08	32.78		32.95	0.002847	1.87	51.38	33.04	0.41
TORA	Tora valle	23	Tr030Tp03h	96.43	29.08	32.88		33.06	0.002910	1.93	54.83	34.51	0.41
TORA	Tora valle	23	Tr030Tp06h	102.83	29.08	32.97		33.16	0.002873	1.96	58.07	34.70	0.41
TORA	Tora valle	23	Tr030Tp07h	102.69	29.08	32.97		33.16	0.002874	1.96	58.00	34.69	0.41
TORA	Tora valle	23	Tr030Tp08h	101.99	29.08	32.96		33.15	0.002874	1.96	57.68	34.67	0.41
TORA	Tora valle	22	Tr030Tp02h	88.35	29.03	32.77		32.94	0.002888	1.87	50.93	34.25	0.41
TORA	Tora valle	22	Tr030Tp03h	96.45	29.03	32.87		33.05	0.002945	1.94	54.35	34.43	0.41
TORA	Tora valle	22	Tr030Tp06h	102.87	29.03	32.96		33.15	0.002909	1.97	57.57	34.61	0.41
TORA	Tora valle	22	Tr030Tp07h	102.73	29.03	32.96		33.15	0.002910	1.97	57.50	34.60	0.41
TORA	Tora valle	22	Tr030Tp08h	102.03	29.03	32.95		33.14	0.002910	1.96	57.18	34.59	0.41
TORA	Tora valle	21	Tr030Tp02h	88.34	28.98	32.63		32.79	0.002752	1.81	50.59	30.37	0.40
TORA	Tora valle	21	Tr030Tp03h	96.45	28.98	32.72		32.90	0.002848	1.88	53.48	31.53	0.41
TORA	Tora valle	21	Tr030Tp06h	102.94	28.98	32.81		33.00	0.002834	1.92	56.42	32.67	0.41
TORA	Tora valle	21	Tr030Tp07h	102.80	28.98	32.81		33.00	0.002835	1.92	56.35	32.64	0.41
TORA	Tora valle	21	Tr030Tp08h	102.08	28.98	32.80		32.99	0.002831	1.91	56.08	32.53	0.41
TORA	Tora valle	20	Tr030Tp02h	88.34	29.00	32.61		32.77	0.002770	1.83	50.73	31.88	0.40
TORA	Tora valle	20	Tr030Tp03h	96.45	29.00	32.70		32.88	0.002873	1.91	53.75	33.84	0.41
TORA	Tora valle	20	Tr030Tp06h	102.94	29.00	32.79		32.98	0.002850	1.94	56.96	34.87	0.41
TORA	Tora valle	20	Tr030Tp07h	102.80	29.00	32.79		32.98	0.002851	1.94	56.88	34.87	0.41
TORA	Tora valle	20	Tr030Tp08h	102.08	29.00	32.78		32.97	0.002849	1.94	56.57	34.85	0.41
TORA	Tora valle	19	Tr030Tp02h	88.05	29.08	32.54		32.69	0.002500	1.76	52.77	33.33	0.38
TORA	Tora valle	19	Tr030Tp03h	95.81	29.08	32.63		32.80	0.002568	1.82	55.88	33.49	0.39
TORA	Tora valle	19	Tr030Tp06h	101.97	29.08	32.73		32.90	0.002522	1.85	59.10	33.66	0.39
TORA	Tora valle	19	Tr030Tp07h	101.83	29.08	32.72		32.89	0.002524	1.85	59.02	33.66	0.39
TORA	Tora valle	19	Tr030Tp08h	101.15	29.08	32.72		32.89	0.002523	1.84	58.72	33.64	0.39
TORA	Tora valle	18	Tr030Tp02h	88.31	29.04	32.49		32.64	0.002424	1.75	53.46	33.08	0.38
TORA	Tora valle	18	Tr030Tp03h	96.35	29.04	32.58		32.74	0.002519	1.82	56.43	33.24	0.39
TORA	Tora valle	18	Tr030Tp06h	102.71	29.04	32.67		32.84	0.002487	1.85	59.62	33.42	0.39
TORA	Tora valle	18	Tr030Tp07h	102.57	29.04	32.67		32.84	0.002489	1.85	59.54	33.41	0.39
TORA	Tora valle	18	Tr030Tp08h	101.87	29.04	32.66		32.83	0.002486	1.85	59.25	33.40	0.39
TORA	Tora valle	17	Tr030Tp02h	88.31	29.04	32.47		32.63	0.002547	1.77	53.08	33.99	0.39
TORA	Tora valle	17	Tr030Tp03h	96.36	29.04	32.56		32.73	0.002638	1.85	56.12	34.16	0.40
TORA	Tora valle	17	Tr030Tp06h	102.73	29.04	32.65		32.83	0.002593	1.87	59.43	34.34	0.40
TORA	Tora valle	17	Tr030Tp07h	102.59	29.04	32.65		32.83	0.002595	1.87	59.35	34.34	0.40
TORA	Tora valle	17	Tr030Tp08h	101.89	29.04	32.64		32.82	0.002592	1.87	59.05	34.32	0.40
TORA	Tora valle	16	Tr030Tp02h	88.29	28.98	32.44		32.59	0.002436	1.75	54.49	32.99	0.38
TORA	Tora valle	16	Tr030Tp03h	96.31	28.98	32.53		32.70	0.002531	1.83	57.41	33.16	0.39
TORA	Tora valle	16	Tr030Tp06h	102.68	28.98	32.63		32.80	0.002490	1.85	60.65	33.34	0.39
TORA	Tora valle	16	Tr030Tp07h	102.54	28.98	32.63		32.79	0.002492	1.85	60.57	33.34	0.39
TORA	Tora valle	16	Tr030Tp08h	101.84	28.98	32.62		32.78	0.002489	1.85	60.28	33.32	0.39
TORA	Tora valle	15	Tr030Tp02h	88.26	28.92	32.41		32.56	0.002445	1.74	56.13	36.74	0.38
TORA	Tora valle	15	Tr030Tp03h	96.23	28.92	32.50		32.65	0.002523	1.81	59.38	36.91	0.39
TORA	Tora valle	15	Tr030Tp06h	102.49	28.92	32.60		32.76	0.002451	1.82	63.08	37.10	0.39
TORA	Tora valle	15	Tr030Tp07h	102.35	28.92	32.59		32.75	0.002453	1.82	62.99	37.10	0.39
TORA	Tora valle	15	Tr030Tp08h	101.66	28.92	32.58		32.74	0.002453	1.82	62.66	37.08	0.39
TORA	Tora valle	14	Tr030Tp02h	88.00	28.50	32.37		32.52	0.002191	1.69	57.20	36.07	0.36
TORA	Tora valle	14	Tr030Tp03h	95.78	28.50	32.46		32.61	0.002273	1.75	60.37	36.24	0.37
TORA	Tora valle	14	Tr030Tp06h	101.86	28.50	32.56		32.72	0.002215	1.77	64.04	36.45	0.37
TORA	Tora valle	14	Tr030Tp07h	101.73	28.50	32.56		32.71	0.002217	1.77	63.95	36.44	0.37

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	14	Tr030Tp08h	101.05	28.50	32.55		32.70	0.002216	1.77	63.63	36.42	0.37
TORA	Tora valle	13	Tr030Tp02h	88.02	28.16	32.35		32.49	0.002158	1.68	55.82	32.47	0.36
TORA	Tora valle	13	Tr030Tp03h	95.78	28.16	32.43		32.59	0.002260	1.76	58.58	32.62	0.37
TORA	Tora valle	13	Tr030Tp06h	101.78	28.16	32.53		32.69	0.002213	1.78	61.88	32.80	0.37
TORA	Tora valle	13	Tr030Tp07h	101.65	28.16	32.53		32.69	0.002215	1.78	61.80	32.80	0.37
TORA	Tora valle	13	Tr030Tp08h	101.00	28.16	32.52		32.68	0.002214	1.77	61.51	32.78	0.37
TORA	Tora valle	12	Tr030Tp02h	88.34	28.15	32.24		32.39	0.002460	1.71	51.54	24.49	0.38
TORA	Tora valle	12	Tr030Tp03h	96.44	28.15	32.31		32.48	0.002662	1.81	53.28	24.74	0.39
TORA	Tora valle	12	Tr030Tp06h	102.94	28.15	32.41		32.58	0.002677	1.85	55.61	25.06	0.40
TORA	Tora valle	12	Tr030Tp07h	102.80	28.15	32.41		32.58	0.002677	1.85	55.56	25.05	0.40
TORA	Tora valle	12	Tr030Tp08h	102.08	28.15	32.40		32.57	0.002666	1.84	55.37	25.03	0.40
TORA	Tora valle	11	Tr030Tp02h	88.34	28.24	32.22		32.38	0.002559	1.76	50.33	23.80	0.39
TORA	Tora valle	11	Tr030Tp03h	96.44	28.24	32.29		32.46	0.002781	1.86	51.96	24.03	0.40
TORA	Tora valle	11	Tr030Tp06h	102.94	28.24	32.38		32.56	0.002801	1.90	54.22	24.35	0.41
TORA	Tora valle	11	Tr030Tp07h	102.80	28.24	32.38		32.56	0.002803	1.90	54.16	24.34	0.41
TORA	Tora valle	11	Tr030Tp08h	102.08	28.24	32.37		32.55	0.002790	1.89	53.98	24.32	0.41
TORA	Tora valle	10	Tr030Tp02h	88.34	28.89	32.17		32.35	0.003178	1.90	46.57	23.29	0.43
TORA	Tora valle	10	Tr030Tp03h	96.44	28.89	32.23		32.44	0.003461	2.01	48.03	23.48	0.45
TORA	Tora valle	10	Tr030Tp06h	102.93	28.89	32.32		32.54	0.003461	2.05	50.22	23.77	0.45
TORA	Tora valle	10	Tr030Tp07h	102.80	28.89	32.32		32.54	0.003463	2.05	50.16	23.77	0.45
TORA	Tora valle	10	Tr030Tp08h	102.08	28.89	32.31		32.53	0.003449	2.04	49.99	23.74	0.45
TORA	Tora valle	9	Tr030Tp02h	88.34	28.79	32.15		32.34	0.003224	1.92	45.93	22.60	0.43
TORA	Tora valle	9	Tr030Tp03h	96.44	28.79	32.21		32.42	0.003530	2.04	47.28	22.78	0.45
TORA	Tora valle	9	Tr030Tp06h	102.93	28.79	32.30		32.52	0.003542	2.08	49.38	23.04	0.45
TORA	Tora valle	9	Tr030Tp07h	102.80	28.79	32.30		32.52	0.003542	2.08	49.33	23.04	0.45
TORA	Tora valle	9	Tr030Tp08h	102.08	28.79	32.29		32.51	0.003527	2.08	49.17	23.02	0.45
TORA	Tora valle	8	Tr030Tp02h	88.34	28.84	32.12		32.31	0.003339	1.95	45.35	22.56	0.44
TORA	Tora valle	8	Tr030Tp03h	96.44	28.84	32.18		32.39	0.003672	2.07	46.62	22.73	0.46
TORA	Tora valle	8	Tr030Tp06h	102.93	28.84	32.27		32.49	0.003679	2.11	48.71	23.01	0.46
TORA	Tora valle	8	Tr030Tp07h	102.80	28.84	32.26		32.49	0.003682	2.11	48.65	23.00	0.46
TORA	Tora valle	8	Tr030Tp08h	102.08	28.84	32.26		32.48	0.003665	2.10	48.50	22.98	0.46
TORA	Tora valle	7	Tr030Tp02h	88.34	28.86	32.11		32.30	0.003372	1.96	45.18	22.50	0.44
TORA	Tora valle	7	Tr030Tp03h	96.44	28.86	32.16		32.38	0.003718	2.08	46.40	22.66	0.46
TORA	Tora valle	7	Tr030Tp06h	102.93	28.86	32.25		32.48	0.003725	2.12	48.49	22.94	0.47
TORA	Tora valle	7	Tr030Tp07h	102.80	28.86	32.25		32.48	0.003728	2.12	48.43	22.93	0.47
TORA	Tora valle	7	Tr030Tp08h	102.08	28.86	32.24		32.47	0.003710	2.11	48.28	22.91	0.47
TORA	Tora valle	6	Tr030Tp02h	88.34	28.58	32.09		32.27	0.003124	1.90	46.48	22.93	0.43
TORA	Tora valle	6	Tr030Tp03h	96.44	28.58	32.14		32.35	0.003456	2.02	47.68	23.09	0.45
TORA	Tora valle	6	Tr030Tp06h	102.93	28.58	32.23		32.45	0.003468	2.07	49.80	23.39	0.45
TORA	Tora valle	6	Tr030Tp07h	102.80	28.58	32.23		32.45	0.003471	2.07	49.75	23.38	0.45
TORA	Tora valle	6	Tr030Tp08h	102.08	28.58	32.22		32.44	0.003452	2.06	49.60	23.36	0.45
TORA	Tora valle	5	Tr030Tp02h	88.34	28.79	32.03		32.23	0.003503	1.98	44.64	22.59	0.45
TORA	Tora valle	5	Tr030Tp03h	96.44	28.79	32.07		32.30	0.003921	2.11	45.60	22.72	0.48
TORA	Tora valle	5	Tr030Tp06h	102.91	28.79	32.16		32.40	0.003918	2.16	47.69	23.01	0.48
TORA	Tora valle	5	Tr030Tp07h	102.79	28.79	32.16		32.40	0.003923	2.16	47.63	23.00	0.48
TORA	Tora valle	5	Tr030Tp08h	102.08	28.79	32.15		32.39	0.003902	2.15	47.49	22.98	0.48
TORA	Tora valle	4	Tr030Tp02h	88.34	28.82	31.98		32.20	0.004030	2.07	42.72	22.54	0.48
TORA	Tora valle	4	Tr030Tp03h	96.44	28.82	32.02		32.27	0.004552	2.22	43.51	22.65	0.51
TORA	Tora valle	4	Tr030Tp06h	102.90	28.82	32.11		32.37	0.004516	2.26	45.59	22.93	0.51
TORA	Tora valle	4	Tr030Tp07h	102.80	28.82	32.11		32.37	0.004525	2.26	45.53	22.92	0.51
TORA	Tora valle	4	Tr030Tp08h	102.08	28.82	32.10		32.36	0.004498	2.25	45.40	22.90	0.51
TORA	Tora valle	3	Tr030Tp02h	88.34	28.71	31.93		32.15	0.004311	2.08	42.38	22.78	0.49
TORA	Tora valle	3	Tr030Tp03h	96.44	28.71	31.95		32.21	0.004940	2.25	42.94	22.85	0.52
TORA	Tora valle	3	Tr030Tp06h	102.87	28.71	32.05		32.31	0.004868	2.28	45.07	23.12	0.52
TORA	Tora valle	3	Tr030Tp07h	102.79	28.71	32.04		32.31	0.004880	2.28	45.01	23.11	0.52
TORA	Tora valle	3	Tr030Tp08h	102.08	28.71	32.04		32.30	0.004851	2.27	44.89	23.10	0.52
TORA	Tora valle	2	Tr030Tp02h	88.34	28.60	31.83		32.04	0.004078	2.03	43.46	23.63	0.48
TORA	Tora valle	2	Tr030Tp03h	96.44	28.60	31.83		32.08	0.004828	2.21	43.56	23.65	0.52
TORA	Tora valle	2	Tr030Tp06h	102.82	28.60	31.93		32.19	0.004715	2.24	45.85	23.96	0.52
TORA	Tora valle	2	Tr030Tp07h	102.79	28.60	31.93		32.18	0.004736	2.25	45.77	23.95	0.52
TORA	Tora valle	2	Tr030Tp08h	102.07	28.60	31.92		32.18	0.004701	2.24	45.67	23.94	0.52
TORA	Tora valle	1.6	Tr030Tp02h	77.12	28.61	31.67	30.90	31.92	0.006619	2.20	35.02	24.19	0.58
TORA	Tora valle	1.6	Tr030Tp03h	96.44	28.61	31.73	31.38	32.09	0.009095	2.64	36.53	24.38	0.69
TORA	Tora valle	1.6	Tr030Tp06h	102.94	28.61	31.82	31.44	32.18	0.008820	2.67	38.51	24.62	0.68
TORA	Tora valle	1.6	Tr030Tp07h	102.80	28.61	31.81	31.43	32.18	0.008832	2.67	38.45	24.61	0.68
TORA	Tora valle	1.6	Tr030Tp08h	102.08	28.61	31.81	31.43	32.17	0.008819	2.67	38.30	24.59	0.68
TORA	Tora valle	1.5 BR U	Tr030Tp02h	77.12	28.61	31.38	30.90	31.76	0.013070	2.75	28.08	23.31	0.80
TORA	Tora valle	1.5 BR U	Tr030Tp03h	96.44	28.61	31.54	31.38	32.01	0.013990	3.04	31.75	23.78	0.84
TORA	Tora valle	1.5 BR U	Tr030Tp06h	102.94	28.61	31.62	31.44	32.09	0.013261	3.05	33.70	24.03	0.82
TORA	Tora valle	1.5 BR U	Tr030Tp07h	102.80	28.61	31.62	31.43	32.09	0.013277	3.05	33.66	24.02	0.82
TORA	Tora valle	1.5 BR U	Tr030Tp08h	102.08	28.61	31.61	31.43	32.08	0.013352	3.05	33.45	23.99	0.83
TORA	Tora valle	1.5 BR D	Tr030Tp02h	77.12	28.67	31.40	30.79	31.65	0.006190	2.22	34.75	22.95	0.58
TORA	Tora valle	1.5 BR D	Tr030Tp03h	96.44	28.67	31.56	31.03	31.88	0.007083	2.51	38.45	23.31	0.62
TORA	Tora valle	1.5 BR D	Tr030Tp06h	102.94	28.67	31.64	31.12	31.97	0.006961	2.55	40.34	23.47	0.62
TORA	Tora valle	1.5 BR D	Tr030Tp07h	102.80	28.67	31.64	31.12	31.97	0.006964	2.55	40.30	23.47	0.62
TORA	Tora valle	1.5 BR D	Tr030Tp08h	102.08	28.67	31.63	31.11	31.96	0.006976	2.55	40.09	23.45	0.62
TORA	Tora valle	1.4	Tr030Tp02h	88.30	28.67	31.33		31.69	0.009206	2.66	33.25	22.63	0.70
TORA	Tora valle	1.4	Tr030Tp03h	96.43	28.67	31.47		31.83	0.008397	2.65	36.39	23.14	0.67

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	1.4	Tr030Tp06h	102.91	28.67	31.56		31.92	0.008136	2.68	38.34	23.30	0.67
TORA	Tora valle	1.4	Tr030Tp07h	102.80	28.67	31.55		31.92	0.008147	2.68	38.30	23.30	0.67
TORA	Tora valle	1.4	Tr030Tp08h	102.08	28.67	31.54		31.91	0.008173	2.68	38.08	23.28	0.67
TORA	Tora valle	1.38	Tr030Tp02h	88.26	28.42	31.17		31.44	0.007537	2.33	37.90	26.98	0.63
TORA	Tora valle	1.38	Tr030Tp03h	96.39	28.42	31.30		31.57	0.006774	2.32	41.53	27.37	0.60
TORA	Tora valle	1.38	Tr030Tp06h	102.90	28.42	31.41		31.68	0.006256	2.31	44.45	27.67	0.58
TORA	Tora valle	1.38	Tr030Tp07h	102.78	28.42	31.40		31.68	0.006270	2.32	44.39	27.66	0.58
TORA	Tora valle	1.38	Tr030Tp08h	102.06	28.42	31.39		31.67	0.006322	2.32	44.07	27.63	0.59
TORA	Tora valle	1.36	Tr030Tp02h	88.26	27.77	31.17		31.29	0.001944	1.55	57.03	27.20	0.34
TORA	Tora valle	1.36	Tr030Tp03h	96.39	27.77	31.30		31.43	0.001918	1.59	60.77	27.59	0.34
TORA	Tora valle	1.36	Tr030Tp06h	102.90	27.77	31.41		31.54	0.001889	1.61	63.81	27.90	0.34
TORA	Tora valle	1.36	Tr030Tp07h	102.78	27.77	31.41		31.54	0.001891	1.61	63.75	27.90	0.34
TORA	Tora valle	1.36	Tr030Tp08h	102.06	27.77	31.40		31.53	0.001893	1.61	63.42	27.86	0.34
TORA	Tora valle	1.34	Tr030Tp02h	88.26	27.70	31.12		31.24	0.001930	1.55	57.01	26.85	0.34
TORA	Tora valle	1.34	Tr030Tp03h	96.39	27.70	31.26		31.39	0.001901	1.59	60.71	27.12	0.34
TORA	Tora valle	1.34	Tr030Tp06h	102.90	27.70	31.37		31.50	0.001872	1.62	63.71	27.33	0.34
TORA	Tora valle	1.34	Tr030Tp07h	102.78	27.70	31.37		31.50	0.001874	1.62	63.64	27.33	0.34
TORA	Tora valle	1.34	Tr030Tp08h	102.05	27.70	31.35		31.49	0.001876	1.61	63.32	27.30	0.34
TORA	Tora valle	1.32	Tr030Tp02h	88.23	27.48	31.01		31.15	0.002392	1.67	52.92	26.19	0.37
TORA	Tora valle	1.32	Tr030Tp03h	96.37	27.48	31.15		31.30	0.002334	1.70	56.60	26.58	0.37
TORA	Tora valle	1.32	Tr030Tp06h	102.90	27.48	31.26		31.41	0.002280	1.73	59.61	26.89	0.37
TORA	Tora valle	1.32	Tr030Tp07h	102.77	27.48	31.26		31.41	0.002283	1.73	59.53	26.89	0.37
TORA	Tora valle	1.32	Tr030Tp08h	102.04	27.48	31.25		31.40	0.002288	1.72	59.21	26.85	0.37
TORA	Tora valle	1.3	Tr030Tp02h	88.22	27.28	30.93		31.06	0.002068	1.55	56.74	27.49	0.35
TORA	Tora valle	1.3	Tr030Tp03h	96.36	27.28	31.07		31.20	0.002008	1.59	60.67	27.77	0.34
TORA	Tora valle	1.3	Tr030Tp06h	102.90	27.28	31.19		31.32	0.001957	1.61	63.88	28.00	0.34
TORA	Tora valle	1.3	Tr030Tp07h	102.77	27.28	31.19		31.32	0.001959	1.61	63.80	27.99	0.34
TORA	Tora valle	1.3	Tr030Tp08h	102.04	27.28	31.17		31.31	0.001964	1.61	63.45	27.97	0.34
TORA	Tora valle	1.28	Tr030Tp02h	88.20	27.28	30.84		30.97	0.002206	1.60	55.18	27.29	0.36
TORA	Tora valle	1.28	Tr030Tp03h	96.34	27.28	30.98		31.12	0.002132	1.63	59.19	27.72	0.36
TORA	Tora valle	1.28	Tr030Tp06h	102.90	27.28	31.10		31.24	0.002069	1.65	62.48	28.05	0.35
TORA	Tora valle	1.28	Tr030Tp07h	102.76	27.28	31.10		31.24	0.002071	1.65	62.40	28.04	0.35
TORA	Tora valle	1.28	Tr030Tp08h	102.03	27.28	31.09		31.22	0.002077	1.64	62.04	28.01	0.35
TORA	Tora valle	1.26	Tr030Tp02h	88.20	27.21	30.81		30.90	0.001421	1.36	64.83	29.62	0.29
TORA	Tora valle	1.26	Tr030Tp03h	96.33	27.21	30.96		31.06	0.001392	1.39	69.23	30.06	0.29
TORA	Tora valle	1.26	Tr030Tp06h	102.90	27.21	31.08		31.18	0.001368	1.41	72.84	30.47	0.29
TORA	Tora valle	1.26	Tr030Tp07h	102.76	27.21	31.07		31.17	0.001369	1.41	72.75	30.46	0.29
TORA	Tora valle	1.26	Tr030Tp08h	102.03	27.21	31.06		31.16	0.001370	1.41	72.36	30.41	0.29
TORA	Tora valle	1.24	Tr030Tp02h	88.19	27.12	30.74		30.86	0.001867	1.54	57.33	26.53	0.33
TORA	Tora valle	1.24	Tr030Tp03h	96.31	27.12	30.89		31.01	0.001820	1.57	61.26	26.82	0.33
TORA	Tora valle	1.24	Tr030Tp06h	102.90	27.12	31.00		31.13	0.001780	1.60	64.47	27.06	0.33
TORA	Tora valle	1.24	Tr030Tp07h	102.75	27.12	31.00		31.13	0.001781	1.60	64.40	27.05	0.33
TORA	Tora valle	1.24	Tr030Tp08h	102.02	27.12	30.99		31.12	0.001785	1.59	64.05	27.02	0.33
TORA	Tora valle	1.22	Tr030Tp02h	88.18	26.99	30.66		30.78	0.001998	1.58	55.77	25.85	0.34
TORA	Tora valle	1.22	Tr030Tp03h	96.30	26.99	30.81		30.94	0.001946	1.61	59.66	26.23	0.34
TORA	Tora valle	1.22	Tr030Tp06h	102.89	26.99	30.93		31.06	0.001982	1.63	62.93	27.53	0.35
TORA	Tora valle	1.22	Tr030Tp07h	102.75	26.99	30.92		31.06	0.001984	1.63	62.85	27.52	0.35
TORA	Tora valle	1.22	Tr030Tp08h	102.02	26.99	30.91		31.05	0.001990	1.63	62.49	27.49	0.35
TORA	Tora valle	1.2	Tr030Tp02h	88.17	26.93	30.58		30.69	0.001753	1.50	58.77	26.79	0.32
TORA	Tora valle	1.2	Tr030Tp03h	96.28	26.93	30.73		30.85	0.001708	1.53	62.89	27.20	0.32
TORA	Tora valle	1.2	Tr030Tp06h	102.89	26.93	30.85		30.97	0.001672	1.55	66.22	27.51	0.32
TORA	Tora valle	1.2	Tr030Tp07h	102.74	26.93	30.85		30.97	0.001673	1.55	66.14	27.50	0.32
TORA	Tora valle	1.2	Tr030Tp08h	102.01	26.93	30.83		30.96	0.001677	1.55	65.77	27.48	0.32
TORA	Tora valle	1.18	Tr030Tp02h	88.16	26.54	30.51		30.60	0.001324	1.36	64.86	27.81	0.28
TORA	Tora valle	1.18	Tr030Tp03h	96.27	26.54	30.66		30.76	0.001299	1.39	69.18	28.13	0.28
TORA	Tora valle	1.18	Tr030Tp06h	102.89	26.54	30.79		30.89	0.001279	1.42	72.67	28.38	0.28
TORA	Tora valle	1.18	Tr030Tp07h	102.73	26.54	30.78		30.89	0.001280	1.42	72.58	28.38	0.28
TORA	Tora valle	1.18	Tr030Tp08h	102.00	26.54	30.77		30.87	0.001282	1.41	72.20	28.35	0.28
TORA	Tora valle	1.16	Tr030Tp02h	88.15	26.24	30.45		30.52	0.000763	1.13	78.08	28.76	0.22
TORA	Tora valle	1.16	Tr030Tp03h	96.25	26.24	30.61		30.68	0.000770	1.17	82.58	29.13	0.22
TORA	Tora valle	1.16	Tr030Tp06h	102.89	26.24	30.73		30.80	0.000775	1.19	86.21	29.41	0.22
TORA	Tora valle	1.16	Tr030Tp07h	102.73	26.24	30.73		30.80	0.000775	1.19	86.12	29.40	0.22
TORA	Tora valle	1.16	Tr030Tp08h	101.99	26.24	30.72		30.79	0.000774	1.19	85.72	29.37	0.22
TORA	Tora valle	1.14	Tr030Tp02h	88.15	26.03	30.41		30.46	0.000629	1.04	84.96	30.64	0.20
TORA	Tora valle	1.14	Tr030Tp03h	96.25	26.03	30.56		30.62	0.000635	1.07	89.75	30.94	0.20
TORA	Tora valle	1.14	Tr030Tp06h	102.89	26.03	30.68		30.75	0.000640	1.10	93.60	31.18	0.20
TORA	Tora valle	1.14	Tr030Tp07h	102.73	26.03	30.68		30.74	0.000640	1.10	93.50	31.17	0.20
TORA	Tora valle	1.14	Tr030Tp08h	101.99	26.03	30.67		30.73	0.000639	1.10	93.09	31.15	0.20
TORA	Tora valle	1.12	Tr030Tp02h	88.15	25.74	30.36		30.43	0.000712	1.09	80.77	29.94	0.21
TORA	Tora valle	1.12	Tr030Tp03h	96.24	25.74	30.52		30.58	0.000723	1.13	85.45	30.50	0.21
TORA	Tora valle	1.12	Tr030Tp06h	102.89	25.74	30.64		30.71	0.000730	1.15	89.24	30.98	0.22
TORA	Tora valle	1.12	Tr030Tp07h	102.72	25.74	30.64		30.71	0.000730	1.15	89.15	30.97	0.22
TORA	Tora valle	1.12	Tr030Tp08h	101.99	25.74	30.63		30.69	0.000729	1.15	88.73	30.92	0.22
TORA	Tora valle	1.1	Tr030Tp02h	88.14	25.74	30.32		30.38	0.000747	1.11	79.44	29.80	0.22
TORA	Tora valle	1.1	Tr030Tp03h	96.24	25.74	30.47		30.54	0.000757	1.14	84.07	30.33	0.22
TORA	Tora valle	1.1	Tr030Tp06h	102.88	25.74	30.60		30.67	0.000764	1.17	87.84	30.81	0.22
TORA	Tora valle	1.1	Tr030Tp07h	102.72	25.74	30.59		30.66	0.000764	1.17	87.75	30.80	0.22
TORA	Tora valle	1.1	Tr030Tp08h	101.99	25.74	30.58		30.65	0.000763	1.17	87.33	30.75	0.22

