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APPENDICES

Appendix 1-A Lithological Log Data

Appendix 1-A ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 3-37 CHANGWAT 17 AMPHOE 189 LOCATION SOI NANGTANI NEW PETHBURI RD. GRID REFERENCE 718198 DRILLED DATE FROM 090577 TO 021077 DRILLED DEPTH 219.50 M.

ORIGINAL CUTTING DATA MWWA ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA DRILLING METHOD REVERSE E ROTARY METHOD

WELL DEVELOPMENT AIR COMP: MPRESSOR, OVER PUMPING STATIC WATER LEVEL 40.44 M.

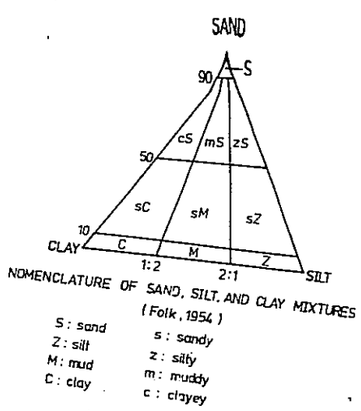
SCREEN 157.5 - 169.6, 194.5 - 206.5 M.

Lithological Log				Sedimentary Analysis				Electrical Log		Groundwater Potential																						Remarks
DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)	ROUNDNESS (Power, 1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES. (ohms-meter)	WATERLEVEL m.	WATERLEVEL date	YIELD $m^3/hr.$	YIELD date	DRAWDOWN m.	DRAWDOWN date	SPECIFIC-Y $m^3/hr/m.$	WATER QUALITY date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albuminoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2	
																						mgL															
10		C	19.0	10YR2/2	-	-	-				58.24	250977	105.00	280977	17.60	280977	20.22																					
20		C	2.5	5Y6/1	-	-	-																															
		sZ	7.0	10YR7/4	-	-	-																															
30																		280977	-	1.5	7.22	364	330	60	2	85.40	-	-	-	trace	18.40	-	-	-	3.40	-	
40		S+R+L	12.0	5Y7/2	.2-.3	high	poor																															
50		C	9.6	5Y6/1	-	-	-																															
60		S+R+L	14.4	5Y7/2	.2-.4	low	moderate																															
70		C	6.5	5Y6/1	-	-	-																															
80		S	8.0	5Y7/2	.2-.3	high	moderate																															
		S+R+L	1.5	N8	.2-.3	high	moderate																															
		C	3.5	5YR4/1	-	-	-																															
90		C	8.0	5Y7/2	-	-	-																															
100		S	7.5	5Y7/2	3-4	high	moderate																															
		G	7.0	N8	.3-.4	low	moderate																															
110		Z+R_1	4.0	5YR4/1	-	-	-																															
120		S+R+L	9.0	5Y7/2	.2-.3	low	moderate																															
		G+P	6.0	N8	.3-.4	high	moderate																															
130		Z	10.0	10YR5/4	-	-	-																															
140		S+R+L	4.0	10R8/2	.15-.3	low	poor																															
		C	5.0	5Y7/2	-	-	-																															
150		S+R+L	3.5	5Y7/2	.2-.3	low	poor																															
		GS	1.0	N8	.15-.2	low	moderate																															
160		C	8.5	5Y7/2	-	-	-																															
170		S+R_2	11.5	10R8/2	.2-.3	high	moderate																															
		C	3.0	5Y7/2	-	-	-																															
180		C+R_3	7.0	10YR5/4	-	-	-																															
190		C	11.0	10YR6/2	-	-	-																															
200		S	1.0	10R8/2	.3-.4	high	moderate																															
		C	3.5	10YR5/4	-	-	-																															
		S	3.0	10R8/2	2-3	high	moderate																															
		G	1.0	N8	.2-.3	high	moderate																															
		S	0.5	10R8/2	.2-.4	low	moderate																															
210		S+R+L	7.5	N8	.3-.4	high	moderate																															
		Z	-	10YR5/4	-	-	-																															
220																																					
230																																					
240																																					
250																																					
260																																					
270																																					
280																																					
290																																					
300																																					

R_1 = quartz fragments

R_2 = greasy sheet lookli mica or shell

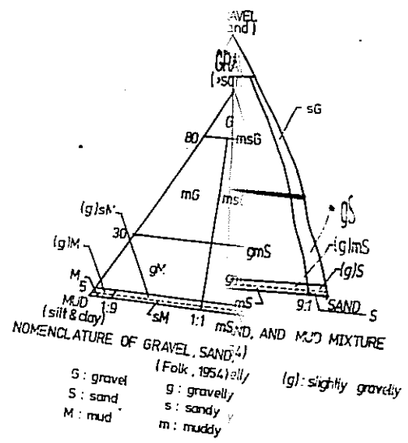
R_3 = quartz fragments



NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand
Z : silt
M : mud
C : clay

s : sandy
z : silty
m : muddy
c : clayey

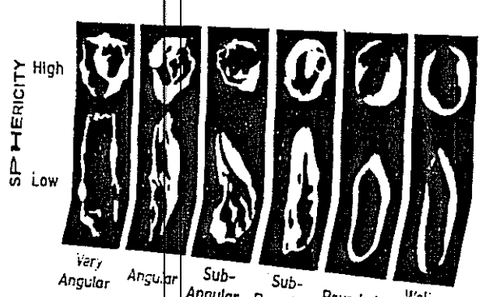


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

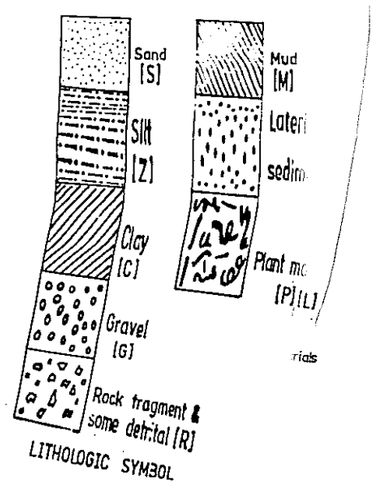
G : gravel
S : sand
M : mud

g : gravelly
s : sandy
m : muddy

(g) : slightly gravelly



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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Appendix 1-A ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 3-48 CHANGWAT 17 AMPHOE 188 LOCATION NIKOMRODFAIHUGKASUN, NEW PETHBURI RD. GRID REFERENCE 682203 DRILLED DATE FROM 050377 TO 050477 DRILLED DEPTH 221.0 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD DIRECT ROTARY METHOD STATIC WATER LEVEL 33.77 M.

WELL DEVELOPMENT AIR COMPRESSOR, OVER PUMPING, SURGING SCREEN 124.72 - 134.36, 173.62 - 185.75 M.

Lithological Log

DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)
10		C	7.0	5YR3/4
20		Z	15.0	5Y7/2
30		Z	9.5	5YR5/6
		S	1.75	10YR5/4
40		Z	6.75	10R5/2
		Z	6.8	10YR5/4
50		S•R•L	2.0	10YR8/2
		M	5.3	5Y8/1
60		S•R•L	1.7	10YR7/4
		S•R•L	3.48	10YR7/4
		S•R•L	3.62	10YR7/4
		C	2.0	N4
70		S•R•L	3.05	5Y8/1
		M	10.8	10YR5/4
80		gS	2.95	N8
		M	10.35	5YR4/4
90		S•R•L	6.15	10YR7/4
100		S•R•L	6.7	10YR8/2
110		C	7.0	N5
		C•R	5.93	10YR5/4
120		S•P	7.7	10YR7/4
130		Z	2.65	5YR6/4
		S•R•L	4.72	5YR8/4
		C	1.43	10YR5/4
140		S•R•L•P	5.79	10YR8/2
150		M_1	7.08	10YR5/4
		S•R•L	14.7	5YR5/6
160		S•R•L	2.5	10YR8/2
170		C	6.0	10YR7/4
		S•R•L	2.8	?
180		C	5.1	5Y7/2
		C	1.6	10R5/6
		S	1.5	5YR6/4
190		S•R•L	6.97	5YR6/4
200		Z	13.53	5R6/2
210		S•R•L	9.6	5YR6/4
220		C	11.4	5YR4/1
230				
240				
250				
260				
270				
280				
290				
300				

Sedimentary Analysis

ROUNDNESS (Power, 1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION
-	-	-	Shelf mud
-	-	-	
-	-	-	Delta [Distributary mouth bar]
.2 - .3	high	poor	
-	-	-	
-	-	-	
.2 - .4	high	poor	
-	-	-	Delta [Delta front & sheet sand]
.15 - .3	low	moderate	
.3 - .4	low	poor	
.3 - .4	high	well	
-	-	-	
.2 - .3	high	moderate	
-	-	-	
.2 - .4	high	moderate	
-	-	-	Delta [Deltaic plain]
.2 - .3	high	moderate	
.2 - .3	low	moderate	
-	-	-	
-	-	-	
.3 - .6	high	moderate	
-	-	-	
.3 - .4	high	poor	
-	-	-	
.2 - .3	low	poor	
-	-	-	
.2 - .4	low	poor	
.2 - .3	low	poor	
-	-	-	
?	?	?	
-	-	-	
.15 - .2	low	poor	
.15 - .3	low	poor	
-	-	-	
.2 - .4	low	poor	
-	-	-	

Electrical Log

SP (mv.) | RES. (ohms-meter)

Groundwater Potential

WATERLEVEL m.	date	YIELD m^3/hr	date	DRAWDOWN m.	date	SPECIFIC-Y $m^3/hr/m.$
46.55	060877	300.0	050877	12.78	050877	23.47

WATER QUALITY (mgl.)

date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albuminoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2
130777	-	5.4	7.21	264	365	118	51.12	63	0.752	-	-	-	36	0.67	-	0.226	6.72	78

Remarks

R_1, R_2 = greasy sheet looklike mica or shell

M_1 = mud + marl

NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) slightly gravelly
S : sand s : sandy
M : mud m : muddy

Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)

Very Angular	Angular	Sub-Angular	Sub-Rounded	Rounded	Well-Rounded
.15	.20	.30	.40	.60	.85

LITHOLOGIC SYMBOL

Sand [S]
Silt [Z]
Clay [C]
Gravel [G]
Rock fragment & some detrital [R]
Mud [M]
Lateritic sediment [L]
Plant materials [P]

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Appendix 1-A ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 3-46 CHANGWAT 17 AMPHOE 164 LOCATION POLICE HOSPITAL, RAMA 1 ROAD GRID REFERENCE 667195 DRILLED DATE FROM 121177 TO 011277 DRILLED DEPTH 210.0 M.

ORIGINAL CUTTING DATA MWWA ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 34.14 M.

WELL DEVELOPMENT AIR COMPRESSOR, SURGING, OVER PUMPING SCREEN 180.5 - 205.0 M.

Lithological Log

DEPTH (m)	LITHOLOGY	THICKNESS (m)	COLOR (rss)
10	C	15.5	5YR4/1
20			
30	M	28.0	10YR7/4
40			
50	S+R+L	4.5	5Y7/2
	sZ	1.0	5Y7/2
	S+R+L	5.0	5Y7/2
60	S+R+L	12.0	10YR6/6
70	sZ	8.0	10YR7/4
80	zS	8.0	5Y7/2
	S	3.0	5Y7/2
90			
100	S+R+L+P	19.7	5Y7/2
110	sZ	5.8	5Y7/2
	S+R+L	7.5	10YR5/4
120	sZ	9.5	10YR7/4
130	S+R+L	4.1	10YR7/4
	sZ	3.4	5YR3/2
	S+R+L	2.0	5Y7/2
140	S+R+L	4.3	10YR5/4
150	sZ	8.7	10YR6/6
	S+R+L	3.0	5Y7/2
	sZ+R	3.5	10YR7/4
160	S+R+L	3.5	5Y6/1
	gS	1.0	5Y6/1
	S+R+L	3.5	5Y6/1
	gS+R+L	2.0	5Y6/1
170	sZ	4.6	10YR7/4
	S+R+L	2.0	10YR7/4
180	sZ	7.5	10YR7/4
	sG	1.5	5YR4/4
	S+R+L	3.0	5YR4/4
190	S+R+L	3.0	5YR4/4
	S+R+L	1.5	5YR4/4
	S+R+L	2.1	5YR4/4
200	S+R+L	4.2	N7
	gS+R+L	1.2	N7
	S+R+L	4.5	N7
	S+M	1.5	N7
	S	2.0	N7
210	sZ	5.0	5Y7/2
220			
230			
240			
250			
260			
270			
280			
290			
300			

Sedimentary Analysis

ROUNDNESS (Power, 1953)	SPHERICITY (Power, 1953)	SORTING	ENVIRONMENT OF DEPOSITION
-	-	-	Shelf mud
-	-	-	
-	-	-	Delta [Deltaic plain]
.2 - .3	high	well	
-	-	-	
.35 - .3	low	moderate	
.2 - .4	low	poor	
-	-	-	
.2 - .3	high	poor	
.35 - .3	high	well	
.2 - .4	low	moderate	Delta [Delta front & sheet sand]
-	-	-	
.35 - .3	low	poor	
-	-	-	
.35 - .3	high	moderate	
-	-	-	
.35 - .3	low	moderate	
.35 - .3	low	poor	
-	-	-	
.2 - .4	low	poor	
.15 - .3	low	moderate	Delta [Deltaic plain]
.2 - .6	low	moderate	
.35 - .3	high	well	
.3 - .4	low	moderate	
.35 - .4	high	moderate	
.2 - .4	low	poor	
.15 - .3	low	moderate	
.35 - .4	high	moderate	
.4 - .6	low	moderate	
.2 - .4	low	poor	
.15 - .3	low	poor	
.2 - .4	low	moderate	
.15 - .3	high	moderate	
.35 - .4	low	poor	
.3 - .6	high	moderate	
.35 - .3	low	moderate	
.35 - .4	low	poor	
.35 - .3	low	moderate	
-	-	-	

Electrical Log

SP (mv.) RES. (ohms-meter)

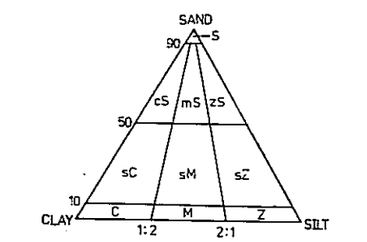
Groundwater Potential

WATERLEVEL m.	date	YIELD m³/hr.	date	DRAWDOWN m.	date	SPECIFIC-Y m³/hr/m.
46.33	241277	300.0	241277	12.19	241277	24.61

WATER QUALITY (mgL.)

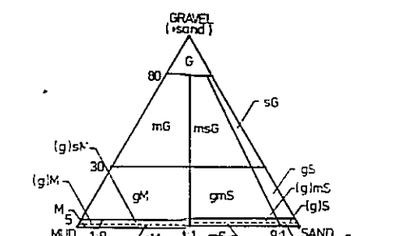
date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albu-minoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2
261277	-	7.5	7.21	220.0	760.0	324.0	370.0	34.1	0.98	-	-	-	86.4	0.77	-	0.848	25.5	62.0

Remarks



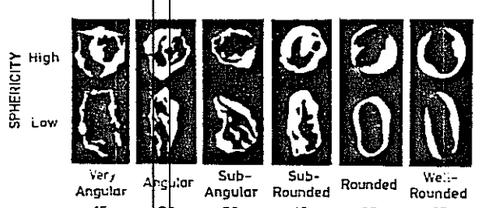
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

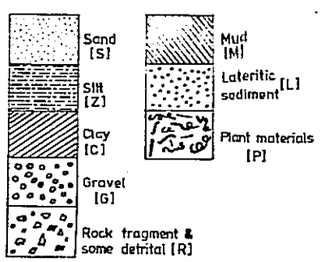


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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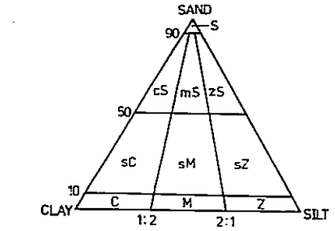
Appendix 1-A **ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS**

WELL No 3-37 CHANGWAT 17 AMPHOE 188 LOCATION SOI NANGTANI NEW PETHBURI RD. GRID REFERENCE 718198 DRILLED DATE FROM 090577 TO 021077 DRILLED DEPTH 219.50 M.

ORIGINAL CUTTING DATA MWWA ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 40.44 M.

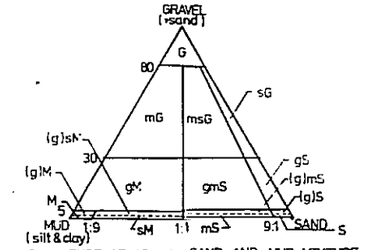
WELL DEVELOPMENT AIR COMPRESSOR, OVER PUMPING SCREEN 157.5 - 169.6, 194.5 - 206.5 M.

Lithological Log					Sedimentary Analysis				Electrical Log		Groundwater Potential																		Remarks
DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m.)	COLOR (rss)	ROUNDNESS (Power, 1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES. (ohms-meter)	WATER LEVEL m.	date	YIELD m^3/hr	date	DRAWDOWN m.	date	SPECIFIC-Y $m^3/hr/m.$	WATER QUALITY mgL												
																		date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid.	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albuminoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2	
10		C	19.0	10YR2/2	-	-	-				58.24	250977	105.00	280977	17.80	280977	20.22														
20		C	2.5	5Y6/1	-	-	-																								
		Z	7.0	10YR7/4	-	-	-											280977	-	1.5	7.22	364	330	60	2	85.40	-	-	-	trace	18.40	-	-	-	3.40	-	
30		S•R•L	12.0	5Y7/2	.2-.3	high	poor																								
40		C	9.6	5Y6/1	-	-	-																								
50		S•R•L	14.4	5Y7/2	.2-.4	low	moderate																								
60		C	6.5	5Y6/1	-	-	-																								
		S	8.0	5Y7/2	.2-.3	high	moderate																								
70		S•R•L	1.5	N8	.2-.3	high	moderate																								
		C	3.5	5YR4/1	-	-	-																								
80		C	8.0	5Y7/2	-	-	-																								
90		S	7.5	5Y7/2	3-4	high	moderate																								
100		G	7.0	N8	.3-.4	low	moderate																								
110		Z•R_1	4.0	5YR4/1	-	-	-																								
120		S•R•L	9.0	5Y7/2	.2-.3	low	moderate																								R_1= quartz fragments
130		G•P	6.0	N8	.3-.4	high	moderate																								
		Z	10.0	10YR5/4	-	-	-																								
140		S•R•L	4.0	10R8/2	.15-.3	low	poor																								
		C	5.0	5Y7/2	-	-	-																								
150		S•R•L	3.5	5Y7/2	.2-.3	low	poor																								
		gS	1.0	N8	.15-.2	low	moderate																								
160		C	8.5	5Y7/2	-	-	-																								
170		S•R_2	11.5	10R8/2	.2-.3	high	moderate																								R_2=greasy sheet looki mica or shell
		C	3.0	5Y7/2	-	-	-																								
180		C•R_3	7.0	10YR5/4	-	-	-																								R_3=quartz fragments
190		C	11.0	10YR6/2	-	-	-																								
		S	1.0	10R8/2	.3-.4	high	moderate																								
200		C	3.5	10YR5/4	-	-	-																								
		S	3.0	10R8/2	.2-.3	high	moderate																								
		G	1.0	N8	.2-.3	high	moderate																								
		S	0.5	10R8/2	.3-.4	low	moderate																								
		S•R•L	7.5	N8	.3-.4	high	moderate																								
210		Z	-	10YR5/4	-	-	-																								
220																															
230																															
240																															
250																															
260																															
270																															
280																															
290																															
300																															



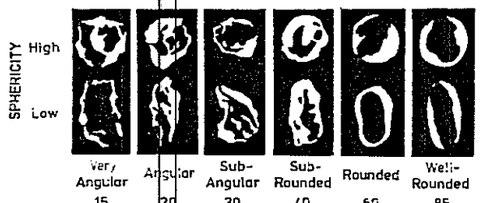
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

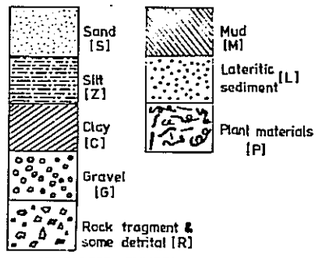


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slighly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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Appendix 1-A **ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS**

WELL No 3-34 CHANGWAT 17 AMPHOE 186 LOCATION SOI UDOMSUK , SUKHUMVIT RD. GRID REFERENCE 606127 DRILLED DATE FROM 301077 TO 091177 DRILLED DEPTH 180.0 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 34.3 M.

WELL DEVELOPMENT AIR COMPRESSOR , OVER PUMPING SCREEN 129.0 - 136.5 154.0 - 167.5 M.

Lithological Log / Sedimentary Analysis

DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)	ROUNDNESS (Power,1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION
10		C	10.5	5YR2/2	-	-	-	Shelf mud
20		C	8.5	5Y4/1	-	-	-	
		C	8.0	10YR7/4	-	-	-	
30		S+R+L	5.0	10YR7/4	.15 -.3	low	moderate	
40		C	11.0	N6	-	-	-	Delta [Distributary mouth bar]
		S	1.0	10YR7/4	.15 -.3	low	poor	
50		C	3.5	N4	-	-	-	
		G	6.0	N6	.3 -.4	low	moderate	
60		C	5.5	5Y6/1	-	-	-	
		S+R+L	5.0	10YR6/6	.2 -.4	low	poor	
70		C	4.5	N5	-	-	-	
		gS+R+L	3.5	N6	.15 -.4	low	poor	
80		M	3.5	5YR4/1	-	-	-	
		S+R+L	7.5	10YR7/4	.15 -.3	low	moderate	
90		C	2.5	5Y4/1	-	-	-	
		S+R+L	9.0	5Y6/1	.2 -.4	low	moderate	Delta [Delta front & sheet sand]
100		C	1.5	5Y6/1	-	-	-	
110		C	22.5	10YR7/4	-	-	-	
120		sZ	6.0	5Y7/2	-	-	-	
130		S+R+L	1.0	10YR7/4	.15 -.3	low	poor	
		sZ	3.5	5Y7/2	-	-	-	
140		S+R+L	3.0	10YR7/4	.15 -.3	low	poor	
		gS+R+L	4.5	10YR8/2	.15 -.4	low	poor	
150		sZ	3.0	10YR6/6	-	-	-	
		sZ	14.5	10YR7/4	-	-	-	Delta [Deltaic plain]
160		S+R+L	10.5	10YR7/4	.2 -.4	low	poor	
170		S+R+L	3.0	N7	.2 -.4	low	moderate	
		C+R	2.5	10YR5/4	-	-	-	
180		M	10.0	10YR5/4	-	-	-	
190								
200								
210								
220								
230								
240								
250								
260								
270								
280								
290								
300								

Electrical Log

SP (mv.) / RES (ohms-meter)

Groundwater Potential

WATERLEVEL m.	date	YIELD m³/hr.	date	DRAWDOWN m.	date	SPECIFIC-Y m³/hr/m.
48.33	050178	300.00	050178	14.03	050178	21.38

WATER QUALITY (mgL.)

date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid.	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albu-minoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2
170178	-	0.26	7.59	348.0	360.0	88.0	16.0	62.5	-	-	-	-	32.80	-	-	0.236	1.44	28.0

Remarks

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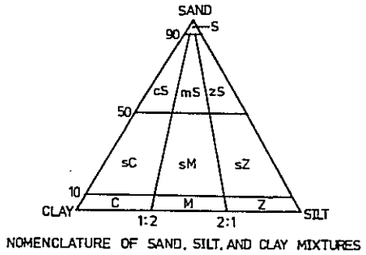
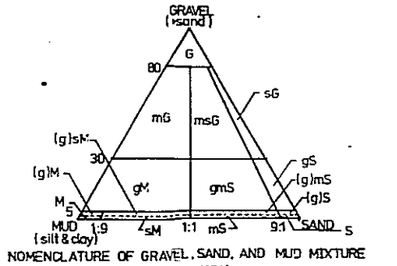


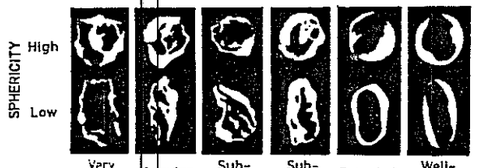
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

