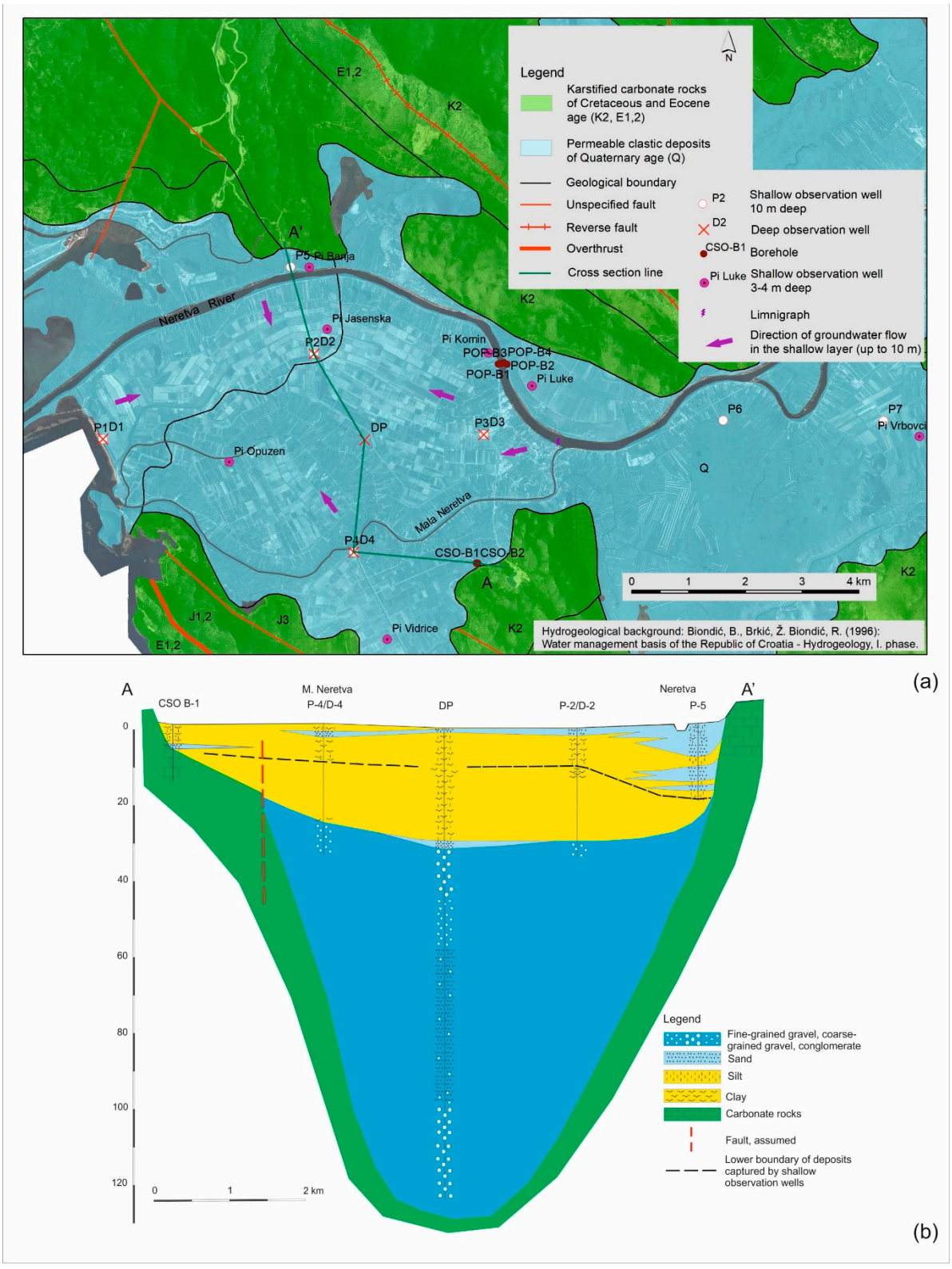

Figure S1. Hydrogeological map (a) and cross section of the Neretva River valley (b)

