GC3 TP95-14, B1

CTL CENTRAL TESTING LABORATORIES LTD.

P.O.Box. 18507 TEL: 791241 / 791242 / 791245 NAIROBI
Nairobi

Sample No. 1861
B1

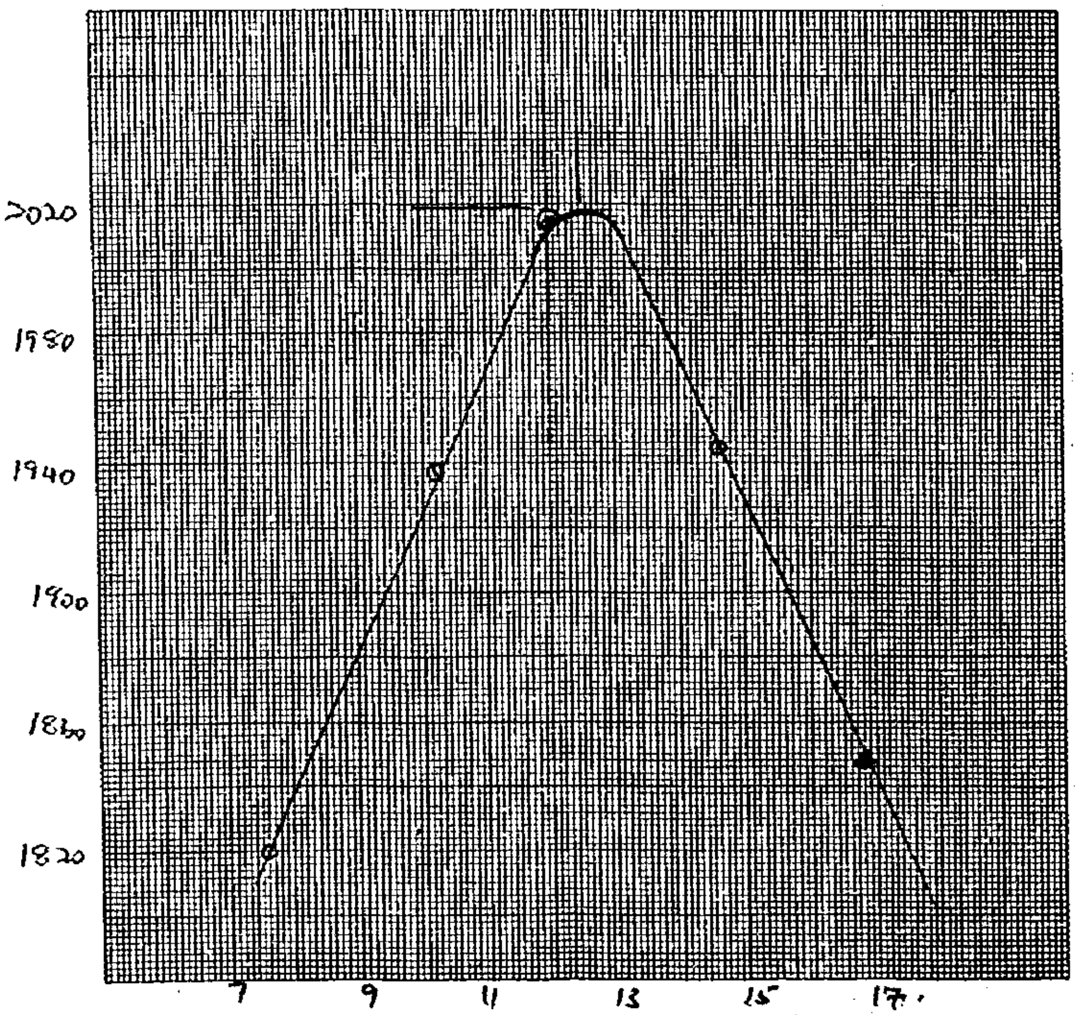
M.D.D./O.M.C. Determination for soils.

Job No. MOWLEM
Location MUTONGA
Date 18-10-95

T99

M.D.D. 2018 kg/m³
O.M.C. 12.5 %

TEST No.		1	2	3	4	5	6	7	8
mould & soil g.	a	3266	3428	3536	3510	3446			
mould g.	b	1500	1500	1500	1500	1500			
Soil g.	c	1766	1926	2036	2010	1946			
Dw = $\frac{c}{0.9439}$ kg/m³	d	1958	2135	2257	2228	2157			
Tin No.		438	Y12	Y21	48	22A			
Wt. of tin & wet soil g.	e	105.00	144.44	128.15	120.60	118.08			
Wt. of tin & dry soil g.	f	99.16	132.56	116.12	107.93	103.42			
Wt. of moisture g.	g	5.84	11.88	12.03	12.67	14.66			
Wt. of tin g	h	22.27	16.12	15.84	21.13	16.13			
Wt. of dry soil g	j	76.89	116.44	100.28	86.80	87.29			
M.C. g/j %	k	7.6	10.2	12.0	14.6	16.8			
Dd = $\frac{100d}{100+k}$ kg/m³	l	1620	1937	2015	1944	1847.			



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P.O Box. 18507 TEL: 791241 / 791242 / 791245 NAIROBI
Nairobi

GC2,7P95-10,B188.

Sample No. 1333 & 1335
B1 & B2

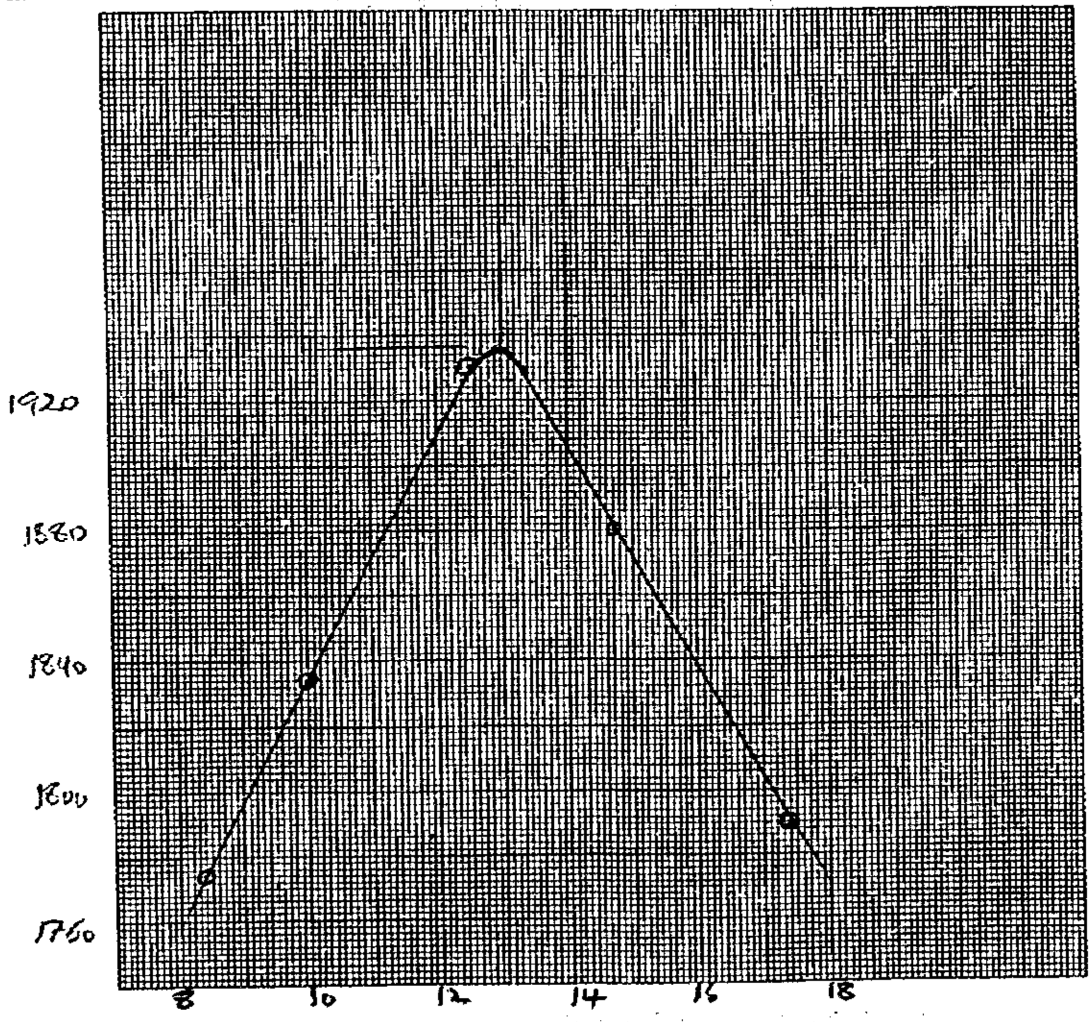
M.D.D./O.M.C. Determination for soils.

Job No. Mowlem
Location MUTONGA
Date 17-10-95

T99

M.D.D. 1936 kg/m³
O.M.C. 12.0 %

TEST No.		1	2	3	4	5	6	7	8
mould & soil g.	a	3235	3320	3458	3445	3396			
mould g.	b	1500	1500	1500	1500	1500			
Soil g.	c	1735	1820	1958	1945	1896			
Dw = $\frac{c}{0.9439}$ kg/m³	d	1923	2017	2171	2156	2101			
Tin No.		109	22	7	6	22			
Wt. of tin & wet soil g.	e	129.09	145.65	183.77	174.52	162.00			
Wt. of tin & dry soil g.	f	120.33	130.15	165.74	155.05	140.38			
Wt. of moisture g.	g	8.76	11.50	18.03	19.47	21.62			
Wt. of tin g	h	15.95	15.12	21.47	22.60	16.12			
Wt. of dry soil g.	j	104.38	115.03	144.27	132.45	124.26			
M.C. g/j %	k	8.4	10.0	12.5	14.7	17.4			
Dd = $\frac{100d}{100+k}$ kg/m³	l	1774	1834	1930	1880	1790			



Gc2,TP95-10,b2

CTL CENTRAL TESTING LABORATORIES LTD.