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	1.08	Tr030Tp02h	88.14	25.74	30.27		30.34	0.000786	1.13	78.08	29.64	0.22
TORA	Tora valle	1.08	Tr030Tp03h	96.23	25.74	30.43		30.50	0.000794	1.16	82.67	30.16	0.22
TORA	Tora valle	1.08	Tr030Tp06h	102.88	25.74	30.55		30.62	0.000800	1.19	86.41	30.63	0.23
TORA	Tora valle	1.08	Tr030Tp07h	102.72	25.74	30.55		30.62	0.000800	1.19	86.31	30.62	0.23
TORA	Tora valle	1.08	Tr030Tp08h	101.99	25.74	30.53		30.61	0.000800	1.19	85.90	30.57	0.23
TORA	Tora valle	1.06	Tr030Tp02h	88.14	25.74	30.22		30.29	0.000832	1.15	76.55	29.47	0.23
TORA	Tora valle	1.06	Tr030Tp03h	96.23	25.74	30.38		30.45	0.000839	1.19	81.10	29.98	0.23
TORA	Tora valle	1.06	Tr030Tp06h	102.88	25.74	30.50		30.57	0.000844	1.21	84.79	30.42	0.23
TORA	Tora valle	1.06	Tr030Tp07h	102.72	25.74	30.49		30.57	0.000844	1.21	84.70	30.41	0.23
TORA	Tora valle	1.06	Tr030Tp08h	101.99	25.74	30.48		30.56	0.000844	1.21	84.29	30.36	0.23
TORA	Tora valle	1.04	Tr030Tp02h	88.14	25.74	30.17		30.24	0.000887	1.18	74.88	29.28	0.24
TORA	Tora valle	1.04	Tr030Tp03h	96.23	25.74	30.32		30.39	0.000892	1.21	79.39	29.79	0.24
TORA	Tora valle	1.04	Tr030Tp06h	102.88	25.74	30.44		30.52	0.000895	1.24	83.05	30.20	0.24
TORA	Tora valle	1.04	Tr030Tp07h	102.72	25.74	30.44		30.52	0.000895	1.24	82.96	30.19	0.24
TORA	Tora valle	1.04	Tr030Tp08h	101.99	25.74	30.42		30.50	0.000895	1.24	82.55	30.15	0.24
TORA	Tora valle	1.02	Tr030Tp02h	88.14	25.74	30.11		30.18	0.000945	1.20	73.27	29.09	0.24
TORA	Tora valle	1.02	Tr030Tp03h	96.23	25.74	30.26		30.34	0.000949	1.24	77.74	29.60	0.24
TORA	Tora valle	1.02	Tr030Tp06h	102.88	25.74	30.38		30.47	0.000950	1.26	81.36	30.01	0.25
TORA	Tora valle	1.02	Tr030Tp07h	102.72	25.74	30.38		30.46	0.000950	1.26	81.28	30.00	0.25
TORA	Tora valle	1.02	Tr030Tp08h	101.99	25.74	30.37		30.45	0.000950	1.26	80.88	29.96	0.25
TORA	Tora valle	1	Tr030Tp02h	88.14	25.74	30.06	28.28	30.14	0.001000	1.23	71.89	28.95	0.25
TORA	Tora valle	1	Tr030Tp03h	96.23	25.74	30.22	28.36	30.30	0.001001	1.26	76.32	29.44	0.25
TORA	Tora valle	1	Tr030Tp06h	102.88	25.74	30.34	28.42	30.42	0.001000	1.29	79.93	29.85	0.25
TORA	Tora valle	1	Tr030Tp07h	102.72	25.74	30.33	28.42	30.42	0.001000	1.29	79.84	29.84	0.25
TORA	Tora valle	1	Tr030Tp08h	101.99	25.74	30.32	28.41	30.40	0.001000	1.28	79.45	29.80	0.25
IL RIO	RIO	27	Tr030Tp02h	12.68	68.12	69.70	69.84	70.14	0.027147	3.08	5.48	14.34	0.99
IL RIO	RIO	27	Tr030Tp03h	11.89	68.12	69.67	69.81	70.10	0.027295	3.02	5.07	13.00	0.99
IL RIO	RIO	27	Tr030Tp06h	9.19	68.12	69.55	69.64	69.94	0.027649	2.82	3.77	8.58	0.98
IL RIO	RIO	27	Tr030Tp07h	8.51	68.12	69.51	69.59	69.89	0.027829	2.77	3.46	7.65	0.97
IL RIO	RIO	27	Tr030Tp08h	7.93	68.12	69.48	69.53	69.85	0.027899	2.73	3.20	7.01	0.97
IL RIO	RIO	26	Tr030Tp02h	13.71	61.77	64.03	63.36	64.26	0.011788	2.19	7.52	13.70	0.64
IL RIO	RIO	26	Tr030Tp03h	9.68	61.77	64.01	63.06	64.13	0.006248	1.58	7.29	13.46	0.47
IL RIO	RIO	26	Tr030Tp06h	9.19	61.77	64.00	63.02	64.11	0.005990	1.53	7.06	13.22	0.46
IL RIO	RIO	26	Tr030Tp07h	8.51	61.77	63.97	62.97	64.08	0.005657	1.47	6.72	12.86	0.44
IL RIO	RIO	26	Tr030Tp08h	7.93	61.77	63.95	62.92	64.05	0.005335	1.40	6.43	12.55	0.43
IL RIO	RIO	25.8 BR U	Tr030Tp02h	13.71	61.77	63.88	64.21	64.23		2.27	8.12	11.59	1.14
IL RIO	RIO	25.8 BR U	Tr030Tp03h	9.68	61.77	64.02	62.97	64.14		1.89	6.40	13.49	0.50
IL RIO	RIO	25.8 BR U	Tr030Tp06h	9.19	61.77	64.00	62.96	64.11		1.90	6.01	13.24	0.50
IL RIO	RIO	25.8 BR U	Tr030Tp07h	8.51	61.77	63.97	62.94	64.08		1.93	5.47	12.87	0.51
IL RIO	RIO	25.8 BR U	Tr030Tp08h	7.93	61.77	63.95	62.91	64.04		1.96	5.01	12.52	0.52
IL RIO	RIO	25.8 BR D	Tr030Tp02h	13.71	61.77	63.88	64.21	64.23		2.27	9.17	11.85	1.14
IL RIO	RIO	25.8 BR D	Tr030Tp03h	9.68	61.77	64.02	62.97	64.14		1.89	6.90	14.95	0.49
IL RIO	RIO	25.8 BR D	Tr030Tp06h	9.19	61.77	64.00	62.96	64.11		1.90	6.38	14.55	0.50
IL RIO	RIO	25.8 BR D	Tr030Tp07h	8.51	61.77	63.97	62.94	64.08		1.93	5.70	13.93	0.51
IL RIO	RIO	25.8 BR D	Tr030Tp08h	7.93	61.77	63.95	62.91	64.04		1.96	5.18	13.36	0.51
IL RIO	RIO	25.5	Tr030Tp02h	13.72	61.77	63.08	63.37	64.21	0.039675	4.71	2.91	4.33	1.39
IL RIO	RIO	25.5	Tr030Tp03h	12.44	61.77	63.00	63.27	64.06	0.040365	4.55	2.73	4.22	1.39
IL RIO	RIO	25.5	Tr030Tp06h	9.19	61.77	62.83	63.03	63.65	0.039584	4.01	2.29	3.96	1.34
IL RIO	RIO	25.5	Tr030Tp07h	8.51	61.77	62.78	62.97	63.56	0.039852	3.90	2.19	3.90	1.33
IL RIO	RIO	25.5	Tr030Tp08h	7.93	61.77	62.75	62.92	63.48	0.040158	3.80	2.09	3.84	1.33
IL RIO	RIO	25	Tr030Tp02h	13.17	58.89	60.81	60.82	61.25	0.029151	2.94	4.48	5.12	1.00
IL RIO	RIO	25	Tr030Tp03h	11.89	58.89	60.75	60.74	61.16	0.028774	2.86	4.16	4.87	0.99
IL RIO	RIO	25	Tr030Tp06h	9.19	58.89	60.58	60.55	60.95	0.028133	2.69	3.42	4.26	0.96
IL RIO	RIO	25	Tr030Tp07h	8.51	58.89	60.54	60.50	60.89	0.027876	2.63	3.23	4.08	0.95
IL RIO	RIO	25	Tr030Tp08h	7.93	58.89	60.50		60.84	0.027532	2.59	3.07	3.92	0.93
IL RIO	RIO	24	Tr030Tp02h	13.07	58.91	60.23		60.60	0.021430	2.71	4.83	5.48	0.92
IL RIO	RIO	24	Tr030Tp03h	11.89	58.91	60.17		60.52	0.021347	2.64	4.51	5.32	0.92
IL RIO	RIO	24	Tr030Tp06h	9.19	58.91	60.01		60.32	0.021546	2.47	3.72	4.89	0.91
IL RIO	RIO	24	Tr030Tp07h	8.51	58.91	59.97		60.27	0.021620	2.43	3.51	4.77	0.90
IL RIO	RIO	24	Tr030Tp08h	7.93	58.91	59.93		60.22	0.021678	2.38	3.33	4.67	0.90
IL RIO	RIO	23	Tr030Tp02h	12.82	55.83	57.61	57.54	57.98	0.019967	2.71	4.98	7.14	0.86
IL RIO	RIO	23	Tr030Tp03h	11.89	55.83	57.58	57.46	57.92	0.018772	2.60	4.77	6.78	0.83
IL RIO	RIO	23	Tr030Tp06h	9.19	55.83	57.45		57.72	0.016909	2.32	3.99	5.15	0.77
IL RIO	RIO	23	Tr030Tp07h	8.51	55.83	57.40		57.66	0.017091	2.28	3.75	4.53	0.77
IL RIO	RIO	23	Tr030Tp08h	7.93	55.83	57.35		57.60	0.017465	2.25	3.52	4.11	0.78
IL RIO	RIO	22	Tr030Tp02h	12.80	54.51	57.27		57.42	0.011214	1.87	9.63	23.34	0.63
IL RIO	RIO	22	Tr030Tp03h	11.89	54.51	57.26		57.39	0.010083	1.76	9.36	23.04	0.59
IL RIO	RIO	22	Tr030Tp06h	9.19	54.51	57.21		57.31	0.007898	1.50	8.22	20.54	0.52
IL RIO	RIO	22	Tr030Tp07h	8.51	54.51	57.19		57.28	0.007442	1.43	7.87	19.83	0.50
IL RIO	RIO	22	Tr030Tp08h	7.93	54.51	57.17		57.26	0.007342	1.40	7.41	19.09	0.50
IL RIO	RIO	21.8	Tr030Tp02h	-12.80									
IL RIO	RIO	21.8	Tr030Tp03h	-11.89									
IL RIO	RIO	21.8	Tr030Tp06h	-9.19									
IL RIO	RIO	21.8	Tr030Tp07h	-8.51									
IL RIO	RIO	21.8	Tr030Tp08h	7.93									
IL RIO	RIO	21.5	Tr030Tp02h	11.67	54.51	56.85	57.12	57.61	0.109676	3.87	3.11	8.57	1.77
IL RIO	RIO	21.5	Tr030Tp03h	11.89	54.51	56.74	57.13	57.97	0.019943	4.90	2.42	6.16	1.09
IL RIO	RIO	21.5	Tr030Tp06h	9.19	54.51	56.51	57.01	57.44	0.017920	4.29	2.14	5.71	1.01
IL RIO	RIO	21.5	Tr030Tp07h	8.51	54.51	56.43	56.98	57.30	0.017559	4.13	2.06	5.59	0.99

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
IL RIO	RIO	21.5	Tr030Tp08h	7.93	54.51	56.37	56.95	57.18	0.017213	3.99	1.99	5.49	0.98
IL RIO	RIO	21	Tr030Tp02h	12.79	54.40	56.33		56.57	0.012290	2.18	5.86	5.60	0.68
IL RIO	RIO	21	Tr030Tp03h	11.89	54.40	56.27		56.50	0.012263	2.14	5.55	5.43	0.68
IL RIO	RIO	21	Tr030Tp06h	9.19	54.40	56.11		56.30	0.011278	1.96	4.70	4.93	0.64
IL RIO	RIO	21	Tr030Tp07h	8.51	54.40	56.06		56.24	0.011120	1.91	4.45	4.78	0.63
IL RIO	RIO	21	Tr030Tp08h	7.93	54.40	56.01		56.19	0.010946	1.87	4.24	4.64	0.62
IL RIO	RIO	20	Tr030Tp02h	12.68	53.57	55.32		55.51	0.017898	2.30	9.46	30.85	0.81
IL RIO	RIO	20	Tr030Tp03h	11.89	53.57	55.25		55.47	0.021177	2.37	7.58	20.40	0.87
IL RIO	RIO	20	Tr030Tp06h	3.33	53.57	55.19		55.21	0.002520	0.77	6.31	18.76	0.30
IL RIO	RIO	20	Tr030Tp07h	3.31	53.57	55.19		55.21	0.002527	0.77	6.27	18.68	0.30
IL RIO	RIO	20	Tr030Tp08h	3.33	53.57	55.19		55.21	0.002535	0.77	6.29	18.72	0.30
IL RIO	RIO	19.8	Tr030Tp02h	-12.68									
IL RIO	RIO	19.8	Tr030Tp03h	-11.89									
IL RIO	RIO	19.8	Tr030Tp06h	-3.33									
IL RIO	RIO	19.8	Tr030Tp07h	-3.31									
IL RIO	RIO	19.8	Tr030Tp08h	-3.33									
IL RIO	RIO	19.5	Tr030Tp02h	12.68	53.54	55.14	55.29	55.53	0.042128	3.10	6.11	20.66	1.20
IL RIO	RIO	19.5	Tr030Tp03h	11.89	53.54	55.12	55.26	55.50	0.042417	3.05	5.67	18.96	1.20
IL RIO	RIO	19.5	Tr030Tp06h	9.19	53.54	55.04	55.18	55.42	0.047738	2.95	4.19	16.74	1.25
IL RIO	RIO	19.5	Tr030Tp07h	8.51	53.54	55.01	55.16	55.40	0.049487	2.92	3.82	16.10	1.26
IL RIO	RIO	19.5	Tr030Tp08h	7.93	53.54	54.99	55.11	55.38	0.051998	2.91	3.46	14.88	1.28
IL RIO	RIO	19	Tr030Tp02h	12.66	51.20	52.77	52.83	53.08	0.017927	2.57	6.41	21.42	0.85
IL RIO	RIO	19	Tr030Tp03h	11.89	51.20	52.74	52.81	53.05	0.018069	2.53	5.86	18.44	0.85
IL RIO	RIO	19	Tr030Tp06h	9.19	51.20	52.62	52.56	52.90	0.018531	2.34	4.24	10.72	0.84
IL RIO	RIO	19	Tr030Tp07h	8.51	51.20	52.58	52.49	52.85	0.019064	2.29	3.86	8.79	0.84
IL RIO	RIO	19	Tr030Tp08h	7.93	51.20	52.55	52.45	52.81	0.019354	2.25	3.59	7.17	0.84
IL RIO	RIO	18.5	Tr030Tp02h	10.60	49.19	51.33		51.45	0.005729	1.55	8.54	15.57	0.44
IL RIO	RIO	18.5	Tr030Tp03h	10.59	49.19	51.33		51.45	0.005732	1.55	8.54	15.56	0.44
IL RIO	RIO	18.5	Tr030Tp06h	9.19	49.19	51.32		51.41	0.004502	1.36	8.30	15.15	0.39
IL RIO	RIO	18.5	Tr030Tp07h	8.51	49.19	51.31		51.39	0.003908	1.27	8.25	15.02	0.37
IL RIO	RIO	18.5	Tr030Tp08h	7.93	49.19	51.31		51.38	0.003447	1.19	8.17	14.85	0.34
IL RIO	RIO	18.01	Tr030Tp02h	10.60									
IL RIO	RIO	18.01	Tr030Tp03h	10.59									
IL RIO	RIO	18.01	Tr030Tp06h	9.19									
IL RIO	RIO	18.01	Tr030Tp07h	8.51									
IL RIO	RIO	18.01	Tr030Tp08h	7.93									
IL RIO	RIO	18	Tr030Tp02h	12.66	49.18	50.74		51.32	0.020128	3.38	3.74	4.94	0.88
IL RIO	RIO	18	Tr030Tp03h	11.89	49.18	50.68		51.24	0.020068	3.30	3.61	4.88	0.88
IL RIO	RIO	18	Tr030Tp06h	9.19	49.18	50.48		50.93	0.019605	2.95	3.11	4.67	0.85
IL RIO	RIO	18	Tr030Tp07h	8.51	49.18	50.43		50.85	0.019530	2.86	2.98	4.61	0.84
IL RIO	RIO	18	Tr030Tp08h	7.93	49.18	50.38		50.78	0.019410	2.78	2.86	4.56	0.83
IL RIO	RIO	17	Tr030Tp02h	12.66	48.00	49.72		49.83	0.003957	1.45	8.74	7.02	0.41
IL RIO	RIO	17	Tr030Tp03h	11.89	48.00	49.67		49.77	0.003899	1.42	8.40	6.92	0.41
IL RIO	RIO	17	Tr030Tp06h	9.19	48.00	49.47		49.56	0.003801	1.30	7.04	6.53	0.40
IL RIO	RIO	17	Tr030Tp07h	8.51	48.00	49.41		49.49	0.003813	1.28	6.66	6.42	0.40
IL RIO	RIO	17	Tr030Tp08h	7.93	48.00	49.36		49.44	0.003842	1.26	6.32	6.31	0.40
IL RIO	RIO	16.9		Lat Struct									
IL RIO	RIO	16.88		Lat Struct									
IL RIO	RIO	16.5	Tr030Tp02h	10.14	46.43	48.91	47.81	48.99	0.002864	1.24	8.18	4.48	0.29
IL RIO	RIO	16.5	Tr030Tp03h	9.86	46.43	48.89	47.79	48.96	0.002819	1.22	8.06	4.48	0.29
IL RIO	RIO	16.5	Tr030Tp06h	8.50	46.43	48.75	47.69	48.82	0.002584	1.14	7.46	4.48	0.28
IL RIO	RIO	16.5	Tr030Tp07h	8.04	46.43	48.71	47.65	48.77	0.002494	1.11	7.26	4.48	0.28
IL RIO	RIO	16.5	Tr030Tp08h	7.62	46.43	48.66	47.62	48.72	0.002410	1.08	7.06	4.48	0.27
IL RIO	RIO	16.01 BR U	Tr030Tp02h	10.14	46.43	48.88	47.55	48.96		1.72		4.48	0.37
IL RIO	RIO	16.01 BR U	Tr030Tp03h	9.86	46.43	48.85	47.54	48.93		1.71		4.48	0.37
IL RIO	RIO	16.01 BR U	Tr030Tp06h	8.50	46.43	48.72	47.52	48.79		1.65		4.48	0.37
IL RIO	RIO	16.01 BR U	Tr030Tp07h	8.04	46.43	48.67	47.51	48.74		1.63		4.48	0.37
IL RIO	RIO	16.01 BR U	Tr030Tp08h	7.62	46.43	48.63	47.50	48.69		1.62		4.48	0.37
IL RIO	RIO	16.01 BR D	Tr030Tp02h	10.14	46.43	48.68	47.55	48.93		1.72		4.48	0.47
IL RIO	RIO	16.01 BR D	Tr030Tp03h	9.86	46.43	48.66	47.54	48.91		1.71		4.48	0.46
IL RIO	RIO	16.01 BR D	Tr030Tp06h	8.50	46.43	48.56	47.52	48.77		1.65		4.48	0.45
IL RIO	RIO	16.01 BR D	Tr030Tp07h	8.04	46.43	48.53	47.51	48.72		1.63		4.48	0.44
IL RIO	RIO	16.01 BR D	Tr030Tp08h	7.62	46.43	48.50	47.50	48.68		1.62		4.48	0.44
IL RIO	RIO	16	Tr030Tp02h	10.14	46.43	48.60		48.72	0.004748	1.49	6.80	4.48	0.39
IL RIO	RIO	16	Tr030Tp03h	9.86	46.43	48.57		48.69	0.004745	1.48	6.66	4.48	0.39
IL RIO	RIO	16	Tr030Tp06h	8.50	46.43	48.44		48.54	0.004598	1.40	6.06	4.48	0.39
IL RIO	RIO	16	Tr030Tp07h	8.04	46.43	48.40		48.49	0.004488	1.37	5.87	4.48	0.38
IL RIO	RIO	16	Tr030Tp08h	7.62	46.43	48.36		48.45	0.004385	1.34	5.70	4.48	0.38
IL RIO	RIO	15	Tr030Tp02h	6.28	44.14	45.88		45.95	0.003814	1.15	5.44	5.98	0.39
IL RIO	RIO	15	Tr030Tp03h	6.23	44.14	45.88		45.94	0.003837	1.15	5.40	5.97	0.39
IL RIO	RIO	15	Tr030Tp06h	5.98	44.14	45.85		45.92	0.003806	1.14	5.27	5.94	0.39
IL RIO	RIO	15	Tr030Tp07h	5.93	44.14	45.85		45.91	0.003809	1.13	5.23	5.93	0.39
IL RIO	RIO	15	Tr030Tp08h	5.86	44.14	45.84		45.91	0.003788	1.13	5.20	5.92	0.38
IL RIO	RIO	14	Tr030Tp02h	6.14	43.66	45.44		45.49	0.002961	1.04	5.88	5.52	0.32
IL RIO	RIO	14	Tr030Tp03h	6.07	43.66	45.42		45.48	0.003034	1.05	5.78	5.52	0.33
IL RIO	RIO	14	Tr030Tp06h	5.72	43.66	45.35		45.41	0.003300	1.06	5.40	5.52	0.34
IL RIO	RIO	14	Tr030Tp07h	5.61	43.66	45.33		45.39	0.003376	1.06	5.29	5.52	0.35

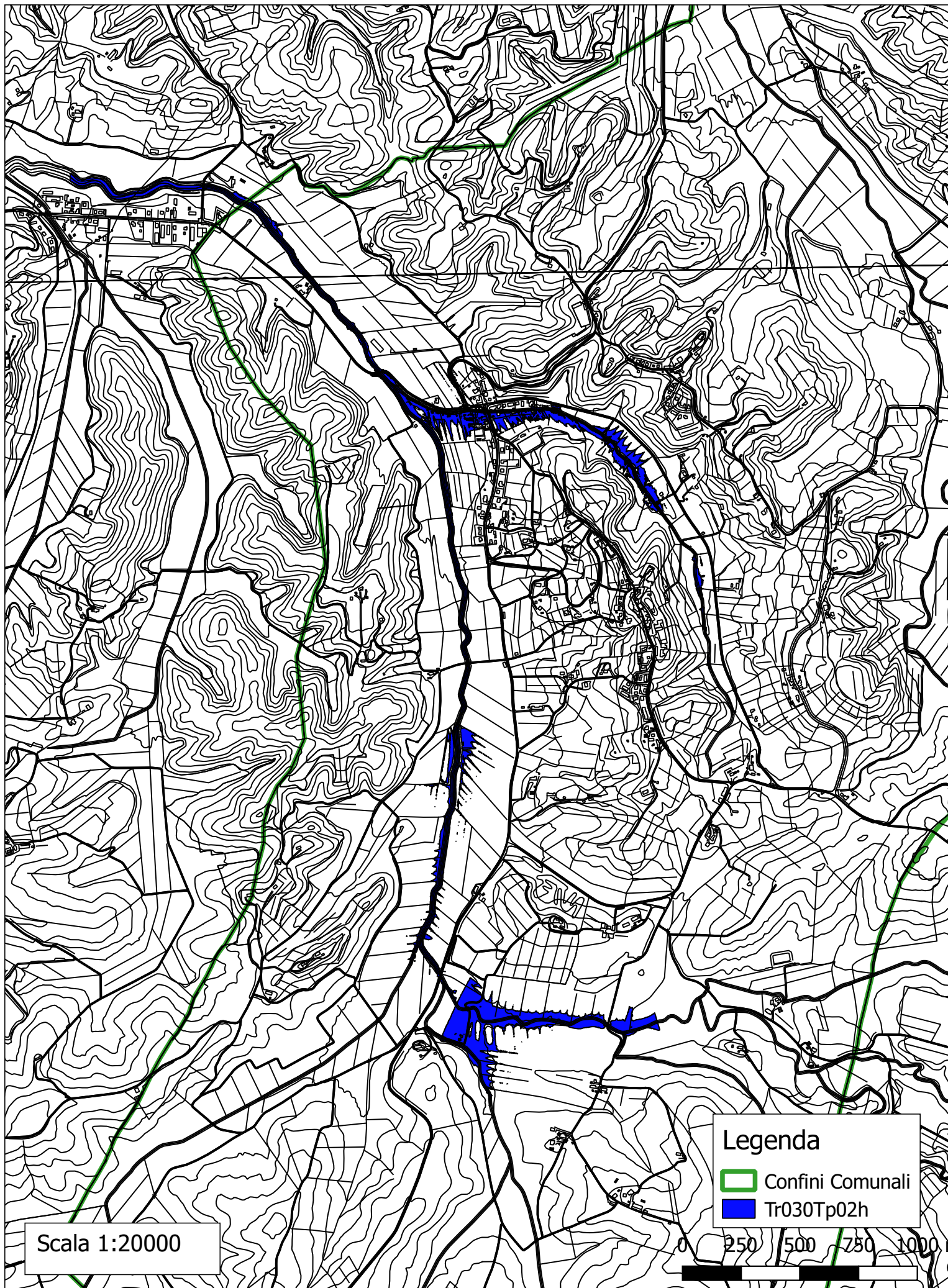
HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
IL RIO	RIO	14	Tr030Tp08h	5.52	43.66	45.31		45.37	0.003451	1.06	5.19	5.52	0.35
IL RIO	RIO	13.5	Tr030Tp02h	6.69	43.10	44.65		44.73	0.005161	1.25	5.35	5.88	0.42
IL RIO	RIO	13.5	Tr030Tp03h	6.56	43.10	44.63		44.71	0.005195	1.25	5.27	5.88	0.42
IL RIO	RIO	13.5	Tr030Tp06h	5.88	43.10	44.58		44.65	0.005065	1.19	4.94	5.88	0.41
IL RIO	RIO	13.5	Tr030Tp07h	5.66	43.10	44.56		44.63	0.004956	1.17	4.85	5.88	0.41
IL RIO	RIO	13.5	Tr030Tp08h	5.45	43.10	44.55		44.61	0.004886	1.15	4.76	5.88	0.41
IL RIO	RIO	13.01	Tr030Tp02h	6.69									
IL RIO	RIO	13.01	Tr030Tp03h	6.56									
IL RIO	RIO	13.01	Tr030Tp06h	5.88									
IL RIO	RIO	13.01	Tr030Tp07h	5.66									
IL RIO	RIO	13.01	Tr030Tp08h	5.45									
IL RIO	RIO	13	Tr030Tp02h	6.69	43.10	44.55		44.65	0.007437	1.42	4.72	5.79	0.50
IL RIO	RIO	13	Tr030Tp03h	6.55	43.10	44.52		44.63	0.007911	1.44	4.57	5.79	0.52
IL RIO	RIO	13	Tr030Tp06h	5.88	43.10	44.43		44.54	0.009323	1.46	4.03	5.79	0.56
IL RIO	RIO	13	Tr030Tp07h	5.66	43.10	44.41		44.51	0.009431	1.44	3.92	5.79	0.56
IL RIO	RIO	13	Tr030Tp08h	5.45	43.10	44.39		44.50	0.009462	1.43	3.82	5.79	0.56
IL RIO	RIO	12.500	Tr030Tp02h	6.15	42.64	44.17		44.25	0.010806	1.22	5.06	5.37	0.40
IL RIO	RIO	12.500	Tr030Tp03h	6.05	42.64	44.15		44.23	0.011109	1.22	4.95	5.37	0.41
IL RIO	RIO	12.500	Tr030Tp06h	5.76	42.64	44.05		44.14	0.014282	1.31	4.40	5.37	0.46
IL RIO	RIO	12.500	Tr030Tp07h	5.69	42.64	44.02		44.11	0.015727	1.34	4.23	5.37	0.48
IL RIO	RIO	12.500	Tr030Tp08h	5.59	42.64	43.99		44.09	0.017123	1.38	4.07	5.37	0.50
IL RIO	RIO	12.071	Tr030Tp02h	8.36	42.24	43.76		43.93	0.010224	1.85	4.53	5.22	0.62
IL RIO	RIO	12.071	Tr030Tp03h	8.05	42.24	43.74		43.91	0.010053	1.82	4.45	5.20	0.62
IL RIO	RIO	12.071	Tr030Tp06h	6.79	42.24	43.67		43.81	0.009428	1.68	4.06	5.13	0.59
IL RIO	RIO	12.071	Tr030Tp07h	6.45	42.24	43.64		43.78	0.009297	1.64	3.95	5.11	0.59
IL RIO	RIO	12.071	Tr030Tp08h	6.15	42.24	43.62		43.75	0.009216	1.60	3.84	5.10	0.58
IL RIO	RIO	12	Tr030Tp02h	8.35	42.17	43.71		43.88	0.010498	1.84	4.53	4.94	0.61
IL RIO	RIO	12	Tr030Tp03h	8.05	42.17	43.70		43.86	0.010214	1.80	4.46	4.94	0.61
IL RIO	RIO	12	Tr030Tp06h	6.79	42.17	43.63		43.76	0.009222	1.65	4.12	4.94	0.58
IL RIO	RIO	12	Tr030Tp07h	6.45	42.17	43.60		43.74	0.008985	1.61	4.01	4.94	0.57
IL RIO	RIO	12	Tr030Tp08h	6.15	42.17	43.58		43.71	0.008820	1.57	3.91	4.94	0.56
IL RIO	RIO	11.688	Tr030Tp02h	8.07	41.67	43.36		43.49	0.006194	1.62	5.35	6.56	0.51
IL RIO	RIO	11.688	Tr030Tp03h	7.82	41.67	43.35		43.47	0.006158	1.60	5.24	6.52	0.50
IL RIO	RIO	11.688	Tr030Tp06h	6.76	41.67	43.26		43.38	0.006165	1.51	4.72	6.37	0.50
IL RIO	RIO	11.688	Tr030Tp07h	6.47	41.67	43.24		43.35	0.006243	1.50	4.55	6.30	0.50
IL RIO	RIO	11.688	Tr030Tp08h	6.20	41.67	43.21		43.32	0.006380	1.48	4.37	6.21	0.50
IL RIO	RIO	11	Tr030Tp02h	7.73	40.56	42.19		42.39	0.012541	1.99	3.88	3.99	0.65
IL RIO	RIO	11	Tr030Tp03h	7.63	40.56	42.18		42.38	0.012593	1.99	3.84	3.99	0.65
IL RIO	RIO	11	Tr030Tp06h	7.20	40.56	42.14		42.33	0.012799	1.97	3.66	3.99	0.65
IL RIO	RIO	11	Tr030Tp07h	6.97	40.56	42.11		42.31	0.012834	1.95	3.58	3.99	0.66
IL RIO	RIO	11	Tr030Tp08h	6.77	40.56	42.09		42.28	0.012964	1.94	3.50	3.99	0.66
IL RIO	RIO	10.650	Tr030Tp02h	8.10	40.22	41.80		41.97	0.009481	1.82	4.58	5.64	0.59
IL RIO	RIO	10.650	Tr030Tp03h	7.94	40.22	41.78		41.95	0.009774	1.83	4.46	5.56	0.60
IL RIO	RIO	10.650	Tr030Tp06h	7.27	40.22	41.72		41.88	0.010330	1.80	4.10	5.32	0.61
IL RIO	RIO	10.650	Tr030Tp07h	7.07	40.22	41.69		41.86	0.010866	1.81	3.95	5.22	0.63
IL RIO	RIO	10.650	Tr030Tp08h	6.93	40.22	41.66		41.83	0.011721	1.85	3.79	5.10	0.65
IL RIO	RIO	10	Tr030Tp02h	10.26	39.58	41.13		41.28	0.008261	1.76	6.11	6.75	0.56
IL RIO	RIO	10	Tr030Tp03h	10.07	39.58	41.11		41.26	0.008413	1.76	5.99	6.75	0.57
IL RIO	RIO	10	Tr030Tp06h	8.63	39.58	41.02		41.16	0.008548	1.67	5.37	6.75	0.57
IL RIO	RIO	10	Tr030Tp07h	8.17	39.58	40.98		41.12	0.008660	1.65	5.15	6.75	0.57
IL RIO	RIO	10	Tr030Tp08h	7.68	39.58	40.95		41.08	0.008890	1.63	4.89	6.75	0.57
IL RIO	RIO	09	Tr030Tp02h	10.55	39.01	40.73		40.89	0.007554	1.77	6.02	6.12	0.54
IL RIO	RIO	09	Tr030Tp03h	10.29	39.01	40.71		40.87	0.007577	1.76	5.91	6.06	0.54
IL RIO	RIO	09	Tr030Tp06h	8.82	39.01	40.62		40.76	0.007333	1.65	5.36	5.69	0.53
IL RIO	RIO	09	Tr030Tp07h	8.32	39.01	40.58		40.72	0.007365	1.62	5.14	5.53	0.52
IL RIO	RIO	09	Tr030Tp08h	7.79	39.01	40.53		40.66	0.007580	1.60	4.86	5.32	0.53
IL RIO	RIO	08	Tr030Tp02h	10.20	38.67	40.55		40.64	0.003313	1.32	7.74	5.59	0.36
IL RIO	RIO	08	Tr030Tp03h	9.96	38.67	40.54		40.62	0.003273	1.30	7.64	5.58	0.36
IL RIO	RIO	08	Tr030Tp06h	8.73	38.67	40.45		40.53	0.002991	1.22	7.18	5.54	0.34
IL RIO	RIO	08	Tr030Tp07h	8.30	38.67	40.41		40.49	0.002945	1.19	6.97	5.52	0.34
IL RIO	RIO	08	Tr030Tp08h	7.79	38.67	40.36		40.43	0.002921	1.17	6.69	5.49	0.34
IL RIO	RIO	07	Tr030Tp02h	9.09	38.21	39.81		40.16	0.020999	2.61	3.52	6.58	0.67
IL RIO	RIO	07	Tr030Tp03h	9.43	38.21	39.83		40.19	0.021771	2.67	3.57	6.58	0.69
IL RIO	RIO	07	Tr030Tp06h	8.25	38.21	39.75		40.06	0.019709	2.47	3.36	6.58	0.65
IL RIO	RIO	07	Tr030Tp07h	8.55	38.21	39.71		40.06	0.022745	2.63	3.28	6.58	0.70
IL RIO	RIO	07	Tr030Tp08h	7.77	38.21	39.62		39.95	0.023026	2.56	3.06	6.38	0.71
IL RIO	RIO	06	Tr030Tp02h	9.42	37.11	39.77	38.17	39.85	0.002892	1.18	7.97	3.22	0.24
IL RIO	RIO	06	Tr030Tp03h	9.36	37.11	39.75	38.16	39.82	0.002928	1.19	7.89	3.22	0.24
IL RIO	RIO	06	Tr030Tp06h	8.40	37.11	39.57	38.09	39.64	0.002856	1.15	7.32	3.20	0.24
IL RIO	RIO	06	Tr030Tp07h	8.19	37.11	39.51	38.07	39.58	0.002903	1.15	7.12	3.19	0.25
IL RIO	RIO	06	Tr030Tp08h	7.77	37.11	39.43	38.04	39.49	0.002871	1.13	6.86	3.17	0.25
IL RIO	RIO	5.5 BR U	Tr030Tp02h	9.42	37.11	38.64	38.16	39.85	0.013351	2.13	4.41	3.04	0.57
IL RIO	RIO	5.5 BR U	Tr030Tp03h	9.36	37.11	38.64	38.16	39.83	0.013174	2.12	4.41	3.04	0.56
IL RIO	RIO	5.5 BR U	Tr030Tp06h	8.40	37.11	38.64	38.09	39.65	0.010628	1.90	4.41	3.04	0.50
IL RIO	RIO	5.5 BR U	Tr030Tp07h	8.19	37.11	38.64	38.07	39.59	0.010094	1.86	4.41	3.04	0.49
IL RIO	RIO	5.5 BR U	Tr030Tp08h	7.77	37.11	38.64	38.04	39.51	0.009080	1.76	4.41	3.04	0.47
IL RIO	RIO	5.5 BR D	Tr030Tp02h	9.42	37.00	38.64	37.97	39.55	0.007574	1.74	5.41	3.49	0.45
IL RIO	RIO	5.5 BR D	Tr030Tp03h	9.36	37.00	38.64	37.97	39.53	0.007473	1.73	5.41	3.49	0.44