Table S1. Surface and groundwater quality monitoring locations (NRD, Croatia) grouped into four water classes and important characteristics of each class

Water body	Water class	Monitoring location	Description
Surface water	RIVER / LATERAL CANAL (R/LC)	R Neretva	Fed by rainfall, runoff from upstream fields, and small tributaries and springs that convey water to the main rivers and side canals
		R Mala Neretva	
		LC Vrbovci	
		LC Vidrice	
	PUMPING STATION (PS)	PS Luke	Refers to water supplied by pumping stations within the polders; the groundwater table and water level in the canals are determined by the flood control project
		PS Vrbovci	
		PS Vidrice	
		PS Opuzen	
	DRAINAGE CANAL (DC)	DC Luke	Together with pumping station drainage canals collect water from the polder and the quality may be greatly affected by agricultural land use
		DC Vrbovci	
		DC Vidrice	
		DC Opuzen	
		DC Jasenska	
		DC Komin	
		DC Banja	
Groundwater	PIEZOMETER (Pi)	Pi Luke	Sampled from groundwater wells i.e. piezometers consisting of 4 m long plastic pipe with a diameter of 110 mm and a porous section at the bottom; positioned at the location within the polder that represents the dominant land use
		Pi Vrbovci	
		Pi Vidrice	
		Pi Opuzen	
		Pi Jasenska	
		Pi Komin	
		Pi Banja	

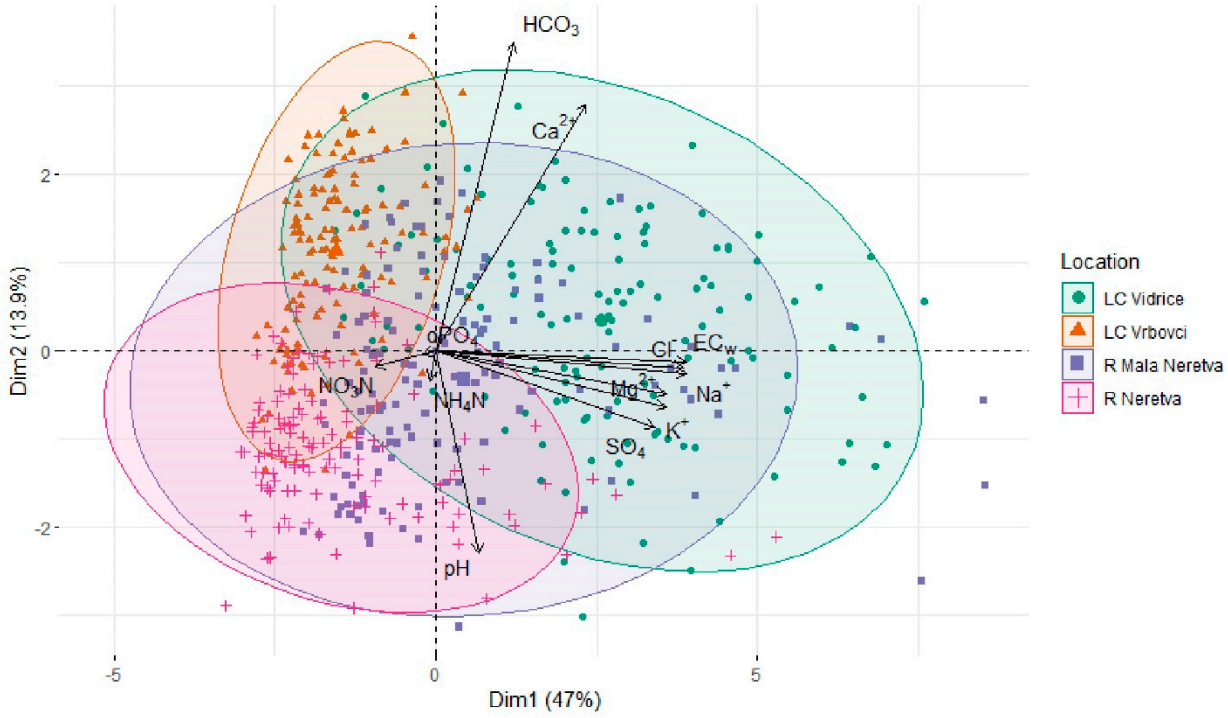

Figure S2. PCA Biplot Class 1 RIVER/LATERAL CANAL (R/LC)