P.O.Box. 18507 TEL: 791241 / 791242 / 791245 NAIROBI
Nairobi

Sample No. 1336

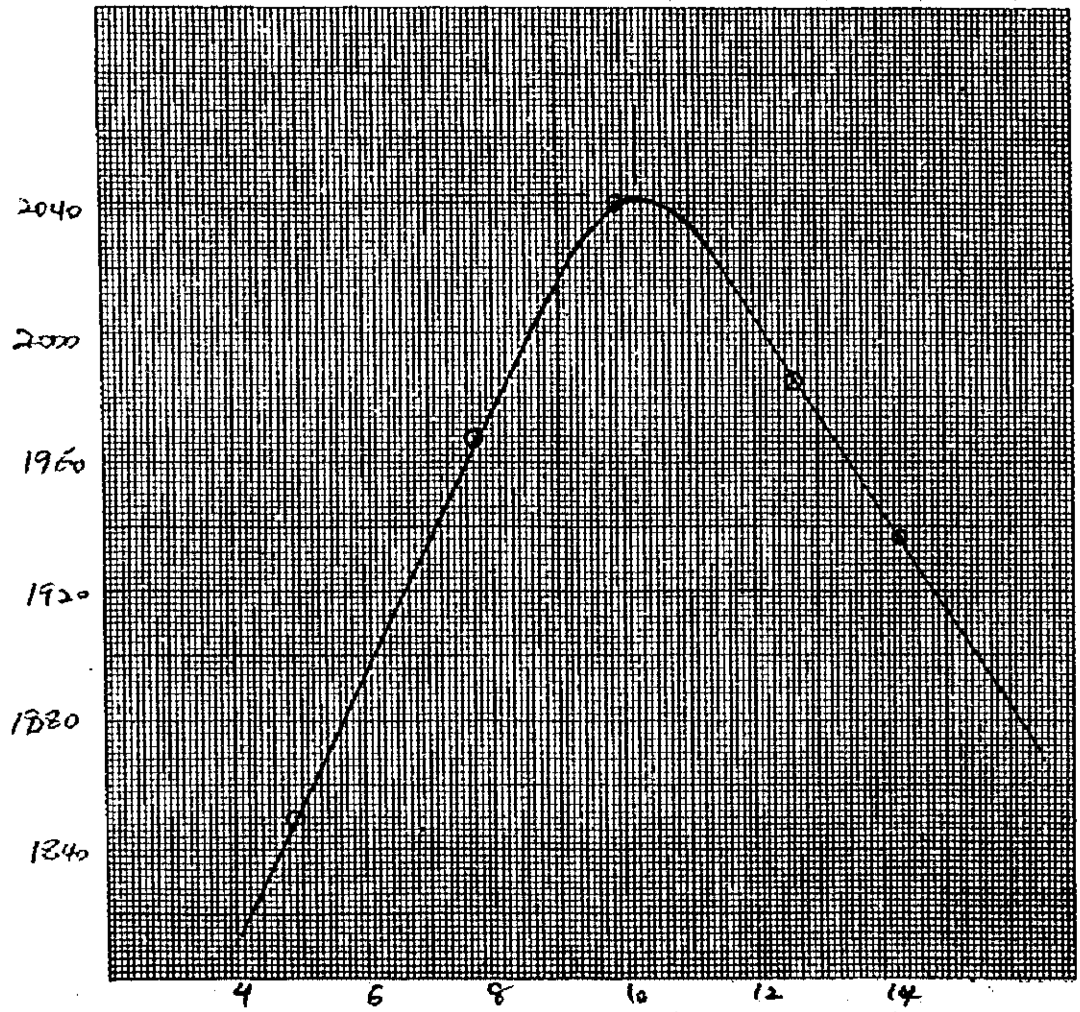
M.D.D./O.M.C. Determination for soils.

Job No. MONLEM
Location MUTONGA
Date 23-10-95

T99

M.D.D. 2042 kg/m³
O.M.C. 10.2 %

TEST No.		1	2	3	4	5	6	7	8
mould & soil g.	a	3250	3410	3522	3516	3496			
mould g.	b	1500	1500	1500	1500	1500			
Soil g.	c	1750	1911	2022	2016	1996			
$\frac{c}{0.902}$ Dw = $\frac{c}{0.9439}$ kg/m³	d	1941	2118	2242	2235	2213			
Tin No.		J101	58	142	J23	J15			
Wt. of tin & wet soil g.	e	103.71	118.72	115.50	105.72	139.58			
Wt. of tin & dry soil g.	f	99.61	111.87	107.10	95.66	124.12			
Wt. of moisture g.	g	4.10	6.85	8.40	10.06	15.46			
Wt. of tin g.	h	15.92	22.93	22.26	15.84	16.01			
Wt. of dry soil g.	j	83.69	88.94	84.84	79.82	108.1			
M.C. g/j %	k	4.9	7.70	9.9	12.6	14.3			
Od = $\frac{100d}{100+k}$ kg/m³	l	1850	1967	2040	1985	1936			



G02,TP95-10,81

CTL CENTRAL TESTING LABORATORIES LTD.

P.O Box. 18507 TEL: 791241 / 791242 / 791245 NAIROBI
Nairobi

Sample No. 1333 / 81

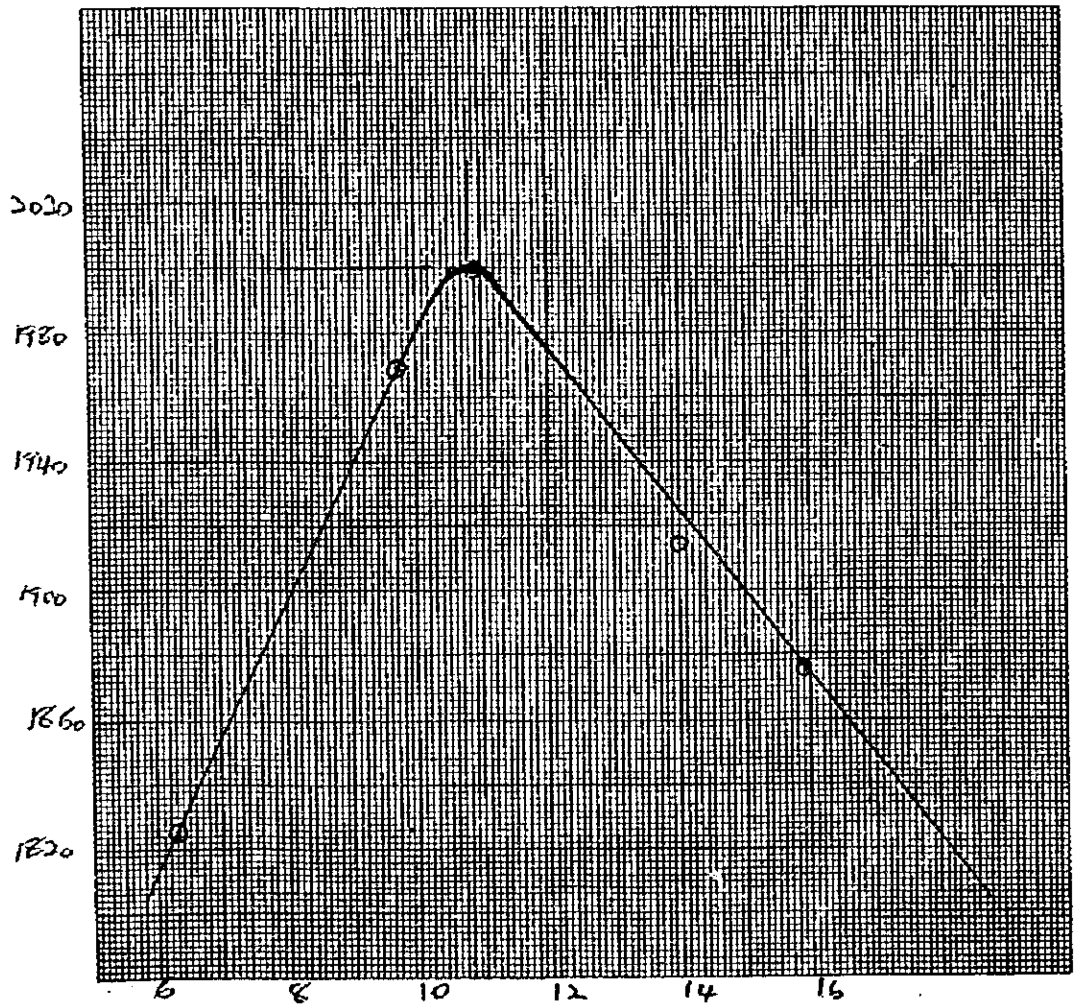
M.D.D./O.M.C. Determination for soils.

Job No. MOWLEM
Location MUTONGA
Date 23-10-95

T99

M.D.D. 2000 kg/m³
O.M.C. 10.8 %

TEST No.		1	2	3	4	5	6	7	8
mould & soil g.	a	3250	3448	3500	3468	3460			
mould g.	b	1500	1500	1500	1500	1500			
Soil g.	c	1750	1948	2000	1968	1960			
$Dw = \frac{c}{0.9439}$ kg/m³	d	1940	2160	2217	2182	2173			
Tin No.		Y3	Y15	Y11	Y103	Y12			
Wt. of tin & wet soil g.	e	133.47	129.14	112.49	122.10	141.96			
Wt. of tin & dry soil g.	f	126.52	119.14	103.05	109.02	124.72			
Wt. of moisture g.	g	6.95	10.00	9.44	13.08	17.24			
Wt. of tin g.	h	16.34	16.02	16.19	15.77	16.07			
Wt. of dry soil g.	j	110.18	103.12	86.86	93.25	108.65			
M.C. g/j %	k	6.3	9.7	10.9	14.0	15.9			
$Dd = \frac{100d}{100+k}$ kg/m³	l	1825	1969	1999	1914	1875			



GC1, TP05-1 B1 B2

CTL

CENTRAL TESTING LABORATORIES LTD.

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Nairobi

Sample No. 1301 K 1303

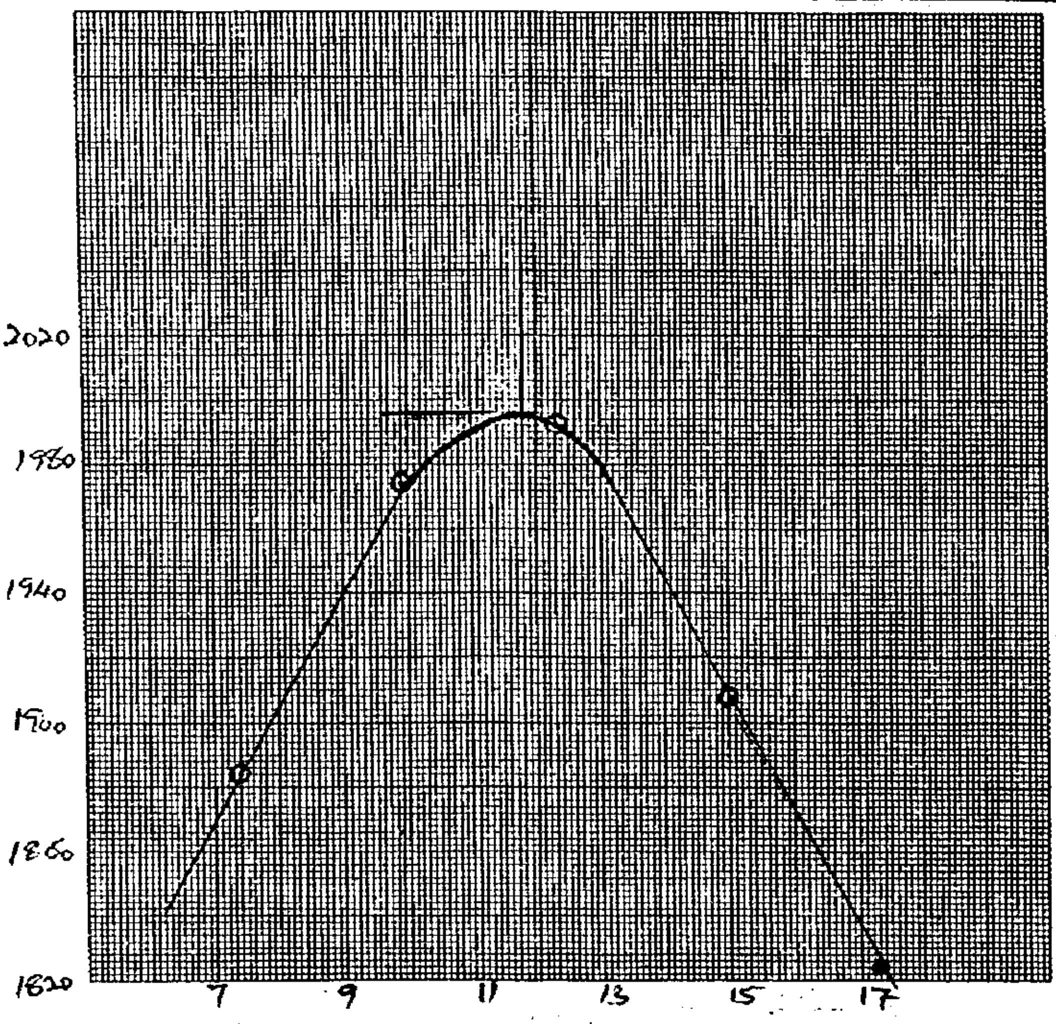
M.D.D./O.M.C. Determination for soils.