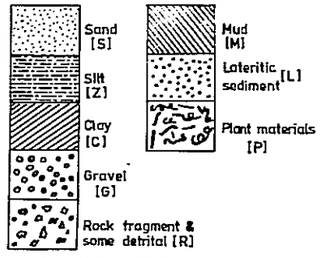


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

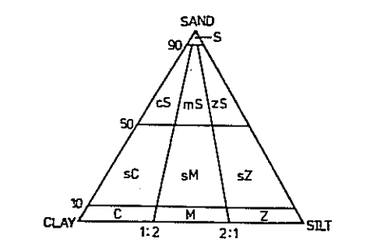
Appendix 1-A ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 3-32 CHANGWAT 17 AMPHOE 166 LOCATION SRINAKARINVIROJ UNIVERSITY, SUKUMVIT RD. GRID REFERENCE 697193 DRILLED DATE FROM 230278 TO 180378 DRILLED DEPTH 213.41 M

ORIGINAL CUTTING DATA M.W.W.A. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA M.W.W.A. DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 41.46 M

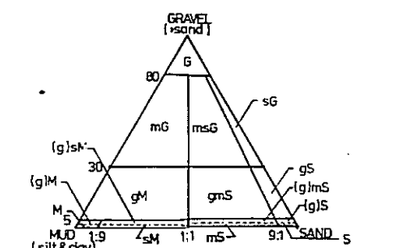
WELL DEVELOPMENT OVER PUMPING SCREEN 170.00 - 181.00 , 198.00 - 206.00 M

Lithological Log					Sedimentary Analysis				Electrical Log		Groundwater Potential																				Remarks
DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)	ROUNDNESS (Power, 1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES. (ohms-meter)	WATER LEVEL m.	WATER LEVEL date	YIELD m³/hr.	YIELD date	DRAWDOWN m.	DRAWDOWN date	SPECIFIC-Y m³/hr/m.	WATER QUALITY mgl. date	color	turbidity jtu.	pH	tot. alkalinity	tot. dis. solid	tot. hardness	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albuminoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2	
10		C	15.24	5YR4/1	-	-	-				57.95	230478	300.00	230478	16.49	230478	18.19																				
20		gH	3.05	10YR8/2	-	-	-																													
		sZ	6.10	10YR5/4	-	-	-																													
30		C	3.04	5YR6/1	-	-	-																													
		C	3.05	10YR6/2	-	-	-																													
		sZ	4.88	10YR5/4	-	-	-																													
40		C	4.27	N6	-	-	-																													
		sZ	3.05	5Y8/1	-	-	-																													
		C	3.05	5YR4/1	-	-	-																													
50		C	3.05	5YR2/1	-	-	-																													
		Z	3.04	5YR4/1	-	-	-																													
		S	5.41	5Y8/1	.2-.3	high	moderate																													
60		S+R+L	9.15	5Y7/2	.2-.3	low	moderate																													
70																																			
80		M+R_1	15.85	10YR5/4	-	-	-																													
90		Z+R_2	9.15	5Y7/2	-	-	-																													R_1+R_2 = quartz detrital
		gH	3.05	5YR7/2	-	-	-																													
		gM	3.05	5Y7/1	-	-	-																													
100		mS	1.22	5YR4/1	.15-.3	high	poor																													
		zS	4.88	10YR7/4	.15-.3	low	poor																													
110		sZ	5.79	5Y7/3	-	-	-																													
		S	2.13	10YR5/4	.2-.3	low	poor																													
120		sC	7.13	10YR7/4	-	-	-																													
		S+R+L	2.44	10YR8/2	.2-.3	high	moderate																													
130		S	7.31	N8	.3-.4	high	poor																													
		sC	1.83	N6	-	-	-																													
140																																			
		M	21.34	10YR5/4	-	-	-																													
150																																			
		C	3.05	10YR7/4	-	-	-																													
160		M	5.19	10YR5/4	-	-	-																													
		C	10.97	5Y7/2	-	-	-																													
170																																			
		S+P +R+L	10.37	10YR5/4	.2-.3	high	poor																													
180		mS	5.49	10YR5/4	.15-.3	low	poor																													
		M	10.97	10YR7/4	-	-	-																													
190																																			
		S+R+L	9.76	10YR5/4	2-3	high	poor																													
200		M	-	10YR7/4	-	-	-																													
210																																			
220																																			
230																																			
240																																			
250																																			
260																																			
270																																			
280																																			
290																																			
300																																			



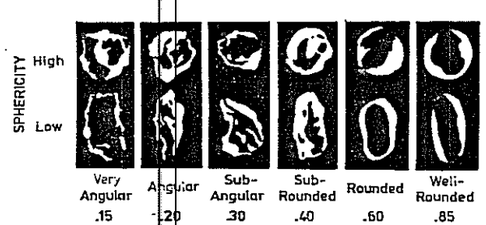
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

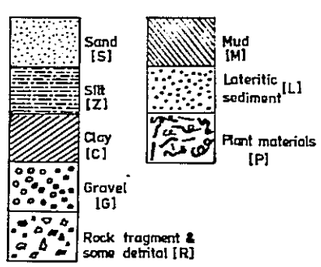


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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Chulalongkorn Univer

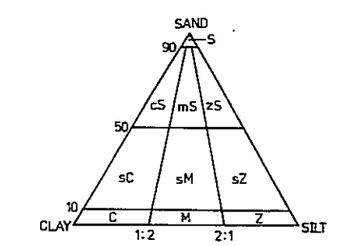
Appendix 1-A **ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS**

WELL No 3-5 CHANGWAT 17 AMPHOE 186 LOCATION SOI 64/1 SUKUMVIT RD. GRID REFERENCE 742133 DRILLED DATE FROM 040178 TO 180178 DRILLED DEPTH 203.0 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 41.76 M.

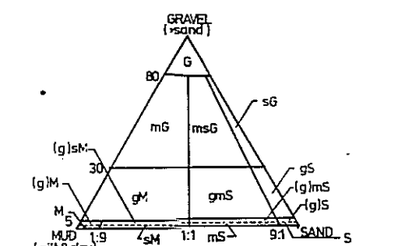
WELL DEVELOPMENT AIR COMPRESSOR, SURGING, OVER PUMPING SCREEN 168.6-175.5, 179.5-192.5 M

Lithological Log					Sedimentary Analysis				Electrical Log		Groundwater Potential																				Remarks
DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)	ROUNDNESS (Power, 1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES. (ohms-meter)	WATER LEVEL m.	WATER LEVEL date	YIELD m^3/hr	YIELD date	DRAWDOWN m.	DRAWDOWN date	SPECIFIC-Y $m^3/hr/m.$	WATER QUALITY (mgL.) date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albuminoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2	
											51.06	080278	300.0	080278	9.30	080278	32.25																			
10		C	20.0	10YR2/2	-	-	-																									
20																																
30		sZ	11.5	10YR5/4	-	-	-											080278	-	14.0	7.7	300.0	345.0	40.0	4.0	45.4	0.30	0.073	-	-	14.4	-	-	0.133	0.96	—	
		sZ	6.5	5Y6/1	-	-	-																									
40		C	9.0	10YR5/4	-	-	-																									
50		S+R+L	1.0	10YR8/2	.2 -.4	low	poor																									
		sZ	9.0	10YR8/2	-	-	-																									
60		S+R+L	3.0	10YR7/4	.2 -.4	low	moderate																									
70		sZ	10.0	10YR5/4	-	-	-																									
		S+R+L	1.6	10YR5/4	.3 -.4	low	poor																									
		sZ	3.9	10YR8/2	-	-	-																									
80																																
90		S+R+L (2)	15.1	5Y7/2	.15 -.3	low	well																									
		gS+R+L	1.4	10YR2/4	.15 -.3	low	well																									
100		S+R+L (3)	4.8	10YR7/4	.2 -.4	low	moderate																									R_1, R_2, R_3, R_4 = greasy she
		S+R+L	7.2	N7	.2 -.4	low	poor																									looklike mica or shel
110		gS+R+L	9.5	5Y6/1	.3 -.6	high	moderate																									
		S	2.0	5Y7/2	.15 -.3	low	poor																									
120		sZ	5.3	10YR5/4	-	-	-																									
		S+R+L	2.7	N7	.2 -.4	low	poor																									
130		M	8.0	10YR5/4	-	-	-																									
		gS	1.5	10YR7/4	.2 -.4	low	poor																									
		sZ	2.5	10YR5/4	-	-	-																									
140		S+R+L	4.0	10YR7/4	.2 -.4	low	moderate																									
150		S+R+L (4)	6.0	10YR7/4	.2 -.4	low	moderate																									
		gS+R+L	4.5	10YR8/2	.15 -.4	low	moderate																									
		sZ	6.0	10YR5/4	-	-	-																									
160		S	3.5	10YR7/4	.2 -.4	high	moderate																									
		sZ	2.2	10YR5/4	-	-	-																									
170		gS	3.8	5Y7/2	.2 -.4	low	moderate																									
		sZ	3.1	10YR5/4	-	-	-																									
		S+R+L	6.9	N7	.2 -.4	low	moderate																									
180		sZ	4.0	10YR5/4	-	-	-																									
		S+R+L	6.1	N7	.2 -.4	low	well																									
190		gS+R+L	2.9	5Y6/1	.2 -.4	low	moderate																									
		S+R+L	4.0	5Y6/1	.2 -.4	low	poor																									
200		M	10.5	10YR5/4	-	-	-																									
210																																
220																																
230																																
240																																
250																																
260																																
270																																
280																																
290																																
300																																



NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

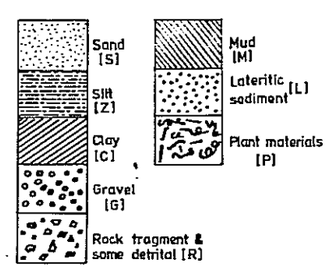
S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey



NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy

Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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Appendix 1-A ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 1-56 CHANGWAT 17 AMPHOE 188 LOCATION NATIONAL HOUSTING AUTHORITY, PRACHASONGKROA RD. GRID REFERENCE 685720

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA.

DRILLED DATE FROM 130877 TO -

DRILLING METHOD REVERSE ROTARY METHOD

WELL DEVELOPMENT AIR PUMPING, OVER PUMPING

DRILLED DEPTH 247.0 M.

STATIC WATER LEVEL 31.70 M.

SCREEN 205.0 - 209.0, 214.7 - 219.24, 226.5 - 238.9 M.

Lithological Log / Sedimentary Analysis

DEPTH (m): 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 230, 240, 250, 260, 270, 280, 290, 300

GRAIN SIZE: g s m

LITHOLOGY	THICKNESS (m)	COLOR (rss)	ROUNDNESS (Power, 1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION
C	12.10	5Y6/1	-	-	-	
C	9.07	10YR6/6	-	-	-	
sZ	15.12	10YR7/4	-	-	-	
C	15.12	10YR8/6	-	-	-	
S+R+L	3.02	N7	?	?	?	
sZ	6.05	10YR7/4	-	-	-	
S	3.02	N7	?	?	?	
sZ	21.17	10YR7/4	-	-	-	
S+R+L	15.12	5Y8/1	.2-.3	low	moderate	
C	18.15	N7	-	-	-	
S+R+L	6.04	10YR8/6	.2-.4	low	poor	
C	46.88	10YR6/6	-	-	-	
sZ	34.14	10YR7/4	-	-	-	
S+R+L	4.00	5Y7/2	.15-.3	low	poor	
sZ	5.70	10YR7/4	-	-	-	
S	4.54	5Y7/2	.15-.3	low	moderate	
sZ	7.26	10YR7/4	-	-	-	
gS	12.40	5Y7/2	.2-.4	high	moderate	
C	9.07	10YR7/4	-	-	-	

Electrical Log

SP (mv)	RES (ohms-meter)

Groundwater Potential

WATERLEVEL m.	WATERLEVEL date	YIELD m^3/hr	YIELD date	DRAWDOWN m.	DRAWDOWN date	SPECIFIC-Y $m^3/hr/m.$
42.52	231277	301.91	231277	10.82	231277	27.90

WATER QUALITY (mgl.)

date	color	turbidity jtu.	pH	tot. alkalinity	tot. dis. solid	tot. hardness	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albuminoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2
201277	-	0.35	7.39	310	375	70	56	31.2	0.6	-	-	0.0072	23.2	trace	-	0.31	2.88	30.0

Remarks

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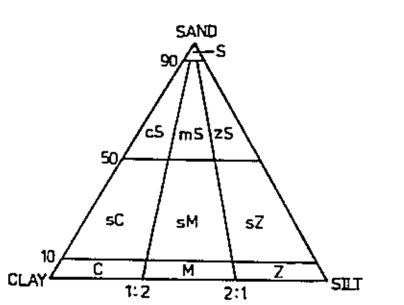
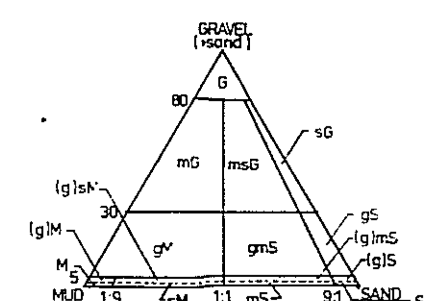


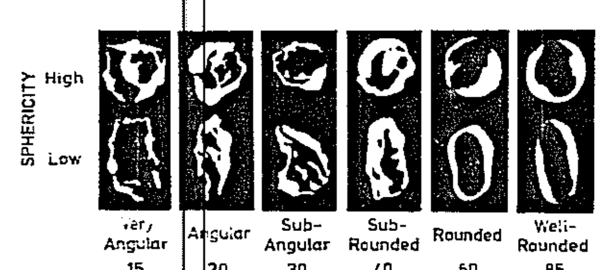
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

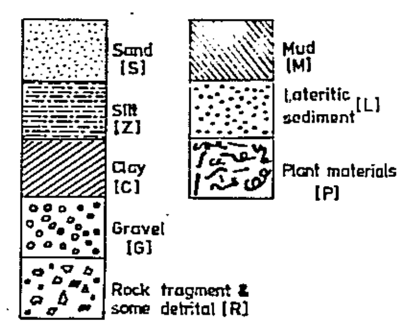


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

Appendix 1-A

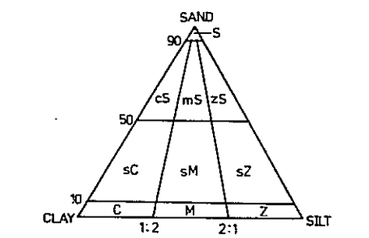
ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 1-38 CHANGWAT 17 AMPHOE 188 LOCATION WAT TASHARUN-SOONTARIKARAM , RAJPAROP RD. GRID REFERENCE 674215 DRILLED DATE FROM 180777 TO - DRILLED DEPTH 230.0 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 33.53 M.

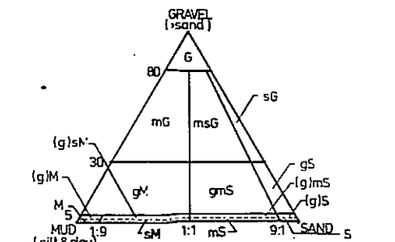
WELL DEVELOPMENT - SCREEN 197.0 - 221.0 M.

Lithological Log					Sedimentary Analysis				Electrical Log		Groundwater Potential																				Remarks
DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)	ROUNDNESS (Power,1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES (ohms-meter)	WATERLEVEL m.	WATERLEVEL date	YIELD $m^3/hr.$	YIELD date	DRAWDOWN m.	DRAWDOWN date	SPECIFIC-Y $m^3/hr/m.$	WATER QUALITY date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid.	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albu-minoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2	
10		C	17.0	5Y2/1	-	-	-				58.83	240977	301.91	240977	25.3	240977	11.93																				
20																																				
30		C	12.0	5Y8/1	-	-	-											270977	-	3.5	7.0	256	710	270	336	93.7	-	-	-	-	45.6	0.32	-	0.535	39.84	69	
40		S	6.4	10YR7/4	.3 - .4	low	poor																													
50		M	17.6	10YR7/4	-	-	-																													
60		S+R+L	6.6	5Y7/2	.3 - .4	high	moderate																													
		Z	2.4	10YR5/4	-	-	-																													
70		S+R+L	10.5	10YR8/2	.2 - .4	low	poor																													
80		Z	5.0	5Y8/4	-	-	-																													R$_1$ = greasy sheet lookir mica or shell .
		S	1.5	10YR7/4	?	?	?																													
		sZ	7.3	5Y8/1	-	-	-																													
90		S	6.1	10YR7/4	.3 - .4	low	moderate																													
100		S+R+L	15.6	5Y7/2	.2 - .3	low	poor																													
110																																			
120		C	8.5	10YR6/6	-	-	-																													
		S+R+L	7.1	10YR7/4	.2 - .3	low	poor																													
130		M	9.1	10YR5/4	-	-	-																													
		Z	4.3	5Y8/4	-	-	-																													
140		S+R+L	2.5	10YR8/2	.3 - .4	high	moderate																													
150		M	16.9	10YR8/6	-	-	-																													
160		S+R+L	5.1	10YR7/4	.2 - .3	low	poor																													
		Z	3.8	5Y8/4	-	-	-																													
170		gS+R+L	1.7	10YR8/2	.2 - .4	low	moderate																													
180		S+R+L	13.5	10YR7/4	.2 - .4	high	moderate																													
		Z	7.5	10YR8/6	-	-	-																													
190		G	4.0	10YR6/6	.3 - .4	high	moderate																													
		Z	5.0	10YR7/4	-	-	-																													
200		S	8.0	10YR5/4	.2 - .3	low	moderate																													
210		S	10.0	10YR7/4	.2 - .3	high	moderate																													
220		S	6.0	10YR6/6	.2 - .3	low	moderate																													
230		M	9.0	10YR7/4	-	-	-																													
240																																			
250																																			
260																																			
270																																			
280																																			
290																																			
300																																			



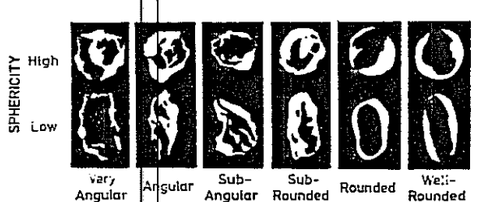
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

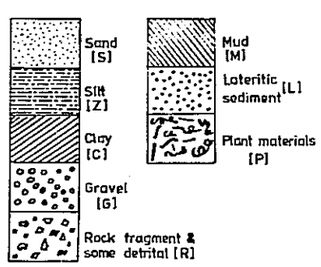


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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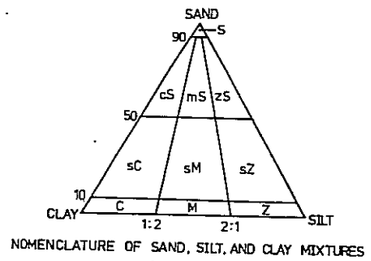
Appendix 1-A ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 1-32 CHANGWAT 17 AMPHOE 172 LOCATION SOI SANGKAWATANA 2, LADPRAOW RD. GRID REFERENCE 712268 DRILLED DATE FROM 010677 TO 230677 DRILLED DEPTH 233.00 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD REVERSE : ROTARY METHOD STATIC WATER LEVEL 38.70 M.

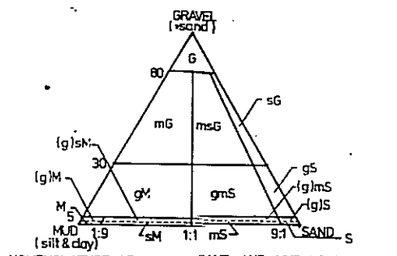
WELL DEVELOPMENT AIR PUMPING, OVER PUMPING SCREEN 192.0 - 197.0 202.0 - 221.0 M

Lithological Log					Sedimentary Analysis				Electrical Log		Groundwater Potential																			Remarks
DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)	ROUNDNESS (Power,1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES. (ohms-meter)	WATERLEVEL m.	WATERLEVEL date	YIELD m³/hr.	YIELD date	DRAWDOWN m.	DRAWDOWN date	SPECIFIC-Y m³/hr/m.	WATER QUALITY																	
																		date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid.	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albuminoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2	
																						mgL.													
10		C	26.0	N5	-	-	-				58.67	090877	301.91	090877	19.97	090677	15.12																			
20																																			
30		S	4.4	10YR2/4	.2 - .4	high	moderate											130777	-	0.54	7.15	320.0	325.0	88.0	3.0	93.72	0.68	-	-	-	28.8	trace	-	0.17	3.84	50.0	
		sZ	4.6	5Y7/2	-	-	-																													
40		gS+R	5.5	10YR7/4	.3 - .4	high	moderate																													
50		sZ	7.5	10YR6/6	-	-	-																													
60		S+R+L	9.5	5Y2/2	.15 - .3	high	well																													
		C	5.5	10YR6/6	-	-	-																													
70		C	2.0	10YR7/4	-	-	-																													
		C	4.0	10YR6/6	-	-	-																													
		sZ	2.0	10YR7/4	-	-	-																													
80		S+R+L	3.0	10YR5/4	.15 - .3	low	moderate																													
		S+R+L	3.0	10YR7/4	.15 - .3	low	moderate																													
90		S+R+L	19.0	10YR6/2	.2 - .4	low	moderate																													
100		sZ	9.0	5Y7/2	-	-	-																													
110		sZ+R	6.0	10YR6/6	-	-	-																													
		S+R+L	2.0	5Y6/1	.2 - .4	low	moderate																													
120		S	3.8	5Y6/1	.15 - .3	low	moderate																													
		gS+R+L	8.7	5Y7/2	.15 - .3	low	poor																													
130																																			
140		gS	13.3	5YR5/6	.2 - .3	high	moderate																													
		sZ	3.7	10YR7/4	-	-	-																													
150		C+R	3.0	10YR7/4	-	-	-																													
		sZ	1.5	5Y7/2	-	-	-																													
		S+R+L	3.0	10YR6/2	.2 - .4	low	moderate																													
		S	2.5	10YR8/2	.15 - .3	low	well																													
160		sZ	5.0	10YR6/6	-	-	-																													
		S+R+L	3.0	5Y7/2	.15 - .3	low	moderate																													
170		S+R+L	5.3	10YR7/4	.15 - .3	low	poor																													
180		M	25.7	10YR7/4	-	-	-																													
190																																			
200		S+R+L	5.0	10YR7/4	.15 - .3	low	poor																													
		sZ	5.0	10YR6/6	-	-	-																													
210	?	S	11.0	?	?	?	?																													
220	?	sG	3.0	10YR5/4	.15 - .4	low	well																													
		S+R+L	2.0	10YR5/4	.2 - .4	low	moderate																													
		GS+R+L	2.0	N7	.2 - .4	low	moderate																													
		S+R	1.0	10YR7/4	.15 - .3	low	moderate																													
230		C	9.0	10YR7/4	-	-	-																													
240																																			
250																																			
260																																			
270																																			
280																																			
290																																			
300																																			



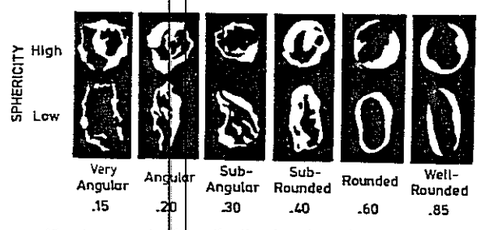
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

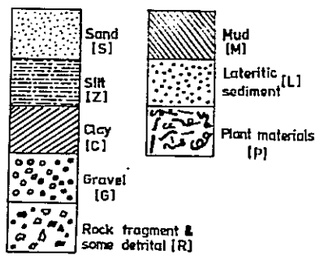


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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Appendix 1-A **ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS**

WELL No 1-30 CHANGWAT 25 AMPHOE 265 LOCATION WAT CHOLPRATANRUNGSARIT , TIWANONT RD. GRID REFERENCE 633371 DRILLED DATE FROM 111077 TO 261077 DRILLED DEPTH 240.00 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 26.04 M.

