Table 1 Drilling Data for the Wells

New No.	Location (Lat , Long.) (deg, min, sec)	Remarks	Dia. (mm)	Total Depth (m)	S.W.L GL- (AGLm	ground level (m)	casing stickup (m)	casing position, material (m)		Screen position,	Scr. Total (m)	Gravel pack	Drilling method	Rig	sampling date	*comple. date	Pump. test (cont.) D.W.L/Disch	Water Quality (hardness)
A1	N 46, 22, 19 E 96, 14, 50	East of the Park	244	200.3	11.12	2165	0.29	200	FRP	56-68, 86-92, 104-116, 128-140, 152-170, 182-194	72	yes	DTH, Rotary	SM-300H	8th Sep	3rd Sep.	87.91m/200l/mi	1000
A2	N 46, 24, 19 E 96, 18, 19	North of the bridge	244	193.0	2.6	2060	0.18	193	FRP	91-103, 109-127, 133-139, 157-169, 175-187,	60	yes	DTH, Rotary	SM-300H	6th Aug	4th Aug	7.8m/60l/min	3725
A3	N 46, 24, 29 E 96, 11, 39	Upstreem of Khadaasan	244	150.3	3.91	2150	0.29	150	FRP	12-36, 60-72, 108-114, 138-144	48	yes	DTH, Rotary	SM-300H	13th Oct.	10th Oct.	64.58m/600l/mi	363
A4	N 46, 22, 50 E 96, 16, 42	Across the oil reservoir	244	160.2	4.61	2120	0.18	160	FRP	16-22, 28-40, 64-70, 100-118, 148-154	48	yes	Rotary	SM-300H	5th Oct.	23rd Sep.	16.1m/1000l/mi	1875
				703.8							228							
B-1	N 46, 22, 10 E 96, 14, 17	West of the park	244	56.2	20.14	2175	0.23	56	FRP	8-20, 26-38, 44-50	30	yes	Rotary	URB-2A	17th Sep.	5th Sep.	32.52m/74l/min	875
B-2	N 46, 25, 36 E 96, 18, 12	Easten edge of Sukhiin hooloi	244	73.6	11.67	2030	0.2	73	FRP	31-43, 49-61	24	yes	Rotary	URB-3A	15th Aug	8th Aug	22.61m/30l/min	845
B-3	N 46, 24, 55 E 96, 18, 26	Easten edge of Sukhiin hooloi	244	131.0	25.7	2050	0.33	130	FRP	76-94, 106-118	30	yes	Rotary	URB-3A	6th July	10th July	116m/80l/min	1950
B-4	N 46, 26, 04 E 96, 19, 38	on a dry river	244	41.6	4.2	2020	0.1	41	FRP	5-23, 29-41	30	yes	Rotary	URB-2A	2nd July	20th June	14.8m/75l/min	900
B-5	N 46, 20, 24 E 96, 19, 01	on a ex-riverbase	244	80.0	3.08	2157	0.2	80	FRP	26-38, 44-56, 68-74	30	yes	Rotary	URB-2A	19th July	10th July	23m/400l/min	225
B-6	N 46, 19, 11 E 96, 20, 45	outskirt of a fan on a small stream	244	120.0	24.51	2190	0.2	120	FRP	24-42, 48-54, 60-78 108-114	48	yes	Rotary	URB-2A	24th Sep.	5th Aug.	25.05m/605l/mi	258
				502.4							192							
				1206.2							420							

* Completion date: defined as the date when the rig was removed

Table 2 Water Quality for Water Supply Facilities

Item No.	Item	Unit	Reservoir water		Tap water					Water wagon		Stored water in ger					Mongolian Standard
			DR-1	DR-2	DT-1	DT-2	DT-3	DT-4	DT-5	DW-1	DW-2	DG-1	DG-2	DG-3	DG-4	DG-5	
1	pH		8.2-8.3	8.2-8.3	8.1-8.3	8.2-8.4	7.9-8.2	8.0-8.1	8.2	8.2-9.1	8.3-8.5	8.2	8.0-8.3	7.8-8.3	8.3	8.3	6.5-8.5
2	Temperature	℃	3.0-5.2	4.0-5.2	12.0-20.0	5.0-20.0	7.0-18.0	9.0-10.0	5.7-14.5	5.0-9.0	7.0-9.0	8.0-19.0	9.4-19.4	11.6-19.7	9.8-19.7	16.0-19.4	
3	Odor	dilution factor	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	1	1	1	≦2
4	Taste	dilution factor	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	1	1	<1	≦2
5	Color	mg/l Pt scale	<1-4	<1-4	<1-2	<1-6	<1-2	<1-20	<1-2	2.0-5.0	<1-4	2.0-4.0	2.0-4.0	<1-5	<1-20	<1-2	≦15$
6	Turbidity	kaolin (JIS)	<1-2	<1	<1	<1	<1	<1-5	<1-6	<1	<1	<1-2	<1-2	<1-1	<1-3	<1	
7	Conductivity	mS/m(at 25℃)	58-89	54-93	54-68	57-93	54-82	54-68	56-86	58-94	58-85	55-86	56-73	58-69	54-75	53-64	
8	Hardness	mg $CaCO_3$/l	265-310	240-300	220-288	188-250	220-300	210-450	430-450	240-313	238-300	230-250	225-300	230-375	285-320	220-275	≦350
10	COD($KMn0_4$, alkali)	mg O_2/l	<1-2	<1	1.0-2.0	1.0-2.0	<1-3.0	<1-2	<1-1.5	<1-2.2	<1-2	<1-3	<1-3	<1-2	1.0-3.5	<1-2.8	
11	Nitrite	mg NO_2/l	<0.01	<0.01	0.01-0.03	<0.01-0.13	0.01	<0.01	<0.01-0.02	<0.01	0.01	<0.01-0.02	<0.01	<0.01-0.5	<0.01-0.25	<0.01	
12	Nitrate	mg NO_3/l	4.0-7.4	3.1-8.6	0.4-7.0	4.6-7.0	4.7-8.0	0.4-9.0	4.1-8.2	4.2-9.2	3.0-5.0	4.0-8.0	4.0-8.2	4.1-9.4	4.9-7.0	2.0-9.0	≦44.3
15	Bicarbonate	mg HCO_3/l	217-244	232-250	214-275	232-250	220-244	220-262	177-275	244-366	214-266	238-275	214-256	226-305	220-275	214-275	
16	Carbonate	mg CO_3/l	0.86-1.22	1.00-1.25	1.00-1.73	0.97-2.50	0.77-1.39	0.69-0.97	1.12-1.38	1.09-11.57	1.35-2.68	0.87-1.50	0.89-2.03	0.77-1.79	1.73-1.99	1.70-2.18	
21	Calcium	mg Ca/l	24-30	21-30	23-30	22-26	25-29	26-38	22-27	20-40	26-70	24-44	11-28	23-52	25-32	24-27	≦100
22	Magnesium	mg Mg/l	49-70	45-55	35-53	25-47	37-55	36-87	50-53	46-58	38-46	34-46	43-59	41-59	52-62	38-42	≦30
22	Magnesium#	mg Mg/l	37							38							≦30
22	Magnesium##	mg Mg/l	31														≦30
23	Copper*	mg Cu/l	0.04-0.14	0.04-0.13	0.06-0.2	0.05-0.4	<0.04-0.05	0.05-0.09	<0.03	<0.04-0.16	<0.06	<0.05-0.08	<0.03-0.05	0.04-0.05	0.03-0.06	<0.05-0.31	≦1
24	Iron	mg Fe/l	0.09-0.12	0.10-0.15	0.08-0.10	0.10-0.12	0.06-0.25	0.05-0.10	0.04-0.10	0.06-0.13	0.03-0.91	0.03-0.2	0.05-0.21	0.04-0.30	0.01-0.3	0.02-0.10	≦0.3
25	Manganese*	mg Mn/l	<0.06	0.1-0.42	<0.07	<0.05	<0.04	<0.02-0.04	<0.06	<0.04	<0.02	<0.06	<0.04-0.06	<0.05	<0.06	<0.02-0.04	≦0.1
26	Zinc*	mg Zn/l	0.11-0.48	0.14-0.27	0.21-0.28	0.2-1.28	0.29-0.43	0.21-0.7	0.1-0.37	0.25-0.43	0.11-0.21	0.17-0.35	0.06-0.26	0.12-0.57	0.23-0.41	0.07-0.26	≦5
27	Lead**	mg Pb/l		0.05		0.04				-	-		0.041				≦0.03
28	Chromium(VI)	mg Cr(VI)/l	0.01-0.04	0.02-0.03	0.02-0.03	0.01-0.02	0.02-0.05	0.02-0.03	0.02-0.03	0.02-0.03	0.01-0.02	0.02-0.04	0.02-0.03	0.01-0.02	0.02	0.01-0.04	
	Chromium**	mg Cr/l		0.10		0.01				-	-	-	-	-	-	-	≦0.05
29	Cadmium**	mg Cd/l		0.03-0.04		0.028-0.03				-	-		0.026				≦0.01
30	Arsenic**	mg As/l		0.03		0.03-0.035		<0.06	<0.02	-	-		0.024				≦0.05
31	Cyanide	mg CN/l	0.04-0.06	0.03-0.05	0.03-0.05	0.03-0.05	0.03-0.05	0.03-0.06	0.03-0.05	0.03-0.05	0.03-0.06	0.02-0.75	0.03-0.05	0.03-0.05	0.04-0.06	0.02-0.05	≦0.1
33	Fluoride	mg F/l	0.05-0.2	<0.05	0.05-0.54	<0.05-0.52	<0.05-0.82	<0.05-0.88	<0.05-0.62	<0.05	<0.05	<0.05-0.74	<0.05-0.7	<0.05-0.69	<0.05-0.61	<0.05	0.7-1.5
38	Total Coliforms	No. in 11	7-39	4-0.21	3.0-70	3-4	3	<0.1	3.0-4.0	7.0-14	11	5.0-11	4.0-28	11-460	2.0-21.0	3.0-43	(<3 in 11)
39	General Bacteria	No. in 1 ml	143-1000	102-700	42-500	250-580	30	300-350	22-150	200-720	300	102-300	240-1000	100-950	345-780	143-850	
40	Residual Chlorine	mg ClO/l	0.02-0.7	0.02-0.1	<0.1	<0.1	<0.1	<0.02-0.1	<0.1	0.03-0.1	<0.02-0.1	<0.02-0.1	<0.02-0.2	<0.02-0.2	<0.02-0.2	<0.02-0.2	
43	Acidity	mg $CaCO_3$/l	35-65	35-50	35-100	28-85	43-78	63-85	35-100	30-80	35-80	30-65	50-60	40-65	50-60	30-60	
44	Alkalinity	mg $CaCO_3$/l	178-200	190-205	175-225	190-205	180-200	180-215	145-225	200-300	175-220	195-225	175-210	185-250	180-225	175-225	
	Nickel*	mg Ni/l	<0.06	<0.05	<0.09	0.03-0.05	<0.04	<0.05	<0.03	<0.02-0.03	<0.05	<0.05	<0.04	<0.05	<0.04	<0.02-0.03	
	Selenium*	mg Se/l	<0.03	<0.06	<0.05	<0.03	<0.03	<0.04	<0.02	<0.04	<0.07	<0.07	<0.05	<0.04	<0.05	<0.04	0.001 $$
	Strontium*	mg Sr/l	0.54-0.61	0.53-0.59	0.52-0.58	0.52-0.55	0.62-0.63	0.42-0.56	0.51-0.52	0.58-0.60	0.53-0.64	0.58-0.61	0.19-0.63	0.27-0.58	0.45-0.59	0.42-0.63	≦2
	Bromine*	mg Br/l	0.12-0.15	0.14-0.23	0.14-0.34	0.09-0.14	0.14-0.3	0.1-0.17	0.11-0.17	0.11-0.25	0.12	0.13-0.3	0.12-0.14	0.13-0.15	0.07-0.12	0.07-0.28	