Job No. MOWLEM
Location MUTONGA
Date 18-10-95

T99

M.D.D. 1996 kg/m³
O.M.C. 11.8 %

TEST No.		1	2	3	4	5	6	7	8
mould & soil g.	a	3324	3456	3518	3478	3430			
mould g.	b	1500	1500	1500	1500	1500			
Soil g.	c	1824	1956	2018	1978	1930			
Dw = $\frac{c}{0.9439}$ kg/m3	d	2022	2169	2237	2193	2140			
Tin No.		11	Z	Y3	Y102	89			
Wt. of tin & wet soil g.	e	108.54	118.45	108.67	125.96	133.52			
Wt. of tin & dry soil g.	f	102.71	109.78	98.56	111.62	117.02			
Wt. of moisture g.	g	5.83	8.67	10.11	14.34	16.50			
Wt. of tin g.	h	22.88	22.21	16.35	16.04	21.64			
Wt. of dry soil g.	j	79.83	87.57	82.21	95.58	95.38			
M.C. g/j %	k	7.3	9.9	12.3	15.0	17.3			
Dd = $\frac{100d}{100+k}$ kg/m3	l	1884	1974	1992	1907	1824			



Gc1, 7195-2, B2

CTL CENTRAL TESTING LABORATORIES LTD.

P.O.Box. 18507 TEL: 791241 / 791242 / 791245 NAIROBI
Nairobi

Sample No. 1303

M.D.D./O.M.C. Determination for soils.

Job No. MOWLEM

Location MUTONGA

T99

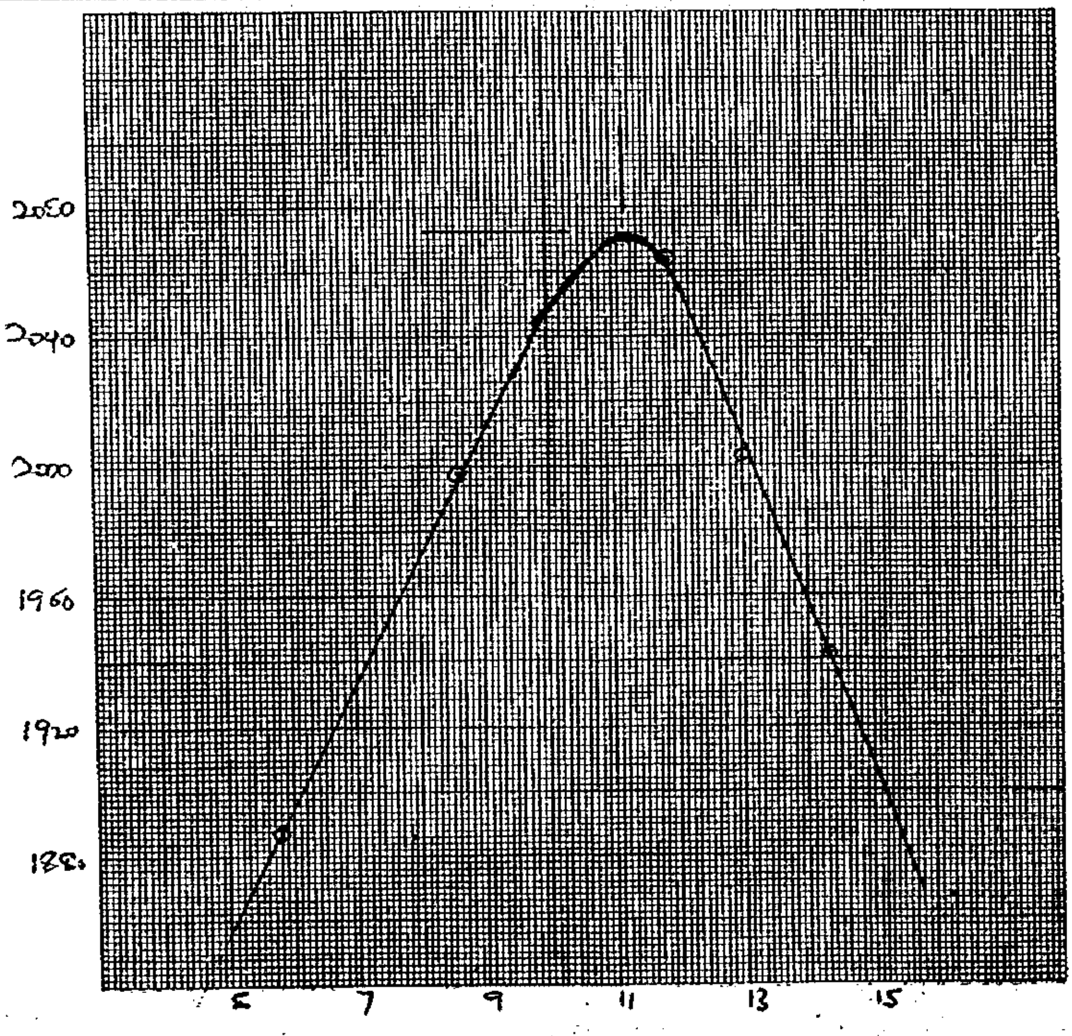
Date 22-10-95

M.D.D. 2072 kg/m³

O.M.C. 11.2 %

$\frac{c}{0.912}$

TEST No.		1	2	3	4	5	6	7	8
mould & soil g.	a	3300	3456	3582	3540	3502			
mould g.	b	1500	1500	1500	1500	1500			
Soil g.	c	1800	1956	2082	2040	2002			
Dw = $\frac{c}{0.9439}$ kg/m³	d	1996	2169	2308	2262	2220		Hygroscopic	
Tin No.		46	H56	B29	Y13	Y21		AA1	
Wt. of tin & wet soil g	e	142.36	113.31	138.40	119.54	180.03		371.88	
Wt. of tin & dry soil g	f	135.85	106.13	126.02	107.66	159.50		368.52	
Wt. of moisture g	g	6.51	7.18	12.38	11.88	20.53		3.36	
Wt. of tin g	h	22.95	22.24	22.11	16.02	15.75		131.34	
Wt. of dry soil g	j	112.90	83.89	103.91	91.64	143.75		247.18	
M.C. g/j %	k	5.8	8.6	11.9	13.0	14.3		1.4	
Dd = $\frac{100d}{100+k}$ kg/m³	l	1887	1997	2063	2002	1942			



GO1, TP95-2, B1

CTL CENTRAL TESTING LABORATORIES LTD.

P.O.Box. 18507 TEL: 791241 / 791242 / 791245 NAIROBI
Nairobi

Sample No. 1301

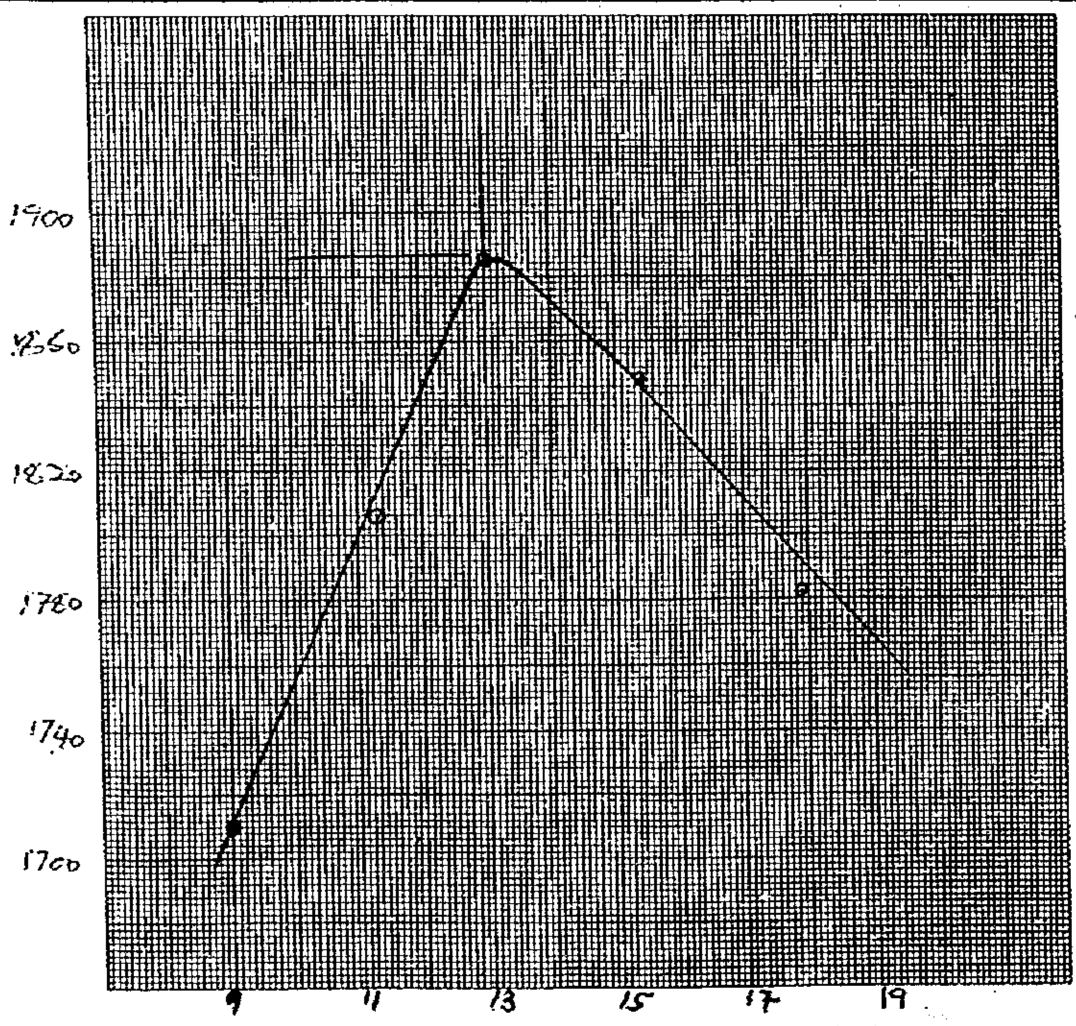
M.D.D./O.M.C. Determination for soils.

