Joint project(Jica/H.D) of Groundwater investigation of Kabul City

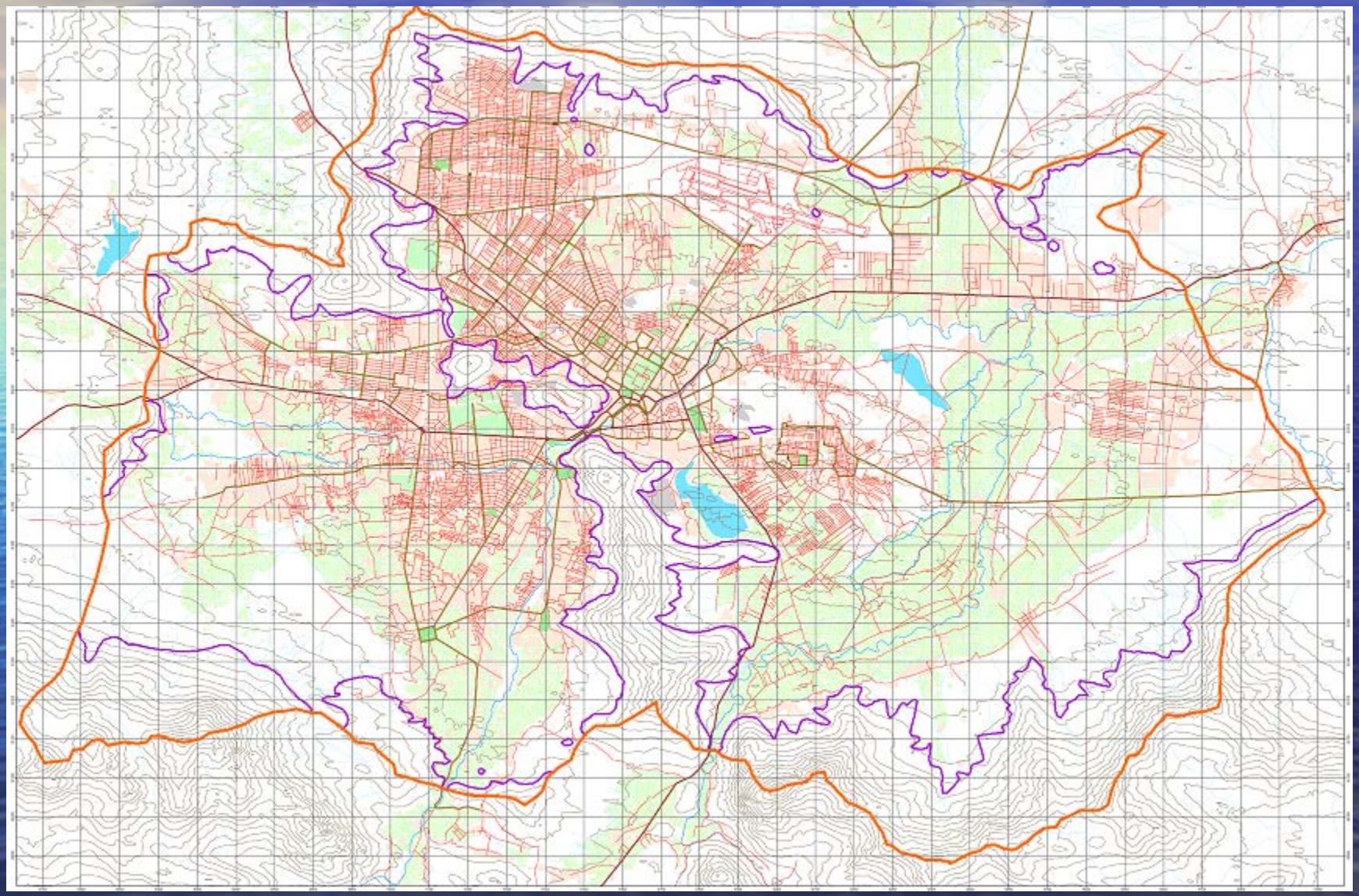
- **Ground Water Measurement .**
- **Geophysical Prospecting .**
- **Test Well Drilling .**
- **Water Quality.**
- **Surface Water Measurement .**
- Ground water Analyses.

New Hydrogeolgical Investigation

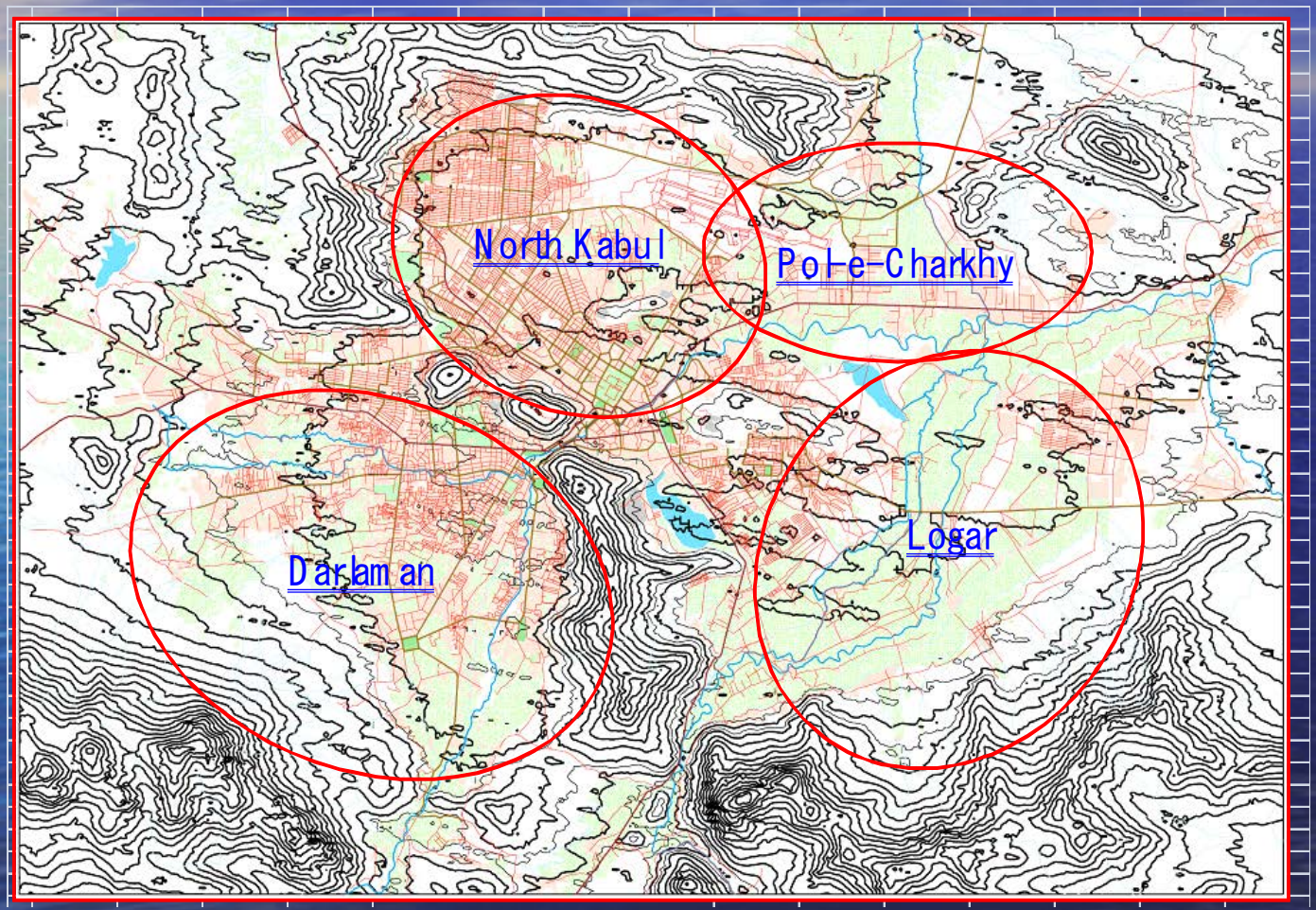
STUDY ON GROUNDWATER RESOURCES POTENTIAL IN KABUL BASIN