* ED-TRXRF
** Colorimetry in Ulaanbaatar
# Analyzed in Japan: the test method for tap water
Calculated from the charge balance
$ WHO guideline
$$ 0.05 (mg/l) as maximum contaminant level (MCL) for the Primary Regulation of USA

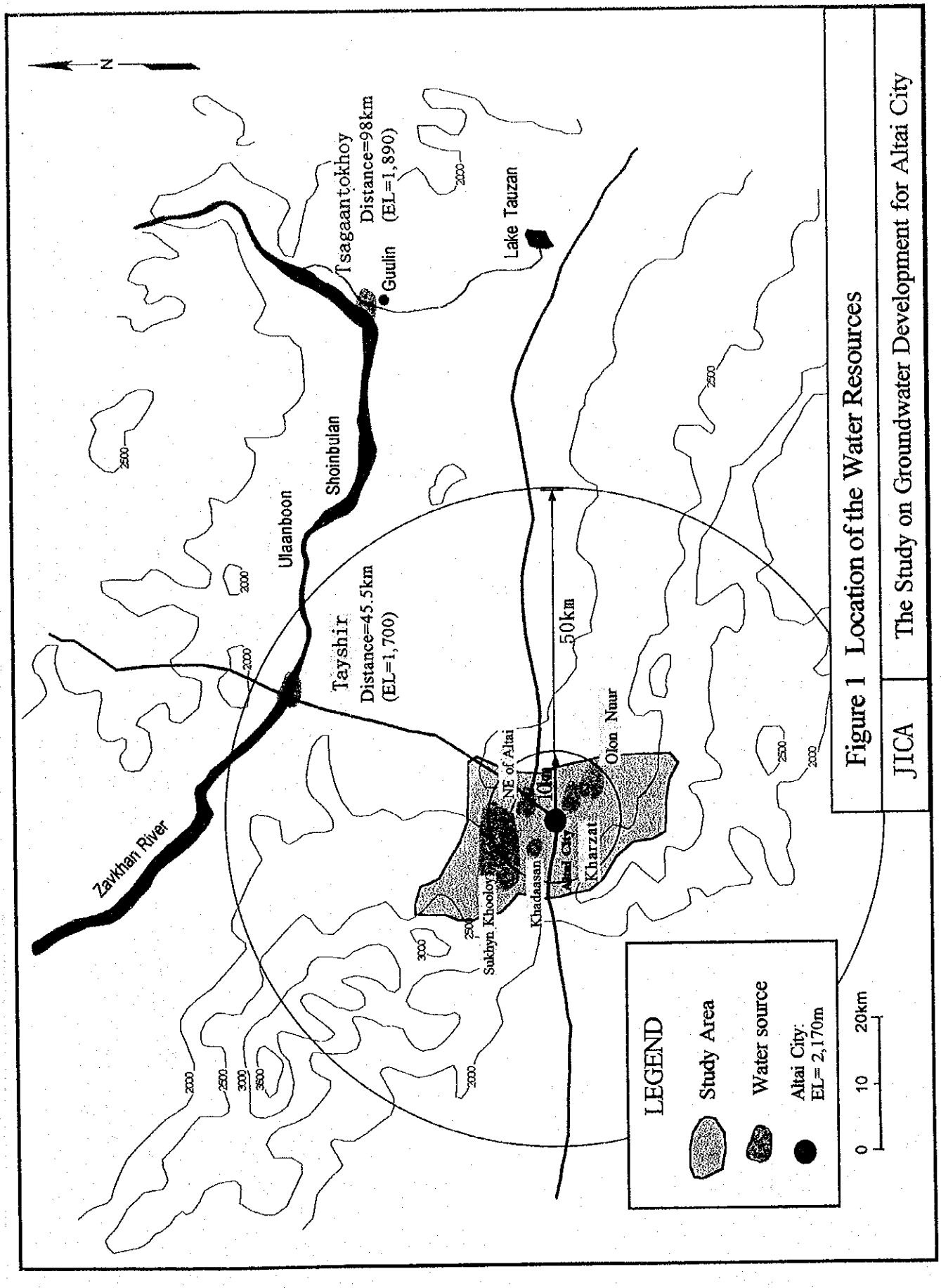
N
Zavkhan River
Ulaanboon
Shoinbulan
Tayshir
Distance=45.5km
(EL=1,700)
Tsagaantokhoy
Distance=98km
(EL=1,890)
Guulin
Lake Tauzan
50km
10km
NE of Altai
Altai City
Khadaasan
Sukhyn Khooloy
Kharzat
Olon Nuur
LEGEND
Study Area
Water source
Altai City:
EL= 2,170m
0
10
20km
Figure 1 Location of the Water Resources
JICA
The Study on Groundwater Development for Altai City