T99

Job No. MOWLEM
Location MUTON GA
Date 23-10-95

M.D.D. 1886 kg/m³
O.M.C. 13.0 %

TEST No.		1	2	3	4	5	6	7	8
mould & soil g.	a	3181	3313	3421	3424	3395			
mould g.	b	1500	1500	1500	1500	1500			
Soil g.	c	1681	1813	1921	1924	1895			
$Dw = \frac{c}{0.9439}$ kg/m³	d	1864	2010	2130	2132	2101			
Tin No.		22	AL	31	151	M43			
Wt. of tin & wet soil g.	e	120.25	131.97	140.08	168.53	162.35			
Wt. of tin & dry soil g.	f	111.65	120.88	126.52	148.18	140.96			
Wt. of moisture g.	g	8.60	11.09	13.56	20.35	21.39			
Wt. of tin g.	h	16.01	22.66	22.19	16.01	21.46			
Wt. of dry soil g.	i	95.64	98.22	104.33	132.17	119.50			
M.C. g/i %	k	9.0	11.3	13.0	15.4	17.9			
$Od = \frac{100d}{100+k}$ kg/m³	l	1710	1806	1885	1848	1782			



CENTRAL TESTING LABORATORIES LTD.

INDEPENDENT SOILS AND MATERIALS TESTING.

CTL

DUNDORI ROAD

P.O. BOX 18507
NAIROBI KENYA

OUR REFERENCE: -96/1337-1388/Jmm.

TELEPHONE ~~560432/33~~ 791241

YOUR REFERENCE:

Fax:- 791244

ATTENTION:

26th February 1996

The Mowlem Construction Co.(E.A.) Ltd.,
P.O. Box 30078,
NAIROBI.

Dear Sirs,

MUTONGA/GRANDFALLS HYDROPOWER SATGE 3

ALKALI AGRESSIVE CHEMICAL TEST RESULTS.

Lab.No.	Site Mark	Concentration of Silica as(SiO_2 mmol/L	Reduction of Alkalinity mmol/L
1337	GS1,100m Gravel	22.311	115
1338	" 500m Sand	29.97	145
1339	" 100m Sand	49.284	60
1340	" 1500m Sand	6.327	115
1341	GS2,0.00m Sand	3.33	92.5
1342	" 800m Gravel	8.658	185
1343	" 1500m Sand	11.99	90
1344	" 10m "	10.989	75
1346	" 1500 "	11.655	80
1385	MS 95-1	3.33	70
1386	" 95-2	13.32	65
1387	" 95-3	4.662	50
1388	" 95-4,500m	3.33	47.5

NB. Aggregates considered innocuous hence not reactive with cement.

Sample Location.

S/No.	1337-1340	- Ngoru River
"	1341-1343	- Kalenge River Downstream
"	1344 & 1346	- Kalenge River Upstream
"	1385-1387	- Makindu River
"	1388	- Kamunyoni River(Downstream from crossing point)

Yours faithfully,

CENTRAL TESTING LABORATORIES LTD.

CENTRAL TESTING LABORATORIES LTD.

INDEPENDENT SOILS AND MATERIALS TESTING.

CTL

DUNDORI ROAD

P.O. BOX 18507
NAIROBI KENYA

OUR REFERENCE: -96/1389-1394/Jmm

YOUR REFERENCE.

ATTENTION:

TELEPHONE 791241
Fax:- 791244

12th March 1996

Mowlem Construction Co. Ltd.,
P.O. Box 30078,
NAIROBI.

Dear Sirs,

MUTONGA/GRANDFALL HYDROPOWER STAGE 3
ALKALI AGGRESSIVE CHEMICAL TEST RESULTS.

Lab No.	Site Mark	Reduction in Alikalinity mm/l	Dissolved Silica (SiO_2) mm/l	Aggregage Considered
1389	MS95-5,1000m	48	3.3	Innocuous
1390	MS95-6,200m	50	7.3	"
1391	MS95-7,750m	60	10.0	"
1392	MS95-8,250m	75	7.0	"
1393	MS95-9,250m	50	11.0	"
1394	MS95-10,750m	75	11.7	"

Location:- 1389- Kamonyoni River (Downstream from crossing point)
1390- Kamonyoni River(Upstream from crossing point)
1391 & 1392- Konyu River (Downstream from crossing point)
1393 & 1394- Konyu River (Upstream from crossing point)

Yours faithfully,

CENTRAL TESTING LABORATORIES LTD.

C4 OTHERS

C4.1 Petrographic Microscope Study

FOREWORD

The whole set of six, samples are all regional metamorphic rocks. They are largely gneisses, an amphibolite and a calc - granulite. They were all metamorphosed either in the amphibolite facies or in the granulite facies.

Some of the rocks show gneissic foliation planes while others are massive. One rock (M95-2; 22.50 m) has a foliation approaching a schist although is largely gneissic in its characteristics.

Because they are medium to high grade metamorphic derivatives, these rocks are medium to coarse grained and crystalline in nature. As a result, they are ideal rocks for engineering purposes. However, in terms of relative weakness, the amphibolite and the schistose gneiss are the weakest, the other gneisses are relatively stronger but the strongest rocks are granitoid gneiss and the calc-granulite. However, the calc-granulite has an appreciable amount of calcite and would not be ideal for use in acidic environments.

More comprehensive descriptions of each rock specimen are presented below:

SAMPLE G 95 - 2 (21.30 m)

A BANDED HORNBLENDE GNEISS

In hand specimen the rock is leucocratic and light grey in colour, granoblastic with a medium grained texture. The grains are approximately 0.1 mm to 1 mm in size.

It is a tough fresh, highly crystalline rock with well pronounced gneissic bands and laminae which define the gneissic foliation planes. The bands and laminae result due to alternation of mafic rich and felsic rich layers. The laminae are approximately 1 to 2 mm thick but the bands, especially of the felsic minerals, range from 0.5 cm to about 1 cm or more in thickness.

The major composing minerals in the felsic bands and laminae are quartz and feldspar, while in the mafic bands they include hornblende, quartz and feldspars. Some greenish hornblende gives a faint dark green coloration to the mafic rich laminae.

In this section, the rock portrays a highly interlocked matrix dominated by quartz and feldspars which have well formed polygonal grains of variable sizes. The rock composing minerals in their approximate volume percentages include:

Hornblende	-	10%
Quartz	-	30%
Feldspars (orthoclase)	-	56%
Sphene	-	3%
Iron oxide	-	< 1%
Total		100%

The quartz and feldspar which dominate the rock matrix are unstrained and these felsic minerals have uniform extinction. This medium to high grade regional metamorphic rock, has therefore undergone complete recrystallisation which has removed strains in the rock. No secondary alteration occurs in the feldspar grains too. Surbodinate oligoclase and microcline make less than 2% of the rock matrix.

Sphene grains, scattered within the rock matrix, are however, often associated with the hornblende grains. They are reddish brown in hand specimen giving few reddish brown spots to the rock. These spots are easily confused for red garnet.

Both mafic and felsic minerals give the rock its characteristic banding, hence the name BANDED HORNBLENDE GNEISS. Due to the low content of mafic minerals and the high content of quartzo-feldspathic minerals, the rock is tough and ideal for engineering purposes.

SAMPLE G95 - 10

<u>(16.00 m) (GRANITOID GNEISS)</u>

This is a massive, leucocratic, medium to coarse grained rock with a weakly defined gneissose fabric orientation. Its composing grains range from less than 0.1 mm to approximately 3 to 4 mm in size. The coarsest grains however, are of quartz-feldspathic minerals which show incompletely developed porphyroblasts.

It is a tough fairly fresh and highly crystalline rock with the feldspars giving few light pinkish mottles. Biotite, quartz and feldspars are its major composing minerals, which are also easily discernible with a naked eye.

In thin section, the rock portrays a granoblastic texture with a highly interlocked matrix. The major composing minerals are:

Biotite	-	5%
Quartz	-	10%
Microcline	-	83%
Accessory minerals (magnetite and sphene)		2%
Total		100%

The biotite flakes however, define a weak preferred orientation. The biotite occurs as medium sized flakes that are scattered with the matrix that is dominated by quartz and feldspars. Both quartz and microcline are unstrained and portray a uniform extinction. However, few microcline grains portray a weak cloudiness possibly resultant from some partial alteration caused by metamorphic fluids.

Magnetite and sphene also occur as few grains scattered within the rock matrix. Both minerals also occur associated with each other. This is a tough rock, ideal for engineering construction purposes. Its mineralogy is typical of granitoid rocks, hence its name as GRANITOID GNEISS. If not faulted or fractured, it is an ideal foundation rock, even for dam sites.

SAMPLE G95.10 (19.30 m)

The rock is highly crystalline, mesocratic, showing alternated white felsic rich and black mafic rich bands and laminae which have heterogeneous textures. The entire rock texture is largely medium to coarse grained. The grains vary in size form approximately 0.5 mm to slightly over 3.0 mm. Largely non-weathered, the rock portrays a gneissic foliation usually defined by the alternated felsic and mafic mineral rich bands. Some of the felsic bands form veins which are spaced at about 0.5 cm to 1.0 cm apart and are about 1.0 mm to 3.00 mm thick. The major composing minerals identifiable with a naked eye are sodic plagioclase feldspars, some quartz, hornblende and biotite. The mafic minerals are however, concentrated in the mafic rich matrix and bands and vice verse for the felsic minerals.

In this section, the coarse texture of the rock portrays a strong preferred orientation particularly defined by the mafic minerals, especially by hornblende. The matrix is highly interlocked. The grains are unaltered, largely strain free as indicated by the uniform extinction of majority of them. However, some mineral grains indicate a moderate strain as depicted by the undulose extinction of some quartz and feldspar grains. The major composing minerals in their approximate volume percentages are:

Hornblende	-	25%
Biotite	-	7%
Quartz	-	7%
Feldspars (mainly plagioclase)		59%
Accessory minerals (mainly sphene)		2%
Total		100%

The hornblende is commonly associated with quartz. The plagioclase is largely of oligoclase-andesine composition and is largely untwinned. subordinate microcline and perthite are occasionally present. Both quartz and the feldspars show heterogeneous textures varying from small to large interlocked grains. The deformed quartz grains occasionally portray Boehm lamellae. Sphene is usually colourless. Very few iron oxide minerals are present in the rock too.