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
IL RIO	RIO	5.5 BR D	Tr030Tp06h	8.40	37.00	38.64	37.90	39.42	0.006029	1.55	5.41	3.49	0.40
IL RIO	RIO	5.5 BR D	Tr030Tp07h	8.19	37.00	38.64	37.89	39.37	0.005726	1.51	5.41	3.49	0.39
IL RIO	RIO	5.5 BR D	Tr030Tp08h	7.77	37.00	38.64	37.86	39.31	0.005151	1.43	5.41	3.49	0.37
IL RIO	RIO	5.2	Tr030Tp02h	9.41	37.00	39.49		39.55	0.002367	1.12	8.44	3.61	0.23
IL RIO	RIO	5.2	Tr030Tp03h	9.35	37.00	39.47		39.53	0.002391	1.12	8.36	3.61	0.23
IL RIO	RIO	5.2	Tr030Tp06h	8.39	37.00	39.36		39.42	0.002177	1.05	7.97	3.61	0.23
IL RIO	RIO	5.2	Tr030Tp07h	8.19	37.00	39.32		39.37	0.002186	1.05	7.81	3.61	0.23
IL RIO	RIO	5.2	Tr030Tp08h	7.77	37.00	39.26		39.31	0.002101	1.02	7.61	3.60	0.22
IL RIO	RIO	5	Tr030Tp02h	10.02	37.00	39.47		39.54	0.002749	1.20	8.36	3.62	0.25
IL RIO	RIO	5	Tr030Tp03h	9.85	37.00	39.45		39.52	0.002706	1.19	8.30	3.62	0.25
IL RIO	RIO	5	Tr030Tp06h	8.55	37.00	39.35		39.41	0.002277	1.08	7.95	3.62	0.23
IL RIO	RIO	5	Tr030Tp07h	8.19	37.00	39.31		39.37	0.002192	1.05	7.80	3.61	0.23
IL RIO	RIO	5	Tr030Tp08h	7.77	37.00	39.26		39.31	0.002107	1.02	7.60	3.60	0.22
IL RIO	RIO	04	Tr030Tp02h	9.46	36.83	39.26		39.37	0.004860	1.46	6.46	3.32	0.33
IL RIO	RIO	04	Tr030Tp03h	9.30	36.83	39.25		39.36	0.004788	1.45	6.42	3.32	0.33
IL RIO	RIO	04	Tr030Tp06h	8.47	36.83	39.16		39.25	0.004515	1.39	6.11	3.30	0.33
IL RIO	RIO	04	Tr030Tp07h	8.16	36.83	39.12		39.21	0.004426	1.36	5.98	3.29	0.32
IL RIO	RIO	04	Tr030Tp08h	7.77	36.83	39.07		39.16	0.004293	1.33	5.83	3.27	0.32
IL RIO	RIO	03	Tr030Tp02h	9.40	36.55	38.36		38.53	0.008247	1.82	5.16	4.40	0.54
IL RIO	RIO	03	Tr030Tp03h	9.27	36.55	38.35		38.52	0.008236	1.81	5.11	4.38	0.54
IL RIO	RIO	03	Tr030Tp06h	8.47	36.55	38.28		38.44	0.008126	1.76	4.80	4.27	0.53
IL RIO	RIO	03	Tr030Tp07h	8.15	36.55	38.25		38.40	0.008100	1.75	4.67	4.22	0.53
IL RIO	RIO	03	Tr030Tp08h	7.77	36.55	38.21		38.36	0.008045	1.72	4.51	4.16	0.53
IL RIO	RIO	02	Tr030Tp02h	8.94	35.39	36.93		37.14	0.012995	2.05	4.37	4.95	0.69
IL RIO	RIO	02	Tr030Tp03h	8.91	35.39	36.99		37.18	0.010636	1.90	4.69	5.08	0.63
IL RIO	RIO	02	Tr030Tp06h	7.72	35.39	37.00		37.14	0.007769	1.63	4.74	5.11	0.54
IL RIO	RIO	02	Tr030Tp07h	7.00	35.39	36.97		37.09	0.006930	1.52	4.60	5.04	0.51
IL RIO	RIO	02	Tr030Tp08h	6.85	35.39	36.94		37.06	0.007272	1.54	4.45	4.98	0.52
IL RIO	RIO	1.6923	Tr030Tp02h	7.35	34.74	36.72		36.78	0.002694	1.09	6.77	6.11	0.33
IL RIO	RIO	1.6923	Tr030Tp03h	7.72	34.74	36.85		36.90	0.002198	1.02	7.58	6.41	0.30
IL RIO	RIO	1.6923	Tr030Tp06h	5.25	34.74	36.92		36.94	0.000861	0.65	8.06	6.59	0.19
IL RIO	RIO	1.6923	Tr030Tp07h	4.96	34.74	36.91		36.93	0.000782	0.62	8.00	6.57	0.18
IL RIO	RIO	1.6923	Tr030Tp08h	4.93	34.74	36.90		36.92	0.000806	0.63	7.88	6.52	0.18
IL RIO	RIO	1.3846	Tr030Tp02h	7.33	34.08	36.69		36.71	0.000765	0.67	10.90	7.78	0.18
IL RIO	RIO	1.3846	Tr030Tp03h	7.26	34.08	36.82		36.84	0.000580	0.61	12.00	8.14	0.16
IL RIO	RIO	1.3846	Tr030Tp06h	4.96	34.08	36.91		36.92	0.000228	0.39	12.72	8.29	0.10
IL RIO	RIO	1.3846	Tr030Tp07h	4.76	34.08	36.91		36.91	0.000213	0.38	12.66	8.28	0.10
IL RIO	RIO	1.3846	Tr030Tp08h	4.82	34.08	36.89		36.89	0.000226	0.39	12.50	8.25	0.10
IL RIO	RIO	01	Tr030Tp02h	6.10	33.26	36.68		36.69	0.000142	0.34	17.94	10.53	0.08
IL RIO	RIO	01	Tr030Tp03h	4.83	33.26	36.83		36.83	0.000069	0.25	19.49	10.81	0.06
IL RIO	RIO	01	Tr030Tp06h	1.54	33.26	36.92		36.92	0.000006	0.08	20.48	11.01	0.02
IL RIO	RIO	01	Tr030Tp07h	1.47	33.26	36.91		36.91	0.000006	0.07	20.39	10.99	0.02
IL RIO	RIO	01	Tr030Tp08h	1.76	33.26	36.89		36.89	0.000008	0.09	20.18	10.95	0.02

Planimetria di esondazione Tr 30 anni - scenario TR30TP02h



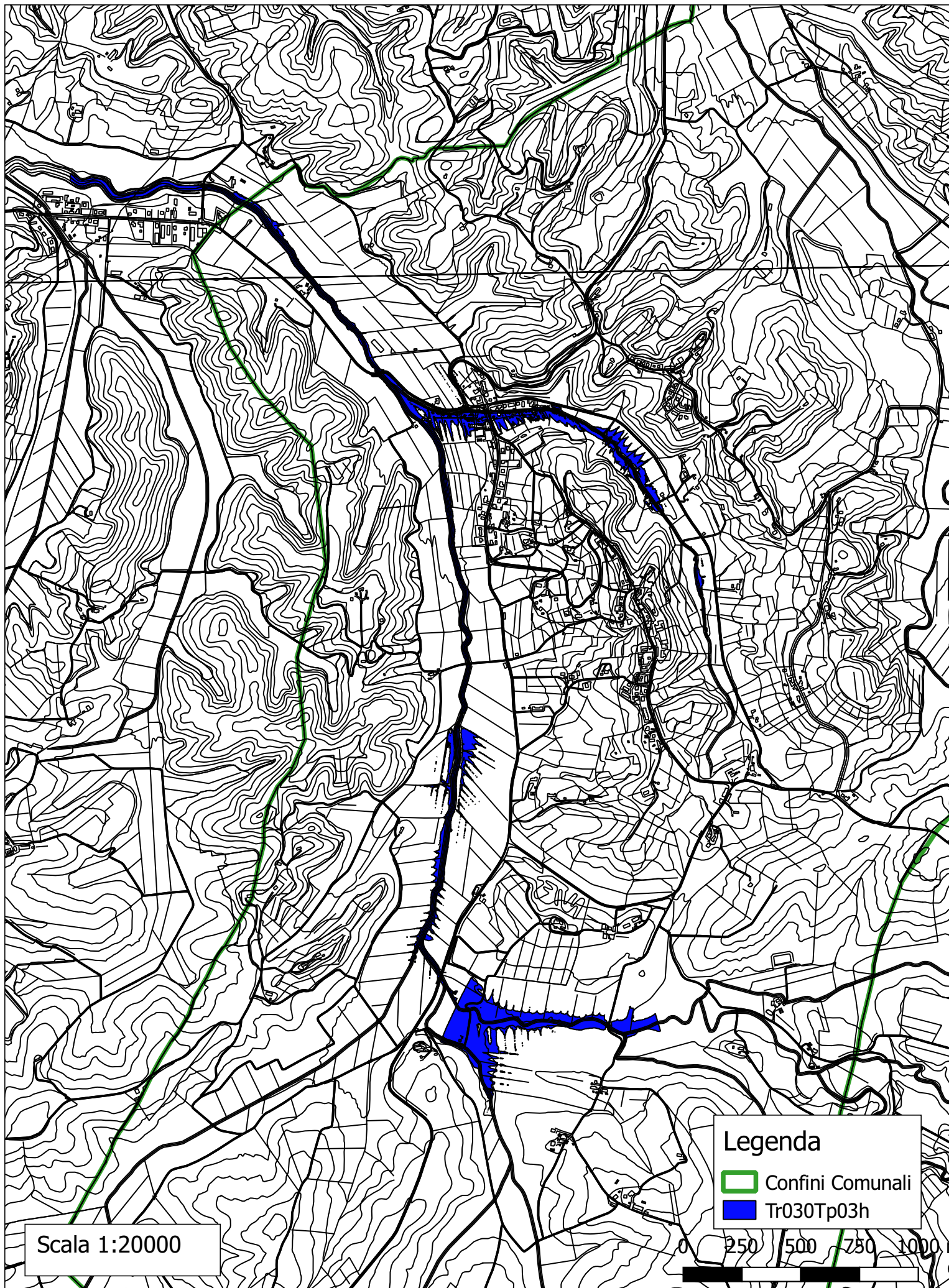
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Legenda

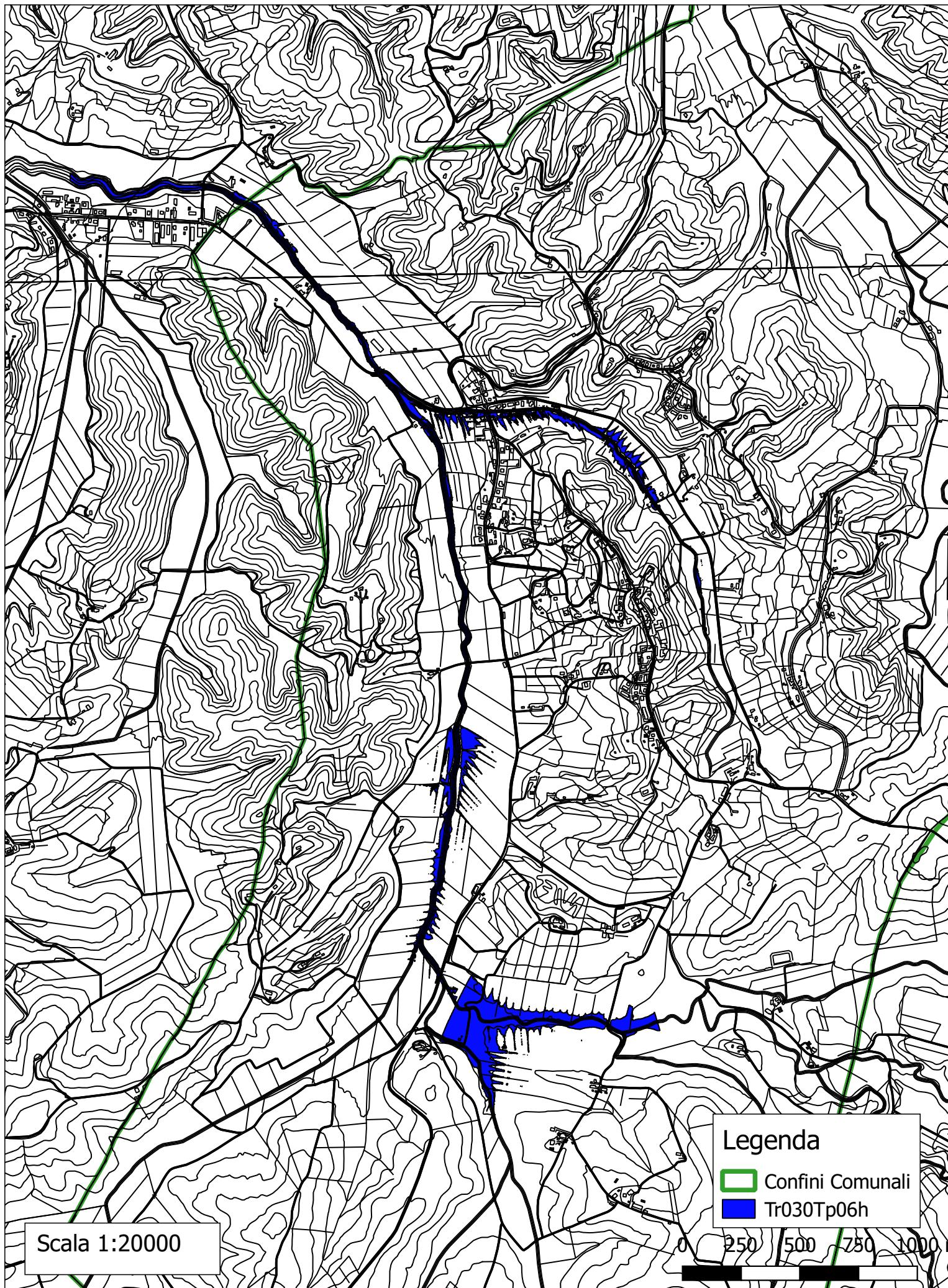
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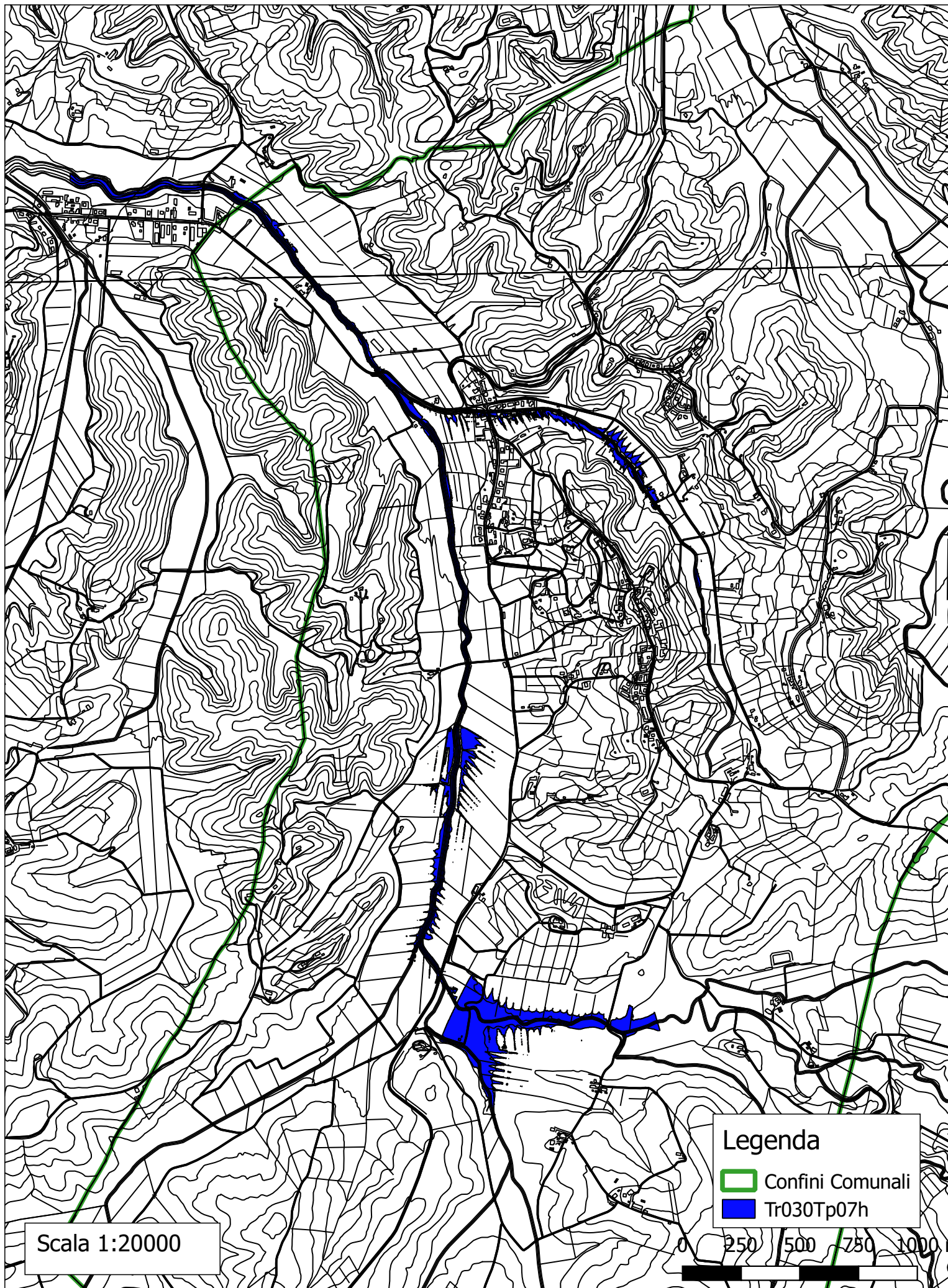
Planimetria di esondazione Tr 30 anni - scenario TR30TP03h



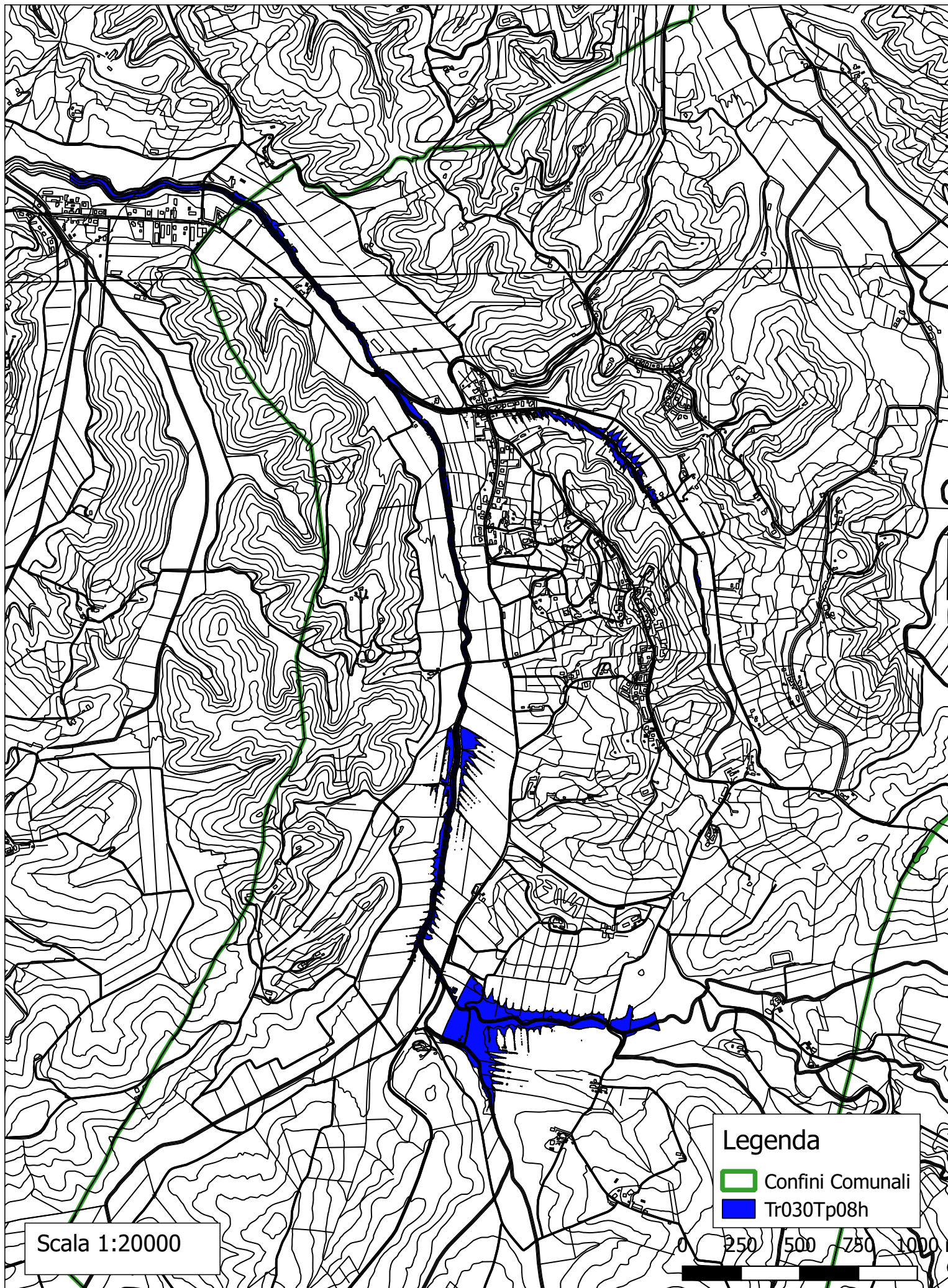
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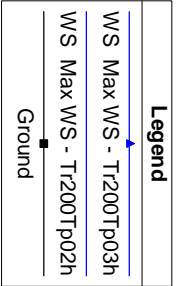
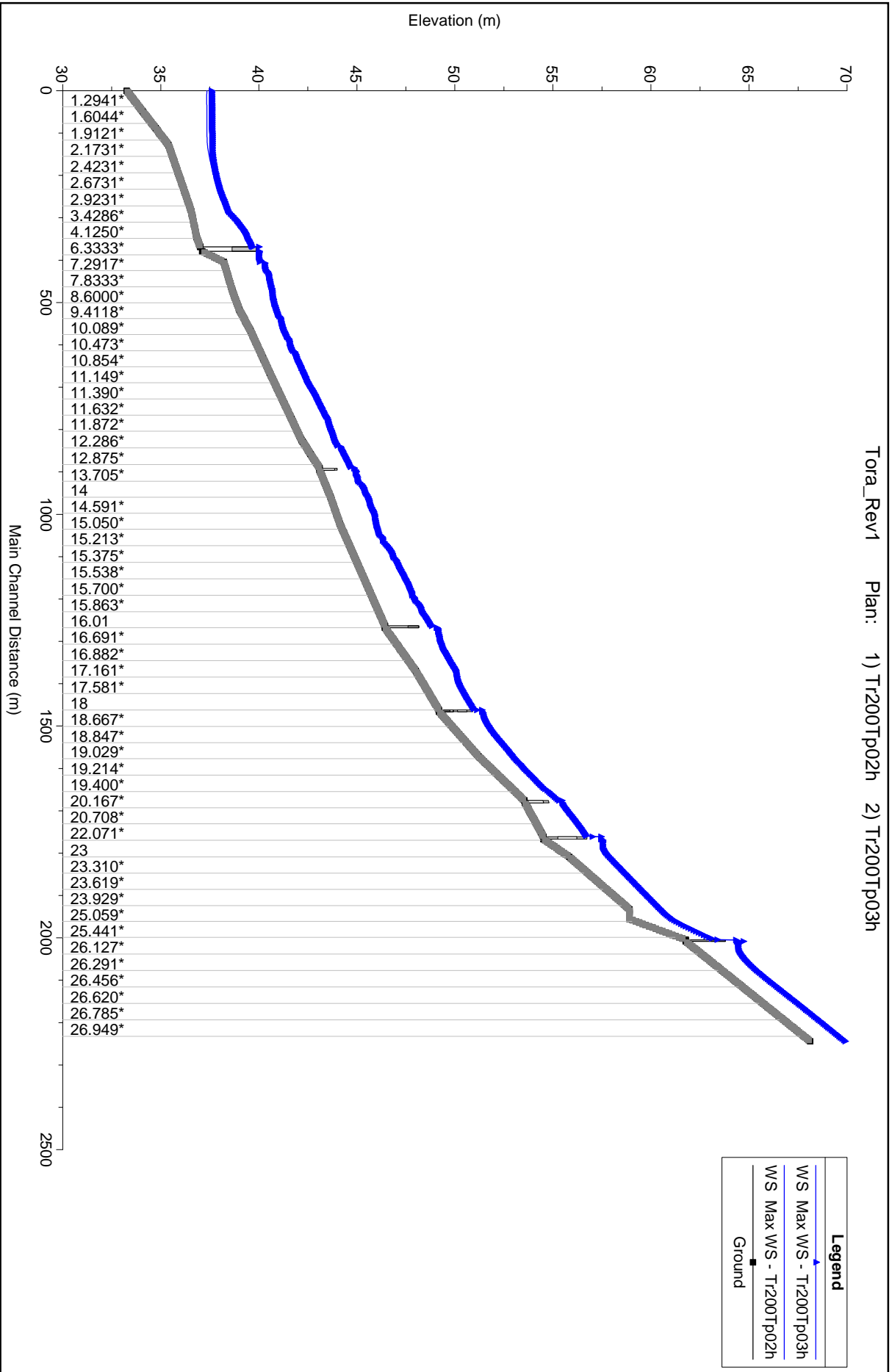
Planimetria di esondazione Tr 30 anni - scenario TR30TP07h

