Table 2. Results of OSL Dating of Paleoflood Deposits at the BLM-TO Site, Colorado River[a]

Sample	Depth (m)	K (%)	U (ppm)	Th (ppm)	Ext. α (µGy/a)	Ext. β (µGy/a)	Ext. γ (µGy/a)	Cosmic (µGy/a)	Total Dose (µGy/a)	De (Gy)	Age (Years)
P2U5	40–50	1.66	2.05	6.7	8	1492	903	214	2617 ± 4 7	3.68 ± 0.27	1410 ± 110
P4U4	110–120	1.99	2.90	9.2	11	1870	1182	182	3245 ± 56	6.95 ± 0.71	2140 ± 220
P5U1	40–50	1.74	2.50	8.4	10	1639	1046	214	2909 ± 51	3.79 ± 0.26	1300 ± 90
P5U2	70–80	1.74	2.50	8.6	10	1643	1055	193	2901 ± 51	4.24 ± 0.22	1460 ± 80
P9U5	90–100	1.58	1.97	5.8	7	1388	816	186	2397 ± 64	0.92 ± 0.24	390 ± 100
P10U3	50–60	1.58	2.30	7.4	9	1487	942	207	2645 ± 46	0.45 ± 0.12	170 ± 40
P10U7	100–110	1.66	1.80	5.5	7	1434	822	184	2447 ± 45	1.01 ± 0.18	410 ± 70
P11U5	90–100	1.58	2.15	7.2	9	1464	917	186	2576 ± 46	0.58 ± 0.15	230 ± 60
P12U5	90–100	1.74	2.58	8.3	10	1646	1050	186	2892 ± 51	1.40 ± 0.45	490 ± 150
P13U6	70–80	1.49	2.53	7.5	10	1458	951	193	2611 ± 47	0.57 ± 0.19	220 ± 70
P14U7	60–70	1.66	4.20	7.7	13	1779	1177	199	3168 ± 55	1.46 ± 0.34	460 ± 110
P14U13	170–180	1.83	4.50	10.8	16	1998	1388	169	3570 ± 61	0.73 ± 0.22	200 ± 60

[a]Gamma dose rate was calculated from the radioelements and the cosmic dose estimated from burial depth. Water content was estimated at 5%. Quartz with grain size 125–150 μm was etched by concentrated HF for 40 min following dissolution of carbonates by HCl. De was obtained on 12–18 aliquots per sample using the single aliquot regeneration (SAR), with preheats of 10 s at 200–260°C. Test dose was ~4.5 Gy and a cut heat of 5s @180°C was used. Ages are in years before 2010.