Table 2 Water Quality for Water Supply Facilities

Item No.	Item	Unit	Reservoir water		Tap water					Water wagon		Stored water in ger					Mongolian Standard
			DR-1	DR-2	DT-1	DT-2	DT-3	DT-4	DT-5	DW-1	DW-2	DG-1	DG-2	DG-3	DG-4	DG-5	
1	pH		8.2-8.3	8.2-8.3	8.1-8.3	8.2-8.4	7.9-8.2	8.0-8.1	8.2	8.2-9.1	8.3-8.5	8.2	8.0-8.3	7.8-8.3	8.3	8.3	6.5-8.5
2	Temperature	℃	3.0-5.2	4.0-5.2	12.0-20.0	5.0-20.0	7.0-18.0	9.0-10.0	5.7-14.5	5.0-9.0	7.0-9.0	8.0-19.0	9.4-19.4	11.6-19.7	9.8-19.7	16.0-19.4	
3	Odor	dilution factor	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	1	1	1	≦2
4	Taste	dilution factor	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	1	1	1	<1	≦2
5	Color	mg/l Pt scale	<1-4	<1-4	<1-2	<1-6	<1-2	<1-20	<1-2	2.0-5.0	<1-4	2.0-4.0	2.0-4.0	<1-5	<1-20	<1-2	≦15$
6	Turbidity	kaolin (JIS)	<1-2	<1	<1	<1	<1	<1-5	<1-6	<1	<1	<1-2	<1-2	<1-1	<1-3	<1	
7	Conductivity	mS/m(at 25℃)	58-89	54-93	54-68	57-93	54-82	54-68	56-86	58-94	58-85	55-86	56-73	58-69	54-75	53-64	
8	Hardness	mg $CaCO_3$/l	265-310	240-300	220-288	188-250	220-300	210-450	230-450	240-313	238-300	230-250	225-300	230-375	285-320	220-275	≦350
10	COD($KMnO_4$, alkali)	mg O_2/l	<1-2	<1	1.0-2.0	1.0-2.0	<1-3.0	<1-2	<1-1.5	<1-2.2	<1-2	<1-3	<1-3	<1-2	1.0-3.5	<1-2.8	
11	Nitrite	mg NO_2/l	<0.01	<0.01	0.01-0.03	<0.01-0.13	0.01	<0.01	<0.01-0.02	<0.01	0.01	<0.01-0.02	<0.01	<0.01-0.5	<0.01-0.25	<0.01	
12	Nitrate	mg NO_3/l	4.0-7.4	3.1-8.6	0.4-7.0	4.6-7.0	4.7-8.0	0.4-9.0	4.1-8.2	4.2-9.2	3.0-5.0	4.0-8.0	4.0-8.2	4.1-9.4	4.9-7.0	2.0-9.0	≦44.3
15	Bicarbonate	mg HCO_3/l	217-244	232-250	214-275	232-250	220-244	220-262	177-275	244-366	214-266	238-275	214-256	226-305	220-275	214-275	
16	Carbonate	mg CO_3/l	0.86-1.22	1.00-1.25	1.00-1.73	0.97-2.50	0.77-1.39	0.69-0.97	1.12-1.38	1.09-11.57	1.35-2.68	0.87-1.50	0.89-2.03	0.77-1.79	1.73-1.99	1.70-2.18	
21	Calcium	mg Ca/l	24-30	21-30	23-30	22-26	25-29	26-38	22-27	20-40	26-70	24-44	11-28	23-52	25-32	24-27	≦100
22	Magnesium	mg Mg/l	49-70	45-55	35-53	25-47	37-55	36-87	39-95	46-58	38-46	34-46	43-59	41-59	52-62	38-42	≦30
22	Magnesium#	mg Mg/l	37							35							≦30
22	Magnesium##	mg Mg/l						31									≦30
23	Copper*	mg Cu/l	0.04-0.14	0.04-0.13	0.06-0.2	0.05-0.4	<0.04-0.05	0.05-0.09	<0.03	<0.04-0.16	<0.06	<0.05-0.08	<0.03-0.05	0.04-0.05	0.03-0.06	<0.05-0.31	≦1
24	Iron	mg Fe/l	0.09-0.12	0.10-0.15	0.08-0.10	0.10-0.12	0.06-0.25	0.05-0.10	0.04-0.10	0.06-0.13	0.03-0.91	0.03-0.2	0.05-0.21	0.04-0.30	0.01-0.3	0.02-0.10	≦0.3
25	Manganese*	mg Mn/l	<0.06	0.1-0.42	<0.07	<0.05	<0.04	<0.02-0.04	<0.06	<0.04	<0.02	<0.06	<0.04-0.06	<0.05	<0.06	<0.02-0.04	≦0.1
26	Zinc*	mg Zn/l	0.11-0.48	0.14-0.27	0.21-0.28	0.2-1.28	0.29-0.43	0.21-0.7	0.1-0.37	0.25-0.43	0.11-0.21	0.17-0.35	0.06-0.26	0.12-0.57	0.23-0.41	0.07-0.26	≦5
27	Lead**	mg Pb/l		0.05		0.04				-	-		0.041				≦0.03
28	Chromium(VI)	mg Cr(VI)/l	0.01-0.04	0.02-0.03	0.02-0.03	0.01-0.02	0.02-0.05	0.02-0.03	0.02-0.03	0.02-0.03	0.01-0.02	0.02-0.04	0.02-0.03	0.01-0.02	0.02	0.01-0.04	
	Chromium**	mg Cr/l		0.10		0.01				-	-	-	-	-	-	-	≦0.05
29	Cadmium**	mg Cd/l		0.03-0.04		0.028-0.03				-	-		0.026				≦0.01
30	Arsenic**	mg As/l		0.03		0.03-0.035		<0.06	<0.02	-	-		0.024				≦0.05
31	Cyanide	mg CN/l	0.04-0.06	0.03-0.05	0.03-0.05	0.03-0.05	0.03-0.05	0.03-0.06	0.03-0.05	0.03-0.05	0.03-0.06	0.02-0.75	0.03-0.05	0.03-0.05	0.04-0.06	0.02-0.05	≦0.1
33	Fluoride	mg F/l	0.05-0.2	<0.05	0.05-0.54	<0.05-0.52	<0.05-0.82	<0.05-0.88	<0.05-0.62	<0.05	<0.05	<0.05-0.74	<0.05-0.7	<0.05-0.69	<0.05-0.61	<0.05	0.7-1.5
38	Total Coliforms	No. in 1l	7-39	4.0-21	3.0-7.0	<3-4	3	<3-4	3.0-4.0	7.0-14	11	3.0-11	4.0-28	11-460	3.0-21.0	3.0-43	(<3 in 1l)
39	General Bacteria	No. in 1 ml	143-1000	102-700	42-500	250-580	30	300-350	22-150	200-720	300	102-300	240-1000	100-950	345-780	143-850	
40	Residual Chlorine	mg ClO/l	0.02-0.7	0.02-0.1	<0.1	<0.1	<0.1	<0.02-0.1	<0.1	0.03-0.1	<0.02-0.1	<0.02-0.1	<0.02-0.2	<0.02-0.2	<0.02-0.2	<0.02-0.2	
43	Acidity	mg $CaCO_3$/l	35-65	35-50	35-100	28-85	43-78	63-85	35-100	30-80	35-80	30-65	50-60	40-65	50-60	30-60	
44	Alkalinity	mg $CaCO_3$/l	178-200	190-205	175-225	190-205	180-200	180-215	145-225	200-300	175-220	195-225	175-210	185-250	180-225	175-225	
	Nickel*	mg Ni/l	<0.06	<0.05	<0.09	0.03-0.05	<0.04	<0.05	<0.03	<0.02-0.03	<0.05	<0.05	<0.04	<0.05	<0.04	<0.02-0.03	
	Selenium*	mg Se/l	<0.03	<0.06	<0.05	<0.03	<0.03	<0.04	<0.02	<0.04	<0.07	<0.07	<0.05	<0.04	<0.05	<0.04	0.001 $$
	Strontium*	mg Sr/l	0.54-0.61	0.53-0.59	0.52-0.58	0.52-0.55	0.62-0.63	0.42-0.56	0.51-0.52	0.58-0.60	0.53-0.64	0.58-0.61	0.19-0.63	0.27-0.58	0.45-0.59	0.42-0.63	≦2
	Bromine*	mg Br/l	0.12-0.15	0.14-0.23	0.14-0.34	0.09-0.14	0.14-0.3	0.1-0.17	0.11-0.17	0.11-0.25	0.12	0.13-0.3	0.12-0.14	0.13-0.15	0.07-0.12	0.07-0.28	