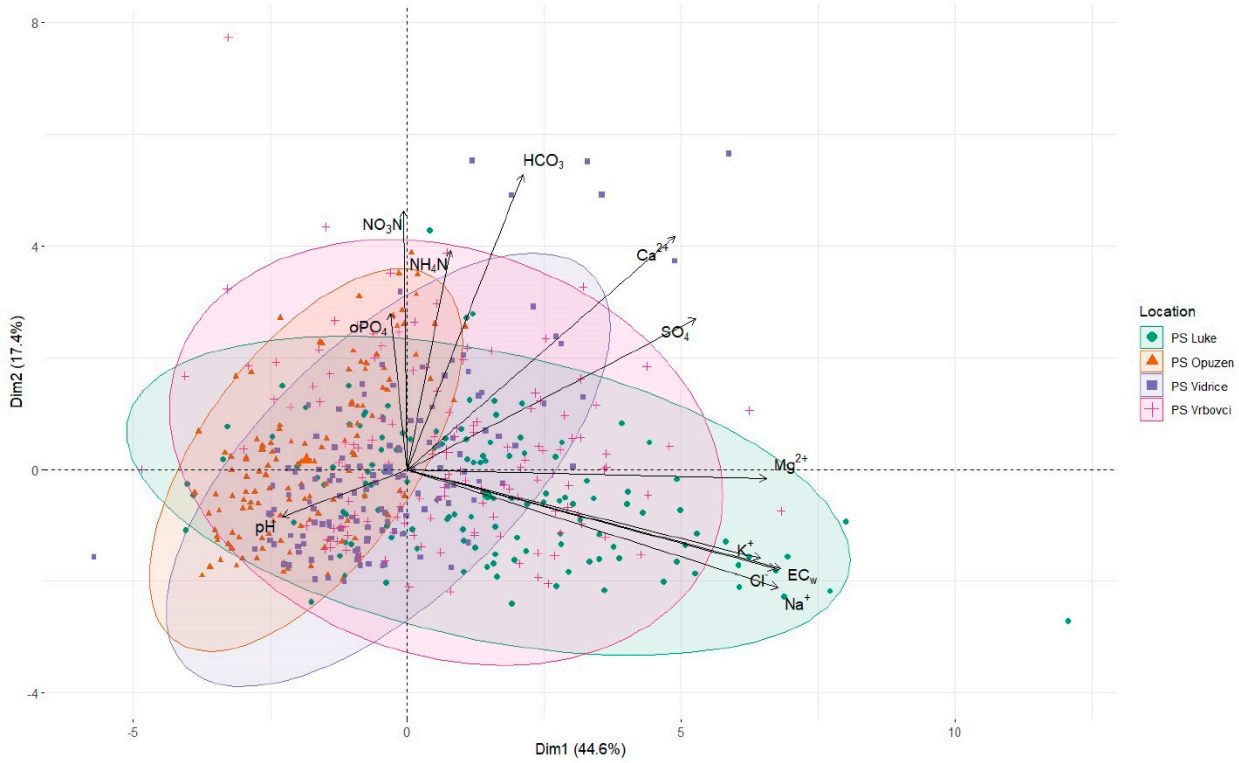

Figure S3. PCA Biplot Class 2 PUMPING STATION (PS)