The rock is only moderately tough for engineering purposes because of the high content of mafic minerals. The rock is a PLAGIOCLASE AMPHIBOLITE, which would grade into an amphibolite by increment of mafic minerals or into a hornblende gneiss, by the decrease of mafic minerals.

It was formed in the middle conditions of amphibolite facies. Its high content of mafic minerals suggests a derivation through metamorphism of mafic rocks such as diorite and gabbro.

SAMPLE G95-14 (13.60 m)

(A CALC-GRANULITE)2

It is a massive, medium to coarse grained, light gray, leucocratic rock with the grains ranging from about 0.5 mm to about 3.0 mm. The rock is fairly fresh and tough because of its interlocked grain matrix and its massive crystalline nature.

The rock fairly reacts with dilute hydrochloric acid because of the presence of calcareous minerals. The major composing minerals discernible with a naked eye include mainly milky white feldspar and quartz, black pyroxenes, mainly augite and the olive green pyroxene, enstatite. These enstatite mineral grains give olive green spots to the otherwise, greyish rock matrix.

In this section, the rock portrays a medium to coarse texture. The composing minerals in their approximate volume percentage are:

Plagioclase feldspars	-	54%
Quartz	-	15%
Calcite	-	15%
Augite and hornblende	-	5%
Sphene (and iron oxide)	-	1%
Enstatite and olivine	-	10%
Total	-	100%

The plagioclase is calcic and of andesine - labradorite composition and show broad albite twinning lamellae. The augite and hornblende are dark green and pleochroic to medium green. They occur associated with each other. Enstatite appears in light green pleochroic shades while olivine is pleochroic from very pale to olive green colour.

This rock was formed in extreme high grade conditions of regional metamophism in the granulite facies. Therefore it is a CALC-GRANULITE. As a result it is a coarsely crystalline and tough rock, essentially similar to igneous plutonic rocks.

For all engineering works, it is as good as granite except it would be etched by acid solutions due to the presence of appreciable amounts of calcite.

SAMPLE M 95 - 1

(6.30 m) (A BANDED BIOTITE GNEISS)

This is a leucocratic, well banded rock, which is closely similar to sample G 95-2. Its texture varies according to the two types of bands. The darker grey, mafic mineral rich bands are fine to medium grained, with grains ranging in size from slightly less than 0.1 mm to about 1 to 2 mm. The felsic mineral rich white bands vary in texture from medium to coarse gained with the grains ranging between 1.0 mm to 3.00 mm in size.

It is a quite tough rock, fairly fresh and crystalline in nature. The bands define the gneissic foliation planes characterising the rock. These alternating mafic and felsic mineral rich bands have an average thickness between 0.5 cm and 1.0 cm within the mafic rich bands, fine laminae, are also distinguishable, which on the average are 1 to 2 mm thick.

The major composing minerals in the felsic bands are quartz and feldspars. However, in the mafic bands, the major composing minerals include biotite, quartz and feldspars.

In thin section, the rock still portrays its strongly preferred fabric orientation, mainly defined by biotite flakes. The texture is heterogenous composed of fine to coarse grains which are also highly interlocked. The composing minerals in their approximate volume percentages are as follows:

Biotite	-	10%
Quartz	-	40%
Feldspars	-	46%
Muscovite	-	2%
Iron oxides	-	2%
(Magnetite mainly)		
Total		100%

The feldspars are largely untwinned potash feldspars (orthoclase and microcline). They have well formed polygonal grains. Large feldspar grains do however, show a weak secondary alteration resulting into some cloudiness and sericitation of the grains. On the whole, however, both quartz and feldspars are largely unstrained and portray a uniform extinction. Few weakly strained quartz grains do show faintly developed Boehm lamellae. Subordinate plagioclase of oligoclase composition is occasionally notable occurring interstitially between the large quartz and potash, feldspar grains.

Muscovite flakes occur associated with biotite and so are the few iron oxide mineral grains, scattered within the rock matrix. The high content of felsic minerals coupled by the low content of mafic minerals makes the rock tough and ideal for engineering works. The mineral content and orientation gives it a banded nature, hence the name BANDED BIOTITE GNEISS. This banding, however, has not weakened the rock much and for all engineering purposes, it is almost as good as granitoid rocks.

SAMPLE M 95-2 (22.50 m)

BIOTITE SCHISTOSE GNEISS

This fine to medium grained crystalline rock is mesocratic and medium grey in colour. Its composing grains vary from approximately 0.1 mm to less than 1 mm in size. The high content of mafic minerals gives the rock a well defined foliation which approaches schistosity. Due to the high content of mafic minerals, the rock is only moderately tough. Its major composing minerals identifiable in hand specimen are predominantly biotite, sodic plagioclase feldspars and some hornblende.

In thin section, the preferred orientation of the composing minerals is quite evident. The identifiable major composing minerals in their approximate volume percentages are:

Quartz	-	10%
Mafic minerals		
(biotite and hornblende)	-	25%
(biotite approx. 18%, hornblende 7%)		
Plagioclase feldspars	-	60%
Iron ores and sphene	-	5%
Total		100%

Hornblende occurs associated with biotite. Plagioclase occurs in irregular granoblasts which are largely untwinned. It is largely oligoclase with a straight extinction. The accessory minerals iron ores and sphene, occur in scattered granules within the rock matrix. Hornblende and biotite are the minerals that define the strong preferred mineral grain orientation which is also enhanced by the irregular shaped quartz and feldspar granoblasts. The two felsic minerals have a uniform extinction which indicates that the grains are not strained or have recrystallized after straining.

The rock is a hornblende-biotite schistose gneiss. The fairly high mafic mineral content together with plagioclase feldspars suggests its derivation through metamorphism of mafic rocks such as diorites and dolerite dykes. The rock is interpreted to have been formed within the medium grade conditions of the amphibolite facies. It is moderately tough for engineering purposes but not as tough as the granites or granitoid gneisses because of the fairly high content of mafic minerals and its schistose nature.

ANNEX-D

DAM RESERVOIR SIMULATION RESULTS

ANNEX-D1

EXISTING POWER PLANT

Table D-1 Masinga Power Simulation Results (1995 Abstraction)

(Unit:MW)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	39.37	37.59	34.73	32.91	38.20	39.91	39.88	39.35	37.53	34.74	33.78	34.92	32.91	36.91	39.91	32.26	39.91
1958	35.09	34.53	33.51	32.03	37.76	39.91	39.91	39.72	38.85	36.63	34.60	34.56	32.03	36.42	39.91	31.66	39.91
1959	35.31	34.74	33.17	31.64	34.17	37.53	37.74	37.35	36.95	34.97	33.44	33.59	31.64	35.05	37.74	31.34	37.85
1960	33.11	32.20	31.09	31.38	34.18	35.06	34.76	33.99	33.14	32.42	33.19	33.64	31.09	33.18	35.06	30.71	35.12
1961	32.85	31.78	30.62	29.89	31.92	32.83	32.41	32.31	32.68	35.15	39.91	39.91	29.89	33.52	39.91	29.76	39.91
1962	39.91	39.84	39.37	38.91	39.82	39.91	39.91	39.55	38.79	37.15	36.10	36.26	36.10	38.79	39.91	35.91	39.91
1963	36.48	36.22	34.44	34.51	39.90	39.91	39.91	39.64	38.85	37.02	35.52	38.54	34.44	37.58	39.91	32.91	39.91
1964	39.88	39.39	38.46	38.83	39.91	39.91	39.91	39.76	39.11	37.91	36.89	38.25	36.89	39.02	39.91	36.69	39.91
1965	38.92	37.70	35.41	33.61	35.93	37.90	37.73	37.11	36.24	34.64	36.16	38.79	33.61	36.68	38.92	33.28	39.03
1966	38.85	37.20	35.02	36.23	39.91	39.91	39.90	39.45	38.24	35.91	36.46	37.54	35.02	37.88	39.91	34.44	39.91
1967	36.89	35.80	33.50	31.67	37.47	39.91	39.91	39.66	39.05	38.18	39.53	39.91	31.67	37.62	39.91	31.43	39.91
1968	39.56	38.56	38.49	39.53	39.91	39.91	39.91	39.65	38.84	37.06	37.16	39.91	37.06	39.04	39.91	36.29	39.91
1969	39.83	39.39	38.88	37.70	38.18	39.47	39.40	39.13	37.76	35.35	33.60	33.26	33.26	37.66	39.83	32.85	39.91
1970	32.43	31.90	31.06	33.56	39.28	39.91	39.90	39.48	38.38	36.24	34.67	33.97	31.06	35.90	39.91	30.76	39.91
1971	32.83	31.67	30.33	29.34	33.73	38.34	38.81	38.80	37.77	35.44	33.68	32.93	29.34	34.47	38.81	29.09	38.84
1972	32.32	31.82	31.18	30.11	30.23	32.62	33.12	32.64	31.92	31.75	36.57	39.87	30.11	32.84	39.87	29.60	39.91
1973	39.65	38.91	37.03	34.91	36.62	38.14	38.26	37.78	36.98	35.02	34.14	34.48	34.14	36.83	39.65	33.79	39.91
1974	33.67	32.48	31.20	31.64	35.93	37.52	39.04	39.73	39.11	37.51	36.10	36.03	31.20	35.83	39.73	30.56	39.87
1975	35.15	33.92	32.45	30.88	32.14	33.35	33.02	32.52	31.88	31.31	31.44	31.15	30.88	32.43	35.15	30.52	35.67
1976	30.38	29.25	28.06	27.02	27.29	27.83	27.38	26.23	24.45	22.64	21.17	20.67	20.67	26.03	30.38	20.24	30.84
1977	19.86	19.19	17.72	22.48	37.49	39.91	39.91	39.55	38.48	36.24	37.07	39.85	17.72	32.31	39.91	16.96	39.91
1978	39.78	39.23	39.02	39.90	39.91	39.91	39.90	39.52	38.39	36.36	36.16	37.42	36.16	38.79	39.91	35.61	39.91
1979	38.21	38.70	38.32	39.25	39.91	39.91	39.91	39.63	38.78	37.04	36.49	37.35	36.49	38.62	39.91	35.93	39.91
1980	36.87	35.92	33.72	31.97	34.52	38.47	38.88	38.78	37.60	35.22	35.55	38.83	31.97	36.36	38.88	31.84	39.17
1981	39.01	37.32	35.00	37.85	39.91	39.91	39.90	39.44	38.06	35.66	34.99	35.25	34.99	37.69	39.91	34.39	39.91
1982	35.24	34.55	33.04	32.07	37.78	39.91	39.90	39.42	37.90	36.29	38.90	39.90	32.07	37.08	39.91	31.45	39.91
1983	39.66	38.80	36.76	34.65	39.02	39.91	39.90	39.41	37.89	35.37	34.09	33.84	33.84	37.44	39.91	33.63	39.91
1984	33.57	32.92	31.89	30.58	29.89	29.20	28.23	27.14	25.35	24.59	27.55	30.13	24.59	29.25	33.57	23.97	33.66
1985	30.59	29.90	29.02	30.77	38.57	39.91	39.90	39.41	37.86	35.23	33.77	33.85	29.02	34.90	39.91	28.65	39.91
1986	33.10	32.06	30.94	30.50	37.74	39.91	39.90	39.40	37.76	35.08	33.58	35.31	30.50	35.44	39.91	30.07	39.91
1987	36.92	36.19	33.92	32.47	34.83	37.87	39.02	38.88	37.65	35.11	33.65	35.07	32.47	35.97	39.02	32.13	39.05
1988	35.08	34.38	32.93	33.82	39.90	39.91	39.90	39.49	38.38	36.18	35.55	38.11	32.93	36.97	39.91	31.58	39.91
1989	38.88	38.03	35.95	34.65	38.44	39.91	39.87	39.37	37.79	35.44	35.81	39.48	34.65	37.80	39.91	34.38	39.91
1990	39.91	39.57	39.16	39.89	39.91	39.91	39.90	39.45	38.10	35.77	35.22	36.49	35.22	38.61	39.91	34.78	39.91
Min.	19.86	19.19	17.72	22.48	27.29	27.83	27.38	26.23	24.45	22.64	21.17	20.67	17.72	26.03	30.38		
Avg.	35.86	35.05	33.69	33.45	36.77	38.07	38.11	37.73	36.66	34.90	34.78	35.85	31.93	35.91	38.96		
Max.	39.91	39.84	39.37	39.90	39.91	39.91	39.91	39.76	39.11	38.18	39.91	39.91	37.06	39.04	39.91		
Daily Min.	19.31	18.53	17.10	16.96	27.06	27.65	27.08	25.30	23.55	21.84	20.59	20.24				16.96	
Daily Max.	39.91	39.91	39.67	39.91	39.91	39.91	39.91	39.91	39.48	39.55	39.91	39.91					39.91

