

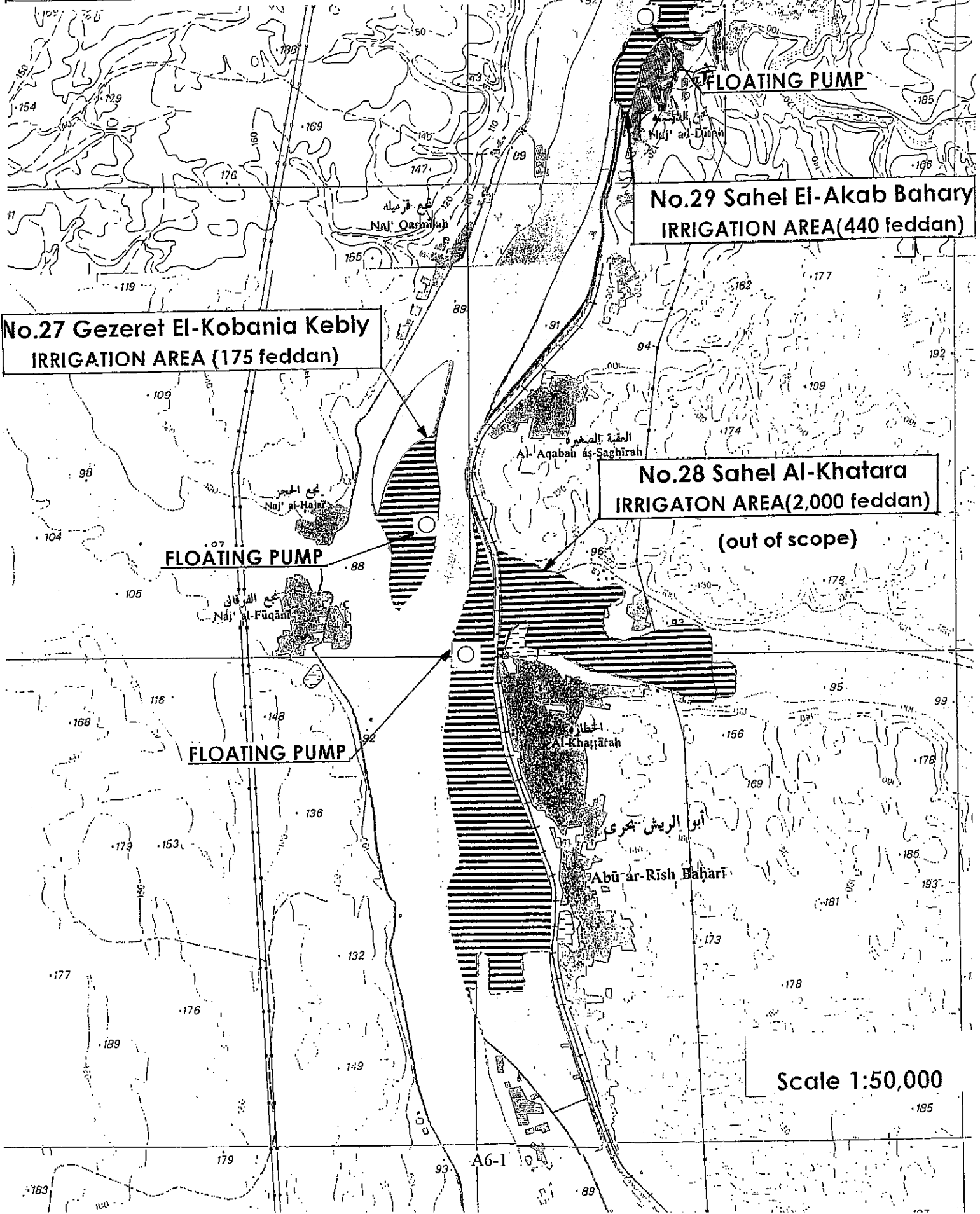
Appendix-6 . Other Relevant Data and Information

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A. Proposed Irrigation Area

Proposed Irrigation Area

- A-1. No.27 Gezeret El-Kobania Kebly**
- No.28 Sahel Al-khatara (out of scope)**
- No.29 Sahel El-Akab Bahary**



**No.29 Sahel El-Akab Bahary
IRRIGATION AREA(440 feddan)**

**No.27 Gezeret El-Kobania Kebly
IRRIGATION AREA (175 feddan)**

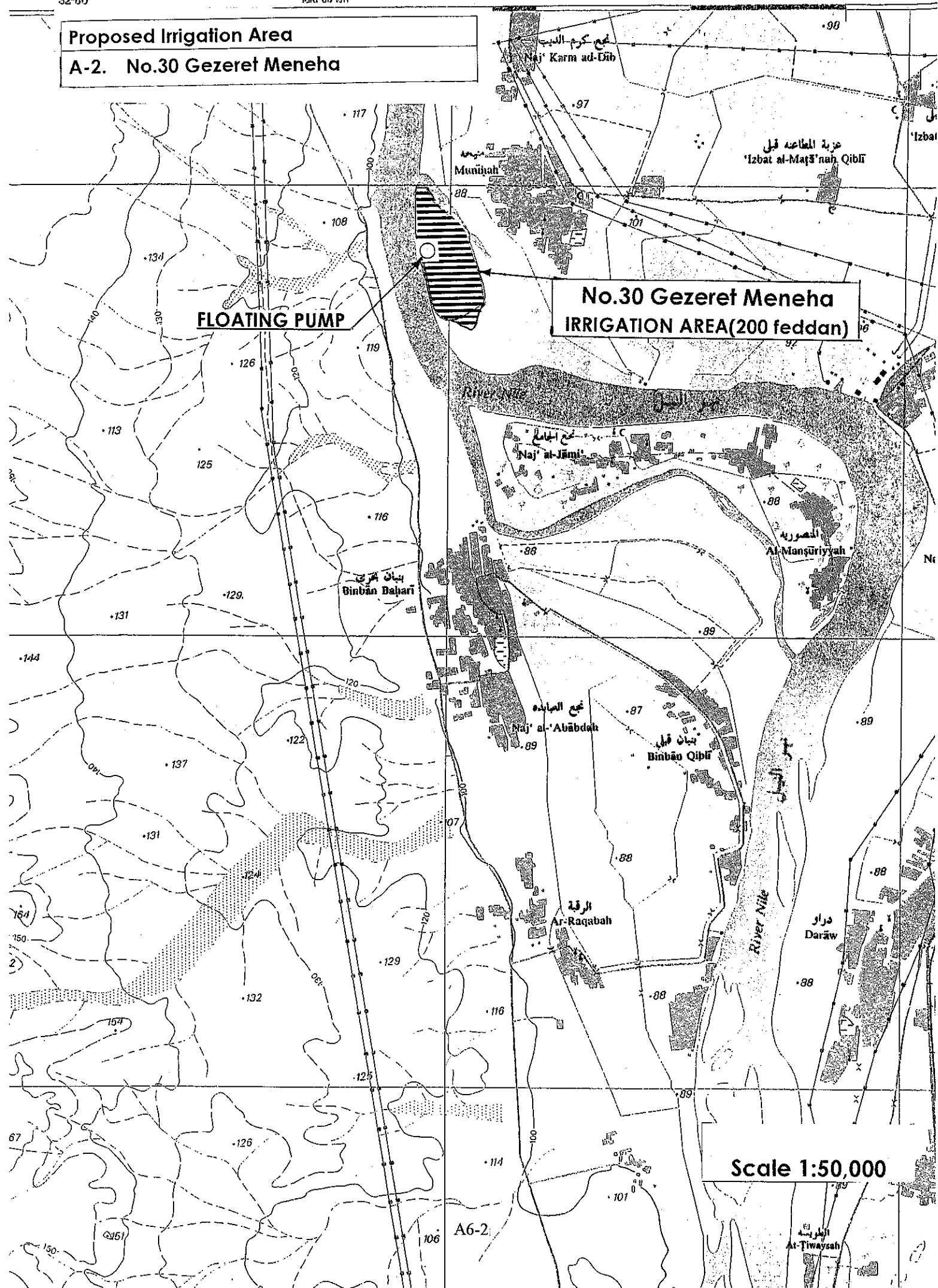
**No.28 Sahel Al-Khatara
IRRIGATION AREA(2,000 feddan)
(out of scope)**

Scale 1:50,000

Proposed Irrigation Area
A-2. No.30 Gezeret Meneha

FLOATING PUMP

No.30 Gezeret Meneha
IRRIGATION AREA(200 feddan)



Scale 1:50,000

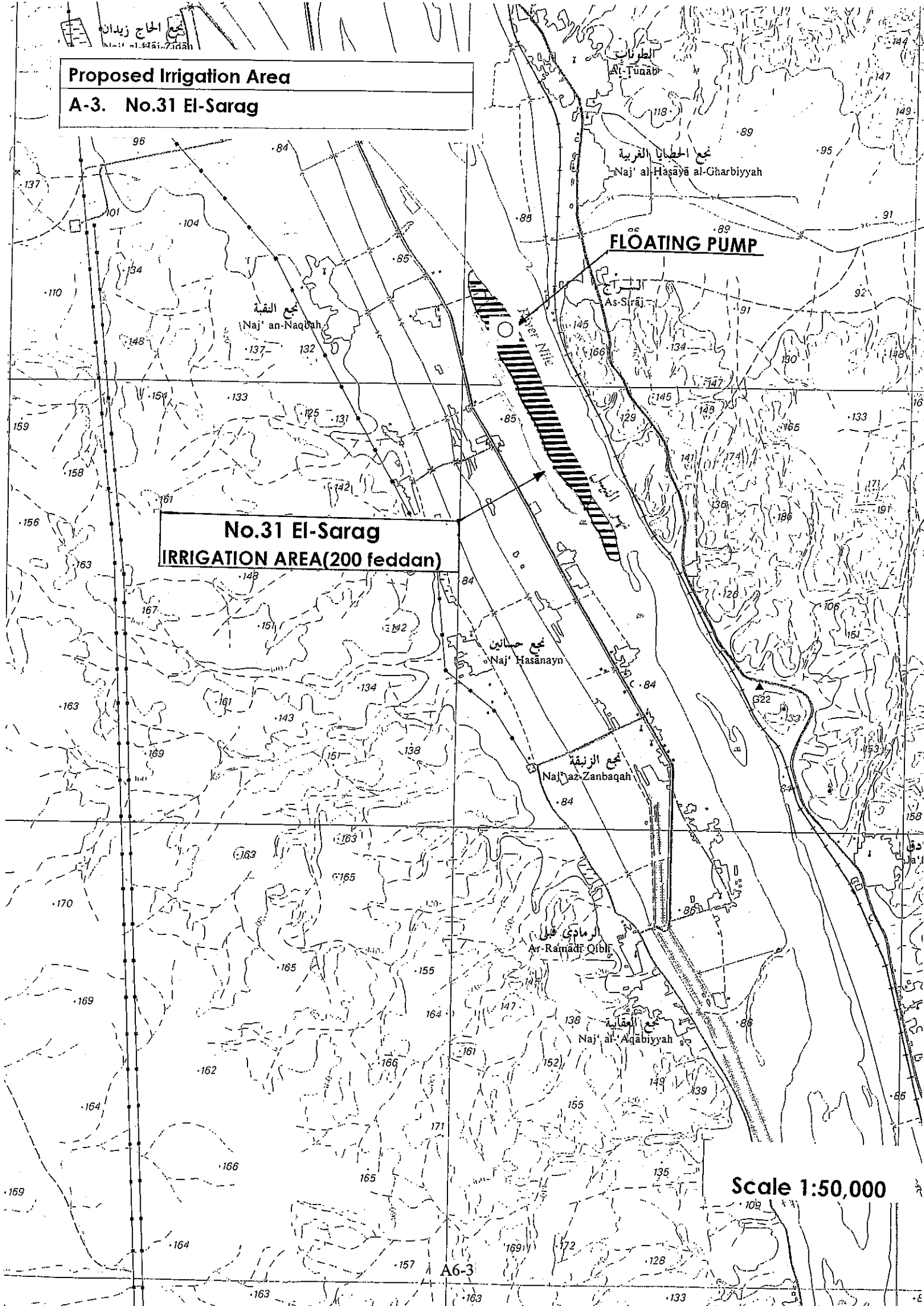
A6-2

الطريق
At-Tiwaysah

Proposed Irrigation Area
A-3. No.31 El-Sarag

No.31 El-Sarag
IRRIGATION AREA(200 feddan)

FLOATING PUMP



Scale 1:50,000

Proposed Irrigation Area

**A-4. No.32 Gezeret El-Fawaza El-Keblia
No.33 Middle Fawaza**

**No.33 Middle Fawaza
IRRIGATION AREA(210 feddan)**

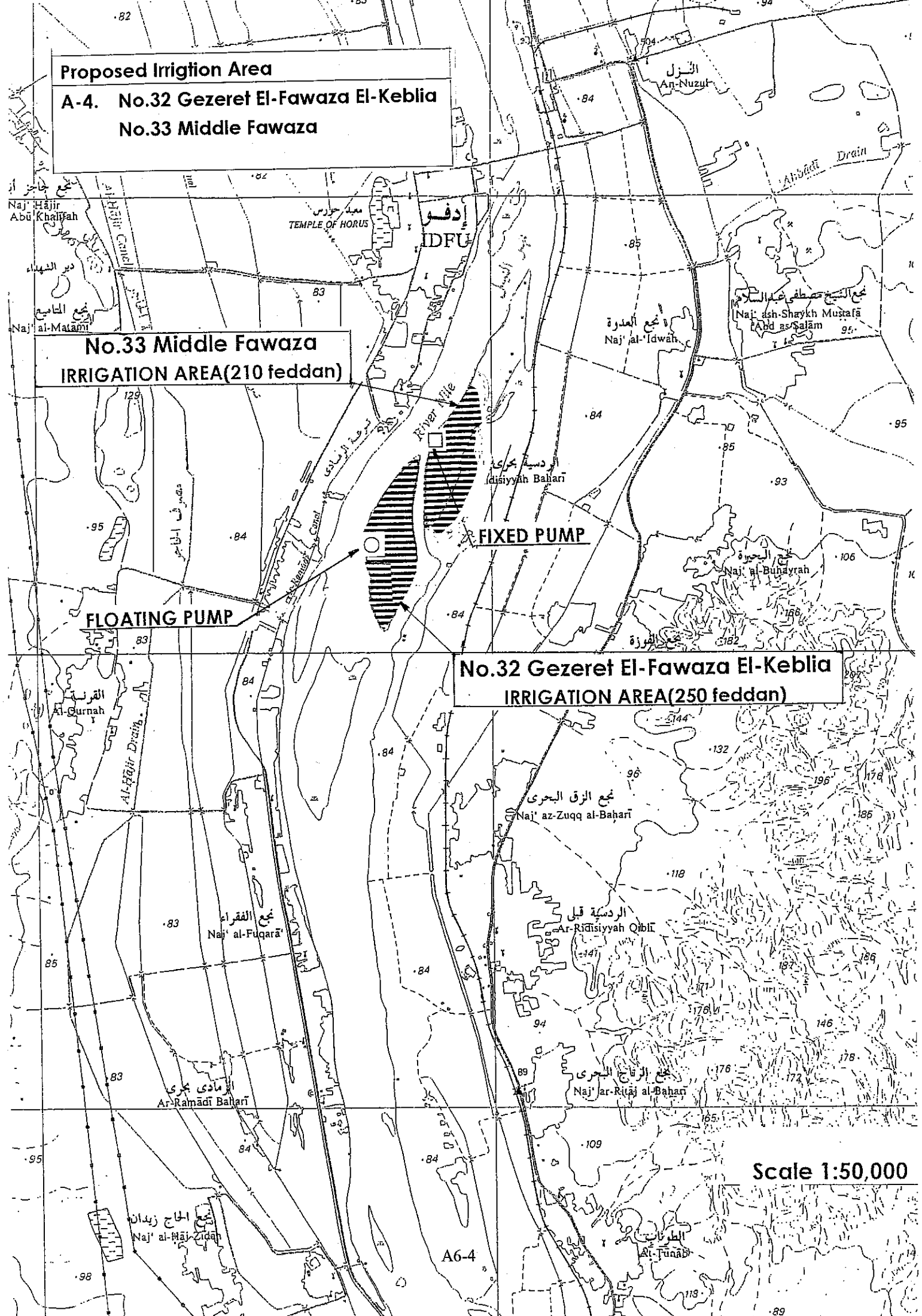
**No.32 Gezeret El-Fawaza El-Keblia
IRRIGATION AREA(250 feddan)**

FLOATING PUMP

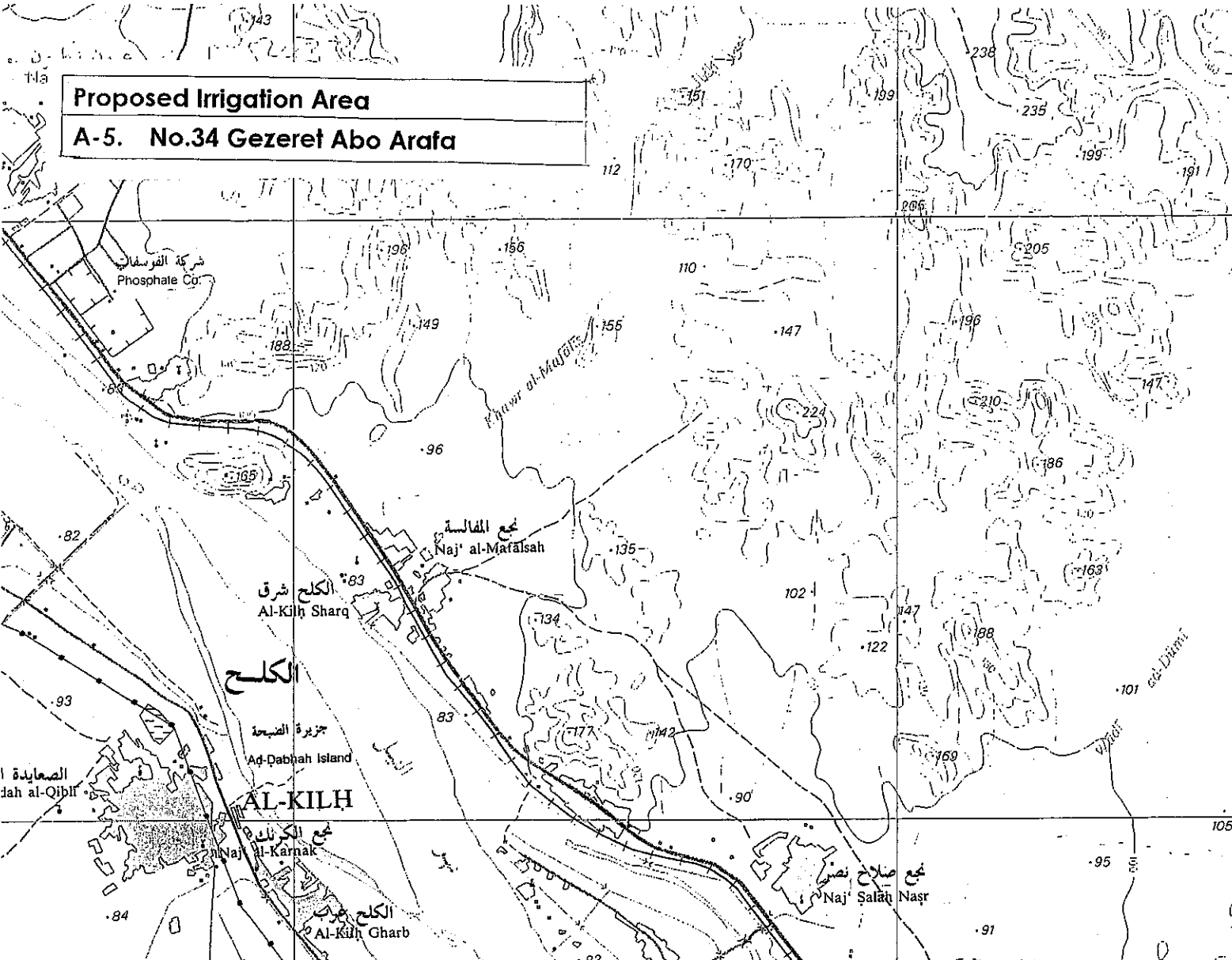
FIXED PUMP

Scale 1:50,000

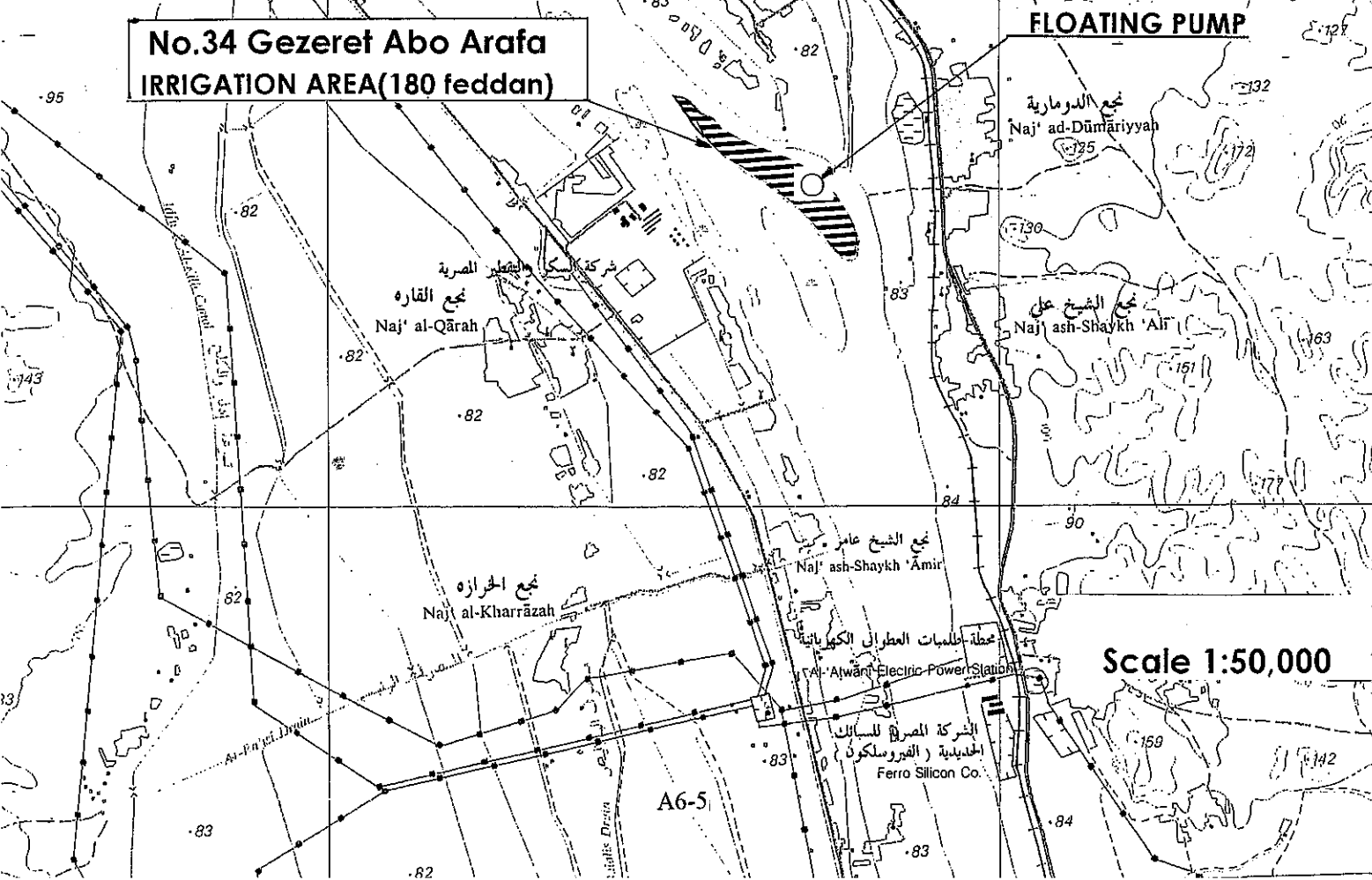
A6-4



Proposed Irrigation Area
A-5. No.34 Gezeret Abo Arafa



No.34 Gezeret Abo Arafa
IRRIGATION AREA(180 feddan)

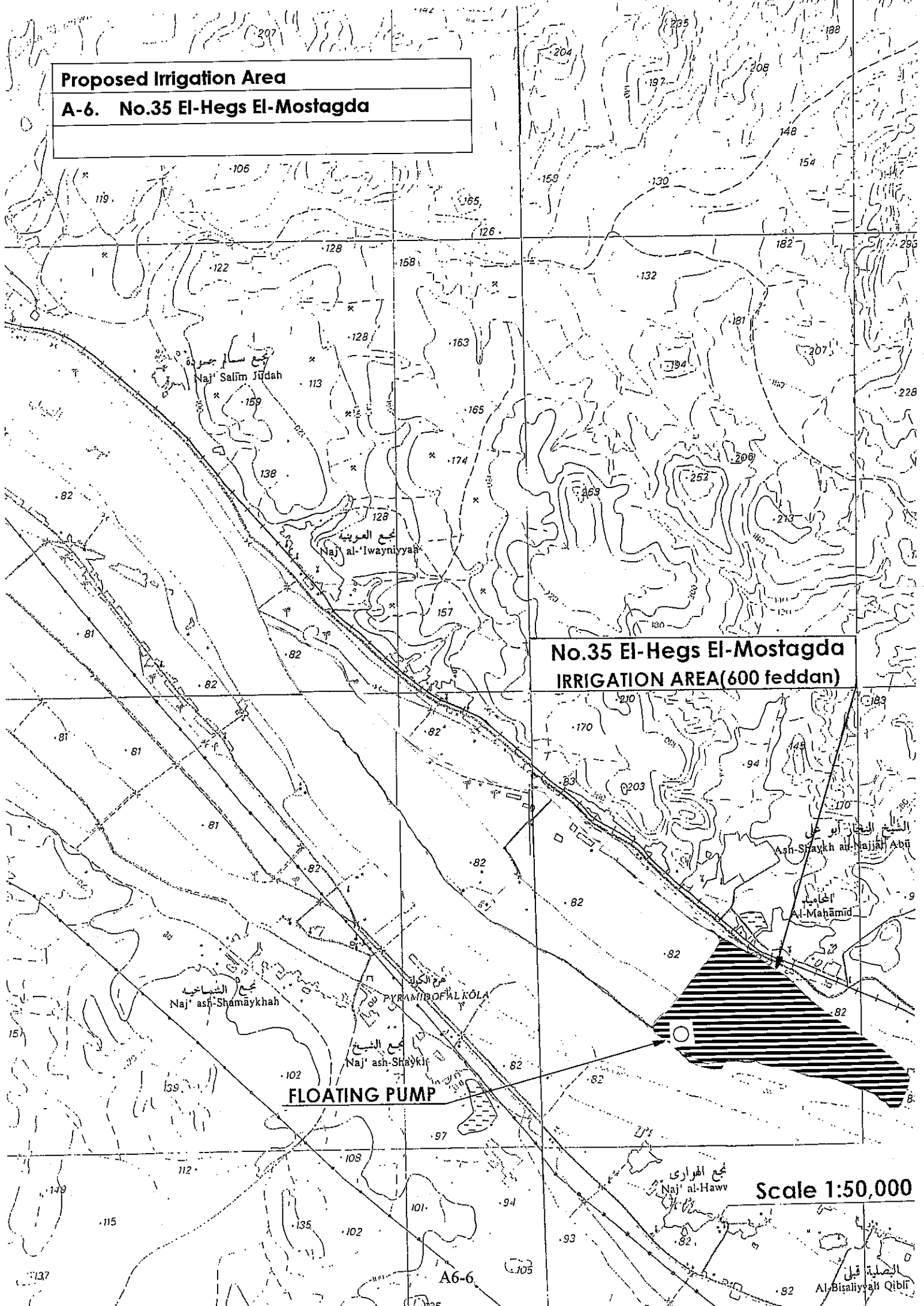


Scale 1:50,000

A6-5

Proposed Irrigation Area

A-6. No.35 El-Hegs El-Mostagda



**No.35 El-Hegs El-Mostagda
IRRIGATION AREA(600 feddan)**

FLOATING PUMP

Scale 1:50,000

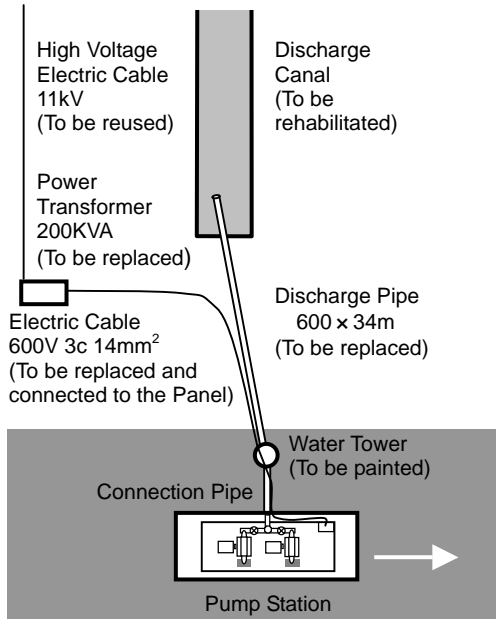
A6-6

الصلبة قبل
Al-Bisaliyyah Qibli

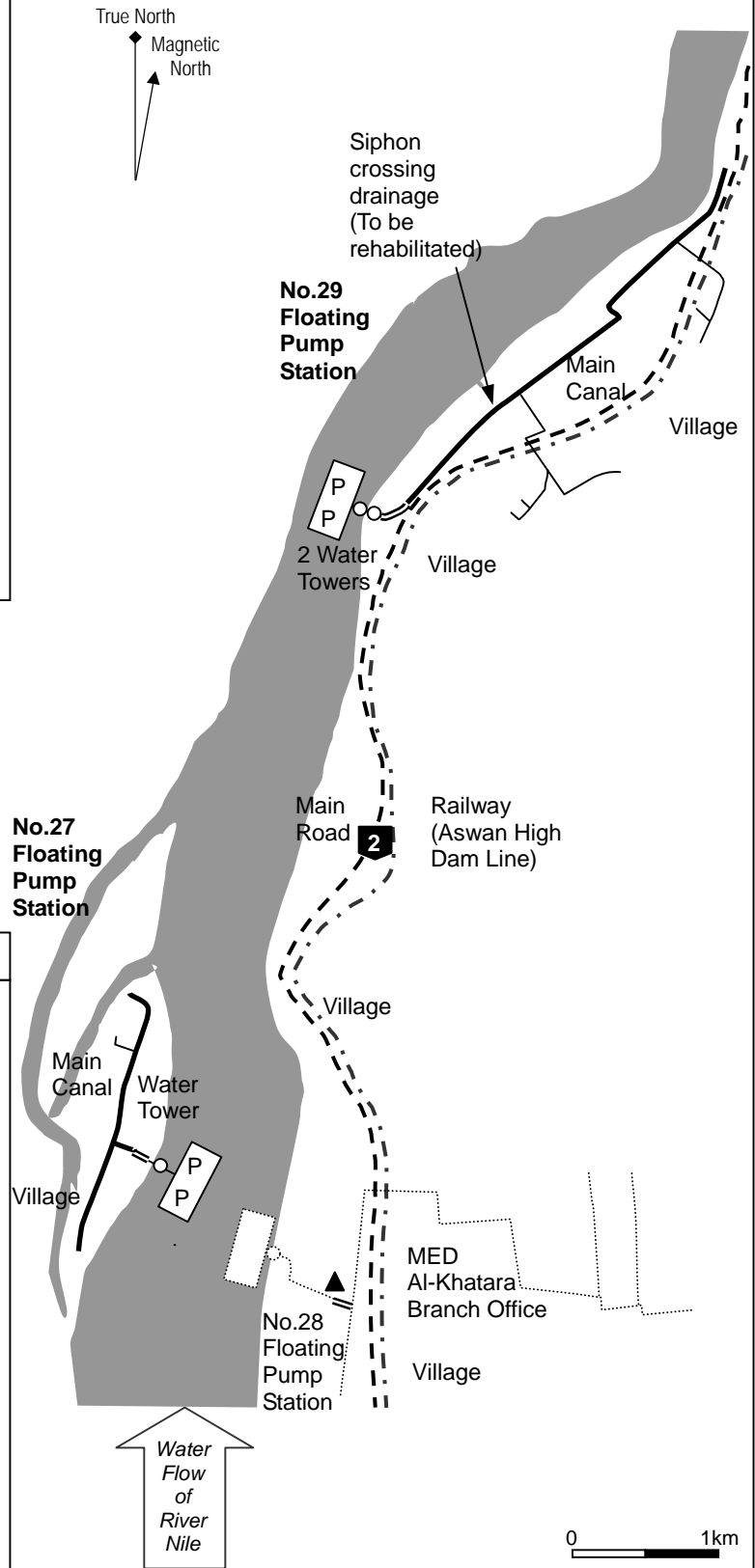
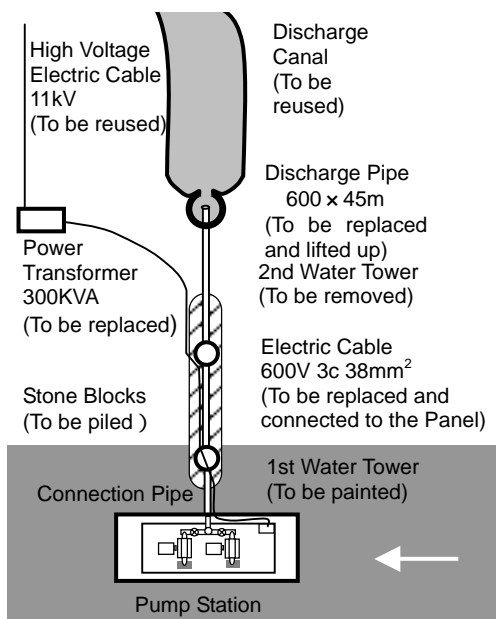
B. Proposed Irrigation Facilities

No.27 Gezerat El-Kobania Kibly Pump Station and No.29 Sahel El-Akab Bahary Pump Station (Floating Pump Type for No.27 and No.29)