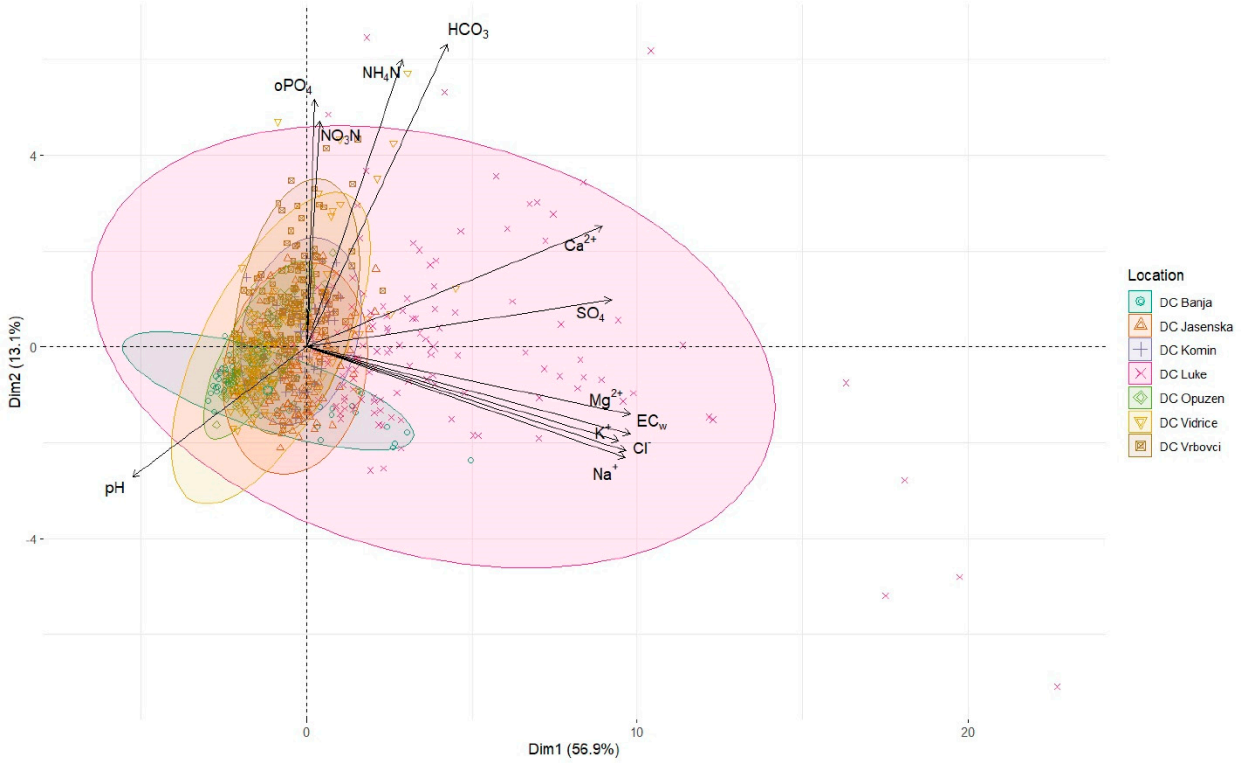

Figure S4. PCA Biplot Class 3 DRAINAGE CANAL (DC)

Table S2. Results for the PCA variable contributions in the first five dimensions for each water class