(2006 – 2011)

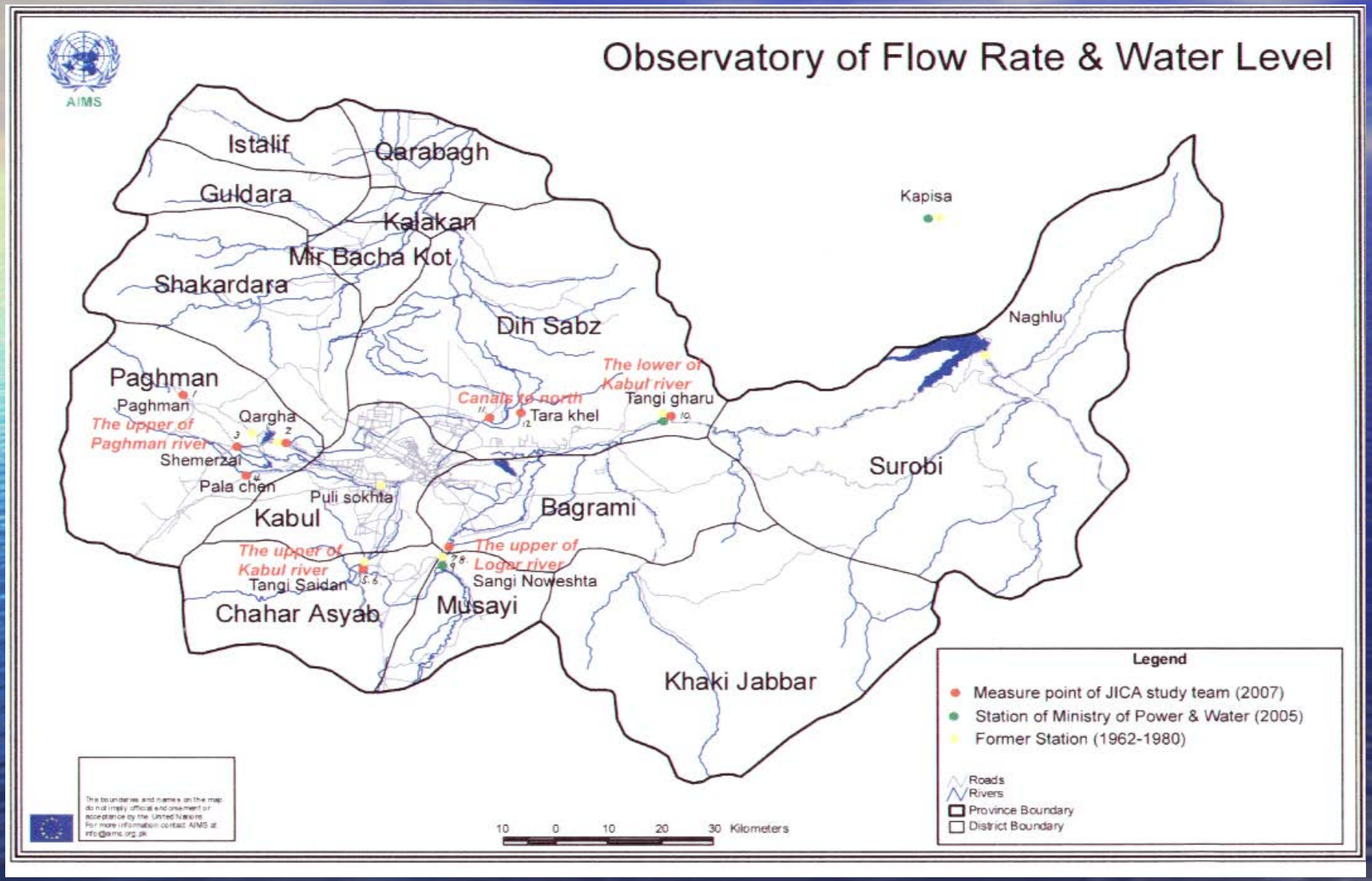
. Boundary of the Study Area



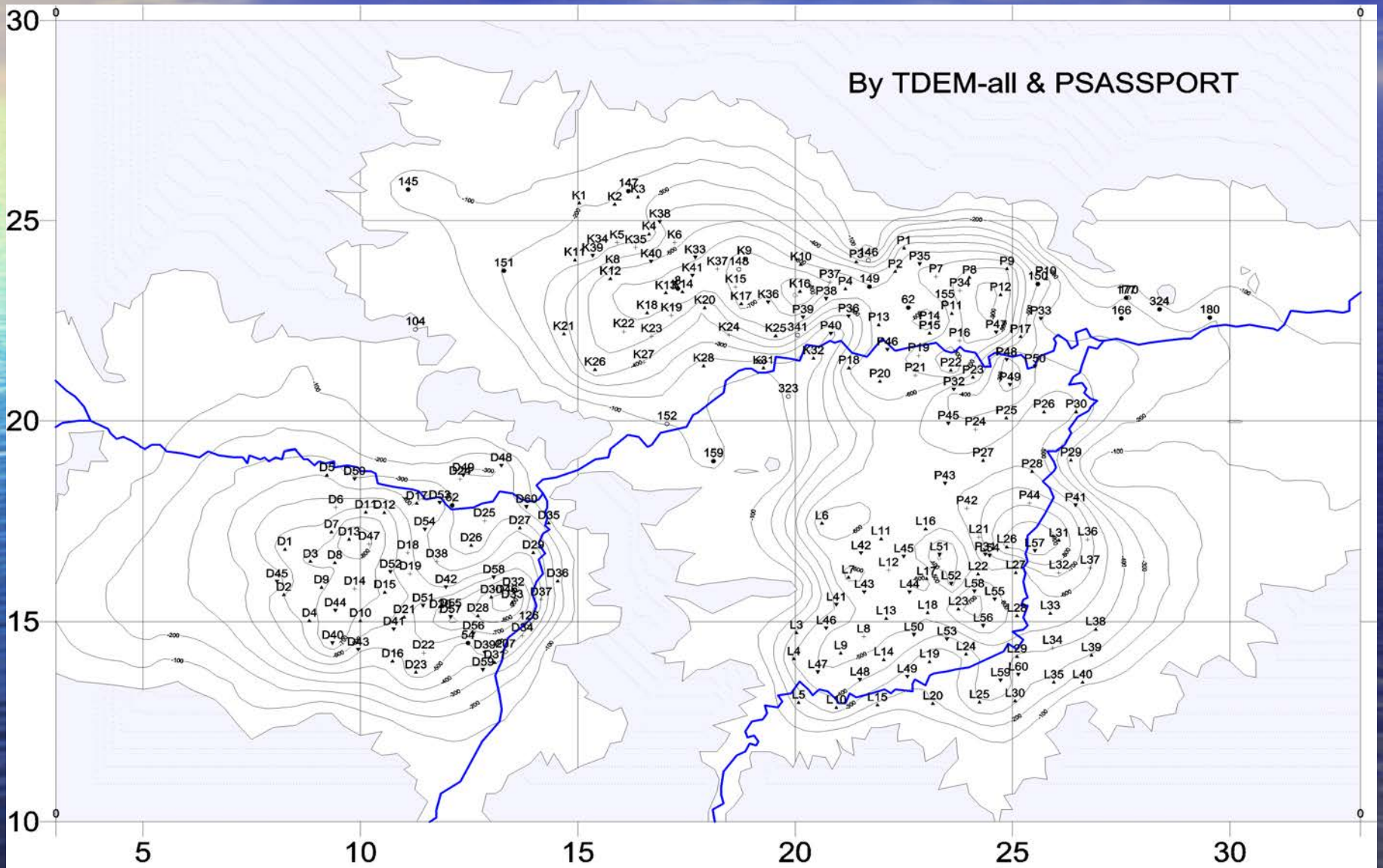
Sub-basins in the Kabul Basin