WELL DEVELOPMENT AIR PUMPING , OVER PUMPING SCREEN 213.0 - 225.0 , 228.0-236.0 M

DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)	ROUNDNESS (Power,1953)	SPHERICITY (Power,1953)	SORTING	ENVIRONMENT OF DEPOSITION
10		C	12.19	N5	-	-	-	Shelf mud
20		S+R+L	24.38	5Y8/1	.2 -.3	high	moderate	Delta [Distributary mouth bar]
30								
40		gS+R+L	9.14	5YR5/6	.15-.4	low	poor	
50		C+R_1	6.10	N7	-	-	-	Delta [Delta front & sheet sand]
60		gS+R+L	12.19	5YR5/6	.2 -.4	high	poor	
70		Z	19.81	10YR7/4	-	-	-	Delta [Distributary mouth bar]
80								
90		gS	16.76	5YR7/2	.3 -.6	low	moderate	
100								
110		C	15.24	10YR7/4	-	-	-	Delta [Delta front & sheet sand]
120								
130		C+G	30.48	10YR8/2	-	-	-	
140								
150		C+R_2	7.62	10YR7/4	-	-	-	
160								
170		gS	19.81	10YR8/6	.2 -.4	low	poor	Delta [Deltaic plain]
180		C+R_3	3.05	10YR8/6	-	-	-	
		S	6.10	5Y7/2	.2 -.4	low	moderate	
190		C+R_4	6.09	5Y7/2	-	-	-	
200		C	22.86	10YR7/4	-	-	-	
210								
220		S+R+L	12.19	10YR6/6	.2 -.4	low	moderate	
230								
240		sZ+G	19.81	10YR8/6	-	-	-	
250		sZ+G	12.19	10YR7/4	-	-	-	
260								
270								
280								
290								
300								

Electrical Log: SP (mv.), RES. (ohms-meter)

Groundwater Potential

WATERLEVEL m.	date	YIELD $m^3/hr.$	date	DRAWDOWN m.	date	SPECIFIC-Y $m^3/hr/m.$
36.98	071177	301.91	071177	8.94	071177	33.77

WATER QUALITY (mg/L)

date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid	tot. hard-ness	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albu-minoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2
081177	-	0.52	7.18	208.0	320.0	100.0	10.0	73.80	-	-	-	-	27.2	0.60	-	0.263	7.68	80.0

Remarks: $R_1R_2P_3R_4$ = quartz rock fragment.

NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g): slightly gravelly
S : sand s : sandy
M : mud m : muddy

SPHERICITY High / Low

Very Angular .15 | Angular .20 | Sub-Angular .30 | Sub-Rounded .40 | Rounded .60 | Well-Rounded .85

Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)

LITHOLOGIC SYMBOL: Sand [S], Silt [Z], Clay [C], Gravel [G], Rock fragment & some detrital [R], Mud [M], Lateritic sediment [L], Plant materials [P]

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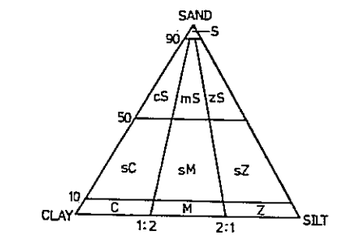
Appendix 1-A ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 1-29 CHANGWAT 25 AMPHOE 264 LOCATION SOI THEPHANOM , NONTHABURI GRID REFERENCE 651332 DRILLED DATE FROM 160377 TO 170477 DRILLED DEPTH 210.0 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 31.00 M.

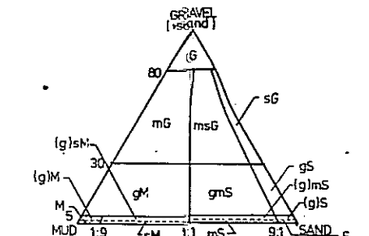
WELL DEVELOPMENT · AIR PUMPING , OVER PUMPING SCREEN 176.5 - 184.0 , 190.0 - 201.5 M

Lithological Log				Sedimentary Analysis				Electrical Log		Groundwater Potential																				Remarks
DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m.)	COLOR (rss)	ROUNDNESS (Power,1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES. (ohms-meter)	WATER LEVEL m. / date		YIELD m³/hr. / date		DRAWDOWN m. / date		SPECIFIC-Y m³/hr/m.	WATER QUALITY mgl.															
																			date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid.	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albu-minoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2	
10		C	14.3	5YR4/1	-	-	-				43.07	170477	301.91	170477	11.98	170477	25.20																
20		C	5.7	5Y7/2	-	-	-																									
		S+R+L	4.0	10YR7/4	.15 -.4	high	poor												200477	-	8.10	6.89	276.0	245.0	134.0	2.0	-	-	-	-	-	-	0.97	-	-	-	55.0	
30		sZ	1.0	5Y7/2	-	-	-																									
		S+R+L	10.0	10YR4/2	.2 -.4	high	moderate																									
40		S+R+L	4.0	5YR5/6	.2 -.4	low	moderate																									
		S+R+L	5.0	10YR7/4	.2 -.4	low	moderate																									
50		sZ	4.0	5Y7/2	-	-	-																									
		G	3.0	N7	.2 -.3	low	well																									
60		C	17.0	5Y7/2	-	-	-																									
70																																
		sZ	12.0	10YR7/4	-	-	-																									
80																																
90		S+R+L +P	18.0	10YR5/4	.15 -.3	low	poor																									
100		sZ	6.0	10YR8/2	-	-	-																									
110		S	4.0	10YR8/2	.15 -.3	high	poor																									
		sZ	5.0	10YR7/4	-	-	-																									
120		C+R	3.5	10YR7/4	-	-	-																									
		sZ	5.5	5YR5/2	-	-	-																									
130		C	5.0	10YR7/4	-	-	-																									
		C+R	3.0	10YR6/6	-	-	-																									
		sZ	1.0	5Y7/2	-	-	-																									
		S+R+L	6.0	10YR7/4	.15 -.3	low	poor																									
140		gS+R+L	3.0	10YR6/2	.2 -.4	low	moderate																									
		sZ	2.0	5Y7/2	-	-	-																									
		S+R+L	3.0	10YR5/4	.15 -.3	low	poor																									
150		sZ	2.5	10YR7/4	-	-	-																									
		gS	3.0	N7	.15 -.3	low	poor																									
		S+R+L	7.5	10YR7/4	.15 -.3	high	moderate																									
160		gS+R+L	3.0	10YR6/6	.15 -.3	low	poor																									
		gS	1.0	N7	.2 -.3	high	poor																									
170		sZ	9.5	10YR6/6	-	-	-																									
180		C	3.5	10YR6/6	-	-	-																									
		sZ	1.5	10YR6/6																												
		S+R+L	3.5	5Y7/2	.15 -.3	low	poor																									
190		gS	4.0	10YR7/4	.15 -.4	low	poor																									
		sZ	6.0	5YR4/4	-	-	-																									
		S+R+L	4.0	N7	.2 -.4	low	moderate																									
200		S+R+L	7.5	10YR7/4	.15 -.3	low	poor																									
210		sZ	8.5	10YR5/4	-	-	-																									
220																																
230																																
240																																
250																																
260																																
270																																
280																																
290																																
300																																



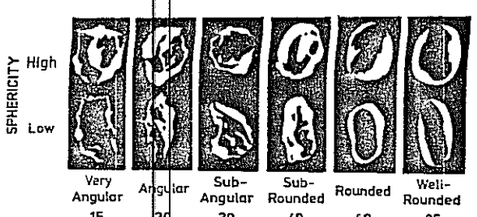
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

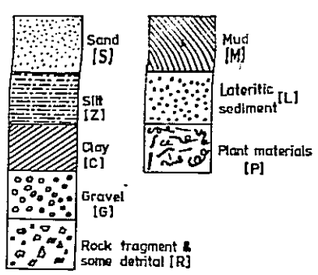


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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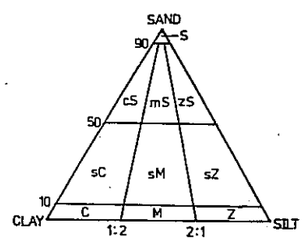
Appendix 1-A **ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS**

WELL No 1-20 CHANGWAT 17 AMPHOE 188 LOCATION 501 SOONWICHAI 4, NEWPETCHABURI RD. GRID REFERENCE 718201 DRILLED DATE FROM 130778 TO 090378 DRILLED DEPTH 254.0 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 36.58 M.

WELL DEVELOPMENT AIR PUMPING, OVER PUMPING SCREEN 213.0-223.0, 234.0-244.0 M.

Lithological Log					Sedimentary Analysis				Electrical Log		Groundwater Potential																					Remarks
DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m.)	COLOR (rss)	ROUNDNESS (Power, 1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES. (ohms-meter)	WATER LEVEL m.	WATER LEVEL date	YIELD m³/hr.	YIELD date	DRAWDOWN m.	DRAWDOWN date	SPECIFIC-Y m³/hr/m.	WATER QUALITY date	color	turbidity. jtu.	pH	tot. alkali-nity. (mg/l)	tot. dis. solid. (mg/l)	tot. hard-ness. (mg/l)	Cl (mg/l)	SO_4 as $NaSO_4$ (mg/l)	ammonia free as N (mg/l)	ammonia albuminoid as N (mg/l)	NO_3 as N (mg/l)	NO_2 as N (mg/l)	Ca (mg/l)	Fe (mg/l)	F (mg/l)	Mn (mg/l)	Mg (mg/l)	free CO_2 (mg/l)	
10		C	16.0	10YR2/2	-	-	-				65.76	010478	301.91	010478	29.18	010478	10.35																		
20		C	13.0	10YR6/2	-	-	-																											
30		S+R+L	16.0	10YR7/4	.2-.4	low	moderate											030478	-	1.6	7.4	378	330	84	5	59.6	-	-	-	-	29.6	0.09	-	0.133	2.4	-	
40		Z	12.0	5Y7/2	-	-	-																											
50		S+R+L	4.4	10YR7/4	.2-.4	low	moderate																											
60		M	8.6	5Y7/2	-	-	-																											
70		S+R+L	8.0	10YR5/4	.2-.4	low	poor																											
80		S+R+L	3.0	10YR8/2	.3-.4	low	moderate																											
90		Z	10.0	10YR7/4	-	-	-																											
100		$S+R_1+L$	8.0	10YR5/4	.2-.4	high	poor																											
110		sZ	9.0	10YR8/2	-	-	-																											$R_1 R_2 R_3 R_4$ = grease sheet mica or shell.
120		gS+R+L	13.0	10YR7/4	.2-.4	low	poor																											
130		Z	2.0	10YR8/2	-	-	-																											
140		S+R+L	11.0	10YR7/4	.2-.4	high	poor																											
150		$S+R_2+L$	8.5	10YR7/4	.2-.4	high	poor																											
		Z	1.5	5Y5/1	-	-	-																											
		$S+R_3+L$	4.4	10YR5/4	.2-.3	high	poor																											
		sZ	8.6	5Y7/2	-	-	-																											
		sG	4.0	10YR7/4	.3-.4	high	moderate																											
		C	5.0	5Y7/2	-	-	-																											
		gS+R+L	4.0	10YR7/4	.3-.4	low	poor																											
		M	24.0	10YR7/4	-	-	-																											
		S+R+L	3.5	10YR8/6	.2-.4	low	poor																											
		C	15.5	10YR7/4	-	-	-																											
		S+R+L	3.0	10YR8/6	.3-.4	high	moderate																											
		S+R+L	3.0	10YR5/4	.3-.4	high	moderate																											
		S+R+L	3.0	5Y7/2	.2-.4	low	moderate																											
		gS	1.0	5Y7/2	.2-.4	low	poor																											
		M	11.0	10YR5/4	-	-	-																											
		$S+R_4+L$	9.0	10YR5/6	.2-.4	low	poor																											
		S+R+L	1.0	N7	.2-.4	low	poor																											
		C	10.0	10YR4/2	-	-	-																											



NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

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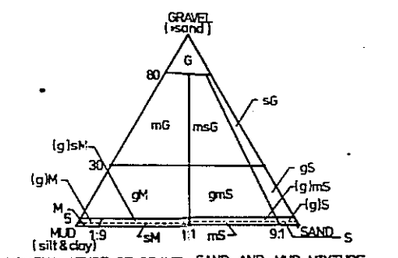
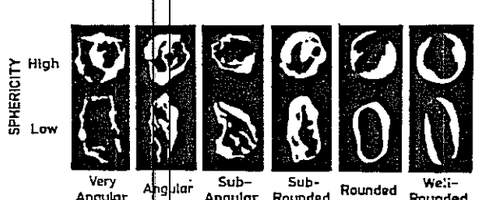
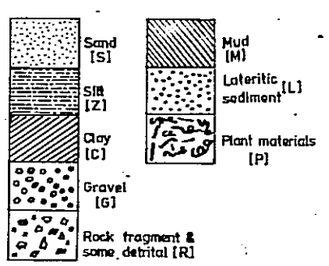


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g) : slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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Appendix 1-A **ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS**

WELL No 1-17 CHANGWAT 25 AMPHOE 264 LOCATION TALAD KWAN , NONTABURI GRID REFERENCE 603322 DRILLED DATE FROM 080277 TO 200277 DRILLED DEPTH 219.50 M.

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA. DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 27.14 M.

WELL DEVELOPMENT AIR PUMPING , OVER PUMPING SCREEN 157.0 - 169.0 , 170.0 - 183.5 M.

Lithological Log

DEPTH (m)	GRAIN SIZE g s m	LITHOLOGY	THICKNESS (m)	COLOR (rss)
10		C	12.0	N4
		C	3.0	10YR6/6
20		C•R	9.0	10YR6/6
		S	3.0	10YR7/4
30		sZ	5.0	5Y8/4
		S•R•L	3.0	10YR7/4
		S•R•L	3.0	10YR7/4
40		gS	2.0	10YR6/6
		sZ	3.0	5Y7/2
		S	4.0	10YR6/6
50		gS•R•L	4.0	10YR7/4
		sZ	2.0	5Y7/2
60		S•R•L	16.0	10YR7/4
70				
80		C	15.5	10YR5/4
90		sZ	5.5	5Y7/2
100		S•R•L	9.0	10YR8/2
110		sZ	5.0	10YR6/6
		S•R•L	6.5	5Y6/1
120		sZ	2.5	10YR6/6
		C•R	3.0	10YR6/6
		sZ	1.5	10YR6/6
130		S•R•L	2.5	5Y6/1
		S•R•L	8.0	10YR7/4
		sZ	5.0	10YR8/6
		S	1.0	10YR6/2
140		sZ	3.0	10YR7/4
		gS	2.5	10YR6/6
		sZ	7.0	10YR5/4
150		S•R•L	3.5	10YR7/4
		sG	1.5	10YR7/4
		sZ	6.5	10YR5/4
160		S	5.5	5Y6/1
		S	6.5	5Y6/1
170		sZ	1.0	10YR6/6
		S	8.0	10YR5/4
180		gS	4.5	10YR6/6
		S	1.0	5Y6/1
190		sZ	11.0	10YR7/4
		M	4.0	10YR7/4
200		S•R•L	4.5	5Y6/1
		M	3.0	10YR6/6
210		S•R•L	6.0	5Y6/1
220		C	8.0	10YR7/4
230				
240				
250				
260				
270				
280				
290				
300				

Sedimentary Analysis

ROUNDNESS (Power, 1953)	SPHERICITY	SORTING	ENVIRONMENT OF DEPOSITION
-	-	-	Shelf mud
-	-	-	
-	-	-	
.2 - .3	low	moderate	Delta [Deltaic plain]
-	-	-	
.15 - .3	low	moderate	
.2 - .4	high	well	
.2 - .4	low	moderate	
-	-	-	
.2 - .4	low	poor	
.3 - .4	low	poor	
-	-	-	
.15 - .3	low	poor	Delta [Distributary mouth bar]
-	-	-	
-	-	-	
.15 - .3	low	moderate	
-	-	-	Delta [Delta front & sheet sand]
.15 - .3	low	moderate	
-	-	-	
-	-	-	
.3 - .4	high	moderate	
.2 - .3	low	moderate	
-	-	-	
.15 - .3	low	poor	
.15 - .3	low	poor	
-	-	-	
.2 - .3	low	moderate	
.2 - .4	low	moderate	
-	-	-	
.15 - .3	low	poor	Delta [Deltaic plain]
.2 - .4	low	poor	
-	-	-	
.2 - .4	low	moderate	
.15 - .3	low	poor	
.2 - .4	low	moderate	
-	-	-	
.15 - .3	low	moderate	
-	-	-	
.15 - .2	low	poor	
-	-	-	

Electrical Log

SP (mv.) RES. (ohms-meter)

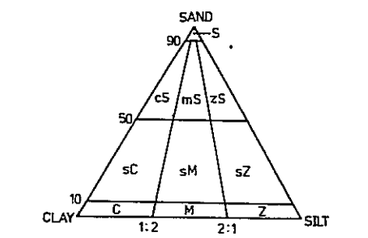
Groundwater Potential

WATERLEVEL m.	date	YIELD m³/hr.	date	DRAWDOWN m.	date	SPECIFIC-Y m³/hr/m.
34.14	190377	301.91	190377	6.09	190377	43.19

WATER QUALITY (mgL.)

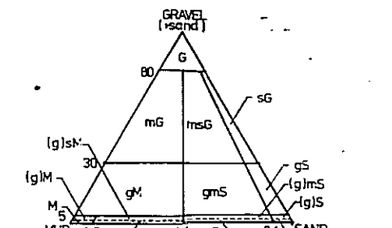
date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid.	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albuminoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2
220377	-	2.0	6.90	284.0	255.0	148.0	10.0	-	-	-	-	-	-	0.744	-	-	-	79.0

Remarks



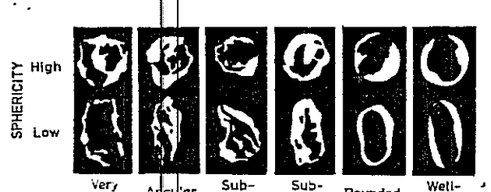
NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

S : sand s : sandy
Z : silt z : silty
M : mud m : muddy
C : clay c : clayey

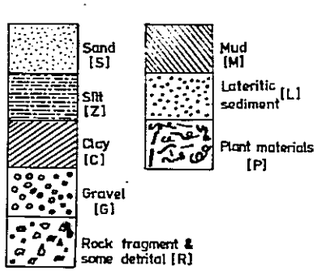


NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

G : gravel g : gravelly (g): slightly gravelly
S : sand s : sandy
M : mud m : muddy



Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)



LITHOLOGIC SYMBOL

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Chulalongkorn Univers

Appendix 1-A ANALYSIS OF SEDIMENTARY FACIES AND GROUNDWATER POTENTIAL OF SOME QUATERNARY DEPOSITS, BANGKOK METROPOLIS

WELL No 1 - 4 CHANGWAT 25 AMPHOE 264 LOCATION WAT PLUBPLA , PIBOONSONGKRAM RD. GRID REFERENCE 631281

ORIGINAL CUTTING DATA MWWA. ORIGINAL ELECTRICAL LOG DATA ORIGINAL WATER QUALITY DATA MWWA.

DRILLED DATE FROM 180777 TO 290777 DRILLED DEPTH 201.50 M.

DRILLING METHOD REVERSE ROTARY METHOD STATIC WATER LEVEL 32.61 M.

WELL DEVELOPMENT AIR PUMPING OVER PUMPING SCREEN 161.20 - 176.00 , 178.00 - 188.00 M.

Lithological Log				Sedimentary Analysis				Electrical Log		Groundwater Potential																				Remarks
SIZE	LITHOLOGY	THICKNESS (m.)	COLOR (rss)	ROUNDNESS (Power,1953)	SPHERICITY (Power,1953)	SORTING	ENVIRONMENT OF DEPOSITION	SP (mv.)	RES. (ohms-meter)	WATER LEVEL m.	WATER LEVEL date	YIELD m3/hr.	YIELD date	DRAWDOWN m.	DRAWDOWN date	SPECIFIC-Y m3/hr/m.						WATER QUALITY mg/L									
																	date	color	turbidity. jtu.	pH	tot. alkali-nity.	tot. dis. solid	tot. hard-ness.	Cl	SO_4 as $NaSO_4$	ammonia free as N	ammonia albu-minoid as N	NO_3 as N	NO_2 as N	Ca	Fe	F	Mn	Mg	free CO_2	
	c	14.0	N4	-	-	-				41.30	170877	301.91	170877	8.69	170877	34.74	170877	-	0.28	7.3	270.0	250.0	122.0	28.0	56.80	0.715	-	-	-	8.8	0.40	-	0.263	24.0	87.0	
	sZ	9.0	5YR5/6	-	-	-																													
	c	2.0	5YR5/6	-	-	-																													
	S+R+L	28.0	5Y7/2	.2 - .4	-	low	moderate																												
	gS	6.0	5Y7/2	.2 - .4	-	low	moderate																												
	c	13.0	10YR5/4	-	-	-	-																												
	sZ	10.0	10YR6/6	-	-	-	-																												
	gS+R+L	22.9	N7	.15 - .3	-	low	moderate																												
	M	9.1	5Y6/1	-	-	-	-																												
	sG	31.0	10YR5/4	.15 - .2	-	low	poor																												
	M	5.6	10YR7/4	.2 - .3	-	low	moderate																												
	S+R+L	3.0	5Y7/2	.15 - .2	-	low	poor																												
	sZ	4.4	10YR5/4	.2 - .4	-	low	moderate																												
	gS	2.0	10YR6/6	.2 - .4	-	low	poor																												
	S+R+L	1.2	5Y6/1	-	-	-	moderate																												
	gS	3.0	10YR7/4	.2 - .3	-	low	poor																												
	M	10.5	10YR5/4	-	-	low	moderate																												
	S+R+L	2.0	10YR6/6	.2 - .3	-	low	poor																												
	S	4.0	10YR7/4	.15 - .3	-	low	moderate																												
	gS	3.3	10YR8/2	.2 - .4	-	-	-																												
	M	2.7	10YR7/4	-	-	-	-																												
		13.0																																

R_1 = greasy sheet looklike mica or shell.