Class	Dimensions	Variable contributions											
		pH	EC_w	Ca^{2+}	Mg^{2+}	K^+	Na^+	HCO_3^-	Cl^-	SO_4^{2-}	o-PO_4	NO_3-N	NH_4-N
RIVER/ LATERAL CANAL (R/LC)	Dim.1	0.25	12	9.2	15	10	17	6.2	17	13	0.10	0.76	0.01
	Dim.2	19	11	16	0.43	13	0.23	32	0.18	2.0	4.6	1.5	0.42
	Dim.3	7.2	1.5	0.03	0.30	0.52	0.04	0.31	0.00	0.38	44	6.9	39
	Dim.4	26	3.4	0.01	0.03	3.1	0.30	1.6	0.36	1.4	9.7	46	8.0
	Dim.5	1.2	0.24	2.0	0.45	0.42	0.04	2.8	0.02	3.0	13	28	49
PUMPING STATION (PS)	Dim.1	1.8	16	8.4	15	15	16	1.6	16	9.8	0.03	0.00	0.22
	Dim.2	0.63	2.8	16	0.02	2.3	4.0	25	2.8	6.6	7.0	19	14
	Dim.3	34	0.01	0.47	1.1	1.4	0.01	0.67	0.47	0.10	39	11	13
	Dim.4	40	0.12	0.02	0.16	0.41	0.02	6.8	0.02	2.1	23	25	2.9
	Dim.5	17	0.18	4.5	0.59	1.1	0.34	8.6	0.01	1.9	1.9	0.01	64
DRAINAGE CANAL (DC)	Dim.1	4.0	14	12	14	13	14	2.6	14	12	0.01	0.02	1.2
	Dim.2	4.6	2.1	4.0	1.2	2.4	3.4	25	3.0	0.62	17	14	23
	Dim.3	1.0	0.02	2.1	0.01	0.35	0.13	0.49	0.22	1.7	38	55	0.53
	Dim.4	46	0.12	0.98	0.48	2.6	0.44	14	0.53	0.29	6.3	2.7	26
	Dim.5	0.75	0.21	0.12	0.13	0.24	0.40	6.5	0.36	0.07	38	22	32
PIEZOMETER (Pi)	Dim.1	0.97	13	1.0	12	11	13	13	13	0.80	10	0.04	12
	Dim.2	6.5	0.40	43	1.6	4.4	0.04	0.00	0.07	41	0.10	3.0	0.05
	Dim.3	15	0.02	0.00	0.23	1.3	0.00	0.71	0.03	1.4	0.01	81	0.40
	Dim.4	75	0.02	1.4	0.93	0.07	0.08	0.02	0.08	8.5	1.1	12	0.90
	Dim.5	0.46	5.6	2.8	7.8	0.52	3.2	3.3	4.2	8.1	45	0.00	19

Table S3. PCA results - eigenvalues, variance (%) and cumulative variance (%) of surface water body and associated water classes

Water body	SURFACE WATER		
Principal component	Eigenvalue	Variance (%)	Cumulative variance (%)
PCOMP 1	6.915	57.63	57.63
PCOMP 2	1.494	12.45	70.08
PCOMP 3	1.017	8.47	78.55
PCOMP 4	0.835	6.96	85.51
PCOMP 5	0.728	6.07	91.58
PCOMP 6	0.560	4.67	96.25
PCOMP 7	0.262	2.18	98.43
PCOMP 8	0.086	0.71	99.14
PCOMP 9	0.044	0.37	99.51
PCOMP 10	0.036	0.29	99.80
PCOMP 11	0.014	0.12	99.92
PCOMP 12	0.009	0.08	100.0
Water class	1. RIVER / LATERAL CANAL (R / LC)		
Principal component	Eigenvalue	Variance (%)	Cumulative variance (%)
PCOMP 1	5.580	46.50	46.50
PCOMP 2	1.569	13.08	59.58
PCOMP 3	1.171	9.76	69.34
PCOMP 4	1.076	8.96	78.30
PCOMP 5	0.875	7.29	85.59
PCOMP 6	0.747	6.22	91.81
PCOMP 7	0.497	4.14	95.95
PCOMP 8	0.163	1.35	97.30
PCOMP 9	0.137	1.14	98.44
PCOMP 10	0.107	0.89	99.33
PCOMP 11	0.054	0.45	99.78
PCOMP 12	0.026	0.22	100.0
Water class	2. PUMPING STATION (PS)		
Principal component	Eigenvalue	Variance (%)	Cumulative variance (%)
PCOMP 1	5.353	44.60	44.60
PCOMP 2	2.094	17.45	62.05
PCOMP 3	1.218	10.15	72.20
PCOMP 4	0.775	6.45	78.65
PCOMP 5	0.757	6.30	84.95
PCOMP 6	0.668	5.57	90.52
PCOMP 7	0.407	3.39	93.91
PCOMP 8	0.362	3.02	96.93
PCOMP 9	0.166	1.38	98.31
PCOMP 10	0.114	0.95	99.26
PCOMP 11	0.053	0.45	99.71
PCOMP 12	0.035	0.29	100.0
Water class	3. DRAINAGE CANAL (DC)		
Principal component	Eigenvalue	Variance (%)	Cumulative variance (%)