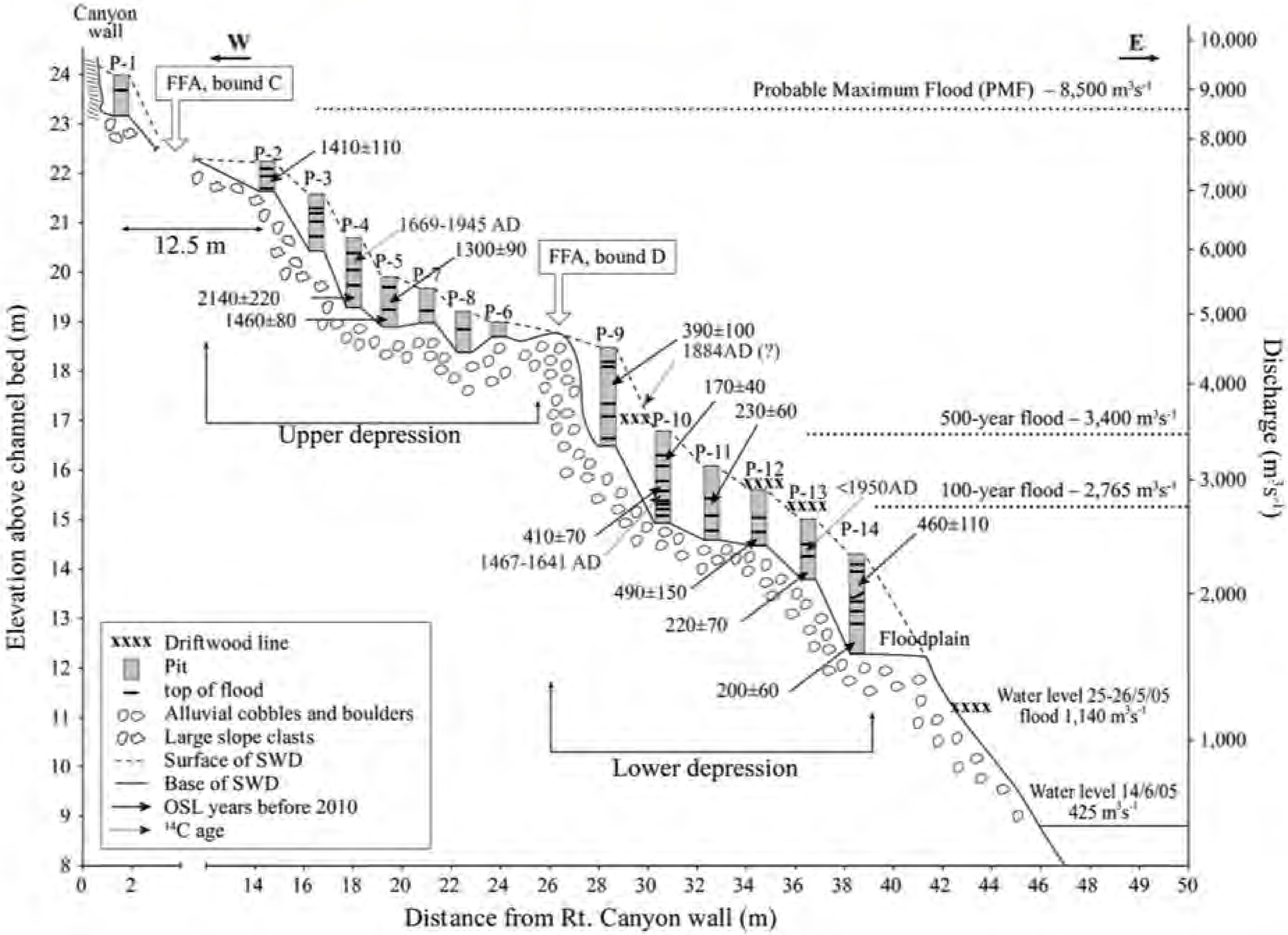

Figure 10. Cross section perpendicular to the Slackwater deposits (SWD) relict at the BLM-TO site including the elevation and horizontal locations of the pits and their associated peak discharges, ages of the paleoflood deposits, the OWS of 25–26 May 2005 flood (1140 $m^3 s^{-1}$), and the upper bounds for the flood frequency analysis. Note that: (a) the SWD trap is composed of two separate depressions—an upper depression (pits 2–8) and a lower depression (pits 9–14). (b) Pit no. 1 is separated and located at the base of a rocky bench of the canyon wall at an elevation of about 24 m above channel bed. (c) The ages of the flood deposits at the upper depression are older than at the lower depression representing older and larger floods. (d) The elevation and discharges for the various pits and flood deposits at the site including the 100 yr flood, the 500 yr flood and the PMF. (e) The OSL age of flood no. 5 in pit 14—460 ± 110 years came out older and does not follow the stratigraphy. This usually characterizes a nonhomogenous population which contains quartz grains that were not completely bleached.