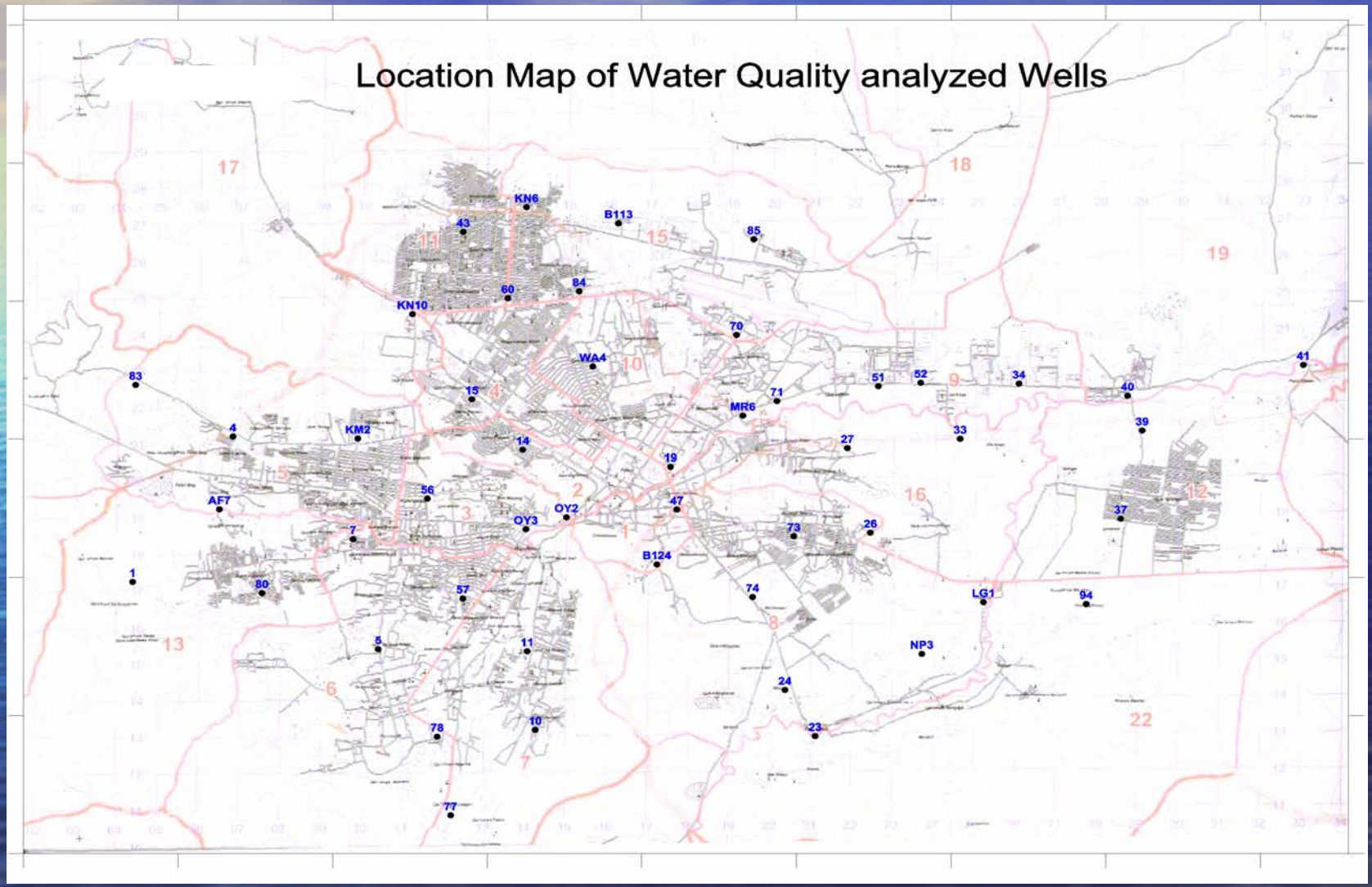
Location Map of Gauging Stations



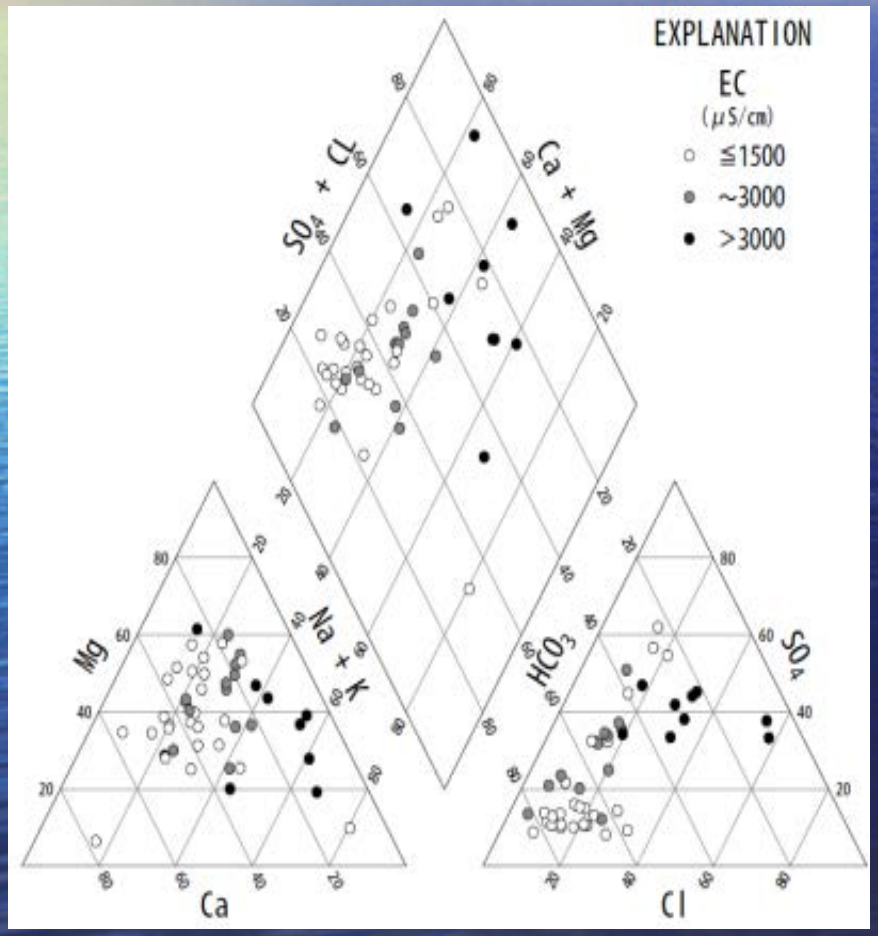
Isobathic Map of Basement by TDEM step-1 & PASSPORT