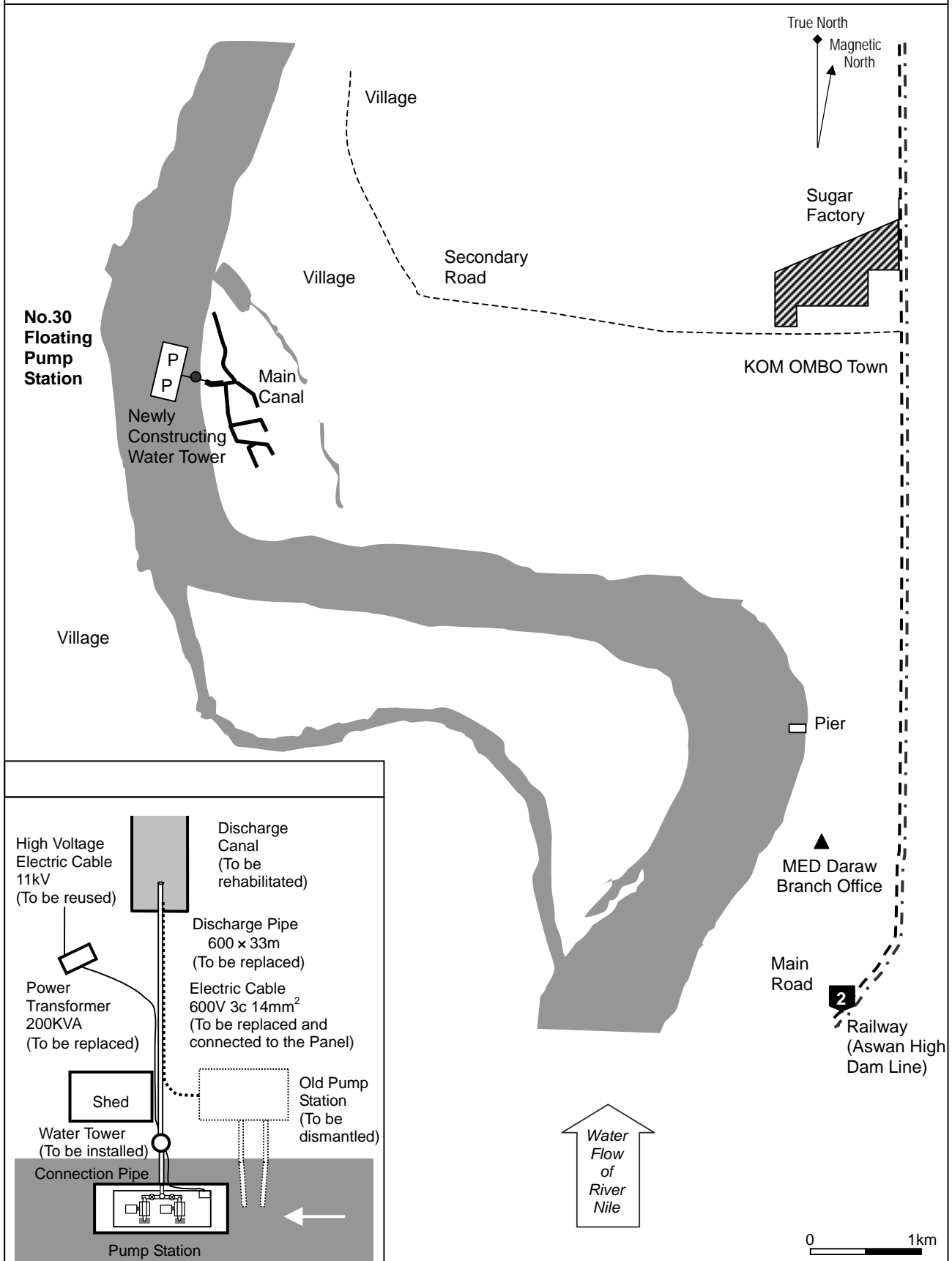
Work Plan for No.27 Pump Station



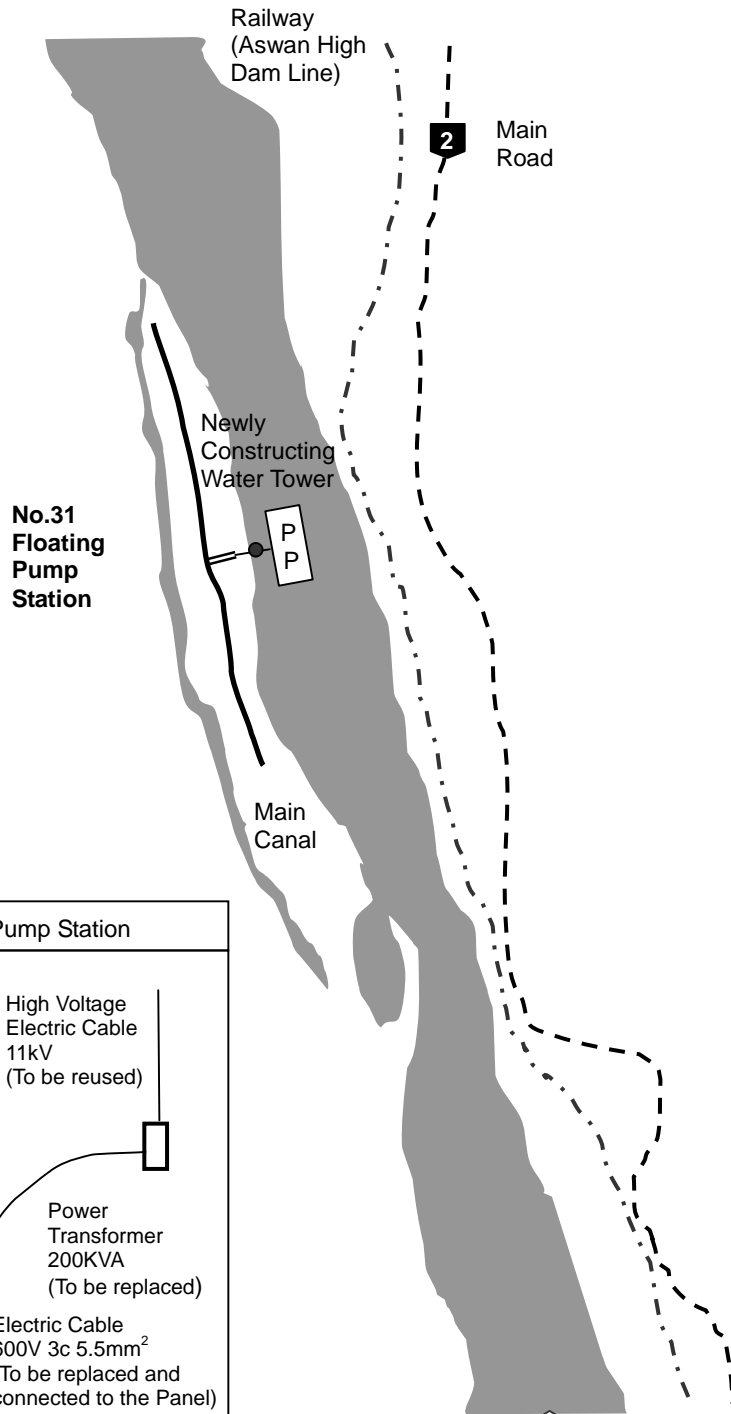
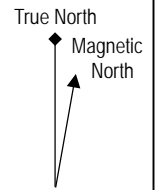
Work Plan for No.29 Pump Station



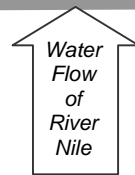
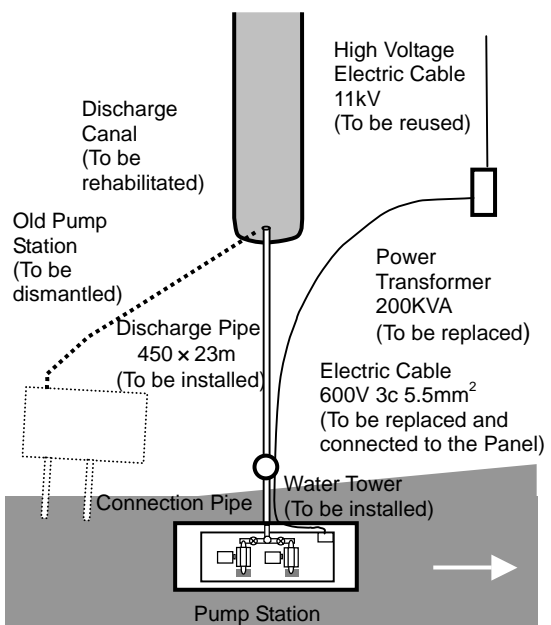
No.30 Gezeret Maneha Pump Station (Floating Pump Type)



No.31 El-Sarag Pump Station (Floating Pump Type)



Work Plan for No.31 Pump Station

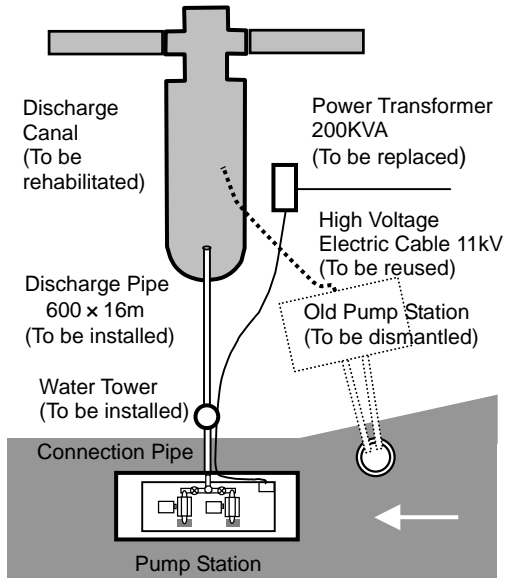


0 1km

No.32 Gezeret El-Fawaza El-Keblia Pump Station and No.33 Middle Fawaza Pump Station

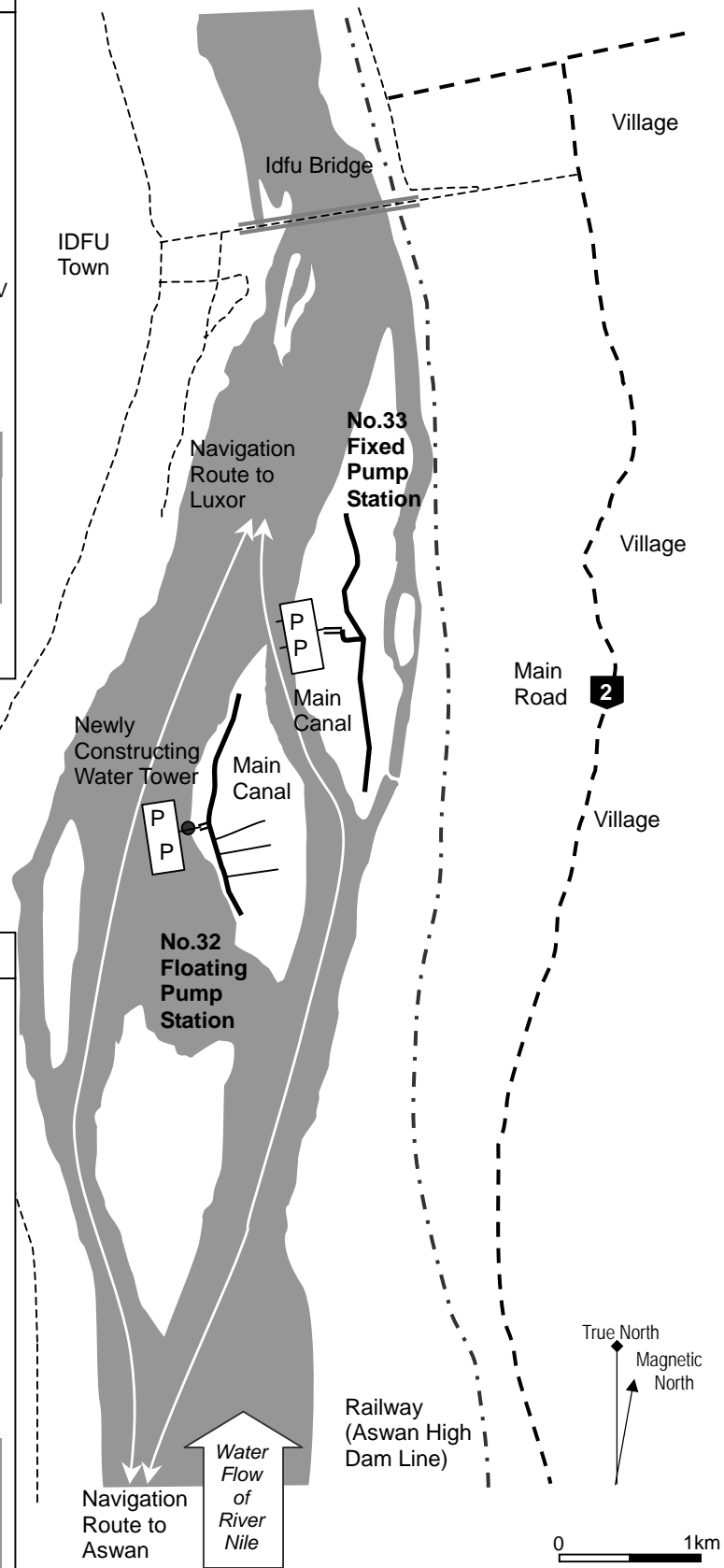
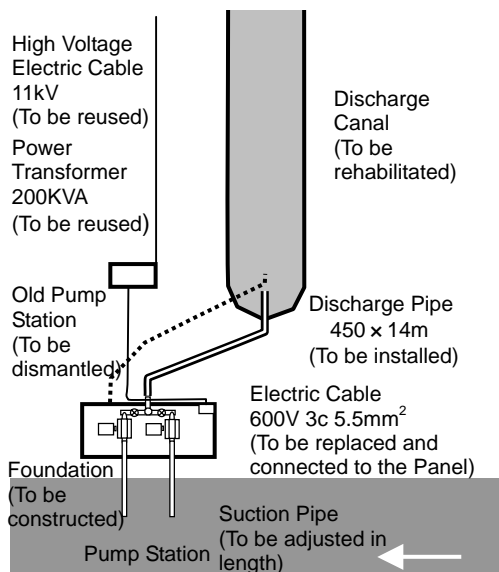
(Floating Pump Type for No.32 and Fixed Pump Type for No.33)

Work Plan for No.32 Pump Station



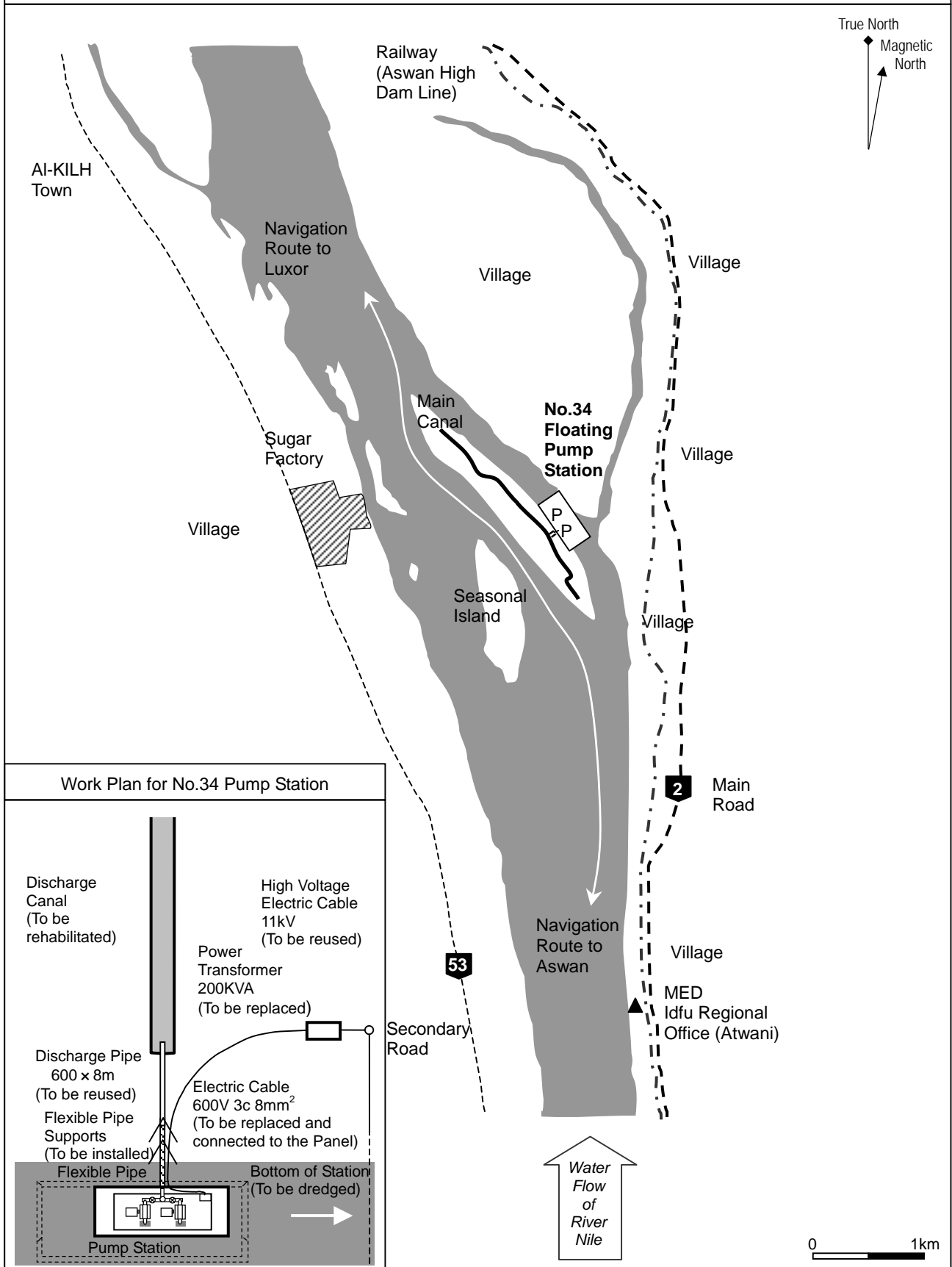
Electric Cable 600V 3c 14mm²
(To be replaced and connected to the Panel)

Work Plan for No.33 Pump Station

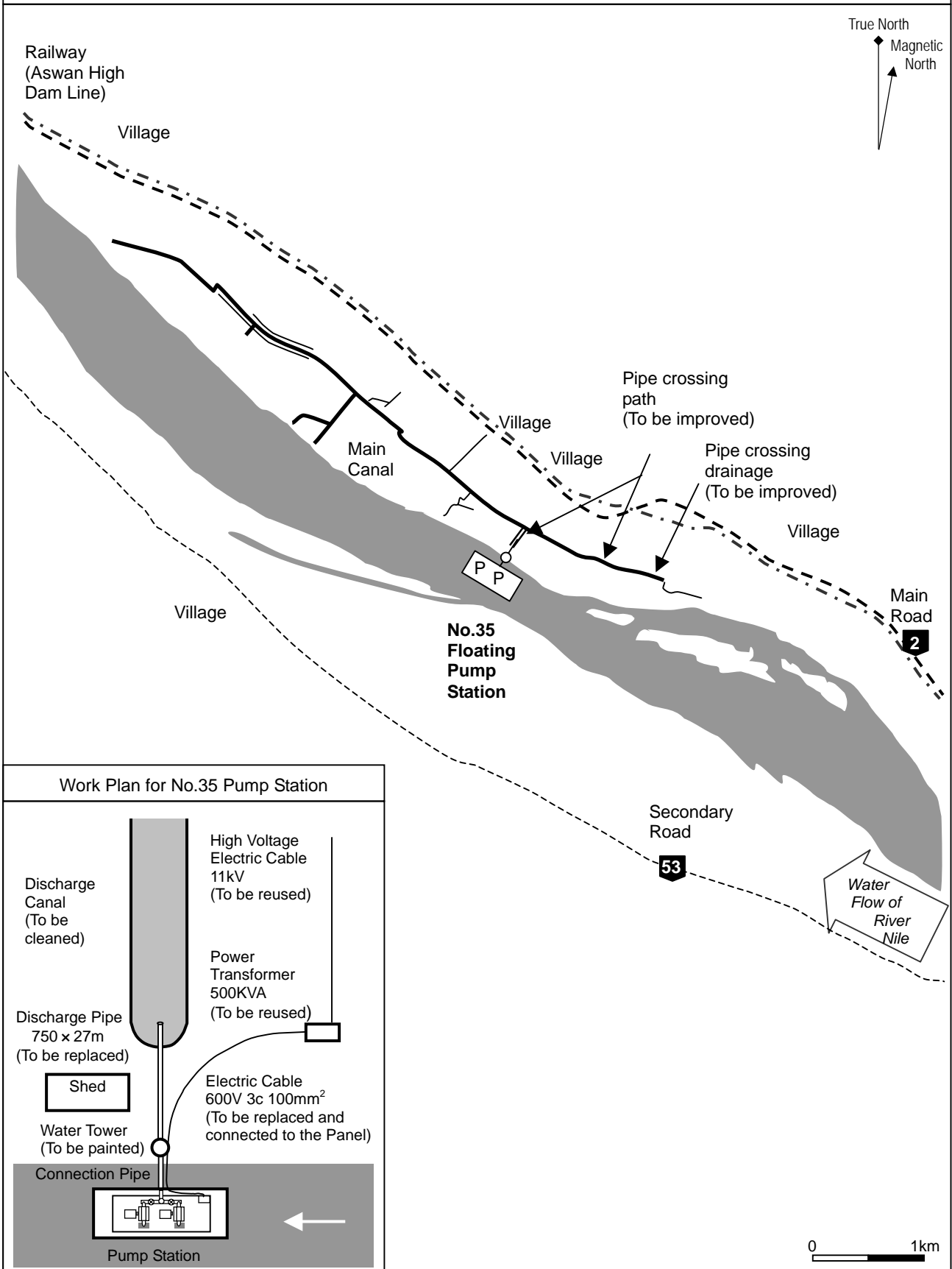


No.34 Gezerat Abo Arafa Pump Station

(Floating Pump Type)



No.35 EI-Hegs EI-Mostagda Pump Station (Floating Pump Type)



C. Proposed Monthly Water Requirement

Table **Cropping Area (%) for Each Crop (Present)** No.27 Gezeret El-Kobania Kebly
 Location: **No.27 Gezeret El-Kobania Kebly** (Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	31.3	31.3	31.3	31.3							31.3	31.3	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover													
Berseem(Fodder)	18.8	18.8									18.8	18.8	
Flax													
Onion	12.5	12.5	12.5	12.5							12.5	12.5	
Garlic													
Vegetables	6.3	6.3	6.3								6.3	6.3	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)					68.9	68.9	68.9						
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
Berseem(Fodder)								68.9	68.9	68.9			
Total	100.0	100.0	81.2	74.9	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

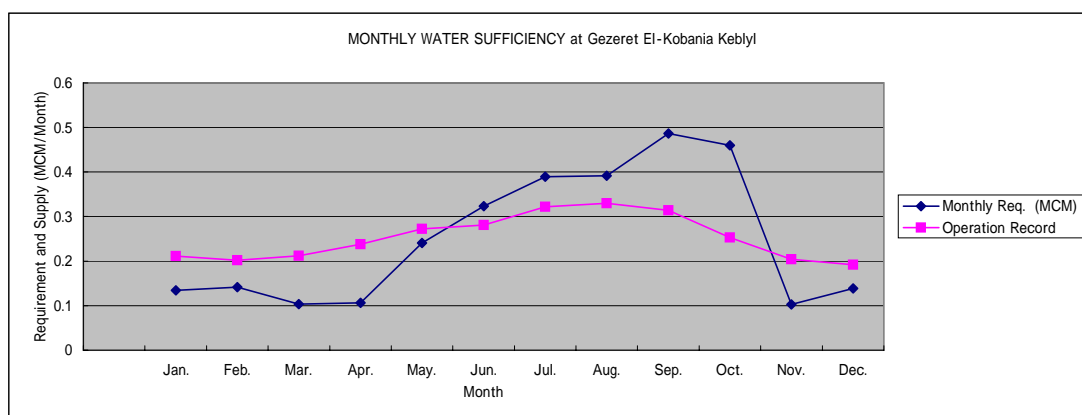
Table
Location: **Consumptive Use of Each Crop (Present)**
No.27 Gezeret El-Kobania Kebly

(Unit : liter/sec/feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	0.252	0.284	0.258	0.262							0.144	0.292	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover													
Berseem(Fodder)	0.093	0.150									0.085	0.093	
Flax													
Onion	0.123	0.137	0.127	0.119							0.086	0.095	
Garlic													
Vegetables	0.073	0.091	0.012								0.046	0.056	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)					1.019	1.418	1.720						
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.139	0.136	0.125	0.177	0.210	0.286	0.270	0.261	0.253	0.237	0.177	0.169	
Berseem(Fodder)								1.740	2.313	2.113			
Total	0.681	0.797	0.522	0.558	1.228	1.704	1.990	2.001	2.567	2.350	0.539	0.704	

Table
Location: **Monthly Water Requirement (Present)**
No.27 Gezeret El-Kobania Kebly

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
(l/s/feddan)	0.681	0.797	0.522	0.558	1.228	1.704	1.990	2.001	2.567	2.350	0.539	0.704	
Water Requirement (m³/s)													
Whole Area (175 feddan)													
Existing 175	0.12	0.14	0.09	0.10	0.21	0.30	0.35	0.35	0.45	0.41	0.09	0.12	
Extension 0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Requirement	0.12	0.14	0.09	0.10	0.21	0.30	0.35	0.35	0.45	0.41	0.09	0.12	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement	0.12	0.14	0.09	0.10	0.22	0.30	0.35	0.35	0.45	0.41	0.10	0.12	Annual Ttl.
Monthly Req. (MCM)	0.134	0.142	0.103	0.107	0.241	0.323	0.390	0.392	0.486	0.460	0.103	0.139	3.019
Operation Record	0.211	0.202	0.212	0.238	0.272	0.281	0.322	0.330	0.314	0.253	0.204	0.192	3.031



Table

Cropping Area (%) for Each Crop (Plan)

No.27 Gezeret El-Kobania Kebly

Location:

No.27 Gezeret El-Kobania Kebly

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	31.3	31.3	31.3	31.3							31.3	31.3	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6
Berseem(Fodder)	18.8	18.8									18.8	18.8	
Flax													
Onion	12.5	12.5	12.5	12.5							12.5	12.5	
Garlic													
Vegetables	6.3	6.3	6.3								6.3	6.3	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)					68.9	68.9	68.9						
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1	31.1
Berseem(Fodder)								68.9	68.9	68.9			
Total	115.6	115.6	96.8	90.5	115.6	115.6	115.6	115.6	115.6	115.6	115.6	115.6	

Table **Consumptive Use of Each Crop (Plan)** 0.5 10 1
 Location: **No.27 Gezeret El-Kobania Kebly** (Unit : liter/sec/ feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	0.252	0.284	0.258	0.262							0.144	0.292	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.226	0.285	0.240	0.237	0.252	0.274	0.260	0.140	0.263	0.224	0.173	0.165	
Berseem(Fodder)	0.093	0.150									0.085	0.093	
Flax													
Onion	0.123	0.137	0.127	0.119							0.086	0.095	
Garlic													
Vegetables	0.073	0.091	0.012								0.046	0.056	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)					1.019	1.418	1.720						
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.139	0.136	0.125	0.177	0.210	0.286	0.270	0.261	0.253	0.237	0.177	0.169	
Berseem(Fodder)								1.740	2.313	2.113			
Total	0.907	1.082	0.763	0.795	1.480	1.978	2.250	2.141	2.830	2.573	0.712	0.869	

Table **Monthly Water Requirement (Plan)**
 Location: **No.27 Gezeret El-Kobania Kebly**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
(l/s/feddan)	0.907	1.082	0.763	0.795	1.480	1.978	2.250	2.141	2.830	2.573	0.712	0.869	
Water Requirement (m³/s)													
Whole Area (175 feddan)													
Existing 175	0.16	0.19	0.13	0.14	0.26	0.35	0.39	0.37	0.50	0.45	0.12	0.15	
Extension 0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Requirement	0.16	0.19	0.13	0.14	0.26	0.35	0.39	0.37	0.50	0.45	0.12	0.15	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement	0.16	0.19	0.13	0.14	0.26	0.35	0.39	0.38	0.50	0.45	0.13	0.15	Annual Ttl.
Monthly Req. (MCM)	0.178	0.192	0.150	0.151	0.290	0.375	0.440	0.419	0.536	0.504	0.136	0.171	3.542

Operation Record

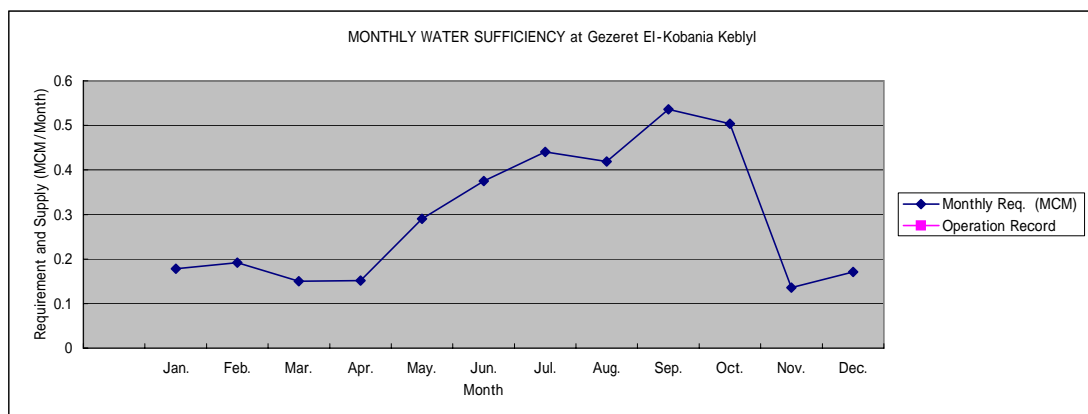


Table Cropping Area (%) for Each Crop (Present)

No.29 Sahal El-Akab Bahary

Location: No.29 Sahal El-Akab Bahary

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	13.7	13.7	13.7	13.7							13.7	13.7	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
Berseem(Fodder)	33.7	33.7									33.7	33.7	
Flax													
Onion	5.1	5.1	5.1	5.1							5.1	5.1	
Garlic	0.6	0.6	0.6	0.6						0.6	0.6	0.6	
Vegetables	4.6	4.6	4.6							4.6	4.6	4.6	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						36.0	36.0	36.0	36.0	36.0			
Sorghum					14.9	14.9	14.9	14.9	14.9				
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)					6.9	6.9	6.9	6.9					
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Berseem(Fodder)													
Total	117.7	117.7	84.0	79.4	81.8	117.8	117.8	117.8	110.9	101.2	117.7	117.7	

Table **Consumptive Use of Each Crop (Present)**

0.5 12 1.0

Location: **No.29 Sahal El-Akab Bahary** (Unit : liter/sec/ feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	0.092	0.104	0.094	0.096							0.053	0.106	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.242	0.304	0.257	0.253	0.269	0.293	0.278	0.149	0.281	0.239	0.185	0.176	
Berseem(Fodder)	0.138	0.224									0.127	0.138	
Flax													
Onion	0.042	0.046	0.043	0.041							0.029	0.032	
Garlic	0.003	0.004	0.004	0.003						0.006	0.008	0.009	
Vegetables	0.045	0.055	0.007							0.025	0.028	0.034	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						0.235	0.433	0.403	0.477	0.247			
Sorghum					0.055	0.159	0.223	0.165	0.032				
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)					0.085	0.118	0.144	0.072					
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.149	0.146	0.134	0.190	0.225	0.307	0.289	0.280	0.272	0.254	0.190	0.181	
Berseem(Fodder)													
Total	0.711	0.883	0.540	0.583	0.633	1.112	1.366	1.069	1.062	0.770	0.621	0.677	

Table **Monthly Water Requirement (Present)**

Location: **No.29 Sahal El-Akab Bahary**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.711	0.883	0.540	0.583	0.633	1.112	1.366	1.069	1.062	0.770	0.621	0.677	
Water Requirement (m³/s)													
Whole Area (440 feddan)													
Existing 440	0.31	0.39	0.24	0.26	0.28	0.49	0.60	0.47	0.47	0.34	0.27	0.30	
Extension 0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Requirement	0.31	0.39	0.24	0.26	0.28	0.49	0.60	0.47	0.47	0.34	0.27	0.30	
Village Water	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	
Total Requirement	0.32	0.40	0.25	0.27	0.29	0.50	0.61	0.48	0.48	0.35	0.28	0.31	Annual Ttl.
Monthly Req. (MCM)	0.433	0.482	0.331	0.345	0.386	0.647	0.818	0.643	0.618	0.467	0.367	0.412	5.951
Operation Record	0.442	0.432	0.505	0.503	0.590	0.623	0.702	0.657	0.586	0.520	0.428	0.426	6.414

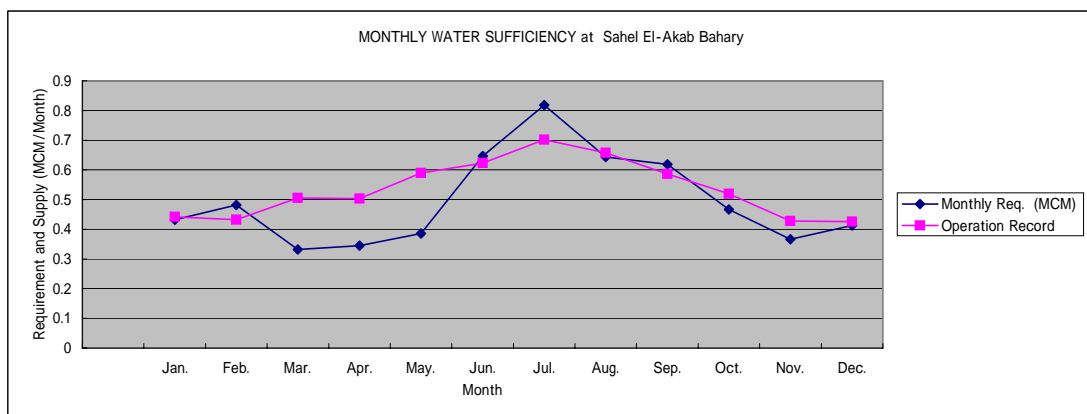


Table Cropping Area (%) for Each Crop (Plan)

No.29 Sahal El-Akab Bahary

Location:

No.29 Sahal El-Akab Bahary

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	13.7	13.7	13.7	13.7							13.7	13.7	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	
Berseem(Fodder)	33.7	33.7									33.7	33.7	
Flax													
Onion	7.4	7.4	7.4	7.4							7.4	7.4	
Garlic	0.6	0.6	0.6	0.6						0.6	0.6	0.6	
Vegetables	4.6	4.6	4.6							4.6	4.6	4.6	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						14.4	14.4	14.4	14.4	14.4			
Sorghum					14.9	14.9	14.9	14.9	14.9				
Soia Beans					7.2	7.2	7.2	7.2					
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)					21.3	21.3	21.3	21.3					
Groundnuts													
Onion													
Vegetables					2.2	2.2	2.2						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables								2.2	2.2	2.2			
Fruits	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	
Berseem(Fodder)													
Total	120.0	120.0	86.3	81.7	105.6	120.0	120.0	120.0	91.5	81.8	120.0	120.0	

Table
 Location: **Consumptive Use of Each Crop (Plan)**
No.29 Sahal El-Akab Bahary (Unit : liter/sec/feddan) 0.5 12 1.0

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	0.092	0.104	0.094	0.096							0.053	0.106	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.242	0.304	0.257	0.253	0.269	0.293	0.278	0.149	0.281	0.239	0.185	0.176	
Berseem(Fodder)	0.138	0.224									0.127	0.138	
Flax													
Onion	0.061	0.067	0.063	0.059							0.043	0.047	
Garlic	0.003	0.004	0.004	0.003						0.006	0.008	0.009	
Vegetables	0.045	0.055	0.007							0.025	0.028	0.034	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						0.094	0.173	0.161	0.191	0.099			
Sorghum					0.055	0.159	0.223	0.165	0.032				
Soia Beans					0.071	0.113	0.152	0.022					
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)					0.262	0.365	0.443	0.221					
Groundnuts													
Onion													
Vegetables					0.044	0.038	0.007						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables								0.047	0.062	0.057			
Fruits	0.149	0.146	0.134	0.190	0.225	0.307	0.289	0.280	0.272	0.254	0.190	0.181	
Berseem(Fodder)													
Total	0.730	0.904	0.559	0.601	0.926	1.369	1.564	1.045	0.838	0.679	0.634	0.692	

Table
 Location: **Monthly Water Requirement (Plan)**
No.29 Sahal El-Akab Bahary

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.730	0.904	0.559	0.601	0.926	1.369	1.564	1.045	0.838	0.679	0.634	0.692	
Water Requirement (m³/s)													
Whole Area (440 feddan)													
Existing 440	0.32	0.40	0.25	0.26	0.41	0.60	0.69	0.46	0.37	0.30	0.28	0.30	
Extension 0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Requirement	0.32	0.40	0.25	0.26	0.41	0.60	0.69	0.46	0.37	0.30	0.28	0.30	
Village Water	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	
Total Requirement (MCM)	0.33	0.41	0.26	0.27	0.42	0.61	0.70	0.47	0.38	0.31	0.29	0.31	Annual Ttl.
Monthly Req. (MCM)	0.444	0.493	0.343	0.356	0.559	0.793	0.935	0.629	0.491	0.413	0.374	0.421	6.252