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Department o
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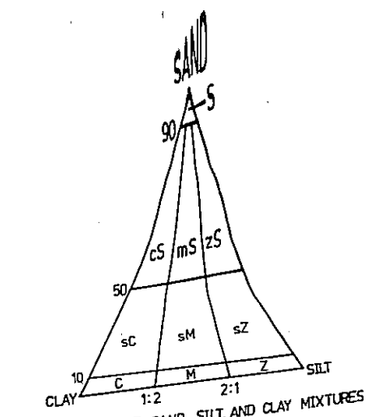
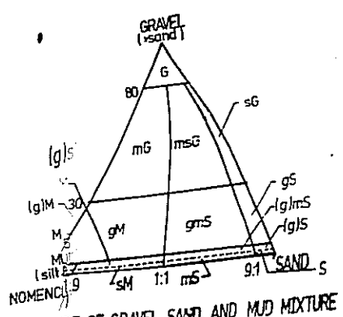


NOMENCLATURE OF SAND, SILT, AND CLAY MIXTURES (Folk, 1954)

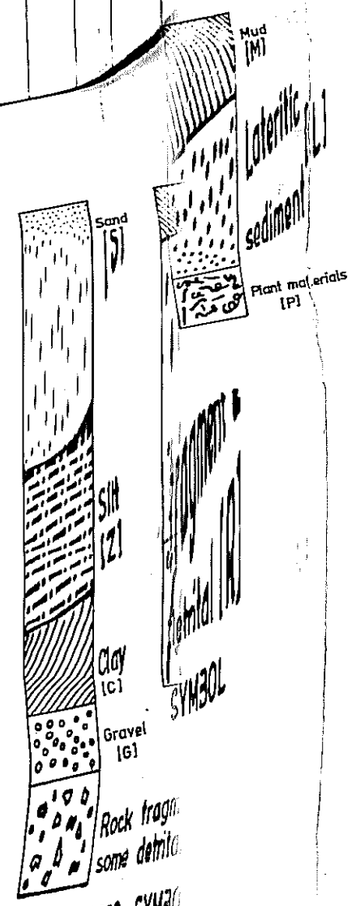
S : sand
Z : silt
M : mud
C : clay
s : sandy
z : silty
m : muddy
c : clayey



NOMENCLATURE OF GRAVEL, SAND, AND MUD MIXTURE (Folk, 1954)

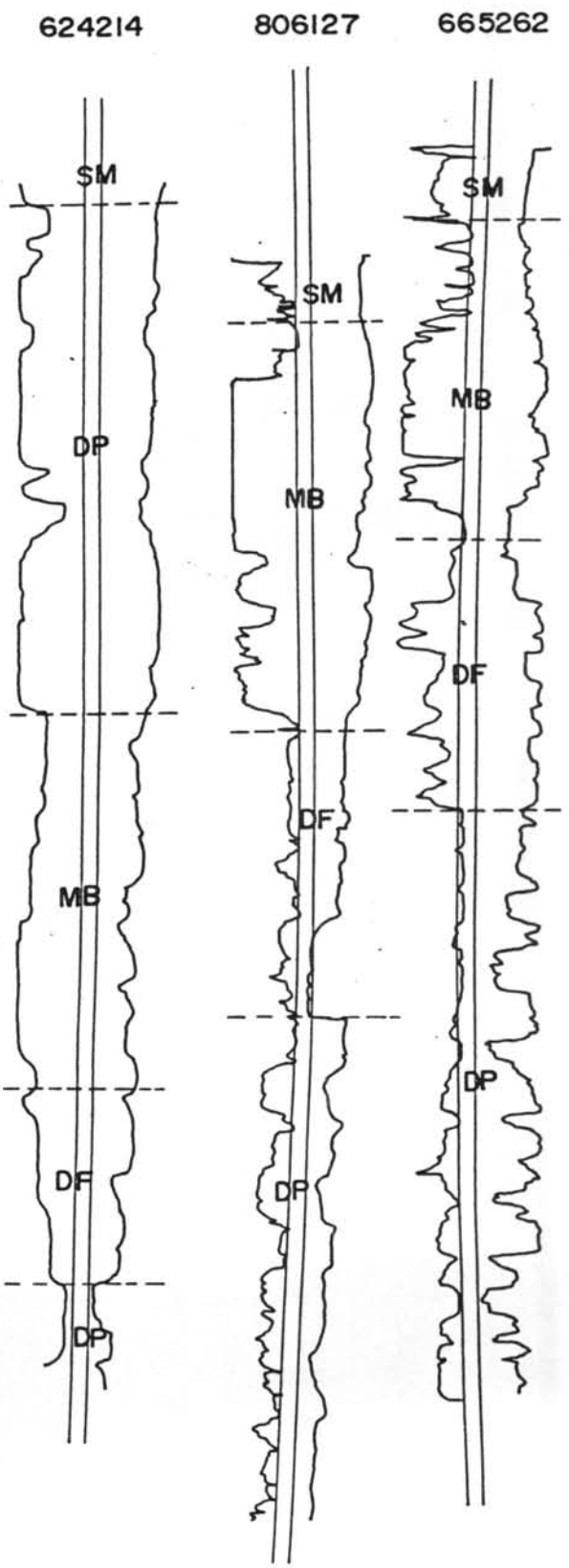
gravel
sand
mud
g : gravelly
s : sandy
m : muddy
(g): slightly gravelly

Visual comparator for estimating two-dimensional roundness of sand grains. (Power, 1953)

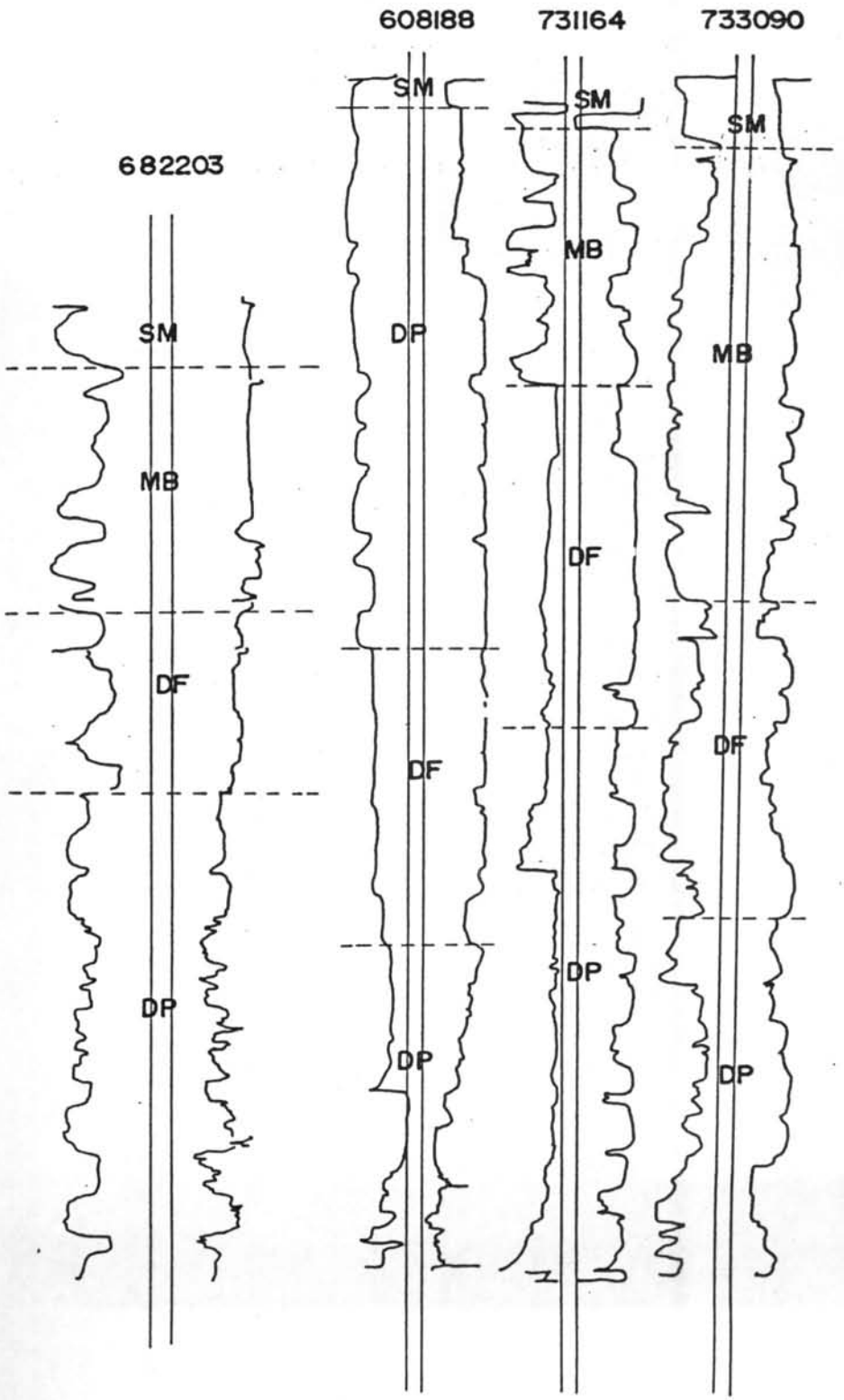


Appendix 1-B Electrical Log Data

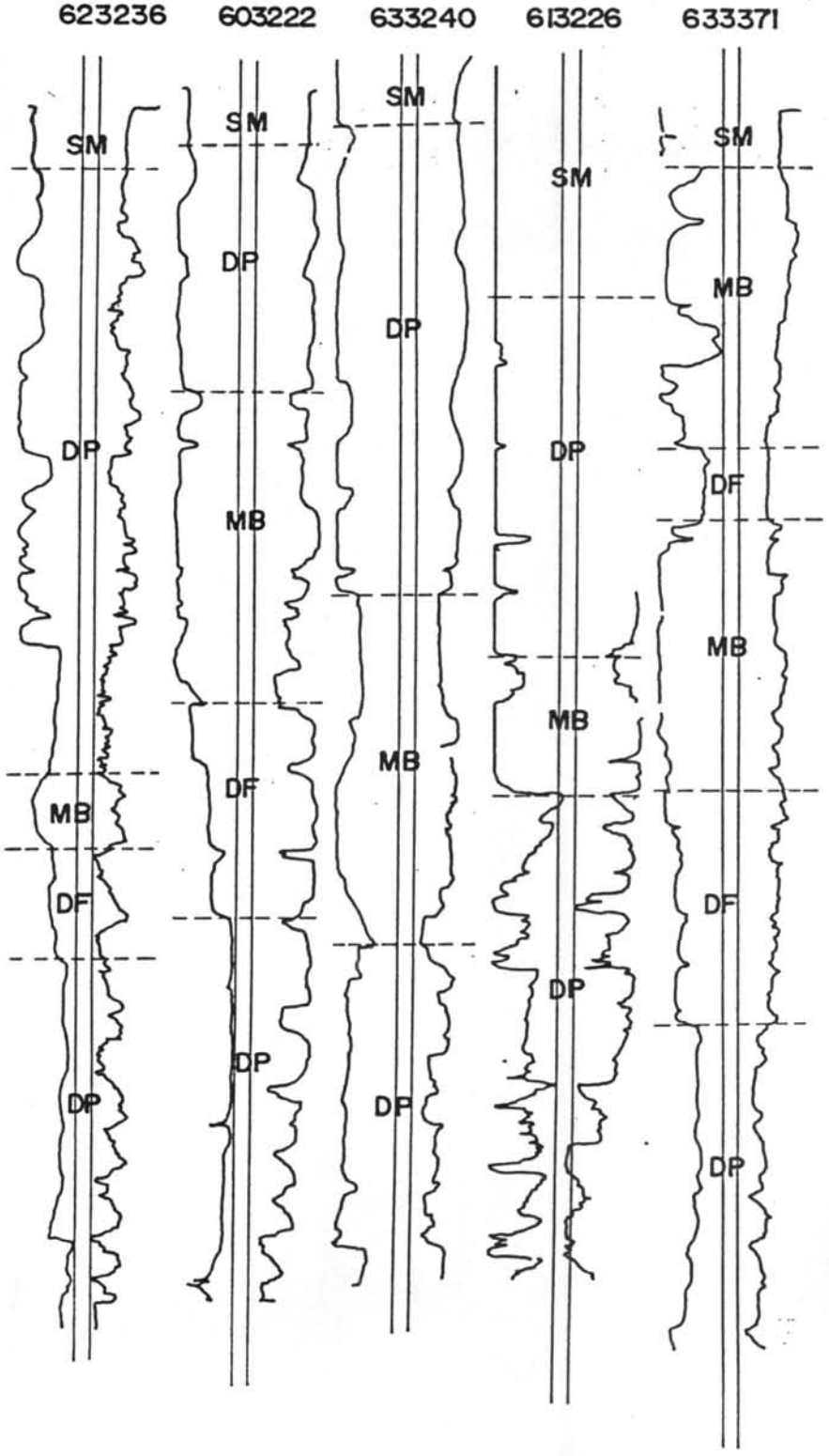
Appendix I-B. Electrical log datas [Self Potential & Resistivity]



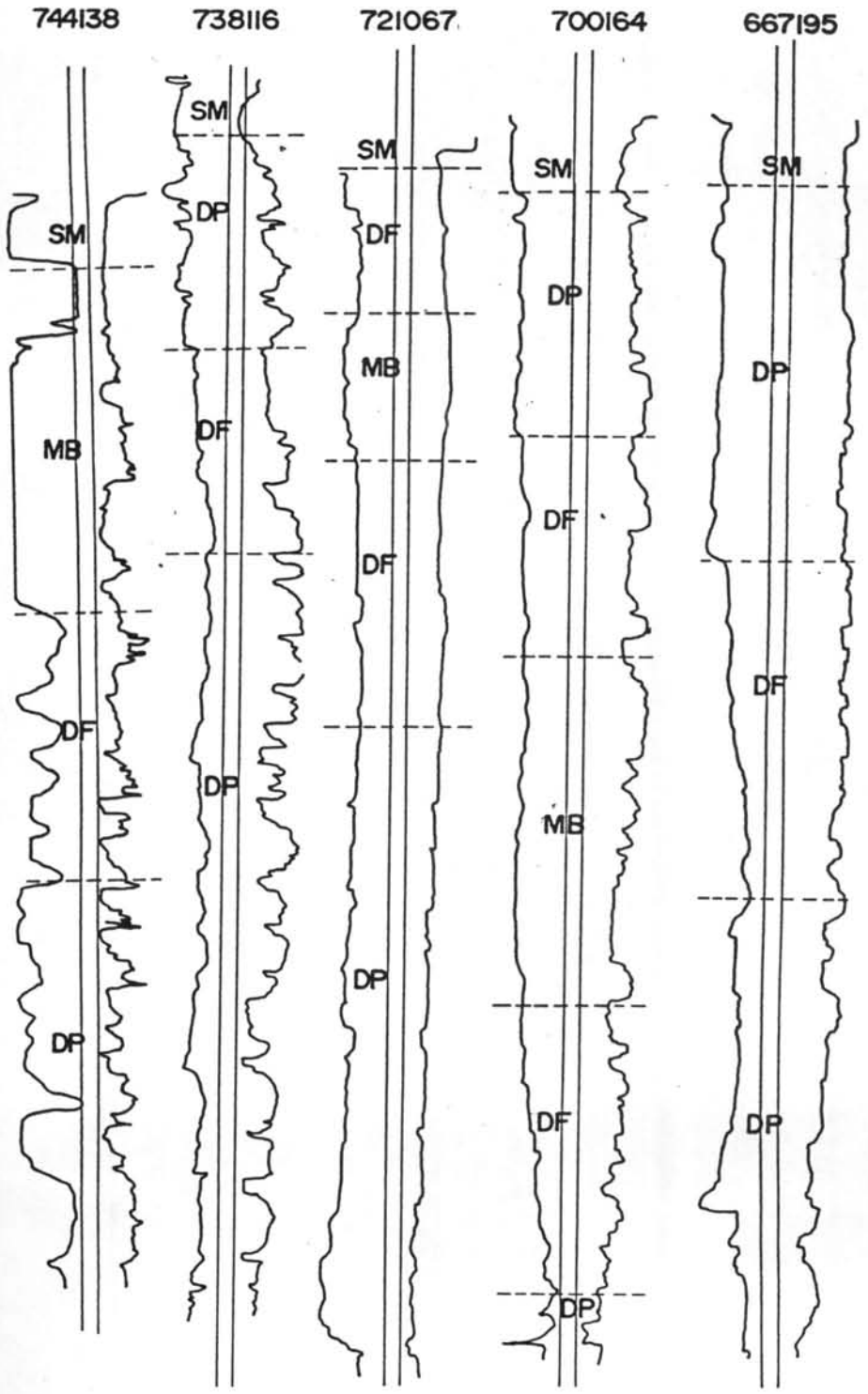
Appendix I-B. Electrical log datas [Self Potential & Resistivity]



Appendix I-B Electrical log datas [Self Potetial & Resistivity]



Appendix I-B. Electrical log datas [Self Potential & Resistivity]



Appendix 2-A : Hydrochemical Data

Appendix 2-A-1 Hydrochemical data of Bangkok Aquifer (1975-1978)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			CO_3 + HCO			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
1	630125	600.0	17.1	80.7	31.2	0.4	1.9	186	3.7	17.4	84.8	4.2	19.8	77.3	6.4	30.2	-	10.6	50.0
2	603142	306.0	8.7	62.6	42.6	0.6	4.3	232	4.6	33.1	45.6	2.3	16.5	39.8	3.3	23.7	-	8.3	59.8
3	654078	316.0	9.1	65.5	41.0	0.6	4. 3	210	4.2	30.2	47.3	2.4	17.3	39.2	3.3	23.7	-	8.2	59.0
4	669111	34.0	0.9	14.5	41.2	0.6	9.7	236	4.7	75.8	28.0	1.4	22.6	12.0	1.0	16.1	-	3.8	51.3
5	654078	291.0	8.3	63.4	41.0	0.6	4.6	210	4.2	32.0	47.3	2.4	18.3	39.2	3.3	25.2	-	7.4	56.5
6	664069	85.2	2.4	36.4	26.0	0.4	6.1	189	3.8	57.5	24.5	1.2	18.2	11.7	0.9	13.6	-	4.5	68.2
7	624113	1160.0	33.1	85.8	0.0	0.0	0.0	274	5.5	14.2	316.0	15.8	40.9	90.0	7.5	19.4	-	15.3	39.7
8	654078	320.0	9.1	65.5	43.0	0.6	4.3	210	4.2	30.2	45.7	2.3	16.5	41.3	3.4	24.5	-	8.2	59.0
9	631110	700.0	20.0	84.7	0.0	0.0	0.0	180	3.6	15.3	88.0	4.4	18.6	52.8	4.4	18.6	-	14.8	62.8
10	687034	242.0	6.9	57.0	18.0	0.3	2.5	244	4.9	40.5	43.2	2.2	18.2	44.2	3.7	30.6	-	6.2	51.2
11	699045	137.0	3.9	40.2	0.0	0.0	0.0	292	5.8	59.8	22.4	1.1	11.3	21.1	1.8	18.6	-	6.8	70.1
12	707007	740.0	21.1	83.4	0.0	0.0	0.0	212	4.2	16.6	132.4	6.6	26.1	75.4	6.3	24.9	-	12.4	49.0
13	838085	5.0	0.1	1.4	0.0	0.0	0.0	348	6.9	98.6	26.4	1.3	18.6	5.3	0.4	5.7	-	5.3	75.7
14	684117	8.0	0.2	3.5	36.6	0.5	8.6	256	5.1	87.9	19.2	0.9	15.5	11.0	0.9	15.5	-	4.0	69.0

Appendix 2-A-2 Hydrochemical data of the Phra Pradaeng Aquifer (1975-1978).

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Ma + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
1	677180	900.0	25.7	77.4	271.2	3.8	11.4	184	3.7	11.2	199.2	9.9	30.0	67.2	5.6	16.9	-	17.6	53.1
2	716154	16.0	0.5	7.2	9.9	0.1	1.4	320	6.4	91.4	29.6	1.5	21.4	16.32	1.4	20.0	-	4.1	58.6
3	701166	30.0	0.9	12.9	19.9	0.3	4.3	288	5.8	82.8	31.2	1.6	22.9	10.6	0.9	12.9	-	4.5	64.2
4	735157	76.0	2.2	29.7	22.7	0.3	3.4	322	6.4	71.9	25.6	1.3	14.6	28.3	2.4	26.9	-	5.2	58.5
5	676152	15.0	0.4	6.5	4.3	0.1	1.6	286	5.7	91.9	24	1.2	19.4	13.4	1.1	17.7	-	3.9	62.9
6	701186	125.0	3.6	39.6	19.9	0.3	3.3	260	5.2	57.1	31.2	1.6	17.6	27.8	2.3	25.3	-	5.2	57.1
7	698168	51.0	1.5	17.4	36.9	0.5	5.8	330	6.6	76.8	31.2	1.6	18.6	8.2	0.7	8.1	-	6.3	73.3
8	750134	176.0	5.0	41.3	28.4	0.4	3.3	336	6.7	55.4	32.0	1.6	13.2	32.2	2.7	22.3	-	7.8	64.5
9	739127	126.0	3.6	41.9	26.9	0.4	4.7	232	4.6	53.4	5.3	0.3	3.5	12.5	1.0	11.6	-	7.3	84.9
10	676150	329.0	9.4	65.7	28.4	0.4	2.8	226	4.5	31.5	60.0	3.0	20.9	40.8	3.4	23.8	-	7.9	55.3
11	651146	300.0	8.6	62.8	42.6	0.6	4.4	224	4.5	32.8	51.2	2.6	18.9	31.2	2.6	18.9	-	8.5	62.2
12	681158	60.0	1.7	22.7	12.8	0.2	2.7	282	5.6	74.6	28.8	1.4	18.7	12.48	1.0	13.3	-	5.1	68.0
13	680157	31.0	0.9	13.0	17.0	0.2	2.9	288	5.8	84.1	24.8	1.2	17.4	9.1	0.8	11.6	-	4.9	71.0
14	732153	38.0	1.1	13.3	25.6	0.4	4.8	338	6.8	81.9	24.0	1.2	14.5	31.2	2.6	31.3	-	4.5	54.2

Appendix 2-A-2 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Ma + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
15	692157	28.0	0.7	10.3	15.6	0.2	2.9	296	5.9	86.8	24.8	1.2	17.6	12.5	1.0	14.7	-	4.6	67.7
16	719193	14.0	0.4	5.3	34.1	0.5	6.7	332	6.6	88.0	16.0	0.8	10.7	12.0	1.0	13.3	-	5.7	76
17	688273	20.0	0.6	8.9	28.4	0.4	5.9	285	5.7	85.2	20	1.0	14.9	12.5	1.0	14.9	-	4.7	70.2
18	722175	55.0	1.6	19.3	28.4	0.4	4.8	316	6.3	75.9	23.2	1.2	14.5	13.24	1.1	13.3	-	6.0	72.2
19	623200	372.0	10.6	67.5	49.7	0.7	4.5	220	4.4	28.0	96.4	4.8	30.6	28.8	2.4	15.3	-	8.5	54.1
20	714169	9.0	0.3	3.9	68.2	0.9	11.7	326	6.5	84.4	21.6	1.1	14.3	11.04	0.9	11.7	-	5.7	74.0
21	630125	600.0	17.1	80.7	31.3	0.4	1.9	186	3.7	17.4	84.8	4.2	19.8	77.3	6.4	30.2	-	10.6	50.0
22	603142	306.0	8.7	62.6	42.6	0.6	4.3	232	4.6	33.1	45.6	2.3	16.5	39.8	3.3	23.7	-	8.3	59.8
23	647121	510.0	14.6	74.1	52.5	0.7	3.6	220	4.4	22.3	64.8	3.2	16.2	56.2	4.7	23.9	-	11.8	59.9
24	638344	4.0	0.1	1.4	22.3	0.3	4.1	346	6.9	94.5	12	0.6	8.2	25.9	2.2	30.1	-	4.5	61.7
25	742030	111.0	3.2	36.8	28.4	0.4	4.6	256	5.1	58.6	14.4	0.7	8.0	14.9	1.2	13.8	-	6.8	78.2
26	732051	114.0	3.3	32.7	41.2	0.6	5.9	308	6.2	61.4	11.0	0.6	5.9	9.1	0.8	7.9	-	8.7	86.2
27	730023	397.0	11.3	72.9	32.7	0.5	3.2	186	3.7	23.9	16.3	0.8	5.2	51.4	4.3	27.7	-	10.4	67.1
28	738027	64.0	1.8	22.5	35.5	0.5	6.3	286	5.7	71.2	12.9	0.7	8.8	9.1	0.8	10.0	-	6.5	81.2

Appendix 2-A-2 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			CO_3 + HCO_3			Ca			Mg			Ma + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
29	682203	72.0	1.5	19.5	51.1	0.9	11.7	264	5.3	68.8	36	1.8	23.4	6.7	0.6	7.8	-	5.3	68.8
30	670185	590.0	16.9	79.3	35.5	0.5	2.3	198	3.9	18.4	112.8	5.6	26.3	77.8	6.5	30.5	-	9.2	43.2
31	695094	21.3	0.6	9.2	19	0.3	4.6	282	5.6	86.2	13.6	0.7	10.8	10.9	0.9	13.8	-	4.9	75.4
32	632119	387.0	11.1	76.0	13.8	0.2	1.4	165	3.3	22.6	81.4	4.1	28.1	43.7	3.6	24.7	-	6.9	47.2
33	949039	124.0	3.5	37.2	9.0	0.1	1.1	289	5.8	61.7	26.0	1.3	13.8	8.5	0.7	7.5	-	7.4	78.7
34	687058	415.0	11.9	73.5	14	0.2	1.2	207	4.1	25.3	70	3.5	21.6	28	2.3	14.2	-	10.4	64.2
35	595200	2840.0	81.1	96.1	0	0	0	166	3.3	3.9	303.6	15.2	18.0	204.1	17.0	20.1	-	52.2	61.9
36	734048	160.0	4.6	43.4	21.3	0.3	2.8	284	5.7	53.8	23.2	1.2	11.3	12.0	1.0	9.4	-	8.4	79.3
37	645106	8.9	0.3	7.0	0	0	0	200	4.0	93.0	16.8	0.8	18.6	8.9	0.7	16.3	-	2.8	65.1
38	753076	14.0	0.4	6.1	0	0	0	312	6.2	93.9	20.0	1.0	15.2	11.0	0.9	13.6	-	4.7	71.2
39	678109	5.0	0.1	1.7	36.6	0.5	8.6	262	5.2	89.7	18.4	0.9	15.5	10.6	0.9	15.5	-	4.0	69.0