* ED-TRXRF
** Colorimetry in Ulaanbaatar
# Analyzed in Japan: the test method for tap water
Calculated from the charge balance
$ WHO guideline
$$ 0.05 (mg/l) as maximum contaminant level (MCL) for the Primary Regulation of USA

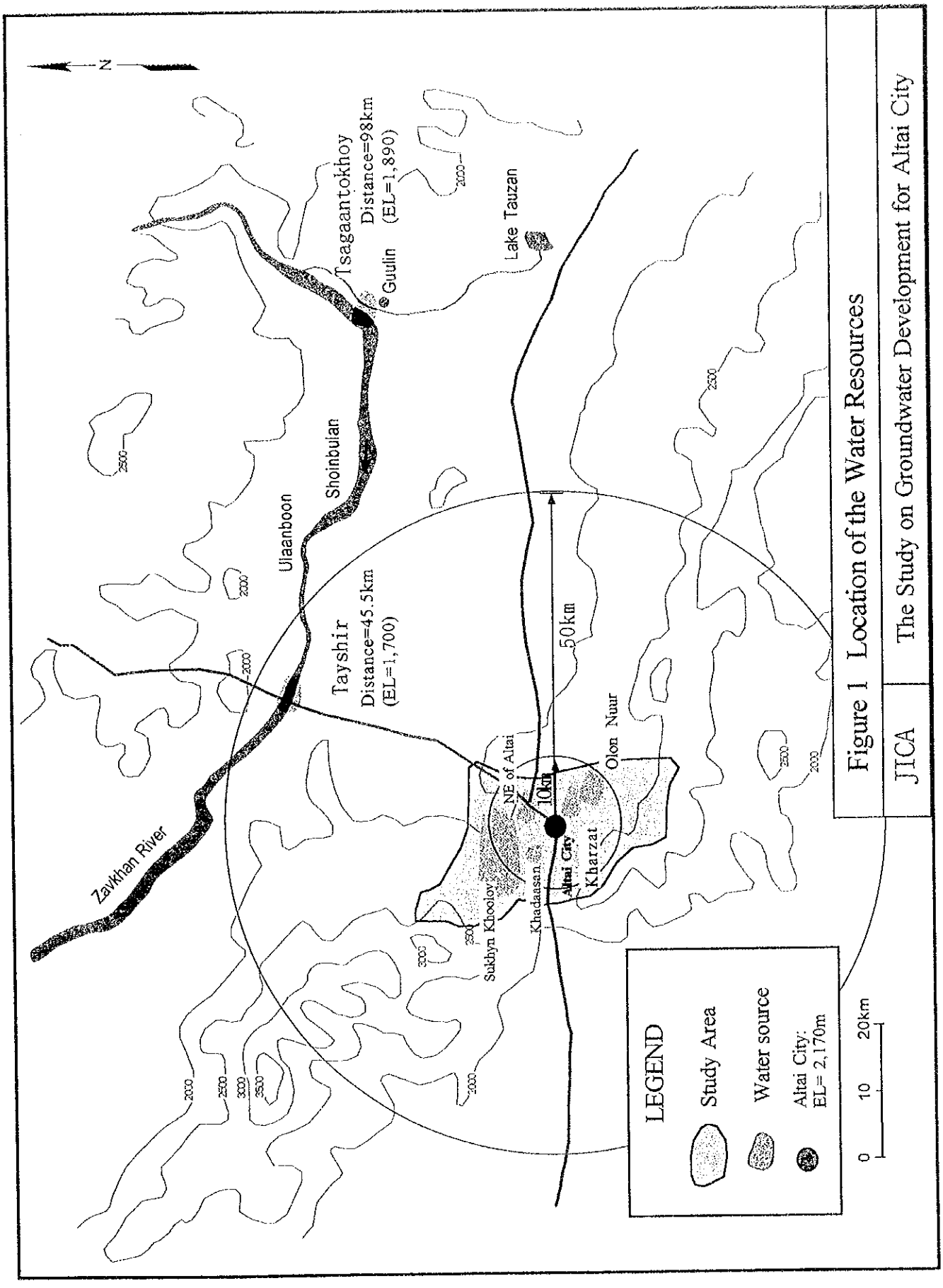

Figure 1 Location of the Water Resources

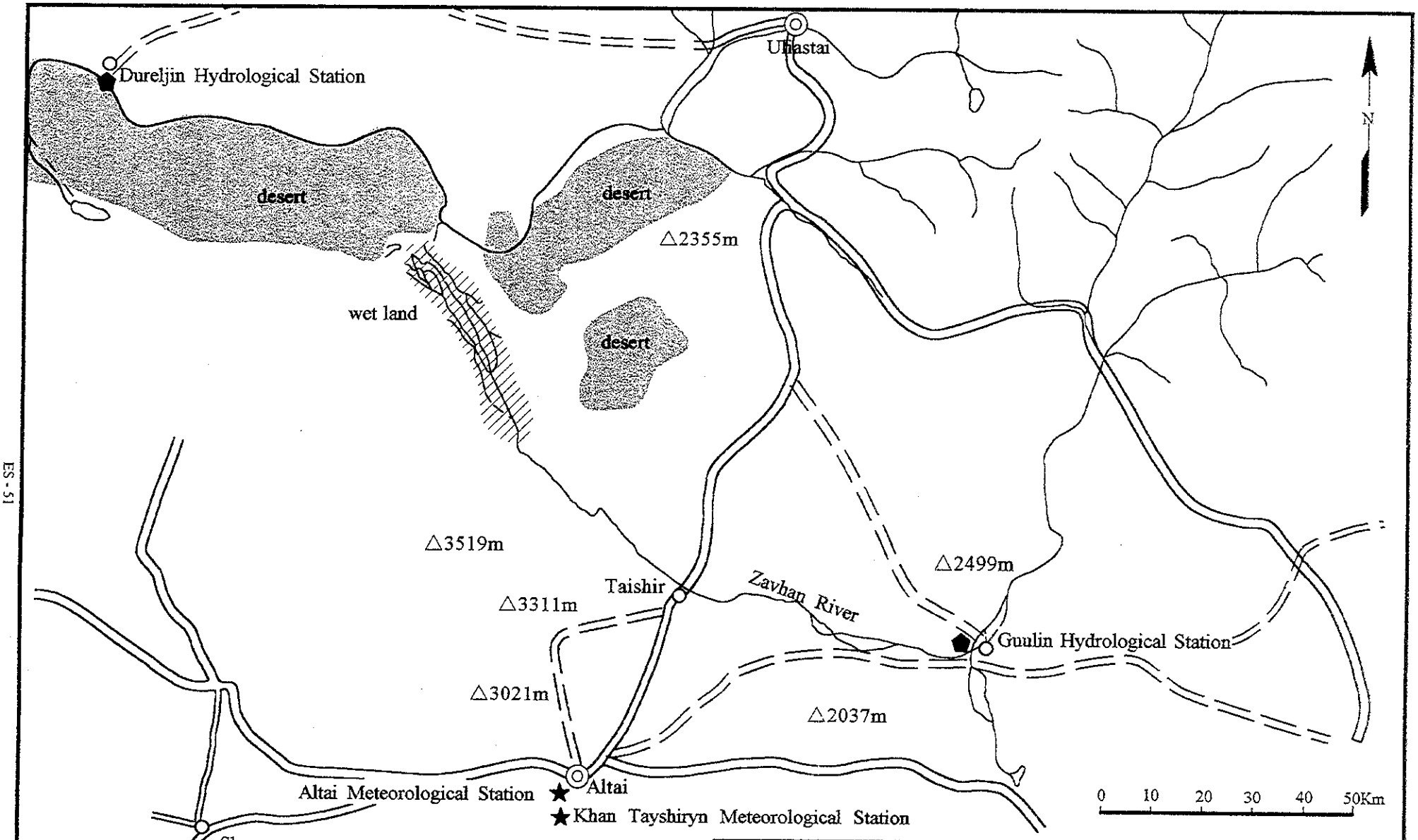

Figure 2 Location of Hydrological and Meteorological Stations

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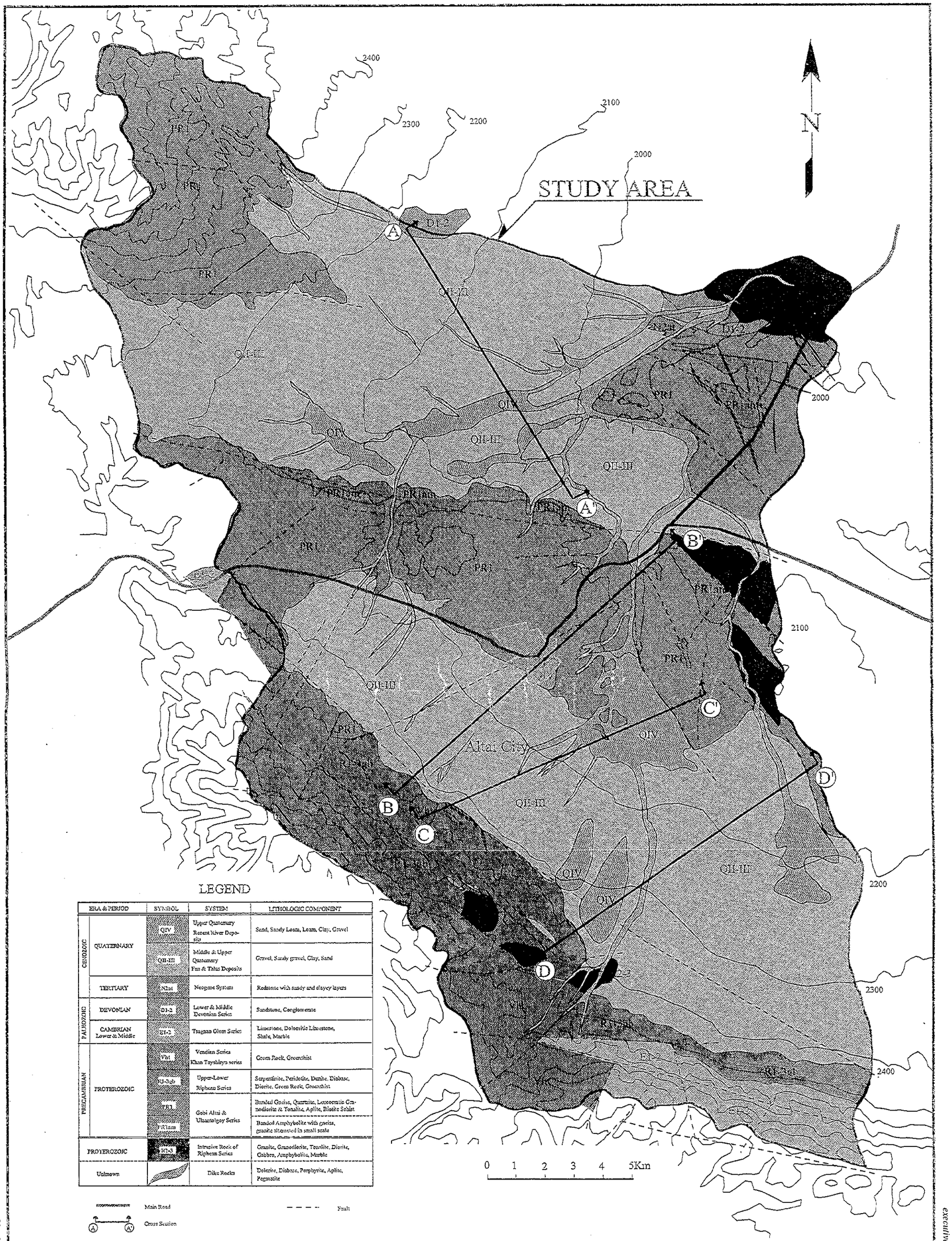

LEGEND

ERA & PERIOD		SYMBOL	SYSTEM	LITHOLOGIC COMPONENT
CENOZOIC	QUATERNARY	QIV	Upper Quaternary Recent River Deposits	Sand, Sandy Loam, Loam, Clay, Gravel
		QII-III	Middle & Upper Quaternary Fan & Talus Deposits	Gravel, Sandy gravel, Clay, Sand
	TERTIARY	N2s1	Neogene System	Redstone with sandy and clayey layers
PALEOZOIC	DEVONIAN	D1-2	Lower & Middle Devonian Series	Sandstone, Conglomerate
	CAMBRIAN Lower & Middle	E1-2	Tsagaan Olom Series	Limestone, Dolomitic Limestone, Shale, Marble
PRECAMBRIAN	PROTEROZOIC	Vht	Vendian Series Khan Tayshiryn series	Green Rock, Greenchist
		R1-3ab	Upper-Lower Riphean Series	Serpentinite, Peridotite, Dunite, Diabase, Diorite, Green Rock, Greenchist
		PR1	Gobi Altai & Ulaantolgoy Series	Banded Gneiss, Quartzite, Leucocratic Granodiorite & Tonalite, Aplite, Biotite Schist
		PR1am		Banded Amphybolite with gneiss, granite alternated in small scale