Operation Record

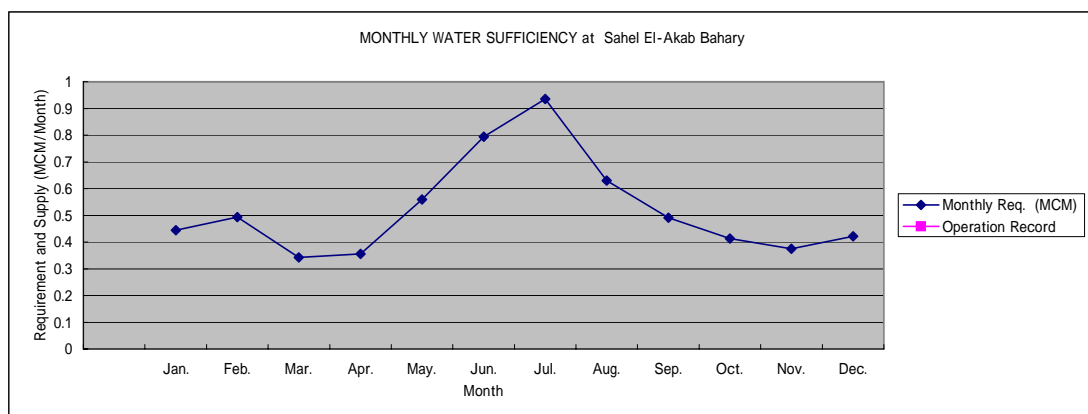


Table
Location: **Cropping Area (%) for Each Crop (Present)**
No.30 Gezeret Meneha (fixed)

No.30 Gezeret Meneha (fixed)

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9
Berseem(Fodder)	15.4	15.4										15.4	15.4
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						7.7	7.7	7.7	7.7	7.7			
Sorghum													
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables					7.7	7.7	7.7						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables								7.7	7.7	7.7			
Fruits	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6
Berseem(Fodder)													
Total	116.9	116.9	101.5	101.5	109.2	116.9	116.9	116.9	116.9	116.9	116.9	116.9	116.9

Table **Consumptive Use of Each Crop (Present)** 0.5 9 1.0
 Location: **No.30 Gezeret Meneha (fixed)** (Unit : liter/sec/feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.272	0.343	0.289	0.285	0.303	0.330	0.313	0.168	0.316	0.269	0.209	0.199	
Berseem(Fodder)	0.084	0.136									0.078	0.084	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						0.067	0.123	0.115	0.136	0.070			
Sorghum													
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables					0.206	0.178	0.031						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables								0.219	0.291	0.264			
Fruits	0.421	0.410	0.379	0.536	0.633	0.865	0.815	0.790	0.766	0.716	0.536	0.510	
Berseem(Fodder)													
Total	0.778	0.890	0.668	0.821	1.142	1.440	1.283	1.292	1.509	1.319	0.822	0.793	

Table **Monthly Water Requirement (Present)**
 Location: **No.30 Gezeret Meneha (fixed)**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.778	0.890	0.668	0.821	1.142	1.440	1.283	1.292	1.509	1.319	0.822	0.793	
Water Requirement (m³/s)													
Whole Area (200 feddan)													
Existing 150	0.12	0.13	0.10	0.12	0.17	0.22	0.19	0.19	0.23	0.20	0.12	0.12	
Extension 50	0.04	0.04	0.03	0.04	0.06	0.07	0.06	0.06	0.08	0.07	0.04	0.04	
Total Requirement	0.16	0.18	0.13	0.16	0.23	0.29	0.26	0.26	0.30	0.26	0.16	0.16	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement (MCM)	0.16	0.18	0.13	0.17	0.23	0.29	0.26	0.26	0.30	0.26	0.17	0.16	Annual Ttl.
Monthly Req. (MCM)	0.157	0.162	0.135	0.161	0.231	0.281	0.259	0.261	0.294	0.266	0.161	0.160	2.528
Operation Record	0.168	0.166	0.186	0.199	0.216	0.231	0.258	0.243	0.224	0.201	0.179	0.144	2.415

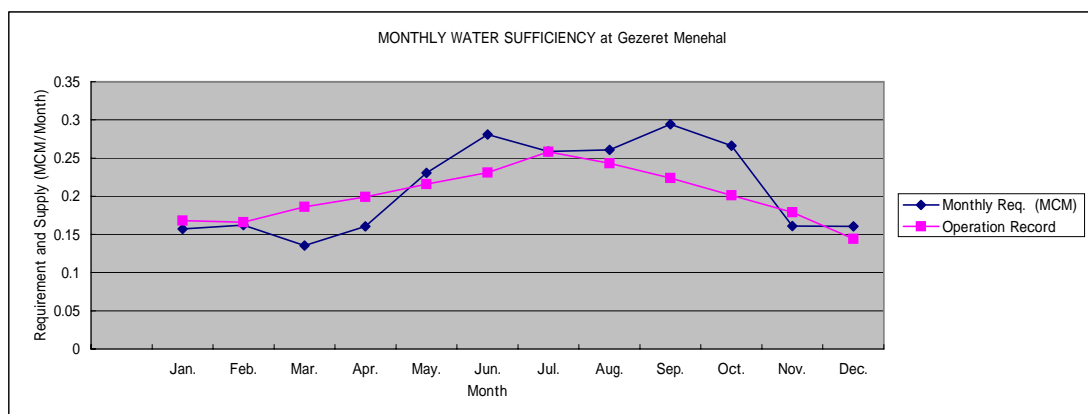


Table **Cropping Area (%) for Each Crop (Plan)**
 Location: **No.30 Gezeret Meneha (fixed)**

No.30 Gezeret Meneha (fixed)

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9	16.9
Berseem(Fodder)	15.4	15.4											
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						7.7	7.7	7.7	7.7	7.7			
Sorghum													
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables					7.7	7.7	7.7						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables								16.2	16.2	16.2			
Fruits	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6	84.6
Berseem(Fodder)													
Total	116.9	116.9	101.5	101.5	109.2	116.9	116.9	125.4	125.4	125.4	116.9	116.9	

Table **Consumptive Use of Each Crop (Plan)** 0.5 7 1.0
 Location: **No.30 Gezeret Meneha (fixed)** (Unit : liter/sec/feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.350	0.441	0.372	0.367	0.389	0.425	0.402	0.216	0.407	0.346	0.268	0.255	
Berseem(Fodder)	0.108	0.175									0.100	0.108	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						0.086	0.159	0.148	0.175	0.090			
Sorghum													
Soia Beans													
Sugarcane													
Banana													
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables					0.265	0.229	0.040						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables								0.593	0.787	0.713			
Fruits	0.541	0.528	0.487	0.689	0.814	1.112	1.048	1.016	0.985	0.921	0.689	0.656	
Berseem(Fodder)													
Total	1.000	1.144	0.859	1.056	1.469	1.852	1.649	1.972	2.353	2.070	1.057	1.020	

Table **Monthly Water Requirement (Plan)**
 Location: **No.30 Gezeret Meneha (fixed)**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	1.000	1.144	0.859	1.056	1.469	1.852	1.649	1.972	2.353	2.070	1.057	1.020	
Water Requirement (m³/s)													
Whole Area (200 feddan)													
Existing	150	0.15	0.17	0.13	0.16	0.22	0.28	0.25	0.30	0.35	0.31	0.16	0.15
Extension	50	0.05	0.06	0.04	0.05	0.07	0.09	0.08	0.10	0.12	0.10	0.05	0.05
Total Requirement	0.20	0.23	0.17	0.21	0.29	0.37	0.33	0.39	0.47	0.41	0.21	0.20	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Requirement (MCM)	0.20	0.23	0.17	0.21	0.29	0.37	0.33	0.40	0.47	0.42	0.21	0.20	Annual Ttl.
Monthly Req. (MCM)	0.157	0.162	0.135	0.160	0.230	0.281	0.258	0.309	0.357	0.324	0.161	0.160	2.695

Operation Record

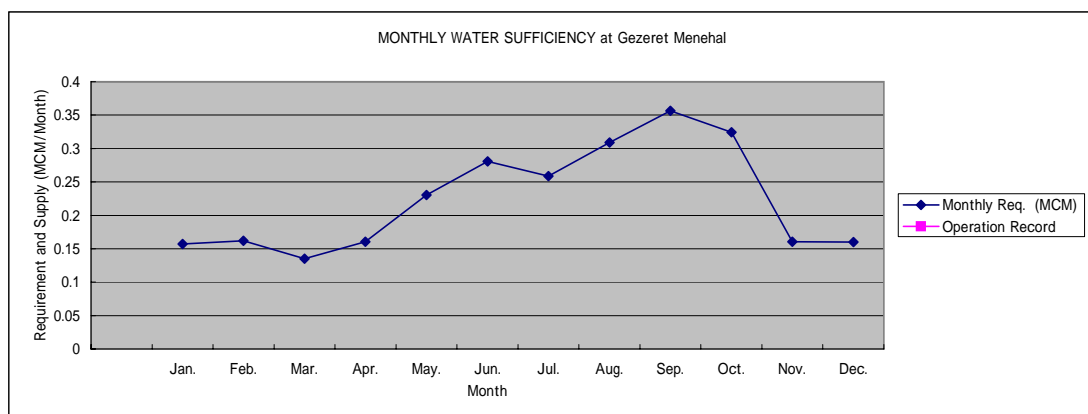


Table Cropping Area (%) for Each Crop (Present)

No.31 El-Sarag (fixed)

Location:

No.31 El-Sarag (fixed)

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9
Berseem(Fodder)	23.9	23.9										23.9	23.9
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						17.4	17.4	17.4	17.4	17.4			
Sorghum													
Soia Beans													
Sugarcane	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Banana													
Sesame													
Berseem(Fodder)					4.4	4.4	4.4	4.4					
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0
Berseem(Fodder)													
Total	110.2	110.2	86.3	86.3	90.7	108.1	108.1	108.1	103.7	103.7	110.2	110.2	

Table **Consumptive Use of Each Crop (Present)** 0.5 12 1.0
 Location: **No.31 El-Sarag (fixed)** (Unit : liter/sec/ feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.228	0.288	0.243	0.239	0.254	0.277	0.263	0.141	0.265	0.226	0.175	0.167	
Berseem(Fodder)	0.098	0.159									0.090	0.098	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						0.114	0.209	0.195	0.231	0.119			
Sorghum													
Soia Beans													
Sugarcane	0.010	0.017	0.017	0.024	0.052	0.061	0.081	0.088	0.078	0.061	0.047	0.024	
Banana													
Sesame													
Berseem(Fodder)					0.054	0.075	0.092	0.046					
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.235	0.229	0.212	0.299	0.354	0.483	0.455	0.441	0.428	0.400	0.299	0.285	
Berseem(Fodder)													
Total	0.572	0.693	0.471	0.562	0.714	1.010	1.100	0.911	1.002	0.806	0.612	0.574	

Table **Monthly Water Requirement (Present)**
 Location: **No.31 El-Sarag (fixed)**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.572	0.693	0.471	0.562	0.714	1.010	1.100	0.911	1.002	0.806	0.612	0.574	
Water Requirement (m³/s)													
Whole Area (200 feddan)													
Existing 150	0.09	0.10	0.07	0.08	0.11	0.15	0.17	0.14	0.15	0.12	0.09	0.09	
Extension 50	0.03	0.03	0.02	0.03	0.04	0.05	0.06	0.05	0.05	0.04	0.03	0.03	
Total Requirement	0.11	0.14	0.09	0.11	0.14	0.20	0.22	0.18	0.20	0.16	0.12	0.11	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement	0.12	0.14	0.10	0.11	0.14	0.20	0.22	0.18	0.20	0.16	0.12	0.12	Annual Ttl.
Monthly Req. (MCM)	0.154	0.169	0.128	0.147	0.193	0.263	0.296	0.245	0.261	0.217	0.160	0.155	2.388
Operation Record	0.135	0.150	0.192	0.214	0.278	0.276	0.301	0.282	0.244	0.232	0.164	0.124	2.592

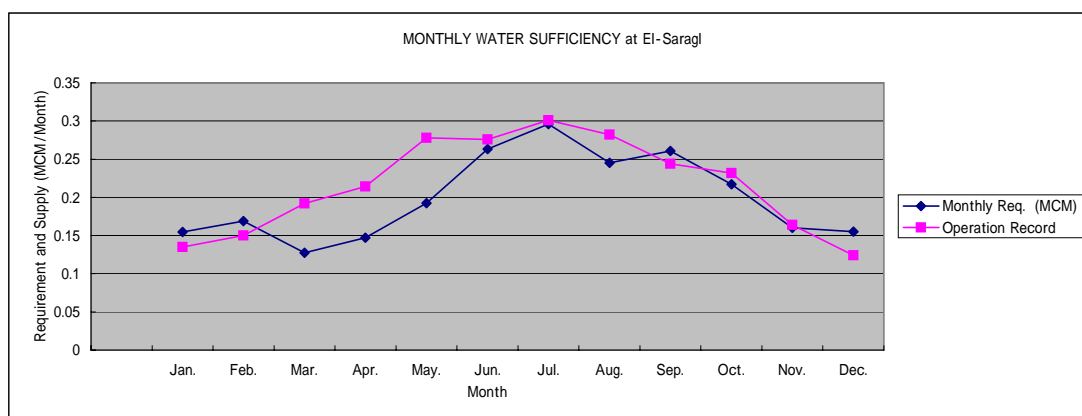


Table Cropping Area (%) for Each Crop (Plan)

No.31 El-Sarag (fixed)

Location:

No.31 El-Sarag (fixed)

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9
Berseem(Fodder)	23.9	23.9										23.9	23.9
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						17.4	17.4	17.4	17.4	17.4			
Sorghum													
Soia Beans													
Sugarcane	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Banana													
Sesame													
Berseem(Fodder)					4.4	4.4	4.4	4.4					
Groundnuts													
Onion													
Vegetables	12.6	12.6	12.6	12.6	12.6	12.6	12.6						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables								12.6	12.6	12.6			
Fruits	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0	63.0
Berseem(Fodder)													
Total	122.8	122.8	98.9	98.9	103.3	120.7	120.7	120.7	116.3	116.3	110.2	110.2	

Table **Consumptive Use of Each Crop (Plan)** 0.5 12 1.0
 Location: **No.31 EI-Sarag (fixed)** (Unit : liter/sec/feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.228	0.288	0.243	0.239	0.254	0.277	0.263	0.141	0.265	0.226	0.175	0.167	
Berseem(Fodder)	0.098	0.159									0.090	0.098	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						0.114	0.209	0.195	0.231	0.119			
Sorghum													
Soia Beans													
Sugarcane	0.010	0.017	0.017	0.024	0.052	0.061	0.081	0.088	0.078	0.061	0.047	0.024	
Banana													
Sesame													
Berseem(Fodder)					0.054	0.075	0.092	0.046					
Groundnuts													
Onion													
Vegetables	0.103	0.116	0.205	0.231	0.253	0.218	0.038						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables								0.269	0.357	0.324			
Fruits	0.235	0.229	0.212	0.299	0.354	0.483	0.455	0.441	0.428	0.400	0.299	0.285	
Berseem(Fodder)													
Total	0.675	0.809	0.676	0.793	0.967	1.228	1.138	1.180	1.359	1.130	0.612	0.574	

Table **Monthly Water Requirement (Plan)**
 Location: **No.31 EI-Sarag (fixed)**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.675	0.809	0.676	0.793	0.967	1.228	1.138	1.180	1.359	1.130	0.612	0.574	
Water Requirement (m³/s)													
Whole Area (200 feddan)													
Existing	150	0.10	0.12	0.10	0.12	0.15	0.18	0.17	0.18	0.20	0.17	0.09	0.09
Extension	50	0.03	0.04	0.03	0.04	0.05	0.06	0.06	0.06	0.07	0.06	0.03	0.03
Total Requirement	0.14	0.16	0.14	0.16	0.19	0.25	0.23	0.24	0.27	0.23	0.12	0.11	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Requirement	0.14	0.16	0.14	0.16	0.19	0.25	0.23	0.24	0.27	0.23	0.12	0.12	Annual Ttl.
Monthly Req. (MCM)	0.182	0.197	0.182	0.207	0.260	0.320	0.306	0.317	0.353	0.304	0.160	0.155	2.944

Operation Record

0.000

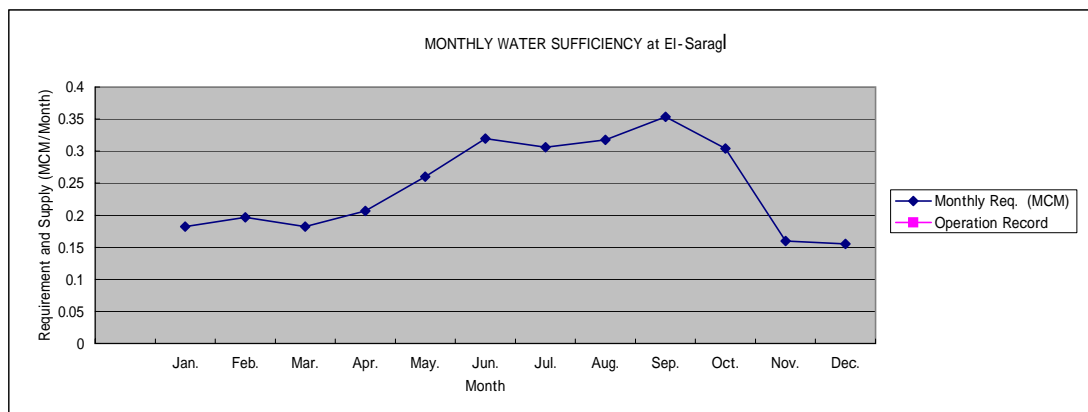


Table
Location: **Cropping Area (%) for Each Crop (Present)**
No.32 Gezeret El-Fawaza El-Keblia (fixed)

No.32 Gezeret El-Fawaza El-Keblia (fixed)

(Unit: %)

Season/Crops	Winter Season					Summer Season				Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6	19.6
Berseem(Fodder)	6.5	6.5										6.5	6.5
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6	31.6
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3	42.3
Berseem(Fodder)													
Total	100.0	100.0	93.5	93.5	93.5	93.5	93.5	93.5	93.5	93.5	100.0	100.0	

Table
 Location: **Consumptive Use of Each Crop (Present)**
No.32 Gezeret El-Fawaza El-Kebliia (fixed) (Unit : liter/sec/feddan) 0.5 10 1.0

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.284	0.358	0.302	0.298	0.316	0.345	0.327	0.176	0.330	0.281	0.218	0.207	
Berseem(Fodder)	0.032	0.052									0.029	0.032	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana	0.091	0.154	0.147	0.211	0.453	0.527	0.702	0.765	0.673	0.566	0.410	0.215	
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.190	0.185	0.171	0.241	0.285	0.389	0.367	0.356	0.345	0.322	0.241	0.230	
Berseem(Fodder)													
Total	0.596	0.748	0.620	0.750	1.054	1.261	1.396	1.296	1.348	1.169	0.898	0.684	

Table
 Location: **Monthly Water Requirement (Present)**
No.32 Gezeret El-Fawaza El-Kebliia (fixed)

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.596	0.748	0.620	0.750	1.054	1.261	1.396	1.296	1.348	1.169	0.898	0.684	
Water Requirement (m³/s)													
Whole Area (250 feddan)													
Existing 200	0.12	0.15	0.12	0.15	0.21	0.25	0.28	0.26	0.27	0.23	0.18	0.14	
Extension 50	0.03	0.04	0.03	0.04	0.05	0.06	0.07	0.06	0.07	0.06	0.04	0.03	
Total Requirement	0.15	0.19	0.15	0.19	0.26	0.32	0.35	0.32	0.34	0.29	0.22	0.17	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement	0.15	0.19	0.16	0.19	0.26	0.32	0.35	0.32	0.34	0.29	0.23	0.17	Annual Ttl.
Monthly Req. (MCM)	0.167	0.189	0.174	0.203	0.295	0.341	0.391	0.363	0.365	0.327	0.244	0.192	3.252
Operation Record	0.176	0.186	0.212	0.258	0.310	0.328	0.374	0.337	0.314	0.275	0.218	0.171	3.159

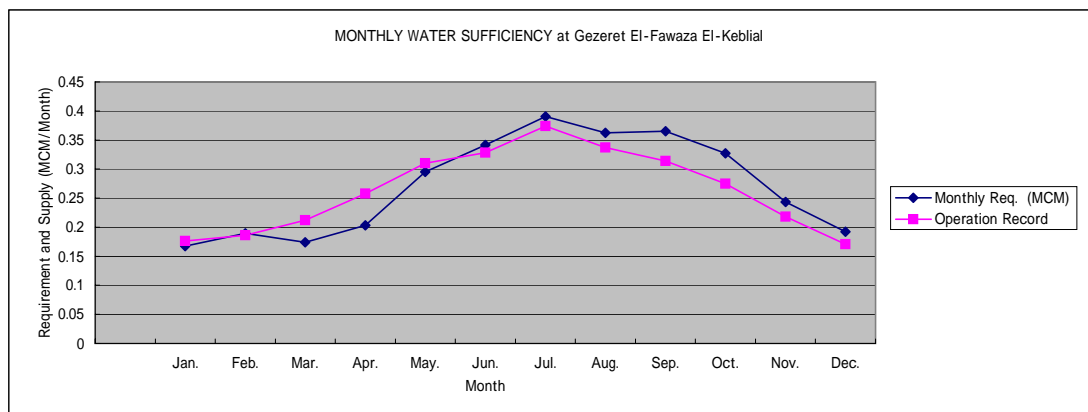


Table
Location: **Cropping Area (%) for Each Crop (Plan)**
No.32 Gezeret El-Fawaza El-Keblia (fixed)

No.32 Gezeret El-Fawaza El-Keblia (fixed)

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
Berseem(Fodder)	6.5	6.5										6.5	6.5
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
Sesame					26.1	26.1	26.1	26.1	26.1				
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4	42.4
Berseem(Fodder)													
Total	107.4	107.4	100.9	100.9	127.0	127.0	127.0	127.0	127.0	127.0	100.9	107.4	107.4

Table
 Location: **Consumptive Use of Each Crop (Plan)**
No.32 Gezeret El-Fawaza El-Keblia (fixed) (Unit : liter/sec/feddan) 0.5 10 1.0

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.391	0.493	0.416	0.410	0.435	0.475	0.450	0.242	0.455	0.387	0.300	0.285	
Berseem(Fodder)	0.032	0.052									0.029	0.032	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana	0.090	0.153	0.147	0.210	0.452	0.525	0.700	0.762	0.671	0.565	0.408	0.215	
Sesame					0.164	0.291	0.298	0.282	0.205				
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.190	0.185	0.171	0.242	0.286	0.390	0.368	0.356	0.345	0.323	0.242	0.230	
Berseem(Fodder)													
Total	0.704	0.883	0.734	0.862	1.337	1.682	1.815	1.642	1.677	1.275	0.980	0.762	

Table
 Location: **Monthly Water Requirement (Plan)**
No.32 Gezeret El-Fawaza El-Keblia (fixed)

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.704	0.883	0.734	0.862	1.337	1.682	1.815	1.642	1.677	1.275	0.980	0.762	
Water Requirement (m³/s)													
Whole Area (250 feddan)													
Existing 200	0.14	0.18	0.15	0.17	0.27	0.34	0.36	0.33	0.34	0.25	0.20	0.15	
Extension 50	0.04	0.04	0.04	0.04	0.07	0.08	0.09	0.08	0.08	0.06	0.05	0.04	
Total Requirement	0.18	0.22	0.18	0.22	0.33	0.42	0.45	0.41	0.42	0.32	0.24	0.19	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement (MCM)	0.18	0.22	0.18	0.22	0.34	0.42	0.45	0.41	0.42	0.32	0.25	0.19	Annual Ttl.
Monthly Req. (MCM)	0.197	0.224	0.206	0.234	0.374	0.455	0.508	0.459	0.454	0.357	0.266	0.214	3.946

Operation Record

0.000

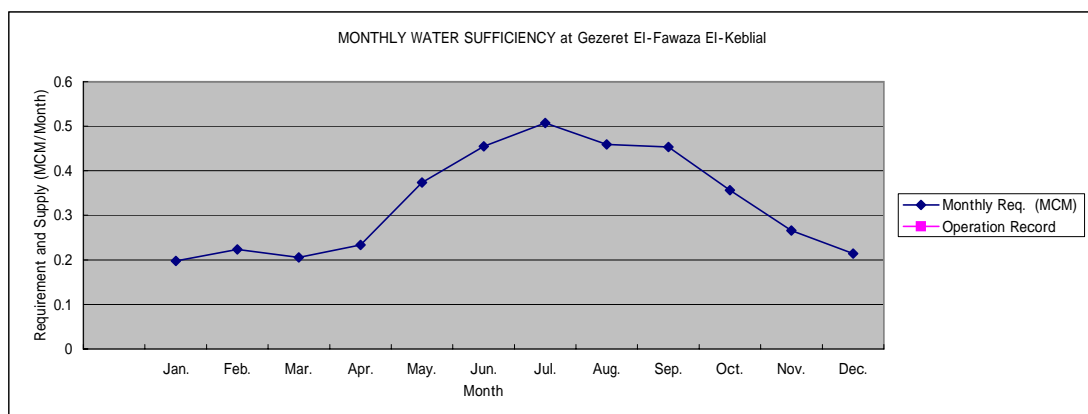


Table Cropping Area (%) for Each Crop (Present)

No.33 Middle Fawaza (fixed)

Location:

No.33 Middle Fawaza (fixed)

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover													
Berseem(Fodder)	4.6	4.6									4.6	4.6	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						2.3	2.3	2.3	2.3	2.3			
Sorghum													
Soia Beans													
Sugarcane													
Banana	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables	2.3	2.3	2.3	2.3	2.3	2.3	2.3						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	
Berseem(Fodder)													
Total	97.8	97.8	93.2	93.2	93.2	95.5	95.5	93.2	93.2	93.2	95.5	95.5	

Table **Consumptive Use of Each Crop (Present)** 0.5 12 1.0
 Location: **No.33 Middle Fawaza (fixed)** (Unit : liter/sec/feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks	
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.		
Winter Season														
Wheat														
Broad Beans														
Barley														
Fenugreek														
Lupine														
Chick-peas														
Lentils														
Clover														
Berseem(Fodder)	0.019	0.031										0.017	0.019	
Flax														
Onion														
Garlic														
Vegetables														
Other Plants														
Beet														
Summer Season														
Cotton														
Rice														
Maize						0.015	0.028	0.026	0.030	0.016				
Sorghum														
Soia Beans														
Sugarcane														
Banana	0.141	0.239	0.229	0.328	0.706	0.821	1.094	1.192	1.049	0.883	0.638	0.335		
Sesame														
Berseem(Fodder)														
Groundnuts														
Onion														
Vegetables	0.019	0.021	0.037	0.042	0.046	0.040	0.007							
Corn														
Other Plants														
Nile Seasons														
Maize														
Sorghum														
Vegetables														
Fruits	0.119	0.116	0.107	0.151	0.179	0.244	0.230	0.223	0.216	0.202	0.151	0.144		
Berseem(Fodder)														
Total	0.298	0.407	0.374	0.522	0.931	1.120	1.359	1.440	1.295	1.100	0.807	0.498		

Table **Monthly Water Requirement (Present)**
 Location: **No.33 Middle Fawaza (fixed)**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.298	0.407	0.374	0.522	0.931	1.120	1.359	1.440	1.295	1.100	0.807	0.498	
Water Requirement (m³/s)													
Whole Area (210 feddan)													
Existing 150	0.04	0.06	0.06	0.08	0.14	0.17	0.20	0.22	0.19	0.17	0.12	0.07	
Extension 60	0.02	0.02	0.02	0.03	0.06	0.07	0.08	0.09	0.08	0.07	0.05	0.03	
Total Requirement	0.06	0.09	0.08	0.11	0.20	0.24	0.29	0.30	0.27	0.23	0.17	0.10	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement (MCM)	0.06	0.09	0.08	0.11	0.20	0.24	0.29	0.30	0.27	0.23	0.17	0.11	Annual Ttl.
Monthly Req. (MCM)	0.085	0.105	0.106	0.143	0.263	0.306	0.384	0.406	0.354	0.311	0.221	0.141	2.825
Operarion Record	0.123	0.125	0.181	0.225	0.247	0.255	0.306	0.259	0.219	0.219	0.155	0.135	2.449

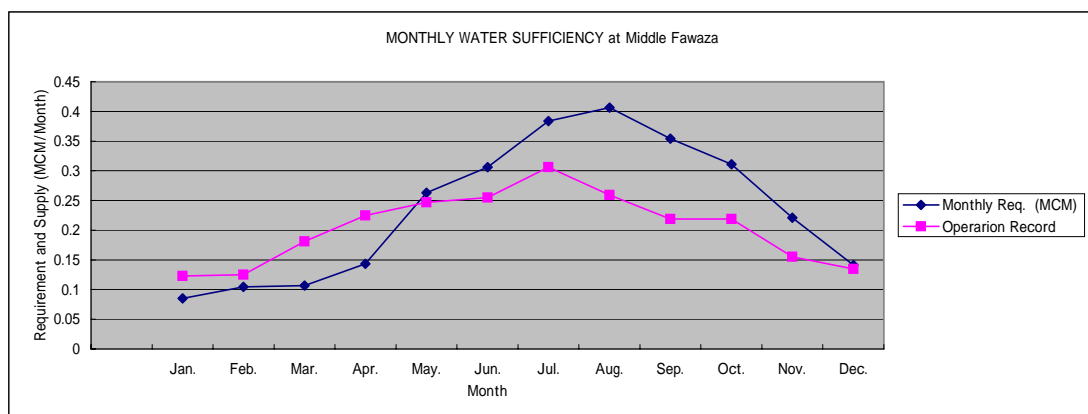


Table Cropping Area (%) for Each Crop (Plan)

No.33 Middle Fawaza (fixed)

Location:

No.33 Middle Fawaza (fixed)

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover													
Berseem(Fodder)	4.6	4.6									4.6	4.6	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						2.3	2.3	2.3	2.3	2.3			
Sorghum													
Soia Beans													
Sugarcane													
Banana	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables	2.3	2.3	2.3	2.3	2.3	2.3	2.3						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	31.8	
Berseem(Fodder)													
Total	97.8	97.8	93.2	93.2	93.2	95.5	95.5	93.2	93.2	93.2	95.5	95.5	

Table **Consumptive Use of Each Crop (Plan)** 0.5 12 1.0
 Location: **No.33 Middle Fawaza (fixed)** (Unit : liter/sec/feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover													
Berseem(Fodder)	0.019	0.031									0.017	0.019	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						0.015	0.028	0.026	0.030	0.016			
Sorghum													
Soia Beans													
Sugarcane													
Banana	0.141	0.239	0.229	0.328	0.706	0.821	1.094	1.192	1.049	0.883	0.638	0.335	
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables	0.019	0.021	0.037	0.042	0.046	0.040	0.007						
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.119	0.116	0.107	0.151	0.179	0.244	0.230	0.223	0.216	0.202	0.151	0.144	
Berseem(Fodder)													
Total	0.298	0.407	0.374	0.522	0.931	1.120	1.359	1.440	1.295	1.100	0.807	0.498	

Table **Monthly Water Requirement (Plan)**
 Location: **No.33 Middle Fawaza (fixed)**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.298	0.407	0.374	0.522	0.931	1.120	1.359	1.440	1.295	1.100	0.807	0.498	
Water Requirement (m³/s)													
Whole Area (210 feddan)													
Existing 150	0.04	0.06	0.06	0.08	0.14	0.17	0.20	0.22	0.19	0.17	0.12	0.07	
Extension 60	0.02	0.02	0.02	0.03	0.06	0.07	0.08	0.09	0.08	0.07	0.05	0.03	
Total Requirement	0.06	0.09	0.08	0.11	0.20	0.24	0.29	0.30	0.27	0.23	0.17	0.10	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement	0.06	0.09	0.08	0.11	0.20	0.24	0.29	0.30	0.27	0.23	0.17	0.11	Annual Ttl.
Monthly Req. (MCM)	0.085	0.105	0.106	0.143	0.263	0.306	0.384	0.406	0.354	0.311	0.221	0.141	2.825

Operation Record

0.000

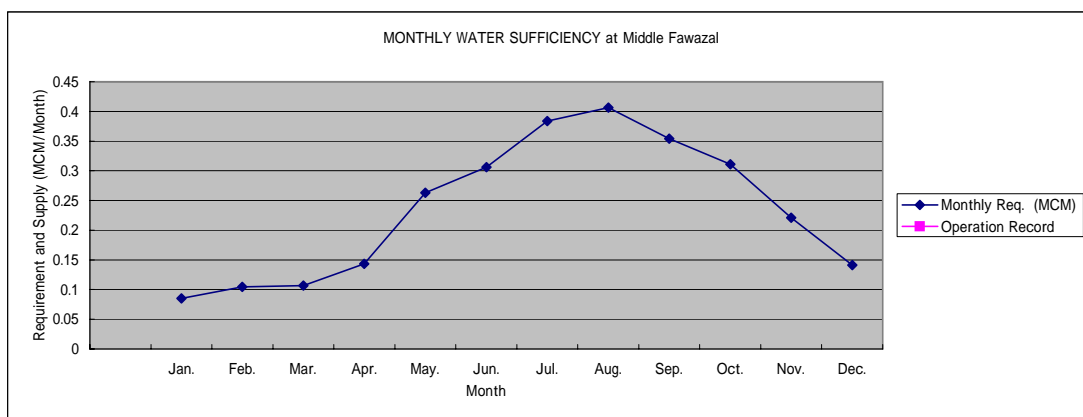


Table Cropping Area (%) for Each Crop (Present)

No.34 Gezeret Abo Arafa

Location: No.34 Gezeret Abo Arafa

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Berseem(Fodder)													
Flax													
Onion	5.4	5.4	5.4	5.4							5.4	5.4	
Garlic													
Vegetables	0.5	0.5	0.5							0.5	0.5	0.5	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Berseem(Fodder)													
Total	100.0	100.0	100.0	99.5	94.1	94.1	94.1	94.1	94.1	94.6	100.0	100.0	

Table **Consumptive Use of Each Crop (Present)** 0.5 11 1.0
 Location: **No.34 Gezeret Abo Arafa** (Unit : liter/sec/feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.014	0.018	0.015	0.015	0.016	0.018	0.017	0.009	0.017	0.014	0.011	0.011	
Berseem(Fodder)													
Flax													
Onion	0.048	0.054	0.050	0.047							0.034	0.037	
Garlic													
Vegetables	0.005	0.007	0.001							0.003	0.003	0.004	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans													
Sugarcane													
Banana	0.235	0.399	0.383	0.547	1.177	1.368	1.824	1.986	1.748	1.471	1.064	0.559	
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.011	0.011	0.010	0.014	0.017	0.023	0.021	0.021	0.020	0.019	0.014	0.013	
Berseem(Fodder)													
Total	0.315	0.488	0.459	0.623	1.210	1.408	1.862	2.016	1.785	1.507	1.126	0.624	

Table **Monthly Water Requirement (Present)**
 Location: **No.34 Gezeret Abo Arafa**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.315	0.488	0.459	0.623	1.210	1.408	1.862	2.016	1.785	1.507	1.126	0.624	
Water Requirement (m³/s)													
Whole Area (180 feddan)													
Existing	150	0.05	0.07	0.07	0.09	0.18	0.21	0.28	0.30	0.27	0.23	0.17	0.09
Extension	30	0.01	0.01	0.01	0.02	0.04	0.04	0.06	0.06	0.05	0.05	0.03	0.02
Total Requirement	0.06	0.09	0.08	0.11	0.22	0.25	0.34	0.36	0.32	0.27	0.20	0.11	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Total Requirement (MCM)	0.06	0.09	0.08	0.11	0.22	0.25	0.34	0.36	0.32	0.27	0.20	0.11	Annual Ttl.
Monthly Req. (MCM)	0.071	0.099	0.103	0.134	0.269	0.302	0.413	0.447	0.383	0.334	0.242	0.139	2.935
Operation Record	0.092	0.101	0.117	0.129	0.175	0.187	0.219	0.248	0.199	0.192	0.156	0.084	1.899