Appendix 2-A-3 Hydrochemical data of the Nakhon Luang Aquifer (1975-1978)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
1	643169	414.0	11.8	67.4	59.6	0.8	4.6	246	4.9	28.0	109.6	5.5	31.4	26.4	2.2	12.6	-	9.8	56.0
2	638209	109.0	3.1	31.9	82.4	1.2	12.4	270	5.4	55.7	48.0	2.4	24.7	13.4	1.1	11.3	-	6.2	64.0
3	641195	25.0	0.7	9.2	90.9	1.3	17.1	280	5.6	73.7	29.6	1.5	19.7	6.7	0.6	7.9	-	5.5	72.4
4	628213	123.0	3.5	36.5	56.8	0.8	8.3	264	5.3	55.2	28.8	1.4	14.6	24.5	2.0	20.8	-	6.2	64.6
5	639227	83.0	2.4	30.8	12.8	0.2	2.6	250	5.2	66.6	38.4	1.9	24.4	7.7	0.6	7.7	-	5.3	67.9
6	682207	45.0	1.3	17.3	38.9	0.5	6.7	284	5.7	76.0	27.2	1.4	18.7	14.9	1.2	16.0	-	4.9	65.3
7	643240	60.0	1.7	21.6	46.9	0.7	8.9	274	5.5	69.5	20.8	1.1	13.2	31.2	2.6	32.9	-	4.2	53.9
8	727174	8.0	0.2	2.8	11.6	0.2	2.8	334	6.7	94.4	17.6	0.9	12.7	8.2	0.7	9.9	-	5.5	77.4
9	629283	2550.0	72.9	95.9	9.9	0.1	0.2	150	3.0	3.9	30.4	1.5	1.9	8.6	0.7	0.9	-	73.8	97.2
10	715262	9.0	0.3	4.7	15.6	0.2	3.1	296	5.9	92.2	7.2	0.4	6.3	26.4	2.2	34.4	-	3.8	59.3
11	645273	99.0	2.8	32.6	25.6	0.4	4.7	268	5.4	62.7	17.6	0.9	10.5	35.5	2.9	33.7	-	4.8	55.8
12	750134	176.0	5.0	41.3	28.4	0.4	3.3	336	6.7	55.4	32.0	1.6	13.2	32.2	2.7	22.3	-	7.8	64.5
13	718152	15.0	0.4	5.1	21.3	0.3	3.8	356	7.1	91.1	10.1	0.5	6.4	9.6	0.8	10.3	-	6.5	83.3
14	688234	2.0	0.1	1.5	41.2	0.6	8.9	302	6.0	89.6	15.2	0.8	11.9	2.9	0.2	2.9	-	5.7	85.2

Appendix 2-A-3 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
15	703178	47.0	1.3	15.9	65.3	0.9	10.9	302	6.0	73.2	14.2	0.7	8.5	5.3	0.4	4.9	-	7.1	86.6
16	708309	3.0	0.1	1.6	19.8	0.3	4.8	288	5.8	93.6	32.0	1.6	25.8	7.7	0.6	9.7	-	4.0	64.5
17	727171	84.0	2.4	27.3	34.1	0.5	5.7	298	5.9	67.0	31.2	1.6	18.2	27.8	2.3	26.1	-	4.9	55.7
18	678206	52.0	1.5	18.1	65.3	0.9	10.8	296	5.9	71.1	18.4	0.9	10.8	4.3	0.4	4.8	-	7.0	84.4
19	713192	7.0	0.2	2.4	93.7	1.3	15.9	334	6.7	81.7	13.6	0.7	8.5	1.4	0.1	1.3	-	7.4	90.2
20	684216	36.0	1.0	12.9	56.8	0.8	10.4	298	5.9	76.7	19.2	0.9	11.7	4.8	0.4	5.2	-	6.4	83.1
21	803121	10.0	0.3	3.8	21.3	0.3	3.8	366	7.3	92.4	12.0	0.6	7.6	11.5	0.9	11.4	-	6.4	81.0
22	755160	19.0	0.5	6.1	45.4	0.6	7.3	358	7.1	86.6	20.0	1.0	12.2	4.8	0.4	4.9	-	6.8	82.9
23	641215	230.0	6.6	55.9	24.1	0.3	2.5	244	4.9	41.6	60.0	3.0	25.4	26.9	2.2	18.6	-	6.6	56.0
24	740112	44.0	1.3	14.9	39.8	0.6	6.9	338	6.8	78.2	9.6	0.5	5.7	2.4	0.2	2.3	-	8.0	92.0
25	700273	10.0	0.3	4.8	22.7	0.3	4.8	286	5.7	90.4	22.4	1.1	17.5	13.9	1.2	19.0	-	4.0	63.5
26	701232	7.0	0.2	2.6	50.6	0.7	8.1	338	6.8	88.3	20.8	1.0	12.9	7.2	0.6	7.8	-	6.1	79.3
27	764123	7.0	0.2	2.4	35.5	0.5	5.9	392	7.8	91.7	12.8	0.6	7.1	3.4	0.3	3.5	-	7.6	89.4
28	721263	15.0	0.4	5.6	17.1	0.2	2.8	330	6.6	91.6	16.8	0.8	11.1	18.2	1.5	20.8	-	4.9	68.1

Appendix 2-A-3 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
29	734118	12.0	0.3	4.1	42.6	0.6	8.2	322	6.4	87.7	6.7	0.3	4.1	2.9	0.2	2.7	-	6.8	93.2
30	720197	15.0	0.4	5.0	42.6	0.6	7.5	350	7.0	87.5	16.8	0.8	10.0	4.3	0.4	5.0	-	6.8	85.0
31	725248	29.0	0.8	11.3	17.3	0.2	2.8	304	6.1	85.9	22.4	1.1	15.5	8.6	0.7	9.9	-	5.3	74.6
32	720323	8.0	0.2	3.1	22.7	0.3	4.7	296	5.9	92.2	24.8	1.2	18.8	13.9	1.2	18.8	-	4.0	62.4
33	717184	47.0	1.3	16.0	45.4	0.6	7.4	310	6.2	76.6	18.4	0.9	11.1	17.8	1.5	18.5	-	5.7	70.4
34	619208	128.0	3.7	39.4	38.3	0.5	5.3	258	5.2	55.3	40.0	2.0	21.3	8.6	0.7	7.4	-	6.7	71.3
35	634305	8.0	0.2	3.3	36.9	0.5	8.2	272	5.4	88.5	44.0	2.2	36.1	9.6	0.8	13.1	-	3.1	50.8
36	656297	13.0	0.4	6.9	19.9	0.3	5.2	256	5.1	87.9	37.6	1.9	32.8	11.0	0.9	15.5	-	3.0	51.7
37	693229	8.0	0.2	2.6	68.2	0.9	11.5	336	6.7	85.9	16.0	0.8	10.3	3.8	0.3	3.8	-	6.7	85.9
38	774163	7.0	0.2	2.4	56.8	0.8	9.6	364	7.3	88.0	19.2	0.9	10.8	12.9	1.1	13.3	-	6.3	75.9
39	753242	6.0	0.2	3.3	19.9	0.3	4.9	280	5.6	91.8	16.8	0.8	13.1	11.5	0.9	14.8	-	4.4	72.1
40	674300	20.0	0.6	9.1	29.8	0.4	6.1	282	5.6	84.8	35.6	1.8	27.3	12.0	1.0	15.2	-	3.8	57.5
41	630281	120.0	3.4	38.6	19.9	0.3	3.4	254	5.1	58.0	37.6	1.9	21.6	16.3	1.4	15.9	-	5.5	62.5
42	648291	4.0	0.1	1.7	51.1	0.7	11.7	258	5.2	86.6	35.2	1.8	30.0	8.2	0.7	11.7	-	3.5	58.3

Appendix 2-A-3 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
43	752190	14.0	0.4	5.6	15.6	0.2	2.8	324	6.5	91.6	24.0	1.2	16.9	24.0	2.0	28.2	-	3.9	54.9
44	699239	7.0	0.2	2.6	62.5	0.9	11.7	328	6.6	85.7	19.2	0.9	11.7	5.8	0.5	6.5	-	6.3	81.8
45	739168	59.0	1.7	20.0	34.1	0.5	5.9	316	6.3	74.1	22.4	1.1	12.9	15.8	1.3	15.3	-	6.1	71.8
46	732141	11.0	0.3	3.9	24.1	0.3	3.9	354	7.1	92.2	7.7	0.4	5.2	6.2	0.5	6.5	-	6.8	88.3
47	741165	16.0	0.5	6.3	42.6	0.6	7.5	344	6.9	86.2	24.0	1.2	15.0	8.2	0.7	8.8	-	6.1	76.2
48	626250	40.0	1.1	15.5	29.8	0.4	5.7	282	5.6	78.8	36.8	1.8	25.4	7.7	0.6	8.5	-	4.7	66.1
49	639259	4.0	0.1	1.9	31.2	0.4	7.5	238	4.8	90.6	28.0	1.4	26.4	12.0	1.0	18.9	-	2.9	54.7
50	606197	440.0	12.6	67.7	56.8	0.8	4.3	260	5.2	28.0	64.4	3.2	17.2	43.7	3.6	19.4	-	11.8	63.4
51	604241	254.0	7.3	57.5	21.3	0.3	2.4	256	5.1	40.1	70.6	3.5	27.6	18.2	1.5	11.8	-	7.7	60.6
52	627242	15.0	0.4	5.6	65.3	0.9	12.5	298	5.9	81.9	28.0	1.4	19.4	9.6	0.8	11.1	-	5.0	69.5
53	641269	65.0	1.9	25.3	26.9	0.4	5.4	258	5.2	69.3	32.0	1.6	21.3	15.4	1.3	17.3	-	4.6	61.4
54	626254	39.0	1.1	15.3	32.7	0.5	6.9	282	5.6	77.8	33.6	1.7	23.6	3.8	0.3	4.2	-	5.2	72.2
55	572165	900.0	25.7	86.5	17.1	0.2	0.7	190	3.8	12.8	236.0	11.8	39.8	96.0	8.0	26.9	-	9.9	33.3
56	617168	402.0	11.5	66.5	65.3	0.9	5.2	248	4.9	28.3	64.8	3.2	18.5	57.1	4.8	27.7	-	9.3	53.8

Appendix 2-A-3 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + k		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
57	612164	264.0	7.5	55.1	76.7	1.1	8.1	252	5.0	36.8	94.6	4.7	34.6	11.1	0.9	6.6	-	8.0	58.8
58	559165	172.0	4.9	37.7	137.2	1.9	14.6	308	6.2	47.7	16.8	0.8	6.2	14.9	1.2	9.2	-	11.0	84.6
59	626240	113.0	3.2	35.9	22.7	0.3	3.4	270	5.4	60.7	32.8	1.6	18.0	13.9	1.2	13.5	-	6.1	68.5
60	533167	200.0	5.7	48.3	68.2	0.9	7.6	260	5.2	44.1	38.4	1.9	16.1	51.8	4.3	36.4	-	5.6	47.5
61	559158	505.0	14.4	69.9	93.7	1.3	6.3	244	4.9	23.8	35.4	1.8	8.7	13.4	1.1	5.3	-	17.7	86.0
62	567167	155.0	4.4	44.9	18.5	0.3	3.1	254	5.1	52.0	15.2	0.8	8.2	4.8	0.4	4.1	-	8.6	87.7
63	622308	188.0	5.4	50.5	15.6	0.2	1.9	256	5.1	47.6	59.2	2.9	27.1	30.7	2.6	24.3	-	5.2	48.6
64	632303	4.0	0.1	1.8	7.1	0.1	1.8	270	5.4	96.4	28.8	1.4	25.0	8.2	0.7	12.5	-	3.5	62.5
65	649297	120.0	3.4	41.5	17.1	0.2	2.4	232	4.6	56.1	28.8	1.4	17.1	12.3	1.0	12.2	-	5.8	70.7
66	666239	11.0	0.3	5.2	19.9	0.3	5.2	260	5.2	89.6	39.2	1.9	32.8	7.2	0.6	10.3	-	3.3	56.9
67	662320	24.0	0.7	10.8	22.7	0.3	4.6	274	5.5	84.6	28.8	1.4	21.5	17.3	1.4	21.5	-	3.7	57.0
68	618311	10.0	0.3	4.4	49.7	0.7	10.3	290	5.8	82.3	14.4	0.7	10.3	26.9	2.2	32.4	-	3.9	57.3
69	642160	672.0	19.2	82.1	22.7	0.3	1.3	298	3.9	16.6	174.6	8.7	37.2	36.9	3.1	13.2	-	11.6	49.6
70	631281	28.0	0.8	11.4	56.8	0.8	11.4	270	5.4	77.2	8.8	0.4	5.7	24.0	2.0	28.6	-	4.6	65.7

Appendix 2-A-3 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
71	595200	188.0	5.4	39.1	229.0	3.2	23.2	260	5.2	37.7	30.4	1.5	10.9	26.8	2.2	15.9	-	10.1	71.2
72	667195	370.0	10.5	68.2	34.1	0.5	3.2	220	4.4	28.6	86.4	4.3	27.9	25.5	2.1	13.6	-	9.0	58.5
73	682203	63.0	1.5	19.5	51.1	0.9	11.7	264	5.3	68.8	36.0	1.8	23.4	6.7	0.6	7.8	-	5.3	68.8
74	709357	10.7	0.3	4.5	2.8	0.1	0.6	315	6.3	94.9	39.3	1.9	28.8	13.1	1.1	16.7	-	3.6	54.5
75	949039	248.0	7.1	55.0	8.0	0.1	0.8	286	5.7	44.2	20.4	1.0	7.8	6.6	0.5	3.9	-	11.4	88.3
76	534387	8850.0	252.9	95.5	576.0	8.0	3.0	190	3.8	1.5	1256.0	62.8	23.7	442.0	36.8	13.9	-	165.1	62.4
77	422453	5.0	0.1	1.7	5.6	0.1	1.7	284	5.7	96.6	27.2	1.4	23.7	6.2	0.5	8.5	-	4.0	67.8
78	712268	3.0	0.1	1.3	93.7	1.3	16.7	320	6.4	82.0	28.8	1.4	17.9	3.8	0.3	3.8	-	6.1	78.3
79	742133	4.0	0.1	1.5	45.4	0.6	8.9	300	6.0	89.6	14.4	0.7	10.4	0.9	0.1	1.5	-	5.9	88.1
80	718198	2.0	0.1	1.2	85.2	1.2	13.9	364	7.3	84.9	18.4	0.9	10.5	3.4	0.3	3.5	-	7.4	86.0
81	806127	16.0	0.5	6.0	62.5	0.9	10.8	348	6.9	83.2	32.8	1.6	19.3	1.4	0.1	1.2	-	6.6	79.5
82	674306	7.0	0.2	3.3	0	0	0	288	5.8	96.7	24	1.2	20.0	2.9	0.2	3.3	-	4.6	76.7
83	621193	681.0	19.5	83.3	52.5	0.7	2.9	162	3.2	13.8	176.0	8.8	37.6	33.6	2.8	11.9	-	11.8	50.5
84	621209	660.0	18.9	79.4	55.4	0.8	3.4	204	4.1	17.2	197.6	9.9	41.6	29.3	2.4	10.1	-	11.5	48.3

Appendix 2-A-3 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			CO_3 + HCO_3			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
85	630217	5.1	0.2	5.3	18.5	0.3	7.9	166	3.3	68.8	23.2	1.2	31.6	15.4	1.3	34.2	-	1.3	34.2
86	641215	79.0	2.3	25.8	76.7	1.1	12.4	276	5.5	61.8	36.0	1.8	20.2	16.3	1.4	15.7	-	5.7	64.1
87	633241	10.0	0.3	15.0	14.2	0.2	10.0	76	1.5	75.0	27.2	1.4	70.0	2.4	0.2	10.0	-	0.4	20.0
88	620237	126.0	3.6	38.3	7.1	0.1	1.1	286	5.7	60.6	43.2	2.2	23.4	12.0	1.0	10.6	-	6.2	66.0
89	632248	8.0	0.2	3.3	18.5	0.3	5.0	276	5.5	91.7	32.0	1.6	26.7	6.7	0.6	10.0	-	3.8	63.3

Appendix 2-A-4 Hydrochemical data of the Nonthabori Aquifer (1975-1978)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
1	632211	42.0	1.2	15.6	56.8	0.8	10.4	284	5.7	74.0	32.0	1.6	20.8	20.0	1.7	22.1	-	4.4	57.1
2	638209	109.0	3.1	31.9	82.4	1.2	12.4	270	5.4	55.7	48.0	2.4	24.7	13.4	1.1	11.3	-	6.2	64.0
3	653238	32.7	0.9	13.6	0.6	0.01	0.2	262	5.7	86.2	32.0	1.6	24.2	10.1	0.8	12.1	-	4.2	63.7
4	696233	9.0	0.3	4.1	32.6	0.5	6.8	330	6.6	89.1	16.8	0.8	10.8	3.8	0.3	4.1	-	6.3	85.1
5	647270	515.0	14.7	71.4	34.1	0.5	2.4	268	5.4	26.2	32.8	1.6	7.8	7.7	0.6	2.9	-	18.4	89.3
6	720296	5.0	0.1	1.5	32.2	0.5	7.7	296	5.9	90.8	28.8	1.4	21.5	5.8	0.5	7.7	-	4.6	70.8
7	700303	1.0	0.03	0.5	31.2	0.4	6.1	310	6.2	93.4	17.6	0.9	13.6	7.2	0.6	9.1	-	5.1	77.3
8	713296	1.0	0.03	0.5	34.1	0.5	7.7	300	6.0	91.8	20.8	1.0	15.4	11.1	0.9	13.8	-	4.6	70.8
9	725248	29.0	0.8	11.3	17.3	0.2	2.8	304	6.1	85.9	22.4	1.1	15.5	8.6	0.7	9.9	-	5.3	74.6
10	690223	40.0	1.1	12.6	65.3	0.9	10.4	334	6.7	77.0	11.2	0.6	6.9	9.6	0.8	9.2	-	7.3	83.9
11	718254	1.0	0.03	0.5	22.7	0.3	4.5	314	6.3	95.0	23.2	1.2	18.2	4.3	0.4	6.1	-	5.1	75.7
12	654277	25.0	0.7	12.1	4.2	0.1	1.7	252	5.0	86.2	36.0	1.8	31.0	15.7	1.3	22.4	-	2.7	46.6
13	665295	2.0	0.1	1.7	17.1	0.2	3.4	278	5.6	94.9	34.4	1.7	28.8	8.2	0.7	11.9	-	3.5	59.3
14	662279	3.0	0.1	1.6	25.6	0.4	6.6	282	5.6	91.8	33.6	1.7	27.9	9.6	0.8	13.1	-	3.6	59.0

Appendix 2-A-4 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
15	634305	8.0	0.2	3.3	36.9	0.5	8.2	272	5.4	88.5	44.0	2.2	36.1	9.6	0.8	13.1	-	3.1	50.8
16	693229	8.0	0.2	2.6	68.2	0.9	11.5	336	6.7	85.9	16.0	0.8	10.3	3.8	0.3	3.8	-	6.7	85.9
17	652245	13.0	0.4	6.9	9.9	0.1	1.7	266	5.3	91.4	37.6	1.9	32.8	8.6	0.7	12.1	-	3.2	55.1
18	774163	7.0	0.2	2.4	56.8	0.8	9.6	364	7.3	88.0	19.2	0.9	10.8	12.9	1.1	13.3	-	6.3	75.9
19	702226	11.0	0.3	3.6	53.9	0.8	9.6	362	7.2	86.8	20.0	1.0	12.0	5.3	0.4	4.8	-	6.9	83.2
20	733250	57.0	1.6	20.8	15.6	0.2	2.6	296	5.9	76.6	22.4	1.1	14.3	11.5	0.9	11.7	-	5.7	74.0
21	649252	8.0	0.2	3.3	28.4	0.4	6.6	274	5.5	90.1	24.0	1.2	19.7	12.9	1.1	18.0	-	3.8	62.3
22	650287	4.0	0.1	1.9	9.9	0.1	1.9	258	5.2	96.2	27.2	1.4	25.9	16.4	1.4	25.9	-	2.6	48.2
23	648291	4.0	0.1	1.7	51.1	0.7	11.7	258	5.2	86.6	35.2	1.8	30.0	8.2	0.7	11.7	-	3.5	58.3
24	712275	8.0	0.2	2.6	65.3	0.9	11.7	330	6.6	85.7	13.6	0.7	9.1	16.8	1.4	18.2	-	5.6	72.7
25	634344	2.0	0.1	1.5	27.0	0.4	6.1	306	6.1	92.4	29.6	1.5	22.7	11.0	0.9	13.6	-	4.2	63.7
26	614353	885.0	25.3	81.9	18.5	0.3	1.0	266	5.3	17.1	24.8	1.2	3.9	12.0	1.0	3.2	-	28.7	92.9
27	666329	11.0	0.3	5.2	19.9	0.3	5.2	260	5.2	89.6	39.2	1.9	32.8	7.2	0.6	10.3	-	3.3	56.9
28	642160	672.0	19.2	82.1	22.7	0.3	1.3	198	3.9	16.6	174.6	8.7	37.2	36.9	3.1	13.2	-	11.6	49.6

Appendix 2-A-4 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			CO_3 + HCO_3			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
29	631281	28.0	0.8	11.4	56.8	0.8	11.4	270	5.4	77.2	8.8	0.4	5.7	24.0	2.0	28.6	-	4.6	65.7
30	712269	3.0	0.1	1.3	93.7	1.3	16.7	320	6.4	82.0	28.8	1.4	17.9	3.8	0.3	3.8	-	6.1	78.3
31	685219	47.0	1.3	15.1	65.3	0.9	10.5	322	6.4	74.4	20.8	1.0	11.6	5.3	0.4	4.7	-	7.2	83.7
32	622236	28.0	0.8	11.0	56.8	0.8	11.0	286	5.7	78.0	39.2	1.9	26.0	7.7	0.6	8.2	-	4.8	65.8
33	595200	4100.0	117.1	97.7	56.8	0.8	0.7	98	1.9	1.6	1280.0	64.0	53.4	312.0	26.0	21.7	-	29.8	24.9
34	685220	56.0	1.6	19.5	31.2	0.4	4.9	310	6.2	75.6	23.2	1.2	14.6	2.9	0.3	3.7	-	6.7	81.7
35	674215	336.0	9.6	60.0	93.7	1.3	8.1	256	5.1	31.9	45.6	2.3	14.4	39.8	3.3	20.6	-	10.4	65.0
36	718201	5.0	0.1	1.2	59.6	0.8	9.4	378	7.6	89.4	29.6	1.5	17.6	2.4	0.2	2.4	-	6.8	80.0
37	667195	370.0	20.5	68.2	34.1	0.5	3.2	220	4.4	28.6	86.4	4.3	27.9	25.5	2.1	13.6	-	9.0	58.5
38	663368	35.5	1.0	11.6	39.0	0.5	5.8	354	7.1	82.6	27.7	1.4	16.3	10.7	0.9	10.5	-	6.3	73.2
39	653322	21.3	0.6	9.1	19.0	0.3	4.5	286	5.7	86.4	32.1	1.6	24.2	12.6	1.1	16.7	-	3.9	59.1
40	949039	327.0	9.3	59.6	6.0	0.1	0.7	310	6.2	39.7	15.2	0.8	5.2	7.8	0.6	3.8	-	14.2	91.0
41	534387	1690.0	48.3	93.6	0	0	0	166	3.3	6.4	476.0	23.8	46.1	36.0	3.0	5.8	-	24.8	48.1
42	422453	6.0	0.2	3.3	1.4	0.01	0.2	298	5.9	96.5	30.4	1.5	24.6	6.7	0.6	9.8	-	4.0	65.6

Appendix 2-A-4 (cont.)