PROTEROZOIC		R1-3	Intrusive Rock of Riphean Series	Granite, Granodiorite, Tonalite, Diorite, Gabbro, Amphybolite, Marble
Unknown			Dike Rocks	Dolerite, Diabase, Porphyrite, Aplite, Pegmatite

Main Road

Cross Section

Fault

Figure 3 Geological Map of the Study Area

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STUDY AREA

N

Altai City

LEGEND

ERA & PERIOD		SYMBOL	SYSTEM	LITHOLOGIC COMPONENT
CENOZOIC	QUATERNARY	QIV	Upper Quaternary Recent River Deposits	Sand, Sandy Loam, Loam, Clay, Gravel
		QII-III	Middle & Upper Quaternary Fan & Talus Deposits	Gravel, Sandy gravel, Clay, Sand
	TERTIARY	N2si	Neogene System	Sandstone with sandy and clayey layers
PALEOZOIC	DEVONIAN	D1-2	Lower & Middle Devonian Series	Sandstone, Conglomerate
	CAMBRIAN Lower & Middle	C1-2	Tsagaan Gol Series	Limestone, Dolomitic Limestone, Shale, Marble
PRECAMBRIAN	PROTEROZOIC	Vbz	Verdien Series Khan Tayshiryn series	Green Rock, Greenthist
		R1-3sb	Upper-Lower Sayhan Series	Serpentinite, Peridotite, Diorite, Diabase, Diorite, Green Rock, Greenthist
		R1-3gt	Gobi Altay & Ulaantolgoy Series	Banded Gneiss, Quartzite, Leptynite Granodiorite & Tonalite, Aplite, Biotite Schist
		PR1am		Banded Amphibolite with quartz, granite pegmatite, Fine small scale
PROTEROZOIC		R1-3	Intrusive Rock of Riphean Series	Granite, Granodiorite, Tonalite, Diorite, Gabbro, Amphybolite, Marble
Unknown			Folie Roches	Dellenite, Diabase, Porphyrite, Aplite, Pegmatite