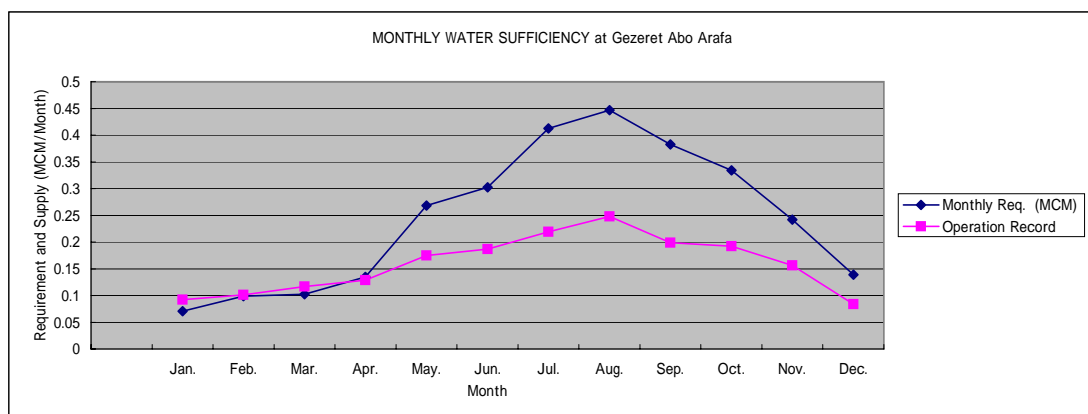


Table **Cropping Area (%) for Each Crop (Plan)**
 Location: **No.34 Gezeret Abo Arafa**

No.34 Gezeret Abo Arafa

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4	10.4
Berseem(Fodder)													
Flax													
Onion	5.4	5.4	5.4	5.4							5.4	5.4	
Garlic													
Vegetables	0.5	0.5	0.5							0.5	0.5	0.5	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans					23.3	23.3	23.3	23.3					
Sugarcane													
Banana	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3	90.3
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Berseem(Fodder)													
Total	109.3	109.3	109.3	108.8	126.7	126.7	126.7	126.7	103.4	103.9	109.3	109.3	

Table **Consumptive Use of Each Crop (Plan)** 0.5 11 1.0
 Location: **No.34 Gezeret Abo Arafa** (Unit : liter/sec/feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat													
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.137	0.173	0.146	0.144	0.152	0.166	0.158	0.085	0.159	0.136	0.105	0.100	
Berseem(Fodder)													
Flax													
Onion	0.048	0.054	0.050	0.047							0.034	0.037	
Garlic													
Vegetables	0.005	0.007	0.001							0.003	0.003	0.004	
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize													
Sorghum													
Soia Beans					0.251	0.398	0.537	0.077					
Sugarcane													
Banana	0.235	0.399	0.383	0.547	1.177	1.368	1.824	1.986	1.748	1.471	1.064	0.559	
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.011	0.011	0.010	0.014	0.017	0.023	0.021	0.021	0.020	0.019	0.014	0.013	
Berseem(Fodder)													
Total	0.437	0.643	0.589	0.752	1.597	1.955	2.540	2.168	1.928	1.628	1.220	0.714	

Table **Monthly Water Requirement (Plan)**
 Location: **No.34 Gezeret Abo Arafa**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.437	0.643	0.589	0.752	1.597	1.955	2.540	2.168	1.928	1.628	1.220	0.714	
Water Requirement (m³/s)													
Whole Area (180 feddan)													
Existing 150	0.07	0.10	0.09	0.11	0.24	0.29	0.38	0.33	0.29	0.24	0.18	0.11	
Extension 30	0.01	0.02	0.02	0.02	0.05	0.06	0.08	0.07	0.06	0.05	0.04	0.02	
Total Requirement	0.08	0.12	0.11	0.14	0.29	0.35	0.46	0.39	0.35	0.29	0.22	0.13	
Village Water	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Total Requirement (MCM)	0.08	0.12	0.11	0.14	0.29	0.35	0.46	0.39	0.35	0.29	0.22	0.13	Annual Ttl.
Monthly Req. (MCM)	0.098	0.129	0.131	0.162	0.354	0.419	0.563	0.480	0.413	0.361	0.262	0.159	3.532

Operation Record

0.000

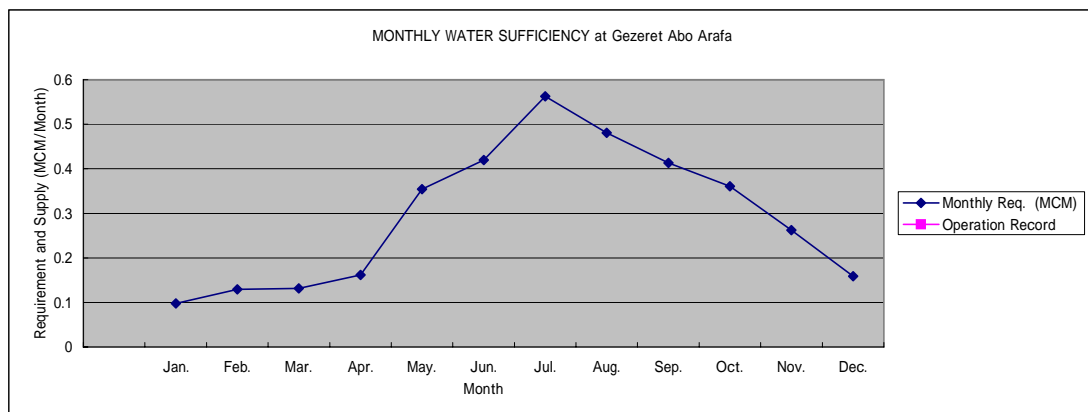


Table Cropping Area (%) for Each Crop (Present,Plan)

No.35 El-Hegs El-Mostagda

Location:

No.35 El-Hegs El-Mostagda

(Unit: %)

Season/Crops	Winter Season				Summer Season					Winter Season			Total
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	2.4	2.4	2.4	2.4							2.4	2.4	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	
Berseem(Fodder)	6.1	6.1									6.1	6.1	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						3.7	3.7	3.7	3.7	3.7			
Sorghum													
Soia Beans													
Sugarcane	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	81.1	
Banana													
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	
Berseem(Fodder)													
Total	100.0	100.0	93.9	93.9	91.5	95.2	95.2	95.2	95.2	95.2	100.0	100.0	

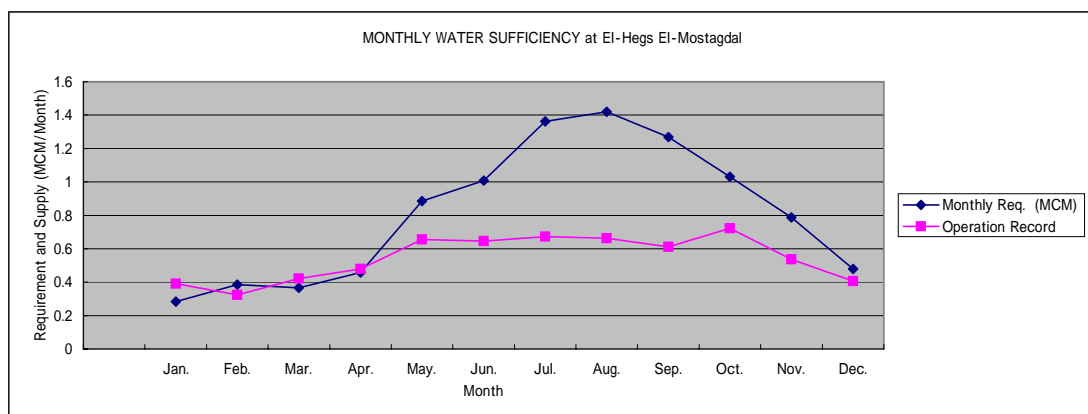
Table **Consumptive Use of Each Crop (Present,Plan)** 0.5 12 1.0
 Location: **No.35 EI-Hegs EI-Mostagda** (Unit : liter/sec/ feddan)

Season/Crops	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Winter Season													
Wheat	0.016	0.018	0.016	0.017							0.009	0.019	
Broad Beans													
Barley													
Fenugreek													
Lupine													
Chick-peas													
Lentils													
Clover	0.095	0.120	0.101	0.100	0.106	0.116	0.110	0.059	0.111	0.094	0.073	0.070	
Berseem(Fodder)	0.025	0.041									0.023	0.025	
Flax													
Onion													
Garlic													
Vegetables													
Other Plants													
Beet													
Summer Season													
Cotton													
Rice													
Maize						0.024	0.044	0.041	0.049	0.025			
Sorghum													
Soia Beans													
Sugarcane	0.186	0.322	0.308	0.438	0.959	1.116	1.501	1.628	1.432	1.126	0.874	0.449	
Banana													
Sesame													
Berseem(Fodder)													
Groundnuts													
Onion													
Vegetables													
Corn													
Other Plants													
Nile Seasons													
Maize													
Sorghum													
Vegetables													
Fruits	0.009	0.009	0.008	0.012	0.014	0.019	0.018	0.018	0.017	0.016	0.012	0.011	
Berseem(Fodder)													
Total	0.332	0.510	0.434	0.566	1.080	1.276	1.673	1.746	1.609	1.261	0.992	0.574	

n b

Table **Monthly Water Requirement (Present,Plan)**
 Location: **No.35 EI-Hegs EI-Mostagda**

Description	Winter Season				Summer Season					Winter Season			Remarks
	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	
Unit Consumption (l/s/feddan)	0.332	0.510	0.434	0.566	1.080	1.276	1.673	1.746	1.609	1.261	0.992	0.574	
Water Requirement (m³/s)													
Whole Area (600 feddan)													
Existing 600	0.20	0.31	0.26	0.34	0.65	0.77	1.00	1.05	0.97	0.76	0.59	0.34	
Extension 0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Requirement	0.20	0.31	0.26	0.34	0.65	0.77	1.00	1.05	0.97	0.76	0.59	0.34	
Village Water	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	
Total Requirement (MCM)	0.21	0.32	0.27	0.35	0.66	0.78	1.02	1.06	0.98	0.77	0.61	0.36	Annual Ttl.
Monthly Req. (MCM)	0.284	0.386	0.366	0.457	0.885	1.009	1.362	1.421	1.268	1.031	0.788	0.479	9.734
Operation Record	0.390	0.323	0.422	0.480	0.655	0.646	0.672	0.663	0.611	0.722	0.537	0.406	6.527



D. Agricultural Production

(1) Present Agricultural Production

Pump Station Area (Fed.)			No.27	No.29	No.30	No.31	No.32	No.33	No.34	No.35	Total(Exl.No.28)
			175	440	200	200	250	210	180	600	2,255
Winter	Wheat	%	31.3	13.7						2.4	47.4
		Fed.	54.8	60.3						14.4	129.5
Season		ton/Fed	1.8	0.9						0.6	
		ton	98.6	54.3						8.64	161.5
	Broad Beans	%									
		Fed.									
		ton/Fed									
		ton									
	Barley	%									
		Fed.									
		ton/Fed									
		ton									
	Clover	%		20.0	16.9	18.9	19.6		1.1	7.9	84.4
		Fed.		88.0	33.8	37.8	49		2.0	47.4	258.0
		ton/Fed		3.0	3.0	3.0	3.0		3.0	3.0	
		ton		264.0	101.4	113.4	147		5.9	142.2	773.9
	Berseem	%	18.8	33.7	15.4	23.9	6.5	4.6		6.1	109.0
		Fed.	32.9	148.3	30.8	47.8	16.3	9.7		36.6	322.3
		ton/Fed	1.0	1.0	1.0	1.0	1.0	1.0		1.0	
		ton	32.9	148.3	30.8	47.8	16.3	9.7		36.6	322.3
	Onion	%	12.5	5.1					5.4		23.0
		Fed.	21.9	22.4					9.7		54.0
		ton/Fed	1.2	0.4					1.2		
		ton	26.3	9.0					11.7		46.9
	Garlic	%		0.6							0.6
		Fed.		2.6							2.6
		ton/Fed		0.3							
		ton		0.8							0.8
	Vegetables	%	6.3	4.6					0.5		11.4
		Fed.	11.0	20.24					0.9		32.2
		ton/Fed	1.6	1.0					1.0		
		ton	17.6	20.2					0.9		38.8
Summer	Maize	%		36	7.7	17.4		2.3		3.7	67.1
		Fed.		158.4	15.4	34.8		4.8		22.2	67.1
Season		ton/Fed		1.2	1.2	1.2		1.2		1.2	
		ton		190.1	18.5	41.76		5.8		26.6	282.8
	Sorghum	%		14.9							14.9
		Fed.		65.6							65.6
		ton/Fed		1.0							
		ton		65.6							65.6
	Soybean	%									
		Fed.									
		ton/Fed									
		ton									
	Sugarcane	%				4.4				81.1	85.5
		Fed.				8.8				486.6	495.4
		ton/Fed				40.0				31.0	
		ton				352				15084.6	15436.6
	Banana	%					31.6	59.1	90.3		181.0
		Fed.					79.0	124.1	162.5		11.4
		ton/Fed					3.0	3.0	4.0		
		ton					237.0	372.3	650.2		1259.5
	Seasame	%									
		Fed.									
		ton/Fed									
		ton									
	Berseem	%	68.9	6.9		4.4					80.2
		Fed.	120.6	30.4		8.8					159.7
		ton/Fed	1.0	1.0		1.0					
		ton	120.6	30.4		8.8					159.7
	Groundnuts	%									
		Fed.									
		ton/Fed									
		ton									
	Onion	%									
		Fed.									
		ton/Fed									
		ton									
	Other Plants	%									
		Fed.									
		ton/Fed									
		ton									
	Vegetables	%			7.7			2.3			10.0
		Fed.			15.4			4.8			20.2
		ton/Fed			4.4			2.0			
		ton			67.8			9.7			77.4
Nile	Vegetables	%			7.7						7.7
		Fed.			15.4						
Season		ton/Fed			2.0						
		ton			30.8						30.8
	Fruits	%	31.1	40.0	84.6	63.0	42.3	31.8	2.7	2.5	298.0
		Fed.	54.4	176.0	169.2	126.0	105.75	66.8	4.9	15.0	718.0
		ton/Fed	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
		ton	54.4	176.0	169.2	126.0	105.75	66.8	4.9	15.0	718.0
	Berseem	%	68.9								68.9
		Fed.	120.6								120.6
		ton/Fed	1.0								
		ton	120.6								120.6
Total (ton)			471.0	958.5	418.4	689.8	506.0	464.2	673.5	15313.7	19495.1

remarks: Unit productions (ton/Fed) of each crops are derived from interview in farmer's survey by BD study team

(2) Planned Agricultural Production

Pump Station		No.27	No.29	No.30	No.31	No.32	No.33	No.34	No.35	Total
Area (Fed.)		175	440	200	200	250	210	180	600	2,255
Winter	Wheat	%	31.3	13.7					2.4	47.4
		Fed.	54.8	60.3					14.4	129.5
Season	Broad Beans	ton/Fed	1.8	1.8					1.8	
		ton	98.6	108.5					25.92	233.0
	Barley	%								
		Fed.								
	Clover	ton/Fed								
		ton								
	Berseem	%	15.6	20.0	16.9	18.9	27.0		10.4	7.9
		Fed.	27.3	88.0	33.8	37.8	67.5		18.7	47.4
	Onion	ton/fed	3.0	3.0	3.0	3.0			3.0	3.0
		ton	81.9	264.0	101.4	113.4	202.5		56.2	142.2
	Garlic	%	18.8	33.7	15.4	23.9	6.5	4.6		6.1
		Fed.	32.9	148.3	30.8	47.8	16.3	9.7		36.6
	Vegetables	ton/Fed	1.0	1.0	1.0	1.0				1.0
		ton	32.9	148.3	30.8	47.8	16.3	9.7		36.6
	Onion	%	12.5	7.4					5.4	
		Fed.	21.9	32.6					9.7	
	Garlic	ton/Fed	1.2	1.2					1.2	
		ton	26.3	39.1					11.7	
	Vegetables	%		0.6						0.6
		Fed.		2.6						
	Vegetables	ton/Fed		0.3						0.3
		ton		0.8						
	Vegetables	%	6.3	4.6					0.5	
		Fed.	11.0	20.2					0.9	
	Vegetables	ton/Fed	1.8	4.5					1.8	
		ton	17.6	40.5					1.8	
Summer	Maize	%		14.4	7.7	17.4		2.3		3.7
		Fed.		63.4	15.4	34.8		4.8		22.2
Season	Sorghum	ton/Fed		1.7	1.7	1.7		1.7		1.7
		ton		107.7	26.18	59.16		8.2		37.7
	Soybean	%		14.9						14.9
		Fed.		65.6						65.6
	Soybean	ton/Fed		1.0						1.0
		ton		65.6						65.6
	Soybean	%		7.2				23.3		30.5
		Fed.		31.7				41.9		73.6
	Soybean	ton/Fed		1.2				1.2		1.2
		ton		38.0				50.3		88.3
	Sugarcane	%				4.4			81.1	85.5
		Fed.				8.8			486.6	495.4
	Sugarcane	ton/Fed				40.0			40.0	40.0
		ton				352.0			1946.0	19816.0
	Banana	%					31.5	59.1	90.3	180.9
		Fed.					78.8	124.1	162.5	365.4
	Banana	ton/Fed					4.0	4.0	4.0	12.0
		ton					315.0	496.4	650.2	1461.6
	Seasame	%					26.1			26.1
		Fed.					65.3			65.3
	Seasame	ton/Fed					0.5			0.5
		ton					32.6			32.6
	Berseem	%	68.9	21.3		4.4				94.6
		Fed.	120.6	93.7		8.8				223.1
	Berseem	ton/Fed	1.0	1.0		1.0				1.0
		ton	120.6	93.7		8.8				223.1
	Groundnuts	%								
		Fed.								
	Onion	ton/Fed								
		ton								
	Other Plants	%								
		Fed.								
	Vegetables	ton/Fed								
		ton								
	Vegetables	%		2.2	7.7	12.6		2.3		24.8
		Fed.		9.7	15.4	25.2		4.8		55.1
	Vegetables	ton/Fed		2.0	4.4	2.0		2.0		6.4
		ton		19.4	67.8	50.4		9.7		147.2
Nile	Vegetables	%		2.2	16.2	12.6				31.0
		Fed.		9.7	32.4	25.2				67.3
Season	Fruits	ton/Fed		2.0	2.0	2.0				2.0
		ton		19.4	64.8	50.4				134.6
	Berseem	%	31.1	40.0	84.6	63.0	42.4	31.8	2.7	2.5
		Fed.	54.4	176.0	169.2	126.0	106.0	66.8	4.9	15.0
	Berseem	ton/Fed	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
		ton	54.4	176.0	169.2	126.0	106.0	66.8	4.9	15.0
	Berseem	%	68.9							68.9
		Fed.	120.6							120.6
	Berseem	ton/Fed	1.0							1.0
		ton	120.6							120.6
Total (ton)		552.9	1120.9	460.1	808.0	672.4	590.8	775.0	19721.5	24701.4

remarks: Unit productions (ton/Fed) of each crops are derived from interview in farmer's survey by BD study team

E. Agricultural Income

Agricultural Income

Crops		Present Production (A) Ton	Planned Production (B) Ton	Unit Price (LE/Ton)	Present Agricultural Income (1,000LE)	Planned Agricultural Income (1,000LE)
Winter Season	Wheat	162	233	1,200	194	280
	Broad Bean	0	0	1,000	0	0
	Barley	0	0	1,000	0	0
	Clover	774	962	800	619	770
	Berseem	322	322	800	258	258
	Onion	47	77	500	24	39
	Garlic	1	1	0	0	0
	Vegetable	39	60	1,000	39	60
Summer Season	Maize	283	239	1,000	283	239
	Sorghum	66	66	1,000	66	66
	Soybean	0	88	1,400	0	123
	Sugarcane	15437	19,816	130	2007	2576
	Banana	1260	1462	2,000	2520	2924
	Sesame	0	33	3,000	0	99
	Berseem	160	223	800	128	178
	Groundnut	0	0		0	0
	Onion	0	0		0	0
	Other Plants	0	0		0	0
	Vegetable	77	147	1,000	77	147
Nile Season	Vegetable	31	135	1,000	31	135
	Fruits	718	718	2,000	1436	1436
	Berseem	121	121	800	97	97
Total		19498	24703		7778	9426
(B)/(A)=1.27					Increased Production = 1,647	

remarks: Unit prices are loco price derived from farmer's survey and market survey by BD stury team

Pump station	No. 27 Gezeret El-Kobania Kelby		No. 28 Sahel Al-Khatara		No. 29 Sahel El-Akab Bahay		No. 30 Gezeret Maneha		No. 31 El-Sarag	
Location	left bank, 22.0km		right bank, 21.5km		right bank, 28.0km		right bank, island, 56.5km		left bank, island, 101.0km	
Commencement of operation	1948		1951		1948		1986		1973	
Major maintenance			1999 by Swiss Gov.				assembled by secondhand		electrified in 1981	
Position	down stream	upper stream	down stream	upper stream	down stream	upper stream	down stream	upper stream	down stream	upper stream
Unit no.	no. 2	no. 1	no. 1	no. 2	no. 1	no. 2	no. 1	no. 2	no. 1	no. 2
1. Main Pump										
1-1. Type	single end suction		2-stage end suction		single end suction		single end suction		single end suction	
1-2. Manufacturer	Kleinschanzlin Bestenbosotel GMBH		Sulzer Pumps Ltd.		Sulzer Pumps Ltd.		Sigma Hranice		Sigma Olomouc	
1-3. Year of manufacturing	1951	1951	1951	1951	1948	1948	1969	1950	1969	1969
1-4. Country of origin	West Germany		Switzerland		Switzerland		Czech		Czech	
1-5. Discharge capacity	0.25m ³ /s	0.25m ³ /s	1.35m ³ /s	1.35m ³ /s	0.35m ³ /s	0.35m ³ /s	2083GPM	3066GPM	2083GPM	2083GPM
1-6. Total head	13m	13m	23m	23m	13m	13m	not discribed	39.4ft	not discribed	not discribed
1-7. Rated revolution	675rpm	675rpm	500rpm	500rpm	1000rpm	1000rpm	1500rpm	960rpm	960rpm	960rpm
1-8. Workability	△	×	○	○	△	×	×	×	×	×
1-9. Casing										
1-9-1. Finish coat	○	○	○	○	○	○	×	×	×	×
1-9-2. Rust	○	○	○	○	○	○	×	×	×	×
1-10. Unit assembling										
1-10-1. Bolt tightness	△	△	○	○	△	△	×	△	×	×
1-10-2. Vibration	△	×	△	△	△	△	×	△	△	×
1-10-3. Noise	△	△	○	○	×	△	×	△	×	×
1-11. Bearing										
1-11-1. Noise	△	×	△	△	△	×	△	△	△	×
1-11-2. Vibration	△	×	△	△	△	×	△	△	△	×
1-11-3. Temperature	△	△	○	○	△	△	△	△	△	×
1-11-4. Oil leak	△	△	○	○	×	×	×	△	×	×
1-12. Coupling										
1-12-1. Bolt tightness	×	×	○	○	△	△	×	△	△	△
1-12-2. Eccentricity	△	△	○	○	×	△	×	△	△	△
1-12-3. Wear	△	△	△	△	×	△	△	×	△	△
1-13. Stuff box										
1-13-1. Water leak	×	×	△	△	×	×	△	△	×	×
1-13-2. Temperature	△	△	△	△	△	△	△	△	△	△
1-14. Others										
1-14-1. Rust	△	△	△	△	△	△	×	×	×	×
1-14-2. Oil leak	×	×	○	○	×	×	×	×	×	×
1-14-3. Water leak	△	△	△	△	×	×	×	×	×	×
1-14-4. Wear	△	△	△	△	△	△	×	×	×	×

2. Prime mover		squirrel cage induction		wound induction		squirrel cage induction		squirrel cage induction		squirrel cage induction	
2-1.	Type										
2-2.	Manufacturer	russian	Abntate	Yaskawa Electric Mfg. Co.		Reliance	Reliance	Reliance	Reliance	АСИНХРОНН Ы ИИ	
2-3.	Year of manufacturing	1978	1978	1978	1978	1948	1948	1950	1950	1969	1969
2-4.	Rated output	40kW	40kW	600HP	600HP	135HP	135HP	60HP	60HP	40kW	40kW
2-5.	Voltage	380V	380V	6000V	6000V	380V	380V	380V	380V	380V	380V
2-6.	Ampere	88.8A	88.8A	50.5A	50.5A	110A	110A	84.7A	84.7A	73A	73A
2-7.	Frequency	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz	50Hz
2-8.	No of revolution	735rpm	735rpm	490rpm	490rpm	985rpm	985rpm	975rpm	975rpm	1470rpm	1470rpm
2-9.	Present Workability	△	×	○	○	△	△	×	×	△	×
2-10.	Outer appearance										
2-10-1.	Finish coat	×	×	○	○	○	○	△	△	×	×
2-10-2.	Rust	×	×	○	○	○	○	△	△	×	×
2-11.	Bearing										
2-11-1.	Noise	×	×	△	△	×	△	×	×	△	△
2-11-2.	Vibration	×	×	△	△	×	△	×	×	△	△
2-11-3.	Temperature	△	△	△	△	△	△	×	×	△	×
2-11-4.	Oil leak	×	×	×	×	△	△	×	×	×	×
2-12.	Rotor & Fun					(mis-assembled)					
2-12-1.	Noise	△	△	○	○	×	△	×	×	△	×
2-12-2.	Vibration	△	△	○	○	×	△	×	×	△	×
2-12-3.	Wind pressure	△	△	○	○	△	△	×	×	△	△
2-13.	Others										
2-13-1.	Rust	×	×	○	○	△	△	△	△	×	×
2-13-2.	Oil leak	×	×	△	△	△	△	×	×	×	×
2-13-3.	Wear	×	×	△	△	×	×	×	×	×	×
3. Vacuum pump		one unit		two units		one unit		one unit		one unit	
3-1.	Type	totally enclosed		totally enclosed		totally enclosed		totally enclosed		totally enclosed	
3-2.	Manufacturer	Sigma Pumpy Hranice		Sigma Pumpy Hranice		Sigma Pumpy Hranice		VN-Pompen		VN-Pompen	
3-3.	Year of manufacturing	not described		not described		not described		1984		1984	
3-4.	Country of origin	Czech Republic		Czech Republic		Czech Republic		West Germany		West Germany	
3-5.	Capacity	7.5lit/sec		50lit/min		7.5lit/sec		30m3/h		30m3/h	
3-6.	No of revolution	1430rpm		1430rpm		1430rpm		2900rpm		2900rpm	
3-7.	Present Workability	△		○		△		△		△	
3-8.	Appearance of casing										
3-8-1.	Finish coat	△		△		×		×		×	
3-8-2.	Rust	×		○		×		×		×	
3-9.	Unit assembling										
3-9-1.	Bolt tightness	△		○		×		×		×	
3-9-2.	Vibration	△		○		△		×		×	
3-9-3.	Noise	△		○		△		×		×	
3-10.	Bearing										
3-10-1.	Noise	×		○		×		×		×	
3-10-2.	Vibration	×		○		×		×		×	
3-10-3.	Temperature	×		○		×		×		×	

3-10-4.	Oil leak	△	○	△	×	×
3-11.	Coupling					
3-11-1.	Bolt tightness	△	○	×	△	△
3-11-2.	Eccentricity	△	○	×	△	△
3-11-3.	Wear	×	○	×	△	△
3-12.	Stuff box					
3-12-1.	Water leak	△	○	△	○	○
3-12-2.	Temperature	△	○	△	△	△
3-13.	Others					
3-13-1.	Rust	×	○	△	△	△
3-13-2.	Oil leak	△	○	△	×	×
3-13-3.	Water leak	△	○	△	△	△
3-13-4.	Wear	×	○	△	×	×
4. Motor for vacuum pump						
4-1.	Type	squirrel cage	squirrel cage	squirrel cage	squirrel cage	squirrel cage
4-2.	Manufacturer	Siemens	Siemens	not described	ATB Austria	ATB Austria
4-3.	Year of manufacturing	not described	not described	not described	not described	not described
4-4.	Rated output	3kW	3kW	not described	not described	not described
4-5.	Voltage	380V	230/400V	380V	380V	380V
4-6.	Ampere	not described	11.3/6.5A	not described	not described	not described
4-7.	Frequency	50Hz	50Hz	50Hz	50Hz	50Hz
4-8.	No of revolution	not described	1420rpm	not described	not described	not described
4-9.	Present workability	×	○	×	△	△
4-10.	Appearance					
4-10-1.	Finish coat	×	△	△	×	△
4-10-2.	Rust	×	△	×	×	△
4-11.	Bearing					
4-11-1.	Noise	×	△	×	×	×
4-11-2.	Vibration	×	△	×	×	×
4-11-3.	Temperature	×	△	×	△	△
4-11-4.	Oil leak	×	○	×	×	×
4-12.	Others					
4-12-1.	Rust	×	△	×	×	×
4-12-2.	Oil leak	×	○	×	×	×
4-12-3.	Wear	×	○	×	×	×
5. Sluice valve						
		two units	four units	two units	two units	two units
5-1.	Type	plate	plate	plate	plate	plate
5-2.	Manufacturer	KSB	Sulzer Pumps Ltd.	Sulzer Pumps Ltd.	local made	MR (local)
5-3.	Year of manufacturing	1951	1951	1948	not described	1978
5-4.	Bore	400	650	300	425	250
5-5.	Appearance					
5-5-1.	Finish coat	○	○	○	×	×
5-5-2.	Rust	○	○	○	×	×
5-5-3.	Water leak	○	○	×	×	×
5-5-4.	Wear	× (Handle is broken.)	○	×	× (broken)	×

6. Check valve	two units	two units	not equipped	not equipped	one unit
6-1. Type	non-return plate	swing	-	-	non-return plate
6-2. Manufacturer	KSB	Sulzer Pumps Ltd.	-	-	MR (local)
6-3. Year of manufacturing	1951	1951	-	-	1978
6-4. Bore	400	650	-	-	450
6-5. Appearance					
6-5-1. Finish coat	○	○	-	-	△
6-5-2. Rust	○	○	-	-	△
6-5-3. Water leak	○	○	-	-	△
6-5-4. Wear	○	○	-	-	△
7. Connection pipe				Suction pipe	Suction pipe
7-1. Type	ball joint	ball joint	ball joint	bell bottom valve	foot valve
7-2. Manufacturer	not described	not described	India made	local made	local made
7-3. Year of manufacturing	not described	not described	not described	not described	not described
7-4. Bore	350	600	450	300	300
7-5. Appearance					
7-5-1. Finish coat	×	△	×	×	△
7-5-2. Rust	×	△	×	×	△
7-5-3. Water leak	×	△	× (so much leaking)	×	△
7-5-4. Wear	×	△	×	×	△
8. Switch board					
8-1. Type	self-stand	self-stand	self-stand	self-stand	self-stand
8-2. Manufacturer	local made	EGEMEC	local made	local made	local made
8-3. Year of manufacturing	not described	not described	not described	not described	not described
8-4. Dimensions (H × W × Dmm)	1910 × 1400 × 500	2200 × 2340 × 1240	2200 × 2340 × 1240	2050 × 1400 × 1150	2050 × 1350 × 550
8-5. Rated voltage	220/380V	220/380V	220/380V	220/380V	220/380V
8-6. Rated frequency	50Hz	50Hz	50Hz	50Hz	50Hz
8-7. Appearance					
8-7-1. Rust	×	△	△	△	△
8-7-2. Wear	×	△	△	△	△
8-7-3. Noise	×	△	△	△	△
8-7-4. Tightness	×	△	×	△	△
8-7-5. Insulation	×	× (dangerous)	×	×	×
8-8. Meters					
8-8-1. Zero setting	△	○	○	×	△
8-8-2. Workability	×	△	△	×	△
8-9. Door opening	△	△	△	△	×
8-10. Inner appearance					×
8-10-1. Lighting	×	×	×	×	×
8-10-2. Rust	△	△	△	△	△
8-10-3. Tightness	△	△	△	△	×
9. Barge				not equipped	not equipped
9-1. Outer appearance of barge					
9-1-1. Finish coat	×	×	×	-	-
9-1-2. Damage	△	△	△	-	-
9-1-3. Rust	△	△	△	-	-

9-1-4.	Wear	x	△	x	-	-
9-2.	Outer appearance of shed					
9-2-1.	Finish coat	△	△	△	-	-
9-2-2.	Damage	△	△	△	-	-
9-2-3.	Rust	wooden made	wooden made	wooden made	-	-
9-2-4.	Wear	△	△	△	-	-
9-3.	Anchoring					
9-3-1.	Type	chain	chain	chain-wire	-	-
9-3-2.	No of anchor	4	4	4	-	-
9-3-3.	Damage	○	○	△	-	-
9-3-4.	Rust	△	△	△	-	-
9-4.	Inner appearance					
9-4-1.	Finish coat	△	○	△	-	-
9-4-2.	Damage	x (Ceiling is damaged.)	△	△	-	-
9-4-3.	Rust	△	○	△	-	-
9-4-4.	Wear	△	○	△	-	-
9-5.	Appearance of intake hole					
9-5-1.	Finish coat	△	x	△	-	-
9-5-2.	Damage	△	△	△	-	-
9-5-3.	Rust	△	x	△	-	-
9-5-4.	Wear	△	x	△	-	-
9-6.	Appearance of pipe support					
9-6-1.	Finish coat	△	△	△	-	-
9-6-2.	Damage	△	△	△	-	-
9-6-3.	Rust	x	△	x	-	-
9-6-4.	Wear	x	△	x	-	-
10.	Discharge tower	1 tower	2 towers in parallel	2 towers in line	not equipped	not equipped
10-1.	Material	steel	steel	steel	-	-
10-2.	Present workability	△	○ △	△	-	-
10-3.	Bore	1000	1050 975	1050	-	-
10-4.	Outer appearance					
10-4-1.	Finish coat	x	x x	x	-	-
10-4-2.	Damage	○	○ ○	○	-	-
10-4-3.	Rust	△	△ △	△	-	-
10-4-4.	Wear	△	△ △	△	-	-
10-4-5.	Water leak	△	△ x	x	-	-
11.	Discharge pipeline					
11-1.	Nominal bore	600	700-600, reduced at joint	600-620	550	300
11-2.	Material	steel	steel	steel	steel	steel
11-3.	Installation	on ground	buried	on ground	on ground	on ground
11-4.	Present workability	○	x (huge velocity)	△ (leaking)	x	△
11-5.	Outer appearance					
11-5-1.	Damage	○	○	△	△	△
11-5-2.	Rust	x	△	x	x	x
11-5-3.	Wear	△	△	x	x	x
11-5-4.	Water leak	○	△	x	x	△

12. Power cable						
12-1.	Outer appearance					
12-1-1.	Damage	○	○	○	△	△
12-1-2.	Wear	○	△	○	△	△
12-1-3.	Covering	○	△	○	△	△
12-1-4.	Connection	△	○	○	△	△
12-1-5.	Insulation	○	○	○	△	△
13. Transformer						
13-1.	Type	oil cooling	oil cooling	oil cooling	oil cooling	oil cooling
13-2.	Capacity	100KVA	1000KVA	300KVA	300KVA	200KVA
13-3.	Primary voltage	11000V	11000V	11000V	11000V	11000V
13-4.	Secondary voltage	380V	6000V	380V	380V	400V
13-5.	Present workability	× (200KVA is required.)	○	×	△	△
13-6.	Outer appearance		concrete block housing			
13-6-1.	Rust	△	○	△	×	△
13-6-2.	Wear	×	○	×	△	△
13-6-3.	Tightness	×	○	×	○	△
13-6-4.	Insulation	×	○	×	×	×
13-7.	Door opening	×	○	△	○	△
13-8.	Inner appearance					
13-6-1.	Rust	×	○	△	△	△
13-6-2.	Wear	×	○	△	△	△
Comprehensive evaluation:		Vibration on No.1 Unit is extremely huge and unusual noise is detected. These are caused by wear-out on bearing of pump impeller and eccentricity of motor shaft with pump shaft. The different current at each phase may cause deterioration of induction motor. There are risks of electrical short and fire due to poor conditions of control panel and wiring.	Impeller, shaft sleeve and grand packing are replaced in 1999. However, only one unit is operable due to limited diameter of discharge pipes, which may also cause water hammer. The wound type induction motors are operated at 6000V inputs, which may cause shocks to human bodies. The pump station is designed double stage discharge, but it is not required.	Motors have been deteriorated, and especially for No.2 motor has huge difference in current among the phases. Water leak is found at pump shaft and sluice valves, which are caused by vibration of pump and motors. Cracks are found at the covers of motors. Impeller can be easily damaged due to absence of a check valve.	Vibrations of pumps and motors are extremely large. The shaft of No.1 Unit has eccentric rotation and reamer bolts of the coupling are broken. There is typical noise of cavitations and it suffocates the durability of impeller and casing.	No.2 Unit has been not operated for long term due to deterioration of both pump and motor. No.1 Unit also has huge vibration due to the wear of rotor. Since backboard and terminals are not insulated, there is possibility of any electric short accident.