Table D-2 Masinga Energy Simulation Results (1995 Abstrauction)

(Unit:GWh/y)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ann.Tot	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	29.18	25.29	25.84	16.62	24.16	28.16	17.39	27.61	27.05	25.85	14.54	14.64	276.33	14.54	23.03	29.18	0.45	0.97
1958	14.69	13.12	24.76	15.65	23.70	28.72	29.05	29.54	27.97	27.25	16.64	14.54	265.63	13.12	22.14	29.54	0.44	0.97
1959	14.75	13.17	23.88	14.52	14.42	14.88	15.44	15.33	19.75	26.02	14.79	14.25	201.20	13.17	16.77	26.02	0.44	0.89
1960	14.11	12.50	13.51	13.16	14.42	14.21	14.59	14.37	13.67	13.91	13.68	14.27	166.40	12.50	13.87	14.59	0.43	0.47
1961	14.04	12.39	13.36	12.72	13.76	13.58	13.90	13.87	13.53	20.66	28.72	29.68	200.21	12.39	16.68	29.68	0.42	0.96
1962	29.68	26.76	29.28	28.01	29.61	27.57	19.41	29.31	28.15	27.63	19.37	15.02	309.80	15.02	25.82	29.68	0.48	0.97
1963	15.08	19.63	25.63	22.11	29.67	28.72	24.18	29.23	28.05	27.53	18.09	16.61	284.53	15.08	23.71	29.67	0.45	0.97
1964	30.00	26.77	28.76	27.95	29.68	27.40	19.62	29.70	28.54	28.22	20.65	15.59	312.88	15.59	26.07	30.00	0.49	0.97
1965	22.06	25.34	26.35	18.68	14.93	14.98	15.44	15.26	14.53	24.69	17.36	15.76	225.38	14.53	18.78	26.35	0.46	0.95
1966	20.92	24.99	26.06	26.09	29.68	24.95	17.46	28.80	27.64	26.72	20.26	15.38	288.95	15.38	24.08	29.68	0.49	0.97
1967	15.20	17.10	24.93	14.86	23.63	28.72	24.39	29.63	28.55	28.39	28.45	28.22	292.07	14.86	24.34	29.63	0.44	0.97
1968	29.45	25.93	28.63	28.45	29.68	28.72	27.05	29.56	28.08	27.57	20.61	29.58	333.31	20.61	27.78	29.68	0.49	0.97
1969	29.97	26.77	29.23	27.13	21.94	15.51	16.00	20.68	27.22	26.30	15.20	14.16	270.11	14.16	22.51	29.97	0.45	0.97
1970	13.91	12.42	13.50	18.14	29.21	27.03	17.93	28.99	27.69	26.96	16.66	14.37	246.81	12.42	20.57	29.21	0.43	0.96
1971	14.03	12.36	13.27	12.55	14.28	15.11	15.76	16.75	27.23	26.37	15.24	14.06	197.01	12.36	16.42	27.23	0.42	0.94
1972	13.88	12.40	13.53	12.78	13.25	13.52	14.12	13.97	13.31	13.71	19.96	24.30	178.73	12.40	14.89	24.30	0.42	0.97
1973	29.27	26.25	27.54	21.84	15.12	15.05	15.58	15.45	18.79	26.06	15.35	14.51	240.81	14.51	20.07	29.27	0.46	0.96
1974	14.28	12.58	13.54	13.23	14.93	14.88	15.87	29.20	28.37	27.90	19.46	14.96	219.20	12.58	18.27	29.20	0.43	0.96
1975	14.71	12.96	18.10	13.63	13.82	13.73	14.09	13.94	13.30	13.57	13.17	13.52	168.54	12.96	14.04	18.10	0.43	0.78
1976	13.29	11.69	12.57	11.85	12.33	12.10	12.36	11.98	11.03	10.80	9.97	10.13	140.10	9.97	11.67	13.29	0.32	0.43
1977	9.84	8.60	8.96	10.32	24.03	27.76	19.84	29.32	27.86	26.96	22.15	26.20	241.84	8.60	20.15	29.32	0.28	0.97
1978	29.63	26.40	29.07	28.76	29.73	25.59	18.49	29.29	27.77	27.05	19.47	15.35	306.60	15.35	25.55	29.73	0.48	0.97
1979	16.40	26.00	28.49	28.25	29.68	28.72	26.69	29.61	28.20	27.55	19.84	15.33	304.76	15.33	25.40	29.68	0.49	0.97
1980	15.19	17.83	25.09	15.29	14.52	15.14	15.79	15.74	26.64	26.21	16.11	15.78	219.33	14.52	18.28	26.64	0.44	0.93
1981	23.02	25.07	26.05	27.25	29.68	27.57	17.65	28.79	27.49	26.53	17.11	14.73	290.94	14.73	24.25	29.68	0.47	0.97
1982	14.73	13.13	22.83	14.63	22.96	28.57	18.75	28.46	27.29	27.00	27.13	28.69	274.17	13.13	22.85	28.69	0.44	0.97
1983	29.53	26.10	27.34	20.63	28.64	25.55	17.22	28.47	27.29	26.32	15.35	14.33	286.77	14.33	23.90	29.53	0.46	0.96
1984	14.25	12.70	15.32	13.23	13.14	12.51	12.63	12.28	11.32	11.45	12.01	13.21	154.05	11.32	12.84	15.32	0.36	0.76
1985	13.35	11.87	12.87	12.97	26.39	26.53	16.76	28.55	27.32	26.21	14.89	14.33	232.04	11.87	19.34	28.55	0.41	0.97
1986	14.11	12.46	13.46	12.90	23.60	28.58	18.78	28.54	27.24	26.10	14.84	14.75	235.36	12.46	19.61	28.58	0.43	0.97
1987	15.21	19.28	25.24	15.93	14.61	14.98	15.85	16.78	27.13	26.12	14.85	14.68	220.66	14.61	18.39	27.13	0.45	0.94
1988	14.68	13.08	21.72	19.06	29.68	27.33	17.92	29.27	27.77	26.92	16.89	15.54	259.86	13.08	21.65	29.68	0.44	0.97
1989	21.87	25.59	26.75	21.64	27.77	24.71	16.37	27.41	27.25	26.37	17.72	20.94	284.39	16.37	23.70	27.77	0.47	0.97
1990	29.89	26.77	29.34	28.91	29.89	27.01	17.33	28.70	27.48	26.62	17.17	15.09	304.20	15.09	25.35	29.89	0.47	0.96
Min.	9.84	8.60	8.96	10.32	12.33	12.10	12.36	11.98	11.03	10.80	9.97	10.13	140.10	8.60	11.67	13.29		
Avg.	19.24	18.69	21.91	18.82	22.25	22.00	17.93	23.66	24.13	24.52	17.76	17.13	248.03	13.79	20.67	27.19		
Max.	30.00	26.77	29.34	28.91	29.89	28.72	29.05	29.70	28.55	28.39	28.72	29.68	333.31	20.61	27.78	30.00		
Daily Min.	0.31	0.30	0.28	0.28	0.40	0.40	0.40	0.38	0.36	0.34	0.33	0.32					0.28	
Daily Max.	0.97	0.96	0.96	0.96	0.96	0.97	0.97	0.97	0.96	0.95	0.96	0.97						0.97

Table D-3 Kamburu Power Simulation Results (1995 Abstraction)