Main Road

Cross Section

0 1 2 3 4 5Km

Figure 3 Geological Map of the Study Area

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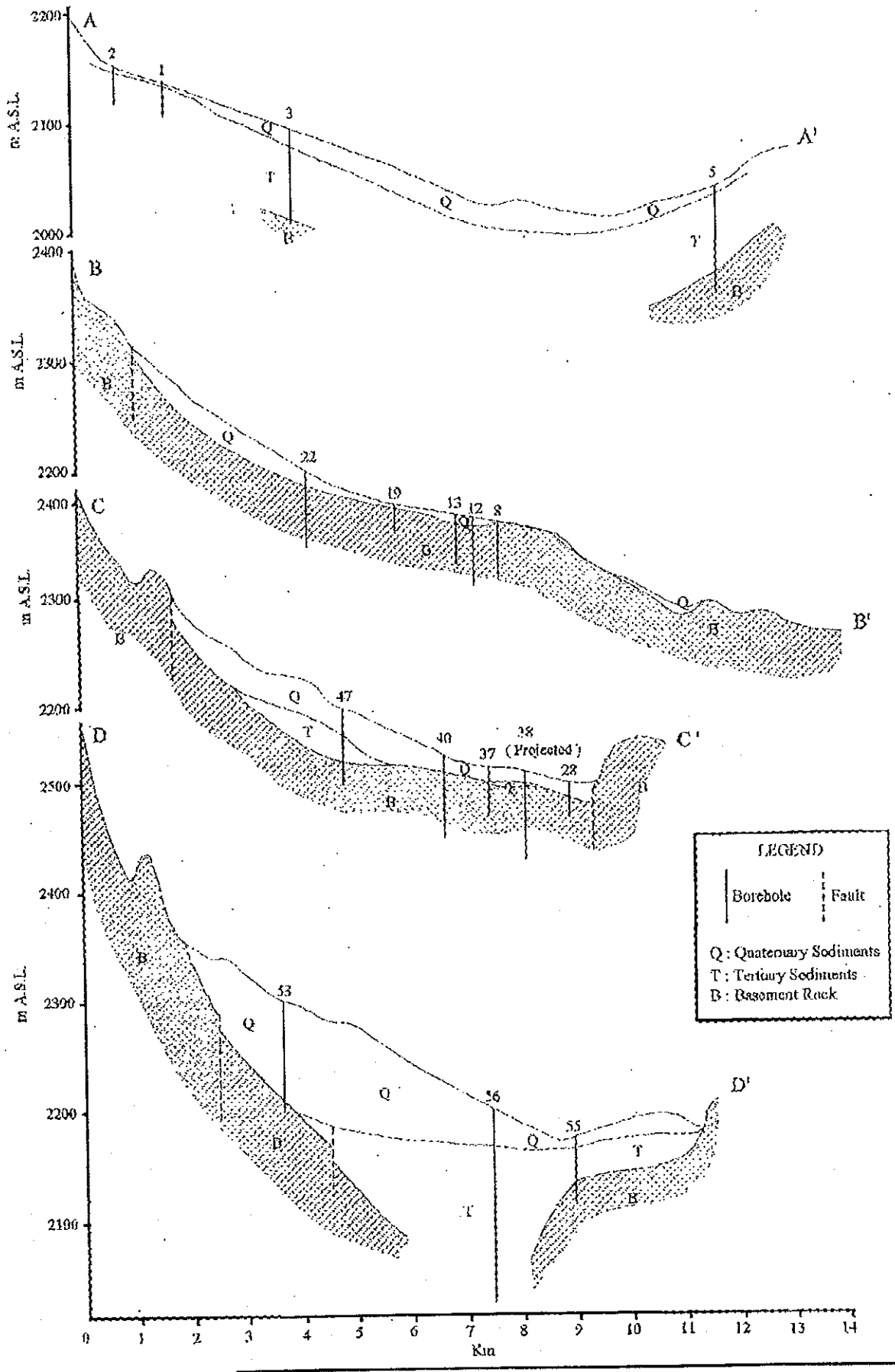

Figure 4 Schematic Geological Sections

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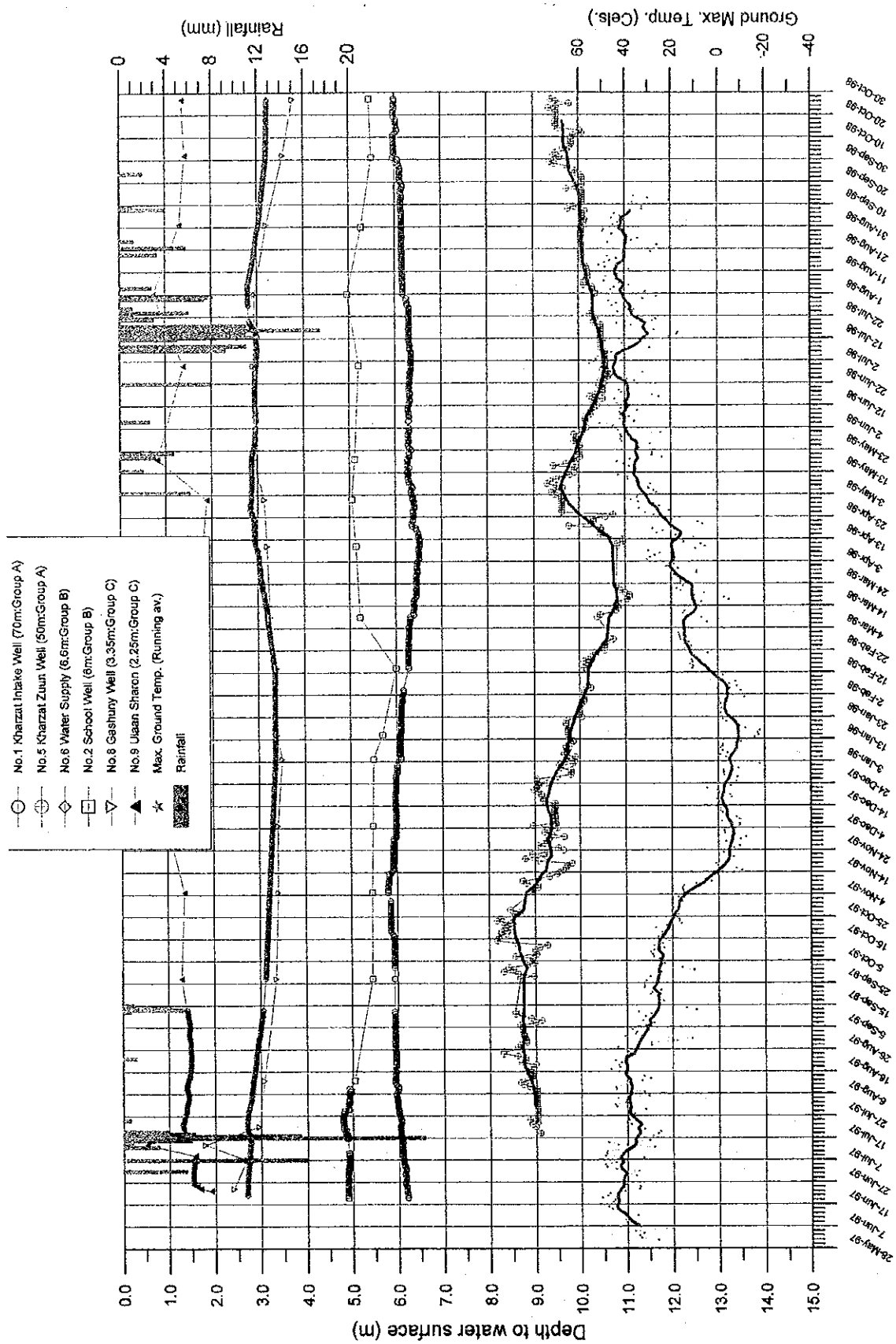

Figure 5 Fluctuation of Groundwater Table in the Study Area

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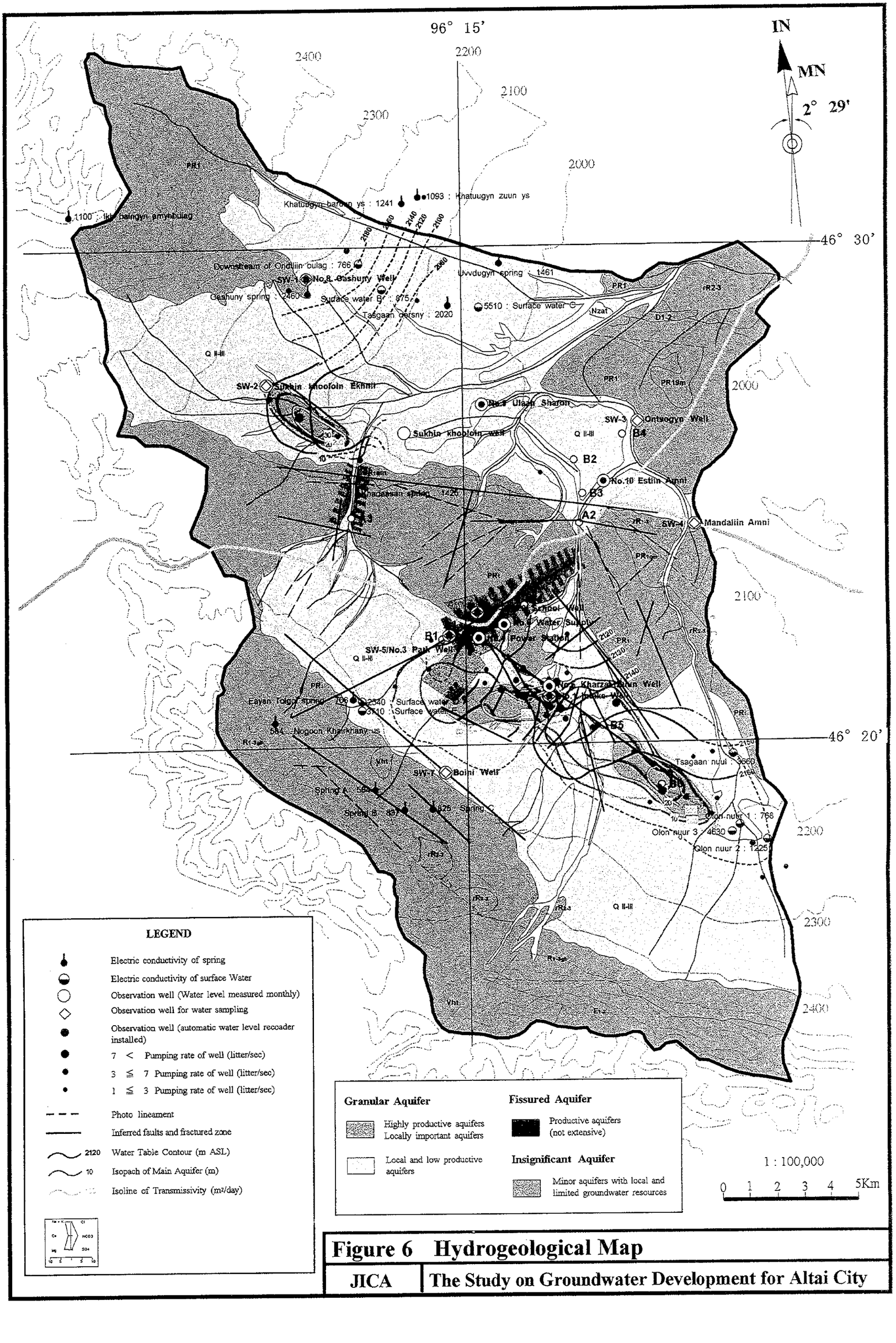