Remarks: ○: Operatable
△: Superannuation is advanced, and repairs or update is necessary though it is operating.
×: Immediate update or improvement is necessary
—: Not correspond

Pump station	No. 32 Gezeret El-Fawaza El-Keblia	No. 33 Middle Fawaza	No. 34 Gezeret Abo Arafa	No. 35 El-Hegs El-Mostageda
Location	right bank, island, 112.0km	right bank, island, 113.0km	right bank, island, 124.0km	right bank, 138.0km
Commencement of operation	1973	1972	1973	1952
Major maintenance	electrified in 1980	electrified in 1981	replaced in 1997	electrified in 1983
Position	down stream upper stream	down stream upper stream	down stream upper stream	down stream upper stream
Unit no.	no. 2 no. 1	no. 1 no. 2	no. 2 no. 1	no. 1 no. 2
1. Main Pump				
1-1. Type	single end suction	single end suction	single end suction	single end suction
1-2. Manufacturer	Sigma Hranice	Sigma Hranice	Kleinschanzilin Bestenbosotel GMBH	Sulzer Pumps Ltd.
1-3. Year of manufacturing	1950 1950	1969 1969	1951 1951	1948 1948
1-4. Country of origin	Czech	Czech	West Germany	Switzerland
1-5. Discharge capacity	3066GPM 3066GPM	2083GPM 2083GPM	0.25m3/s 0.25m3/s	0.35m3/s 0.35m3/s
1-6. Total head	39.4ft 39.4ft	not discribed not discribed	13m 13m	13m 13m
1-7. Rated revolution	960rpm 960rpm	1500rpm 1500rpm	800rpm 800rpm	1000rpm 1000rpm
1-8. Workability	x x	x x	x x	x x
1-9. Casing				
1-9-1. Finish coat	x x	x x	x x	△ △
1-9-2. Rust	△ △	x x	△ △	△ △
1-10. Unit assembling				
1-10-1. Bolt tightness	△ △	x x	△ △	△ △
1-10-2. Vibration	x △	x x	△ △	x x
1-10-3. Noise	x △	x x	x x	x △
1-11. Bearing				
1-11-1. Noise	x x	△ △	x x	x x
1-11-2. Vibration	x △	x x	x x	x x
1-11-3. Temperature	△ △	△ △	△ △	△ △
1-11-4. Oil leak	x x	x x	△ △	x x
1-12. Coupling				
1-12-1. Bolt tightness	x x (no cover)	△ △	x x	x x
1-12-2. Eccentricity	△ x	△ △	x x	x x
1-12-3. Wear	x x	△ △	x x	x x
1-13. Stuff box				
1-13-1. Water leak	△ △	x △	x x	△ x
1-13-2. Temperature	△ △	△ △	△ △	x x
1-14. Others				
1-14-1. Rust	△ △	x x	△ △	△ △
1-14-2. Oil leak	x x	x x	x x	x x
1-14-3. Water leak	x x	x x	x x	x x
1-14-4. Wear	x x	x x	x x	x x

1GPM = 4.54609lit/min

3-11.	Coupling				
3-11-1.	Bolt tightness	△	△	△	△
3-11-2.	Eccentricity	△	△	△	△
3-11-3.	Wear	△	△	△	x
3-12.	Stuff box				(missing)
3-12-1.	Water leak	x	x	x	x
3-12-2.	Temperature	△	△	△	x
3-13.	Others				
3-13-1.	Rust	△	x	x	x
3-13-2.	Oil leak	x	x	x	△
3-13-3.	Water leak	x	x	△	△
3-13-4.	Wear	x	x	x	x
4.	Motor for vacuum pump				
4-1.	Type	squirrel cage	squirrel cage	squirrel cage	squirrel cage
4-2.	Manufacturer	ATB Austria	ATB Austria	AEG Union	Mone/ Nice
4-3.	Year of manufacturing	not described	not described	not described	not described
4-4.	Rated output	not described	not described	1kW	3kW
4-5.	Voltage	380V	380V	380V	380V
4-6.	Ampere	not described	not described	4.7A	11.9A
4-7.	Frequency	50Hz	50Hz	50Hz	50Hz
4-8.	No of revolution	not described	not described	2820rpm	1420rpm
4-9.	Present workability	△	△	△	△
4-10.	Appearance				
4-10-1.	Finish coat	△	△	△	x
4-10-2.	Rust	x	x	△	x
4-11.	Bearing				
4-11-1.	Noise	x	x	△	△
4-11-2.	Vibration	x	x	△	△
4-11-3.	Temperature	△	△	△	△
4-11-4.	Oil leak	△	x	△	△
4-12.	Others				
4-12-1.	Rust	x	△	△	△
4-12-2.	Oil leak	x	△	△	△
4-12-3.	Wear	x	△	x	△
5.	Sluice valve	two units	two units	two units	two units
5-1.	Type	plate	plate	plate	plate
5-2.	Manufacturer	KSB	MR	KSB	not described
5-3.	Year of manufacturing	1978	1978	1951	1952
5-4.	Bore	400	250	400	350
5-5.	Appearance				
5-5-1.	Finish coat	△	△	△	△
5-5-2.	Rust	△	△	△	△
5-5-3.	Water leak	x	△	△	△
5-5-4.	Wear	△	x	x	x

6.	Check valve	not equipped	not equipped	two units non-return plate B & R 1951 400	not equipped
6-1.	Type	-	-		-
6-2.	Manufacturer	-	-		-
6-3.	Year of manufacturing	-	-		-
6-4.	Bore	-	-		-
6-5.	Appearance				
6-5-1.	Finish coat	-	-	△	-
6-5-2.	Rust	-	-	△	-
6-5-3.	Water leak	-	-	△	-
6-5-4.	Wear	-	-	△	-
7.	Connection pipe	Suction pipe	Suction pipe		
7-1.	Type	foot valve local made	bell bottom with suction pit local made	flexible joint local made	flexible joint local made
7-2.	Manufacturer				
7-3.	Year of manufacturing	not described	not described	1977	not described
7-4.	Bore	400	300	500	450
7-5.	Appearance				
7-5-1.	Finish coat	○	○	×	×
7-5-2.	Rust	×	○	textural	textural
7-5-3.	Water leak	△	△	△	△
7-5-4.	Wear	△	△	×	×
8.	Switch board				
8-1.	Type	self-stand local made	self-stand local made	self-stand local made	self-stand local made
8-2.	Manufacturer				
8-3.	Year of manufacturing	not described	not described	1978	1983
8-4.	Dimensions (H × W × Dmm)	2050 × 1350 × 550	2050 × 1350 × 550	1900 × 1380 × 530	2030 × 1400 × 500
8-5.	Rated voltage	220/380V	220/380V	220/380V	220/380V
8-6.	Rated frequency	50Hz	50Hz	50Hz	50Hz
8-7.	Appearance				
8-7-1.	Rust	△	△	△	×
8-7-2.	Wear	△	△	△	△
8-7-3.	Noise	△	△	△	△
8-7-4.	Tightness	△	△	△	△
8-7-5.	Insulation	×	×	×	×
8-8.	Meters				
8-8-1.	Zero setting	△	△	△	×
8-8-2.	Workability	△	△	△	△
8-9.	Door opening	△	△	×	△
8-10.	Inner appearance				
8-10-1.	Lighting	×	×	×	×
8-10-2.	Rust	△	△	×	△
8-10-3.	Tightness	△	△	×	△
9.	Barge	not equipped	not equipped		
9-1.	Outer appearance of barge				
9-1-1.	Finish coat	-	-	×	×
9-1-2.	Damage	-	-	△	×
9-1-3.	Rust	-	-	×	×

9-1-4.	Wear	-	-	x	x
9-2.	Outer appearance of shed				
9-2-1.	Finish coat	-	-	x	x
9-2-2.	Damage	-	-	x	x
9-2-3.	Rust	-	-	wooden made	wooden made
9-2-4.	Wear	-	-	x	x
9-3.	Anchoring				
9-3-1.	Type	-	-	chain	chain
9-3-2.	No. of anchor	-	-	2	2
9-3-3.	Damage	-	-	△	△
9-3-4.	Rust	-	-	x	x
9-4.	Inner appearance				
9-4-1.	Finish coat	-	-	△	△
9-4-2.	Damage	-	-	x	x
9-4-3.	Rust	-	-	wooden made	wooden made
9-4-4.	Wear	-	-	x	△
9-5.	Appearance of intake hole				
9-5-1.	Finish coat	-	-	x	x
9-5-2.	Damage	-	-	x	x
9-5-3.	Rust	-	-	x	x
9-5-4.	Wear	-	-	x	x
9-6.	Appearance of pipe support				
9-6-1.	Finish coat	-	-	x	△
9-6-2.	Damage	-	-	x	△
9-6-3.	Rust	-	-	x	△
9-6-4.	Wear	-	-	x	△
10.	Discharge tower	not equipped	not equipped	not equipped	
10-1.	Material	-	-	-	steel
10-2.	Present workability	-	-	-	△
10-3.	Bore	-	-	-	1000
10-4.	Outer appearance				
10-4-1.	Finish coat	-	-	-	x
10-4-2.	Damage	-	-	-	○
10-4-3.	Rust	-	-	-	△
10-4-4.	Wear	-	-	-	△
10-4-5.	Water leak	-	-	-	△
11.	Discharge pipeline				
11-1.	Nominal bore	600	450	600	700
11-2.	Material	steel	steel	steel	steel
11-3.	Installation	on ground	on ground	on ground	on ground
11-4.	Present workability	△	△	△	△
11-5.	Outer appearance				
11-5-1.	Damage	△	△	△	△
11-5-2.	Rust	△	△	x	x
11-5-3.	Wear	△	△	△	x
11-5-4.	Water leak	△	△	△	x

12. Power cable					
12-1.	Outer appearance				
12-1-1.	Damage	○	△	○	△
12-1-2.	Wear	○	△	○	△
12-1-3.	Covering	△	△	△ (laying under river)	△
12-1-4.	Connection	△	△	△	△
12-1-5.	Insulation	△	△	△	△
13. Transformer					
13-1.	Type	oil cooling	oil cooling	air cooling	oil cooling
13-2.	Capacity	200KVA	200KVA	100KVA	500KVA
13-3.	Primary voltage	11000V	11000V	11000V	11000V
13-4.	Secondary voltage	400V	400V	400V	400V
13-5.	Present workability	×	△	×	△
13-6.	Outer appearance				
13-6-1.	Rust	×	△	no cover	○
13-6-2.	Wear	△	△	no cover	△
13-6-3.	Tightness	×	△	no cover	○
13-6-4.	Insulation	×	×	no cover	×
13-7.	Door opening	△	△	no cover	△
13-8.	Inner appearance				
13-6-1.	Rust	△	△	×	○
13-6-2.	Wear	×	△	×	○
Comprehensive evaluation:		In addition to vibration, remarkable wear-out at pump casing and shaft sleeve is expected due to suction of sand particles in water. Serious cavitations are also confirmed due to the high suction head. These problems cause the declination of the shaft. Since backboard and terminals are not insulated, there is possibility of any electric short accident.	Vibration of motors indicates deterioration. Abnormal noise is reported when the water level is low. Since some levels of cavitations occur, impeller is often replaced. Since backboard and terminals are not insulated, there is possibility of any electric short accident.	The spare parts from Russia are not available, despite motor of No.2 Unit is broken. No. 1 Unit also has huge vibration. It is expected that enough rotation power cannot provide due to the wear of rotors in the motor. Water depth of this pump station is very shallow due to sedimentation, and it is necessary to remove waterweeds in the river bed.	Vibration of the pump indicates abnormal levels and some reamer bolts have been removed. It can be caused by the excess power output of motors and decline of shafts. It is assumed that second-hand motors with high capacity had been introduced so as to secure more discharge volume and to adjust the rotation speed.

Remarks: ○: Operatable
△: Superannuation is advanced, and repairs or update is necessary though it is operating.
×: Immediate update or improvement is necessary
—: Not correspond

Operation Record (year 2001)
phase4

PS No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Max	Min	Ave.
No.27	380	382	384	390	400	420	420	440	430	400	390	380	4816	440	380	401.3
Unit 1	180	182	179	185	180	200	210	220	210	200	190	180	2316	220	179	193.0
Unit 2	200	200	205	205	220	220	210	220	220	200	200	200	2500	220	200	208.3
No.28	400	400	405	410	540	550	580	580	560	550	500	430	5905	580	400	492.1
Unit 1	400	400	405	410	100	550	580	580	560	550	500	430	5465	580	100	455.4
Unit 2	0	0	0	0	440	0	0	0	0	0	0	0	440	440	0	36.7
No.29	500	500	520	530	540	550	560	560	500	480	440	400	6080	560	400	506.7
Unit 1	250	250	260	270	270	270	280	280	260	240	220	200	3050	280	200	254.2
Unit 2	250	250	260	260	270	280	280	280	240	240	220	200	3030	280	200	252.5
No.30	360	360	365	370	380	390	400	410	420	360	340	320	4475	420	320	372.9
Unit 1	180	180	185	185	190	190	200	210	210	180	180	160	2250	210	160	187.5
Unit 2	180	180	180	185	190	200	200	200	210	180	160	160	2225	210	160	185.4
No.31	226	209	213	263	284	265	214	240	226	232	251	170	2793	284	170	232.8
Unit 1	100	80	70	109	110	100	114	100	103	115	118	48	1167	118	48	97.3
Unit 2	126	129	143	154	174	165	100	140	123	117	133	122	1626	174	100	135.5
No.32	330	340	360	360	368	400	410	420	430	370	360	320	4468	430	320	372.3
Unit 1	160	180	180	180	190	200	210	210	220	190	180	160	2260	220	160	188.3
Unit 2	170	160	180	180	178	200	200	210	210	180	180	160	2208	210	160	184.0
No.33	300	300	300	320	340	360	370	400	400	360	340	300	4090	400	300	340.8
Unit 1	150	150	160	180	180	180	190	200	200	180	180	160	2110	200	150	175.8
Unit 2	150	150	140	140	160	180	180	200	200	180	160	140	1980	200	140	165.0
No.34	200	200	210	220	240	240	250	260	260	230	210	200	2720	260	200	226.7
Unit 1	100	100	110	110	120	120	130	130	130	120	100	100	1370	130	100	114.2
Unit 2	100	100	100	110	120	120	120	130	130	110	110	100	1350	130	100	112.5
No.35	220	220	220	240	250	290	368	496	340	336	300	208	3488	496	208	290.7
Unit 1	110	110	120	120	120	140	184	248	170	168	150	104	1744	248	104	145.3
Unit 2	110	110	100	120	130	150	184	248	170	168	150	104	1744	248	100	145.3
Max	500	500	520	530	540	550	580	580	560	550	500	430	6080	580	400.0	506.7
Min	200	200	210	220	240	240	214	240	226	230	210	170	2720	260	170.0	226.7
Ave.	324.0	323.4	330.8	344.8	371.3	385.0	396.9	422.9	396.2	368.7	347.9	303.1	4315.0	430.0	299.8	359.6

Operation Record (year 2002)
phase4

PS No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Max	Min	Ave.
No.27	387	391	380	390	400	420	450	460	450	410	400	370	4908	460	370	409.0
Unit 1	182	186	180	190	200	220	220	230	230	220	200	180	2438	230	180	203.2
Unit 2	205	205	200	200	200	200	230	230	220	190	200	190	2470	230	190	205.8
No.28	458	492	405	410	550	521	560	560	546	460	430	400	5792	560	400	482.7
Unit 1	200	180	405	410	550	150	560	560	546	460	430	400	4851	560	150	404.3
Unit 2	258	312	0	0	0	371	0	0	0	0	0	0	941	371	0	78.4
No.29	510	520	520	540	560	560	521	570	530	500	420	410	6161	570	410	513.4
Unit 1	260	260	260	270	280	280	290	280	260	240	220	200	3100	290	200	258.3
Unit 2	250	260	260	270	280	280	231	290	270	260	200	210	3061	290	200	255.1
No.30	370	360	382	380	400	410	420	420	430	390	360	330	4652	430	330	387.7
Unit 1	190	180	192	190	200	210	210	210	220	200	180	170	2352	220	170	196.0
Unit 2	180	180	190	190	200	200	210	210	210	190	180	160	2300	210	160	191.7
No.31	215	214	251	355	388	258	251	262	270	284	229	183	3160	388	183	263.3
Unit 1	100	100	121	159	181	119	115	125	130	146	114	90	1500	181	90	125.0
Unit 2	115	114	130	196	207	139	136	137	140	138	115	93	1660	207	93	138.3
No.32	330	350	360	348	395	435	426	483	382	375	343	232	4459	483	232	371.6
Unit 1	170	180	180	182	207	216	215	247	186	188	172	120	2263	247	120	188.6
Unit 2	160	170	180	166	188	219	211	236	196	187	171	112	2196	236	112	183.0
No.33	310	310	339	454	450	460	474	470	480	370	346	300	4763	480	300	396.9
Unit 1	160	160	156	223	220	230	237	230	240	208	200	180	2444	240	156	203.7
Unit 2	150	150	183	231	230	230	237	240	240	162	146	120	2319	240	120	193.3
No.34	210	220	220	230	240	250	254	260	268	210	200	170	2732	268	170	227.7
Unit 1	100	110	120	120	120	130	130	130	134	110	100	90	1394	134	90	116.2
Unit 2	110	110	100	110	120	120	124	130	134	100	100	80	1338	134	80	111.5
No.35	230	220	240	240	304	318	384	426	410	400	364	216	3752	426	216	312.7
Unit 1	110	110	120	130	152	164	192	213	200	200	182	120	1893	213	110	157.8
Unit 2	120	110	120	110	152	154	192	213	210	200	182	96	1859	213	96	154.9
Max	510	520	520	540	560	560	560	570	546	500	430	410	6161	570	410.0	513.4
Min	210	214	220	230	240	250	251	260	268	210	200	170	2732	268	170.0	227.7
Ave.	335.6	341.9	344.1	371.9	409.7	403.6	415.6	434.6	418.4	377.7	343.6	290.1	4486.6	451.7	290.1	373.9

Operation Record (year 2003)
phase4

PS No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Max	Min	Ave.
No.27	364	351	360	398	421	453	450	460	454	380	300	-	4391	460	300	399.2
Unit 1	161	196	200	220	220	230	230	230	220	200	160	-	2267	230	160	206.1
Unit 2	203	155	160	178	201	223	220	230	234	180	140	-	2124	234	140	193.1
No.28	435	416	455	474	475	480	522	504	396	482	428	-	5067	522	396	460.6
Unit 1	435	416	455	474	475	480	522	504	396	482	428	-	5067	522	396	460.6
Unit 2	0	0	0	0	0	0	0	0	0	0	0	-	0	0	0	0.0
No.29	520	530	540	550	550	560	570	570	560	460	420	-	5830	570	420	530.0
Unit 1	260	270	270	280	270	280	290	290	280	220	200	-	2910	290	200	264.5
Unit 2	260	260	270	270	280	280	280	280	280	240	220	-	2920	280	220	265.5
No.30	338	280	300	370	370	380	390	400	380	340	320	-	3868	400	280	351.6
Unit 1	184	160	180	180	200	200	200	200	180	180	160	-	2024	200	160	184.0
Unit 2	154	120	120	190	170	180	190	200	200	160	160	-	1844	200	120	167.6
No.31	212	205	187	252	303	311	223	248	244	299	165	-	2649	311	165	240.8
Unit 1	100	80	86	124	118	148	102	122	144	190	80	-	1294	190	80	117.6
Unit 2	112	125	101	128	185	163	121	126	100	109	85	-	1355	185	85	123.2
No.32	300	306	340	346	414	377	453	397	425	373	252	-	3983	453	252	362.1
Unit 1	160	180	180	180	211	194	229	196	225	198	128	-	2081	229	128	189.2
Unit 2	140	126	160	166	203	183	224	201	200	175	124	-	1902	224	124	172.9
No.33	320	320	310	434	448	462	476	474	422	360	336	-	4362	476	310	396.5
Unit 1	170	160	160	212	224	231	238	237	211	180	185	-	2208	238	160	200.7
Unit 2	150	160	150	222	224	231	238	237	211	180	151	-	2154	238	150	195.8
No.34	190	210	220	230	240	250	230	210	220	210	180	-	2390	250	180	217.3
Unit 1	80	100	110	120	120	130	110	100	110	110	80	-	1170	130	80	106.4
Unit 2	110	110	110	110	120	120	120	110	110	100	100	-	1220	120	100	110.9
No.35	214	220	230	236	388	388	392	408	424	480	338	-	3718	480	214	338.0
Unit 1	120	120	110	116	194	194	196	204	212	240	169	-	1875	240	110	170.5
Unit 2	94	100	120	120	194	194	196	204	212	240	169	-	1843	240	94	167.5
Max	520	530	540	550	550	560	570	570	560	482	428	-	5830	570	420.0	530.0
Min	190	205	187	230	240	250	223	210	220	210	165	-	2390	250	165.0	217.3
Ave.	321.4	315.3	326.9	365.6	401.0	406.8	411.8	407.9	391.7	376.0	304.3	-	4028.7	435.8	279.7	366.2

Operation Record (year 2004)
phase4

PS No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Max	Min	Ave.
No.27	360	240	265	310	319	277	333	391	385	312	248	246	3686	391	240	307.2
Unit 1	180	120	150	150	114	66	102	152	169	102	83	86	1474	180	66	122.8
Unit 2	180	120	115	160	205	211	231	239	216	210	165	160	2212	239	115	184.3
No.28	284	272	416	385	460	429	434	517	417	406	401	349	4770	517	272	397.5
Unit 1	284	0	416	385	0	429	434	517	417	406	401	0	3689	517	0	307.4
Unit 2	0	272	0	0	460	0	0	0	0	0	0	349	1081	460	0	90.1
No.29	320	288	390	338	408	416	492	472	456	462	352	418	4812	492	288	401.0
Unit 1	160	144	195	169	204	208	246	236	228	231	176	209	2406	246	144	200.5
Unit 2	160	144	195	169	204	208	246	236	228	231	176	209	2406	246	144	200.5
No.30	284	247	253	253	236	256	304	270	245	244	268	196	3056	304	196	254.7
Unit 1	153	136	138	140	125	155	168	150	137	132	134	98	1666	168	98	138.8
Unit 2	131	111	115	113	111	101	136	120	108	112	134	98	1390	136	98	115.8
No.31	183	160	221	245	338	245	194	228	210	293	194	145	2656	338	145	221.3
Unit 1	62	80	112	126	180	127	107	154	106	149	99	80	1382	180	62	115.2
Unit 2	121	80	109	119	158	118	87	74	104	144	95	65	1274	158	65	106.2
No.32	235	249	286	318	414	371	438	366	372	392	276	247	3964	438	235	330.3
Unit 1	128	130	149	166	224	194	232	189	203	206	142	130	2093	232	128	174.4
Unit 2	107	119	137	152	190	177	206	177	169	186	134	117	1871	206	107	155.9
No.33	202	214	344	430	444	394	492	380	350	424	280	250	4204	492	202	350.3
Unit 1	101	107	172	215	222	196	246	190	157	208	140	125	2079	246	101	173.3
Unit 2	101	107	172	215	222	198	246	190	193	216	140	125	2125	246	101	177.1
No.34	32	46	72	86	90	78	64	102	68	46	66	36	786	102	32	65.5
Unit 1	32	46	72	86	90	78	64	102	68	46	66	36	786	102	32	65.5
Unit 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
No.35	234	176	240	182	362	348	388	408	344	524	444	300	3950	524	176	329.2
Unit 1	117	88	120	91	181	174	194	204	172	262	222	150	1975	262	88	164.6
Unit 2	117	88	120	91	181	174	194	204	172	262	222	150	1975	262	88	164.6
Max	360	288	416	430	460	429	492	517	456	524	444	418	4812	524	288.0	401.0
Min	32	46	72	86	90	78	64	102	68	46	66	36	786	102	32.0	65.5
Ave.	237.1	210.2	276.3	283.0	341.2	312.7	348.8	348.2	316.3	344.8	281.0	243.0	3542.7	399.8	198.4	295.2

Operation Record (year 2005)
phase4

PS No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Max	Min	Ave.
No.27	247	215	251	225	325	273	282	344	418	336	245	274	3435	418	215	286.3
Unit 1	81	65	94	75	133	88	109	145	209	137	80	89	1305	209	65	108.8
Unit 2	166	150	157	150	192	185	173	199	209	199	165	185	2130	209	150	177.5
No.28	267	277	278	256	450	468	386	497	480	438	366	324	4487	497	256	373.9
Unit 1	267	6	22	256	363	468	386	0	0	0	0	0	1768	468	0	147.3
Unit 2	0	271	256	0	87	0	0	497	480	438	366	324	2719	497	0	226.6
No.29	444	330	396	334	480	464	548	484	424	352	352	374	4982	548	330	415.2
Unit 1	222	165	198	167	240	232	274	242	212	176	176	187	2491	274	165	207.6
Unit 2	222	165	198	167	240	232	274	242	212	176	176	187	2491	274	165	207.6
No.30	210	244	296	255	304	254	220	275	277	316	229	217	3097	316	210	258.1
Unit 1	105	122	162	133	201	115	138	114	170	171	130	117	1678	201	105	139.8
Unit 2	105	122	134	122	103	139	82	161	107	145	99	100	1419	161	82	118.3
No.31	97	163	253	259	289	222	210	211	220	246	150	170	2490	289	97	207.5
Unit 1	51	68	125	132	154	114	107	166	117	131	82	87	1334	166	51	111.2
Unit 2	46	95	128	127	135	108	103	45	103	115	68	83	1156	135	45	96.3
No.32	305	266	334	284	351	380	365	389	403	394	328	215	4014	403	215	334.5
Unit 1	151	135	187	146	157	195	192	197	198	197	164	103	2022	198	103	168.5
Unit 2	154	131	147	138	194	185	173	192	205	197	164	112	1992	205	112	166.0
No.33	272	172	344	436	424	440	476	504	356	421	288	236	4369	504	172	364.1
Unit 1	132	83	184	236	212	220	238	252	178	215	144	118	2212	252	83	184.3
Unit 2	140	89	160	200	212	220	238	252	178	206	144	118	2157	252	89	179.8
No.34	40	50	56	54	88	78	97	96	70	86	56	60	831	97	40	69.3
Unit 1	40	50	56	54	88	78	97	96	70	86	56	60	831	97	40	69.3
Unit 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
No.35	278	144	280	306	316	368	420	384	452	456	262	224	3890	456	144	324.2
Unit 1	139	72	140	153	158	184	210	192	226	252	131	112	1969	252	72	164.1
Unit 2	139	72	140	153	158	184	210	192	226	204	131	112	1921	226	72	160.1
Max	444	330	396	436	480	468	548	504	480	456	366	374	4982	548	330.0	415.2
Min	40	50	56	54	88	78	97	96	70	86	56	60	831	97	40.0	69.3
Ave.	240.0	206.8	276.4	267.7	336.3	327.4	333.8	353.8	344.4	338.3	252.9	232.7	3510.6	392.0	186.6	292.5

Operation Record (year 2005)
phase 1 to 3

PS No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Max	Min	Ave
No.1	456	488	672	738	816	900	896	751	822	684	574	548	8345	900	456	695.4
Unit 1	230	244	336	369	416	450	448	382	411	342	287	274	4189	450	230	349.1
Unit 2	226	244	336	369	400	450	448	369	411	342	287	274	4156	450	226	346.3
No.2	876	852	972	858	900	828	792	900	900	936	828	828	10470	972	792	872.5
Unit 1	438	426	486	432	450	414	396	450	450	468	414	414	5238	486	396	436.5
Unit 2	438	426	486	426	450	414	396	450	450	468	414	414	5232	486	396	436.0
No.3	150	184	308	362	440	428	472	494	420	416	312	368	4354	494	150	362.8
Unit 1	75	103	154	181	220	214	236	247	210	208	156	184	2188	247	75	182.3
Unit 2	75	81	154	181	220	214	236	247	210	208	156	184	2166	247	75	180.5
No.4	417	380	380	440	284	472	454	448	468	448	354	356	4901	472	284	408.4
Unit 1	211	190	190	220	164	236	227	224	234	224	178	178	2476	236	164	206.3
Unit 2	206	190	190	220	120	236	227	224	234	224	176	178	2425	236	120	202.1
No.5	1044	984	1040	994	994	1064	1116	1064	1114	1070	894	906	12284	1116	894	1023.7
Unit 1	522	492	520	497	497	532	558	532	557	535	447	453	6142	558	447	511.8
Unit 2	522	492	520	497	497	532	558	532	557	535	447	453	6142	558	447	511.8
No.6	354	582	186	56	182	459	237	670	407	350	248	514	4245	670	56	353.8
Unit 1	298	474	179	56	182	348	237	497	372	285	202	257	3387	497	56	282.3
Unit 2	56	108	7	0	0	111	0	173	35	65	46	257	858	257	0	71.5
No.7	204	240	332	372	383	442	390	436	416	372	282	230	4099	442	204	341.6
Unit 1	102	120	166	186	202	221	195	218	208	188	140	115	2061	221	102	171.8
Unit 2	102	120	166	186	181	221	195	218	208	184	142	115	2038	221	102	169.8
No.8	558	504	566	528	554	538	552	576	500	647	541	510	6574	647	500	547.8
Unit 1	283	252	283	264	277	269	276	288	250	329	285	289	3345	329	250	278.8
Unit 2	275	252	283	264	277	269	276	288	250	318	256	221	3229	318	221	269.1
No.9	308	330	402	355	362	404	434	456	391	358	294	350	4444	456	294	370.3
Unit 1	154	165	201	179	181	202	217	228	195	179	147	175	2223	228	147	185.3
Unit 2	154	165	201	176	181	202	217	228	196	179	147	175	2221	228	147	185.1
No.10	524	576	646	576	656	624	650	728	660	718	570	576	7504	728	524	625.3
Unit 1	262	288	323	288	328	312	325	364	330	359	285	288	3752	364	262	312.7
Unit 2	262	288	323	288	328	312	325	364	330	359	285	288	3752	364	262	312.7
No.11	292	236	328	312	370	306	320	382	366	342	268	244	3766	382	236	313.8
Unit 1	146	118	164	156	185	153	160	191	183	171	134	122	1883	191	118	156.9
Unit 2	146	118	164	156	185	153	160	191	183	171	134	122	1883	191	118	156.9

Operation Record (year 2005)
phase 1 to 3

PS No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Max	Min	Ave
No.12	98	126	154	160	182	149	179	201	188	190	116	109	1852	201	98	154.3
Unit 1	51	65	87	86	94	77	93	103	95	91	62	62	966	103	51	80.5
Unit 2	47	61	67	74	88	72	86	98	93	99	54	47	886	99	47	73.8
No.13	298	328	450	380	378	488	366	496	512	441	399	352	4888	512	298	407.3
Unit 1	170	180	225	190	191	251	188	249	256	222	206	182	2510	256	170	209.2
Unit 2	128	148	225	190	187	237	178	247	256	219	193	170	2378	256	128	198.2
No.14	552	580	672	628	696	654	670	650	676	580	568	472	7398	696	472	616.5
Unit 1	276	290	336	314	348	327	335	325	338	290	284	236	3699	348	236	308.3
Unit 2	276	290	336	314	348	327	335	325	338	290	284	236	3699	348	236	308.3
No.15	85	58	120	145	144	120	171	158	154	194	104	108	1561	194	58	130.1
Unit 1	41	29	78	92	88	62	89	97	80	107	57	53	873	107	29	72.8
Unit 2	44	29	42	53	56	58	82	61	74	87	47	55	688	87	29	57.3
No.16	257	256	312	309	331	346	360	500	393	336	285	280	3965	500	256	330.4
Unit 1	141	126	164	151	165	185	188	250	203	168	141	98	1980	250	98	165.0
Unit 2	116	130	148	158	166	161	172	250	190	168	144	182	1985	250	116	165.4
No.17	98	128	98	166	148	158	148	182	156	196	115	80	1673	196	80	139.4
Unit 1	66	56	66	80	74	78	70	92	82	78	71	46	859	92	46	71.6
Unit 2	32	72	32	86	74	80	78	90	74	118	44	34	814	118	32	67.8
No.18	162	150	162	258	250	246	282	294	310	168	168	180	2630	310	150	219.2
Unit 1	72	84	72	126	136	126	158	138	138	84	78	88	1300	158	72	108.3
Unit 2	90	66	90	132	114	120	124	156	172	84	90	92	1330	172	66	110.8
No.19	200	224	126	100	222	264	238	248	198	210	236	262	2528	264	100	210.7
Unit 1	100	112	81	50	111	132	119	124	99	105	118	131	1282	132	50	106.8
Unit 2	100	112	45	50	111	132	119	124	99	105	118	131	1246	132	45	103.8
No.20	405	480	632	576	584	644	646	672	712	696	468	560	7075	712	405	589.6
Unit 1	206	240	316	288	292	322	323	336	356	348	229	280	3536	356	206	294.7
Unit 2	199	240	316	288	292	322	323	336	356	348	239	280	3539	356	199	294.9
No.21	159	250	266	282	257	410	399	379	376	343	223	220	3564	410	159	297.0
Unit 1	68	132	132	154	144	221	189	177	201	179	135	123	1855	221	68	154.6
Unit 2	91	118	134	128	113	189	210	202	175	164	88	97	1709	210	88	142.4
No.22	368	336	476	384	628	534	474	556	512	462	384	342	5456	628	336	454.7
Unit 1	184	168	238	192	314	267	237	278	256	231	192	171	2728	314	168	227.3
Unit 2	184	168	238	192	314	267	237	278	256	231	192	171	2728	314	168	227.3

Operation Record (year 2005)
phase 1 to 3

PS No.	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Max	Min	Ave
No.23	570	506	564	564	504	660	714	684	594	624	470	694	7148	714	470	595.7
Unit 1	285	253	282	282	252	330	357	342	297	312	235	347	3574	357	235	297.8
Unit 2	285	253	282	282	252	330	357	342	297	312	235	347	3574	357	235	297.8
No.24	481	371	476	463	539	608	641	706	472	492	702	418	6369	706	371	530.8
Unit 1	152	299	152	235	539	261	347	322	214	234	40	0	2795	539	0	232.9
Unit 2	329	72	324	228	0	347	294	384	258	258	662	418	3574	662	0	297.8
No.25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Unit 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
Unit 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
No.26	298	498	216	56	151	12	374	283	691	608	377	544	4108	691	12	342.3
Unit 1	298	474	179	56	151	12	130	48	250	302	215	188	2303	474	12	191.9
Unit 2	0	24	37	0	0	0	244	235	441	306	162	356	1805	441	0	150.4
Max	1044	984	1040	994	994	1064	1116	1064	1114	1070	894	906	12284	1116	894	1023.7
Min	85	58	98	56	144	12	148	158	154	168	104	80	1561	194	12	130.1
Ave.	368.6	385.9	422.2	402.5	438.2	470.3	479.0	516.6	496.3	475.2	391.2	402.0	5248.0	560.5	306.2	437.3

Remarks: Operation record of pump stations (A6-59 to A6-65) is collected from maintenance offices in Aswan, Iduf and Luxor.