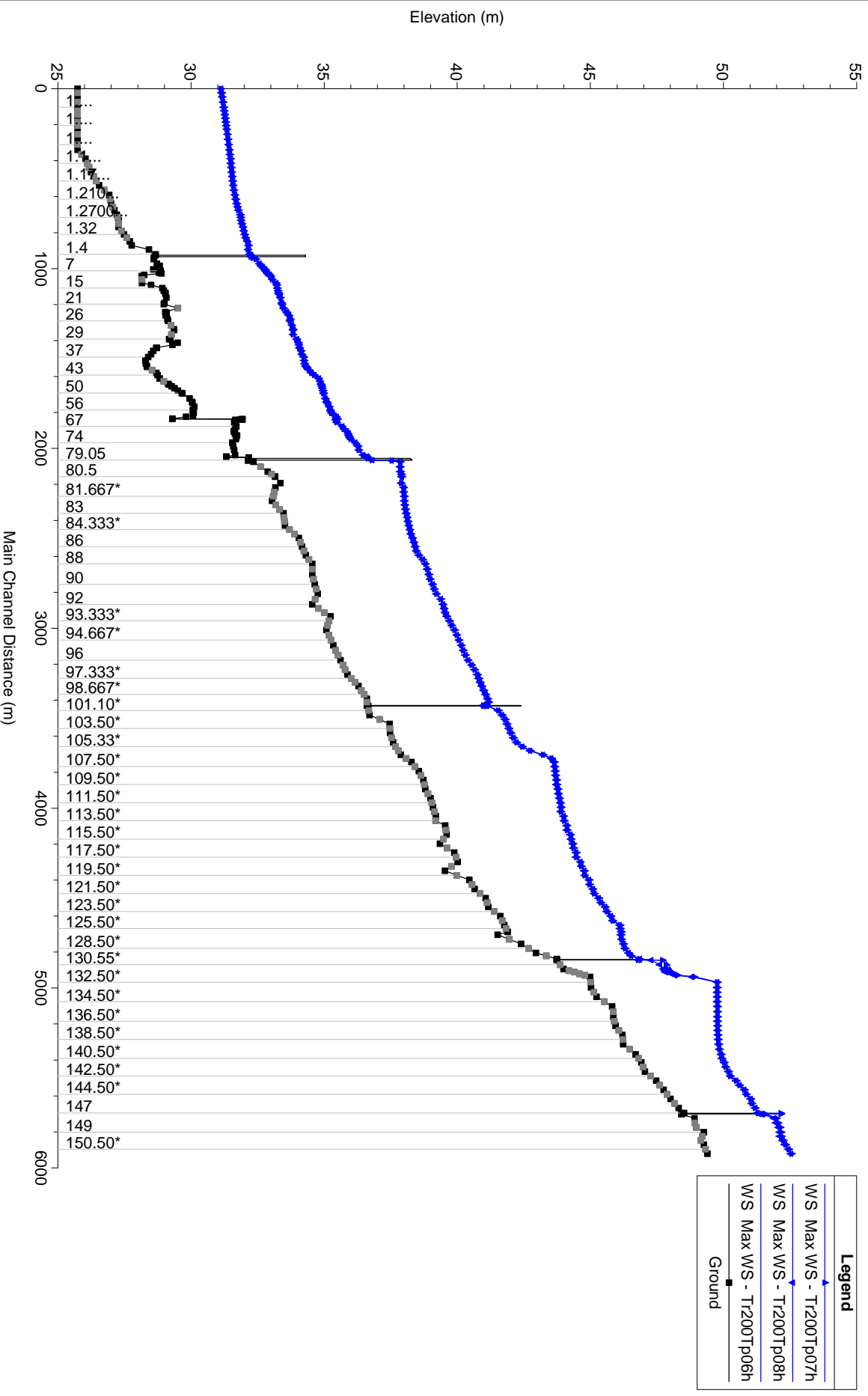


Planimetria di esondazione Tr 30 anni - scenario TR30TP08h



Allegato 3 - Risultati modello RAS per Tr 200





HEC-RAS Profile: Max WS

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	151	Tr200Tp02h	89.63	49.40	52.31		52.39	0.002294	1.60	93.89	88.59	0.37
TORA	Tora	151	Tr200Tp03h	100.98	49.40	52.45		52.53	0.002115	1.60	106.08	91.65	0.36
TORA	Tora	151	Tr200Tp06h	110.11	49.40	52.57		52.64	0.001930	1.59	117.24	94.27	0.34
TORA	Tora	151	Tr200Tp07h	109.00	49.40	52.55		52.63	0.001951	1.59	115.90	94.01	0.34
TORA	Tora	151	Tr200Tp08h	107.38	49.40	52.52		52.60	0.002007	1.60	113.38	93.46	0.35
TORA	Tora	150	Tr200Tp02h	89.61	49.26	52.08		52.25	0.004180	2.22	61.83	51.32	0.49
TORA	Tora	150	Tr200Tp03h	100.95	49.26	52.22		52.39	0.004040	2.28	69.21	54.87	0.49
TORA	Tora	150	Tr200Tp06h	109.87	49.26	52.35		52.52	0.003704	2.27	76.70	57.43	0.48
TORA	Tora	150	Tr200Tp07h	108.78	49.26	52.33		52.51	0.003738	2.27	75.79	57.08	0.48
TORA	Tora	150	Tr200Tp08h	107.37	49.26	52.30		52.48	0.003871	2.29	73.92	56.36	0.48
TORA	Tora	149	Tr200Tp02h	89.59	49.26	51.86		51.92	0.002080	1.41	114.06	121.84	0.34
TORA	Tora	149	Tr200Tp03h	100.93	49.26	52.02		52.07	0.001800	1.39	133.54	133.10	0.32
TORA	Tora	149	Tr200Tp06h	109.76	49.26	52.19		52.23	0.001388	1.29	156.68	139.78	0.29
TORA	Tora	149	Tr200Tp07h	108.67	49.26	52.16		52.21	0.001428	1.30	153.46	137.90	0.29
TORA	Tora	149	Tr200Tp08h	107.36	49.26	52.10		52.15	0.001608	1.35	145.22	134.80	0.31
TORA	Tora	148	Tr200Tp02h	89.58	48.91	51.61		51.74	0.003622	1.88	71.12	71.87	0.46
TORA	Tora	148	Tr200Tp03h	100.92	48.91	51.79		51.91	0.002969	1.82	84.78	75.83	0.42
TORA	Tora	148	Tr200Tp06h	109.75	48.91	52.02		52.11	0.002141	1.66	102.42	84.30	0.36
TORA	Tora	148	Tr200Tp07h	108.66	48.91	51.99		52.08	0.002234	1.68	99.93	82.73	0.37
TORA	Tora	148	Tr200Tp08h	107.35	48.91	51.90		52.01	0.002627	1.77	93.03	78.52	0.40
TORA	Tora	147.2	Tr200Tp02h	89.58	48.43	51.23		51.63	0.007207	2.80	31.94	13.44	0.58
TORA	Tora	147.2	Tr200Tp03h	100.92	48.43	51.37		51.82	0.007695	2.98	33.86	13.47	0.60
TORA	Tora	147.2	Tr200Tp06h	109.75	48.43	51.60		52.05	0.007009	2.96	37.05	13.67	0.57
TORA	Tora	147.2	Tr200Tp07h	108.65	48.43	51.57		52.02	0.007112	2.97	36.61	13.64	0.58
TORA	Tora	147.2	Tr200Tp08h	107.35	48.43	51.46		51.93	0.007876	3.06	35.04	13.52	0.61
TORA	Tora	147.1	Tr200Tp02h	89.58	48.43	51.21	50.49	51.62	0.006328	2.84	31.52	13.44	0.59
TORA	Tora	147.1	Tr200Tp03h	100.92	48.43	51.35	50.63	51.82	0.006656	3.03	33.34	13.47	0.61
TORA	Tora	147.1	Tr200Tp06h	109.75	48.43	51.58	50.74	52.05	0.005866	3.01	36.42	13.65	0.58
TORA	Tora	147.1	Tr200Tp07h	108.65	48.43	51.55	50.72	52.02	0.005977	3.02	36.00	13.62	0.58
TORA	Tora	147.1	Tr200Tp08h	107.35	48.43	51.43	50.71	51.93	0.006742	3.11	34.47	13.50	0.61
TORA	Tora	147.05 BR U	Tr200Tp02h	89.58	48.43	51.15	50.50	51.60	0.008307	2.95	30.41	12.94	0.57
TORA	Tora	147.05 BR U	Tr200Tp03h	100.92	48.43	51.27	50.64	51.78	0.009105	3.16	31.96	12.94	0.60
TORA	Tora	147.05 BR U	Tr200Tp06h	109.75	48.43	51.34	50.75	51.91	0.009970	3.35	32.79	12.94	0.63
TORA	Tora	147.05 BR U	Tr200Tp07h	108.65	48.43	52.16	50.74	52.47		3.22	36.06		0.54
TORA	Tora	147.05 BR U	Tr200Tp08h	107.35	48.43	51.35	50.72	51.89	0.009417	3.26	32.95	12.94	0.61
TORA	Tora	147.05 BR D	Tr200Tp02h	89.58	48.51	51.09	50.48	51.55	0.008650	3.01	29.81	12.95	0.60
TORA	Tora	147.05 BR D	Tr200Tp03h	100.92	48.51	51.20	50.63	51.73	0.009588	3.23	31.20	12.94	0.63
TORA	Tora	147.05 BR D	Tr200Tp06h	109.75	48.51	51.25	50.73	51.85	0.010706	3.45	31.81	12.94	0.67
TORA	Tora	147.05 BR D	Tr200Tp07h	108.65	48.51	52.16	50.72	52.47		3.20	36.72		0.54
TORA	Tora	147.05 BR D	Tr200Tp08h	107.35	48.51	51.27	50.70	51.84	0.009939	3.34	32.12	12.94	0.64
TORA	Tora	147	Tr200Tp02h	89.58	48.51	51.10		51.54	0.006442	2.97	30.20	13.74	0.62
TORA	Tora	147	Tr200Tp03h	100.92	48.51	51.20		51.72	0.007005	3.19	31.64	13.78	0.66
TORA	Tora	147	Tr200Tp06h	109.74	48.51	51.25		51.84	0.007751	3.40	32.27	13.80	0.69
TORA	Tora	147	Tr200Tp07h	108.65	48.51	51.29		51.85	0.007211	3.31	32.78	13.82	0.67
TORA	Tora	147	Tr200Tp08h	107.35	48.51	51.28		51.83	0.007185	3.29	32.58	13.81	0.67
TORA	Tora	146	Tr200Tp02h	89.57	48.32	51.04		51.26	0.004447	2.41	64.68	77.78	0.52
TORA	Tora	146	Tr200Tp03h	100.90	48.32	51.13		51.36	0.004603	2.51	71.96	84.62	0.53
TORA	Tora	146	Tr200Tp06h	109.74	48.32	51.20		51.44	0.004655	2.58	78.03	89.92	0.54
TORA	Tora	146	Tr200Tp07h	108.64	48.32	51.19		51.43	0.004644	2.57	77.31	89.31	0.54
TORA	Tora	146	Tr200Tp08h	107.34	48.32	51.18		51.42	0.004637	2.56	76.42	88.55	0.53
TORA	Tora	145	Tr200Tp02h	89.57	48.01	50.87		50.95	0.001874	1.63	107.85	107.09	0.34
TORA	Tora	145	Tr200Tp03h	100.87	48.01	50.96		51.04	0.001945	1.70	117.90	112.71	0.35
TORA	Tora	145	Tr200Tp06h	109.73	48.01	51.04		51.12	0.002081	1.80	145.64	200.43	0.36
TORA	Tora	145	Tr200Tp07h	108.63	48.01	51.03		51.12	0.002099	1.80	143.81	199.91	0.37
TORA	Tora	145	Tr200Tp08h	107.33	48.01	51.02		51.11	0.002116	1.80	141.74	199.34	0.37
TORA	Tora	144	Tr200Tp02h	89.56	47.75	50.63		50.75	0.002820	1.97	90.45	120.08	0.41
TORA	Tora	144	Tr200Tp03h	100.84	47.75	50.72		50.86	0.003192	2.15	101.47	135.57	0.44
TORA	Tora	144	Tr200Tp06h	109.71	47.75	50.80		50.93	0.003045	2.14	112.23	141.70	0.43
TORA	Tora	144	Tr200Tp07h	108.55	47.75	50.79		50.92	0.003048	2.14	111.02	140.66	0.43
TORA	Tora	144	Tr200Tp08h	107.30	47.75	50.77		50.91	0.003079	2.14	109.31	139.65	0.44
TORA	Tora	143	Tr200Tp02h	89.54	47.47	50.32		50.52	0.004102	2.30	69.68	95.27	0.50
TORA	Tora	143	Tr200Tp03h	100.71	47.47	50.41		50.62	0.004335	2.42	80.36	142.39	0.51
TORA	Tora	143	Tr200Tp06h	109.50	47.47	50.49		50.70	0.004139	2.43	94.36	181.42	0.50
TORA	Tora	143	Tr200Tp07h	108.40	47.47	50.48		50.69	0.004161	2.43	92.76	180.25	0.51
TORA	Tora	143	Tr200Tp08h	107.16	47.47	50.47		50.68	0.004227	2.44	90.35	178.48	0.51
TORA	Tora	142	Tr200Tp02h	89.19	47.04	49.99		50.17	0.004902	2.42	69.56	89.29	0.52
TORA	Tora	142	Tr200Tp03h	99.92	47.04	50.09		50.25	0.004327	2.35	95.46	178.24	0.50
TORA	Tora	142	Tr200Tp06h	108.66	47.04	50.20		50.33	0.003536	2.19	117.40	200.12	0.45
TORA	Tora	142	Tr200Tp07h	107.90	47.04	50.20		50.33	0.003528	2.19	116.67	199.42	0.45
TORA	Tora	142	Tr200Tp08h	105.59	47.04	50.18		50.31	0.003586	2.19	112.93	195.75	0.45
TORA	Tora	141	Tr200Tp02h	88.44	46.91	49.76		49.93	0.004459	2.37	78.93	105.33	0.51
TORA	Tora	141	Tr200Tp03h	97.90	46.91	49.90		50.03	0.003564	2.20	118.21	224.42	0.46
TORA	Tora	141	Tr200Tp06h	108.00	46.91	50.04		50.12	0.002539	1.93	150.41	233.82	0.39
TORA	Tora	141	Tr200Tp07h	107.05	46.91	50.04		50.12	0.002516	1.92	149.84	233.66	0.39
TORA	Tora	141	Tr200Tp08h	103.84	46.91	50.02		50.11	0.002518	1.91	145.93	232.54	0.39
TORA	Tora	140	Tr200Tp02h	86.88	46.70	49.63		49.71	0.002178	1.72	109.62	131.95	0.36
TORA	Tora	140	Tr200Tp03h	96.61	46.70	49.76		49.84	0.002124	1.76	129.10	175.95	0.36
TORA	Tora	140	Tr200Tp06h	104.63	46.70	49.91		49.98	0.001690	1.64	160.18	214.47	0.32
TORA	Tora	140	Tr200Tp07h	104.18	46.70	49.91		49.98	0.001670	1.63	160.37	214.52	0.32

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	140	Tr200Tp08h	102.43	46.70	49.90		49.96	0.001683	1.63	157.05	212.98	0.32
TORA	Tora	139	Tr200Tp02h	84.37	46.23	49.48		49.55	0.001994	1.60	113.20	170.51	0.34
TORA	Tora	139	Tr200Tp03h	93.45	46.23	49.64		49.70	0.001588	1.49	143.93	209.72	0.31
TORA	Tora	139	Tr200Tp06h	103.01	46.23	49.83		49.87	0.001128	1.33	185.35	229.12	0.27
TORA	Tora	139	Tr200Tp07h	102.89	46.23	49.83		49.87	0.001120	1.32	185.77	229.24	0.26
TORA	Tora	139	Tr200Tp08h	101.43	46.23	49.81		49.85	0.001142	1.33	181.93	228.15	0.27
TORA	Tora	138	Tr200Tp02h	82.95	46.20	49.39		49.43	0.001224	1.39	137.08	156.13	0.28
TORA	Tora	138	Tr200Tp03h	92.47	46.20	49.58		49.62	0.000970	1.30	169.34	180.19	0.25
TORA	Tora	138	Tr200Tp06h	102.28	46.20	49.80		49.81	0.000284	0.74	440.19	607.88	0.14
TORA	Tora	138	Tr200Tp07h	102.55	46.20	49.80		49.81	0.000284	0.74	441.49	608.51	0.14
TORA	Tora	138	Tr200Tp08h	101.21	46.20	49.78		49.79	0.000294	0.75	430.77	603.81	0.14
TORA	Tora	137	Tr200Tp02h	82.68	45.94	49.36		49.36	0.000275	0.69	386.81	590.80	0.13
TORA	Tora	137	Tr200Tp03h	92.27	45.94	49.56		49.57	0.000162	0.55	510.95	619.15	0.10
TORA	Tora	137	Tr200Tp06h	102.33	45.94	49.79		49.79	0.000100	0.46	653.54	657.76	0.08
TORA	Tora	137	Tr200Tp07h	102.47	45.94	49.79		49.79	0.000100	0.46	655.15	658.33	0.08
TORA	Tora	137	Tr200Tp08h	101.12	45.94	49.77		49.77	0.000102	0.46	643.15	653.99	0.08
TORA	Tora	136	Tr200Tp02h	82.62	45.86	49.35		49.35	0.000086	0.40	520.76	443.58	0.07
TORA	Tora	136	Tr200Tp03h	92.23	45.86	49.56		49.56	0.000066	0.37	614.11	457.18	0.07
TORA	Tora	136	Tr200Tp06h	102.33	45.86	49.78		49.78	0.000051	0.34	719.21	472.27	0.06
TORA	Tora	136	Tr200Tp07h	102.45	45.86	49.78		49.79	0.000051	0.34	720.22	472.42	0.06
TORA	Tora	136	Tr200Tp08h	101.10	45.86	49.77		49.77	0.000051	0.34	711.73	471.22	0.06
TORA	Tora	135	Tr200Tp02h	82.57	45.81	49.34		49.34	0.000159	0.54	354.64	321.97	0.10
TORA	Tora	135	Tr200Tp03h	92.20	45.81	49.55		49.55	0.000123	0.50	423.45	336.06	0.09
TORA	Tora	135	Tr200Tp06h	102.33	45.81	49.78		49.78	0.000095	0.46	501.63	349.04	0.08
TORA	Tora	135	Tr200Tp07h	102.43	45.81	49.78		49.78	0.000095	0.46	502.48	349.12	0.08
TORA	Tora	135	Tr200Tp08h	101.10	45.81	49.76		49.76	0.000096	0.46	496.10	348.49	0.08
TORA	Tora	134	Tr200Tp02h	82.56	45.24	49.33		49.33	0.000078	0.42	465.03	317.60	0.07
TORA	Tora	134	Tr200Tp03h	92.21	45.24	49.54		49.55	0.000065	0.40	532.87	323.32	0.07
TORA	Tora	134	Tr200Tp06h	102.32	45.24	49.77		49.77	0.000053	0.37	607.11	324.42	0.06
TORA	Tora	134	Tr200Tp07h	102.43	45.24	49.77		49.78	0.000053	0.37	607.80	324.43	0.06
TORA	Tora	134	Tr200Tp08h	101.09	45.24	49.76		49.76	0.000053	0.37	601.87	324.34	0.06
TORA	Tora	133	Tr200Tp02h	82.52	45.02	49.33		49.33	0.000059	0.30	528.80	322.16	0.05
TORA	Tora	133	Tr200Tp03h	92.19	45.02	49.54		49.54	0.000050	0.28	597.53	325.29	0.05
TORA	Tora	133	Tr200Tp06h	102.35	45.02	49.77		49.77	0.000042	0.27	672.36	327.35	0.04
TORA	Tora	133	Tr200Tp07h	102.42	45.02	49.77		49.77	0.000042	0.27	673.16	327.39	0.04
TORA	Tora	133	Tr200Tp08h	101.09	45.02	49.75		49.76	0.000042	0.27	667.18	327.08	0.04
TORA	Tora	132	Tr200Tp02h	82.21	44.99	48.46	48.79	50.00	0.047672	5.49	14.97	6.47	1.15
TORA	Tora	132	Tr200Tp03h	92.19	44.99	48.63	48.98	50.30	0.050623	5.74	16.06	6.80	1.19
TORA	Tora	132	Tr200Tp06h	102.26	44.99	48.93	49.16	50.51	0.045488	5.56	18.38	7.59	1.14
TORA	Tora	132	Tr200Tp07h	101.77	44.99	48.90	49.16	50.51	0.047106	5.62	18.10	7.57	1.16
TORA	Tora	132	Tr200Tp08h	100.57	44.99	48.82	49.14	50.50	0.050480	5.74	17.52	7.55	1.20
TORA	Tora	131	Tr200Tp02h	82.71	43.99	47.54		47.65	0.002243	1.85	84.90	109.12	0.36
TORA	Tora	131	Tr200Tp03h	92.17	43.99	47.41		47.59	0.003715	2.31	72.22	83.23	0.46
TORA	Tora	131	Tr200Tp06h	83.64	43.99	48.03		48.07	0.000835	1.26	149.99	154.90	0.22
TORA	Tora	131	Tr200Tp07h	100.87	43.99	47.91		47.99	0.001609	1.71	132.12	143.73	0.31
TORA	Tora	131	Tr200Tp08h	100.11	43.99	47.74		47.84	0.002054	1.86	108.78	128.55	0.35
TORA	Tora	130.1	Tr200Tp02h	82.85	43.74	46.67	46.15	47.45	0.011404	3.91	21.16	13.72	0.74
TORA	Tora	130.1	Tr200Tp03h	92.16	43.74	46.94	46.33	47.74	0.010849	3.98	23.17	14.36	0.72
TORA	Tora	130.1	Tr200Tp06h	101.05	43.74	47.81	46.49	47.99	0.005062	2.18	91.10	189.74	0.49
TORA	Tora	130.1	Tr200Tp07h	100.80	43.74	47.70	46.49	47.98	0.007804	2.60	70.65	183.91	0.61
TORA	Tora	130.1	Tr200Tp08h	100.17	43.74	47.28	46.47	48.05	0.009841	3.89	25.77	15.63	0.69
TORA	Tora	130.05 BR U	Tr200Tp02h	82.85	43.74	46.20	46.20	47.39	0.028709	4.83	17.10	7.17	0.98
TORA	Tora	130.05 BR U	Tr200Tp03h	92.16	43.74	46.68	46.38	47.70	0.021415	4.48	20.58	7.23	0.83
TORA	Tora	130.05 BR U	Tr200Tp06h	101.05	43.74	46.80	46.55	47.93	0.023091	4.72	21.42	7.25	0.86
TORA	Tora	130.05 BR U	Tr200Tp07h	100.80	43.74	46.79	46.54	47.93	0.023044	4.71	21.39	7.25	0.86
TORA	Tora	130.05 BR U	Tr200Tp08h	100.17	43.74	46.79	46.53	47.91	0.022825	4.69	21.37	7.24	0.86
TORA	Tora	130.05 BR D	Tr200Tp02h	82.85	43.74	46.17	46.07	47.26	0.025848	4.61	17.94	7.30	0.94
TORA	Tora	130.05 BR D	Tr200Tp03h	92.16	43.74	46.73	46.25	47.63	0.018279	4.19	22.00	7.26	0.77
TORA	Tora	130.05 BR D	Tr200Tp06h	101.05	43.74	46.85	46.41	47.85	0.019749	4.42	22.88	7.25	0.80
TORA	Tora	130.05 BR D	Tr200Tp07h	100.80	43.74	46.85	46.40	47.84	0.019707	4.41	22.86	7.25	0.80
TORA	Tora	130.05 BR D	Tr200Tp08h	100.17	43.74	46.84	46.39	47.83	0.019531	4.39	22.83	7.25	0.79
TORA	Tora	130	Tr200Tp02h	82.55	43.74	46.12		47.15	0.013131	4.50	18.33	17.04	0.93
TORA	Tora	130	Tr200Tp03h	91.24	43.74	46.73		47.53	0.007464	3.96	23.06	19.57	0.73
TORA	Tora	130	Tr200Tp06h	100.66	43.74	46.86		47.75	0.007908	4.19	24.04	20.09	0.76
TORA	Tora	130	Tr200Tp07h	99.74	43.74	46.85		47.73	0.007793	4.15	24.01	20.08	0.75
TORA	Tora	130	Tr200Tp08h	99.71	43.74	46.85		47.73	0.007826	4.16	23.98	20.06	0.75
TORA	Tora	129	Tr200Tp02h	80.47	42.95	46.24		46.44	0.003719	1.99	48.22	58.60	0.46
TORA	Tora	129	Tr200Tp03h	90.08	42.95	46.34		46.55	0.003833	2.08	54.04	63.13	0.47
TORA	Tora	129	Tr200Tp06h	100.07	42.95	46.44		46.65	0.003865	2.14	60.64	68.89	0.47
TORA	Tora	129	Tr200Tp07h	99.70	42.95	46.44		46.65	0.003865	2.14	60.39	68.71	0.47
TORA	Tora	129	Tr200Tp08h	99.69	42.95	46.43		46.65	0.003909	2.15	59.99	68.43	0.48
TORA	Tora	128	Tr200Tp02h	78.07	42.40	46.10		46.22	0.002062	1.59	56.35	51.81	0.35
TORA	Tora	128	Tr200Tp03h	86.13	42.40	46.15		46.29	0.002281	1.69	59.41	55.05	0.37
TORA	Tora	128	Tr200Tp06h	94.27	42.40	46.27		46.41	0.002152	1.70	72.26	85.77	0.36
TORA	Tora	128	Tr200Tp07h	94.71	42.40	46.25		46.39	0.002274	1.73	70.31	84.71	0.37
TORA	Tora	128	Tr200Tp08h	99.64	42.40	46.24		46.40	0.002576	1.84	69.33	84.26	0.39
TORA	Tora	127	Tr200Tp02h	74.10	41.51	46.04		46.12	0.001198	1.31	64.62	48.07	0.27
TORA	Tora	127	Tr200Tp03h	85.71	41.51	46.07		46.18	0.001513	1.48	66.36	48.07	0.30