Well No.	Grid Ref.	Anion = 100 %									Cation = 100 %								
		Cl			SO_4			$CO_3 + HCO_3$			Ca			Mg			Na + K		
		ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%	ppm.	epm.	%
43	633371	10.0	0.3	5.5	73.8	1.0	18.2	208	4.2	76.3	27.2	1.4	25.5	7.7	0.6	10.9	-	3.5	63.6
44	718198	2.0	0.1	1.2	85.2	1.2	13.9	364	7.3	84.9	18.4	0.9	10.5	3.4	0.3	3.5	-	7.4	86.0
45	614349	4.0	0.1	1.4	0.0	0.0	0.0	346	6.9	98.6	15.2	0.8	11.4	18.7	1.6	22.9	-	4.6	65.7
46	674306	7.0	0.2	3.3	0.0	0.0	0.0	288	5.8	96.7	24.0	1.2	20.0	2.9	0.2	3.3	-	4.6	76.7
47	630217	5.1	0.2	5.3	18.5	0.3	7.9	166	3.3	86.8	23.2	1.2	31.6	15.4	1.3	34.2	-	1.3	34.2
48	609223	40.0	1.1	14.9	25.6	0.4	5.4	294	5.9	79.7	31.2	1.6	21.6	12.5	1.0	13.5	-	4.8	64.9

Appendix 2-B : Chemical Quality of Groundwater

Appendix 2-B-1 : Chemical quality of groundwater in Bangkok Aquifer (1975 - 1978)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
52Th	630125	1,250	536	600.0	3.22
53Th	603142	670	260	295.0	0.29
A-5	624113	2,000	1,160	1,160.0	4.80
587	618134	980	525	575.0	2.46
588	643120	480	190	188.0	0.97
589	645119	440	174	158.0	0.83
590	630115	730	340	380.0	16.00
591	629121	680	380	322.0	0.52
592	614128	900	445	500.0	0.93
593	613132	1,300	660	740.0	5.96
594	618129	1,300	660	760.0	2.62
605	634119	925	510	510.0	1.57
606	631113	590	268	275.0	0.78
607	629118	735	388	365.0	0.38
608	616118	770	320	378.0	0.47
609	616132	1,300	760	820.0	3.20
610	623128	1,150	780	720.0	1.42
612	640114	690	1,300	316.0	3.60
622	697093	692	282	255.0	0.42

Appendix 2-B-1 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
636	664069	529	109	85.2	0.90
643	682092	749	192	-	0.45
651	631110	1,300	440	700.0	3.25
653	687034	760	292	242.0	0.11
654	699045	465	144	137.0	0.50
655	707007	1,400	688	740.0	1.35
657	838085	325	88	5.0	0.13
665	669111	270	120	34.0	0.71
667	684117	240	94	8.0	0.50
T-8	488150	5,512	1,469	2,735.0	0.20
506	654078	645	277	291.0	0.90

Appendix 2-B-2 : Chemical quality of groundwater in Phra Pradaeng Aquifer (1975 - 1978)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
61/7	677180	1,800	946	900.0	1.96
73/8	716154	240	142	16.0	0.94
74/8	701160	320	132	30.0	0.81
75/11	735157	380	182	76.0	0.53
82/8	676152	215	116	15.0	0.81
84/10	701186	430	194	125.0	1.31
86/10	698168	350	88	40.0	0.30
97/11	750134	570	280	159.0	0.36
98/11	739127	480	268	120.0	0.91
100/8	676150	750	320	329.0	2.59
101/8	651146	610	258	300.0	2.40
103/8	681158	350	124	60.0	0.59
104/8	680157	325	100	33.0	0.32
109/11	732153	370	154	37.0	0.83
110/8	692157	245	114	28.0	0.77
112/10	719193	320	70	6.0	0.19
115/5	688273	310	102	20.0	0.09
140/7	670185	1,250	606	590.0	0.24
145/10	722175	370	134	55.0	0.44

Appendix 2-B-2 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
153/1	623200	805	352	372.0	1.21
154/10	714169	295	100	9.0	0.30
52Th	630125	1,250	536	600.0	3.22
53Th	603142	670	260	295.0	0.29
55Th	647121	1,000	450	510.0	3.16
5/N	638344	265	138	14.0	1.18
4/S	742030	450	122	111.0	0.91
5/S	733033	600	164	215.0	1.21
6/S	732051	480	84	114.0	0.72
7/S	734048	530	108	160.0	0.81
8/S	730023	860	282	397.0	3.92
9/S	738027	405	92	64.0	0.68
A-1	632144	1,400	310	650.0	10.50
A-4	718153	290	140	15.0	0.87
A-5	624113	2,000	1,160	1,160.0	4.80
2-25T	595200	4,400	1,700	2,840.0	12.00
503	695094	379	79	21.3	0.70
512	632119	1,016	364	387.0	1.65
516	949039	688	92	181.0	1.00
544	383984	252	58	3.3	0.07

Appendix 2-B-2 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
587	618134	980	525	575.0	2.46
593	613132	1,300	660	740.0	5.96
594	618129	1,300	660	760.0	2.62
597	707260	504	184	82.0	0.38
598	631154	2,284	988	1,088.0	2.70
609	616132	1,300	760	820.0	3.20
611	642123	1,850	1,100	1,160.0	0.05
622	697093	692	282	255.0	0.42
627	645106	522	80	8.9	0.55
633	775953	467	112	14.2	0.20
647	708091	344	90	5.0	0.41
650	477131	1,300	892	705.0	2.55
656	753076	300	96	14.0	0.47
666	678109	245	90	5.0	0.32
668	374946	-	158	32.5	0.33
670	384114	-	206	13.0	0.50
673	106257	-	450	573.0	0.10
T-6	687058	955	290	415.0	0.75
T-7	640117	600	462	502.0	0.33
T-8	488150	2,340	953	823.0	0.79

Appendix 2-B-2 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid	Total Hardness	Cl (ppm.)	Fe (ppm.)
D-16	630369	4,137	-	2,123.0	1.30
3-34	806127	360	88	16.0	trace
3-75	700164	310	122	18.0	0.69
3-48	682203	365	118	51.1	0.67

Appendix 2-B-3 : Chemical quality of groundwater in Nakhon Luang Aquifer (1975 - 1978)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
4/1	621193	1,200	572	681.0	0.41
7/8	643169	670	384	414.0	0.28
10/1	621209	1,350	580	660.0	1.84
11/1	630217	260	122	5.1	2.99
13/2	641215	325	158	79.0	0.05
16/1	638209	340	176	109.0	0.23
18/1	641195	249	102	25.0	0.05
20/2	628213	375	174	123.0	0.53
25/6	633241	94	78	10.0	0.06
29/3	639227	360	128	83.0	0.04
33/6	682207	330	144	45.0	0.15
45/4	643240	327	182	60.0	0.05
85/10	695198	335	56	33.0	0.24
88/10	727174	325	78	8.0	0.26
94/4	629283	4,250	1,780	2,550.0	20.60
95/5	715262	300	128	9.0	0.21
96/4	645273	395	178	99.0	0.33
97/11	750134	570	280	159.0	0.36
105/10	718152	335	82	11.0	0.24

Appendix 2-B-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
107/5	688234	275	54	2.0	0.55
111/10	703178	370	58	32.0	0.41
113/5	708309	270	114	3.0	0.07
114/10	727171	400	194	84.0	0.49
122/6	678206	360	64	52.0	0.26
123/10	713192	300	40	7.0	0.10
124/5	684216	320	68	36.0	0.38
126/11	803121	355	78	10.0	0.01
128/11	755160	355	70	19.0	0.13
130/1	641215	440	262	230.0	0.70
131/11	740112	325	48	95.0	0.09
132/5	700273	270	118	6.0	0.30
134/5	701232	285	82	7.0	0.09
137/11	764123	350	54	6.0	0.01
138/5	721263	300	118	12.0	0.09
139/11	734118	330	40	12.0	0.09
142/6	720197	340	60	15.0	0.23
145/10	722175	370	134	55.0	0.44
146/5	725248	330	92	29.0	0.09
148/5	720323	272	120	8.0	0.64

Appendix 2-B-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
150/10	717184	340	120	47.0	0.38
152/2	619208	470	172	128.0	0.55
160/4	634305	255	114	8.0	0.67
161/1	634217	340	158	105.0	0.47
162/4	656297	240	144	13.0	0.53
163/5	717318	275	96	4.0	0.27
165/5	693229	270	54	2.0	0.24
167/11	774163	330	98	1.0	0.12
169/5	753242	290	144	7.0	0.11
171/4	674300	305	128	34.0	0.32
174/4	630281	420	180	120.0	0.35
175/4	648291	230	120	4.0	0.79
176/5	752190	285	132	24.0	0.15
178/5	699239	300	58	3.0	0.22
179/10	739168	370	122	59.0	0.33
180/11	732141	320	64	9.0	0.05
183/11	741165	345	94	16.0	0.26
184/3	645223	278	65	3.0	0.14
14/Th	620237	465	158	126.0	0.27
15/Th	632248	275	108	8.0	0.84

Appendix 2-B-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
33/Th	626250	340	130	40.0	0.28
34/Th	639259	270	122	4.0	0.59
36/Th	606197	850	400	440.0	0.83
38/Th	604241	620	254	254.0	0.91
39/Th	627242	249	110	15.0	0.32
44/Th	641269	340	148	65.0	0.38
45/Th	626254	330	100	39.0	0.20
47/Th	572165	1,700	990	900.0	1.36
48/Th	617168	790	412	402.0	1.09
49/Th	612164	605	250	260.0	0.89
54/Th	559165	460	36	151.0	0.15
56/Th	626240	410	140	113.0	0.33
57/Th	533167	500	312	200.0	1.13
66/Th	559158	860	98	430.0	0.16
67/Th	567167	490	62	155.0	0.60
4/N	622308	526	274	188.0	0.09
120/N	632303	245	108	4.0	0.70
121/N	649297	350	216	88.0	0.12
147/N	666329	255	128	11.0	0.20
156/N	662320	275	142	18.0	0.04

Appendix 2-B-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
164/N	618311	270	126	10.0	0.29
A-2	642160	1,400	592	672.0	1.56
A-3	674306	263	72	7.0	0.35
A-4	718153	290	140	15.0	0.87
1-4	631281	260	122	28.0	0.40
1-30T	633371	920	494	460.0	3.80
2-25T	595200	520	188	188.0	2.20
2-42T	609223	3,450	2,120	1,875.0	1.40
2-50T	606187	1,020	615	300.0	0.35
2-54T	632239	380	150	72.0	none
511	709357	416	144	10.7	0.80
516	949039	772	78	248.0	2.40
518	760183	283	69	7.1	0.12
525	731327	336	61	1.0	0.16
620	703310	378	107	36.0	0.58
621	701355	404	133	4.0	0.88
623	669198	360	84	22.0	0.26
624	765325	460	124	3.0	0.31
625	663183	340	113	11.0	0.24
626	676156	1,762	616	672.0	2.10

Appendix 2-B-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
628	705165	444	81	10.7	0.70
629	701347	520	210	120.0	0.91
630	568168	490	48	127.8	0.50
632	692291	362	137	16.0	0.50
634	732123	564	56	96.0	0.26
635	749208	394	132	4.0	0.32
637	667307	344	84	1.0	0.56
640	921040	567	143	106.5	0.40
642	781234	554	225	118.0	0.10
645	804179	440	58	1.0	0.14
646	736244	431	84	7.1	0.30
648	712090	519	69	106.5	0.12
658	892064	380	116	43.0	0.09
659	771214	310	122	6.0	0.18
660	782214	320	128	5.0	0.20
661	784209	310	132	2.0	0.08
662	862272	370	59	65.7	0.10
672	435263	-	116	14.5	0.10
676	862500	-	32	98.0	0.40
T-7	640117	635	630	780.0	0.93

Appendix 2-B-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
T-9	534387	14,400	4,980	8,850.0	2.80
T-10	422453	410	83	14.0	0.16
D-146	752342	1,179	-	441.0	1.40
D-159	782165	412	-	3.8	3.10
3-34	806127	360	88	16.0	trace
1-32	712268	325	88	3.0	trace
1-17	603322	255	148	10.0	0.74
1-29	651332	245	134	2.0	0.97
3-5	742133	345	40	4.0	trace
3-37	718198	330	60	2.0	trace
3-46	667195	780	324	370.0	0.77
3-32	697193	335	60	36.0	trace
3-48	682203	365	118	51.1	0.67

Appendix 2-B-4 : Chemical quality of groundwater in Nonthaburi Aquifer (1975 - 1978)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
11/1	630217	260	122	5.1	2.99
14/2	632211	260	130	42.0	0.34
16/1	638209	340	176	109.0	0.23
44/4	653238	260	120	2.0	0.21
117/5	696233	290	50	9.0	0.42
125/4	647270	1,020	640	515.0	1.80
127/5	720296	280	96	5.0	0.16
129/5	700303	300	74	1.0	0.62
131/11	740112	325	48	95.0	0.09
144/5	713296	275	98	1.0	0.21
146/5	725248	330	92	29.0	0.09
149/5	690223	350	68	40.0	0.03
151/5	718254	290	94	2.0	0.07
157/4	654277	270	140	25.0	0.30
158/4	665295	255	120	4.0	0.23
159/4	662279	265	122	4.0	0.10
160/4	634305	255	114	8.0	0.67
163/5	717318	275	96	4.0	0.27
165/5	693229	270	54	2.0	0.24

Appendix 2-B-4 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
166/4	652245	203	130	13.0	0.59
167/11	774163	330	98	1.0	0.12
168/5	702226	290	72	2.0	0.23
169/5	753242	290	144	7.0	0.11
170/5	733250	370	158	50.0	0.07
172/4	649252	230	140	8.0	0.73
173/4	650287	240	128	4.0	0.98
175/4	648291	230	120	4.0	0.79
182/5	712275	300	104	8.0	0.11
1/N	634344	290	114	2.0	0.41
3/N	614353	1,700	540	885.0	5.70
147/N	666329	255	128	11.0	0.20
181/N	614349	325	116	4.0	trace
A-2	642160	1,400	592	672.0	1.56
A-3	674306	263	72	7.0	0.35
1-4	631281	260	122	28.0	0.40
1-30T	633371	310	102	17.0	0.96
1-52	712269	325	88	3.0	0.24
1-56T	685219	365	74	47.0	0.32
2-19	622236	315	130	28.0	0.51

Appendix 2-B-4 (cont.)

Reference Well No. (MNWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
2-23T	626214	290	122	28.0	0.15
2-25T	595200	6,600	4,500	4,100.0	none
2-42T	609223	360	140	60.0	0.53
2-50T	606187	280	110	11.0	none
2-54T	632239	270	140	7.0	0.15
2-57	747141	690	164	272.0	0.04
500	663368	466	113	35.5	0.85
505	653322	311	132	21.3	1.50
516	949039	918	70	327.0	0.65
620	703310	378	107	36.0	0.58
625	663183	340	113	11.0	0.24
626	676156	1,762	616	672.0	2.10
637	667307	344	84	1.0	0.56
638	671266	340	113	1.6	0.16
641	684294	374	61	7.1	0.45
649	479145	1,780	963	1,019.0	0.80
663	634375	365	108	20.0	0.40
685	617268	-	106	8.0	0.33
T-7	640117	-	6,870	6,890.0	8.00
T-8	488150	11,408	4,395	5,580.0	0.86

Appendix 2-B-4 (cont.)

Reference Well No. (MWWA)	Grid reference	Tot. Dis. Solid (ppm.)	Total Hardness (ppm.)	Cl (ppm.)	Fe (ppm.)
T-9	534387	2,800	1,340	1,690.0	2.00
T-10	422453	342	106	8.0	0.18
1-32	712268	325	88	3.0	trace
1-30	633371	320	100	10.0	0.60
1-56	685220	375	70	56.0	trace
1-38	674215	710	270	336.0	0.32
1-20	718201	330	84	5.0	0.09

Appendix 2-C : Hydraulic Character Data

Appendix 2-C-1 : Hydraulic character data of Bangkok Aquifer

(1975 - 1978)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity ($m^3/h/m$)
52Th	630125	15.75	240.00	10.10	23.76
53Th	603142	19.50	250.00	8.50	29.40
A-5	624113	25.30	241.00	8.50	28.35
506	654078	23.90	57.00	4.90	11.63
552	688046	27.10	100.00	4.60	21.74
582	681050	15.50	91.00	14.30	6.36
508	654078	11.60	77.00	2.10	36.67
D-59	672080	19.00	92.00	19.50	4.70
D-62	674057	18.60	58.00	3.30	17.58
D-86	696048	16.00	91.00	14.00	6.50
D-98	702993	5.10	30.00	4.20	7.14
D-110	718974	5.00	12.00	3.00	4.00

Appendix 2-C-2 : Hydraulic character data of Phra Pradaeng Aquifer (1975 - 1978)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity ($m^3/h/m$)
75/11	735157	5.38	228.00	2.50	91.20
82/8	676152	18.30	180.00	4.90	36.73
84/10	701186	3.98	161.00	6.30	25.56
97/11	750134	16.50	200.00	4.00	50.00
98/11	739127	12.98	165.00	5.50	30.00
110/8	692157	19.80	155.00	9.10	17.03
112/10	719193	18.00	185.00	7.00	26.43
145/10	722175	22.90	303.00	10.70	28.32
52Th	630125	15.75	240.00	10.10	23.76
53Th	603142	19.50	250.00	8.50	29.41
55Th	647121	17.70	265.00	11.60	22.84
3/S	730020	18.00	304.00	14.00	21.71
A-1	632144	24.39	200.00	6.10	32.79
A-4	718153	34.36	200.00	5.40	37.04
A-5	624113	25.30	241.00	8.50	28.35
503	695094	29.90	118.00	13.70	8.61
512	632119	17.40	105.00	5.80	18.10
522	747090	27.40	40.00	9.20	4.35
544	383984	6.00	60.00	6.20	9.68

Appendix 2-C-2 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity (m^3/h/m)
547	687193	29.00	16.00	5.50	2.91
548	713086	25.60	10.00	2.40	4.17
597	707260	22.00	100.00	0.90	111.11
598	631154	23.80	76.00	6.80	11.18
602	817050	25.80	13.00	3.50	3.71
604	359187	13.70	218.00	5.80	37.59
616	665105	35.70	100.00	0.90	111.11
617	686163	33.50	50.00	3.10	16.13
644	713037	26.80	75.00	3.70	20.27
668	374946	14.80	46.00	7.10	6.48
673	106257	5.80	13.00	9.20	1.41
D-39	656217	4.00	19.00	4.30	4.42
D-50	661092	13.20	48.00	3.80	12.63
D-59	672080	19.00	92.00	19.50	4.72
D-61	674057	13.00	27.00	8.70	3.10
D-65	677186	20.00	32.50	9.40	34.57
D-88	696317	20.50	62.00	6.00	10.33
D-98	702993	5.10	30.00	4.20	7.14
D-111	718974	5.30	45.00	4.00	11.25
D-129	732044	15.00	28.00	7.00	4.00

Appendix 2-C-2 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity ($m^3/h/m$)
D-167	818095	18.00	45.00	12.00	3.75
D-203	697196	5.40	142.00	9.10	15.60
D-232	678183	19.80	304.00	10.40	29.23
3-34	806127	48.33	300.00	14.03	21.38
3-75	700164	60.13	300.00	19.43	15.44
3-48	682203	46.55	300.00	12.78	23.47

Appendix 2-C-3 : Hydraulic character data of Nakhon Luang Aquifer (1975 - 1978)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity ($m^3/h/m$)
94/4	629283	15.80	160.00	10.70	14.95
95/5	715262	16.48	170.00	4.00	42.50
97/11	750134	16.50	200.00	4.00	50.00
105/10	718152	19.20	145.00	8.20	17.68
106/4	676304	14.00	155.00	12.20	12.70
108/4	646279	18.60	180.00	11.30	15.90
119/4	671306	27.70	350.00	10.70	32.71
123/10	713192	17.40	180.00	5.80	31.03
130/1	641215	18.90	170.00	10.40	16.35
131/11	740112	18.00	230.00	7.00	32.86
137/11	764123	19.20	320.00	14.20	22.54
138/5	721263	22.90	325.00	8.50	38.24
139/11	734118	21.00	304.00	7.50	40.53
142/6	720197	23.50	350.00	7.00	50.00
143/5	704246	21.30	341.00	16.80	20.30
145/10	722175	22.90	303.00	10.70	28.32
146/5	725248	27.00	311.00	7.60	40.92
148/5	720323	29.60	300.00	12.50	24.00
160/4	634305	21.50	301.00	7.30	41.23

Appendix 2-C-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity ($m^3/h/m$)
163/5	717318	27.19	347.00	10.00	34.70
165/5	693229	33.53	330.00	18.37	17.96
167/11	774163	25.49	320.00	36.51	8.76
169/5	753242	28.18	323.00	12.49	25.86
174/4	630281	25.89	336.00	26.37	12.74
176/5	752190	28.65	340.00	12.35	27.53
178/5	699239	36.57	158.00	10.76	14.68
179/10	739168	32.00	181.00	10.50	17.24
180/11	732141	29.90	181.00	10.82	16.72
183/11	741165	30.48	181.00	7.70	23.51
184/3	645223	31.90	181.00	12.87	14.06
32Th	635183	21.60	150.00	7.30	20.55
33Th	626250	20.80	170.00	9.50	17.89
37Th	609206	21.30	180.00	7.90	22.78
38Th	604241	19.80	200.00	9.10	21.98
39Th	627242	20.70	210.00	8.80	23.86
40Th	610183	18.90	200.00	9.40	21.28
TT-41	617221	21.00	185.00	4.90	37.76
43Th	624237	20.70	200.00	8.80	22.73
44Th	641269	22.20	173.00	7.00	24.71

Appendix 2-C-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity ($m^3/h/m$)
45Th	626254	21.00	184.00	8.50	21.65
46Th	588172	18.90	169.00	10.70	15.79
47Th	572165	15.00	169.00	7.30	23.15
48Th	617168	18.90	240.00	11.90	20.17
49Th	612164	17.70	240.00	11.00	21.82
50Th	588154	18.00	220.00	10.70	20.56
51Th	627174	20.10	144.00	16.20	8.89
56Th	626240	25.30	376.00	6.40	58.75
4/N	622308	15.20	155.00	7.30	21.23
120/N	632303	20.70	214.00	6.40	33.44
121/N	649297	16.50	210.00	9.10	23.08
156/N	662320	20.70	350.00	3.40	102.94
164/N	618311	18.60	354.00	11.00	32.18
A-2	642160	28.66	200.00	17.40	11.49
A-3	674306	34.15	200.00	15.60	12.82
A-4	718153	34.36	200.00	5.40	37.04
1-4	631281	32.61	360.00	10.80	33.33
1-17	603322	27.12	360.00	8.80	40.91
1-29	651332	31.09	360.00	15.40	23.38
511	709357	12.20	54.00	4.60	11.74

Appendix 2-C-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity (m^3/h/m)
513	647172	7.60	142.00	6.10	23.28
518	760183	37.50	153.00	15.20	10.07
520	740198	39.60	19.00	0.60	31.67
524	727186	37.00	66.00	6.00	11.00
527	784556	30.00	60.00	4.60	13.04
528	721115	34.00	60.00	8.00	7.50
530	750493	25.90	86.00	3.10	27.74
531	683194	35.00	96.00	11.00	8.72
534	789185	34.00	161.00	8.00	20.13
535	714268	38.09	60.00	2.50	24.00
538	780242	33.50	76.00	10.70	7.10
539	760239	34.50	65.00	2.10	30.95
540	754203	34.50	150.00	5.80	25.86
541	672298	29.00	170.00	16.00	10.63
545	739259	31.10	30.00	4.90	6.12
546	711163	36.30	60.00	3.60	16.67
549	652372	20.40	150.00	4.60	32.61
551	793239	36.60	180.00	5.50	32.73
554	783231	36.00	250.00	5.50	45.45
555	703331	36.60	150.00	4.60	32.61

Appendix 2-C-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity (m^3/h/m)
601	009301	17.40	19.00	1.00	19.00
603	529157	19.80	68.00	6.70	10.15
604	359187	13.70	218.00	5.80	37.59
637	667307	37.20	200.00	12.80	15.63
672	435263	13.50	60.00	5.00	12.00
D-4	514159	18.00	20.00	2.00	10.00
D-10	619220	24.00	53.00	3.00	17.67
D-15	629369	11.50	13.00	14.10	0.92
D-26	642277	18.20	181.00	10.60	17.08
D-40	656217	21.00	28.00	7.30	3.84
D-57	670207	21.20	91.00	9.70	9.38
D-58	671208	21.20	94.00	9.80	9.59
D-69	686241	20.00	80.00	16.00	5.00
D-74	689276	17.00	150.00	6.10	24.59
D-88	696317	20.50	62.00	6.00	10.33
D-89	698351	20.00	65.00	8.00	8.13
D-91	700317	24.40	87.00	36.60	2.38
D-97	702372	20.00	100.00	11.60	8.62
D-160	782256	22.70	34.00	19.60	1.73
D-167	818095	18.00	45.00	12.00	3.75

Appendix 2-C-3 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity (m^3/h/m)
D-183	637214	8.40	122.00	7.00	17.43
D-194	662257	5.50	142.00	10.20	13.92
D-226	386013	14.00	110.00	4.30	25.58
D-227	386013	14.00	106.00	4.30	24.65
D-229	636230	27.40	19.00	6.10	3.11
D-233	694353	20.00	180.00	12.10	14.88
D-234	712235	21.00	183.00	11.00	16.64
D-237	740456	18.30	41.00	9.10	4.51
D-239	750493	10.40	45.00	7.60	5.92
1-17	603322	34.14	301.91	6.09	43.19
1-32	712268	58.67	301.91	19.97	15.12
1-4	631281	41.30	301.91	8.69	34.74
1-29	651332	43.07	301.91	11.98	25.20
3-5	742133	51.06	300.00	9.30	32.25
3-32	697193	57.95	300.00	16.49	18.19
3-34	806127	48.33	300.00	14.03	21.38
3-37	718198	58.24	306.00	17.80	20.22
3-46	667195	46.33	300.00	12.19	24.61
3-48	682203	46.55	300.00	12.78	23.47

Appendix 2-C-4 : Hydraulic character data of Nonthaburi Aquifer (1975 - 1978)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity ($m^3/h/m$)
119/4	671306	27.70	350.00	10.70	32.71
125/4	647270	16.80	220.00	10.40	21.15
127/5	720296	18.90	210.00	8.80	23.86
129/5	700303	15.90	205.00	3.70	55.41
131/11	740112	18.00	230.00	7.00	32.86
146/5	725248	27.00	311.00	7.60	40.92
157/4	654277	24.00	302.00	16.20	18.64
159/4	662279	24.69	301.00	20.40	14.75
160/4	634305	21.50	301.00	7.30	41.23
163/5	717318	27.19	347.00	10.00	34.70
165/5	693229	33.53	330.00	18.37	17.96
166/4	652245	26.15	333.00	35.85	9.29
167/11	774163	25.49	320.00	36.51	8.76
168/5	702226	29.20	330.00	29.20	11.30
169/5	753242	28.18	323.00	12.49	25.86
182/5	712275	37.00	181.00	14.80	12.23
181/N	614349	22.00	180.87	10.30	17.56
A-2	642160	28.66	200.00	17.40	11.49
A-3	674306	34.15	200.00	15.60	12.82

Appendix 2-C-4 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP.capacity (m^3/h/m)
1-4	631281	32.61	360.00	10.80	33.33
1-29	651332	31.09	360.00	15.40	23.38
1-52	712269	38.70	360.00	23.80	15.13
2-18	646235	32.60	300.00	12.60	23.81
2-57	747141	25.30	360.00	9.00	40.00
500	663368	23.50	45.00	10.50	4.29
505	653322	29.00	57.00	10.20	5.59
523	747323	35.66	150.00	11.58	12.95
529	696160	42.00	190.00	25.00	7.60
537	641249	32.30	180.00	7.90	22.78
550	785220	35.40	60.00	7.30	8.22
554	783231	36.00	250.00	5.50	45.45
637	667307	37.20	200.00	12.80	15.63
638	671266	35.00	100.00	7.00	14.29
663	634375	23.30	29.00	1.80	16.10
669	382978	11.80	74.00	10.10	7.33
685	617268	20.70	36.00	4.30	8.37
D-10	619220	24.00	53.00	3.00	17.67
D-35	649326	9.80	26.00	20.00	1.30
D-90	700312	19.00	80.00	3.00	26.67

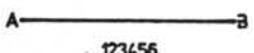
Appendix 2-C-4 (cont.)