PCOMP 1	6.825	56.87	56.87
PCOMP 2	1.571	13.09	69.96
PCOMP 3	1.044	8.70	78.66
PCOMP 4	0.848	7.07	85.73
PCOMP 5	0.745	6.21	91.94
PCOMP 6	0.580	4.83	96.77
PCOMP 7	0.258	2.15	98.92
PCOMP 8	0.070	0.58	99.50
PCOMP 9	0.027	0.23	99.73
PCOMP 10	0.020	0.16	99.89
PCOMP 11	0.008	0.07	99.96
PCOMP 12	0.005	0.04	100.0

Table S4. PCA results - eigenvalues, variance (%) and cumulative variance (%) of groundwater body /class piezometer

Water body (class)	GROUNDWATER (PIEZOMETER)		
Principal component	Eigenvalue	Variance (%)	Cumulative variance (%)
PCOMP 1	7.320	61.00	61.00
PCOMP 2	1.854	15.45	76.45
PCOMP 3	1.034	8.62	85.07
PCOMP 4	0.861	7.18	92.25
PCOMP 5	0.395	3.29	95.54
PCOMP 6	0.214	1.79	97.33
PCOMP 7	0.122	1.02	98.35
PCOMP 8	0.082	0.69	99.04
PCOMP 9	0.051	0.42	99.46
PCOMP 10	0.034	0.28	99.74
PCOMP 11	0.024	0.20	99.94
PCOMP 12	0.007	0.06	100.0

Table S5. Augmented Dickey-Fuller stationarity test results for all location and water quality parameters with lag orders and calculated *p*-values

Water class	Location	Lag order	Parameters											
			pH	EC_w	Ca^{2+}	Mg^{2+}	K^+	Na^+	HCO_3^-	Cl^-	SO_4^{2-}	o-PO_4	NO_3-N	NH_4-N
			p-value											
RIVER/ LATERAL CANAL (R/LC)	R Neretva	5	0.01	0.01	0.03	0.02	0.03	0.01	0.01	0.01	0.23	0.38	0.01	0.14
	R Mala Neretva	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.03
	LC Vidrice	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.46	0.01	0.16
	LC Vrbovci	5	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.01	0.05	0.55	0.01	0.23
PUMPING STATION (PS)	PS Luke	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.44	0.12	0.07
	PS Opuzen	5	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01	0.09	0.01	0.01
	PS Vidrice	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01	0.01
	PS Vrbovci	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.08
DRAINAGE CANAL (DC)	DC Luke	5	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.04	0.01	0.02
	DC Opuzen	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.09	0.01	0.01
	DC Vidrice	5	0.01	0.04	0.01	0.02	0.01	0.04	0.01	0.07	0.01	0.01	0.01	0.01
	DC Jasenska	5	0.31	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.01	0.01
	DC Vrbovci	5	0.04	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	DC Komin	4	0.10	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.31
	DC Banja	4	0.08	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.04	0.01	0.53
PIEZOMETER (Pi)	Pi Luke	4	0.01	0.52	0.30	0.36	0.63	0.42	0.66	0.51	0.25	0.06	0.09	0.01
	Pi Opuzen	5	0.01	0.26	0.01	0.01	0.27	0.19	0.01	0.26	0.04	0.01	0.01	0.21
	Pi Vidrice	5	0.01	0.01	0.43	0.01	0.04	0.01	0.01	0.01	0.10	0.91	0.29	0.01
	Pi Jasenska	5	0.01	0.01	0.38	0.04	0.08	0.05	0.02	0.01	0.30	0.03	0.03	0.02
	Pi Vrbovci	5	0.01	0.06	0.04	0.01	0.17	0.17	0.09	0.36	0.11	0.08	0.02	0.01
	Pi Komin	4	0.02	0.13	0.32	0.10	0.07	0.02	0.07	0.02	0.68	0.62	0.08	0.01
	Pi Banja	4	0.01	0.88	0.19	0.35	0.04	0.32	0.09	0.79	0.24	0.02	0.06	0.79