(Unit:MW)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	59.73	58.37	55.49	58.55	76.63	75.11	36.90	53.07	54.96	55.43	50.66	48.99	36.90	56.99	76.63	31.24	83.04
1958	37.56	31.48	55.67	46.34	75.92	82.42	75.69	66.95	59.78	59.16	44.89	36.36	31.48	56.02	82.42	31.08	83.04
1959	34.47	31.40	52.55	43.10	54.81	43.09	40.73	37.26	46.58	57.89	39.96	36.06	31.40	43.16	57.89	30.01	79.26
1960	34.29	31.02	32.68	42.14	48.88	41.39	37.57	32.11	29.75	37.37	45.59	36.57	29.75	37.45	48.88	29.06	76.64
1961	32.95	29.29	31.39	38.39	47.27	37.26	42.67	39.21	45.82	75.59	83.04	83.04	29.29	48.83	83.04	29.06	83.04
1962	82.96	67.98	62.50	66.07	82.10	71.32	46.62	61.00	60.67	62.28	49.00	36.79	36.79	62.44	82.96	34.32	83.04
1963	36.90	46.16	56.57	64.64	83.04	83.04	61.76	61.71	58.51	57.59	46.29	47.03	36.90	58.60	83.04	31.47	83.04
1964	70.02	57.64	61.09	76.14	83.04	74.07	47.69	63.75	59.23	65.87	52.90	40.61	40.61	62.67	83.04	36.14	83.04
1965	50.52	58.22	56.54	51.33	40.91	40.42	35.26	35.18	29.61	57.05	56.57	43.69	29.61	46.27	58.22	29.10	83.04
1966	47.86	58.13	59.58	77.15	82.50	65.37	43.75	59.54	59.76	61.80	66.30	33.71	33.71	59.62	82.50	30.31	83.04
1967	34.16	40.43	54.87	45.32	79.78	82.82	64.42	67.17	66.58	74.26	81.93	72.82	34.16	63.72	82.82	30.15	83.04
1968	63.97	60.65	65.38	75.87	83.04	83.04	72.74	70.36	62.82	64.49	71.39	82.25	60.65	71.33	83.04	34.54	83.04
1969	71.93	71.00	64.71	69.77	54.54	39.09	36.38	43.95	60.58	60.06	41.27	37.18	36.38	54.21	71.93	31.75	83.04
1970	36.79	33.29	33.41	68.96	82.35	72.24	43.84	61.24	60.22	60.28	44.06	36.20	33.29	52.74	82.35	30.91	83.04
1971	34.85	30.65	29.88	40.01	52.40	44.54	41.68	40.00	58.32	57.93	38.59	34.83	29.88	41.97	58.32	29.06	83.04
1972	35.61	34.30	31.96	34.14	47.26	46.81	38.48	33.68	34.52	54.04	77.69	67.37	31.96	44.65	77.69	29.10	83.04
1973	65.39	62.22	60.86	62.81	53.99	47.71	40.74	37.31	43.26	59.59	48.49	42.42	37.31	52.07	65.39	34.89	75.05
1974	39.35	36.40	36.30	42.33	44.93	40.66	57.18	67.29	60.68	60.71	51.10	39.14	36.30	48.01	67.29	36.26	74.01
1975	38.58	35.97	44.97	56.67	60.02	46.50	39.88	38.15	34.66	35.73	39.01	38.42	34.66	42.38	60.02	34.25	79.08
1976	38.04	35.45	35.38	55.40	59.96	48.32	40.38	36.18	34.28	37.14	38.95	40.27	34.28	41.65	59.96	33.53	77.03
1977	38.22	35.12	35.04	65.90	83.04	75.59	47.50	60.48	58.60	59.54	78.36	75.84	35.04	59.43	83.04	34.91	83.04
1978	66.01	61.03	62.86	81.62	83.04	64.54	44.01	60.33	58.64	63.40	60.83	42.36	42.36	62.39	83.04	36.48	83.04
1979	41.28	66.69	62.87	76.27	83.04	83.04	67.40	61.89	59.44	59.80	60.75	41.78	41.28	63.69	83.04	38.24	83.04
1980	38.56	45.36	57.97	45.35	50.15	43.99	39.14	36.89	58.00	59.19	78.21	52.39	36.89	50.43	78.21	35.34	83.04
1981	53.57	60.29	64.97	83.04	83.04	75.45	43.93	60.34	59.14	60.97	49.20	40.70	40.70	61.22	83.04	37.49	83.04
1982	38.74	35.86	54.24	52.33	78.91	80.62	46.95	61.25	59.43	73.52	72.98	76.87	35.86	60.97	80.62	35.77	83.04
1983	64.61	61.27	60.04	61.53	83.04	70.01	43.50	60.46	59.28	59.88	47.35	38.86	38.86	59.15	83.04	37.72	83.04
1984	39.04	36.08	39.42	41.43	44.54	38.53	38.35	35.93	33.81	41.83	51.99	47.34	33.81	40.69	51.99	33.77	58.73
1985	40.45	36.40	36.82	60.72	80.31	71.60	41.53	59.58	58.74	58.73	41.84	38.96	36.40	52.14	80.31	35.58	83.04
1986	38.13	35.43	35.36	47.82	77.87	80.11	46.41	59.57	58.51	58.43	48.36	47.67	35.36	52.81	80.11	35.32	83.04
1987	40.09	48.49	57.93	52.80	56.60	53.12	41.70	46.04	63.17	58.98	45.08	41.50	40.09	50.46	63.17	35.84	71.42
1988	38.29	35.27	51.58	70.64	83.04	72.14	43.35	60.39	59.21	64.03	79.23	61.17	35.27	59.86	83.04	35.15	83.04
1989	60.81	62.58	59.95	67.03	79.33	65.92	40.30	57.33	58.64	65.10	66.81	65.59	40.30	62.45	79.33	36.64	83.04
1990	79.41	62.86	70.12	82.71	83.04	73.54	43.84	60.56	59.25	64.29	62.21	47.89	43.84	65.81	83.04	37.66	83.04
Min.	32.95	29.29	29.88	34.14	40.91	37.26	35.26	32.11	29.61	35.73	38.59	33.71	29.29	37.45	48.88		
Avg.	47.74	46.85	50.91	58.95	68.89	62.16	46.24	52.53	53.66	58.88	56.20	48.61	36.51	54.30	74.78		
Max.	82.96	71.00	70.12	83.04	83.04	83.04	75.69	70.36	66.58	75.59	83.04	83.04	60.65	71.33	83.04		
Daily Min.	31.33	29.06	29.06	30.79	33.89	33.88	33.50	31.16	29.06	29.38	33.07	30.31				29.06	
Daily Max.	83.04	83.04	80.96	83.04	83.04	83.04	83.04	74.01	83.04	83.04	83.04	83.04					83.04

Table D-4 Kamburu Energy Simulation Results (1995 Abstraction)

(Unit:GWh/y)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ann.Tot	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	44.44	39.23	41.28	42.16	57.01	54.08	27.45	39.48	39.57	41.24	36.47	36.45	498.86	27.45	41.57	57.01	0.75	1.99
1958	27.94	21.15	41.42	33.37	56.48	59.34	56.31	49.81	43.04	44.02	32.32	27.05	492.25	21.15	41.02	59.34	0.75	1.99
1959	25.64	21.10	39.09	31.03	40.78	31.03	30.30	27.72	33.54	43.07	28.77	26.83	378.90	21.10	31.58	43.07	0.72	1.90
1960	25.51	20.84	24.31	30.34	36.36	29.80	27.95	23.89	21.42	27.80	32.83	27.21	328.26	20.84	27.36	36.36	0.70	1.84
1961	24.51	19.68	23.36	27.64	35.17	26.83	31.74	29.17	32.99	56.24	59.79	61.78	428.90	19.68	35.74	61.78	0.70	1.99
1962	61.72	45.69	46.50	47.57	61.08	51.35	34.69	45.38	43.68	46.34	35.28	27.37	546.65	27.37	45.55	61.72	0.82	1.99
1963	27.46	31.02	42.09	46.54	61.78	59.79	45.95	45.91	42.12	42.85	33.33	34.99	513.83	27.46	42.82	61.78	0.76	1.99
1964	52.09	38.74	45.45	54.82	61.78	53.33	35.48	47.43	42.65	49.01	38.08	30.21	549.07	30.21	45.76	61.78	0.87	1.99
1965	37.58	39.12	42.07	36.96	30.44	29.10	26.23	26.17	21.32	42.44	40.73	32.50	404.66	21.32	33.72	42.44	0.70	1.99
1966	35.61	39.06	44.33	55.55	61.38	47.06	32.55	44.30	43.02	45.98	47.74	25.08	521.66	25.08	43.47	61.38	0.73	1.99
1967	25.41	27.17	40.83	32.63	59.36	59.63	47.93	49.97	47.94	55.25	58.99	54.18	559.29	25.41	46.61	59.63	0.72	1.99
1968	47.59	40.76	48.65	54.63	61.78	59.79	54.12	52.35	45.23	47.98	51.40	61.19	625.47	40.76	52.12	61.78	0.83	1.99
1969	53.52	47.71	48.14	50.24	40.58	28.15	27.07	32.70	43.62	44.68	29.71	27.66	473.78	27.07	39.48	53.52	0.76	1.99
1970	27.37	22.37	24.86	49.65	61.27	52.02	32.62	45.57	43.36	44.85	31.72	26.93	462.59	22.37	38.55	61.27	0.74	1.99
1971	25.93	20.60	22.23	28.81	38.99	32.07	31.01	29.76	41.99	43.10	27.78	25.91	368.18	20.60	30.68	43.10	0.70	1.99
1972	26.49	23.05	23.78	24.58	35.16	33.70	28.63	25.06	24.86	40.21	55.94	50.13	391.59	23.05	32.63	55.94	0.70	1.99
1973	48.65	41.81	45.28	45.22	40.17	34.35	30.31	27.76	31.15	44.33	34.91	31.56	455.50	27.76	37.96	48.65	0.84	1.80
1974	29.28	24.46	27.01	30.48	33.43	29.27	42.54	50.06	43.69	45.17	36.79	29.12	421.30	24.46	35.11	50.06	0.87	1.78
1975	28.70	24.17	33.46	40.81	44.65	33.48	29.67	28.38	24.96	26.58	28.09	28.59	371.54	24.17	30.96	44.65	0.82	1.90
1976	28.30	23.82	26.32	39.89	44.61	34.79	30.04	26.92	24.68	27.63	28.05	29.96	365.01	23.82	30.42	44.61	0.80	1.85
1977	28.43	23.60	26.07	47.45	61.78	54.42	35.34	44.99	42.19	44.30	56.42	56.42	521.41	23.60	43.45	61.78	0.84	1.99
1978	49.11	41.01	46.77	58.76	61.78	46.47	32.75	44.88	42.22	47.17	43.80	31.52	546.24	31.52	45.52	61.78	0.88	1.99
1979	30.71	44.82	46.78	54.92	61.78	59.79	50.14	46.05	42.80	44.49	43.74	31.08	557.10	30.71	46.43	61.78	0.92	1.99
1980	28.69	30.48	43.13	32.65	37.31	31.68	29.12	27.45	41.76	44.04	56.31	38.98	441.60	27.45	36.80	56.31	0.85	1.99
1981	39.85	40.52	48.34	59.79	61.78	54.32	32.69	44.89	42.58	45.36	35.43	30.28	535.83	30.28	44.65	61.78	0.90	1.99
1982	28.82	24.10	40.36	37.68	58.71	58.05	34.93	45.57	42.79	54.70	52.54	57.19	535.44	24.10	44.62	58.71	0.86	1.99
1983	48.07	41.17	44.67	44.30	61.78	50.41	32.36	44.98	42.68	44.55	34.09	28.91	517.97	28.91	43.16	61.78	0.91	1.99
1984	29.05	24.25	29.33	29.83	33.14	27.74	28.53	26.73	24.34	31.12	37.43	35.22	356.71	24.25	29.73	37.43	0.81	1.41
1985	30.10	24.46	27.39	43.71	59.75	51.55	30.90	44.33	42.29	43.70	30.12	28.99	457.29	24.46	38.11	59.75	0.85	1.99
1986	28.37	23.81	26.31	34.43	57.93	57.68	34.53	44.32	42.13	43.47	34.82	35.47	463.27	23.81	38.61	57.93	0.85	1.99
1987	29.83	32.58	43.10	38.02	42.11	38.25	31.02	34.26	45.48	43.88	32.46	30.87	441.86	29.83	36.82	45.48	0.86	1.71
1988	28.49	23.70	38.38	50.86	61.78	51.94	32.25	44.93	42.63	47.64	57.04	45.51	525.15	23.70	43.76	61.78	0.84	1.99
1989	45.24	42.05	44.61	48.26	59.02	47.46	29.99	42.65	42.22	48.44	48.10	48.80	546.84	29.99	45.57	59.02	0.88	1.99
1990	59.08	42.24	52.17	59.55	61.78	52.95	32.62	45.05	42.66	47.83	44.79	35.63	576.35	32.62	48.03	61.78	0.90	1.99
Min.	24.51	19.68	22.23	24.58	30.44	26.83	26.23	23.89	21.32	26.58	27.78	25.08	328.26	19.68	27.36	36.36		
Avg.	35.52	31.48	37.38	42.44	51.26	44.75	34.41	39.08	38.64	43.81	40.47	36.16	475.89	26.07	39.66	55.21		
Max.	61.72	47.71	52.17	59.79	61.78	59.79	56.31	52.35	47.94	56.24	59.79	61.78	625.47	40.76	52.12	61.78		
Daily Min.	0.75	0.70	0.70	0.74	0.81	0.81	0.80	0.75	0.70	0.71	0.79	0.73					0.70	
Daily Max.	1.99	1.99	1.94	1.99	1.99	1.99	1.99	1.78	1.99	1.99	1.99	1.99						1.99