Reference Well No. (MWWA)	Grid reference	Water level (m.)	Yield (m^3/h)	Drawdown (m.)	SP. capacity (m^3/h/m)
D-97	702372	20.00	100.00	11.60	8.62
D-166	804124	18.00	155.00	8.00	19.38
D-201	676435	11.00	57.00	2.70	21.11
1-32	712268	58.67	301.91	19.97	15.12
1-30	633371	36.98	301.91	8.94	33.77
1-56	685220	42.52	301.91	10.82	27.90
1-38	674215	58.83	301.91	25.30	11.93
1-20	718201	65.76	301.91	29.18	10.35

VITA

Mr. Santichai Jitapunkul was born in Bangkok, Thailand on June 20, 1955. In 1978, he received a B.Sc. degree in Geology from the Department of Geology, Faculty of Science, Chulalongkorn University. At present, he is working as an instructor in the Department of Geological Science of Chiang Mai University.

EXPLANATION

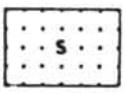


DATUM PLANE [mean sea level]

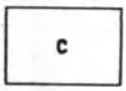
DRILLING WELL

BOUNDARY between PERMEABLE and IMPERMEABLE STRATA

BOUNDARY between MAJOR and MINOR component



PERMEABLE STRATA



IMPERMEABLE STRATA

MAJOR COMPONENTS

S = Sand

C = Clay

MINOR COMPONENTS

G = Gravel
Z = Zilt
cS = clayey Sand
gS = gravelly Sand
zS = zilty Sand
sG = sandy Gravel
zG = zilty Gravel
sZ = sandy Zilt
gZ = gravelly Zilt
lS = lateritic Sand

M = Mud
Z = Zilt
sC = sandy Clay
gC = gravelly Clay
zC = zilty Clay
cZ = clayey Zilt
lC = lateritic Clay