F-3 Discharge Rate of Existing Pump Stations

Cropping Area

	No.27	No.28	No.29	No.30	No.31	No.32	No.33	No.34	No.35	Total
Area (Feddan)	175.0	2,000.0	440.0	200.0	200.0	250.0	210.0	180.0	600.0	4,255
Present Cropping Ratio	96.3%	70.4%	106.8%	113.7%	103.0%	95.7%	94.7%	97.1%	96.3%	
Present Cropping Area (Feddan)	168.5	1,408.0	469.9	227.4	206.0	239.3	198.9	174.8	577.8	3,671
Planned Cropping Ratio	111.9%	101.5%	107.2%	115.8%	113.5%	113.9%	94.7%	114.1%	96.3%	
Planned Cropping Area	195.8	2,030.0	471.7	231.6	227.0	284.8	198.9	205.4	577.8	4,423

Present Discharge Rate

year 2005

(Unit: 1,000m3)

Month	No.27	No.28	No.29	No.30	No.31	No.32	No.33	No.34	No.35
Jan	148.75	884.21	449.97	114.69	55.19	189.22	157.35	28.86	461.37
Feb	136.11	934.40	348.03	139.80	99.46	173.46	104.89	37.65	248.25
Mar	167.47	955.56	435.33	178.34	166.44	229.54	221.80	44.08	502.19
Apr	158.68	896.95	383.41	161.99	184.83	206.29	298.20	44.53	571.90
May	243.07	1,607.76	576.51	204.22	225.33	270.35	308.75	76.18	616.52
Jun	217.32	1,705.69	584.34	181.04	190.75	311.49	342.56	71.07	750.93
Jul	239.92	1,435.70	725.33	167.00	200.95	319.73	398.12	93.29	898.28
Aug	273.83	1,811.39	609.53	196.01	181.30	318.86	392.39	87.48	783.58
Sep	312.62	1,714.94	509.25	186.08	171.53	310.40	259.24	60.60	881.85
Oct	236.96	1,534.63	404.07	200.74	175.55	286.19	287.94	70.91	852.25
Nov	163.47	1,258.04	386.96	137.97	98.68	225.42	185.70	44.08	469.91
Dec	173.46	1,092.95	394.43	124.33	103.73	140.21	143.92	45.18	386.17
Total	2,471.65	15,832.24	5,807.15	1,992.20	1,853.74	2,981.15	3,100.88	703.90	7,423.19

Present Discharge Rate

year 2004

(Unit: 1,000m3)

Month	No.27	No.28	No.29	No.30	No.31	No.32	No.33	No.34	No.35
Jan	216.80	940.51	324.30	155.11	104.12	145.80	116.86	23.09	388.35
Feb	151.93	917.54	303.73	141.52	97.63	162.38	130.51	34.63	303.42
Mar	176.81	1,429.91	428.73	152.43	145.39	196.55	221.80	56.67	430.45
Apr	218.63	1,348.93	388.00	160.72	174.84	230.99	294.10	70.91	340.15
May	238.58	1,643.49	490.04	158.54	263.53	318.87	323.32	77.91	706.26
Jun	220.50	1,563.55	523.89	182.47	210.52	304.11	306.75	71.07	710.12
Jul	283.31	1,614.24	651.21	230.76	185.64	383.68	411.51	61.55	829.84
Aug	311.25	1,884.28	594.42	192.44	195.91	300.01	295.85	92.94	832.55
Sep	287.94	1,489.86	547.69	164.58	163.73	286.52	254.87	58.87	671.14
Oct	220.04	1,422.51	530.35	155.00	209.09	284.74	289.99	37.93	979.33
Nov	165.47	1,378.35	386.96	161.47	127.63	189.68	180.54	51.95	796.33
Dec	155.73	1,177.28	440.83	112.30	88.48	161.07	152.46	27.11	517.19
Total	2,646.99	16,810.44	5,610.14	1,967.33	1,966.49	2,964.39	2,978.55	664.64	7,505.14

Present Discharge Rate **year 2003** (Unit : 1,000m3)

Month	No.27	No.28	No.29	No.30	No.31	No.32	No.33	No.34	No.35
Jan	219.21	1,440.57	526.99	184.60	170.69	198.53	109.92	154.42	368.43
Feb	285.51	1,437.03	558.95	160.42	186.72	221.72	128.07	165.64	353.41
Mar	240.19	1,563.96	593.63	180.75	223.67	213.05	141.85	181.03	335.39
Apr	280.69	1,660.77	631.36	235.04	246.91	315.24	157.31	194.59	470.98
May	314.86	1,697.08	660.59	248.56	322.79	345.06	174.77	335.90	591.15
Jun	360.60	1,749.43	705.24	270.85	323.94	378.70	194.64	353.55	634.62
Jul	382.86	1,941.55	754.45	296.04	433.47	416.97	192.37	377.01	476.94
Aug	366.17	1,836.90	717.83	285.10	341.12	388.54	163.50	371.77	506.06
Sep	339.54	1,450.56	672.60	255.27	331.37	325.03	160.20	367.06	476.04
Oct	267.99	1,688.80	528.05	215.98	266.18	261.49	143.63	395.78	558.82
Nov	200.16	1,471.15	461.71	192.80	165.78	230.91	116.06	266.04	295.93
Dec	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	3,257.80	17,937.78	6,811.39	2,525.42	3,012.64	3,295.24	1,682.31	3,162.80	5,067.79

Present Discharge Rate **year 2002** (Unit : 1,000m3)

Month	No.27	No.28	No.29	No.30	No.31	No.32	No.33	No.34	No.35
Jan	233.06	1,516.74	516.86	202.08	187.76	192.33	121.49	165.97	356.81
Feb	247.52	1,659.66	548.41	206.26	213.57	202.16	134.17	165.64	368.93
Mar	253.54	1,392.10	571.64	230.15	236.83	232.98	141.85	188.91	450.18
Apr	275.05	1,436.53	619.89	241.39	248.34	329.77	157.31	197.89	663.48
May	299.16	1,965.04	672.60	268.71	307.98	346.60	174.77	263.18	756.99
Jun	334.33	1,898.86	705.24	292.23	373.77	377.06	194.64	289.77	526.47
Jul	382.86	2,082.89	689.59	318.81	407.63	415.21	212.44	369.32	536.83
Aug	366.17	2,041.00	717.83	299.36	415.02	385.26	202.42	388.18	534.63
Sep	336.55	1,950.75	636.57	288.86	297.84	369.70	195.16	354.94	526.77
Oct	289.15	1,611.71	573.97	247.75	267.60	268.76	143.63	329.82	530.78
Nov	266.88	1,478.03	461.71	216.90	225.65	237.79	128.96	286.51	410.72
Dec	234.23	1,349.32	432.40	189.07	141.56	195.64	103.67	162.63	315.49
Total	3,518.51	20,382.62	7,146.69	3,001.57	3,323.55	3,553.24	1,910.50	3,162.74	5,978.08

Present Discharge Rate **year 2001** (Unit : 1,000m3)

Month	No.27	No.28	No.29	No.30	No.31	No.32	No.33	No.34	No.35
Jan	228.85	1,324.66	506.72	196.62	187.76	186.12	115.70	158.75	375.07
Feb	241.83	1,349.32	527.31	206.26	207.47	195.64	121.97	165.64	360.31
Mar	256.21	1,392.10	571.64	219.91	236.83	206.17	135.40	173.16	382.02
Apr	275.05	1,436.53	608.41	235.04	256.90	232.44	150.47	197.89	491.54
May	299.16	1,929.31	648.58	255.27	286.93	261.87	174.77	216.43	554.08
Jun	334.33	2,004.55	692.65	277.98	343.70	295.09	186.85	264.25	540.75
Jul	357.33	2,157.28	741.21	303.63	392.32	324.11	209.10	353.93	457.70
Aug	350.25	2,113.89	705.24	292.23	360.88	327.88	202.42	451.96	489.74
Sep	321.60	2,000.77	600.53	282.15	335.27	308.09	189.33	294.34	440.93
Oct	282.10	1,927.05	551.01	228.69	264.04	261.49	157.31	277.05	433.60
Nov	260.21	1,718.64	483.69	204.85	236.83	233.66	135.40	236.13	450.18
Dec	240.56	1,450.52	421.85	183.34	195.26	195.64	121.97	156.61	293.08
Total	3,447.47	20,804.61	7,058.84	2,885.96	3,304.18	3,028.20	1,900.70	2,946.14	5,268.99

Total Present Discharge Rate (year 2001-2005) (Unit : 1,000m3)

	No.27	No.28	No.29	No.30	No.31	No.32	No.33	No.34	No.35
Total	15,342.43	91,767.70	32,434.21	12,372.48	13,460.60	15,822.22	11,572.94	10,640.23	31,243.19

Average Present Discharge Rate (year 2001-2005)(Unit: 1,000m³)

Month	No.27	No.28	No.29	No.30	No.31	No.32	No.33	No.34	No.35
Jan	209.33	1221.34	464.97	170.62	141.10	182.40	124.26	106.22	390.01
Feb	212.58	1259.59	457.29	170.85	160.97	191.07	123.92	113.84	326.87
Mar	218.84	1346.72	520.19	192.31	201.83	215.66	172.54	128.77	420.05
Apr	241.62	1355.94	526.21	206.84	222.36	262.95	211.48	141.16	507.61
May	278.97	1768.53	609.66	227.06	281.31	308.55	231.27	193.92	645.00
Jun	293.42	1784.42	642.27	240.91	288.54	333.29	245.09	209.94	632.58
Jul	329.26	1846.33	712.36	263.24	324.00	371.94	284.71	251.02	639.92
Aug	333.54	1937.49	668.97	253.03	298.85	344.11	251.32	278.47	629.31
Sep	319.65	1721.37	593.33	235.39	259.95	319.95	211.76	227.16	599.35
Oct	259.25	1636.94	517.49	209.63	236.49	272.53	204.50	222.30	670.96
Nov	211.24	1460.84	436.20	182.80	170.91	223.49	149.33	176.94	484.61
Dec	200.99	1267.52	422.38	152.26	132.26	173.14	130.51	97.88	377.98

annotation: Present cropping area is derived from farmers survey in BD study team
Present discharge rate is calculated from operation record of pump station and pump capacity

Unit cost of O&M before installation of renewal pump

No.	Station Name	Water Demand (1000m ³)	Estimated total discharge (1000m ³)	Cost of maintenance	Cost of electricity	Cost of oil & grease	Wages & salary	Existing		Irrigated area (feddan)	Unit cost of Electricity (LE/1000m3) a= /	Unit cost of O&M Cost (LE/1000m3) b= /	Unit Cost of Irrigation (LE/1000m3) c= /
								Total O&M Cost (LE) = ~	Total Cost including salary (LE) =Σ ~				
27	Gezeret El-Kobania												
	2003	3,019.0	3,257.8	0.0	4,745.4	107.4	10,528.8	4,852.8	15,381.6	168.5	1.46	1.49	4.72
	2004	3,019.0	2,647.0	0.0	4,395.0	47.5	14,061.8	4,442.5	18,504.3	168.5	1.66	1.68	6.99
	2005	3,019.0	2,471.7	100.0	3,515.4	88.2	19,873.2	3,703.6	23,576.8	168.5	1.42	1.50	9.54
	Average	3,019.0	2,792.1	33.3	4,218.6	81.0	14,821.3	4,333.0	19,154.2	168.5	1.51	1.56	7.08
29	Sahel El-Akab Bahary												
	2003	5,951.0	6,811.4	0.0	18,940.0	123.0	24,122.2	19,063.0	43,185.2	469.9	2.78	2.80	6.34
	2004	5,951.0	5,610.1	0.0	8,940.0	87.1	36,039.5	9,027.1	45,066.6	469.9	1.59	1.61	8.03
	2005	5,951.0	5,807.2	91.7	8,260.0	92.3	43,076.0	8,444.0	51,520.0	469.9	1.42	1.45	8.87
	Average	5,951.0	6,076.2	30.6	12,046.7	100.8	34,412.6	12,178.0	46,590.6	469.9	1.93	1.95	7.75
30	Gezeret Meneha												
	2003	2,539.0	2,525.4	135.0	8,952.0	93.0	40,550.9	9,180.0	49,730.9	227.4	3.54	3.64	19.69
	2004	2,539.0	1,967.3	270.8	7,956.0	58.3	38,662.5	8,285.1	46,947.6	227.4	4.04	4.21	23.86
	2005	2,539.0	1,992.2	88.3	7,596.0	76.6	37,788.0	7,760.9	45,548.9	227.4	3.81	3.90	22.86
	Average	2,539.0	2,161.7	164.7	8,168.0	76.0	39,000.5	8,408.7	47,409.1	227.4	3.80	3.91	22.14
31	El-Sarag												
	2003	2,871.0	3,012.6	264.0	8,800.0	154.9	53,616.6	9,218.9	62,835.5	206.0	2.92	3.06	20.86
	2004	2,871.0	1,966.5	44.7	5,900.0	99.7	37,609.2	6,044.4	43,653.6	206.0	3.00	3.07	22.20
	2005	2,871.0	1,853.7	115.5	8,050.0	252.0	61,057.0	8,417.5	69,474.5	206.0	4.34	4.54	37.48
	Average	2,871.0	2,277.6	141.4	7,583.3	168.9	50,760.9	7,893.6	58,654.5	206.0	3.42	3.56	26.84

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F-4 O/M Cost of Existing Pump Stations

No.	Station Name	Existing											Unit Cost of Irrigation (LE/1000m3)
		Water Demand (1000m ³)	Estimated total discharge (1000m ³)	Cost of maintenance	Cost of electricity	Cost of oil & grease	Wages & salary	Total O&M Cost (LE)	Total Cost including salary (LE)	Irrigated area (feddan)	Unit cost of Electricity (LE/1000m3)	Unit cost of O&M Cost (LE/1000m3)	
32	Gezeret El-Fawaza												
	2003	3,255.0	3,295.2	369.0	11,840.0	19.9	54,727.3	12,228.9	66,956.2	239.3	3.59	3.71	20.32
	2004	3,255.0	2,964.4	0.0	7,752.0	76.0	33,739.1	7,828.0	41,567.1	239.3	2.62	2.64	14.02
	2005	3,255.0	2,981.2	337.3	20,000.0	210.4	39,789.7	20,547.7	60,337.4	239.3	6.71	6.89	20.24
	Average	3,255.0	3,080.3	235.4	13,197.3	102.1	42,752.0	13,534.9	56,286.9	239.3	4.31	4.41	18.19
33	Middle Fawaza												
	2003	2,825.0	1,682.3	49.9	8,658.0	118.0	27,038.8	8,825.9	35,864.7	198.9	5.15	5.25	21.32
	2004	2,825.0	2,978.6	107.1	6,272.0	140.1	21,023.0	6,519.2	27,542.2	198.9	2.11	2.19	9.25
	2005	2,825.0	3,100.9	66.3	8,776.0	139.2	32,173.0	8,981.5	41,154.5	198.9	2.83	2.90	13.27
	Average	2,825.0	2,587.2	74.4	7,902.0	132.4	26,744.9	8,108.9	34,853.8	198.9	3.36	3.44	14.61
34	Gezeret Abo Arafa												
	2003	2,936.0	3,162.8	6.0	14,935.6	83.0	69,332.9	15,024.6	84,357.5	174.8	4.72	4.75	26.67
	2004	2,936.0	664.6	25.4	3,138.6	23.3	18,050.5	3,187.3	21,237.8	174.8	4.72	4.80	31.95
	2005	2,936.0	703.9	200.5	3,324.0	55.7	29,180.3	3,580.2	32,760.5	174.8	4.72	5.09	46.54
	Average	2,936.0	1,510.4	77.3	7,132.7	54.0	38,854.6	7,264.0	46,118.6	174.8	4.72	4.88	35.06
35	El-Hegs El-Mostagda												
	2003	9,734.0	5,067.8	10.8	18,980.0	216.5	37,706.8	19,207.3	56,914.1	577.8	3.75	3.79	11.23
	2004	9,734.0	7,505.1	0.0	11,700.0	76.0	29,954.5	11,776.0	41,730.5	577.8	1.56	1.57	5.56
	2005	9,734.0	7,423.2	111.5	19,340.0	250.2	48,604.1	19,701.7	68,305.8	577.8	2.61	2.65	9.20
	Average	9,734.0	6,665.4	40.8	16,673.3	180.9	38,755.1	16,895.0	55,650.1	577.8	2.64	2.67	8.66

8 Pump Stations Total

2003	33,130	28,815	835	95,851	916	317,624	97,601	415,226	2,263	28	28	131
2004	33,130	26,304	448	56,054	608	229,140	57,110	286,250	2,263	21	22	122
2005	33,130	26,334	1,111	78,861	1,165	311,541	81,137	392,678	2,263	28	29	168
Average	33,130	27,151	798	76,922	896	286,102	78,616	364,718	2,263	26	26	140

Electricity cost of No.34 in 2003 and 2004 are prorated from the data in 2005 so that these data are not available.

Unit cost of O&M after installation of renewal pump

		Plan							
No.	Station Name	Water demand (1000m ³)	Cost of Electricity (LE)	Maintainace cost	Total O&M Cost (LE) = +	Total Cost including salary (LE) = +	Irrigated area (feddan)	Unit cost of O&M Cost (LE/1000m3) a= /	Unit Cost of Irrigation (LE/1000m3) b= /
27	Gezeret El-Kobania	3,542.0	9,209.2	152.0	9,361.2	29,234.4	195.8	2.64	8.25
29	Sahel El-Akab Bahary	6,252.0	16,255.2	268.3	16,523.5	59,599.5	471.7	2.64	9.53
30	Gezeret Meneha	2,695.0	7,007.0	115.7	7,122.7	44,910.7	231.6	2.64	16.66
31	El-Sarag	2,944.0	7,654.4	126.3	7,780.7	68,837.7	227.0	2.64	23.38
32	Gezeret El-Fawaza	3,950.0	10,270.0	169.5	10,439.5	50,229.2	284.8	2.64	12.72
33	Middle Fawaza	2,825.0	7,345.0	121.2	7,466.2	39,639.2	198.9	2.64	14.03
34	Gezeret Abo Arafa	3,530.0	9,178.0	151.5	9,329.5	38,509.8	205.4	2.64	10.91
35	El-Hegs El-Mostagda	9,734.0	25,308.4	417.7	25,726.1	74,330.2	577.8	2.64	7.64
8 Pump Stations Total		35,472	92,227	1,522	93,750	405,291	2,393	21	103

- 1) Water Demand (1,000m³) is derived form Planned Monthly Water Requirement (p. A8-13 ~ p. A8-42)
- 2) Cost of Electricity = (Unit cost of Electricity LE/1,000m³) 2.73×(Water Demand)
(Refer to Maintenance Cost of Phase-1 to 3 Floating Pump Station(2005) p.A8-72)
- 3) Maintenance Cost = (Unit Cost of Maintenance Cost LE/1,000m³) 0.043×(Water Demand)
(Refer to Maintenance Cost of Phase-1 to 3 Floating Pump Station(2005) p.A8-72)
- 4) Wege and salary is suppose to be same amount in 2005

Maintenance Cost of Phase-1 to 3 Floating Pump Stations (2005)

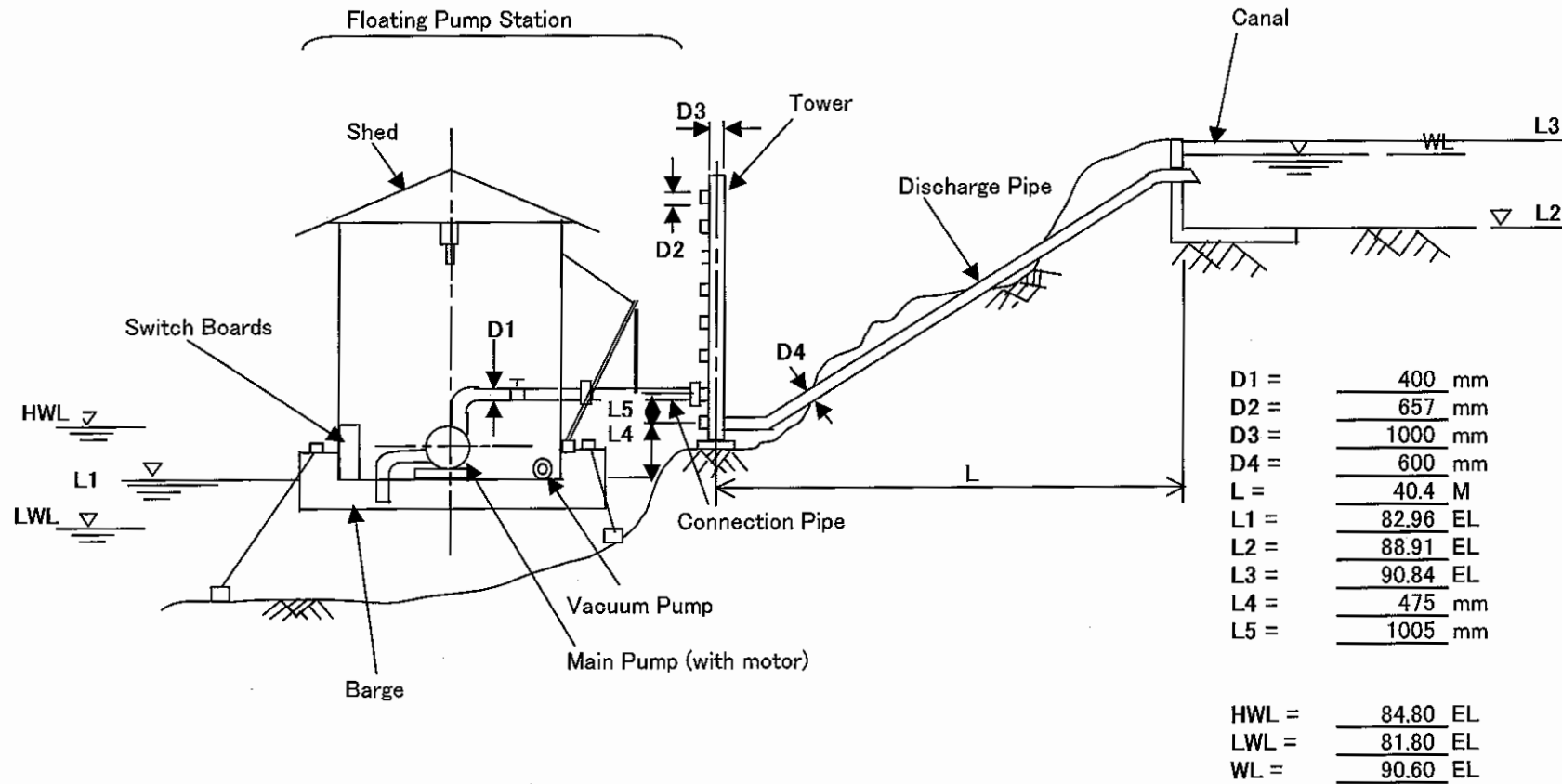
No.	Station Name	pump capacity m3/s		Total operating hours (hr)	Estimated total discharge (1000 m3)	Cost of maintenance (LE)	Cost of oil & grease (LE)	Cost of Electricity (LE)	Maintenance Cost (LE)	Unit Cost of Electricity (LE/1000m3)	Unit Cost of Maintenance (LE/1000m3)
		capacity m3/s	unit								
1	El Shelkh Fadl	0.25	2	8,345	7,510.5	294.0	11.3	36,448.0	305.3	4.85	0.04
2	Sahel WI Hamam	0.15	2	10,470	5,653.8	390.3	19.5	20,940.0	409.8	3.70	0.07
3	El Foza El Baharia	0.15	2	4,354	2,351.2	19.4	3.3	1,127.0	22.7	0.48	0.01
4	Sahel El Kobania	0.35	2	4,901	6,175.3	0.0	4.0	8,130.0	4.0	1.32	0.00
5	Sahel Fares	0.50	2	12,284	22,111.2	534.2	1.7	80,544.0	535.9	3.64	0.02
7	El Twisa	0.25	2	4,099	3,689.1	268.6	8.1	17,514.0	276.7	4.75	0.08
8	Gharb Aswan Baharia	0.50	2	6,574	11,833.2	0.0	12.0	17,320.0	12.0	1.46	0.00
9	Gezirat Fares	0.50	2	4,444	7,999.2	325.2	1.7	32,340.0	326.9	4.04	0.04
10	Gezirat Bahrif	0.35	2	7,504	9,455.0	0.0	13.2	11,520.0	13.2	1.22	0.00
11	Gezirat Ballola	0.25	2	3,766	3,389.4	1,993.1	1.7	14,725.0	1,994.8	4.34	0.59
12	Gezirat Al Arab	0.15	2	1,852	1,000.1	80.7	1.7	4,200.0	82.4	4.20	0.08
13	Kubania	0.15	2	4,888	2,639.5	0.0	6.6	7,110.5	6.6	2.69	0.00
14	Sahel Abu Rish	0.50	2	7,398	13,316.4	0.0	8.0	31,140.0	8.0	2.34	0.00
15	Sahel El Kelh	0.60	2	1,561	3,371.8	4.3	12.0	1,040.7	16.3	0.31	0.00
16	Wadi El Kubania	0.60	2	3,965	8,564.4	0.0	8.0	10,164.0	8.0	1.19	0.00
17	El Sharunia	1.00	2	1,673	6,022.8	975.3	3.3	1,378.0	978.6	0.23	0.16
18	El Owenia	0.70	2	2,630	6,627.6	923.6	11.2	2,360.0	934.8	0.36	0.14
19	Baklous	0.15	2	2,528	1,365.1	0.0	8.0	3,172.0	8.0	2.32	0.01
20	New Sahel Fares	0.80	2	7,075	20,376.0	440.2	6.7	132,580.0	446.9	6.51	0.02
21	El Karabia	0.50	2	3,564	6,415.2	4.0	20.8	2,095.0	24.8	0.33	0.00
22	Sahel Alakaba Kebli	0.20	2	5,456	3,928.3	0.0	89.2	19,066.8	89.2	4.85	0.02
23	Al Rakikin Sahel	0.10	2	7,148	2,573.3	303.8	49.1	1,872.0	352.9	0.73	0.14
24	Blowkher	1.00	2	6,369	22,928.4	800.0	37.0	157,917.0	837.0	6.89	0.04
6	El Biadiea El Ollia	1.30	28.0	460.0	2	4,245	39,831.5	11,360.0	35.0	491,529.4	11,395.0
26		1.35	28.0	460.0	2	4,108					
	Average			5,341	7,795.5	319.9	14.7	26,726.3	334.6	2.73	0.04

annotation: O/M cost of pump stations is collected from management offices in Aswan, Iduf and Luxor.

No. 27

Survey Date: March 2006

Name of Pump Station: Gezeret El-Kobania Kelby
 Pump: units: 2 Type: End suction single volute
 discharge: 0.25 lit/sec total head: 13 m
 revolution: 675 min⁻¹
 Motor: 40 kW 380 V 735 min⁻¹
88.8 amp. Type: squirrel cage
 Transformer: 11k/380 V/V 100 kVA (200kVA is required)

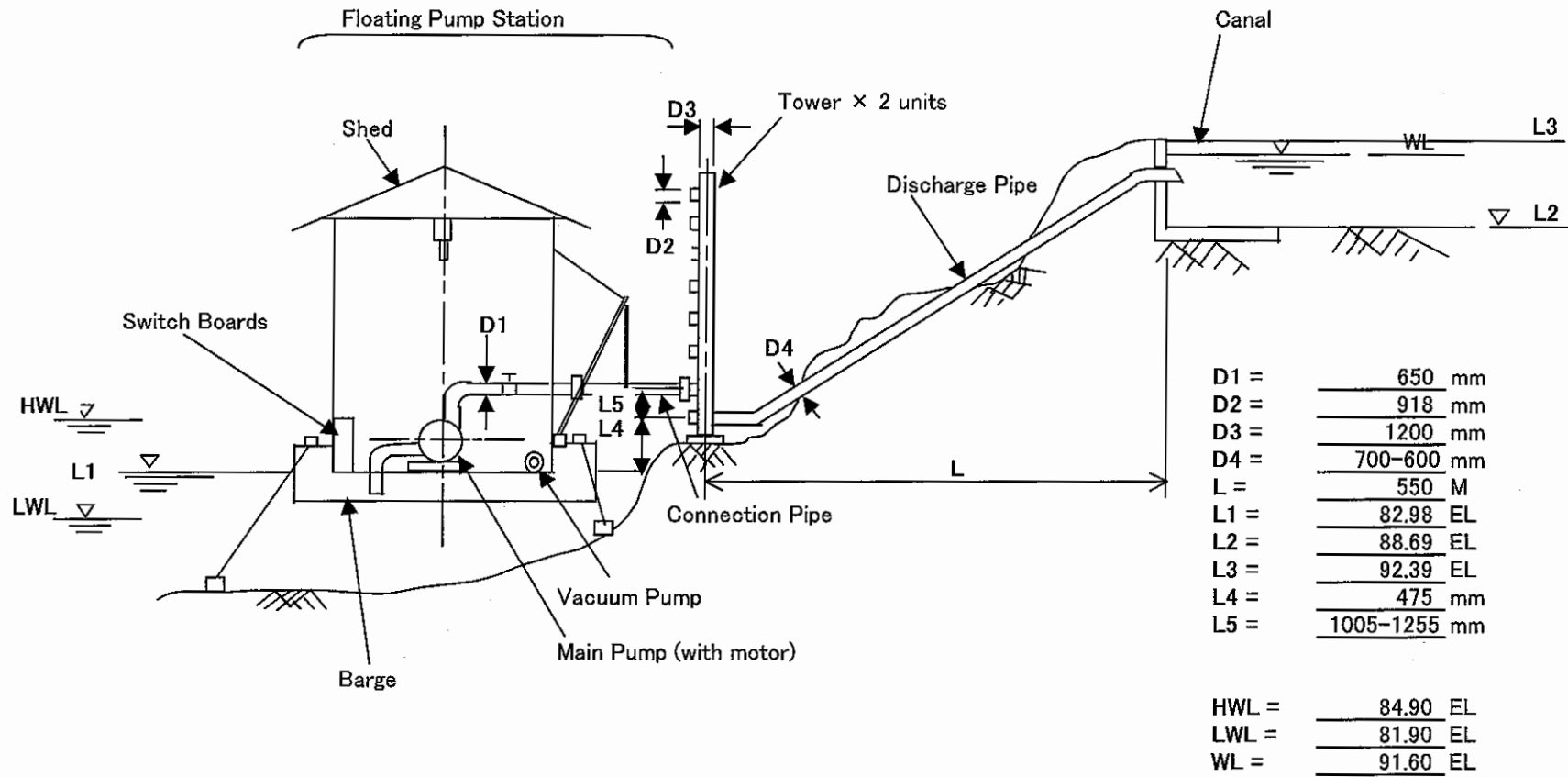


GENERAL LAYOUT FOR EXISTING FLOATING PUMP STATION
 FLOATING PUMP STATION DATA SHEET

No. 28

Survey Date: March 2006

Name of Pump Station: Sahel Al-Khatara
 Pump: units: 2 Type: End suction single volute
 discharge: 1.35 lit/sec total head: 23 m
 revolution: 500 min⁻¹
 Motor: 447.42 kW 6000 V 490 min⁻¹
50.5 amp. Type: winding
 Transformer: 11k/6k V/V 1000 kVA



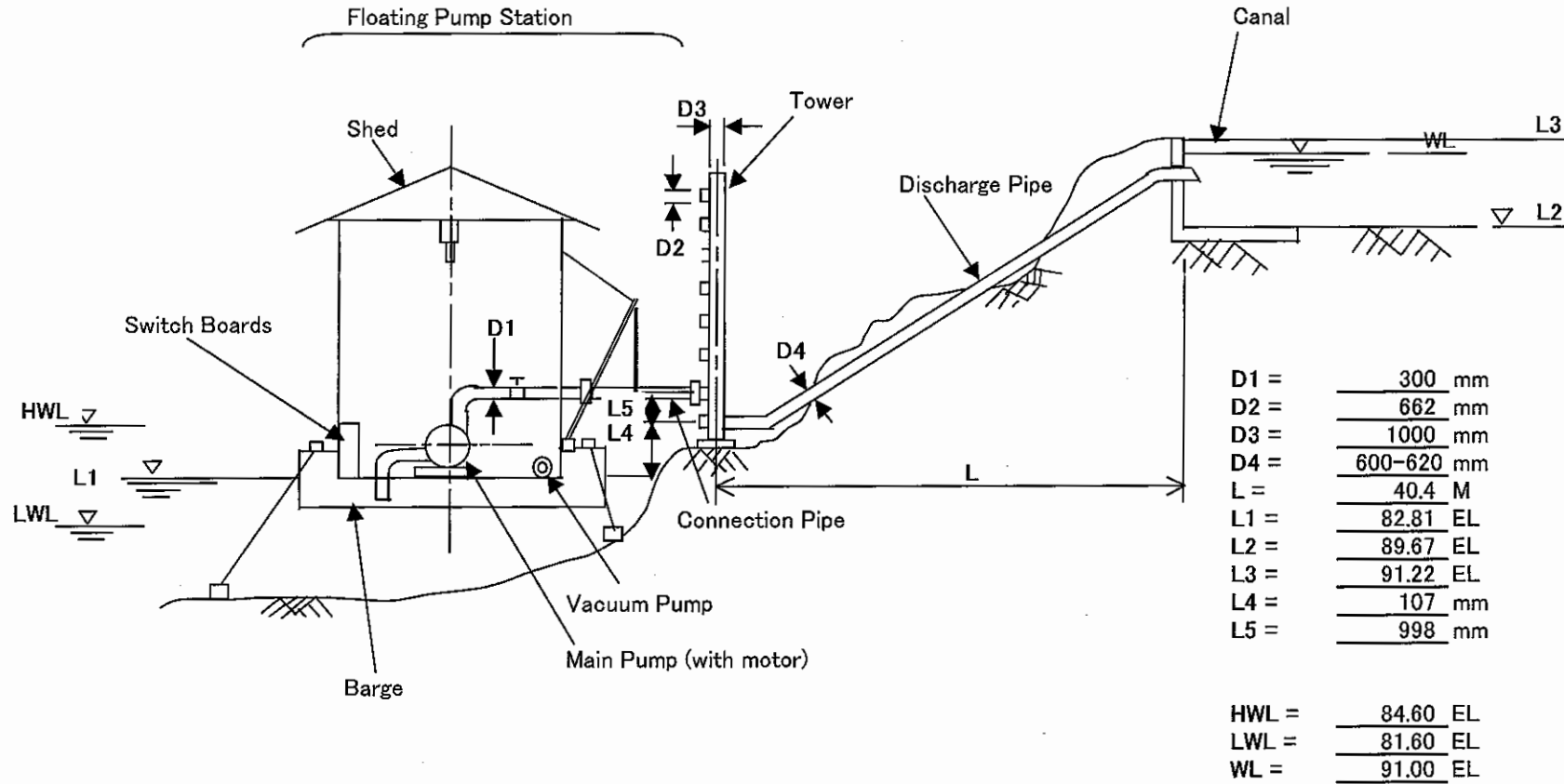
GENERAL LAYOUT FOR EXISTING FLOATING PUMP STATION
 FLOATING PUMP STATION DATA SHEET