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	127	Tr200Tp06h	93.84	41.51	46.18		46.29	0.001540	1.54	71.42	48.07	0.31
TORA	Tora	127	Tr200Tp07h	94.03	41.51	46.15		46.27	0.001604	1.56	70.27	48.07	0.31
TORA	Tora	127	Tr200Tp08h	94.24	41.51	46.14		46.26	0.001651	1.58	69.51	48.07	0.32
TORA	Tora	126	Tr200Tp02h	74.11	41.89	46.05		46.08	0.000556	0.91	127.13	112.79	0.19
TORA	Tora	126	Tr200Tp03h	85.50	41.89	46.09		46.13	0.000699	1.03	131.63	117.10	0.21
TORA	Tora	126	Tr200Tp06h	94.11	41.89	46.19		46.24	0.000702	1.06	144.68	125.47	0.21
TORA	Tora	126	Tr200Tp07h	94.12	41.89	46.17		46.21	0.000733	1.07	141.80	123.99	0.22
TORA	Tora	126	Tr200Tp08h	94.30	41.89	46.15		46.20	0.000758	1.09	139.88	123.16	0.22
TORA	Tora	125	Tr200Tp02h	71.03	41.77	45.99		46.03	0.000621	0.99	114.43	120.44	0.20
TORA	Tora	125	Tr200Tp03h	84.78	41.77	46.01		46.06	0.000847	1.16	116.96	124.06	0.23
TORA	Tora	125	Tr200Tp06h	93.57	41.77	46.15		46.20	0.000809	1.17	135.27	137.34	0.23
TORA	Tora	125	Tr200Tp07h	93.73	41.77	46.12		46.18	0.000857	1.20	131.29	135.35	0.23
TORA	Tora	125	Tr200Tp08h	93.89	41.77	46.10		46.16	0.000906	1.22	127.98	132.22	0.24
TORA	Tora	124	Tr200Tp02h	123.92	41.61	45.61		45.80	0.002776	2.04	84.53	84.19	0.42
TORA	Tora	124	Tr200Tp03h	136.66	41.61	45.71		45.91	0.002814	2.11	93.28	89.20	0.42
TORA	Tora	124	Tr200Tp06h	147.81	41.61	45.81		46.00	0.002756	2.14	102.06	93.80	0.42
TORA	Tora	124	Tr200Tp07h	145.89	41.61	45.78		45.98	0.002800	2.15	99.97	91.65	0.42
TORA	Tora	124	Tr200Tp08h	143.83	41.61	45.77		45.97	0.002809	2.14	98.41	91.31	0.42
TORA	Tora	123	Tr200Tp02h	123.90	41.17	45.39		45.61	0.002972	2.13	75.24	88.84	0.43
TORA	Tora	123	Tr200Tp03h	136.84	41.17	45.49		45.71	0.003057	2.22	83.97	95.74	0.44
TORA	Tora	123	Tr200Tp06h	147.78	41.17	45.60		45.82	0.002919	2.23	94.96	103.92	0.43
TORA	Tora	123	Tr200Tp07h	145.87	41.17	45.57		45.80	0.002999	2.24	91.92	101.36	0.44
TORA	Tora	123	Tr200Tp08h	143.81	41.17	45.55		45.78	0.003013	2.24	90.06	99.45	0.44
TORA	Tora	122	Tr200Tp02h	123.87	41.07	45.13		45.37	0.003480	2.23	71.46	76.51	0.46
TORA	Tora	122	Tr200Tp03h	137.05	41.07	45.25		45.49	0.003464	2.30	81.69	91.79	0.46
TORA	Tora	122	Tr200Tp06h	147.76	41.07	45.34		45.59	0.003353	2.32	90.54	93.41	0.46
TORA	Tora	122	Tr200Tp07h	145.87	41.07	45.32		45.57	0.003390	2.32	88.74	93.16	0.46
TORA	Tora	122	Tr200Tp08h	143.81	41.07	45.31		45.55	0.003404	2.31	87.16	92.93	0.46
TORA	Tora	121	Tr200Tp02h	123.83	40.66	44.92		45.11	0.002776	2.02	75.51	62.32	0.41
TORA	Tora	121	Tr200Tp03h	136.86	40.66	45.03		45.24	0.002828	2.10	82.50	65.94	0.42
TORA	Tora	121	Tr200Tp06h	147.73	40.66	45.11		45.33	0.002864	2.16	88.23	68.16	0.42
TORA	Tora	121	Tr200Tp07h	145.86	40.66	45.10		45.31	0.002855	2.15	87.29	67.81	0.42
TORA	Tora	121	Tr200Tp08h	143.79	40.66	45.08		45.30	0.002846	2.14	86.24	67.42	0.42
TORA	Tora	120	Tr200Tp02h	123.81	40.45	44.78		44.93	0.001971	1.79	87.74	70.87	0.35
TORA	Tora	120	Tr200Tp03h	136.80	40.45	44.89		45.05	0.002030	1.87	95.56	75.46	0.36
TORA	Tora	120	Tr200Tp06h	147.64	40.45	44.97		45.14	0.002073	1.93	103.10	86.47	0.37
TORA	Tora	120	Tr200Tp07h	145.81	40.45	44.96		45.12	0.002068	1.92	100.96	78.46	0.37
TORA	Tora	120	Tr200Tp08h	143.76	40.45	44.94		45.11	0.002056	1.91	99.82	77.84	0.37
TORA	Tora	119	Tr200Tp02h	123.73	39.54	44.60		44.73	0.001906	1.62	95.42	105.74	0.34
TORA	Tora	119	Tr200Tp03h	136.70	39.54	44.71		44.84	0.001900	1.67	107.84	121.16	0.34
TORA	Tora	119	Tr200Tp06h	147.58	39.54	44.79		44.93	0.001898	1.71	118.55	133.59	0.34
TORA	Tora	119	Tr200Tp07h	145.70	39.54	44.78		44.91	0.001895	1.70	116.81	131.55	0.34
TORA	Tora	119	Tr200Tp08h	143.71	39.54	44.77		44.90	0.001894	1.69	114.90	129.31	0.34
TORA	Tora	118	Tr200Tp02h	123.67	40.02	44.45		44.60	0.001892	1.88	103.17	119.72	0.35
TORA	Tora	118	Tr200Tp03h	136.58	40.02	44.56		44.72	0.001921	1.93	116.56	132.09	0.36
TORA	Tora	118	Tr200Tp06h	147.51	40.02	44.64		44.80	0.001932	1.98	127.84	141.93	0.36
TORA	Tora	118	Tr200Tp07h	145.57	40.02	44.63		44.79	0.001922	1.97	126.16	140.51	0.36
TORA	Tora	118	Tr200Tp08h	143.65	40.02	44.62		44.77	0.001919	1.96	124.24	138.87	0.36
TORA	Tora	117	Tr200Tp02h	122.96	39.88	44.31		44.43	0.001548	1.67	111.89	134.04	0.32
TORA	Tora	117	Tr200Tp03h	136.42	39.88	44.40		44.53	0.001598	1.73	125.49	142.79	0.32
TORA	Tora	117	Tr200Tp06h	147.15	39.88	44.48		44.61	0.001611	1.77	136.74	147.84	0.33
TORA	Tora	117	Tr200Tp07h	145.42	39.88	44.47		44.60	0.001600	1.76	135.39	147.25	0.33
TORA	Tora	117	Tr200Tp08h	143.43	39.88	44.46		44.59	0.001597	1.76	133.33	146.33	0.32
TORA	Tora	116	Tr200Tp02h	122.90	39.35	44.19		44.31	0.001434	1.64	112.09	126.60	0.31
TORA	Tora	116	Tr200Tp03h	136.26	39.35	44.28		44.41	0.001502	1.71	124.02	137.83	0.31
TORA	Tora	116	Tr200Tp06h	147.10	39.35	44.35		44.49	0.001529	1.76	134.45	143.72	0.32
TORA	Tora	116	Tr200Tp07h	145.23	39.35	44.35		44.48	0.001512	1.75	133.31	143.09	0.32
TORA	Tora	116	Tr200Tp08h	143.28	39.35	44.33		44.46	0.001508	1.74	131.40	142.02	0.32
TORA	Tora	115	Tr200Tp02h	122.85	39.60	44.11		44.22	0.001302	1.57	125.81	164.73	0.29
TORA	Tora	115	Tr200Tp03h	136.16	39.60	44.19		44.31	0.001349	1.63	140.22	173.46	0.30
TORA	Tora	115	Tr200Tp06h	146.64	39.60	44.27		44.38	0.001355	1.66	153.15	184.52	0.30
TORA	Tora	115	Tr200Tp07h	145.08	39.60	44.26		44.37	0.001344	1.65	151.92	183.49	0.30
TORA	Tora	115	Tr200Tp08h	143.15	39.60	44.25		44.36	0.001344	1.65	149.47	181.44	0.30
TORA	Tora	114	Tr200Tp02h	122.71	39.55	43.98		44.08	0.001343	1.55	135.14	171.55	0.30
TORA	Tora	114	Tr200Tp03h	135.88	39.55	44.06		44.16	0.001432	1.63	149.62	197.82	0.31
TORA	Tora	114	Tr200Tp06h	146.38	39.55	44.13		44.24	0.001414	1.65	165.01	210.03	0.31
TORA	Tora	114	Tr200Tp07h	144.81	39.55	44.12		44.23	0.001401	1.64	163.80	209.07	0.30
TORA	Tora	114	Tr200Tp08h	142.98	39.55	44.11		44.22	0.001408	1.64	160.82	206.67	0.30
TORA	Tora	113	Tr200Tp02h	122.59	39.19	43.86		43.96	0.001338	1.59	140.49	199.08	0.30
TORA	Tora	113	Tr200Tp03h	135.76	39.19	43.93		44.04	0.001432	1.67	155.57	218.74	0.31
TORA	Tora	113	Tr200Tp06h	146.03	39.19	44.01		44.11	0.001388	1.67	172.96	228.49	0.30
TORA	Tora	113	Tr200Tp07h	144.59	39.19	44.00		44.11	0.001373	1.66	172.05	228.01	0.30
TORA	Tora	113	Tr200Tp08h	142.78	39.19	43.99		44.09	0.001389	1.66	168.39	226.03	0.30
TORA	Tora	112	Tr200Tp02h	122.47	39.09	43.77		43.83	0.000970	1.34	176.57	202.27	0.25
TORA	Tora	112	Tr200Tp03h	135.74	39.09	43.83		43.90	0.001033	1.40	189.77	207.27	0.26
TORA	Tora	112	Tr200Tp06h	145.72	39.09	43.91		43.98	0.001018	1.41	206.83	219.86	0.26
TORA	Tora	112	Tr200Tp07h	144.43	39.09	43.91		43.98	0.001006	1.41	206.23	219.71	0.26
TORA	Tora	112	Tr200Tp08h	142.66	39.09	43.89		43.96	0.001021	1.41	202.42	218.71	0.26

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	111	Tr200Tp02h	122.39	38.99	43.70		43.78	0.001442	1.35	154.81	209.14	0.29
TORA	Tora	111	Tr200Tp03h	135.74	38.99	43.76		43.84	0.001609	1.40	167.65	215.10	0.31
TORA	Tora	111	Tr200Tp06h	145.30	38.99	43.85		43.91	0.001596	1.34	186.03	223.17	0.31
TORA	Tora	111	Tr200Tp07h	144.38	38.99	43.84		43.91	0.001585	1.34	185.55	223.08	0.31
TORA	Tora	111	Tr200Tp08h	142.60	38.99	43.83		43.89	0.001631	1.35	181.35	222.29	0.31
TORA	Tora	110	Tr200Tp02h	122.36	38.80	43.66		43.70	0.000860	1.12	203.73	242.25	0.23
TORA	Tora	110	Tr200Tp03h	135.72	38.80	43.71		43.76	0.000927	1.19	216.79	247.59	0.24
TORA	Tora	110	Tr200Tp06h	145.29	38.80	43.79		43.84	0.000868	1.17	237.97	256.14	0.23
TORA	Tora	110	Tr200Tp07h	144.35	38.80	43.79		43.84	0.000859	1.17	237.66	256.02	0.23
TORA	Tora	110	Tr200Tp08h	142.57	38.80	43.77		43.82	0.000879	1.17	232.53	253.92	0.23
TORA	Tora	109	Tr200Tp02h	122.33	38.73	43.60		43.64	0.000588	1.02	248.24	279.23	0.19
TORA	Tora	109	Tr200Tp03h	135.23	38.73	43.65		43.69	0.000646	1.07	261.59	291.79	0.20
TORA	Tora	109	Tr200Tp06h	145.28	38.73	43.74		43.77	0.000643	1.09	288.48	322.43	0.20
TORA	Tora	109	Tr200Tp07h	144.33	38.73	43.74		43.77	0.000636	1.09	288.19	322.35	0.20
TORA	Tora	109	Tr200Tp08h	142.56	38.73	43.72		43.75	0.000653	1.10	281.52	320.68	0.20
TORA	Tora	108	Tr200Tp02h	122.31	38.55	43.53		43.56	0.000583	0.99	241.47	247.82	0.19
TORA	Tora	108	Tr200Tp03h	134.98	38.55	43.57		43.61	0.000660	1.06	252.05	253.94	0.20
TORA	Tora	108	Tr200Tp06h	145.15	38.55	43.70		43.73	0.000576	1.02	283.92	259.87	0.19
TORA	Tora	108	Tr200Tp07h	144.33	38.55	43.70		43.73	0.000570	1.02	283.84	259.85	0.19
TORA	Tora	108	Tr200Tp08h	142.55	38.55	43.67		43.71	0.000584	1.02	278.15	258.80	0.19
TORA	Tora	107	Tr200Tp02h	122.31	38.27	43.49		43.53	0.000577	1.08	194.49	148.39	0.19
TORA	Tora	107	Tr200Tp03h	134.98	38.27	43.52		43.57	0.000660	1.16	199.90	149.69	0.21
TORA	Tora	107	Tr200Tp06h	144.94	38.27	43.65		43.70	0.000612	1.15	219.19	152.33	0.20
TORA	Tora	107	Tr200Tp07h	144.32	38.27	43.65		43.69	0.000607	1.14	219.19	152.33	0.20
TORA	Tora	107	Tr200Tp08h	142.55	38.27	43.63		43.67	0.000615	1.15	215.76	151.87	0.20
TORA	Tora	106	Tr200Tp02h	122.31	37.88	42.47	42.39	43.73	0.030003	4.97	24.62	8.96	0.96
TORA	Tora	106	Tr200Tp03h	134.97	37.88	43.10		44.08	0.020783	4.38	30.82	10.36	0.81
TORA	Tora	106	Tr200Tp06h	144.64	37.88	43.23		44.26	0.021112	4.50	32.15	10.45	0.82
TORA	Tora	106	Tr200Tp07h	144.32	37.88	43.23		44.26	0.020918	4.48	32.21	10.46	0.82
TORA	Tora	106	Tr200Tp08h	142.55	37.88	43.21		44.22	0.020843	4.46	31.97	10.44	0.81
TORA	Tora	105	Tr200Tp02h	122.30	37.59	41.88		42.20	0.005966	2.53	48.70	25.77	0.57
TORA	Tora	105	Tr200Tp03h	134.91	37.59	42.12		42.43	0.005179	2.48	57.40	61.83	0.54
TORA	Tora	105	Tr200Tp06h	146.89	37.59	42.23		42.55	0.005029	2.53	65.90	78.99	0.53
TORA	Tora	105	Tr200Tp07h	144.29	37.59	42.23		42.54	0.004871	2.49	65.73	78.92	0.52
TORA	Tora	105	Tr200Tp08h	142.53	37.59	42.22		42.53	0.004895	2.48	64.44	78.36	0.53
TORA	Tora	104	Tr200Tp02h	122.29	37.48	41.70		41.94	0.003304	2.17	59.03	42.51	0.45
TORA	Tora	104	Tr200Tp03h	134.89	37.48	41.89		42.13	0.003052	2.20	68.13	54.90	0.43
TORA	Tora	104	Tr200Tp06h	145.78	37.48	42.04		42.28	0.002850	2.20	78.45	75.63	0.42
TORA	Tora	104	Tr200Tp07h	144.12	37.48	42.02		42.26	0.002887	2.21	76.63	70.14	0.43
TORA	Tora	104	Tr200Tp08h	142.53	37.48	42.00		42.24	0.002900	2.20	75.38	68.89	0.43
TORA	Tora	103	Tr200Tp02h	122.29	37.46	41.53		41.77	0.003308	2.15	59.05	37.75	0.45
TORA	Tora	103	Tr200Tp03h	134.88	37.46	41.74		41.97	0.002988	2.16	67.87	50.62	0.43
TORA	Tora	103	Tr200Tp06h	145.44	37.46	41.90		42.14	0.002758	2.17	77.82	70.15	0.42
TORA	Tora	103	Tr200Tp07h	143.99	37.46	41.87		42.11	0.002810	2.17	75.91	67.80	0.42
TORA	Tora	103	Tr200Tp08h	142.53	37.46	41.86		42.09	0.002809	2.16	74.73	63.73	0.42
TORA	Tora	102	Tr200Tp02h	122.29	36.71	41.32		41.59	0.003658	2.26	54.04	22.01	0.46
TORA	Tora	102	Tr200Tp03h	134.88	36.71	41.54		41.80	0.003473	2.29	59.38	33.05	0.45
TORA	Tora	102	Tr200Tp06h	145.51	36.71	41.71		41.98	0.003234	2.31	66.20	47.37	0.44
TORA	Tora	102	Tr200Tp07h	144.73	36.71	41.70		41.97	0.003254	2.31	65.57	44.03	0.44
TORA	Tora	102	Tr200Tp08h	142.53	36.71	41.67		41.94	0.003291	2.30	64.19	41.16	0.44
TORA	Tora	100.2	Tr200Tp02h	122.28	36.65	40.87	39.51	41.38	0.003648	3.17	38.62	14.23	0.52
TORA	Tora	100.2	Tr200Tp03h	134.87	36.65	41.02	39.68	41.60	0.003910	3.36	40.11	14.43	0.54
TORA	Tora	100.2	Tr200Tp06h	145.44	36.65	41.14	39.81	41.77	0.004122	3.52	41.31	14.59	0.56
TORA	Tora	100.2	Tr200Tp07h	144.53	36.65	41.13	39.80	41.76	0.004096	3.51	41.23	14.58	0.55
TORA	Tora	100.2	Tr200Tp08h	142.52	36.65	41.11	39.77	41.73	0.004049	3.47	41.03	14.55	0.55
TORA	Tora	100.1 BR U	Tr200Tp02h	122.28	36.65	40.79	39.51	41.39	0.008838	3.41	35.83	7.80	0.54
TORA	Tora	100.1 BR U	Tr200Tp03h	134.87	36.65	40.91	39.67	41.60	0.010191	3.68	36.69	7.55	0.57
TORA	Tora	100.1 BR U	Tr200Tp06h	145.44	36.65	40.99	39.80	41.76	0.011434	3.90	37.28	7.38	0.60
TORA	Tora	100.1 BR U	Tr200Tp07h	144.53	36.65	40.98	39.78	41.75	0.011313	3.88	37.25	7.39	0.60
TORA	Tora	100.1 BR U	Tr200Tp08h	142.52	36.65	40.97	39.76	41.72	0.011057	3.83	37.16	7.42	0.59
TORA	Tora	100.1 BR D	Tr200Tp02h	122.28	36.60	40.80	39.42	41.36	0.008493	3.34	36.64	7.80	0.52
TORA	Tora	100.1 BR D	Tr200Tp03h	134.87	36.60	40.91	39.58	41.57	0.009804	3.60	37.49	7.55	0.55
TORA	Tora	100.1 BR D	Tr200Tp06h	145.44	36.60	40.99	39.72	41.73	0.011008	3.82	38.09	7.38	0.58
TORA	Tora	100.1 BR D	Tr200Tp07h	144.53	36.60	40.98	39.70	41.72	0.010891	3.80	38.06	7.39	0.58
TORA	Tora	100.1 BR D	Tr200Tp08h	142.52	36.60	40.97	39.68	41.69	0.010644	3.75	37.97	7.42	0.57
TORA	Tora	100	Tr200Tp02h	122.28	36.60	40.85		41.34	0.004511	3.10	39.40	11.94	0.50
TORA	Tora	100	Tr200Tp03h	134.87	36.60	40.98		41.54	0.004931	3.32	40.68	12.04	0.53
TORA	Tora	100	Tr200Tp06h	145.44	36.60	41.07		41.69	0.005307	3.49	41.64	12.11	0.55
TORA	Tora	100	Tr200Tp07h	144.57	36.60	41.07		41.68	0.005267	3.48	41.58	12.10	0.55
TORA	Tora	100	Tr200Tp08h	142.52	36.60	41.05		41.65	0.005180	3.44	41.43	12.09	0.54
TORA	Tora	99.99		Lat Struct									
TORA	Tora	99	Tr200Tp02h	122.28	36.61	40.89		41.13	0.003442	2.17	56.30	23.67	0.45
TORA	Tora	99	Tr200Tp03h	134.87	36.61	41.04		41.30	0.003545	2.25	60.01	24.54	0.46
TORA	Tora	99	Tr200Tp06h	145.44	36.61	41.16		41.43	0.003577	2.31	63.41	33.76	0.46
TORA	Tora	99	Tr200Tp07h	144.49	36.61	41.15		41.42	0.003567	2.30	62.91	27.85	0.46
TORA	Tora	99	Tr200Tp08h	142.52	36.61	41.13		41.40	0.003550	2.29	62.42	26.74	0.46
TORA	Tora	98	Tr200Tp02h	122.28	36.29	40.67		40.89	0.003107	2.06	59.53	27.98	0.43
TORA	Tora	98	Tr200Tp03h	134.86	36.29	40.82		41.05	0.003105	2.13	64.17	33.76	0.43

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	98	Tr200Tp06h	145.39	36.29	40.94		41.18	0.003113	2.19	68.32	37.61	0.44
TORA	Tora	98	Tr200Tp07h	144.48	36.29	40.93		41.18	0.003101	2.18	68.06	37.17	0.44
TORA	Tora	98	Tr200Tp08h	142.51	36.29	40.92		41.16	0.003083	2.17	67.42	36.07	0.43
TORA	Tora	97.98		Lat Struct									
TORA	Tora	97	Tr200Tp02h	122.39	35.88	40.50		40.69	0.002626	1.94	63.44	28.72	0.40
TORA	Tora	97	Tr200Tp03h	134.97	35.88	40.65		40.86	0.002649	2.01	67.94	31.52	0.40
TORA	Tora	97	Tr200Tp06h	145.64	35.88	40.77		40.98	0.002688	2.07	71.83	37.62	0.41
TORA	Tora	97	Tr200Tp07h	144.82	35.88	40.76		40.98	0.002681	2.07	71.57	37.27	0.41
TORA	Tora	97	Tr200Tp08h	142.90	35.88	40.74		40.96	0.002659	2.05	71.00	36.44	0.41
TORA	Tora	96	Tr200Tp02h	122.52	35.61	40.17		40.43	0.003991	2.26	54.31	23.93	0.48
TORA	Tora	96	Tr200Tp03h	135.11	35.61	40.31		40.59	0.004202	2.34	57.79	27.96	0.49
TORA	Tora	96	Tr200Tp06h	145.95	35.61	40.41		40.71	0.004225	2.42	61.07	34.64	0.50
TORA	Tora	96	Tr200Tp07h	145.24	35.61	40.41		40.71	0.004202	2.41	60.97	34.55	0.50
TORA	Tora	96	Tr200Tp08h	143.39	35.61	40.40		40.69	0.004171	2.39	60.53	34.14	0.49
TORA	Tora	95	Tr200Tp02h	122.67	35.35	39.93		40.13	0.002844	1.98	61.91	25.91	0.41
TORA	Tora	95	Tr200Tp03h	135.05	35.35	40.06		40.28	0.002911	2.07	65.49	27.33	0.42
TORA	Tora	95	Tr200Tp06h	145.79	35.35	40.16		40.40	0.002965	2.14	68.39	29.12	0.42
TORA	Tora	95	Tr200Tp07h	145.18	35.35	40.16		40.39	0.002950	2.13	68.32	29.09	0.42
TORA	Tora	95	Tr200Tp08h	143.45	35.35	40.15		40.38	0.002924	2.12	67.98	28.93	0.42
TORA	Tora	94	Tr200Tp02h	122.64	35.08	39.68		39.89	0.002741	2.05	60.61	28.23	0.41
TORA	Tora	94	Tr200Tp03h	134.48	35.08	39.80		40.04	0.002818	2.14	64.26	29.51	0.41
TORA	Tora	94	Tr200Tp06h	144.71	35.08	39.90		40.15	0.002884	2.22	67.22	30.39	0.42
TORA	Tora	94	Tr200Tp07h	144.23	35.08	39.90		40.15	0.002870	2.21	67.17	30.38	0.42
TORA	Tora	94	Tr200Tp08h	142.66	35.08	39.89		40.13	0.002843	2.19	66.87	30.29	0.42
TORA	Tora	93	Tr200Tp02h	122.78	35.24	39.41		39.65	0.003488	2.17	56.49	24.21	0.45
TORA	Tora	93	Tr200Tp03h	135.03	35.24	39.52		39.78	0.003802	2.29	59.17	26.75	0.48
TORA	Tora	93	Tr200Tp06h	144.20	35.24	39.62		39.90	0.003871	2.34	61.86	27.31	0.48
TORA	Tora	93	Tr200Tp07h	143.82	35.24	39.62		39.89	0.003855	2.33	61.84	27.30	0.48
TORA	Tora	93	Tr200Tp08h	142.71	35.24	39.60		39.88	0.003850	2.33	61.50	27.24	0.48
TORA	Tora	92	Tr200Tp02h	121.14	34.56	39.25		39.44	0.002502	1.94	64.10	29.06	0.39
TORA	Tora	92	Tr200Tp03h	130.27	34.56	39.37		39.57	0.002484	1.99	67.63	29.06	0.39
TORA	Tora	92	Tr200Tp06h	139.04	34.56	39.47		39.68	0.002506	2.04	70.56	29.06	0.39
TORA	Tora	92	Tr200Tp07h	138.74	34.56	39.47		39.68	0.002496	2.04	70.54	29.06	0.39
TORA	Tora	92	Tr200Tp08h	137.44	34.56	39.46		39.66	0.002479	2.02	70.25	29.06	0.39
TORA	Tora	91	Tr200Tp02h	121.41	34.76	38.96		39.24	0.004154	2.35	53.85	32.28	0.49
TORA	Tora	91	Tr200Tp03h	130.92	34.76	39.10		39.38	0.003951	2.38	58.17	32.28	0.49
TORA	Tora	91	Tr200Tp06h	138.49	34.76	39.22		39.51	0.003702	2.38	62.18	32.28	0.48
TORA	Tora	91	Tr200Tp07h	138.29	34.76	39.22		39.50	0.003694	2.38	62.16	32.28	0.47
TORA	Tora	91	Tr200Tp08h	137.31	34.76	39.21		39.49	0.003703	2.38	61.78	32.28	0.48
TORA	Tora	90	Tr200Tp02h	121.67	34.64	38.83		39.03	0.002840	2.00	63.64	35.26	0.41
TORA	Tora	90	Tr200Tp03h	132.90	34.64	38.96		39.17	0.002813	2.06	68.16	35.26	0.42
TORA	Tora	90	Tr200Tp06h	142.37	34.64	39.08		39.30	0.002730	2.10	72.44	35.26	0.41
TORA	Tora	90	Tr200Tp07h	142.25	34.64	39.08		39.30	0.002727	2.10	72.42	35.26	0.41
TORA	Tora	90	Tr200Tp08h	141.14	34.64	39.07		39.29	0.002729	2.09	72.00	35.26	0.41
TORA	Tora	89	Tr200Tp02h	119.96	34.55	38.68		38.88	0.002624	1.98	63.37	33.19	0.40
TORA	Tora	89	Tr200Tp03h	130.54	34.55	38.82		39.02	0.002594	2.03	67.72	33.19	0.40
TORA	Tora	89	Tr200Tp06h	139.91	34.55	38.94		39.15	0.002531	2.07	71.83	33.19	0.40
TORA	Tora	89	Tr200Tp07h	139.80	34.55	38.94		39.15	0.002528	2.07	71.82	33.19	0.40
TORA	Tora	89	Tr200Tp08h	138.66	34.55	38.93		39.14	0.002523	2.06	71.44	33.19	0.40
TORA	Tora	88	Tr200Tp02h	119.90	34.55	38.54		38.73	0.002522	1.96	65.65	35.29	0.40
TORA	Tora	88	Tr200Tp03h	130.15	34.55	38.68		38.88	0.002448	2.00	70.62	36.76	0.40
TORA	Tora	88	Tr200Tp06h	139.24	34.55	38.81		39.01	0.002347	2.02	75.93	43.29	0.39
TORA	Tora	88	Tr200Tp07h	139.14	34.55	38.81		39.01	0.002345	2.02	75.91	43.28	0.39
TORA	Tora	88	Tr200Tp08h	137.96	34.55	38.80		39.00	0.002338	2.01	75.45	42.07	0.39
TORA	Tora	87	Tr200Tp02h	122.43	34.31	38.31		38.60	0.003295	2.49	58.82	32.00	0.46
TORA	Tora	87	Tr200Tp03h	133.56	34.31	38.43		38.75	0.003360	2.59	62.94	33.54	0.47
TORA	Tora	87	Tr200Tp06h	142.77	34.31	38.57		38.89	0.003297	2.64	67.58	38.22	0.47
TORA	Tora	87	Tr200Tp07h	142.69	34.31	38.57		38.89	0.003295	2.63	67.57	38.19	0.47
TORA	Tora	87	Tr200Tp08h	141.54	34.31	38.56		38.88	0.003276	2.62	67.23	37.43	0.46
TORA	Tora	86	Tr200Tp02h	122.22	34.16	38.15		38.45	0.002925	2.57	62.37	36.23	0.44
TORA	Tora	86	Tr200Tp03h	133.09	34.16	38.28		38.59	0.002963	2.65	66.93	36.23	0.44
TORA	Tora	86	Tr200Tp06h	142.01	34.16	38.42		38.74	0.002824	2.66	72.29	36.23	0.44
TORA	Tora	86	Tr200Tp07h	141.94	34.16	38.42		38.74	0.002821	2.66	72.29	36.23	0.44
TORA	Tora	86	Tr200Tp08h	140.84	34.16	38.41		38.72	0.002809	2.65	71.94	36.23	0.44
TORA	Tora	85	Tr200Tp02h	120.54	34.05	38.01		38.32	0.003204	2.68	61.68	34.25	0.46
TORA	Tora	85	Tr200Tp03h	130.01	34.05	38.15		38.46	0.003114	2.71	66.46	34.25	0.46
TORA	Tora	85	Tr200Tp06h	136.37	34.05	38.32		38.62	0.002756	2.64	72.57	34.25	0.44
TORA	Tora	85	Tr200Tp07h	136.30	34.05	38.32		38.62	0.002752	2.64	72.58	34.25	0.44
TORA	Tora	85	Tr200Tp08h	135.29	34.05	38.32		38.60	0.002741	2.63	72.27	34.25	0.43
TORA	Tora	84	Tr200Tp02h	119.47	33.53	37.82		38.09	0.002737	2.53	67.46	43.61	0.43
TORA	Tora	84	Tr200Tp03h	128.91	33.53	37.96		38.24	0.002650	2.56	74.33	46.86	0.42
TORA	Tora	84	Tr200Tp06h	134.42	33.53	38.19		38.42	0.002161	2.40	84.72	46.86	0.39
TORA	Tora	84	Tr200Tp07h	134.37	33.53	38.19		38.42	0.002158	2.40	84.73	46.86	0.39
TORA	Tora	84	Tr200Tp08h	133.33	33.53	38.18		38.41	0.002148	2.39	84.33	46.86	0.39
TORA	Tora	83	Tr200Tp02h	121.34	33.47	37.63		37.90	0.002664	2.49	68.16	39.69	0.43
TORA	Tora	83	Tr200Tp03h	129.79	33.47	37.80		38.06	0.002445	2.46	74.87	39.69	0.41
TORA	Tora	83	Tr200Tp06h	130.74	33.47	38.09		38.28	0.001760	2.19	86.07	39.69	0.36
TORA	Tora	83	Tr200Tp07h	130.67	33.47	38.09		38.28	0.001757	2.19	86.10	39.69	0.36