AGU Water Resources Research 10.1002/2013WR014835

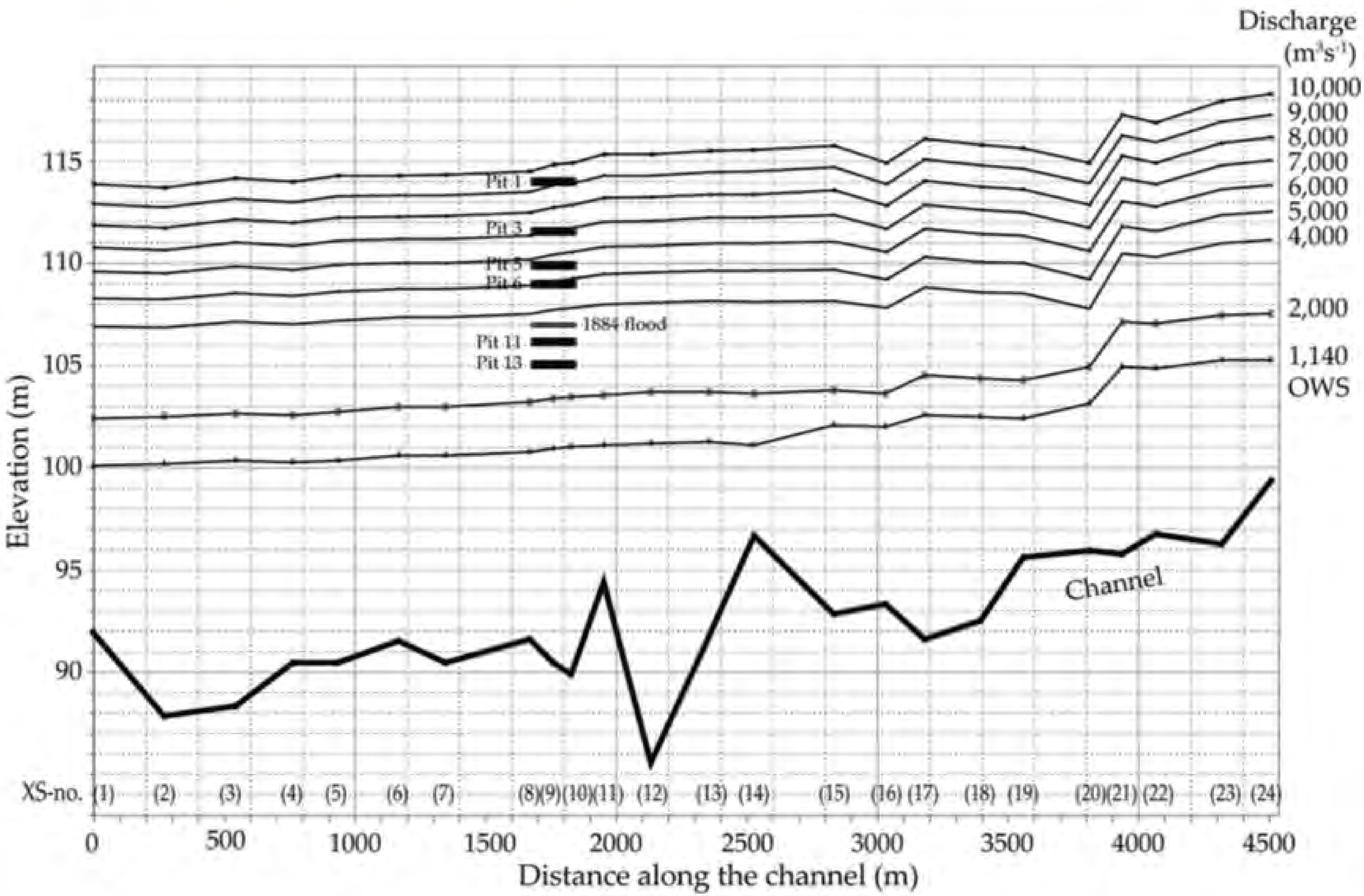

Figure 11. Water surface profiles (WSP) for peak discharges of 1140–10,000 m^3s^{-1} along the study reach using the HEC-RAS hydraulic program in relations to the top surface of pits 1,3,5,6,11,13 and the 1884 flood (3500 m^3s^{-1}). The downstream boundary conditions (DBC) are water surface gradient of 0.0004 based on the calibration shown in Figure 9 indicating that scenario 2—Manning ***n*** coefficients—channel—0.028, banks—0.045 is the best fit for the high discharges due to the decrease in relative roughness with increasing water depth. XS-20 serves as control discharges up to 6000 m^3s^{-1} and is subcritical close to critical for the larger discharges.