Figure 6 Hydrogeological Map

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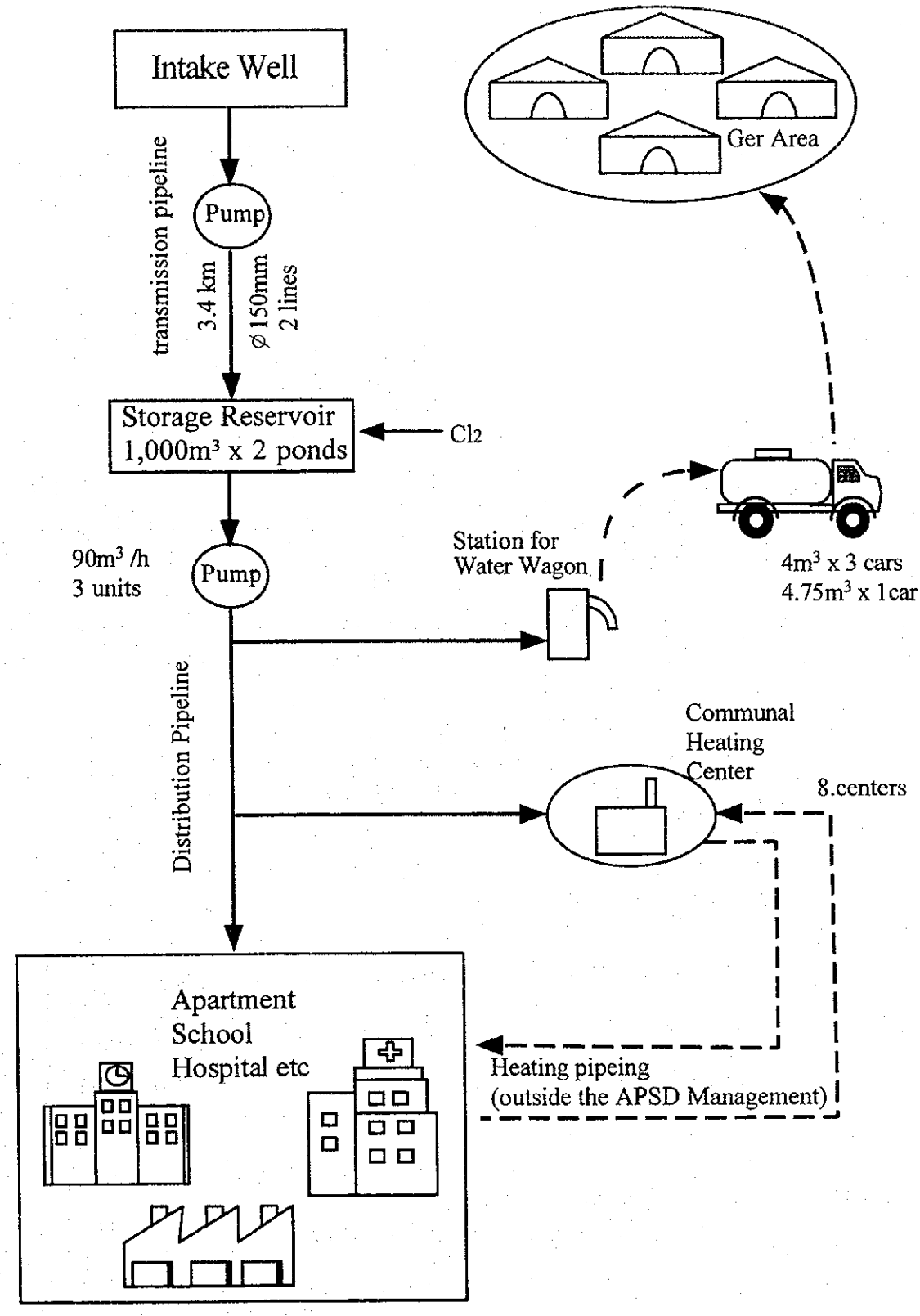

Figure 7 Water Supply System of Altai City

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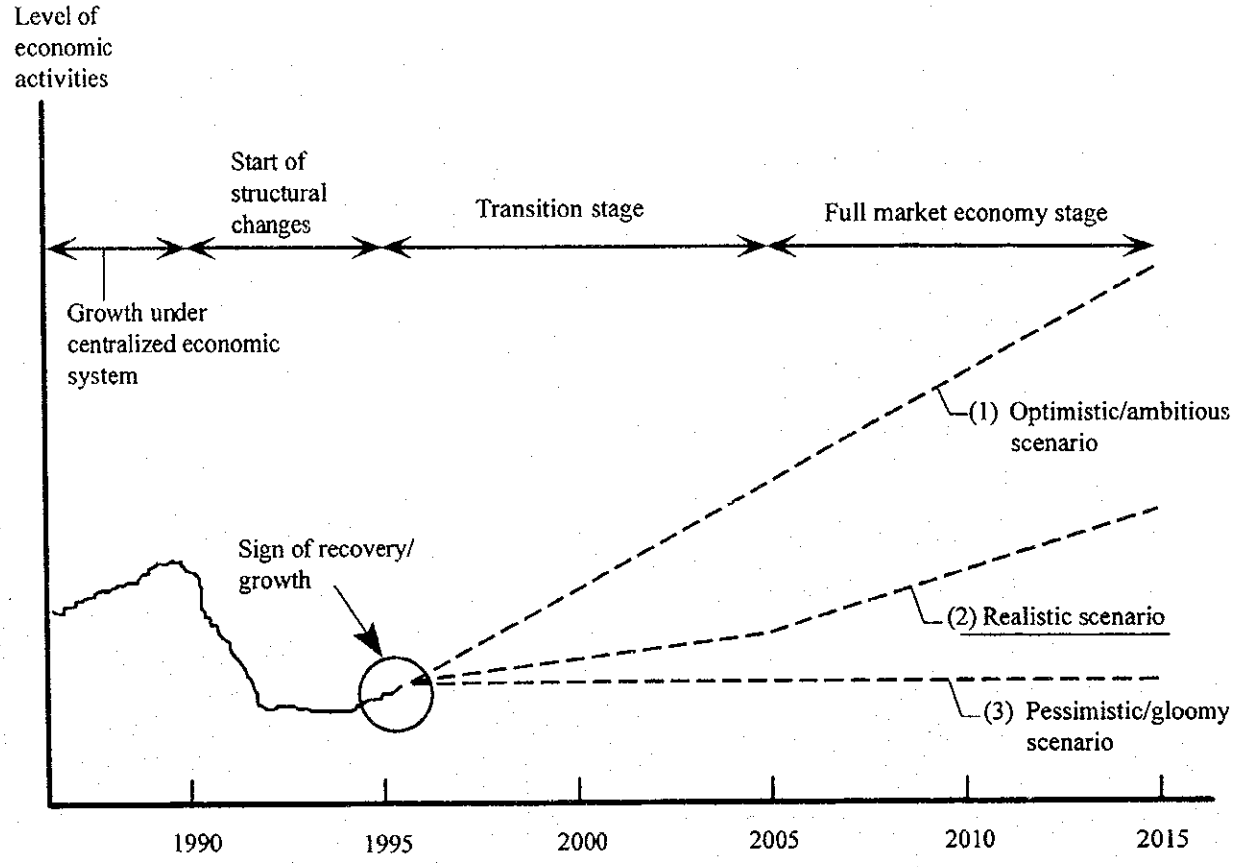