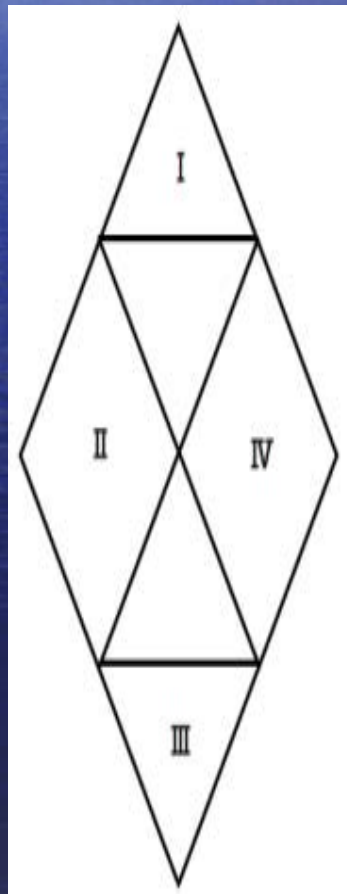


Water Quality on Shallow Aquifer



. Piper Diagram (The 5th Shallow Aquifer Analysis)





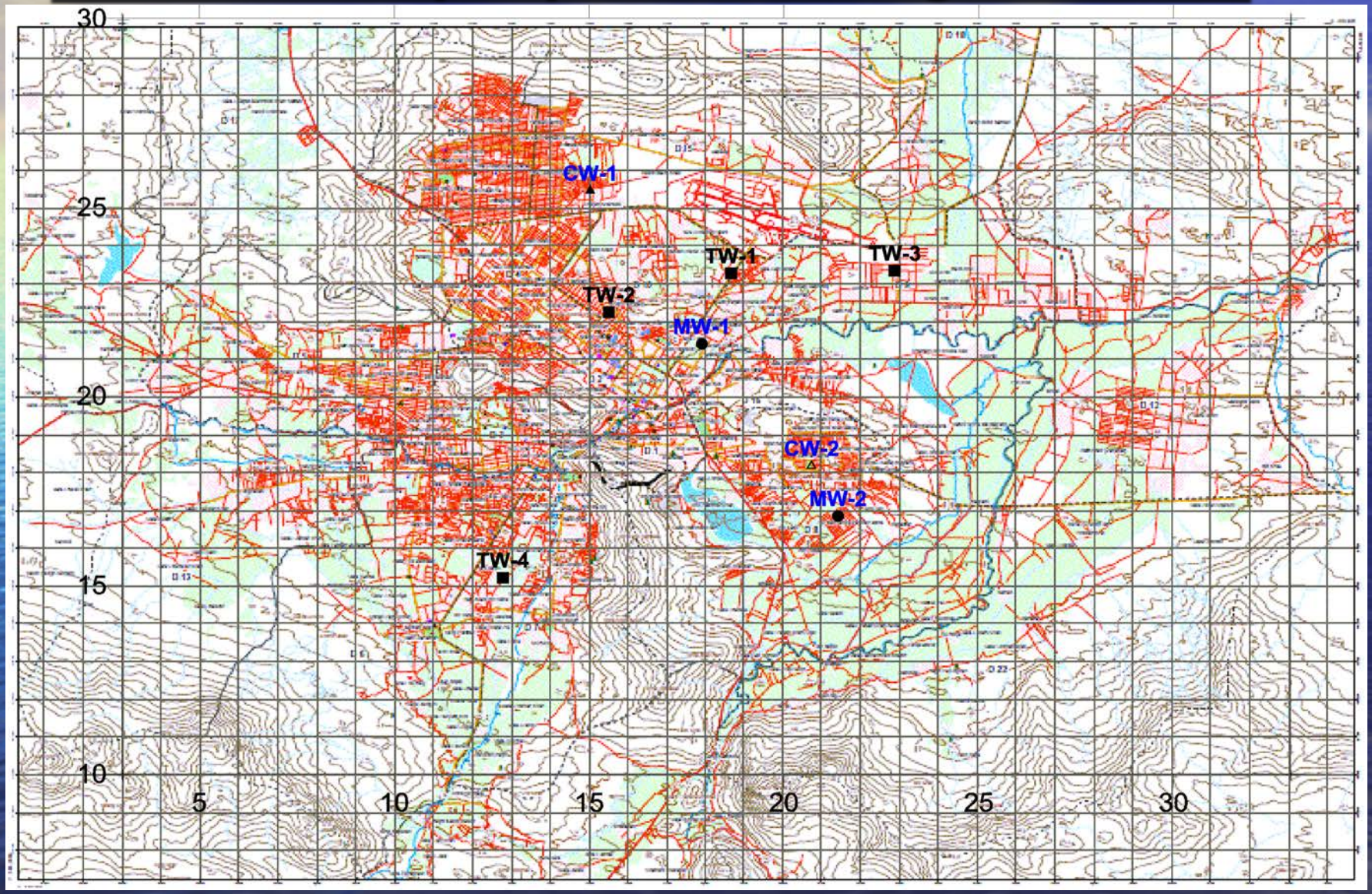
I – Allaline earths – Noncarbonate type
(e. g. – Hot spring water, fossil water)
II – Allaline earths – Carbonate type
(e. g. – River water, shallow aquifer groundwater)
III – Allaline – Carbonate type
(e. g. – Deep aquifer groundwater in stangnance)
IV – Allaline – Carbonate type
(e. g. – Hot spring water, saline water in oil field)