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora	83	Tr200Tp08h	129.79	33.47	38.08		38.27	0.001752	2.19	85.75	39.69	0.35
TORA	Tora	82	Tr200Tp02h	115.11	33.05	37.50		37.74	0.002311	2.38	65.73	28.56	0.40
TORA	Tora	82	Tr200Tp03h	121.48	33.05	37.69		37.92	0.002080	2.34	71.18	28.56	0.38
TORA	Tora	82	Tr200Tp06h	118.75	33.05	38.02		38.19	0.001416	2.04	80.59	28.56	0.32
TORA	Tora	82	Tr200Tp07h	118.67	33.05	38.02		38.19	0.001413	2.04	80.61	28.56	0.32
TORA	Tora	82	Tr200Tp08h	117.83	33.05	38.01		38.18	0.001404	2.03	80.39	28.56	0.32
TORA	Tora	81	Tr200Tp02h	111.73	33.16	37.36		37.58	0.002085	2.17	68.08	40.47	0.38
TORA	Tora	81	Tr200Tp03h	116.53	33.16	37.59		37.77	0.001706	2.05	77.26	40.47	0.34
TORA	Tora	81	Tr200Tp06h	105.92	33.16	37.99		38.10	0.000896	1.59	93.59	40.47	0.25
TORA	Tora	81	Tr200Tp07h	105.87	33.16	37.99		38.10	0.000884	1.59	93.63	40.47	0.25
TORA	Tora	81	Tr200Tp08h	105.11	33.16	37.99		38.09	0.000879	1.58	93.31	40.47	0.25
TORA	Tora	80.6	Tr200Tp02h	124.44	33.36	37.16		37.45	0.003693	2.43	56.56	28.50	0.48
TORA	Tora	80.6	Tr200Tp03h	132.71	33.36	37.39		37.66	0.003092	2.35	63.64	31.44	0.45
TORA	Tora	80.6	Tr200Tp06h	120.41	33.36	37.89		38.04	0.001380	1.76	79.43	31.44	0.31
TORA	Tora	80.6	Tr200Tp07h	120.32	33.36	37.90		38.04	0.001377	1.75	79.46	31.44	0.31
TORA	Tora	80.6	Tr200Tp08h	119.88	33.36	37.89		38.03	0.001380	1.75	79.18	31.44	0.31
TORA	Tora valle	80.5	Tr200Tp02h	126.96	33.16	37.16		37.29	0.002462	1.61	78.78	44.03	0.38
TORA	Tora valle	80.5	Tr200Tp03h	137.92	33.16	37.41		37.53	0.001956	1.54	90.20	55.91	0.34
TORA	Tora valle	80.5	Tr200Tp06h	129.30	33.16	37.91		37.98	0.000793	1.14	121.25	62.94	0.23
TORA	Tora valle	80.5	Tr200Tp07h	129.31	33.16	37.92		37.98	0.000792	1.14	121.31	62.94	0.23
TORA	Tora valle	80.5	Tr200Tp08h	128.47	33.16	37.91		37.97	0.000792	1.13	120.73	62.94	0.23
TORA	Tora valle	80.49		Lat Struct									
TORA	Tora valle	80.38		Lat Struct									
TORA	Tora valle	80.333	Tr200Tp02h	127.00	32.88	37.09		37.23	0.002412	1.63	78.03	46.04	0.38
TORA	Tora valle	80.333	Tr200Tp03h	138.93	32.88	37.35		37.48	0.001897	1.57	90.15	46.58	0.34
TORA	Tora valle	80.333	Tr200Tp06h	139.44	32.88	37.87		37.95	0.000917	1.25	118.10	60.92	0.25
TORA	Tora valle	80.333	Tr200Tp07h	139.45	32.88	37.87		37.95	0.000916	1.25	118.17	60.93	0.25
TORA	Tora valle	80.333	Tr200Tp08h	139.75	32.88	37.86		37.94	0.000935	1.26	117.43	60.83	0.25
TORA	Tora valle	80	Tr200Tp02h	127.00	32.34	36.96		37.10	0.002162	1.62	79.87	46.74	0.36
TORA	Tora valle	80	Tr200Tp03h	136.64	32.34	37.26		37.38	0.001604	1.51	94.98	50.68	0.31
TORA	Tora valle	80	Tr200Tp06h	120.04	32.34	37.86		37.91	0.000572	1.03	125.75	53.44	0.19
TORA	Tora valle	80	Tr200Tp07h	120.02	32.34	37.86		37.92	0.000571	1.03	125.80	53.45	0.19
TORA	Tora valle	80	Tr200Tp08h	119.88	32.34	37.85		37.90	0.000578	1.03	125.17	53.28	0.19
TORA	Tora valle	79.1	Tr200Tp02h	127.00	32.14	36.42	35.43	36.90	0.005101	3.06	41.46	27.24	0.56
TORA	Tora valle	79.1	Tr200Tp03h	138.21	32.14	36.71	35.55	37.18	0.004495	3.05	45.30	28.59	0.53
TORA	Tora valle	79.1	Tr200Tp06h	126.81	32.14	37.55	35.43	37.80	0.001802	2.24	56.60	43.73	0.35
TORA	Tora valle	79.1	Tr200Tp07h	126.79	32.14	37.55	35.43	37.80	0.001799	2.24	56.62	43.76	0.35
TORA	Tora valle	79.1	Tr200Tp08h	126.77	32.14	37.53	35.43	37.79	0.001819	2.25	56.42	43.48	0.35
TORA	Tora valle	79.05 BR U	Tr200Tp02h	127.00	32.14	36.19	35.33	36.96	0.016033	3.89	32.61	6.51	0.62
TORA	Tora valle	79.05 BR U	Tr200Tp03h	138.21	32.14	36.28	35.44	37.17	0.018583	4.17	33.17	6.00	0.65
TORA	Tora valle	79.05 BR U	Tr200Tp06h	126.81	32.14	36.80	35.33	38.02	0.018214	3.61	35.17		0.53
TORA	Tora valle	79.05 BR U	Tr200Tp07h	126.79	32.14	36.80	35.33	38.02	0.018207	3.61	35.17		0.53
TORA	Tora valle	79.05 BR U	Tr200Tp08h	126.77	32.14	36.80	35.33	38.02	0.018202	3.60	35.17		0.53
TORA	Tora valle	79.05 BR D	Tr200Tp02h	127.00	32.17	36.28	34.75	36.77	0.008607	3.10	40.92	5.98	0.49
TORA	Tora valle	79.05 BR D	Tr200Tp03h	138.21	32.17	36.38	34.86	36.95	0.010131	3.33	41.48	5.36	0.52
TORA	Tora valle	79.05 BR D	Tr200Tp06h	126.81	32.17	36.64	34.75	36.92	0.008918	2.98	42.61	3.01	0.45
TORA	Tora valle	79.05 BR D	Tr200Tp07h	126.79	32.17	36.65	34.75	36.92	0.008930	2.98	42.62	2.95	0.45
TORA	Tora valle	79.05 BR D	Tr200Tp08h	126.77	32.17	36.64	34.75	36.91	0.008893	2.98	42.59	3.07	0.45
TORA	Tora valle	79	Tr200Tp02h	127.00	32.17	36.39		36.70	0.002698	2.49	51.04	33.13	0.42
TORA	Tora valle	79	Tr200Tp03h	138.21	32.17	36.51		36.86	0.002852	2.62	52.81	36.78	0.43
TORA	Tora valle	79	Tr200Tp06h	126.80	32.17	36.64		36.92	0.002132	2.32	54.72	37.11	0.38
TORA	Tora valle	79	Tr200Tp07h	126.79	32.17	36.65		36.92	0.002124	2.31	54.78	37.12	0.38
TORA	Tora valle	79	Tr200Tp08h	126.77	32.17	36.64		36.91	0.002141	2.32	54.64	37.10	0.38
TORA	Tora valle	78.9	Tr200Tp02h	127.00	32.17	36.38	34.79	36.70	0.002707	2.49	50.99	33.05	0.42
TORA	Tora valle	78.9	Tr200Tp03h	138.21	32.17	36.51	34.91	36.86	0.002861	2.62	52.76	36.77	0.43
TORA	Tora valle	78.9	Tr200Tp06h	126.80	32.17	36.64	34.79	36.92	0.002137	2.32	54.68	37.10	0.38
TORA	Tora valle	78.9	Tr200Tp07h	126.79	32.17	36.65	34.79	36.92	0.002128	2.32	54.74	37.11	0.38
TORA	Tora valle	78.9	Tr200Tp08h	126.77	32.17	36.64	34.79	36.91	0.002146	2.32	54.61	37.09	0.38
TORA	Tora valle	78.5		Inl Struct									
TORA	Tora valle	78	Tr200Tp02h	127.00	31.32	36.36		36.51	0.002381	1.72	74.17	37.65	0.37
TORA	Tora valle	78	Tr200Tp03h	138.21	31.32	36.49		36.65	0.002318	1.76	79.60	39.97	0.37
TORA	Tora valle	78	Tr200Tp06h	126.80	31.32	36.60		36.72	0.001692	1.54	83.76	40.18	0.32
TORA	Tora valle	78	Tr200Tp07h	126.79	31.32	36.60		36.72	0.001682	1.54	83.94	40.19	0.32
TORA	Tora valle	78	Tr200Tp08h	126.77	31.32	36.59		36.71	0.001702	1.54	83.57	40.17	0.32
TORA	Tora valle	77	Tr200Tp02h	126.99	31.66	36.18		36.47	0.004724	2.40	52.83	24.04	0.52
TORA	Tora valle	77	Tr200Tp03h	138.21	31.66	36.30		36.61	0.004744	2.47	55.89	24.42	0.52
TORA	Tora valle	77	Tr200Tp06h	126.80	31.66	36.46		36.69	0.003268	2.12	59.87	24.83	0.44
TORA	Tora valle	77	Tr200Tp07h	126.79	31.66	36.47		36.70	0.003248	2.11	59.98	24.83	0.43
TORA	Tora valle	77	Tr200Tp08h	126.77	31.66	36.46		36.69	0.003290	2.12	59.73	24.82	0.44
TORA	Tora valle	76.99		Lat Struct									
TORA	Tora valle	76.98		Lat Struct									
TORA	Tora valle	76	Tr200Tp02h	126.99	31.62	36.00		36.33	0.005267	2.54	50.03	22.78	0.55
TORA	Tora valle	76	Tr200Tp03h	138.21	31.62	36.12		36.47	0.005334	2.62	52.81	23.16	0.55
TORA	Tora valle	76	Tr200Tp06h	131.73	31.62	36.30		36.57	0.003830	2.31	57.61	30.03	0.47
TORA	Tora valle	76	Tr200Tp07h	131.71	31.62	36.30		36.57	0.003797	2.30	57.80	30.05	0.47

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	76	Tr200Tp08h	131.31	31.62	36.30		36.57	0.003815	2.30	57.56	30.03	0.47
TORA	Tora valle	75	Tr200Tp02h	126.99	31.58	35.98		36.19	0.003627	2.05	61.90	30.26	0.46
TORA	Tora valle	75	Tr200Tp03h	138.21	31.58	36.11		36.33	0.003584	2.10	65.79	30.71	0.46
TORA	Tora valle	75	Tr200Tp06h	135.68	31.58	36.27		36.46	0.002765	1.91	70.94	31.30	0.41
TORA	Tora valle	75	Tr200Tp07h	135.73	31.58	36.28		36.47	0.002745	1.91	71.13	31.32	0.40
TORA	Tora valle	75	Tr200Tp08h	135.05	31.58	36.27		36.46	0.002741	1.90	70.92	31.30	0.40
TORA	Tora valle	74	Tr200Tp02h	126.99	31.55	35.88		36.12	0.003922	2.15	59.02	28.15	0.47
TORA	Tora valle	74	Tr200Tp03h	138.21	31.55	36.01		36.26	0.003882	2.21	62.59	28.41	0.48
TORA	Tora valle	74	Tr200Tp06h	140.47	31.55	36.16		36.38	0.003285	2.10	66.83	28.73	0.44
TORA	Tora valle	74	Tr200Tp07h	140.53	31.55	36.17		36.39	0.003258	2.10	67.03	28.74	0.44
TORA	Tora valle	74	Tr200Tp08h	139.66	31.55	36.16		36.38	0.003237	2.09	66.90	28.73	0.44
TORA	Tora valle	73	Tr200Tp02h	127.10	31.68	35.71		36.01	0.005883	2.45	51.94	27.61	0.57
TORA	Tora valle	73	Tr200Tp03h	138.32	31.68	35.84		36.16	0.005654	2.49	55.57	27.86	0.56
TORA	Tora valle	73	Tr200Tp06h	143.39	31.68	35.99		36.29	0.004841	2.40	59.83	28.14	0.52
TORA	Tora valle	73	Tr200Tp07h	143.59	31.68	36.00		36.29	0.004806	2.39	60.03	28.15	0.52
TORA	Tora valle	73	Tr200Tp08h	142.65	31.68	36.00		36.29	0.004762	2.38	59.95	28.15	0.52
TORA	Tora valle	72	Tr200Tp02h	127.16	31.70	35.66		35.95	0.005639	2.39	53.32	28.72	0.56
TORA	Tora valle	72	Tr200Tp03h	138.39	31.70	35.79		36.09	0.005369	2.42	57.22	28.95	0.55
TORA	Tora valle	72	Tr200Tp06h	144.52	31.70	35.95		36.23	0.004652	2.34	61.66	29.20	0.52
TORA	Tora valle	72	Tr200Tp07h	144.80	31.70	35.95		36.23	0.004625	2.34	61.85	29.22	0.51
TORA	Tora valle	72	Tr200Tp08h	143.83	31.70	35.95		36.23	0.004575	2.33	61.80	29.21	0.51
TORA	Tora valle	71	Tr200Tp02h	127.22	31.73	35.62		35.89	0.005455	2.31	55.13	31.11	0.55
TORA	Tora valle	71	Tr200Tp03h	138.45	31.73	35.76		36.03	0.005266	2.32	59.61	32.49	0.55
TORA	Tora valle	71	Tr200Tp06h	145.28	31.73	35.92		36.17	0.004609	2.24	64.82	33.74	0.52
TORA	Tora valle	71	Tr200Tp07h	145.63	31.73	35.92		36.18	0.004587	2.24	65.05	33.79	0.52
TORA	Tora valle	71	Tr200Tp08h	144.66	31.73	35.92		36.17	0.004536	2.23	65.00	33.78	0.51
TORA	Tora valle	70	Tr200Tp02h	127.30	31.65	35.61		35.82	0.003642	2.06	61.77	30.47	0.46
TORA	Tora valle	70	Tr200Tp03h	138.52	31.65	35.74		35.97	0.003514	2.10	66.05	30.78	0.46
TORA	Tora valle	70	Tr200Tp06h	145.45	31.65	35.90		36.12	0.003151	2.05	70.90	31.70	0.44
TORA	Tora valle	70	Tr200Tp07h	145.90	31.65	35.91		36.12	0.003147	2.05	71.09	32.29	0.44
TORA	Tora valle	70	Tr200Tp08h	145.01	31.65	35.91		36.12	0.003115	2.04	71.04	32.14	0.43
TORA	Tora valle	69	Tr200Tp02h	127.36	31.60	35.54		35.78	0.004172	2.17	58.72	29.64	0.49
TORA	Tora valle	69	Tr200Tp03h	138.59	31.60	35.68		35.93	0.004019	2.20	63.54	30.42	0.49
TORA	Tora valle	69	Tr200Tp06h	146.26	31.60	35.84		36.08	0.003514	2.14	69.86	38.91	0.46
TORA	Tora valle	69	Tr200Tp07h	146.78	31.60	35.85		36.08	0.003510	2.14	70.08	38.93	0.46
TORA	Tora valle	69	Tr200Tp08h	145.94	31.60	35.85		36.08	0.003478	2.13	70.02	38.92	0.46
TORA	Tora valle	68	Tr200Tp02h	127.44	31.64	35.44		35.71	0.004642	2.32	54.90	26.85	0.52
TORA	Tora valle	68	Tr200Tp03h	138.64	31.64	35.58		35.86	0.004625	2.35	59.15	26.54	0.52
TORA	Tora valle	68	Tr200Tp06h	148.34	31.64	35.73		36.01	0.004240	2.34	64.82	37.03	0.50
TORA	Tora valle	68	Tr200Tp07h	148.92	31.64	35.74		36.02	0.004243	2.34	65.02	37.05	0.50
TORA	Tora valle	68	Tr200Tp08h	148.12	31.64	35.74		36.01	0.004201	2.33	64.99	37.05	0.50
TORA	Tora valle	67	Tr200Tp02h	130.42	31.70	35.31		35.63	0.004881	2.50	52.23	23.06	0.53
TORA	Tora valle	67	Tr200Tp03h	141.46	31.70	35.45		35.78	0.004815	2.55	55.43	23.31	0.53
TORA	Tora valle	67	Tr200Tp06h	145.64	31.70	35.67		35.96	0.003792	2.39	61.97	29.35	0.47
TORA	Tora valle	67	Tr200Tp07h	146.39	31.70	35.67		35.97	0.003819	2.40	62.04	29.35	0.48
TORA	Tora valle	67	Tr200Tp08h	145.64	31.70	35.67		35.96	0.003780	2.39	62.04	29.35	0.47
TORA	Tora valle	66	Tr200Tp02h	127.65	31.62	35.14		35.51	0.006309	2.68	47.66	23.69	0.60
TORA	Tora valle	66	Tr200Tp03h	138.85	31.62	35.28		35.66	0.006099	2.72	51.12	24.22	0.60
TORA	Tora valle	66	Tr200Tp06h	150.43	31.62	35.45		35.83	0.005699	2.73	55.49	32.04	0.58
TORA	Tora valle	66	Tr200Tp07h	151.21	31.62	35.47		35.85	0.005571	2.71	56.24	32.08	0.58
TORA	Tora valle	66	Tr200Tp08h	150.64	31.62	35.47		35.84	0.005541	2.71	56.19	32.08	0.58
TORA	Tora valle	65	Tr200Tp02h	127.72	31.66	35.12		35.42	0.004991	2.42	52.71	24.58	0.53
TORA	Tora valle	65	Tr200Tp03h	138.92	31.66	35.26		35.57	0.004895	2.47	56.30	25.09	0.53
TORA	Tora valle	65	Tr200Tp06h	150.82	31.66	35.42		35.74	0.004731	2.50	60.44	26.89	0.52
TORA	Tora valle	65	Tr200Tp07h	151.76	31.66	35.44		35.76	0.004693	2.50	60.84	26.89	0.52
TORA	Tora valle	65	Tr200Tp08h	151.26	31.66	35.44		35.75	0.004672	2.49	60.80	26.89	0.52
TORA	Tora valle	64	Tr200Tp02h	127.73	31.83	35.12		35.40	0.005061	2.37	54.01	27.85	0.53
TORA	Tora valle	64	Tr200Tp03h	138.93	31.83	35.27		35.56	0.004765	2.40	58.12	27.87	0.52
TORA	Tora valle	64	Tr200Tp06h	150.84	31.83	35.43		35.73	0.004437	2.42	62.68	27.89	0.51
TORA	Tora valle	64	Tr200Tp07h	151.79	31.83	35.44		35.74	0.004401	2.42	63.10	27.89	0.50
TORA	Tora valle	64	Tr200Tp08h	151.29	31.83	35.44		35.74	0.004381	2.42	63.06	27.89	0.50
TORA	Tora valle	63	Tr200Tp02h	127.74	31.93	35.12		35.40	0.004697	2.32	54.96	24.66	0.50
TORA	Tora valle	63	Tr200Tp03h	138.94	31.93	35.27		35.55	0.004564	2.37	58.54	24.67	0.49
TORA	Tora valle	63	Tr200Tp06h	150.85	31.93	35.43		35.72	0.004389	2.41	62.50	24.67	0.48
TORA	Tora valle	63	Tr200Tp07h	151.81	31.93	35.44		35.74	0.004368	2.42	62.85	24.67	0.48
TORA	Tora valle	63	Tr200Tp08h	151.32	31.93	35.44		35.73	0.004348	2.41	62.81	24.67	0.48
TORA	Tora valle	62	Tr200Tp02h	127.75	31.93	35.18	33.72	35.36	0.002122	1.84	69.30	24.01	0.35
TORA	Tora valle	62	Tr200Tp03h	138.95	31.93	35.33	33.80	35.51	0.002161	1.91	72.78	24.01	0.35
TORA	Tora valle	62	Tr200Tp06h	150.88	31.93	35.49	33.88	35.68	0.002178	1.97	76.61	24.54	0.35
TORA	Tora valle	62	Tr200Tp07h	151.85	31.93	35.50	33.89	35.70	0.002175	1.97	76.95	24.58	0.35
TORA	Tora valle	62	Tr200Tp08h	151.37	31.93	35.50	33.89	35.70	0.002166	1.97	76.91	24.58	0.35
TORA	Tora valle	61.2		Inl Struct									
TORA	Tora valle	61	Tr200Tp02h	127.75	29.30	35.14		35.22	0.000565	1.18	108.60	30.92	0.19
TORA	Tora valle	61	Tr200Tp03h	138.95	29.30	35.29		35.37	0.000596	1.24	113.15	31.88	0.20
TORA	Tora valle	61	Tr200Tp06h	150.89	29.30	35.45		35.53	0.000622	1.30	118.21	32.39	0.20
TORA	Tora valle	61	Tr200Tp07h	151.85	29.30	35.46		35.55	0.000624	1.30	118.65	32.43	0.20
TORA	Tora valle	61	Tr200Tp08h	151.38	29.30	35.46		35.54	0.000621	1.30	118.58	32.43	0.20

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	14	Tr200Tp08h	146.94	28.50	33.22		33.39	0.001974	1.90	88.30	37.76	0.36
TORA	Tora valle	13	Tr200Tp02h	123.27	28.16	32.89		33.05	0.002041	1.84	73.67	33.45	0.36
TORA	Tora valle	13	Tr200Tp03h	132.92	28.16	33.00		33.18	0.002070	1.89	77.46	33.65	0.36
TORA	Tora valle	13	Tr200Tp06h	143.36	28.16	33.20		33.37	0.001919	1.89	84.15	34.01	0.35
TORA	Tora valle	13	Tr200Tp07h	144.55	28.16	33.20		33.37	0.001960	1.91	84.01	34.00	0.35
TORA	Tora valle	13	Tr200Tp08h	144.15	28.16	33.20		33.37	0.001950	1.90	83.99	34.00	0.35
TORA	Tora valle	12	Tr200Tp02h	127.86	28.15	32.73		32.93	0.002775	2.00	63.82	26.16	0.41
TORA	Tora valle	12	Tr200Tp03h	139.17	28.15	32.82		33.04	0.002959	2.10	66.20	26.47	0.42
TORA	Tora valle	12	Tr200Tp06h	152.50	28.15	33.00		33.24	0.002894	2.14	71.11	27.10	0.42
TORA	Tora valle	12	Tr200Tp07h	153.74	28.15	32.99		33.23	0.002972	2.17	70.85	27.07	0.43
TORA	Tora valle	12	Tr200Tp08h	153.55	28.15	32.99		33.23	0.002970	2.17	70.80	27.07	0.43
TORA	Tora valle	11	Tr200Tp02h	127.86	28.24	32.70		32.91	0.002925	2.06	62.11	25.44	0.42
TORA	Tora valle	11	Tr200Tp03h	139.17	28.24	32.79		33.02	0.003131	2.16	64.35	25.74	0.44
TORA	Tora valle	11	Tr200Tp06h	152.49	28.24	32.97		33.22	0.003065	2.21	69.11	26.37	0.44
TORA	Tora valle	11	Tr200Tp07h	153.73	28.24	32.96		33.21	0.003152	2.23	68.83	26.34	0.44
TORA	Tora valle	11	Tr200Tp08h	153.55	28.24	32.96		33.21	0.003150	2.23	68.79	26.33	0.44
TORA	Tora valle	10	Tr200Tp02h	127.86	28.89	32.64		32.89	0.003544	2.21	57.81	24.75	0.46
TORA	Tora valle	10	Tr200Tp03h	139.17	28.89	32.72		32.99	0.003800	2.33	59.84	25.01	0.48
TORA	Tora valle	10	Tr200Tp06h	152.49	28.89	32.90		33.19	0.003675	2.36	64.49	25.59	0.48
TORA	Tora valle	10	Tr200Tp07h	153.73	28.89	32.89		33.18	0.003791	2.40	64.16	25.55	0.48
TORA	Tora valle	10	Tr200Tp08h	153.55	28.89	32.89		33.18	0.003789	2.39	64.12	25.54	0.48
TORA	Tora valle	9	Tr200Tp02h	127.86	28.79	32.61		32.87	0.003664	2.26	56.65	23.95	0.47
TORA	Tora valle	9	Tr200Tp03h	139.17	28.79	32.69		32.98	0.003951	2.38	58.52	24.18	0.49
TORA	Tora valle	9	Tr200Tp06h	152.49	28.79	32.87		33.17	0.003831	2.42	63.01	24.72	0.48
TORA	Tora valle	9	Tr200Tp07h	153.73	28.79	32.86		33.16	0.003957	2.45	62.66	24.68	0.49
TORA	Tora valle	9	Tr200Tp08h	153.55	28.79	32.85		33.16	0.003956	2.45	62.61	24.68	0.49
TORA	Tora valle	8	Tr200Tp02h	127.86	28.84	32.57		32.84	0.003798	2.29	55.94	23.95	0.48
TORA	Tora valle	8	Tr200Tp03h	139.17	28.84	32.65		32.95	0.004109	2.41	57.72	24.17	0.50
TORA	Tora valle	8	Tr200Tp06h	152.49	28.84	32.83		33.14	0.003967	2.45	62.25	24.74	0.49
TORA	Tora valle	8	Tr200Tp07h	153.73	28.84	32.82		33.13	0.004107	2.49	61.85	24.69	0.50
TORA	Tora valle	8	Tr200Tp08h	153.54	28.84	32.82		33.13	0.004105	2.48	61.81	24.68	0.50
TORA	Tora valle	7	Tr200Tp02h	127.86	28.86	32.56		32.83	0.003849	2.30	55.67	23.89	0.48
TORA	Tora valle	7	Tr200Tp03h	139.17	28.86	32.63		32.93	0.004174	2.42	57.41	24.12	0.50
TORA	Tora valle	7	Tr200Tp06h	152.49	28.86	32.82		33.13	0.004027	2.46	61.95	24.71	0.50
TORA	Tora valle	7	Tr200Tp07h	153.73	28.86	32.80		33.12	0.004173	2.50	61.53	24.66	0.51
TORA	Tora valle	7	Tr200Tp08h	153.54	28.86	32.80		33.12	0.004171	2.50	61.49	24.65	0.50
TORA	Tora valle	6	Tr200Tp02h	127.86	28.58	32.54		32.80	0.003596	2.24	57.14	24.38	0.47
TORA	Tora valle	6	Tr200Tp03h	139.17	28.58	32.61		32.90	0.003911	2.36	58.87	24.60	0.49
TORA	Tora valle	6	Tr200Tp06h	152.49	28.58	32.80		33.09	0.003771	2.40	63.54	25.21	0.48
TORA	Tora valle	6	Tr200Tp07h	153.73	28.58	32.78		33.08	0.003911	2.44	63.09	25.15	0.49
TORA	Tora valle	6	Tr200Tp08h	153.54	28.58	32.78		33.08	0.003909	2.44	63.05	25.15	0.49
TORA	Tora valle	5	Tr200Tp02h	127.86	28.79	32.46		32.74	0.004039	2.33	54.79	23.94	0.49
TORA	Tora valle	5	Tr200Tp03h	139.17	28.79	32.53		32.84	0.004436	2.47	56.24	24.13	0.52
TORA	Tora valle	5	Tr200Tp06h	152.49	28.79	32.72		33.04	0.004228	2.50	60.93	24.73	0.51
TORA	Tora valle	5	Tr200Tp07h	153.72	28.79	32.69		33.03	0.004410	2.55	60.38	24.66	0.52
TORA	Tora valle	5	Tr200Tp08h	153.54	28.79	32.69		33.02	0.004408	2.54	60.34	24.65	0.52
TORA	Tora valle	4	Tr200Tp02h	127.86	28.82	32.41		32.71	0.004582	2.43	52.63	23.84	0.52
TORA	Tora valle	4	Tr200Tp03h	139.17	28.82	32.46		32.80	0.005070	2.58	53.87	24.00	0.55
TORA	Tora valle	4	Tr200Tp06h	152.49	28.82	32.66		33.00	0.004758	2.60	58.64	24.60	0.54
TORA	Tora valle	4	Tr200Tp07h	153.71	28.82	32.63		32.99	0.004991	2.65	58.00	24.52	0.55
TORA	Tora valle	4	Tr200Tp08h	153.53	28.82	32.63		32.99	0.004989	2.65	57.96	24.52	0.55
TORA	Tora valle	3	Tr200Tp02h	127.86	28.71	32.35		32.65	0.004880	2.45	52.18	24.01	0.53
TORA	Tora valle	3	Tr200Tp03h	139.17	28.71	32.39		32.74	0.005466	2.62	53.18	24.13	0.56
TORA	Tora valle	3	Tr200Tp06h	152.49	28.71	32.59		32.94	0.005046	2.62	58.17	24.73	0.55
TORA	Tora valle	3	Tr200Tp07h	153.70	28.71	32.56		32.93	0.005332	2.68	57.40	24.64	0.56
TORA	Tora valle	3	Tr200Tp08h	153.52	28.71	32.56		32.93	0.005329	2.68	57.36	24.64	0.56
TORA	Tora valle	2	Tr200Tp02h	127.86	28.60	32.23		32.53	0.004685	2.40	53.29	24.95	0.52
TORA	Tora valle	2	Tr200Tp03h	139.17	28.60	32.26		32.60	0.005384	2.58	53.85	25.03	0.56
TORA	Tora valle	2	Tr200Tp06h	152.47	28.60	32.48		32.81	0.004836	2.56	59.47	25.75	0.54
TORA	Tora valle	2	Tr200Tp07h	153.68	28.60	32.44		32.79	0.005178	2.63	58.41	25.61	0.56
TORA	Tora valle	2	Tr200Tp08h	153.50	28.60	32.43		32.79	0.005175	2.63	58.38	25.61	0.56
TORA	Tora valle	1.6	Tr200Tp02h	127.86	28.61	32.04	31.64	32.47	0.008932	2.89	44.23	25.31	0.70
TORA	Tora valle	1.6	Tr200Tp03h	139.17	28.61	32.17	31.73	32.61	0.008616	2.94	47.34	25.67	0.69
TORA	Tora valle	1.6	Tr200Tp06h	152.47	28.61	32.31	31.83	32.76	0.008254	2.99	51.03	26.10	0.68
TORA	Tora valle	1.6	Tr200Tp07h	153.72	28.61	32.32	31.84	32.78	0.008219	2.99	51.38	26.14	0.68
TORA	Tora valle	1.6	Tr200Tp08h	153.54	28.61	32.32	31.84	32.78	0.008219	2.99	51.34	26.13	0.68
TORA	Tora valle	1.5 BR U	Tr200Tp02h	127.86	28.61	31.92	31.64	32.41	0.011077	3.10	41.20	24.94	0.77
TORA	Tora valle	1.5 BR U	Tr200Tp03h	139.17	28.61	32.07	31.73	32.56	0.010070	3.10	44.96	25.39	0.74
TORA	Tora valle	1.5 BR U	Tr200Tp06h	152.47	28.61	32.23	31.83	32.72	0.009312	3.11	49.02	25.87	0.72
TORA	Tora valle	1.5 BR U	Tr200Tp07h	153.72	28.61	32.25	31.84	32.74	0.009197	3.11	49.49	25.92	0.72
TORA	Tora valle	1.5 BR U	Tr200Tp08h	153.54	28.61	32.25	31.84	32.74	0.009202	3.11	49.44	25.92	0.72
TORA	Tora valle	1.5 BR D	Tr200Tp02h	127.86	28.67	31.94	31.35	32.31	0.006518	2.69	47.49	24.05	0.61
TORA	Tora valle	1.5 BR D	Tr200Tp03h	139.17	28.67	32.09	31.44	32.47	0.006210	2.73	51.01	24.33	0.60
TORA	Tora valle	1.5 BR D	Tr200Tp06h	152.47	28.67	32.24	31.54	32.64	0.006001	2.78	54.80	24.63	0.60
TORA	Tora valle	1.5 BR D	Tr200Tp07h	153.72	28.67	32.26	31.55	32.65	0.005955	2.78	55.24	24.67	0.59
TORA	Tora valle	1.5 BR D	Tr200Tp08h	153.54	28.67	32.26	31.55	32.65	0.005956	2.78	55.20	24.67	0.59
TORA	Tora valle	1.4	Tr200Tp02h	127.77	28.67	31.87		32.27	0.007324	2.80	45.68	23.90	0.65
TORA	Tora valle	1.4	Tr200Tp03h	139.17	28.67	32.02		32.42	0.006868	2.82	49.35	24.20	0.63