(1) Optimistic/ambitious scenario:

Water demand projection by Altai City Public Service Department (18.2% / year for industry and 12.5% / year for total)

(2) Realistic Scenario

Economic Growth (%/year)	1995-2005	2005-2015
Economy	3.0	4.0
Industry	4.0	5.0
Population (000)	18.8 (2005)	21.0 (2015)

(3) Pessimistic/gloomy scenario :

stagnation or deterioration of economy

Figure 8 Growth Targets of Altai City

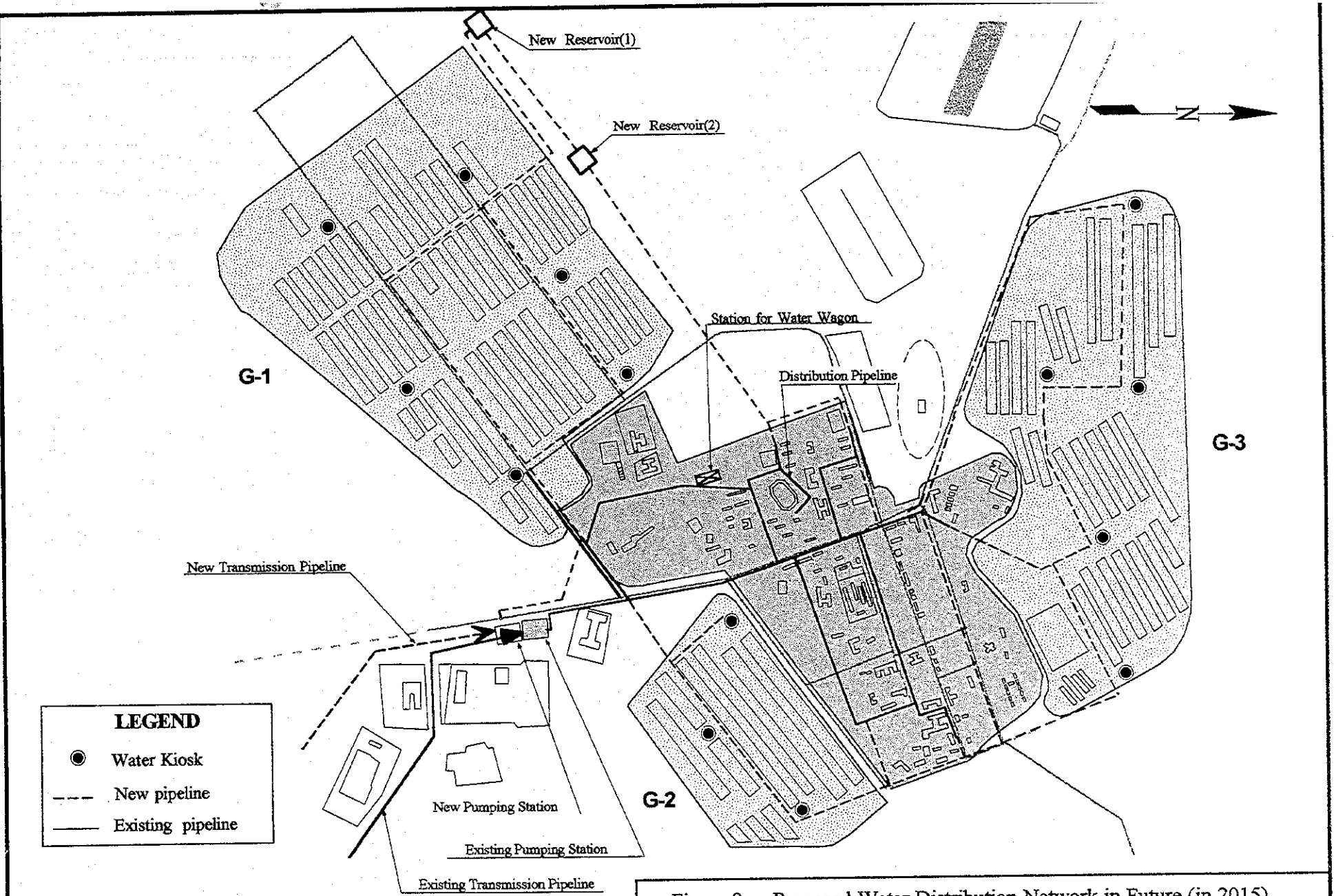

Figure 9 Proposed Water Distribution Network in Future (in 2015)

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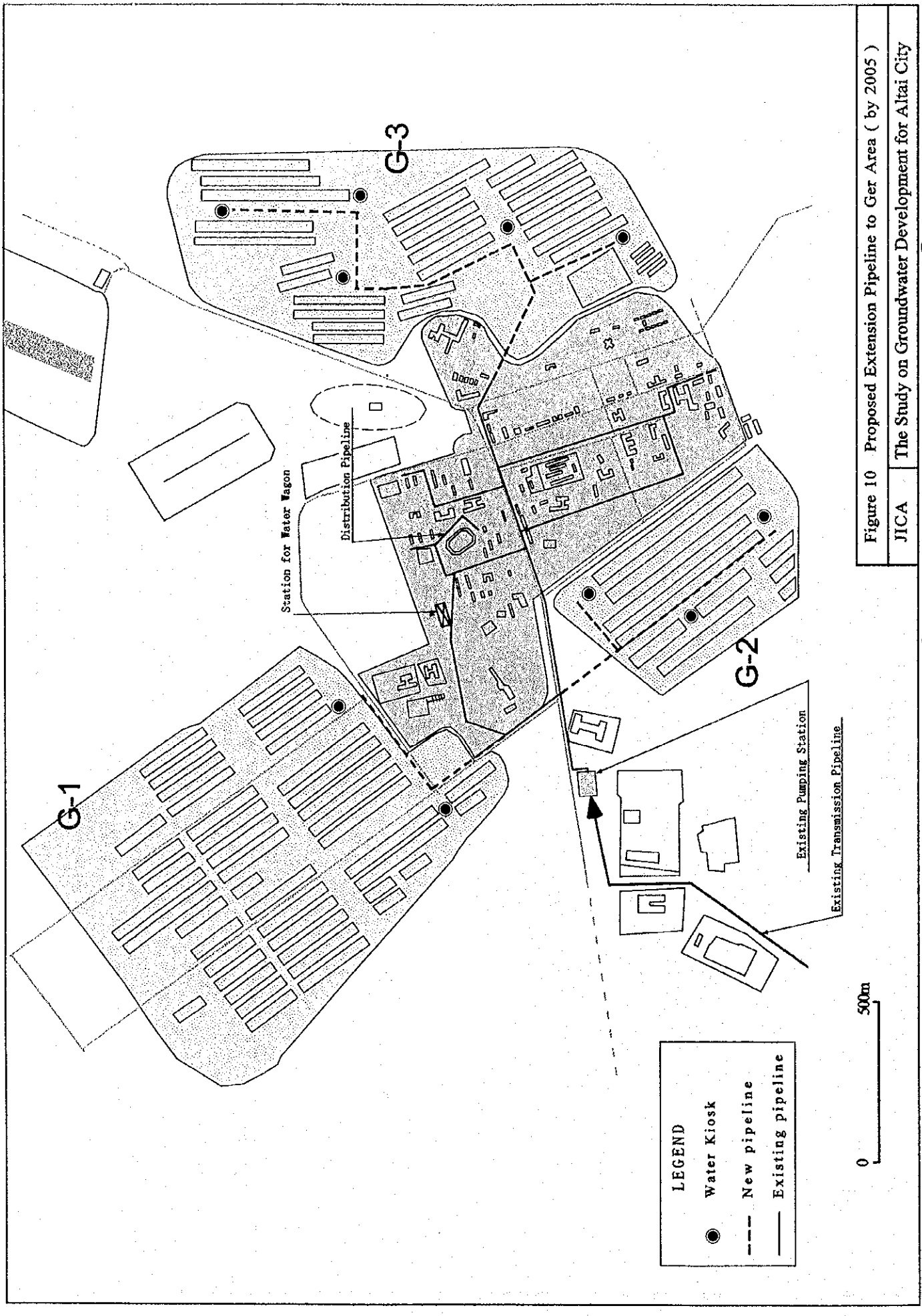

Figure 10 Proposed Extension Pipeline to Ger Area (by 2005)

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