Test Well Drilling

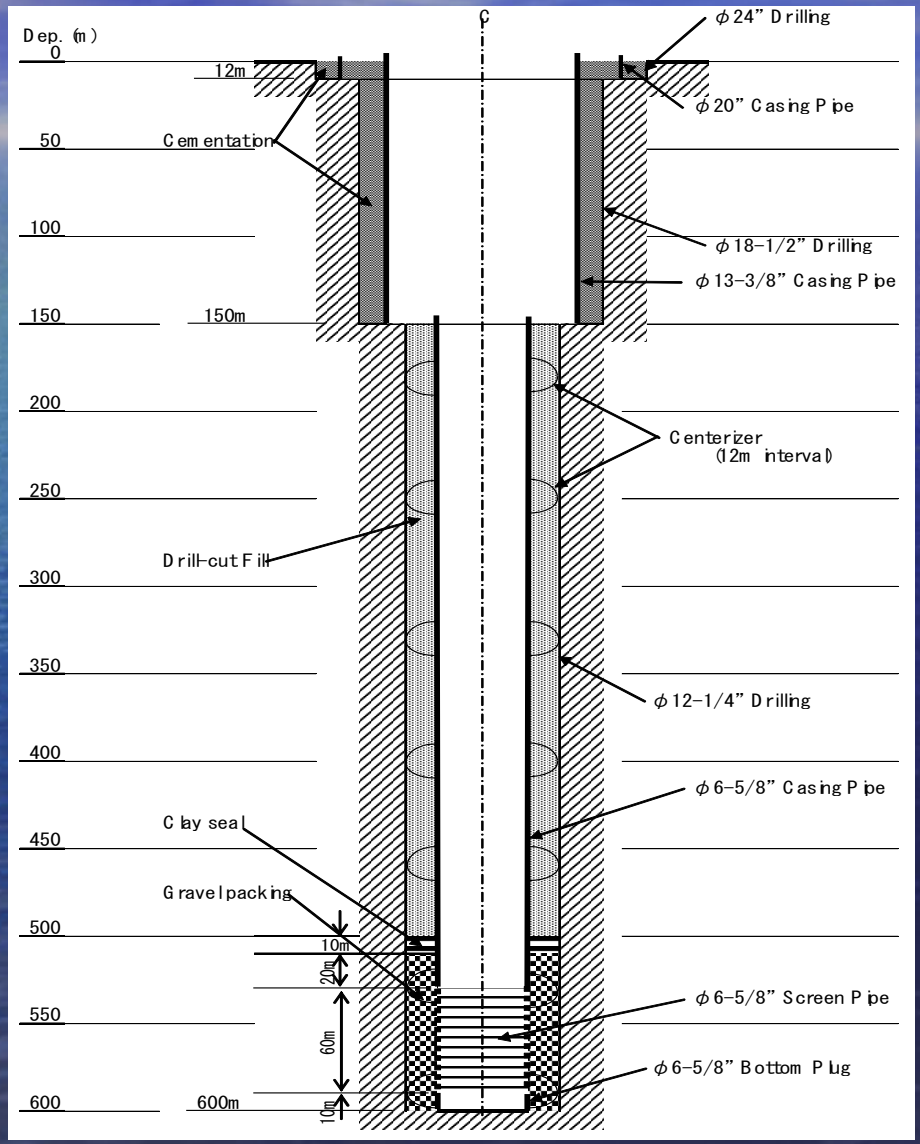
- Categories of Test Well Original

Test wells	Planed	Achievement	Remarks
1000 m wells	0 wells	1well	TW4
600 m wells	6 wells	3 well	TW1,2,3
400 m wells	4 wells	2 well	MW 1,2
200 m wells	2 wells	2 well	CW1,2

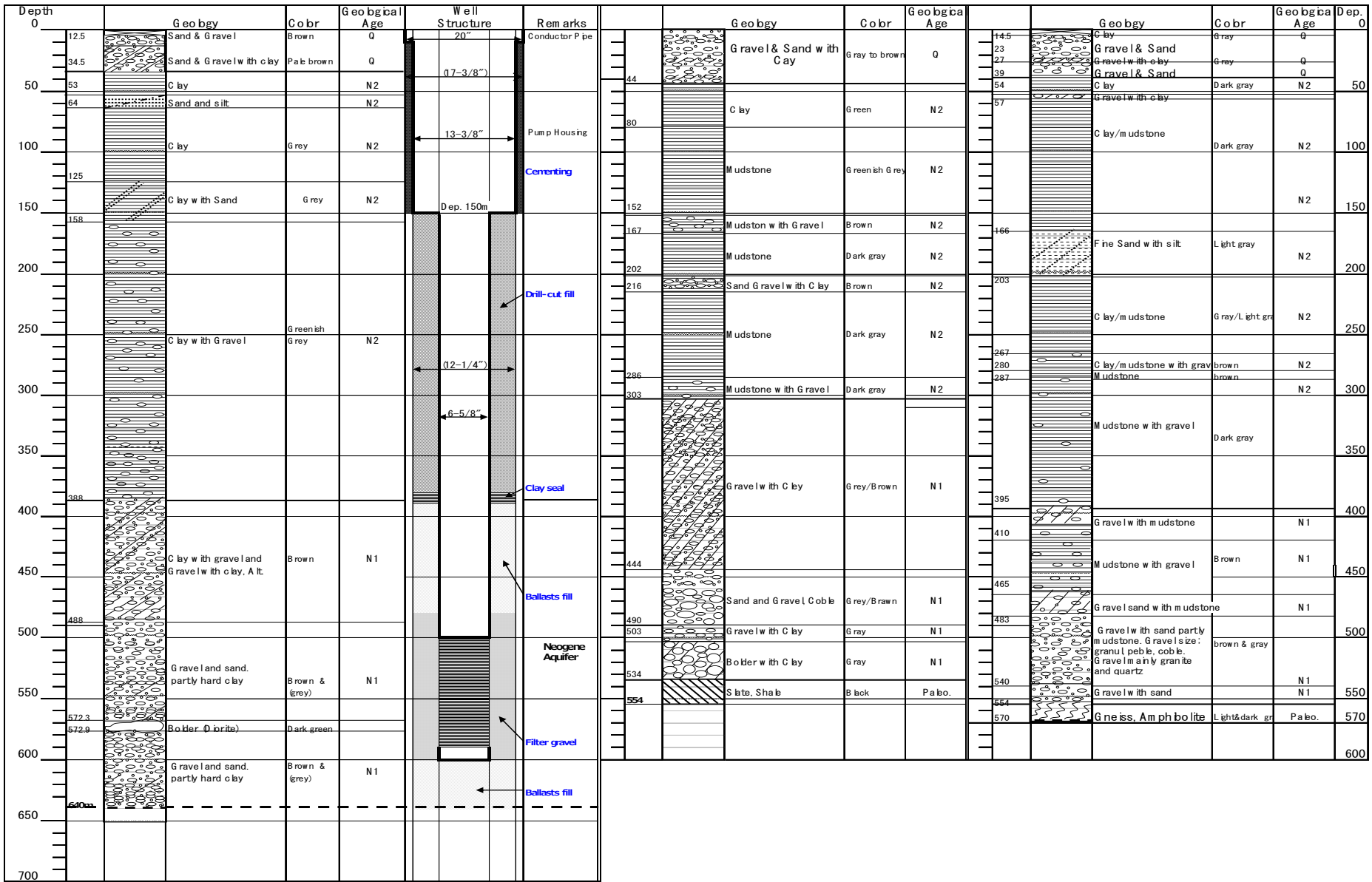
The final Deep Aquifer Investigation Plan