A6-74

No. 29

Survey Date: March 2006

Name of Pump Station: Sahel El-Akab Behary
 Pump: units: 2 Type: End suction single volute
 discharge: 0.35 lit/sec total head: 13 m
 revolution: 1000 min⁻¹
 Motor: 100.67 kW 380 V 985 min⁻¹
110 amp. Type: squirrel cage
 Transformer: 11k/380 V/V 300 kVA

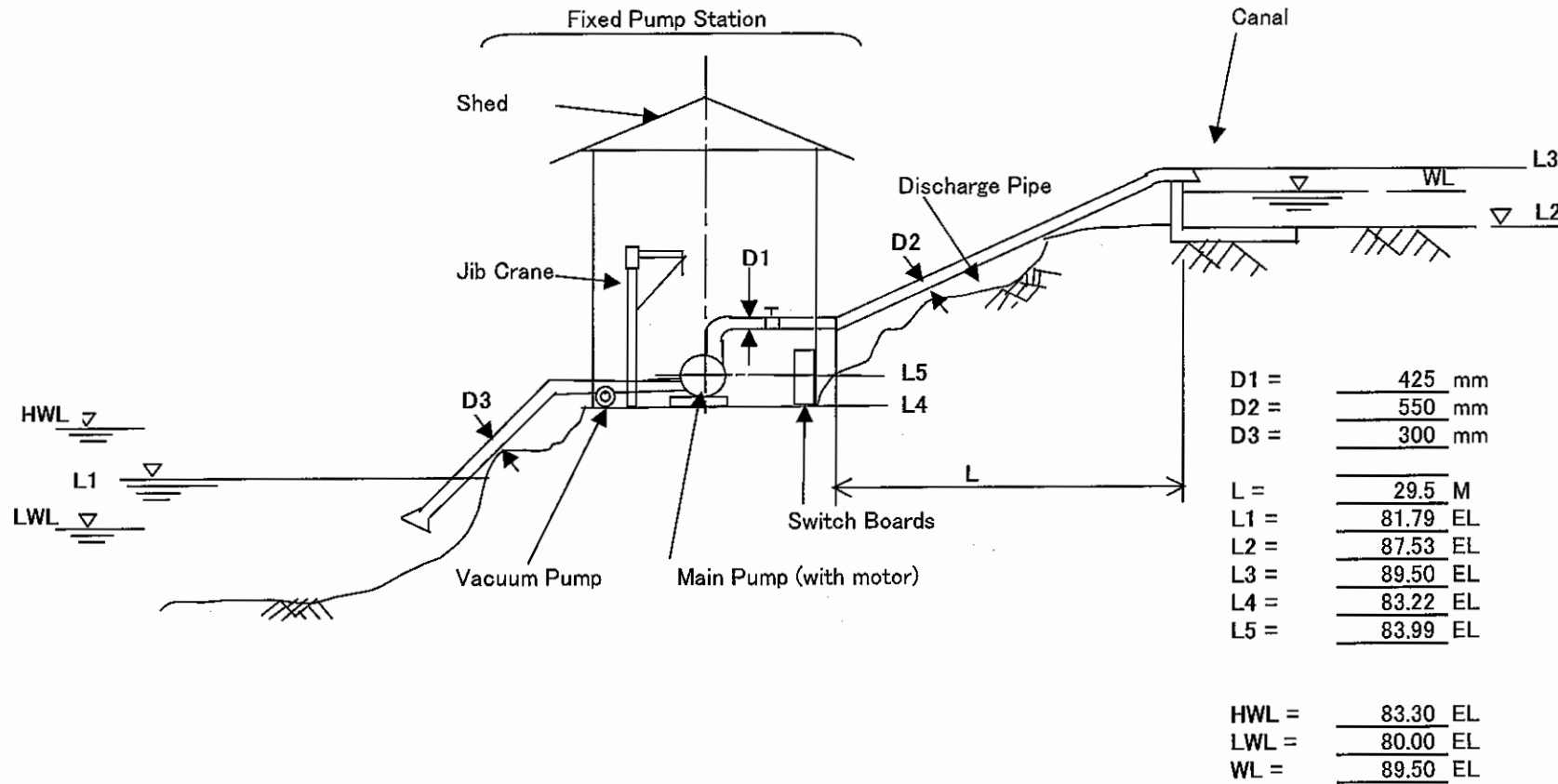


GENERAL LAYOUT FOR EXISTING FLOATING PUMP STATION
 FLOATING PUMP STATION DATA SHEET

No. 30

Survey Date: March 2006

Name of Pump Station: Gezeret Meneha
 Pump: units: 2 Type: End suction single volute
 discharge: 0.23 lit/sec total head: 16 m
 revolution: 960/1500 min⁻¹
 Motor: 44.74 kW 380 V 975 min⁻¹
84.7 amp. Type: squirrel cage
 Transformer: 11k/380 V/V 300 kVA

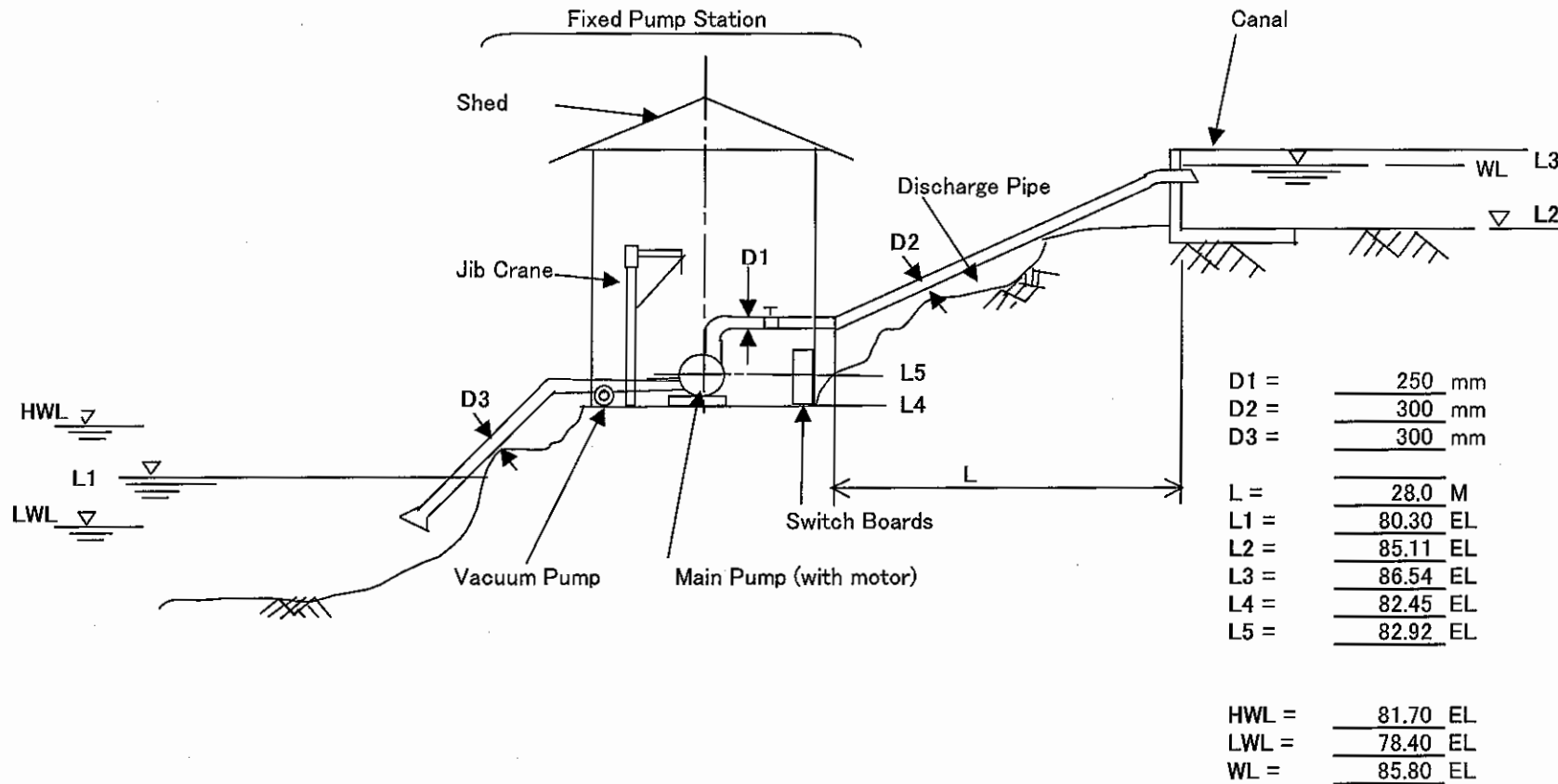


GENERAL LAYOUT FOR EXISTING FIXED PUMP STATION
 FLOATING PUMP STATION DATA SHEET

No. 31

Survey Date: March 2006

Name of Pump Station: El-Sarag
 Pump: units: 2 Type: End suction single volute
 discharge: 0.15 lit/sec total head: 11 m
 revolution: 960 min⁻¹
 Motor: 40 kW 380 V 1470 min⁻¹
73 amp. Type: squirrel cage
 Transformer: 11k/400 V/V 200 kVA



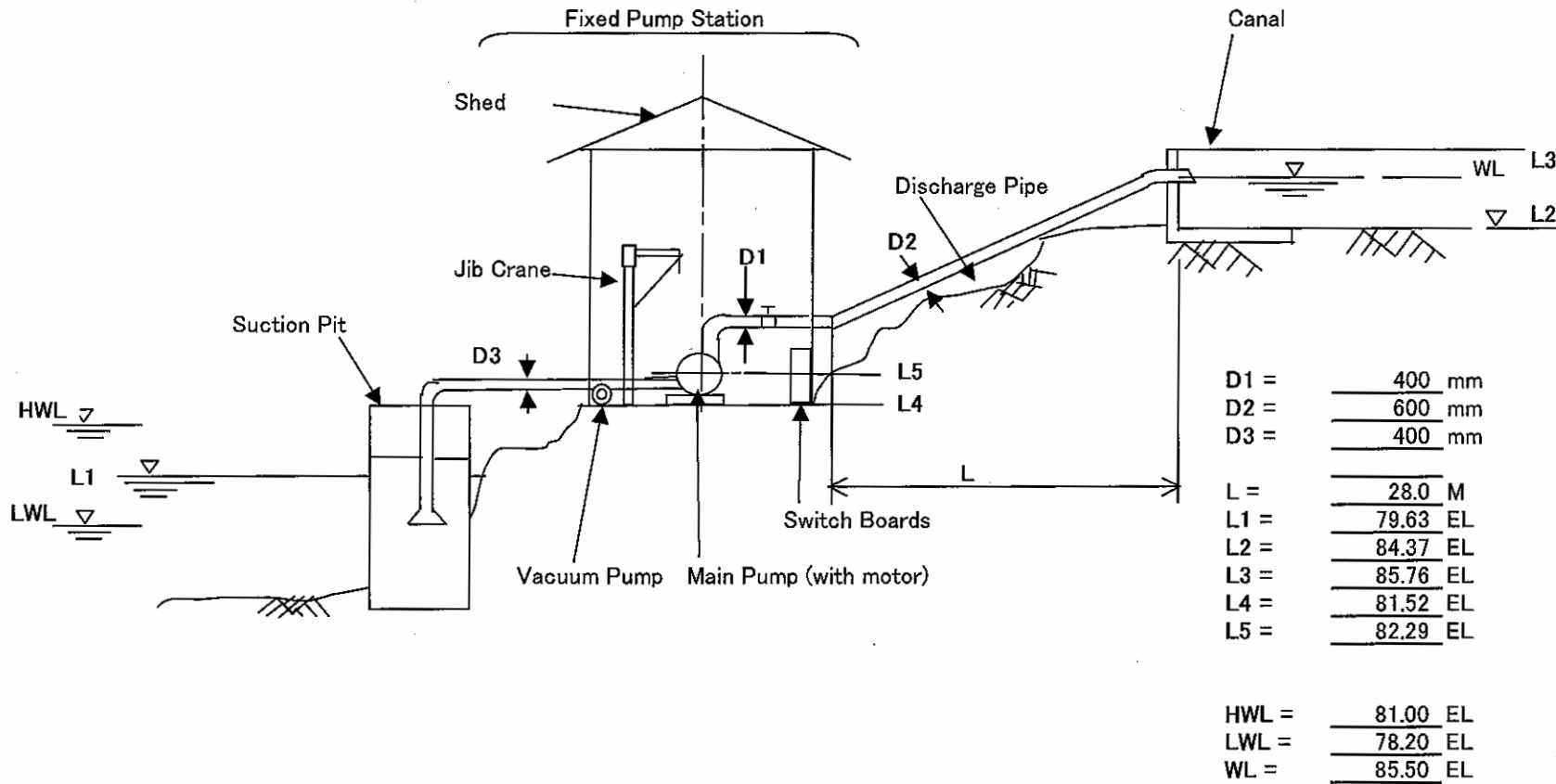
GENERAL LAYOUT FOR EXISTING FIXED PUMP STATION
 FLOATING PUMP STATION DATA SHEET

A6-77

No. 32

Survey Date: March 2006

Name of Pump Station: Gezeret El-Fawaza El-Keblia
 Pump: units: 2 Type: End suction single volute
 discharge: 0.23 lit/sec total head: 12 m
 revolution: 960 min⁻¹
 Motor: 44.74 kW 380 V 975 min⁻¹
84.7 amp. Type: squirrel cage
 Transformer: 11k/400 V/V 200 kVA



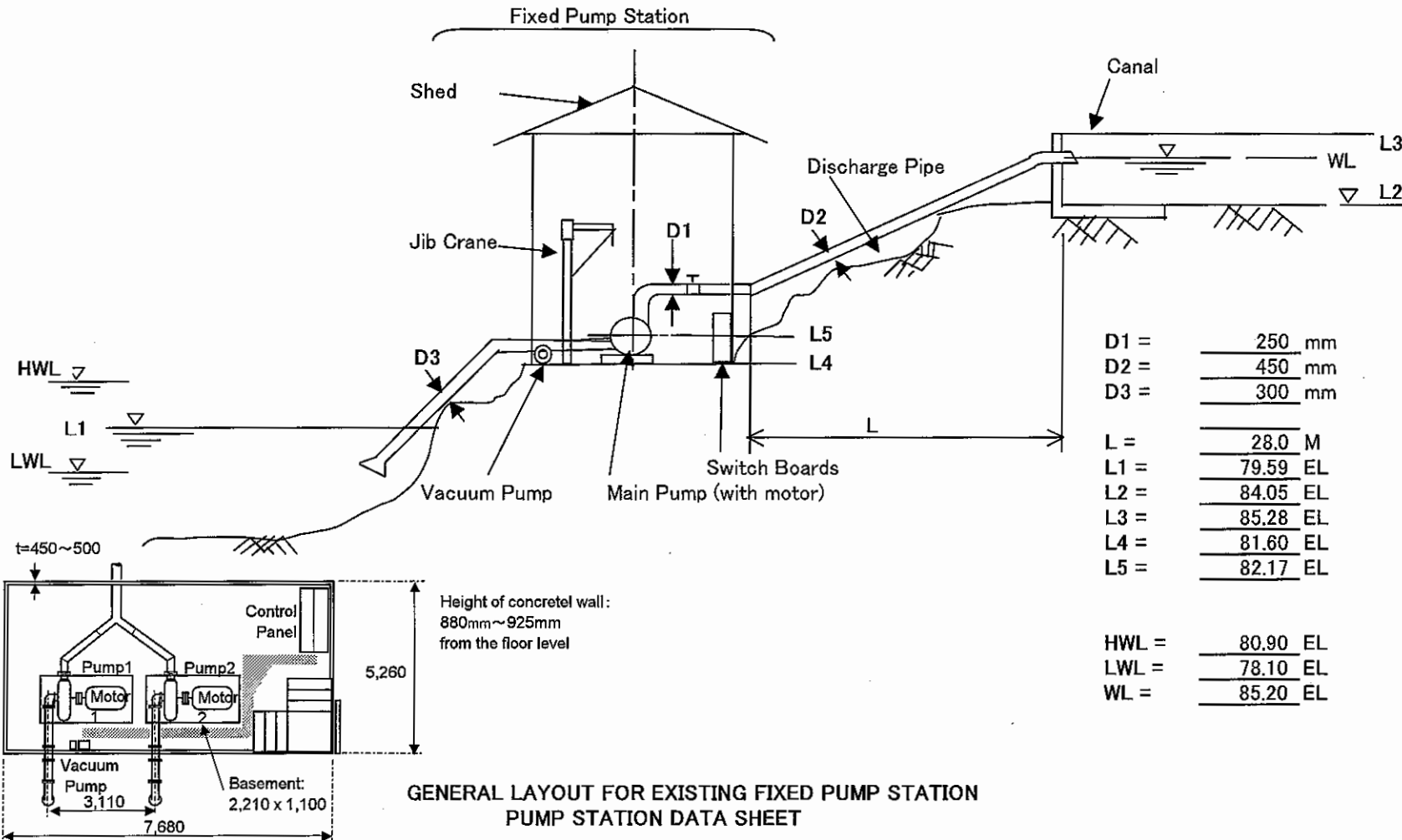
GENERAL LAYOUT FOR EXISTING FIXED PUMP STATION
 FLOATING PUMP STATION DATA SHEET

A6-78

No. 33

Survey Date: March 2006

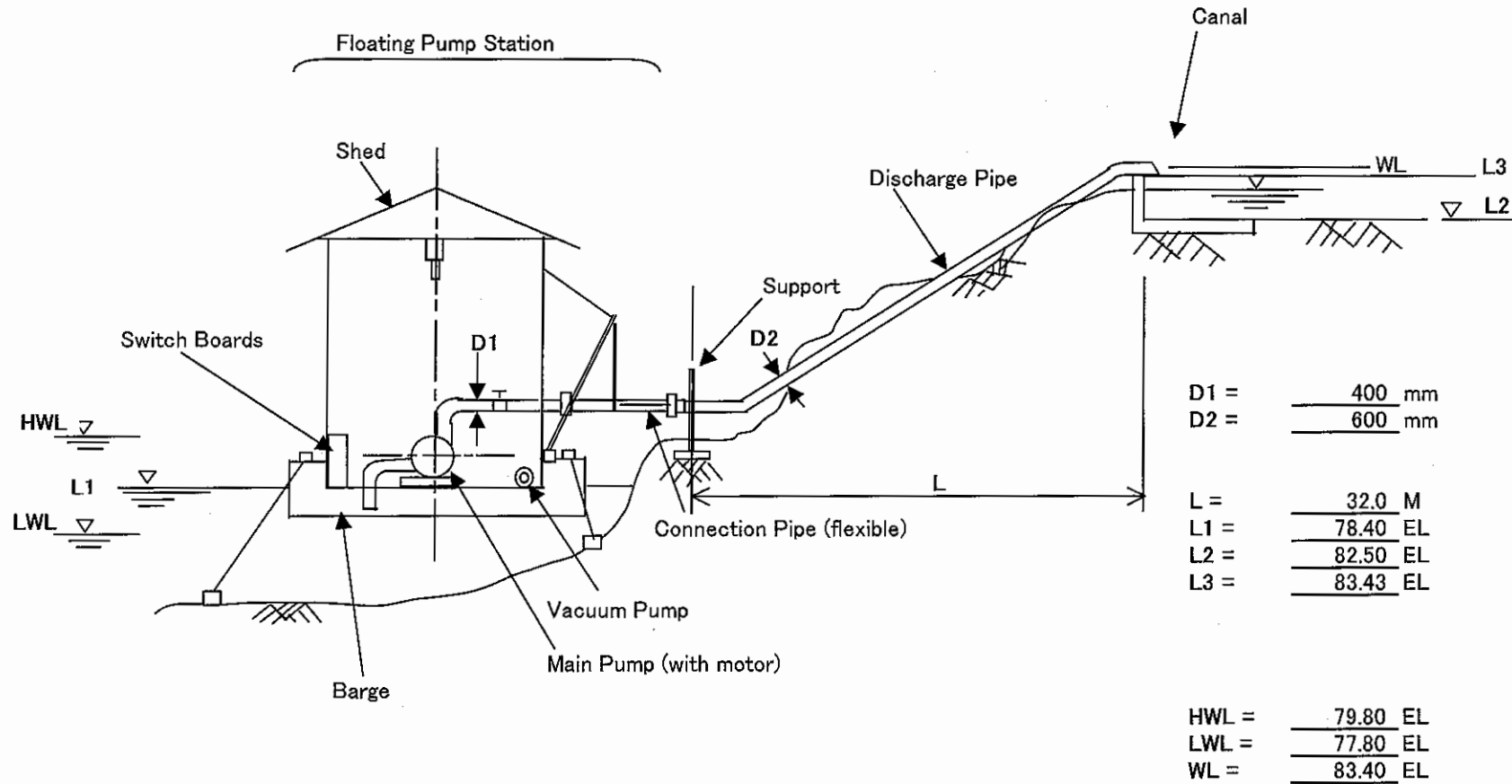
Name of Pump Station: Middle Fawaza
 Pump: units: 2 Type: End suction single volute
 discharge: 0.15 lit/sec total head: 10.6 m
 revolution: 1500 min⁻¹
 Motor: 40 kW 380 V 1470 min⁻¹
73 amp. Type: squirrel cage
 Transformer: 11k/400 V/V 200 kVA



No. 34

Survey Date: March 2006

Name of Pump Station: Gezeret Abo Arafa
 Pump: units: 2 Type: End suction single volute
 discharge: 0.25 lit/sec total head: 13 m
 revolution: 800 min⁻¹
 Motor: 40 kW 380 V 735 min⁻¹
75-80 amp. Type: squirrel cage
 Transformer: 11k/400 V/V 100 kVA

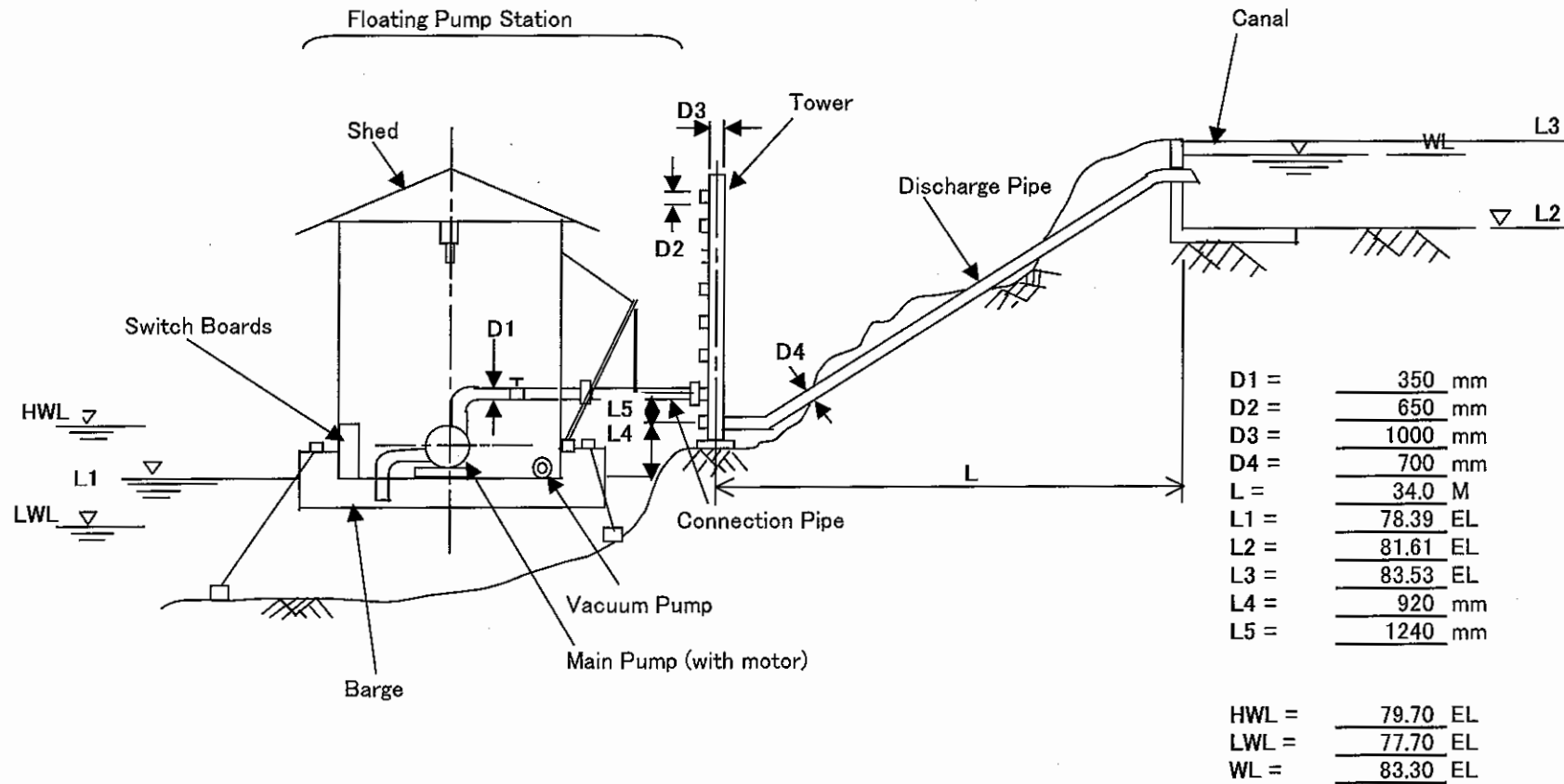


GENERAL LAYOUT FOR EXISTING FLOATING PUMP STATION
 FLOATING PUMP STATION DATA SHEET

No. 35

Survey Date: March 2006

Name of Pump Station: El-Hegs El-Mostageda
 Pump: units: 2 Type: End suction single volute
 discharge: 0.35 lit/sec total head: 13 m
 revolution: 1000 min⁻¹
 Motor: 100.67 kW 380 V 985 min⁻¹
185 amp. Type: squirrel cage
 Transformer: 11k/400 V/V 500 kVA



GENERAL LAYOUT FOR EXISTING FLOATING PUMP STATION
 FLOATING PUMP STATION DATA SHEET

G. Monthly Water Level and Discharge of Nile River

Water Level (m)

year	2001	2002	2003	2004	2005	Average
Jan	83.01	82.64	82.40	82.43	82.30	82.55
Feb	83.36	83.27	83.42	83.16	83.21	83.28
Mar	83.84	84.03	83.42	83.60	83.78	83.73
Apr	84.11	84.28	83.68	84.54	84.06	84.14
May	84.75	85.31	84.80	84.79	84.63	84.86
Jun	85.74	85.69	85.34	85.20	85.20	85.43
Jul	85.60	85.57	85.11	85.11	85.14	85.31
Aug	85.46	85.28	85.00	85.22	85.04	85.20
Sep	85.61	83.97	83.75	83.68	83.69	84.14
Oct	84.56	83.15	83.40	83.33	83.49	83.59
Nov	83.29	83.24	83.23	83.17	83.18	83.22
Dec	82.69	82.29	82.29	82.30	82.42	82.40
Average	84.33	84.06	83.82	83.88	83.85	-

Discharge (MCM/d)

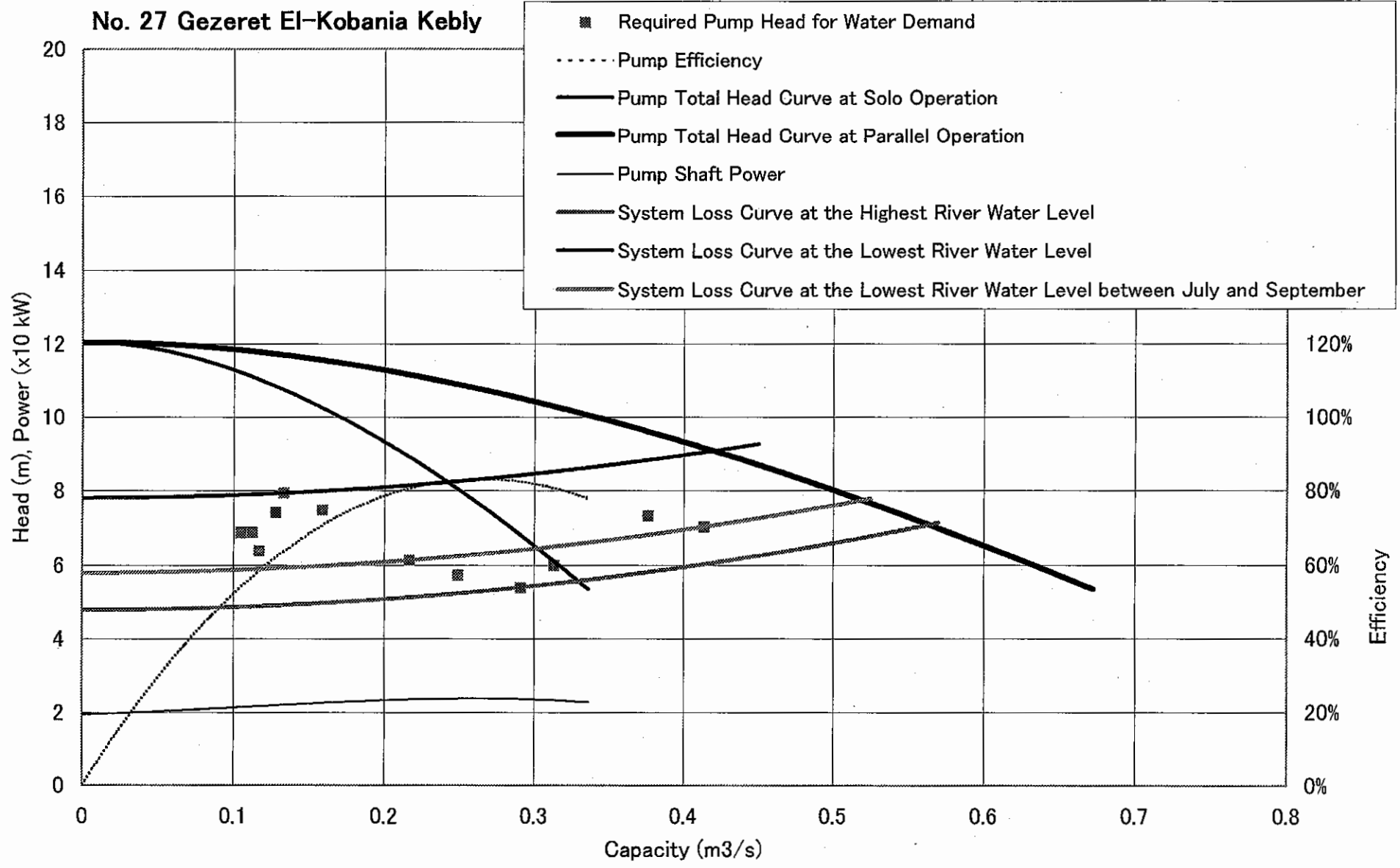
year	2001	2002	2003	2004	2005	Average
Jan	110	94	84	85	79	90
Feb	128	119	131	123	122	125
Mar	152	163	131	140	149	147
Apr	167	177	144	192	164	169
May	204	240	209	205	197	211
Jun	268	264	232	231	231	245
Jul	258	256	225	225	227	238
Aug	248	236	218	231	220	231
Sep	258	159	147	144	145	171
Oct	192	118	130	127	135	140
Nov	124	122	122	119	119	121
Dec	96	79	79	80	85	84
Average	183.85	168.90	154.26	158.45	156.11	-