Horizontal scale 1:40,000

200 0 200 400 600 meters

Vertical scale 1:1,000

5 0 5 10 15 meters

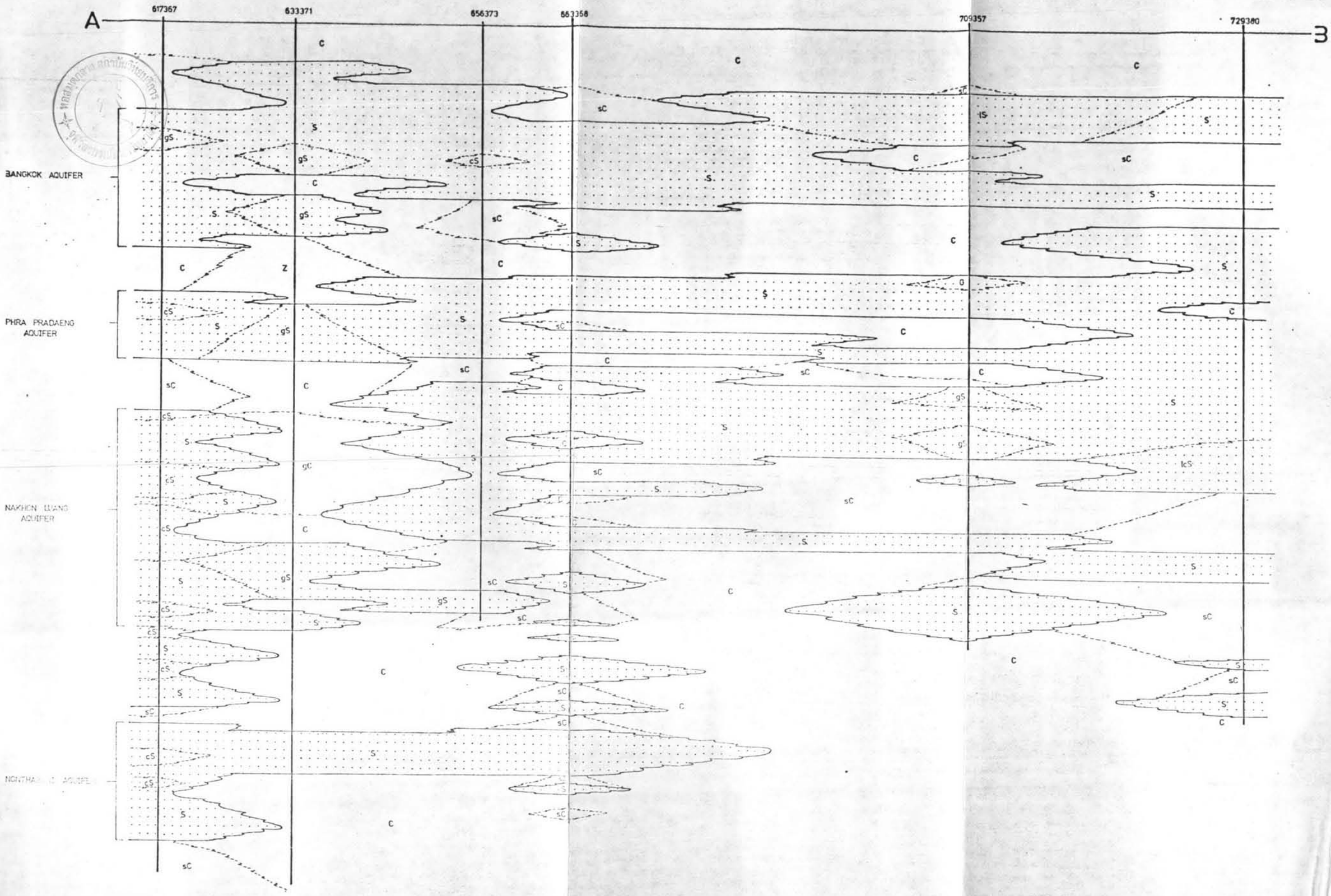


PLATE 4-1 CROSS SECTION ALONG LINE AB

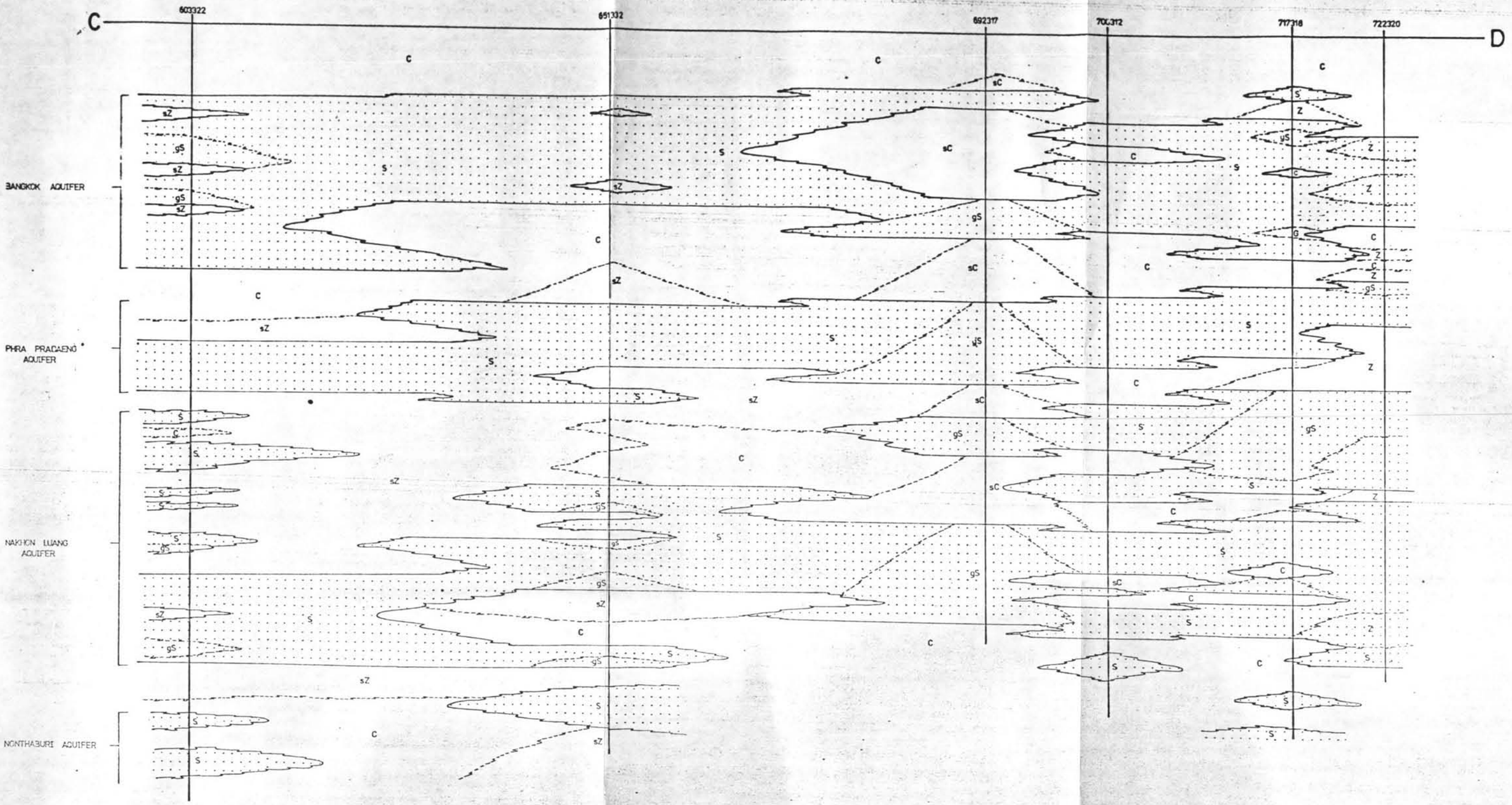


PLATE 4-2 CROSS SECTION ALONG LINE CD

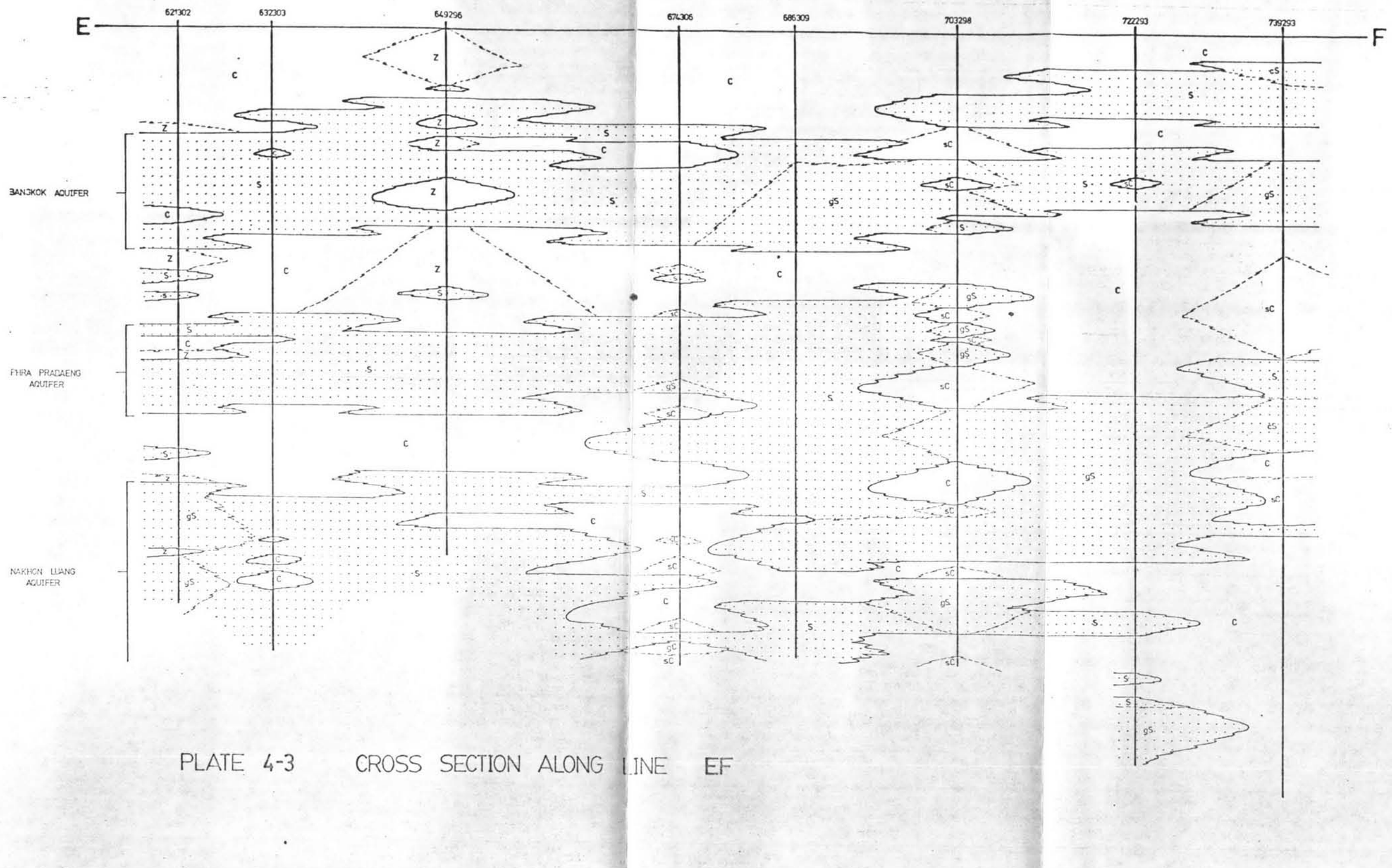


PLATE 4-3 CROSS SECTION ALONG LINE EF

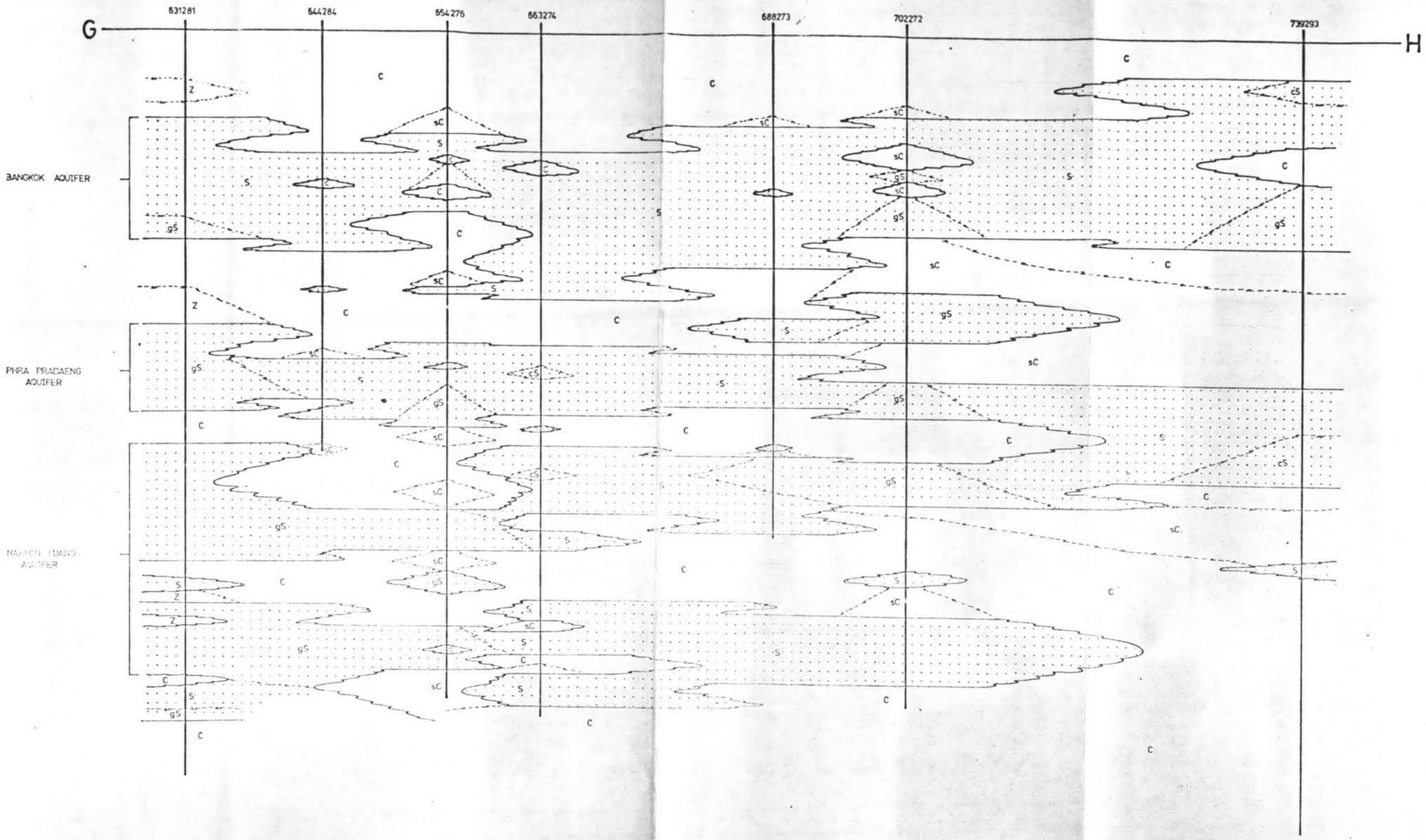


PLATE 4-4 CROSS SECTION ALONG LINE GH

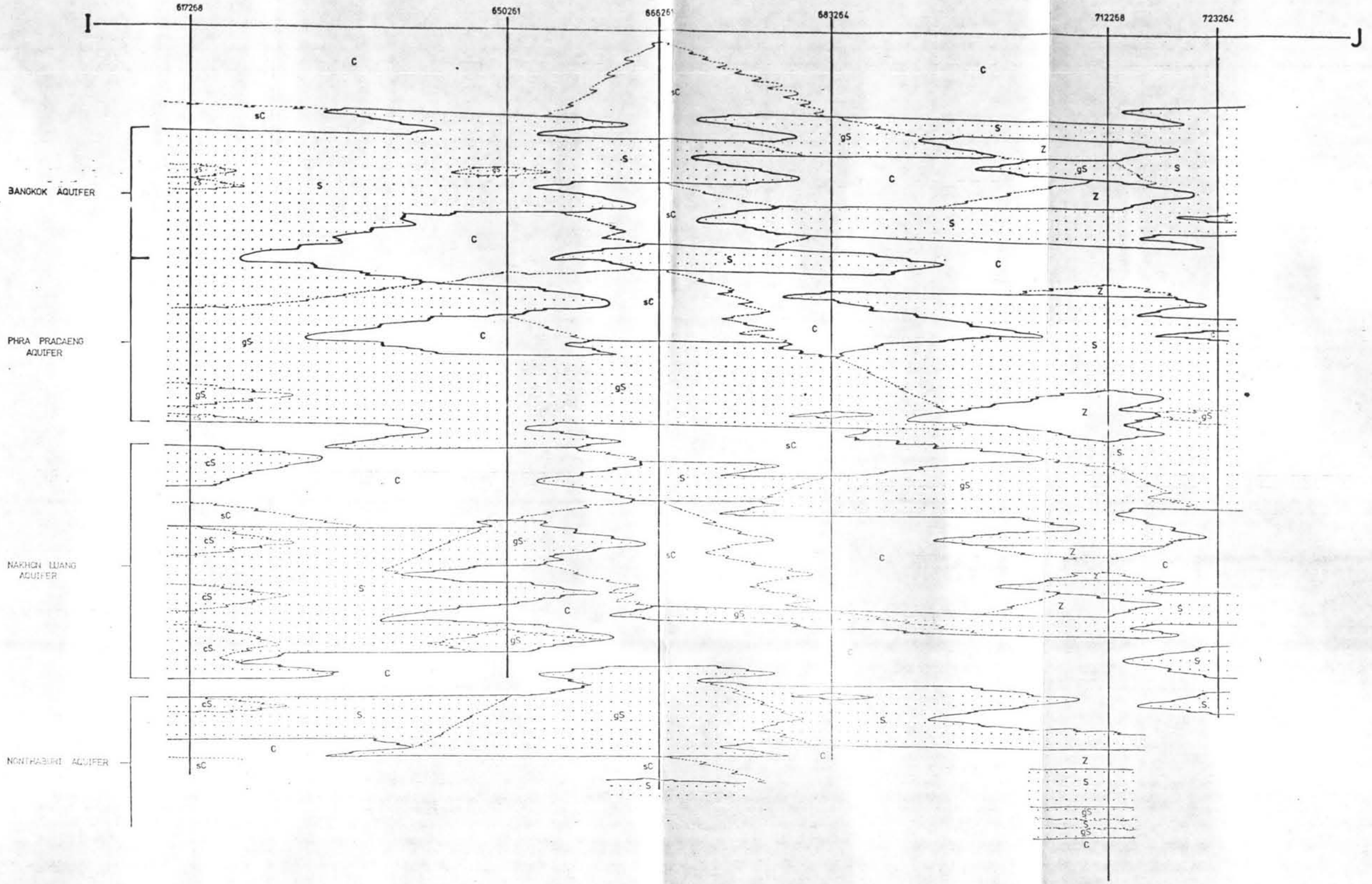


PLATE 4-5 CROSS SECTION ALONG LINE IJ

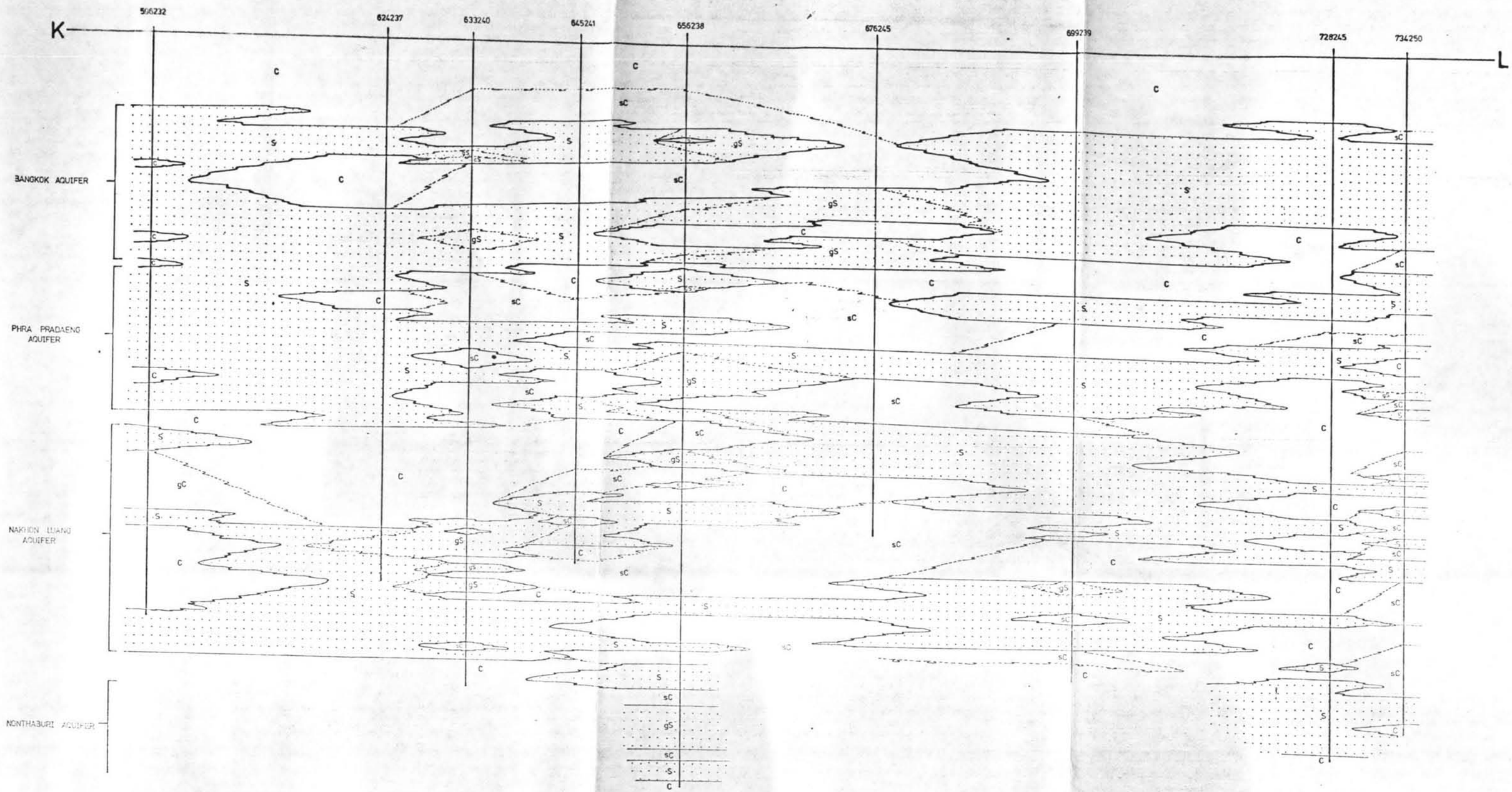


PLATE 4-6 CROSS SECTION ALONG LINE KL

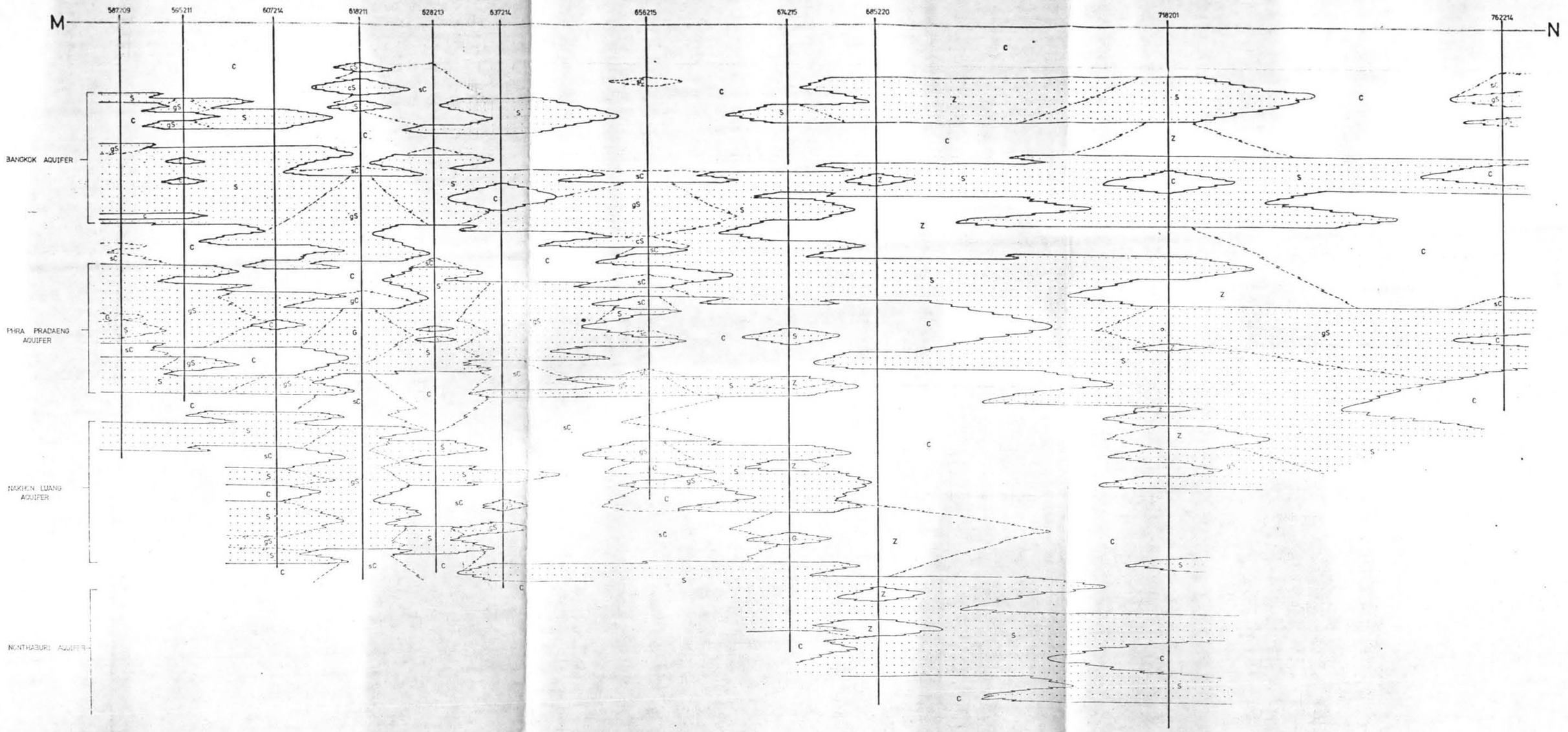


PLATE 4-7 CROSS SECTION ALONG LINE MN

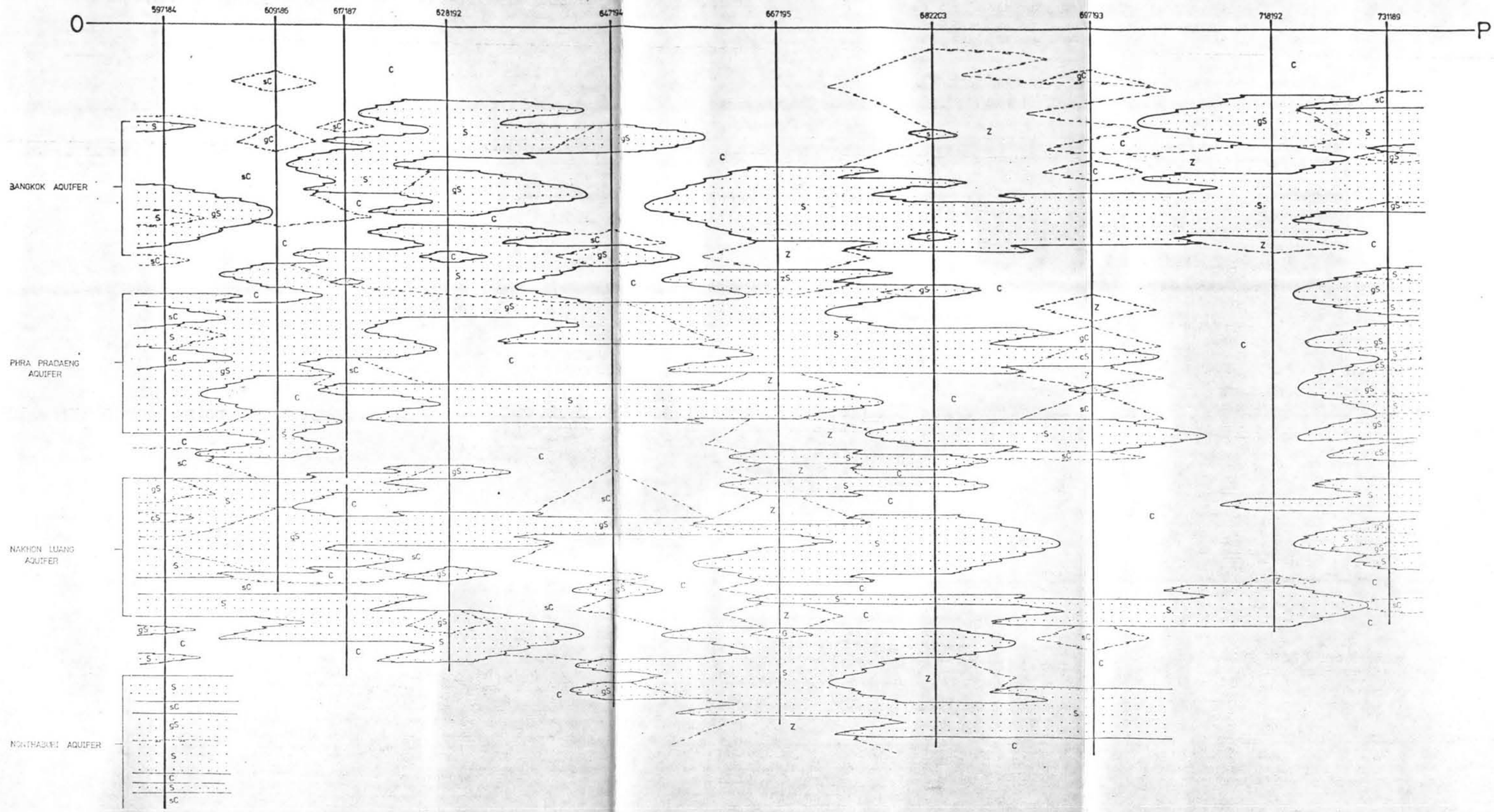


PLATE 4-8 CROSS SECTION ALONG LINE OP

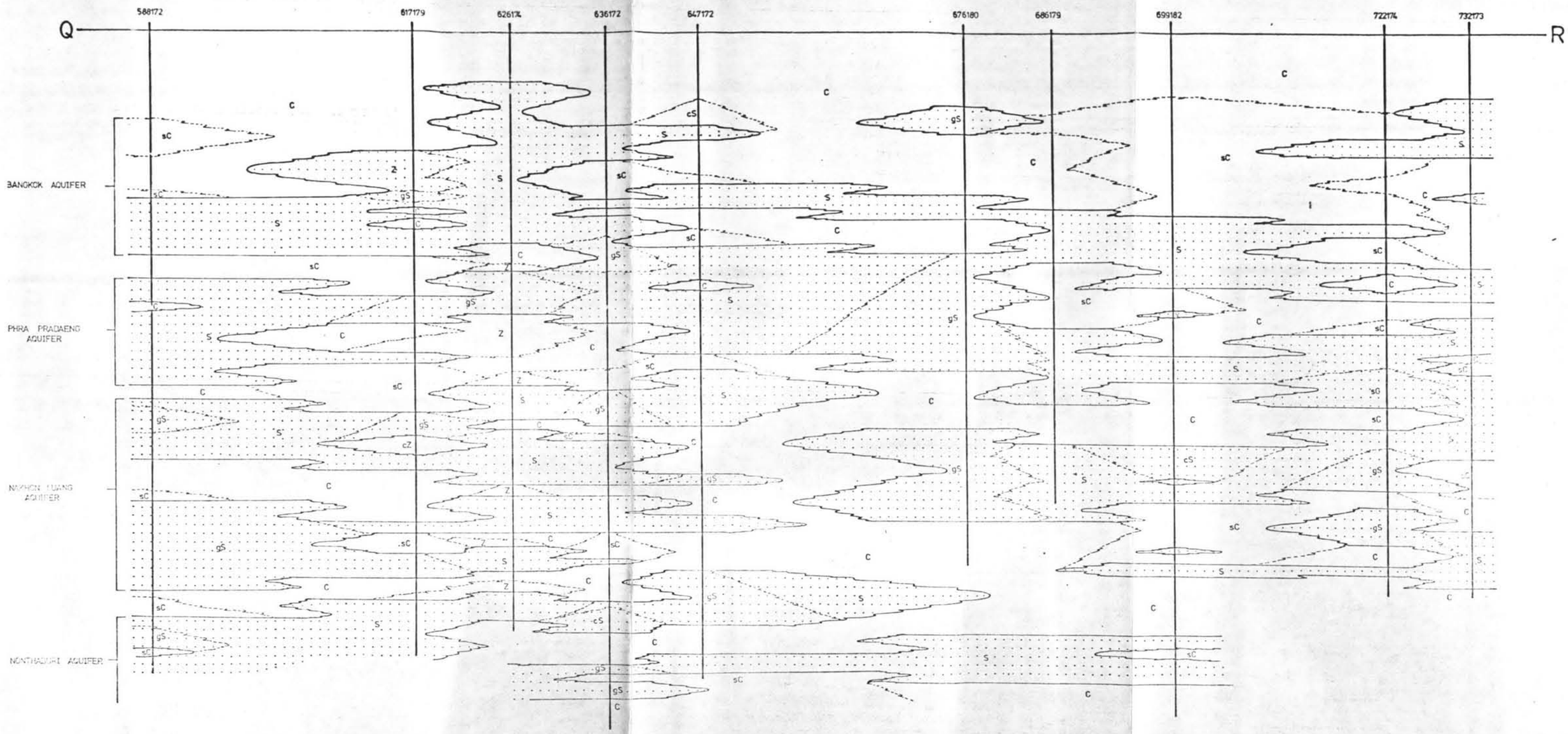


PLATE 4-9 CROSS SECTION ALONG LINE QR

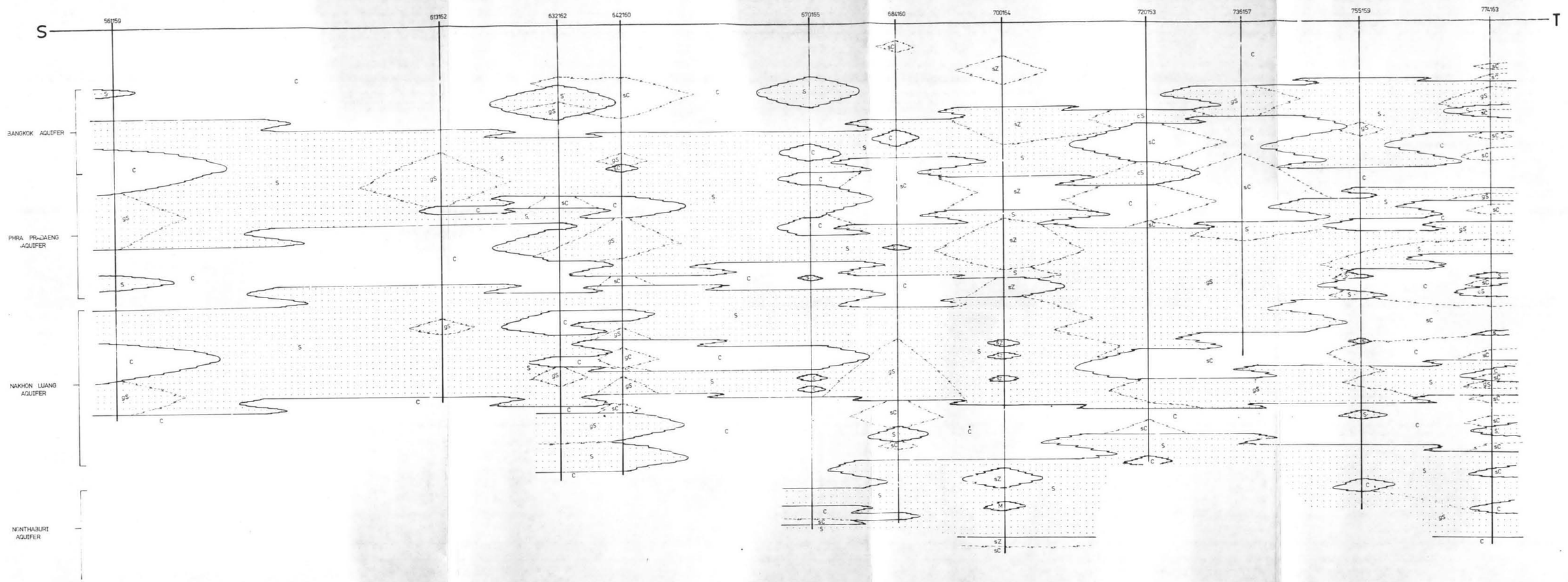


PLATE 4-10 CROSS SECTION ALONG LINE ST

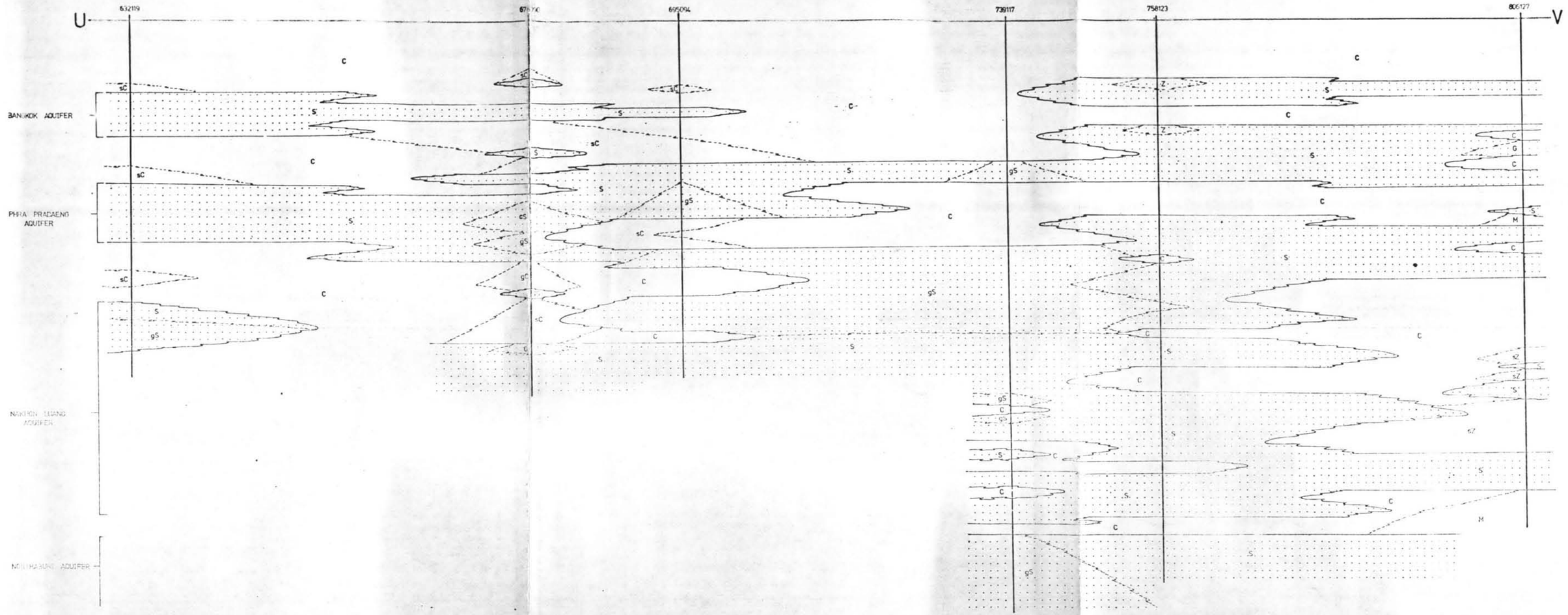


PLATE 4-11 CROSS SECTION ALONG LINE UV

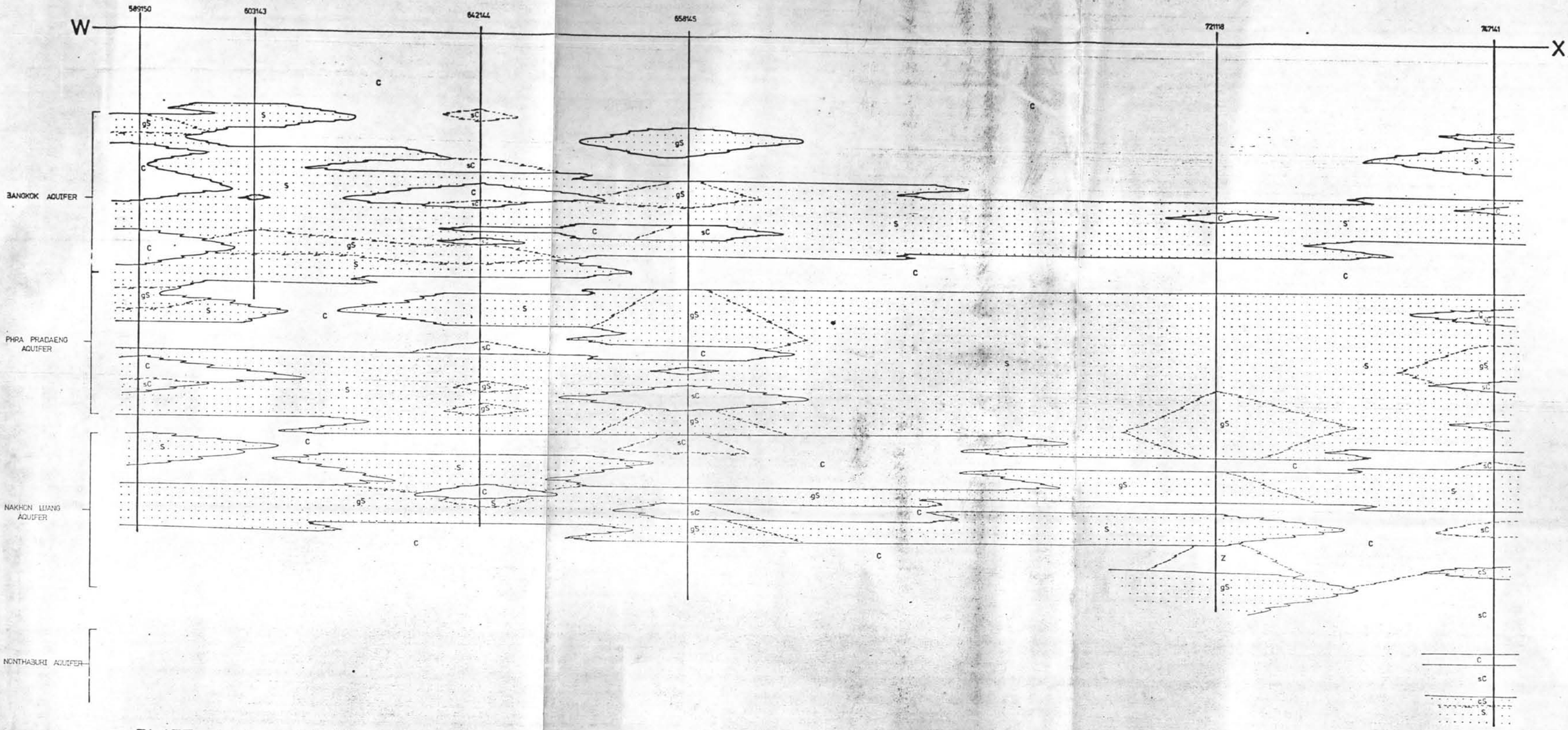


PLATE 4-12 CROSS SECTION ALONG LINE WX