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
TORA	Tora valle	1.08	Tr200Tp02h	127.68	25.74	30.98		31.06	0.000802	1.28	100.19	34.51	0.23
TORA	Tora valle	1.08	Tr200Tp03h	139.15	25.74	31.14		31.23	0.000809	1.32	105.99	34.78	0.23
TORA	Tora valle	1.08	Tr200Tp06h	152.17	25.74	31.33		31.42	0.000817	1.37	112.38	35.09	0.24
TORA	Tora valle	1.08	Tr200Tp07h	153.46	25.74	31.34		31.44	0.000817	1.37	113.01	35.12	0.24
TORA	Tora valle	1.08	Tr200Tp08h	153.33	25.74	31.34		31.44	0.000817	1.37	112.94	35.12	0.24
TORA	Tora valle	1.06	Tr200Tp02h	127.68	25.74	30.92		31.01	0.000846	1.30	98.35	34.43	0.24
TORA	Tora valle	1.06	Tr200Tp03h	139.15	25.74	31.09		31.18	0.000852	1.35	104.12	34.69	0.24
TORA	Tora valle	1.06	Tr200Tp06h	152.17	25.74	31.27		31.37	0.000858	1.39	110.48	34.98	0.24
TORA	Tora valle	1.06	Tr200Tp07h	153.46	25.74	31.29		31.39	0.000858	1.40	111.09	35.01	0.24
TORA	Tora valle	1.06	Tr200Tp08h	153.33	25.74	31.29		31.39	0.000858	1.40	111.04	35.01	0.24
TORA	Tora valle	1.04	Tr200Tp02h	127.68	25.74	30.86		30.95	0.000897	1.33	96.37	34.35	0.24
TORA	Tora valle	1.04	Tr200Tp03h	139.15	25.74	31.03		31.13	0.000901	1.37	102.11	34.60	0.24
TORA	Tora valle	1.04	Tr200Tp06h	152.17	25.74	31.21		31.31	0.000906	1.42	108.43	34.89	0.25
TORA	Tora valle	1.04	Tr200Tp07h	153.46	25.74	31.23		31.33	0.000906	1.42	109.05	34.92	0.25
TORA	Tora valle	1.04	Tr200Tp08h	153.33	25.74	31.23		31.33	0.000906	1.42	108.98	34.92	0.25
TORA	Tora valle	1.02	Tr200Tp02h	127.68	25.74	30.81		30.90	0.000951	1.35	94.48	32.75	0.25
TORA	Tora valle	1.02	Tr200Tp03h	139.15	25.74	30.97		31.07	0.000953	1.40	100.16	34.51	0.25
TORA	Tora valle	1.02	Tr200Tp06h	152.17	25.74	31.16		31.26	0.000955	1.44	106.46	34.80	0.25
TORA	Tora valle	1.02	Tr200Tp07h	153.46	25.74	31.17		31.28	0.000955	1.45	107.07	34.83	0.25
TORA	Tora valle	1.02	Tr200Tp08h	153.33	25.74	31.17		31.28	0.000955	1.45	107.01	34.82	0.25
TORA	Tora valle	1	Tr200Tp02h	127.68	25.74	30.76	28.62	30.86	0.001000	1.37	92.92	32.09	0.25
TORA	Tora valle	1	Tr200Tp03h	139.15	25.74	30.93	28.71	31.03	0.001000	1.42	98.49	34.43	0.26
TORA	Tora valle	1	Tr200Tp06h	152.17	25.74	31.11	28.80	31.22	0.001000	1.46	104.78	34.72	0.26
TORA	Tora valle	1	Tr200Tp07h	153.46	25.74	31.13	28.81	31.23	0.001000	1.47	105.39	34.75	0.26
TORA	Tora valle	1	Tr200Tp08h	153.33	25.74	31.12	28.81	31.23	0.001000	1.47	105.33	34.75	0.26
IL RIO	RIO	27	Tr200Tp02h	20.14	68.12	69.91	70.10	70.39	0.026194	3.44	9.57	25.43	1.01
IL RIO	RIO	27	Tr200Tp03h	18.84	68.12	69.88	70.05	70.35	0.026450	3.39	8.80	23.33	1.01
IL RIO	RIO	27	Tr200Tp06h	14.56	68.12	69.77	69.92	70.21	0.026833	3.19	6.47	17.18	1.00
IL RIO	RIO	27	Tr200Tp07h	13.50	68.12	69.73	69.88	70.17	0.026752	3.12	5.94	15.71	0.99
IL RIO	RIO	27	Tr200Tp08h	12.58	68.12	69.70	69.84	70.13	0.027196	3.07	5.42	14.16	0.99
IL RIO	RIO	26	Tr200Tp02h	17.69	61.77	64.34	64.06	64.50	0.006771	1.94	13.04	22.28	0.51
IL RIO	RIO	26	Tr200Tp03h	17.67	61.77	64.34	64.05	64.50	0.006742	1.93	13.06	22.30	0.51
IL RIO	RIO	26	Tr200Tp06h	14.56	61.77	64.04	63.42	64.29	0.012725	2.29	7.68	13.87	0.67
IL RIO	RIO	26	Tr200Tp07h	13.50	61.77	64.03	63.35	64.25	0.011584	2.17	7.46	13.64	0.64
IL RIO	RIO	26	Tr200Tp08h	9.69	61.77	64.01	63.06	64.13	0.006270	1.58	7.28	13.45	0.47
IL RIO	RIO	25.8 BR U	Tr200Tp02h	17.69	61.77	64.84	64.31	64.88		1.22	27.00	34.35	0.14
IL RIO	RIO	25.8 BR U	Tr200Tp03h	17.67	61.77	64.69	64.31	64.75		1.37	22.50	32.93	0.18
IL RIO	RIO	25.8 BR U	Tr200Tp06h	14.56	61.77	64.02	64.23	64.29		1.84	9.30	13.59	0.74
IL RIO	RIO	25.8 BR U	Tr200Tp07h	13.50	61.77	63.89	64.20	64.22		2.27	7.92	11.75	1.08
IL RIO	RIO	25.8 BR U	Tr200Tp08h	9.69	61.77	64.02	62.97	64.14		1.89	6.40	13.49	0.50
IL RIO	RIO	25.8 BR D	Tr200Tp02h	17.69	61.77	64.30	64.30	64.54		1.22	27.23	27.18	0.38
IL RIO	RIO	25.8 BR D	Tr200Tp03h	17.67	61.77	64.30	64.30	64.58		1.37	23.51	27.19	0.38
IL RIO	RIO	25.8 BR D	Tr200Tp06h	14.56	61.77	64.02	64.23	64.29		1.84	10.68	15.11	0.73
IL RIO	RIO	25.8 BR D	Tr200Tp07h	13.50	61.77	63.89	64.21	64.22		2.27	8.92	12.11	1.07
IL RIO	RIO	25.8 BR D	Tr200Tp08h	9.69	61.77	64.02	62.97	64.14		1.89	6.91	14.96	0.49
IL RIO	RIO	25.5	Tr200Tp02h	20.14	61.77	63.41	64.19	64.88	0.036602	5.36	3.76	5.03	1.40
IL RIO	RIO	25.5	Tr200Tp03h	18.84	61.77	63.35	64.15	64.74	0.036826	5.23	3.60	4.75	1.39
IL RIO	RIO	25.5	Tr200Tp06h	14.56	61.77	63.14	63.42	64.29	0.037704	4.75	3.07	4.42	1.37
IL RIO	RIO	25.5	Tr200Tp07h	13.50	61.77	63.08	63.35	64.17	0.038016	4.62	2.92	4.34	1.36
IL RIO	RIO	25.5	Tr200Tp08h	12.58	61.77	63.03	63.28	64.06	0.038279	4.50	2.80	4.26	1.36
IL RIO	RIO	25	Tr200Tp02h	20.14	58.89	61.08	61.18	61.64	0.027735	3.33	6.46	9.69	1.02
IL RIO	RIO	25	Tr200Tp03h	18.84	58.89	61.04	61.13	61.58	0.027888	3.25	6.07	9.60	1.02
IL RIO	RIO	25	Tr200Tp06h	14.56	58.89	60.88	60.89	61.34	0.028971	3.00	4.86	5.39	1.01
IL RIO	RIO	25	Tr200Tp07h	13.50	58.89	60.83	60.83	61.27	0.028928	2.95	4.58	5.19	1.00
IL RIO	RIO	25	Tr200Tp08h	12.58	58.89	60.78	60.78	61.21	0.028846	2.90	4.34	5.01	0.99
IL RIO	RIO	24	Tr200Tp02h	20.14	58.91	60.52	60.48	61.00	0.021345	3.08	6.58	7.33	0.95
IL RIO	RIO	24	Tr200Tp03h	18.84	58.91	60.47	60.43	60.93	0.021398	3.01	6.28	6.69	0.94
IL RIO	RIO	24	Tr200Tp06h	14.56	58.91	60.30	60.30	60.69	0.021217	2.77	5.25	5.69	0.92
IL RIO	RIO	24	Tr200Tp07h	13.50	58.91	60.25	60.25	60.63	0.021262	2.72	4.96	5.55	0.92
IL RIO	RIO	24	Tr200Tp08h	12.58	58.91	60.20	60.20	60.57	0.021297	2.67	4.70	5.42	0.92
IL RIO	RIO	23	Tr200Tp02h	20.14	55.83	57.85	57.94	58.37	0.023496	3.28	7.09	10.88	0.96
IL RIO	RIO	23	Tr200Tp03h	18.84	55.83	57.86	57.88	58.31	0.020032	3.04	7.17	11.08	0.89
IL RIO	RIO	23	Tr200Tp06h	14.56	55.83	57.70	57.65	58.09	0.019681	2.80	5.66	8.24	0.86
IL RIO	RIO	23	Tr200Tp07h	13.47	55.83	57.64	57.58	58.02	0.019829	2.74	5.23	7.57	0.86
IL RIO	RIO	23	Tr200Tp08h	12.58	55.83	57.61	57.52	57.97	0.019295	2.67	4.97	7.12	0.84
IL RIO	RIO	22	Tr200Tp02h	20.14	54.51	57.47		57.63	0.010695	2.08	14.43	25.87	0.63
IL RIO	RIO	22	Tr200Tp03h	18.84	54.51	57.43		57.60	0.011118	2.07	13.45	25.39	0.64
IL RIO	RIO	22	Tr200Tp06h	14.56	54.51	57.31		57.47	0.012296	2.01	10.37	23.79	0.66
IL RIO	RIO	22	Tr200Tp07h	14.45	54.51	57.30		57.47	0.012654	2.02	10.17	23.67	0.67
IL RIO	RIO	22	Tr200Tp08h	12.58	54.51	57.27		57.42	0.010974	1.85	9.57	23.30	0.62
IL RIO	RIO	21.8	Tr200Tp02h	-20.14									
IL RIO	RIO	21.8	Tr200Tp03h	-18.84									
IL RIO	RIO	21.8	Tr200Tp06h	-14.56									
IL RIO	RIO	21.8	Tr200Tp07h	-14.45									
IL RIO	RIO	21.8	Tr200Tp08h	-12.58									
IL RIO	RIO	21.5	Tr200Tp02h	20.14	54.51	57.04	57.35	58.02	0.096453	4.52	5.29	14.46	1.75
IL RIO	RIO	21.5	Tr200Tp03h	18.84	54.51	56.99	57.32	58.06	0.115668	4.69	4.57	12.72	1.89
IL RIO	RIO	21.5	Tr200Tp06h	11.74	54.51	56.91	57.12	57.50	0.073797	3.42	3.67	10.24	1.48
IL RIO	RIO	21.5	Tr200Tp07h	14.50	54.51	56.88	57.22	57.89	0.134793	4.47	3.41	9.48	1.98

HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
IL RIO	RIO	21.5	Tr200Tp08h	11.63	54.51	56.85	57.12	57.60	0.107258	3.83	3.13	8.63	1.75
IL RIO	RIO	21	Tr200Tp02h	20.14	54.40	56.61	56.39	56.96	0.014548	2.64	8.14	11.56	0.76
IL RIO	RIO	21	Tr200Tp03h	18.84	54.40	56.57	56.33	56.90	0.014291	2.57	7.66	11.15	0.75
IL RIO	RIO	21	Tr200Tp06h	14.68	54.40	56.41		56.68	0.013373	2.33	6.31	5.84	0.72
IL RIO	RIO	21	Tr200Tp07h	14.18	54.40	56.38		56.65	0.013253	2.30	6.16	5.76	0.71
IL RIO	RIO	21	Tr200Tp08h	12.58	54.40	56.31		56.55	0.012506	2.19	5.75	5.54	0.69
IL RIO	RIO	20	Tr200Tp02h	20.13	53.57	55.48		55.67	0.015946	2.45	14.82	35.19	0.79
IL RIO	RIO	20	Tr200Tp03h	18.83	53.57	55.45		55.64	0.016479	2.44	13.85	34.60	0.80
IL RIO	RIO	20	Tr200Tp06h	14.57	53.57	55.39		55.55	0.014547	2.19	11.71	32.45	0.74
IL RIO	RIO	20	Tr200Tp07h	13.72	53.57	55.37		55.53	0.014266	2.15	11.22	32.11	0.73
IL RIO	RIO	20	Tr200Tp08h	12.58	53.57	55.31		55.51	0.018868	2.35	9.17	30.64	0.83
IL RIO	RIO	19.8	Tr200Tp02h	-20.13									
IL RIO	RIO	19.8	Tr200Tp03h	-18.83									
IL RIO	RIO	19.8	Tr200Tp06h	-14.57									
IL RIO	RIO	19.8	Tr200Tp07h	-13.72									
IL RIO	RIO	19.8	Tr200Tp08h	-12.58									
IL RIO	RIO	19.5	Tr200Tp02h	20.13	53.54	55.31	55.44	55.70	0.035846	3.32	10.19	27.92	1.15
IL RIO	RIO	19.5	Tr200Tp03h	18.83	53.54	55.29	55.38	55.68	0.036613	3.29	9.53	27.21	1.16
IL RIO	RIO	19.5	Tr200Tp06h	14.57	53.54	55.19	55.33	55.59	0.040214	3.18	7.18	23.14	1.19
IL RIO	RIO	19.5	Tr200Tp07h	13.71	53.54	55.17	55.31	55.56	0.040752	3.13	6.68	21.50	1.19
IL RIO	RIO	19.5	Tr200Tp08h	12.58	53.54	55.14	55.29	55.53	0.042321	3.10	6.06	20.58	1.21
IL RIO	RIO	19	Tr200Tp02h	20.17	51.20	52.98	53.06	53.27	0.015317	2.73	13.26	44.59	0.81
IL RIO	RIO	19	Tr200Tp03h	18.83	51.20	52.94	53.04	53.26	0.016487	2.76	11.52	40.58	0.84
IL RIO	RIO	19	Tr200Tp06h	14.56	51.20	52.83	52.91	53.14	0.017248	2.63	7.93	25.91	0.84
IL RIO	RIO	19	Tr200Tp07h	13.49	51.20	52.80	52.86	53.11	0.017521	2.59	7.11	24.15	0.84
IL RIO	RIO	19	Tr200Tp08h	12.58	51.20	52.76	52.83	53.08	0.017957	2.57	6.35	21.07	0.85
IL RIO	RIO	18.5	Tr200Tp02h	20.14	49.19	51.39		51.74	0.016770	2.74	9.47	16.13	0.77
IL RIO	RIO	18.5	Tr200Tp03h	18.82	49.19	51.35		51.69	0.016965	2.70	8.81	15.73	0.77
IL RIO	RIO	18.5	Tr200Tp06h	10.60	49.19	51.33		51.45	0.005736	1.55	8.54	15.56	0.44
IL RIO	RIO	18.5	Tr200Tp07h	10.60	49.19	51.33		51.45	0.005734	1.55	8.54	15.56	0.44
IL RIO	RIO	18.5	Tr200Tp08h	10.59	49.19	51.33		51.45	0.005732	1.55	8.54	15.56	0.44
IL RIO	RIO	18.01	Tr200Tp02h	-20.14									
IL RIO	RIO	18.01	Tr200Tp03h	-18.82									
IL RIO	RIO	18.01	Tr200Tp06h	-10.60									
IL RIO	RIO	18.01	Tr200Tp07h	-10.60									
IL RIO	RIO	18.01	Tr200Tp08h	10.59									
IL RIO	RIO	18	Tr200Tp02h	20.14	49.18	51.12	51.39	51.83	0.042622	3.76	5.84	10.28	1.18
IL RIO	RIO	18	Tr200Tp03h	19.20	49.18	51.09	51.37	51.78	0.042888	3.71	5.58	9.84	1.17
IL RIO	RIO	18	Tr200Tp06h	15.90	49.18	50.90	51.15	51.65	0.022367	3.83	4.16	6.83	0.95
IL RIO	RIO	18	Tr200Tp07h	14.15	49.18	50.82		51.47	0.020794	3.57	3.96	5.56	0.91
IL RIO	RIO	18	Tr200Tp08h	12.58	49.18	50.73		51.31	0.020159	3.38	3.73	4.94	0.88
IL RIO	RIO	17	Tr200Tp02h	20.13	48.00	50.07		50.23	0.004896	1.78	11.32	7.58	0.46
IL RIO	RIO	17	Tr200Tp03h	18.95	48.00	50.03		50.18	0.004712	1.73	10.99	7.52	0.46
IL RIO	RIO	17	Tr200Tp06h	14.87	48.00	49.85		49.97	0.004166	1.54	9.64	7.26	0.43
IL RIO	RIO	17	Tr200Tp07h	13.78	48.00	49.78		49.90	0.004091	1.50	9.18	7.14	0.42
IL RIO	RIO	17	Tr200Tp08h	12.58	48.00	49.71		49.82	0.003956	1.45	8.70	7.01	0.41
IL RIO	RIO	16.9		Lat Struct									
IL RIO	RIO	16.88		Lat Struct									
IL RIO	RIO	16.5	Tr200Tp02h	11.81	46.43	49.08	47.93	49.17	0.003068	1.32	8.93	4.48	0.30
IL RIO	RIO	16.5	Tr200Tp03h	11.63	46.43	49.06	47.91	49.15	0.003053	1.31	8.84	4.48	0.30
IL RIO	RIO	16.5	Tr200Tp06h	10.82	46.43	48.98	47.86	49.06	0.002979	1.28	8.46	4.48	0.30
IL RIO	RIO	16.5	Tr200Tp07h	10.49	46.43	48.94	47.83	49.02	0.002931	1.26	8.32	4.48	0.30
IL RIO	RIO	16.5	Tr200Tp08h	10.10	46.43	48.91	47.81	48.99	0.002856	1.24	8.16	4.48	0.29
IL RIO	RIO	16.01 BR U	Tr200Tp02h	11.81	46.43	49.05	47.56	49.15		1.75		4.48	0.37
IL RIO	RIO	16.01 BR U	Tr200Tp03h	11.63	46.43	49.03	47.56	49.12		1.75		4.48	0.37
IL RIO	RIO	16.01 BR U	Tr200Tp06h	10.82	46.43	48.94	47.55	49.03		1.74		4.48	0.38
IL RIO	RIO	16.01 BR U	Tr200Tp07h	10.49	46.43	48.91	47.55	48.99		1.73		4.48	0.38
IL RIO	RIO	16.01 BR U	Tr200Tp08h	10.10	46.43	48.87	47.55	48.95		1.71		4.48	0.37
IL RIO	RIO	16.01 BR D	Tr200Tp02h	11.81	46.43	48.83	47.56	49.12		1.75		4.48	0.46
IL RIO	RIO	16.01 BR D	Tr200Tp03h	11.63	46.43	48.79	47.56	49.09		1.75		4.48	0.47
IL RIO	RIO	16.01 BR D	Tr200Tp06h	10.82	46.43	48.72	47.55	49.00		1.74		4.48	0.47
IL RIO	RIO	16.01 BR D	Tr200Tp07h	10.49	46.43	48.70	47.55	48.97		1.73		4.48	0.47
IL RIO	RIO	16.01 BR D	Tr200Tp08h	10.10	46.43	48.67	47.55	48.93		1.71		4.48	0.47
IL RIO	RIO	16	Tr200Tp02h	11.81	46.43	48.83		48.94	0.004426	1.51	7.80	4.48	0.37
IL RIO	RIO	16	Tr200Tp03h	11.62	46.43	48.79		48.91	0.004506	1.52	7.65	4.48	0.37
IL RIO	RIO	16	Tr200Tp06h	10.82	46.43	48.67		48.79	0.004795	1.52	7.10	4.48	0.39
IL RIO	RIO	16	Tr200Tp07h	10.48	46.43	48.64		48.75	0.004787	1.51	6.94	4.48	0.39
IL RIO	RIO	16	Tr200Tp08h	10.10	46.43	48.60		48.71	0.004738	1.49	6.78	4.48	0.39
IL RIO	RIO	15	Tr200Tp02h	6.57	44.14	45.96		46.03	0.003244	1.11	5.93	5.99	0.36
IL RIO	RIO	15	Tr200Tp03h	6.52	44.14	45.95		46.01	0.003334	1.12	5.84	5.99	0.36
IL RIO	RIO	15	Tr200Tp06h	6.33	44.14	45.91		45.97	0.003596	1.13	5.58	5.99	0.37
IL RIO	RIO	15	Tr200Tp07h	6.24	44.14	45.90		45.96	0.003620	1.13	5.52	5.99	0.38
IL RIO	RIO	15	Tr200Tp08h	6.27	44.14	45.88		45.95	0.003814	1.15	5.44	5.98	0.39
IL RIO	RIO	14	Tr200Tp02h	7.04	43.66	45.56		45.62	0.002825	1.07	6.56	5.52	0.31
IL RIO	RIO	14	Tr200Tp03h	6.89	43.66	45.55		45.60	0.002816	1.06	6.47	5.52	0.31
IL RIO	RIO	14	Tr200Tp06h	6.35	43.66	45.48		45.53	0.002838	1.04	6.11	5.52	0.32
IL RIO	RIO	14	Tr200Tp07h	6.23	43.66	45.46		45.51	0.002882	1.04	5.99	5.52	0.32