※ Observation Point : Just behind Aswan High Dam

※ Monthly Average Data

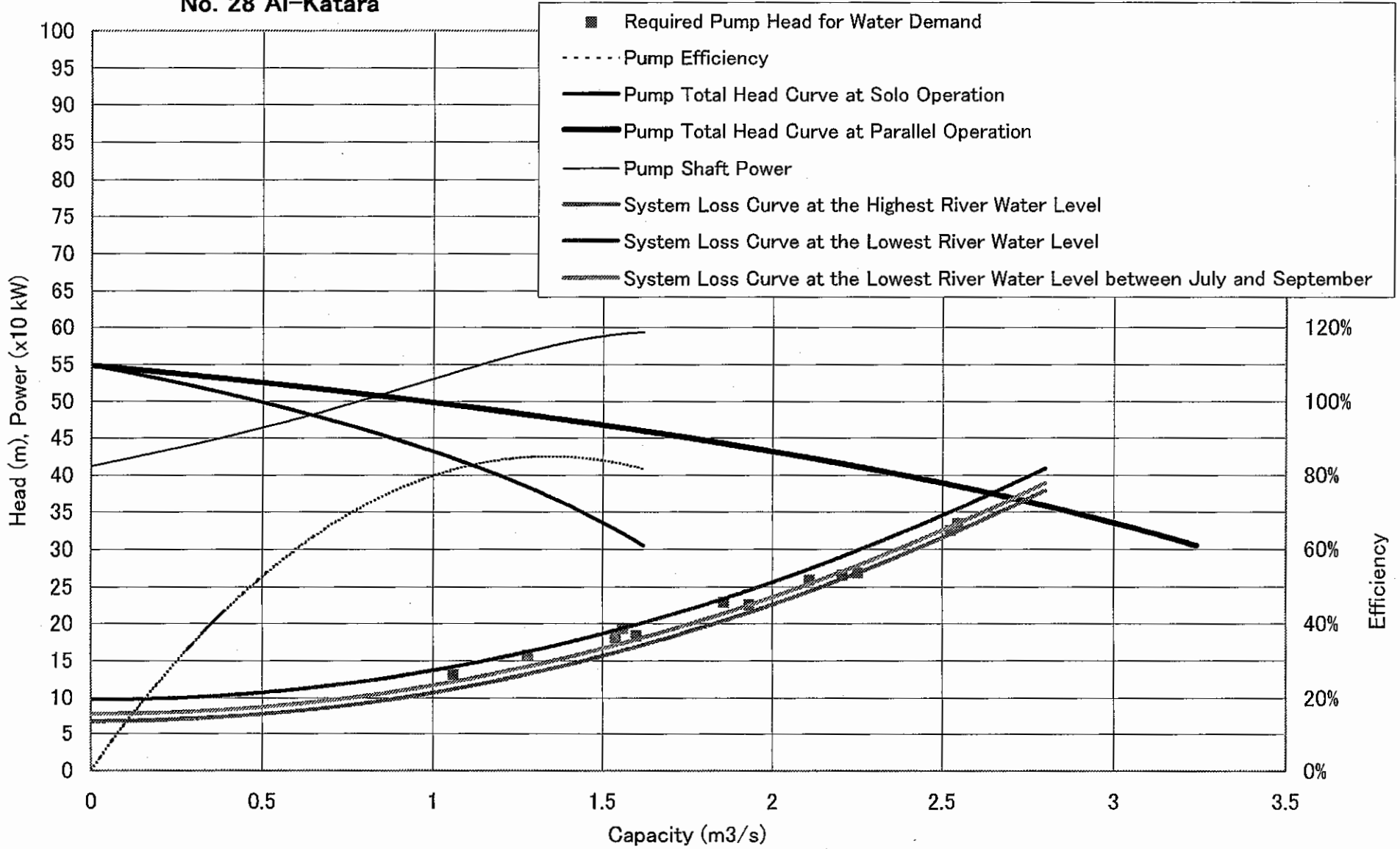
PUMP SYSTEM CURVE

No. 27 Gezeret El-Kobania Kebly



PUMP SYSTEM CURVE

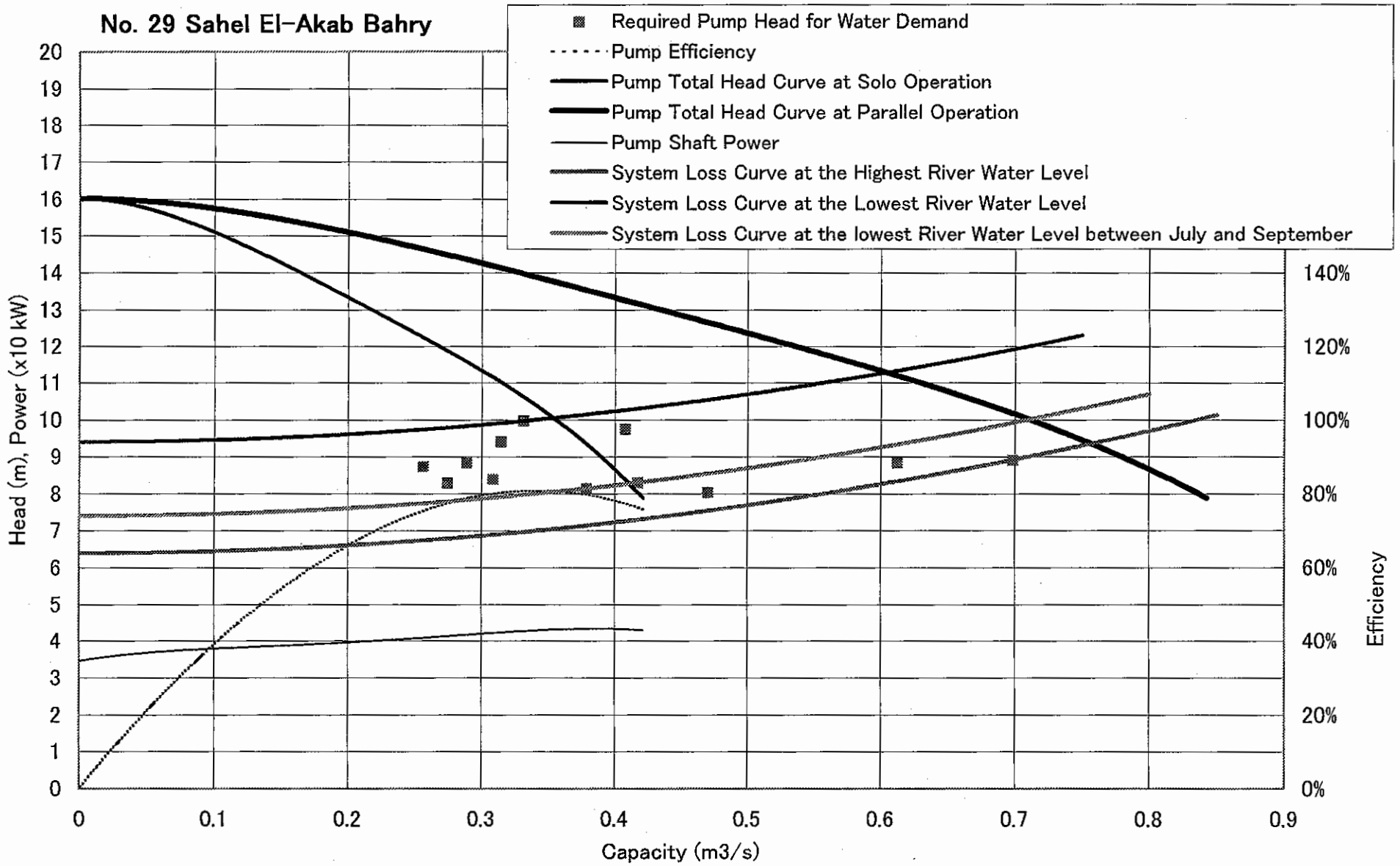
No. 28 Al-Katara



A6-84

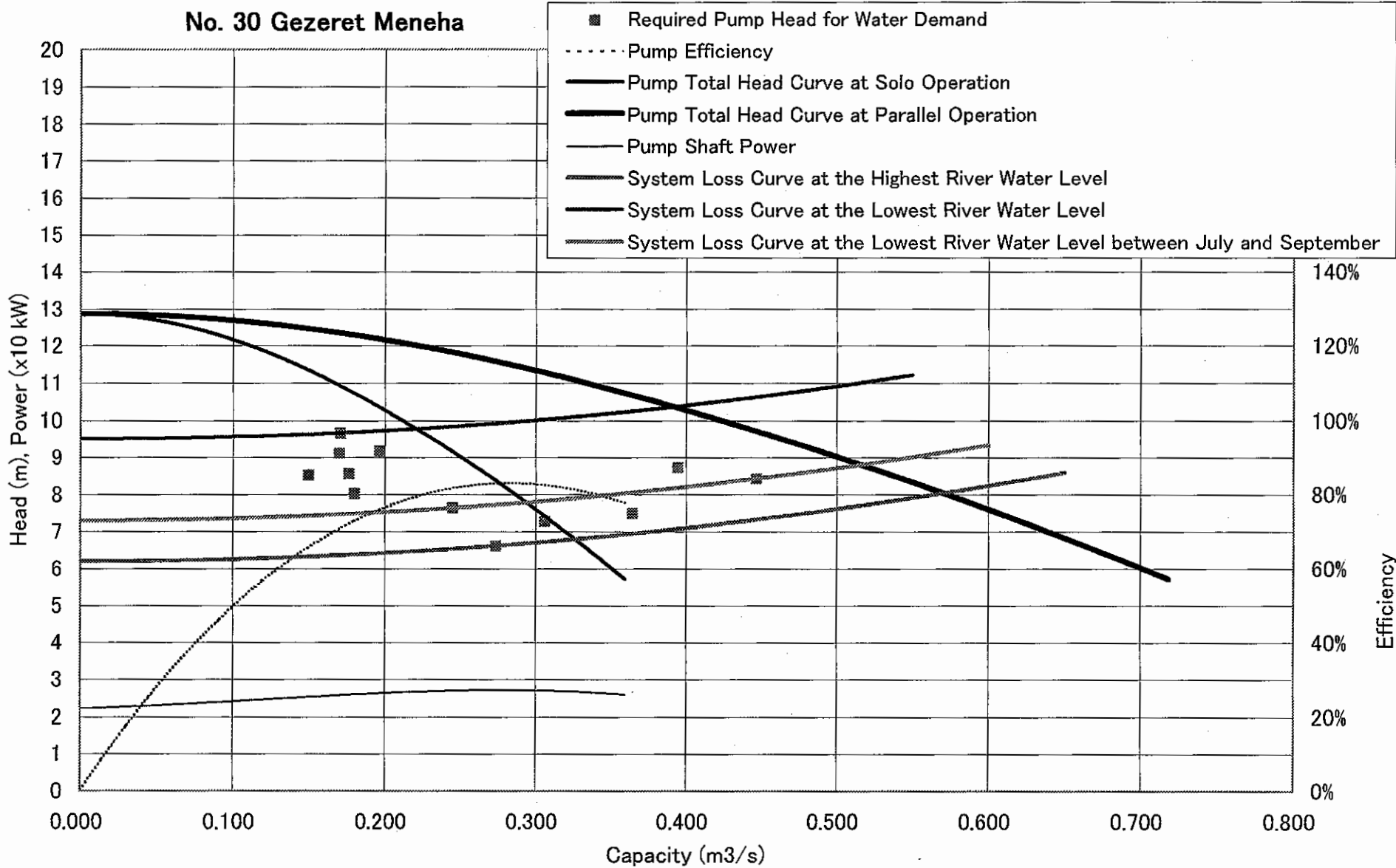
PUMP SYSTEM CURVE

No. 29 Sahel El-Akab Bahry



PUMP SYSTEM CURVE

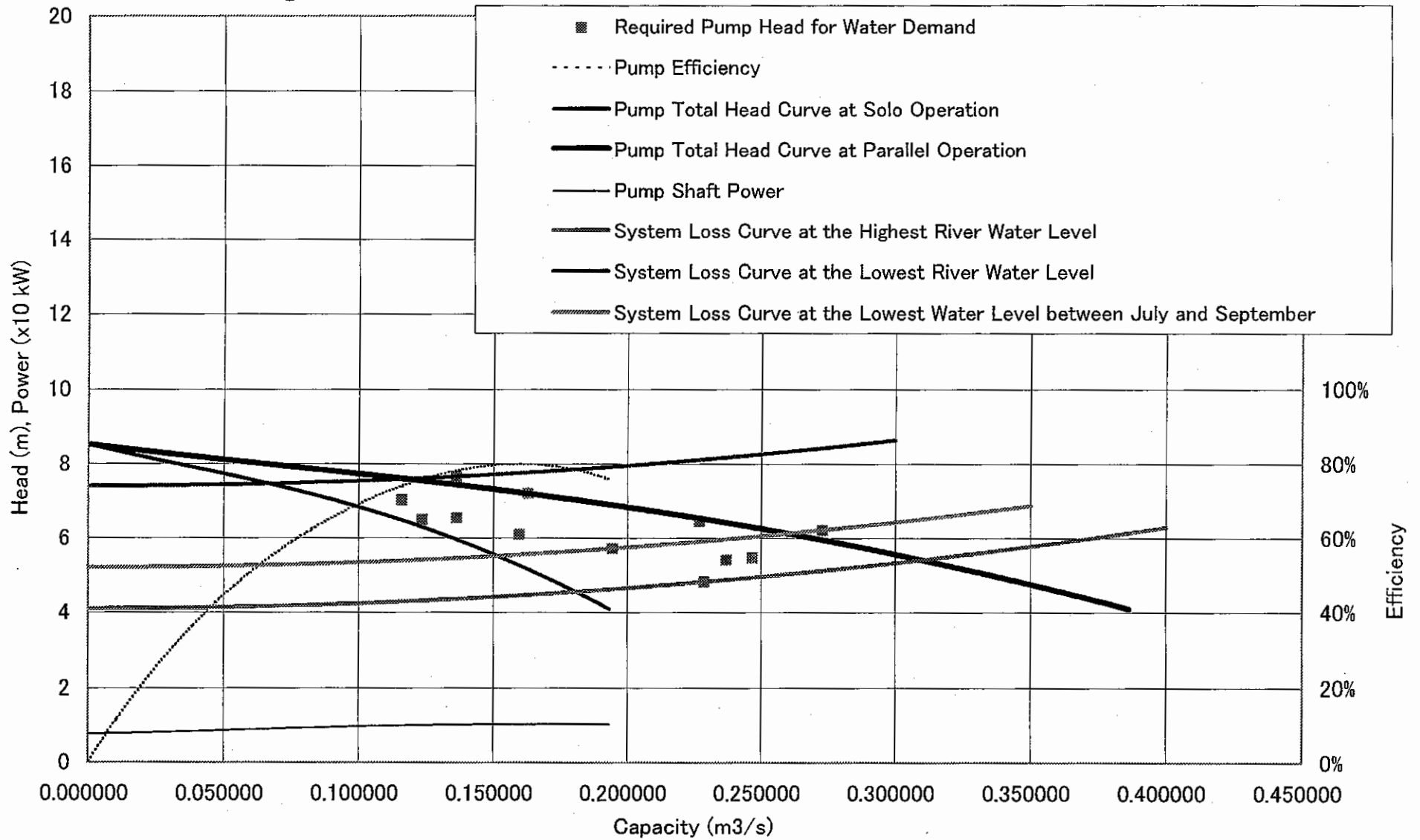
No. 30 Gezeret Meneha



A6-86

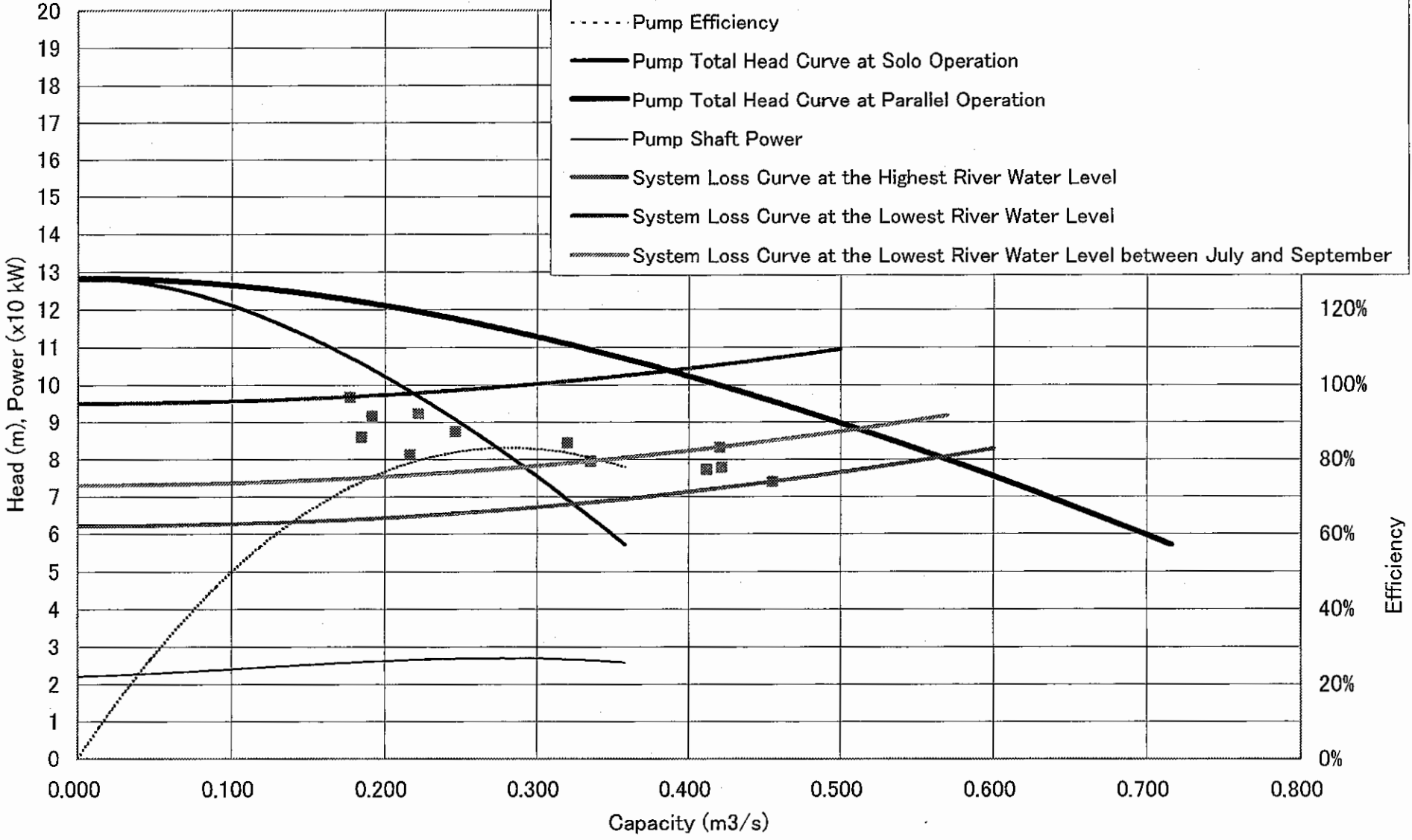
PUMP SYSTEM CURVE

No. 31 El-Sarag



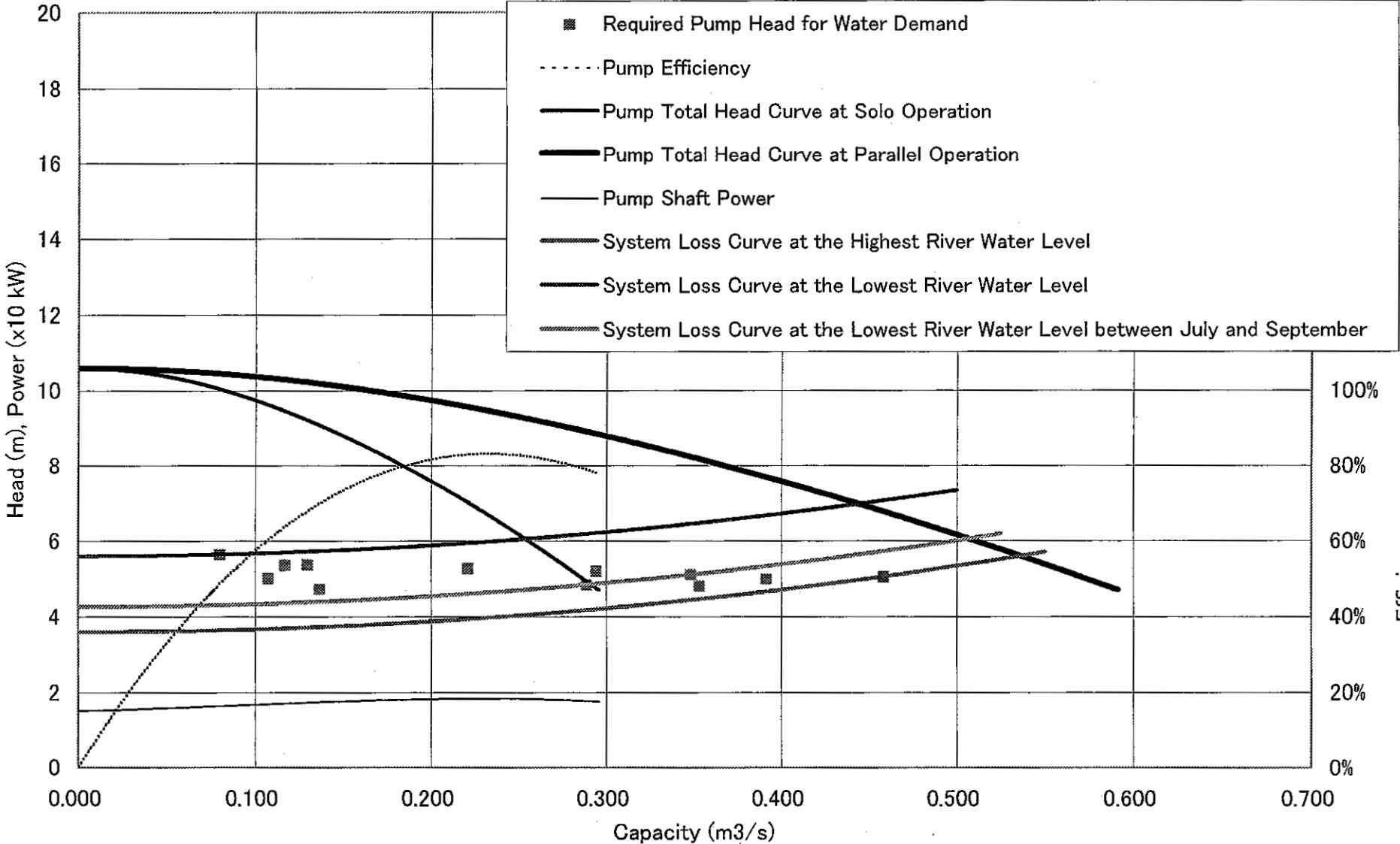
PUMP SYSTEM CURVE

No. 32 Gezeret El-Fawaza El-Keblia



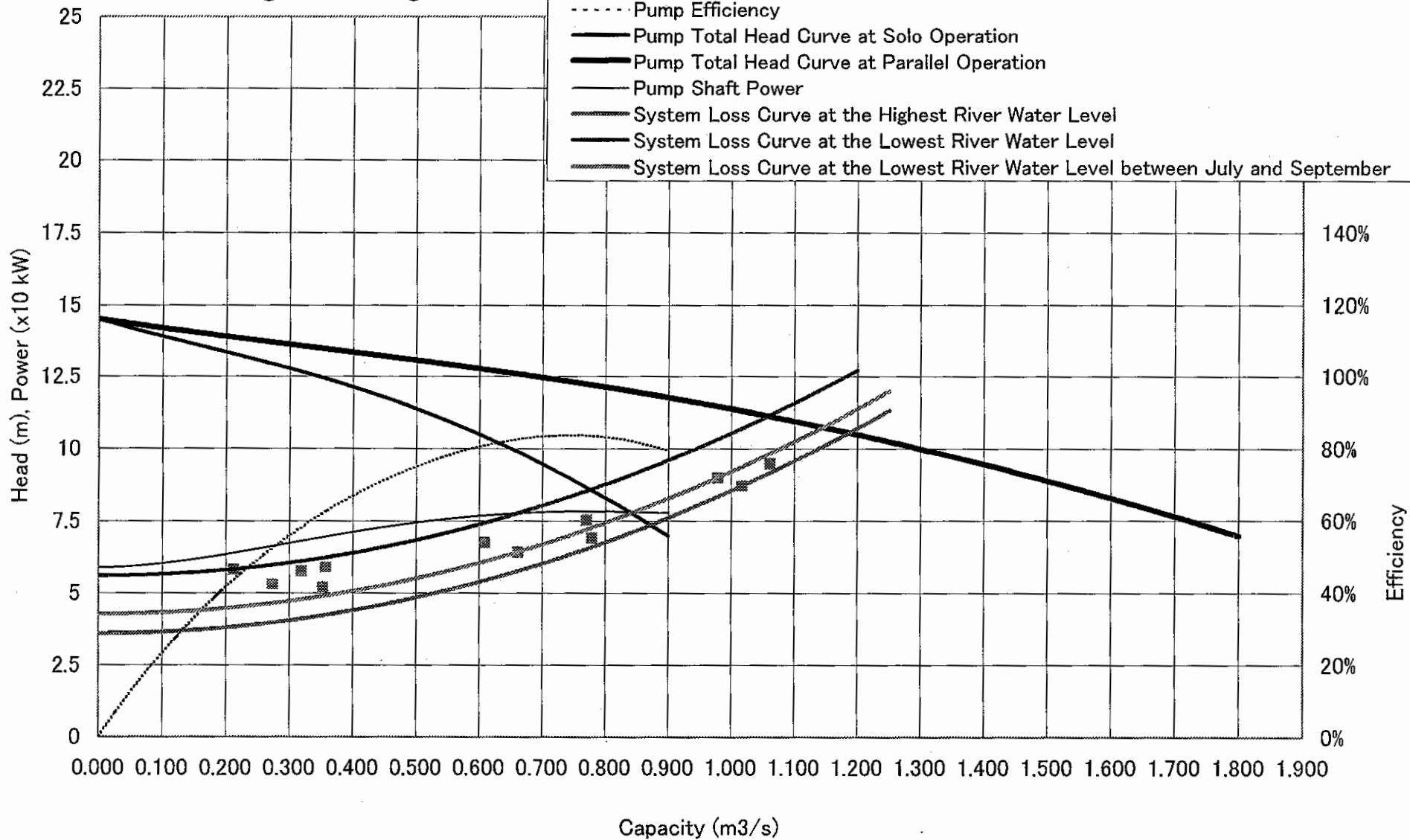
PUMP SYSTEM CURVE

No. 34 Gezeret Abo Arafa



PUMP SYSTEM CURVE

No. 35 El-Hegs El-Mostagada



A6-90

Maximum Total Head of Each Pump Station

Total Head at Low Water Level

	No.27	No.29	No.30	No.31	No.32	No.33	No.34	No.35
Actual Head (m) At the low water level	8.800	9.400	9.500	7.400	9.500	7.100	5.600	5.600
Head Loss (m) Calculated by friction of piping system	1.800	2.530	1.414	1.233	1.446	1.474	1.701	5.983
Total Head (m) Actual head + Head loss	10.600	11.930	10.914	8.633	10.946	8.574	7.301	11.583

Basic Conditions

Nominal Diameter of Discharge Pipe	φ 600mm	φ 600mm	φ 600mm	φ 450mm	φ 600mm	φ 450mm	φ 600mm	φ 600mm
Discharge Rate	0.25m ³ /s 2units	0.35m ³ /s 2units	0.25m ³ /s 2units	0.15m ³ /s 2units	0.25m ³ /s 2units	0.15m ³ /s 2units	0.25m ³ /s 2units	0.55m ³ /s 2units

1. Friction Loss of Pipes

(1) Pipe Line Inside Pump Station

Darcy-Weisbach Formula $hf = \lambda \cdot L/D \cdot V^2/2g$

hf = Friction loss of pipes (m)	0.126	0.126	0.126	0.099	0.126	0.099	0.126	0.311
λ = Coefficient of friction loss General steel pipe $\lambda = \{0.02 + 1/(2000 \cdot D)\} \cdot 1.5$	0.032	0.032	0.032	0.033	0.032	0.033	0.032	0.032
L = Length of suction & discharge pipes (m)	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000
D = Nominal diameter of pipe (m)	0.350	0.400	0.350	0.300	0.350	0.300	0.350	0.400
V = Water velocity in pipe (m/s) $= Q/(D/2)^2/\pi$	2.598	2.785	2.598	2.122	2.598	2.122	2.598	4.377
Q =	0.250	0.350	0.250	0.150	0.250	0.150	0.250	0.550
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

(2) Pipe Line Outside Pump Station

Hazen-Williams Formula $hf = 10.666 \cdot Q^{1.85} / (C^{1.85} \cdot D^{4.87}) \cdot L$

hf = Friction loss of pipes (m)	0.287	0.535	0.210	0.314	0.242	0.314	0.227	1.039
Q = Water volume (m ³ /s)	0.500	0.700	0.500	0.300	0.500	0.300	0.500	1.100
D = Nominal diameter of pipe (m)	0.600	0.600	0.600	0.450	0.600	0.450	0.600	0.600
L = Length of pipe (m)	40.4	40.4	29.5	28.0	34.0	28.0	32.0	34.0
C = Coefficient of water velocity	100	100	100	100	100	100	100	100

2. Head Loss in Suction $hi = fi \cdot Vin^2/2g$

hi = Head loss in suction (m)	0.026	0.031	0.026	0.018	0.026	0.018	0.026	0.077
Vin = Water velocity in suction (m/s)	1.133	1.238	1.133	0.943	1.133	0.943	1.133	1.945
fi = Coefficient of suction loss for steel made bell mouth	0.400	0.400	0.400	0.400	0.400	0.400	0.400	0.400
D = Nominal diameter of bell mouth (m)	0.530	0.600	0.530	0.450	0.530	0.450	0.530	0.600
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

3. Head Loss in Discharge $h0 = f0 \cdot Vout^2/2g$

h0 = Head loss in discharge (m)	0.159	0.313	0.159	0.181	0.159	0.181	0.159	0.772
Vout = Water velocity in discharge (m/s)	1.768	2.476	1.768	1.886	1.768	1.886	1.768	3.890
f0 = Coefficient of discharge loss for steel made pipe	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

4. Head Loss in Change of Cross Sectional Areas (Loss in Water Tower)

(1) Rapid expansion (Borta Formula) $h_{se} = V_1^2/2g \cdot (1 - A_1/A_2)^2 = f_{se} \cdot V_1^2/2g$

h_{se} = Head loss in rapid expansion (m)	0.186	0.233	0.196	0.067	0.186	0.067	0.186	0.532
V_1 = Water velocity before expansion (m/s)	2.546	2.946	2.546	1.528	2.546	1.528	2.546	4.630
A_1 = Sectional area of pipe before rapid expansion (m ²)	0.196	0.238	0.196	0.196	0.196	0.196	0.196	0.238
$= (D_{pipe}/2)^2/\pi$ Connection pipe dia. =	0.500	0.550	0.500	0.500	0.500	0.500	0.500	0.550
A_2 = Sectional area of pipe after rapid expansion (m ²)	0.785	0.866	0.785	0.785	0.785	0.785	0.785	0.785
$= (D_{tower}/2)^2/\pi$ Water tower dia. =	1.000	1.050	1.000	1.000	1.000	1.000	1.000	1.000
f_{se} = Loss coefficient of rapid expansion $(1 - A_1/A_2)^2$	0.563	0.527	0.563	0.563	0.563	0.563	0.563	0.487
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

(2) Rapid contraction (Weisbach coe $h_{sc} = V_2^2/2g \cdot (1 - A_2/A_1)^2 = f_{sc} \cdot V_2^2/2g$

h_{sc} = Head loss in rapid contraction (m)	0.029	0.063	0.029	0.047	0.029	0.047	0.029	0.139
V_1 = Water velocity before contraction (m/s)	0.637	0.808	0.637	0.382	0.637	0.382	0.637	1.401
A_1 = Sectional area of pipe before rapid contraction (m ²)	0.785	0.866	0.785	0.785	0.785	0.785	0.785	0.785
$= (D_{tower}/2)^2/\pi$ Water tower dia. =	1.000	1.050	1.000	1.000	1.000	1.000	1.000	1.000
A_2 = Sectional area of pipe after rapid contraction (m ²)	0.283	0.283	0.283	0.159	0.283	0.159	0.283	0.283
$= (D_{pipe}/2)^2/\pi$ Discharge pipe dia. =	0.600	0.600	0.600	0.450	0.600	0.450	0.600	0.600
f_{sc} = Loss coefficient of rapid contraction $(1 - A_1/A_2)^2$	0.180	0.200	0.180	0.260	0.180	0.260	0.180	0.180
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807
V_2 = Water velocity after contraction (m/s)	1.768	2.476	1.768	1.886	1.768	1.886	1.768	3.890

5. Head Loss in Bend and Refraction

(1) Refraction in water tower $h_{be} = f_{be} \cdot V^2/2g$

h_{be} = Head loss in refraction (m)	0.023	0.037	0.023	0.008	0.023	0.008	0.023	0.110
V = Water velocity (m/s) $Q/A_1 =$	0.637	0.808	0.637	0.382	0.637	0.382	0.637	1.401
f_{be} = Loss coefficient regarding Reynolds figure (Re) and angle (α)	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100
Angle $\alpha =$	90	90	90	90	90	90	90	90
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807
Total $h_{be} =$ $h_{be} \times 2$ times refraction in water tower	0.045	0.073	0.045	0.016	0.045	0.016	0.045	0.220

(2) Bend in discharge pipe $h_{be} = f_{be} \cdot V^2/2g$

h_{be} = Head loss in bend (m)	0.008	0.000	0.040	0.045	0.040	0.045	0.008	0.039
V = Water velocity (m/s)	1.768	2.476	1.768	1.886	1.768	1.886	1.768	3.890
f_{be} = Loss coefficient regarding Reynolds figure (Re) and angle (α)	0.050	0.000	0.250	0.250	0.250	0.250	0.050	0.050
Angle $\alpha =$	20	—	45	45	45	45	20	20
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

(3) Bend in suction pipe $h_b = f_b \cdot V^2/2g$

h_b = Head loss in bend (m)	0.059	0.067	0.059	0.039	0.059	0.039	0.059	0.166
V = Water velocity (m/s)	2.598	2.785	2.598	2.122	2.598	2.122	2.598	4.377
f_b = Loss coefficient regarding Reynolds figure (Re) and angle (α)	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Angle $\alpha =$	90	90	90	90	90	90	90	90
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

6. Head Loss in Joint

(1) T-shape joint $h_{13} = f_{13} \cdot V^3 / 2g$

h_{13} = Head loss in joint (m)	0.104	0.203	0.104	0.118	0.104	0.118	0.104	0.502
f_{13} = Loss coefficient of Joint in T-shape	0.650	0.650	0.650	0.650	0.650	0.650	0.650	0.650
V = Average water velocity after joint (m/s)	1.768	2.476	1.768	1.886	1.768	1.886	1.768	3.890
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

7. Head Loss in Valves

(1) Butterfly valve $h_v = f_v \cdot V^2 / 2g$

h_v = Head loss in valve (m)	0.069	0.079	0.069	0.046	0.069	0.046	0.069	0.195
f_v = Loss coefficient of valve, opened at 100%	0.200	0.200	0.200	0.200	0.200	0.200	0.200	0.200
V = Water velocity (m/s)	2.598	2.785	2.598	2.122	2.598	2.122	2.598	4.377
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

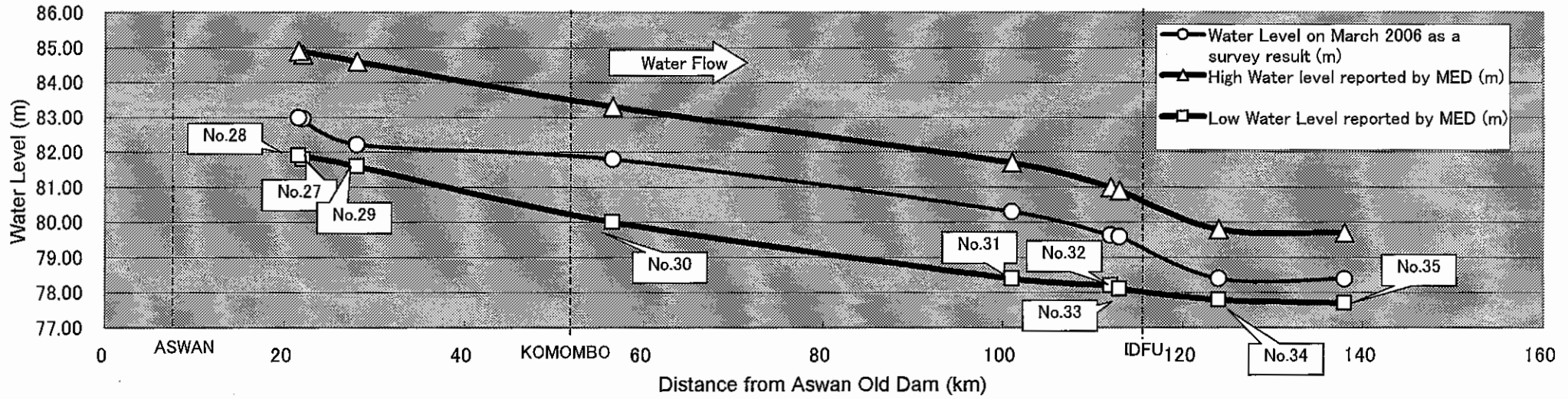
(2) Check valve

h_v = Head loss in valve (m)	0.361	0.415	0.361	0.241	0.361	0.241	0.361	1.026
f_v = Loss coefficient of valve	1.050	1.050	1.050	1.050	1.050	1.050	1.050	1.050
V = Water velocity (m/s)	2.598	2.785	2.598	2.122	2.598	2.122	2.598	4.377
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

(3) Flap valve/ Foot valve for fixed pump station

h_v = Head loss in valve (m)	0.341	0.392	0.000	0.000	0.000	0.241	0.361	0.967
f_v = Loss coefficient of valve	0.990	0.990	0.000	0.000	0.000	1.050	0.875	0.990
V = Water velocity (m/s)	2.598	2.785	2.598	2.122	2.598	2.122	2.598	4.377
g = Gravitational acceleration (m/s ²)	9.807	9.807	9.807	9.807	9.807	9.807	9.807	9.807

Change of Water Levels of the River Nile in Upper Egypt



Water Level and Design Total Head of Each Pump Station

Pump Station	Distance from Aswan Old Dam (km)	Water Level on March 2006 as a survey result	High Water level reported by MED (m)	Low Water Level reported by MED (m) A	Water Level on Maximum Water Demand (m) B	Discharge Water Level (m) C	Maximum Water Head (m) D=C-B	Head Loss (m) E	Total Head at Low Water Level (m) F=D+E	Total Head at Maximum Water Demand (m) G=C-B+E	Design Total Head (m)	Head of Existing Pump (m)
No.27 (Left, Island)	22.0	82.96	84.800	81.800	83.827	90.600	8.800	1.800	10.600	8.573	9	13
No.28 (Right Bank)	21.5	82.98	84.900	81.900	83.927	91.600	9.700	31.080	40.780	38.753	N.A.	23
No.29 (Right Bank)	28.0	82.21	84.600	81.600	84.611	91.000	9.400	2.530	11.930	8.919	10	13
No.30 (Right, Island))	56.5	81.79	83.300	80.000	82.486	89.500	9.500	1.414	10.914	8.428	9	11
No.31 (Left, Island)	101.0	80.30	81.700	78.400	80.814	85.800	7.400	1.233	8.633	6.219	7	16
No.32 (Right, Island)	112.0	79.63	81.000	78.200	81.749	87.700	9.500	1.446	10.946	7.397	9	12
No.33 (Right, Island)	113.0	79.59	80.900	78.100	80.400	85.200	7.100	1.474	8.574	6.274	7	10.6
No.34 (Right, Island)	124.0	78.40	79.800	77.800	80.039	83.400	5.600	1.701	7.301	5.062	6	13
No.35 (Right Bank)	138.0	78.39	79.700	77.700	79.783	83.300	5.600	5.983	11.583	9.500	11	13