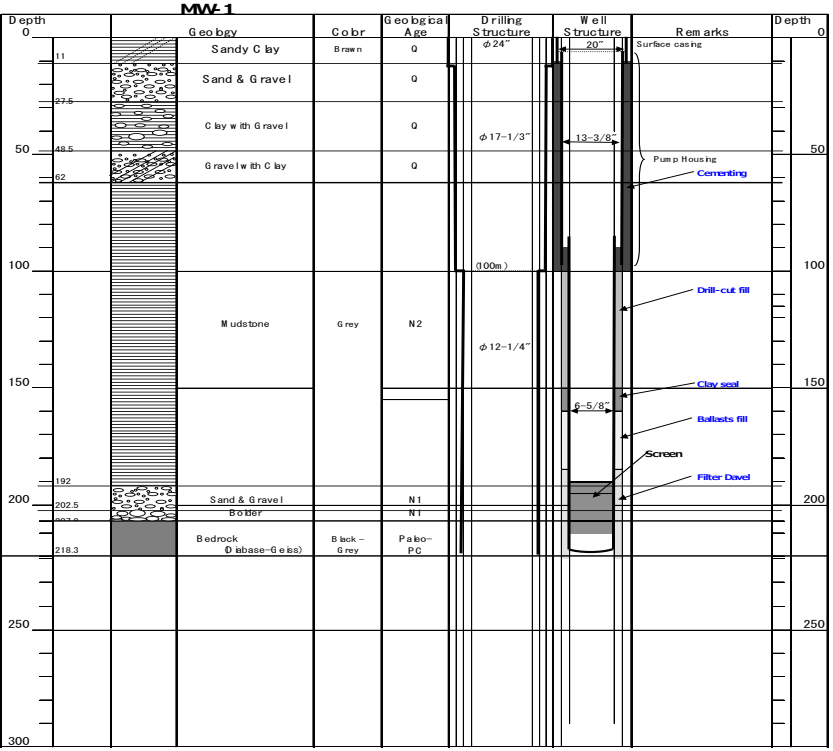
Test Well Structure

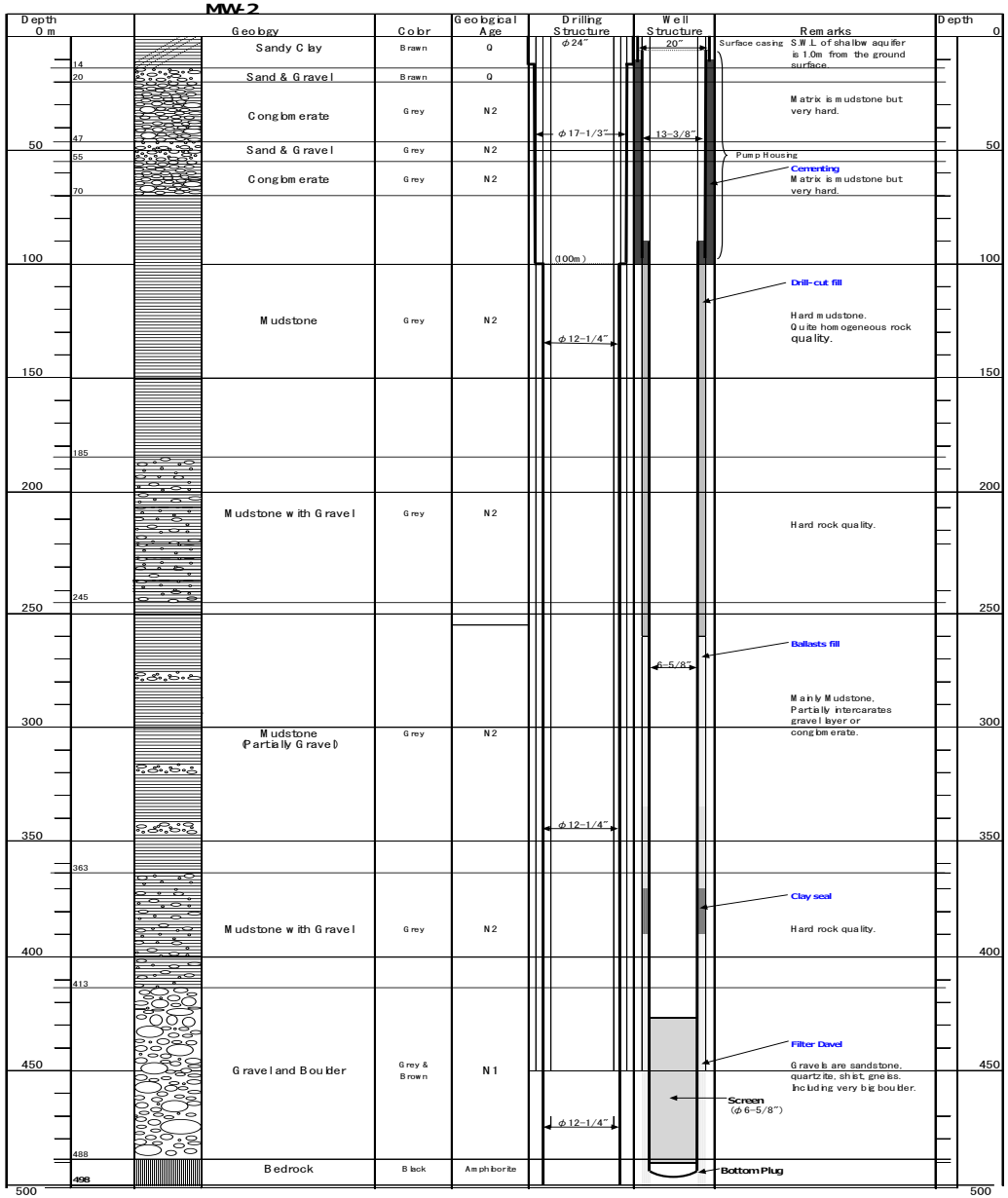


Geological Logs of Deep Test Wells

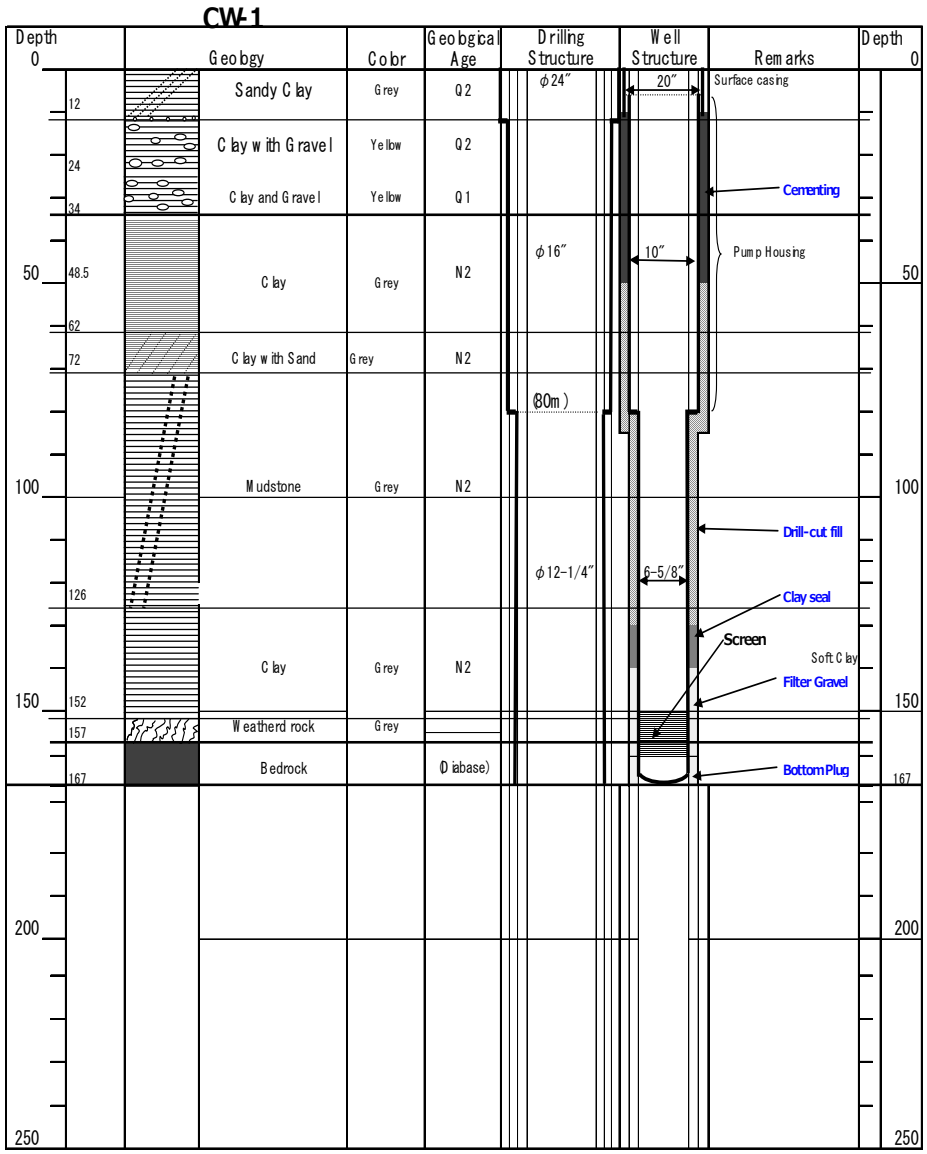


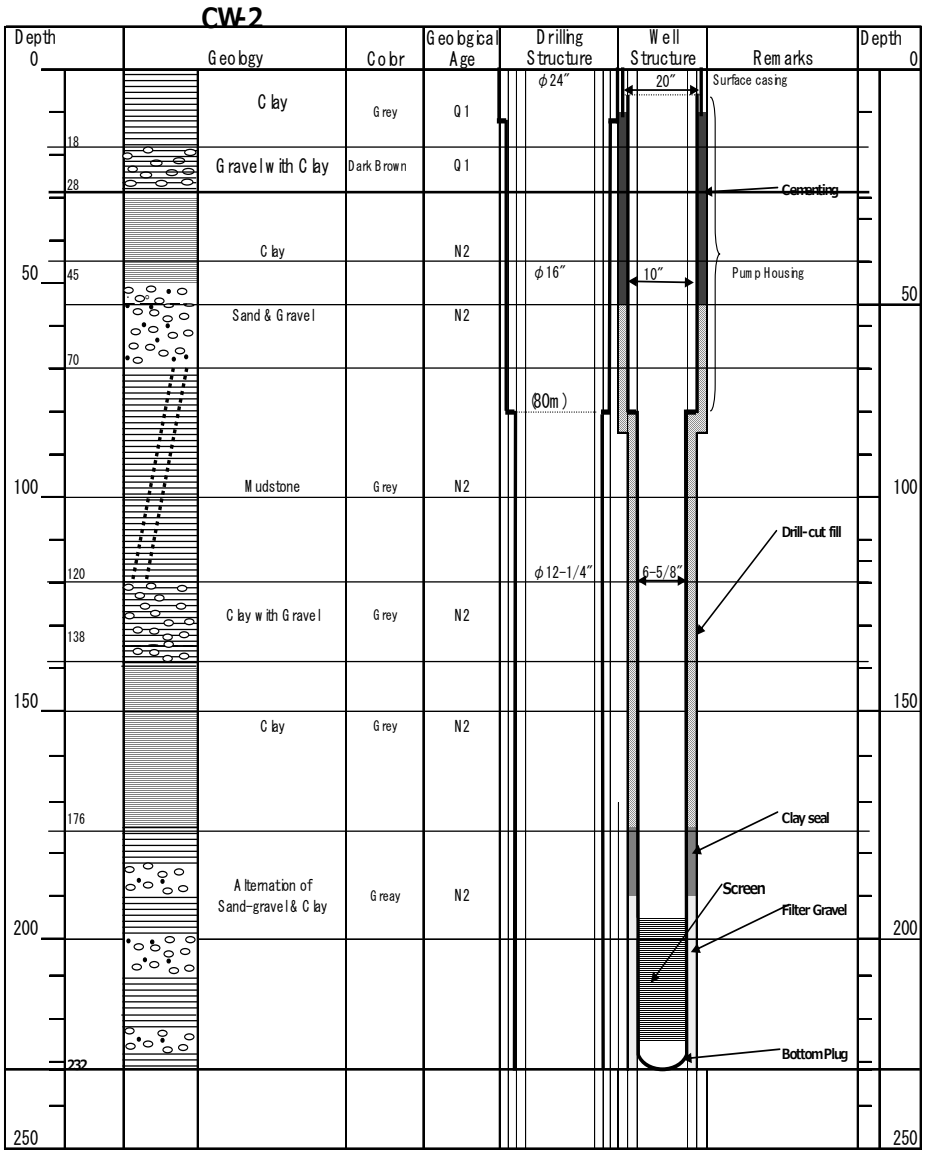
Geological Logs of Middle Test Well





Geological Logs of Shallow Test Well

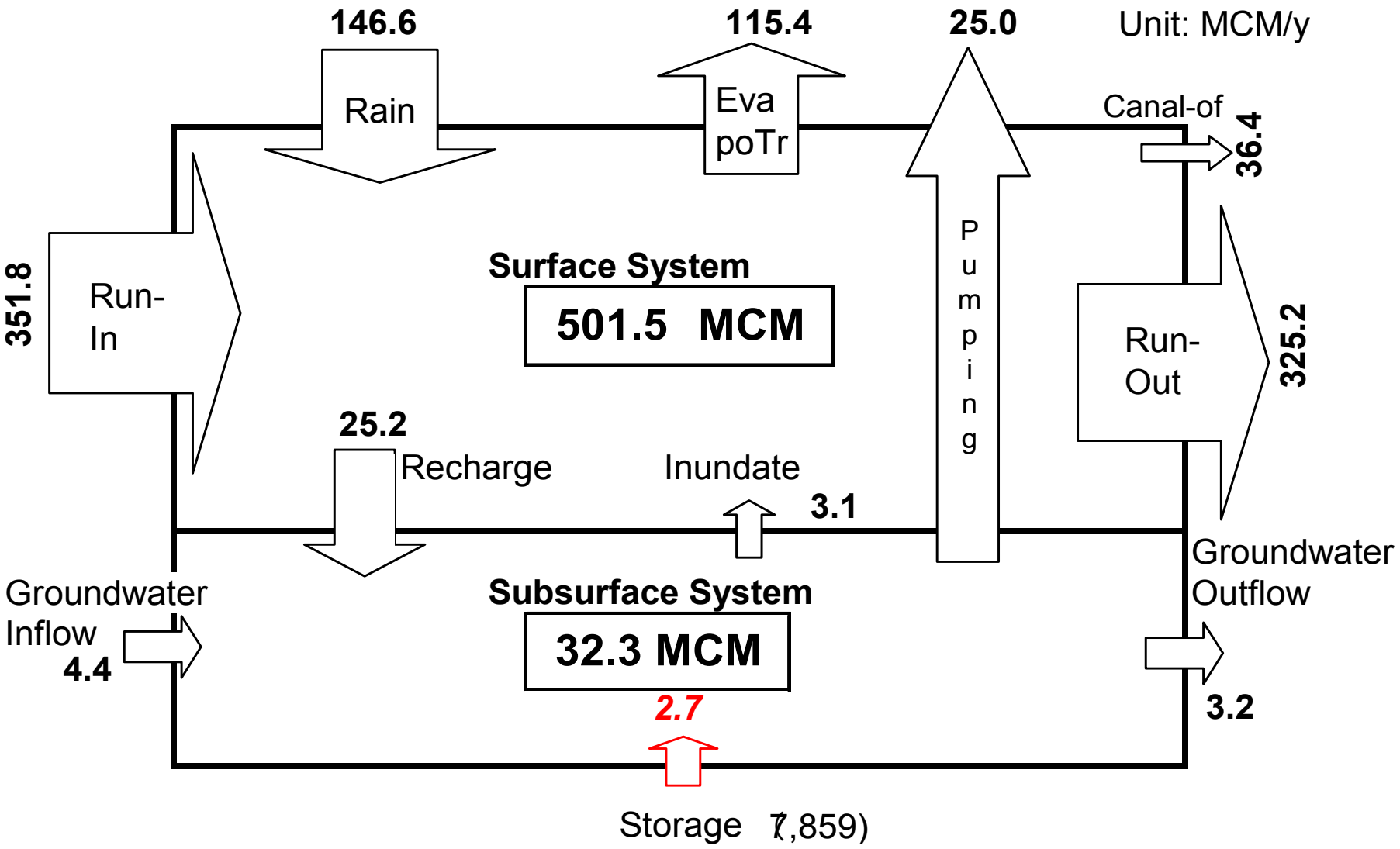




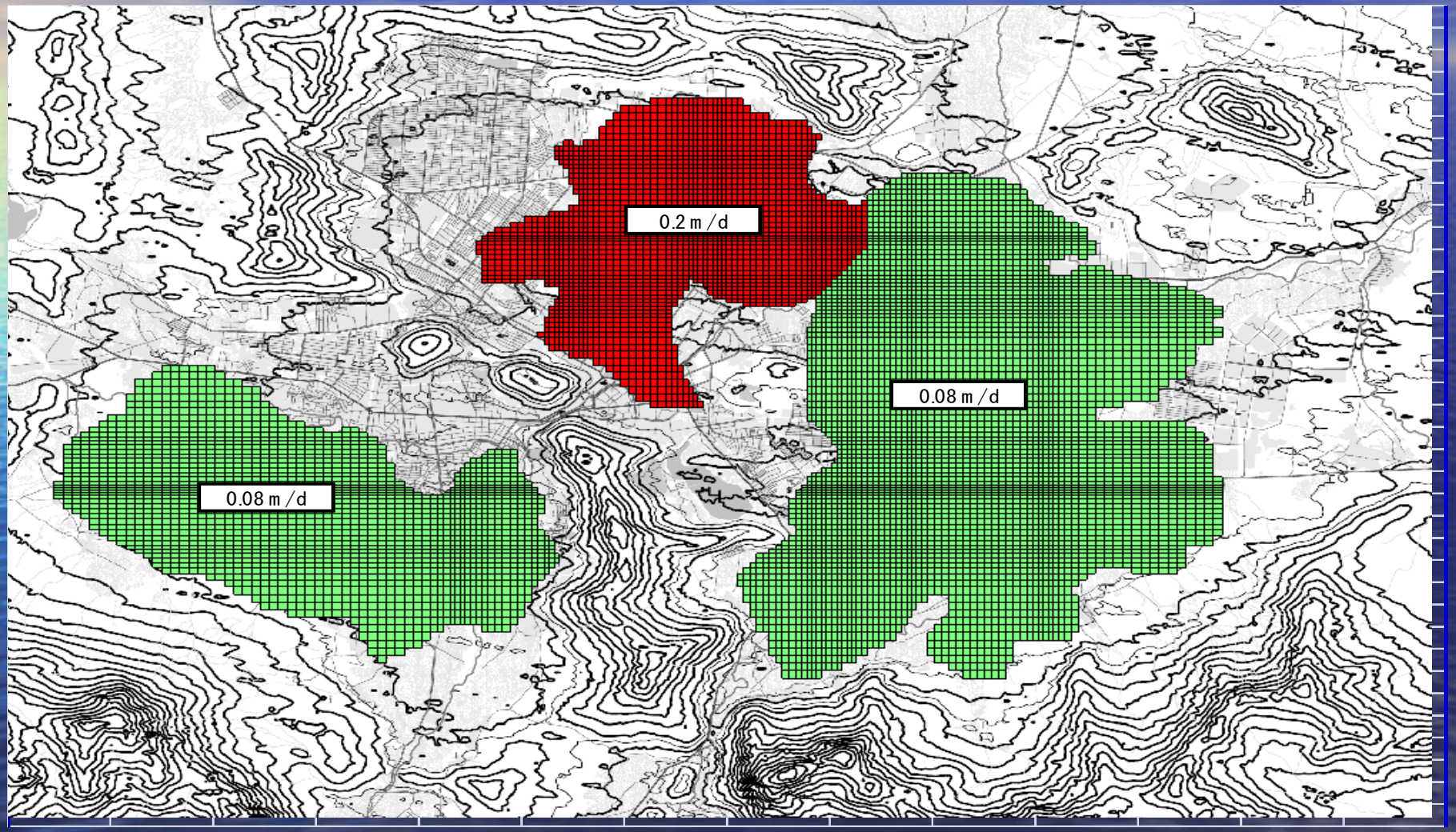
Summary of Pumping Test

Well	Depth (m)	S.W.L. (GL-m)	Sp. Yield (m^3/d/m)	D.W.L. (GL-m)	T. (m^2/d)	W.E (%)
TW-1	640	10.35	7.90	41.85	7.89	96.74
TW-2	554	3.21	16.80	32.59	8.98	84.96
TW-3	570	5.73	9.00	38.80	11.50	86.67
TW-4	678	4.65	27.32	44.20	27.00	36.40
MW-1	218	12.72	7.53	40.14	2.16	96.30
MW-2	498	6.95	6.47	35.10	5.91	10.44
CW-1	167	7.35	16.85	21.60	14.80	89.30
CW-2	232	7.65	7.19	25.80	5.24	82.50
Ave.	444.6	7.33	12.38	35.01	10.44	72.91

. Total Water Balance of Kabul Basin (Recent 10 year average)



Distribution of Permeability



Total groundwater storage of deep aquifer

- Through a hydro geological consideration, the total volume of deep aquifer was calculated as 47,000 MCM. The effective porosity was estimated as 0.03 and thus the total groundwater storage volume was estimated as large as 1,410 MCM