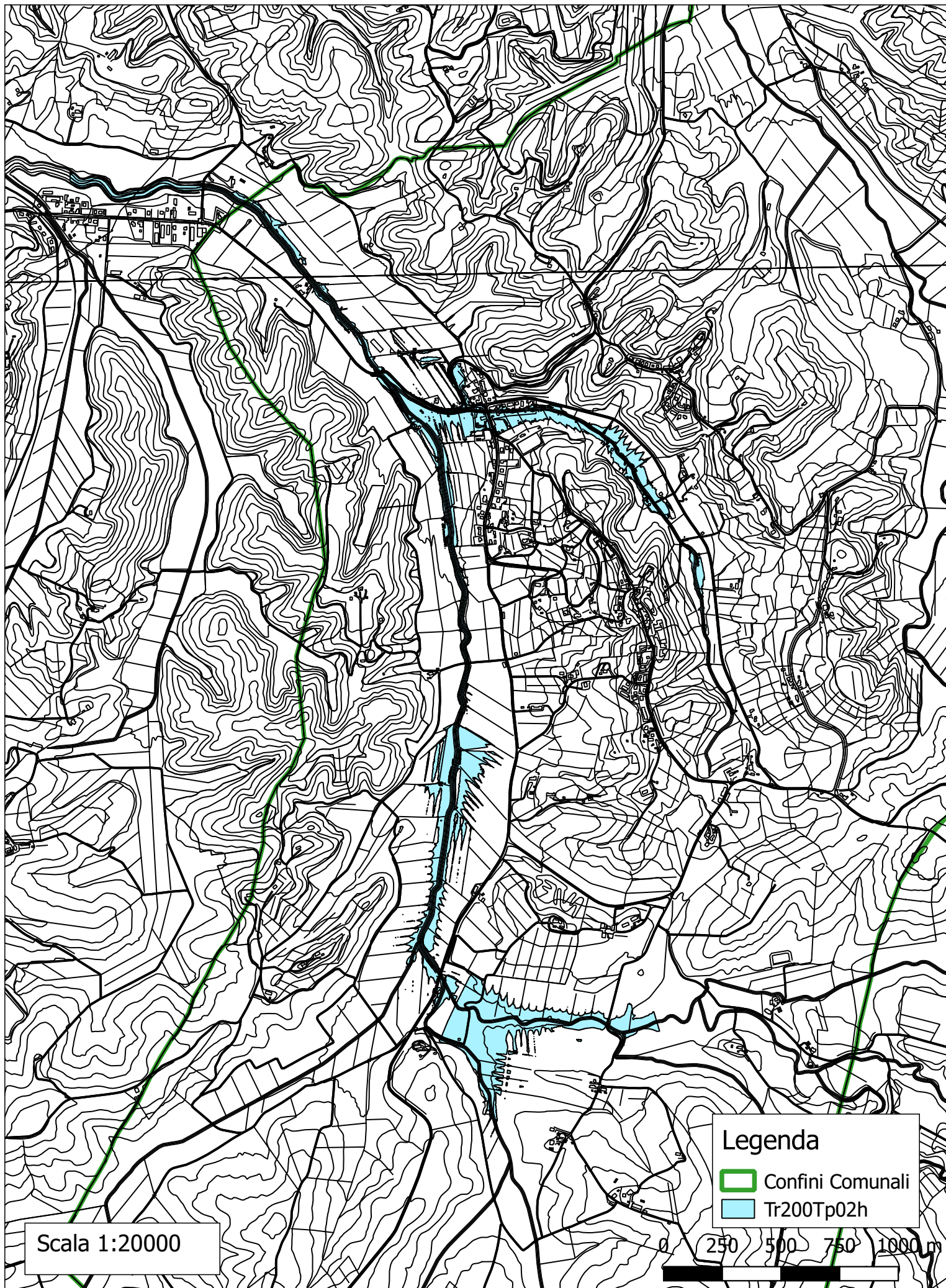
HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
IL RIO	RIO	14	Tr200Tp08h	6.14	43.66	45.44		45.49	0.002971	1.05	5.87	5.52	0.32
IL RIO	RIO	13.5	Tr200Tp02h	7.36	43.10	44.97		45.03	0.002512	1.01	7.26	5.88	0.29
IL RIO	RIO	13.5	Tr200Tp03h	7.12	43.10	44.89		44.95	0.002864	1.05	6.79	5.88	0.31
IL RIO	RIO	13.5	Tr200Tp06h	6.95	43.10	44.69		44.77	0.004897	1.25	5.58	5.88	0.41
IL RIO	RIO	13.5	Tr200Tp07h	6.85	43.10	44.66		44.74	0.005144	1.26	5.44	5.88	0.42
IL RIO	RIO	13.5	Tr200Tp08h	6.62	43.10	44.64		44.72	0.005119	1.24	5.33	5.88	0.42
IL RIO	RIO	13.01	Tr200Tp02h	7.36									
IL RIO	RIO	13.01	Tr200Tp03h	7.12									
IL RIO	RIO	13.01	Tr200Tp06h	6.95									
IL RIO	RIO	13.01	Tr200Tp07h	6.85									
IL RIO	RIO	13.01	Tr200Tp08h	6.62									
IL RIO	RIO	13	Tr200Tp02h	7.36	43.10	44.91		44.97	0.002990	1.08	6.82	5.79	0.32
IL RIO	RIO	13	Tr200Tp03h	7.15	43.10	44.83		44.90	0.003464	1.12	6.37	5.79	0.34
IL RIO	RIO	13	Tr200Tp06h	6.95	43.10	44.61		44.71	0.006349	1.36	5.10	5.79	0.46
IL RIO	RIO	13	Tr200Tp07h	6.85	43.10	44.58		44.68	0.006973	1.40	4.90	5.79	0.49
IL RIO	RIO	13	Tr200Tp08h	6.62	43.10	44.54		44.65	0.007356	1.41	4.71	5.79	0.50
IL RIO	RIO	12.500	Tr200Tp02h	7.67	42.64	44.35		44.43	0.010265	1.28	5.98	5.37	0.39
IL RIO	RIO	12.500	Tr200Tp03h	7.38	42.64	44.32		44.40	0.010303	1.27	5.81	5.37	0.39
IL RIO	RIO	12.500	Tr200Tp06h	6.49	42.64	44.22		44.29	0.010561	1.23	5.28	5.37	0.40
IL RIO	RIO	12.500	Tr200Tp07h	6.30	42.64	44.19		44.27	0.010662	1.22	5.16	5.37	0.40
IL RIO	RIO	12.500	Tr200Tp08h	6.13	42.64	44.17		44.25	0.010817	1.22	5.04	5.37	0.40
IL RIO	RIO	12.071	Tr200Tp02h	10.69	42.24	43.92		44.12	0.010062	2.01	5.37	5.36	0.62
IL RIO	RIO	12.071	Tr200Tp03h	10.60	42.24	43.88		44.10	0.010937	2.06	5.19	5.33	0.65
IL RIO	RIO	12.071	Tr200Tp06h	9.08	42.24	43.79		43.98	0.010651	1.93	4.72	5.25	0.64
IL RIO	RIO	12.071	Tr200Tp07h	8.71	42.24	43.77		43.96	0.010463	1.89	4.62	5.23	0.63
IL RIO	RIO	12.071	Tr200Tp08h	8.32	42.24	43.76		43.93	0.010188	1.85	4.52	5.22	0.62
IL RIO	RIO	12	Tr200Tp02h	10.77	42.17	43.85		44.06	0.011632	2.07	5.21	4.94	0.64
IL RIO	RIO	12	Tr200Tp03h	10.56	42.17	43.83		44.05	0.011727	2.06	5.12	4.94	0.65
IL RIO	RIO	12	Tr200Tp06h	9.07	42.17	43.74		43.93	0.011108	1.93	4.70	4.94	0.63
IL RIO	RIO	12	Tr200Tp07h	8.70	42.17	43.73		43.91	0.010825	1.89	4.61	4.94	0.62
IL RIO	RIO	12	Tr200Tp08h	8.31	42.17	43.71		43.88	0.010435	1.84	4.53	4.94	0.61
IL RIO	RIO	11.688	Tr200Tp02h	10.19	41.67	43.50		43.66	0.006305	1.78	6.32	7.14	0.52
IL RIO	RIO	11.688	Tr200Tp03h	9.94	41.67	43.48		43.64	0.006358	1.77	6.18	7.06	0.52
IL RIO	RIO	11.688	Tr200Tp06h	8.70	41.67	43.40		43.54	0.006342	1.68	5.60	6.70	0.52
IL RIO	RIO	11.688	Tr200Tp07h	8.36	41.67	43.38		43.52	0.006265	1.65	5.47	6.61	0.51
IL RIO	RIO	11.688	Tr200Tp08h	8.04	41.67	43.36		43.49	0.006176	1.62	5.34	6.55	0.51
IL RIO	RIO	11	Tr200Tp02h	8.77	40.56	42.28		42.50	0.012402	2.06	4.25	3.99	0.64
IL RIO	RIO	11	Tr200Tp03h	8.30	40.56	42.27		42.47	0.011536	1.98	4.20	3.99	0.62
IL RIO	RIO	11	Tr200Tp06h	7.93	40.56	42.21		42.41	0.012444	2.00	3.96	3.99	0.64
IL RIO	RIO	11	Tr200Tp07h	7.77	40.56	42.20		42.40	0.012315	1.98	3.92	3.99	0.64
IL RIO	RIO	11	Tr200Tp08h	7.70	40.56	42.19		42.39	0.012477	1.99	3.87	3.99	0.64
IL RIO	RIO	10.650	Tr200Tp02h	9.62	40.22	41.94		42.12	0.008734	1.88	5.37	6.02	0.57
IL RIO	RIO	10.650	Tr200Tp03h	9.29	40.22	41.92		42.09	0.008624	1.85	5.26	6.02	0.57
IL RIO	RIO	10.650	Tr200Tp06h	8.42	40.22	41.84		42.01	0.009133	1.82	4.78	5.76	0.58
IL RIO	RIO	10.650	Tr200Tp07h	8.24	40.22	41.82		41.99	0.009476	1.83	4.64	5.68	0.59
IL RIO	RIO	10.650	Tr200Tp08h	8.09	40.22	41.80		41.97	0.009663	1.83	4.54	5.61	0.60
IL RIO	RIO	10	Tr200Tp02h	12.79	39.58	41.29		41.47	0.007829	1.87	7.23	6.75	0.55
IL RIO	RIO	10	Tr200Tp03h	12.43	39.58	41.27		41.44	0.007843	1.85	7.09	6.75	0.55
IL RIO	RIO	10	Tr200Tp06h	10.90	39.58	41.17		41.33	0.008098	1.79	6.41	6.75	0.56
IL RIO	RIO	10	Tr200Tp07h	10.63	39.58	41.15		41.31	0.008248	1.78	6.26	6.75	0.56
IL RIO	RIO	10	Tr200Tp08h	10.34	39.58	41.13		41.28	0.008357	1.77	6.12	6.75	0.56
IL RIO	RIO	09	Tr200Tp02h	13.17	39.01	40.88		41.07	0.007875	1.94	6.96	6.45	0.55
IL RIO	RIO	09	Tr200Tp03h	12.81	39.01	40.86		41.05	0.007799	1.92	6.85	6.45	0.55
IL RIO	RIO	09	Tr200Tp06h	11.22	39.01	40.77		40.94	0.007604	1.82	6.28	6.24	0.54
IL RIO	RIO	09	Tr200Tp07h	10.89	39.01	40.75		40.92	0.007576	1.79	6.16	6.18	0.54
IL RIO	RIO	09	Tr200Tp08h	10.56	39.01	40.73		40.89	0.007577	1.78	6.02	6.12	0.54
IL RIO	RIO	08	Tr200Tp02h	12.80	38.67	40.67		40.79	0.004127	1.52	8.41	5.61	0.40
IL RIO	RIO	08	Tr200Tp03h	12.47	38.67	40.66		40.77	0.004033	1.50	8.32	5.61	0.39
IL RIO	RIO	08	Tr200Tp06h	10.86	38.67	40.59		40.68	0.003503	1.37	7.93	5.61	0.37
IL RIO	RIO	08	Tr200Tp07h	10.51	38.67	40.57		40.66	0.003391	1.34	7.84	5.60	0.36
IL RIO	RIO	08	Tr200Tp08h	10.21	38.67	40.55		40.64	0.003328	1.32	7.73	5.59	0.36
IL RIO	RIO	07	Tr200Tp02h	10.46	38.21	40.03		40.37	0.018805	2.61	4.04	6.59	0.63
IL RIO	RIO	07	Tr200Tp03h	10.33	38.21	40.01		40.36	0.018873	2.61	4.00	6.59	0.64
IL RIO	RIO	07	Tr200Tp06h	9.42	38.21	39.88		40.22	0.020051	2.59	3.67	6.58	0.66
IL RIO	RIO	07	Tr200Tp07h	9.38	38.21	39.87		40.21	0.020036	2.59	3.66	6.58	0.66
IL RIO	RIO	07	Tr200Tp08h	9.24	38.21	39.85		40.19	0.020313	2.59	3.61	6.58	0.66
IL RIO	RIO	06	Tr200Tp02h	10.34	37.11	40.01	38.23	40.08	0.002784	1.19	8.72	3.22	0.23
IL RIO	RIO	06	Tr200Tp03h	10.22	37.11	39.98	38.22	40.05	0.002787	1.18	8.63	3.22	0.23
IL RIO	RIO	06	Tr200Tp06h	9.61	37.11	39.84	38.18	39.91	0.002813	1.17	8.19	3.22	0.24
IL RIO	RIO	06	Tr200Tp07h	9.57	37.11	39.81	38.18	39.88	0.002874	1.18	8.09	3.22	0.24
IL RIO	RIO	06	Tr200Tp08h	9.46	37.11	39.78	38.17	39.85	0.002903	1.18	7.98	3.22	0.24
IL RIO	RIO	5.5 BR U	Tr200Tp02h	10.34	37.11	40.01	38.23	40.08		2.03		3.22	0.40
IL RIO	RIO	5.5 BR U	Tr200Tp03h	10.22	37.11	39.99	38.22	40.06		2.04		3.22	0.40
IL RIO	RIO	5.5 BR U	Tr200Tp06h	9.61	37.11	39.85	38.18	39.92		2.10			0.42
IL RIO	RIO	5.5 BR U	Tr200Tp07h	9.57	37.11	39.82	38.18	39.89		2.14			0.42
IL RIO	RIO	5.5 BR U	Tr200Tp08h	9.46	37.11	38.64	38.17	39.86	0.013461	2.14	4.41	3.04	0.57
IL RIO	RIO	5.5 BR D	Tr200Tp02h	10.34	37.00	40.00	38.03	40.06		1.67		3.61	0.32
IL RIO	RIO	5.5 BR D	Tr200Tp03h	10.22	37.00	39.98	38.03	40.04		1.68		3.61	0.32

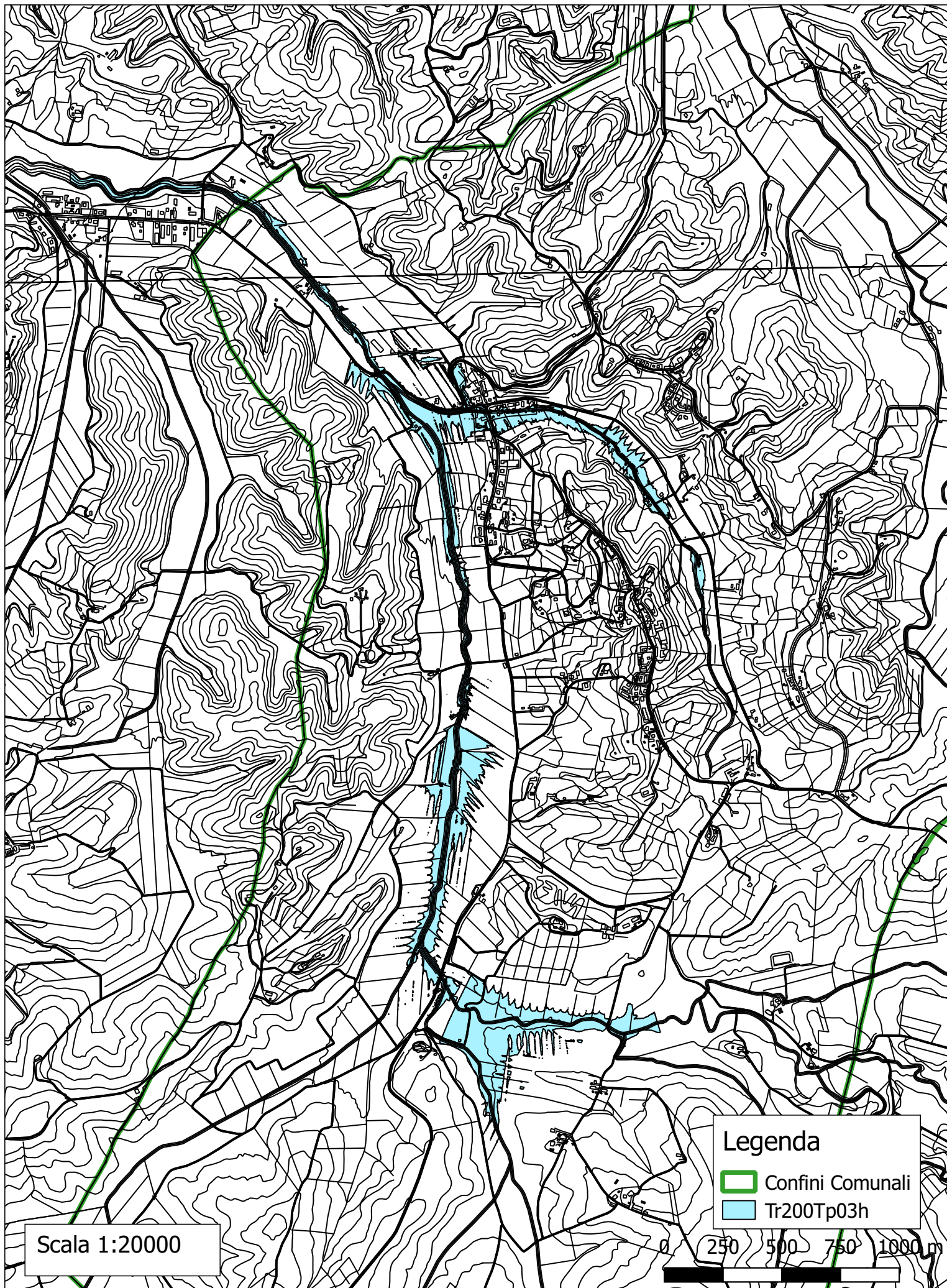
HEC-RAS Profile: Max WS (Continued)

River	Reach	River Sta	Plan	Q Total (m3/s)	Min Ch El (m)	W.S. Elev (m)	Crit W.S. (m)	E.G. Elev (m)	E.G. Slope (m/m)	Vel Chnl (m/s)	Flow Area (m2)	Top Width (m)	Froude # Chl
IL RIO	RIO	5.5 BR D	Tr200Tp06h	9.61	37.00	39.85	37.98	39.92		1.72			0.34
IL RIO	RIO	5.5 BR D	Tr200Tp07h	9.57	37.00	39.82	37.98	39.89		1.74			0.34
IL RIO	RIO	5.5 BR D	Tr200Tp08h	9.46	37.00	38.64	37.98	39.56	0.007637	1.75	5.41	3.49	0.45
IL RIO	RIO	5.2	Tr200Tp02h	10.34	37.00	39.69		39.76	0.002313	1.13	9.17	3.61	0.23
IL RIO	RIO	5.2	Tr200Tp03h	10.22	37.00	39.67		39.73	0.002316	1.13	9.08	3.61	0.23
IL RIO	RIO	5.2	Tr200Tp06h	9.61	37.00	39.55		39.61	0.002316	1.11	8.65	3.61	0.23
IL RIO	RIO	5.2	Tr200Tp07h	9.57	37.00	39.52		39.58	0.002370	1.12	8.54	3.61	0.23
IL RIO	RIO	5.2	Tr200Tp08h	9.46	37.00	39.49		39.56	0.002384	1.12	8.45	3.61	0.23
IL RIO	RIO	5	Tr200Tp02h	12.18	37.00	39.63		39.72	0.003412	1.36	8.95	3.62	0.28
IL RIO	RIO	5	Tr200Tp03h	11.88	37.00	39.61		39.70	0.003310	1.34	8.88	3.62	0.27
IL RIO	RIO	5	Tr200Tp06h	10.52	37.00	39.52		39.59	0.002866	1.23	8.54	3.62	0.26
IL RIO	RIO	5	Tr200Tp07h	10.31	37.00	39.49		39.57	0.002832	1.22	8.45	3.62	0.26
IL RIO	RIO	5	Tr200Tp08h	10.06	37.00	39.47		39.54	0.002761	1.20	8.37	3.62	0.25
IL RIO	RIO	04	Tr200Tp02h	11.07	36.83	39.40		39.53	0.005552	1.60	6.93	3.32	0.35
IL RIO	RIO	04	Tr200Tp03h	10.85	36.83	39.39		39.52	0.005445	1.58	6.88	3.32	0.35
IL RIO	RIO	04	Tr200Tp06h	9.84	36.83	39.31		39.42	0.004951	1.49	6.62	3.32	0.34
IL RIO	RIO	04	Tr200Tp07h	9.66	36.83	39.29		39.40	0.004913	1.48	6.54	3.32	0.34
IL RIO	RIO	04	Tr200Tp08h	9.46	36.83	39.27		39.38	0.004842	1.46	6.47	3.32	0.33
IL RIO	RIO	03	Tr200Tp02h	10.32	36.55	38.44		38.62	0.008455	1.88	5.49	4.52	0.55
IL RIO	RIO	03	Tr200Tp03h	10.00	36.55	38.41		38.59	0.008402	1.86	5.37	4.48	0.54
IL RIO	RIO	03	Tr200Tp06h	8.77	36.55	38.40		38.54	0.006613	1.65	5.33	4.46	0.48
IL RIO	RIO	03	Tr200Tp07h	8.88	36.55	38.39		38.54	0.006871	1.68	5.30	4.45	0.49
IL RIO	RIO	03	Tr200Tp08h	8.26	36.55	38.38		38.51	0.006109	1.58	5.25	4.43	0.46
IL RIO	RIO	02	Tr200Tp02h	6.93	35.39	37.38		37.43	0.002359	1.02	6.80	5.92	0.30
IL RIO	RIO	02	Tr200Tp03h	3.17	35.39	37.59		37.60	0.000307	0.39	8.11	6.38	0.11
IL RIO	RIO	02	Tr200Tp06h	6.74	35.39	38.04		38.06	0.000531	0.60	11.18	7.18	0.15
IL RIO	RIO	02	Tr200Tp07h	6.97	35.39	38.04		38.06	0.000566	0.62	11.19	7.18	0.16
IL RIO	RIO	02	Tr200Tp08h	6.97	35.39	38.03		38.05	0.000577	0.63	11.13	7.17	0.16
IL RIO	RIO	1.6923	Tr200Tp02h	5.51	34.74	37.35		37.36	0.000394	0.50	11.09	7.51	0.13
IL RIO	RIO	1.6923	Tr200Tp03h	3.98	34.74	37.58		37.59	0.000131	0.31	12.88	8.01	0.08
IL RIO	RIO	1.6923	Tr200Tp06h	9.19	34.74	38.02		38.03	0.000319	0.56	16.55	8.90	0.12
IL RIO	RIO	1.6923	Tr200Tp07h	9.35	34.74	38.02		38.03	0.000330	0.57	16.56	8.90	0.13
IL RIO	RIO	1.6923	Tr200Tp08h	9.23	34.74	38.01		38.03	0.000326	0.57	16.48	8.90	0.13
IL RIO	RIO	1.3846	Tr200Tp02h	5.09	34.08	37.35		37.35	0.000108	0.31	16.59	9.62	0.07
IL RIO	RIO	1.3846	Tr200Tp03h	4.09	34.08	37.58		37.58	0.000047	0.22	18.93	10.31	0.05
IL RIO	RIO	1.3846	Tr200Tp06h	13.04	34.08	37.99		38.01	0.000261	0.58	23.32	10.83	0.12
IL RIO	RIO	1.3846	Tr200Tp07h	13.14	34.08	37.99		38.01	0.000265	0.59	23.33	10.83	0.12
IL RIO	RIO	1.3846	Tr200Tp08h	13.10	34.08	37.98		38.00	0.000266	0.59	23.23	10.83	0.12
IL RIO	RIO	01	Tr200Tp02h	2.27	33.26	37.35		37.35	0.000007	0.09	25.28	11.11	0.02
IL RIO	RIO	01	Tr200Tp03h	5.21	33.26	37.57		37.58	0.000027	0.19	27.78	11.11	0.04
IL RIO	RIO	01	Tr200Tp06h	8.92	33.26	37.99		38.00	0.000048	0.29	32.46	11.11	0.05
IL RIO	RIO	01	Tr200Tp07h	9.01	33.26	38.00		38.00	0.000049	0.29	32.47	11.11	0.05
IL RIO	RIO	01	Tr200Tp08h	8.60	33.26	37.99		37.99	0.000045	0.28	32.37	11.11	0.05

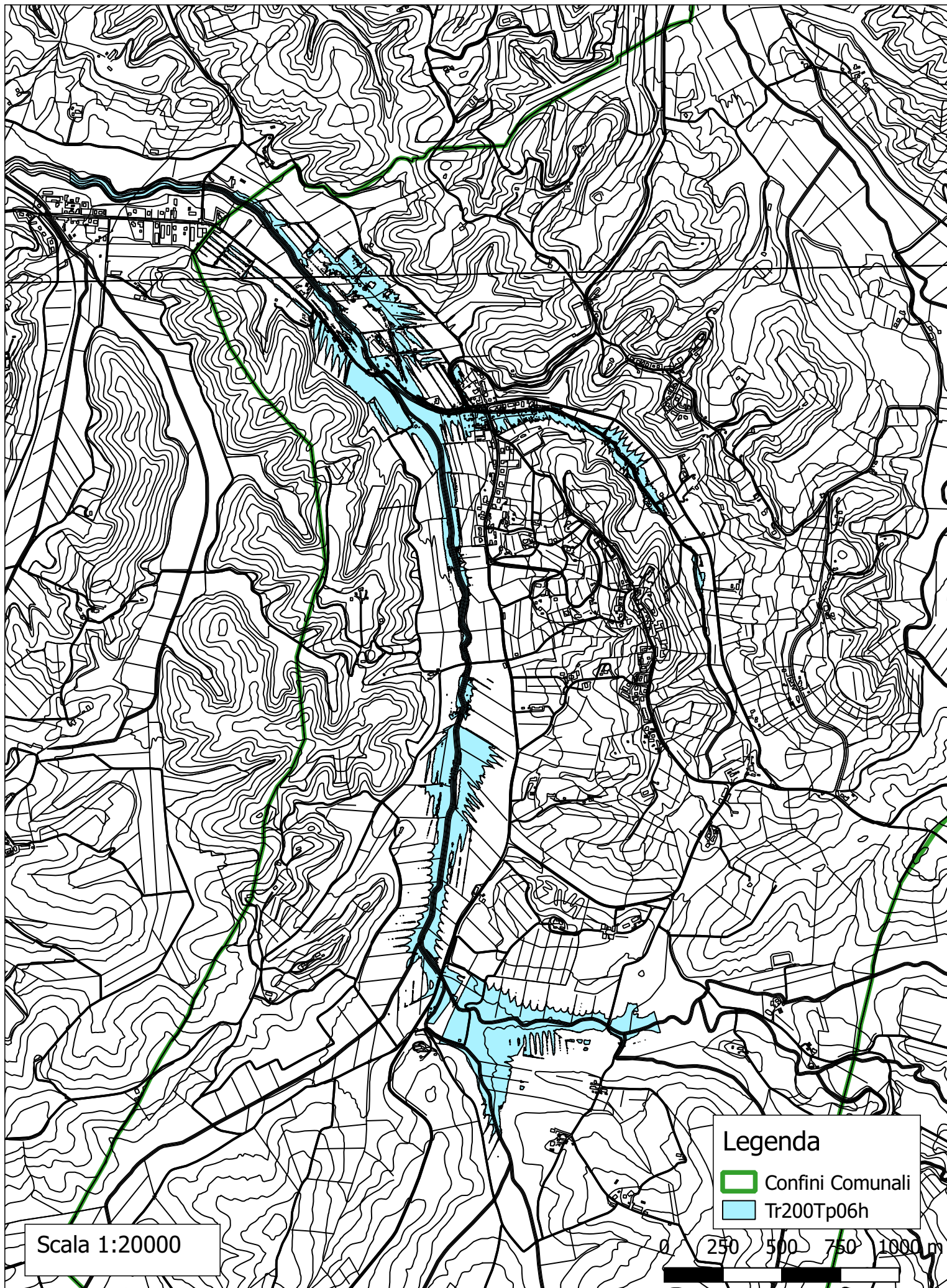
Planimetria di esondazione Tr 200 anni - scenario TR200TP02h



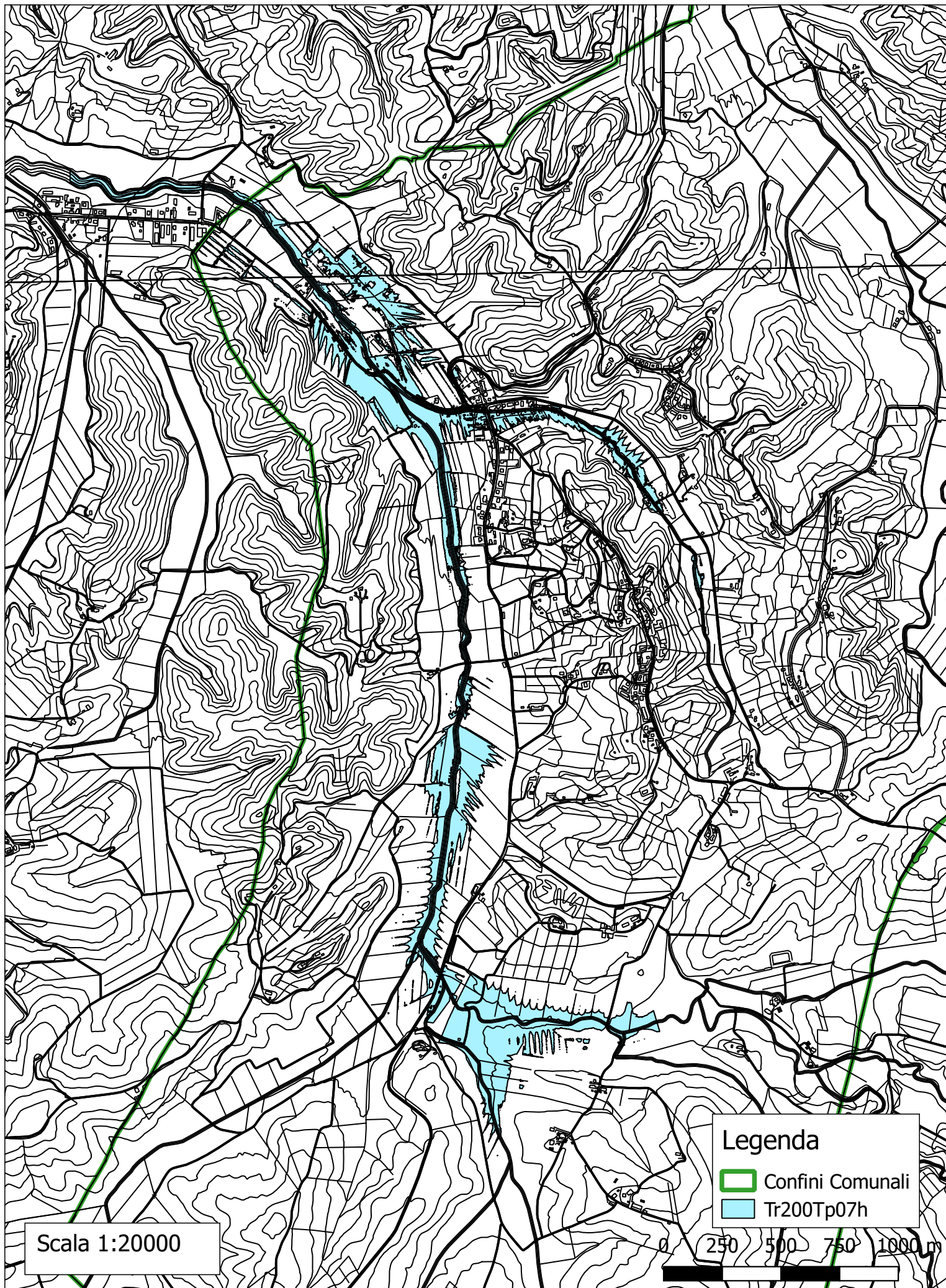
Planimetria di esondazione Tr 200 anni - scenario TR200TP03h



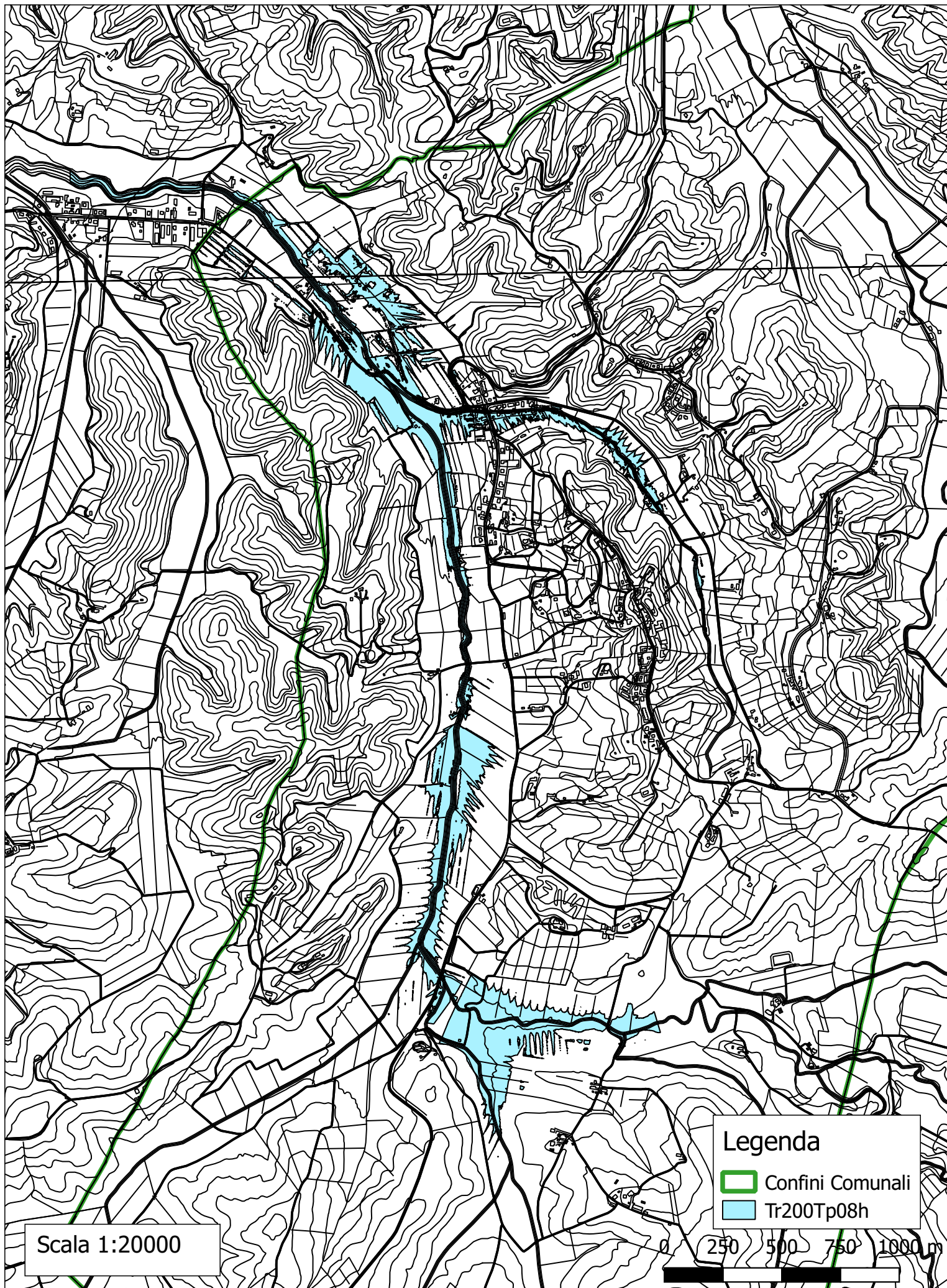
Planimetria di esondazione Tr 200 anni - scenario TR200TP06h



Planimetria di esondazione Tr 200 anni - scenario TR200TP07h



Planimetria di esondazione Tr 200 anni - scenario TR200TP08h



Allegato 4 – Sezioni RAS