Table D-5 Gitaru Power Simulation Results (1995 Abstraction)

(Unit:MW)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.	Avg.	Max.	Daily Min.	Max.
1957	127.88	125.05	118.31	116.03	139.64	137.70	76.21	113.47	116.82	117.84	105.82	101.84	76.21	116.38	139.64	68.07	143.01
1958	76.77	68.44	118.46	95.93	136.54	143.01	141.43	139.43	128.24	126.92	92.97	74.70	68.44	111.90	143.01	67.84	143.01
1959	71.36	68.32	111.24	90.22	114.59	88.64	83.64	76.31	98.31	124.12	82.86	74.57	68.32	90.35	124.12	66.16	143.01
1960	71.23	67.73	69.74	87.60	101.37	85.22	76.76	69.40	65.63	80.01	93.49	74.97	65.63	78.60	101.37	64.41	143.01
1961	70.20	64.83	68.74	79.52	98.43	76.10	88.00	80.30	94.25	135.67	143.01	143.01	64.83	95.17	143.01	64.41	143.01
1962	143.01	141.58	133.93	137.66	143.01	138.48	97.11	130.28	130.15	132.31	102.77	75.25	75.25	125.46	143.01	70.08	143.01
1963	75.46	98.74	120.74	125.57	143.01	143.01	123.94	131.68	125.79	123.62	97.21	95.17	75.46	116.99	143.01	68.49	143.01
1964	137.08	123.71	129.15	139.74	143.01	138.98	99.22	135.28	127.19	136.71	110.45	83.64	83.64	125.35	143.01	74.67	143.01
1965	106.40	124.93	120.86	108.25	83.93	83.00	72.14	74.03	65.42	121.09	114.27	90.07	65.42	97.03	124.93	64.47	143.01
1966	100.04	124.66	125.97	141.91	143.01	132.49	90.17	127.20	127.92	130.65	124.45	71.74	71.74	120.02	143.01	66.75	143.01
1967	71.13	86.74	116.48	94.36	141.24	143.01	132.97	140.09	139.28	141.45	143.01	137.76	71.13	123.96	143.01	66.40	143.01
1968	135.96	129.71	137.97	142.79	143.01	143.01	140.93	142.35	133.94	132.01	133.70	142.61	129.71	138.17	143.01	70.47	143.01
1969	142.92	142.64	137.39	140.45	113.78	80.19	74.33	93.32	129.86	128.45	86.11	77.84	74.33	112.27	142.92	68.91	143.01
1970	75.36	70.60	71.50	128.56	143.01	136.57	90.60	130.70	129.15	128.83	90.83	73.89	70.60	105.80	143.01	67.61	143.01
1971	71.06	67.16	65.89	82.94	110.91	92.18	85.67	82.16	125.04	124.14	80.01	72.59	65.89	88.31	125.04	64.41	143.01
1972	73.58	72.08	68.85	71.81	97.55	97.05	78.71	71.24	71.08	110.92	142.32	132.60	68.85	90.65	142.32	64.47	143.01
1973	138.04	132.92	130.36	131.78	114.29	98.99	83.53	76.21	90.43	127.92	100.87	87.13	76.21	109.37	138.04	71.13	143.01
1974	80.49	74.30	74.08	86.94	92.52	83.34	120.95	139.43	130.01	130.06	107.09	80.09	74.08	99.94	139.43	74.00	143.01
1975	78.86	73.40	94.27	113.97	128.08	96.37	81.64	77.96	70.67	72.89	79.81	78.54	70.67	87.20	128.08	69.84	143.01
1976	77.74	72.30	72.15	112.57	128.00	100.52	82.74	73.84	72.21	75.84	79.67	82.51	72.15	85.84	128.00	71.51	143.01
1977	78.10	71.61	71.45	130.10	143.01	139.20	99.29	129.44	126.11	127.86	143.01	142.19	71.45	116.78	143.01	71.18	143.01
1978	139.44	131.06	134.19	143.01	143.01	128.32	91.00	129.10	126.17	132.27	119.26	87.59	87.59	125.37	143.01	74.53	143.01
1979	84.90	140.64	134.06	141.86	143.01	143.01	131.88	132.09	127.65	128.34	124.42	85.87	84.90	126.48	143.01	78.17	143.01
1980	78.85	95.15	124.63	94.25	104.50	90.57	80.05	75.33	124.56	127.15	143.01	110.01	75.33	104.00	143.01	72.08	143.01
1981	112.47	129.27	132.80	143.01	143.01	139.00	90.67	128.78	127.08	130.38	102.13	83.44	83.44	121.84	143.01	76.58	143.01
1982	79.19	73.16	115.90	109.75	142.16	142.78	97.73	130.39	127.62	138.45	139.64	137.88	73.16	119.55	142.78	72.97	143.01
1983	137.01	131.13	128.78	125.95	143.01	133.11	89.56	129.00	127.34	128.48	97.79	79.46	79.46	120.88	143.01	77.07	143.01
1984	79.83	73.63	81.37	85.38	91.74	78.76	78.38	73.31	72.32	86.70	109.38	98.05	72.32	84.07	109.38	72.25	126.26
1985	82.92	74.29	75.23	125.52	142.96	134.17	85.27	127.12	126.31	126.34	86.24	79.68	74.29	105.50	142.96	72.57	143.01
1986	77.93	72.27	72.12	97.87	142.91	142.86	96.61	127.13	125.84	125.66	100.95	98.92	72.12	106.75	142.91	72.03	143.01
1987	82.15	102.37	124.51	110.84	121.00	112.10	85.58	94.96	134.31	126.76	93.26	85.16	82.15	106.08	134.31	73.13	143.01
1988	78.26	71.93	109.56	137.13	143.01	136.66	89.52	129.27	127.55	130.93	143.01	129.99	71.93	118.90	143.01	71.69	143.01
1989	126.69	133.65	128.72	135.40	141.84	128.16	82.74	122.20	126.18	134.42	136.43	131.22	82.74	127.30	141.84	74.91	143.01
1990	143.01	135.04	138.99	143.01	143.01	138.49	91.95	130.16	128.08	132.94	128.63	100.75	91.95	129.50	143.01	78.31	143.01
Min.	70.20	64.83	65.89	71.81	83.93	76.10	72.14	69.40	65.42	72.89	79.67	71.74	64.83	78.60	101.37		
Avg.	97.22	98.97	107.60	116.23	127.85	118.38	94.44	110.67	114.66	122.89	111.11	97.08	76.22	109.76	137.62		
Max.	143.01	142.64	138.99	143.01	143.01	143.01	141.43	142.35	139.28	141.45	143.01	143.01	129.71	138.17	143.01		
Daily Min.	68.25	64.41	64.41	67.39	69.99	69.83	69.22	67.96	64.41	65.00	69.55	66.75				64.41	
Max.	143.01	143.01	143.01	143.01	143.01	143.01	143.01	143.01	143.01	143.01	143.01	143.01					143.01

Table D-6 Gitaru Energy Simulation Results (1995 Abstraction)

(Unit:GWh/y)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ann.Tot	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	95.15	84.03	88.02	83.54	103.89	99.14	56.70	84.42	84.11	87.67	76.19	75.77	1018.63	56.70	84.89	103.89	1.63	3.43
1958	57.12	45.99	88.13	69.07	101.58	102.97	105.22	103.73	92.33	94.43	66.94	55.58	983.09	45.99	81.92	105.22	1.63	3.43
1959	53.09	45.91	82.76	64.96	85.25	63.82	62.23	56.77	70.78	92.35	59.66	55.48	793.06	45.91	66.09	92.35	1.59	3.43
1960	52.99	45.52	51.89	63.07	75.42	61.36	57.11	51.63	47.25	59.52	67.31	55.78	688.85	45.52	57.41	75.42	1.55	3.43
1961	52.23	43.57	51.14	57.25	73.23	54.79	65.48	59.74	67.86	100.94	102.97	106.40	835.60	43.57	69.63	106.40	1.55	3.43
1962	106.40	95.14	99.64	99.12	106.40	99.70	72.25	96.93	93.70	98.44	73.99	55.98	1097.69	55.98	91.47	106.40	1.68	3.43
1963	56.14	66.36	89.83	90.41	106.40	102.97	92.21	97.97	90.57	91.97	69.99	70.81	1025.63	56.14	85.47	106.40	1.64	3.43
1964	101.98	83.13	96.09	100.62	106.40	100.07	73.82	100.65	91.58	101.72	79.53	62.23	1097.82	62.23	91.48	106.40	1.79	3.43
1965	79.16	83.95	89.92	77.94	62.44	59.76	53.67	55.08	47.10	90.09	82.27	67.01	848.39	47.10	70.70	90.09	1.55	3.43
1966	74.43	83.77	93.72	102.17	106.40	95.39	67.09	94.64	92.10	97.20	89.60	53.38	1049.89	53.38	87.49	106.40	1.60	3.43
1967	52.92	58.29	86.66	67.94	105.08	102.97	96.93	104.23	100.28	105.24	102.97	102.49	1088.00	52.92	90.67	105.24	1.59	3.43
1968	101.15	87.16	102.65	102.81	106.40	102.97	104.85	105.91	96.43	98.22	96.27	106.10	1210.92	87.16	100.91	106.40	1.69	3.43
1969	106.34	95.85	102.22	101.12	84.65	57.73	55.30	69.43	93.50	95.57	62.00	57.91	981.62	55.30	81.80	106.34	1.65	3.43
1970	56.07	47.44	53.19	92.57	106.40	98.33	67.41	97.24	92.99	95.85	65.40	54.97	927.86	47.44	77.32	106.40	1.62	3.43
1971	52.87	45.13	49.03	59.72	82.52	66.37	63.74	61.13	90.03	92.36	57.61	54.01	774.52	45.13	64.54	92.36	1.55	3.43
1972	54.74	48.44	51.22	51.70	72.58	69.87	58.56	53.00	51.18	82.52	102.47	98.65	794.93	48.44	66.25	102.47	1.55	3.43
1973	102.70	89.32	96.99	94.89	85.03	71.27	62.14	56.70	65.11	95.17	72.63	64.82	956.77	56.70	79.73	102.70	1.71	3.43
1974	59.89	49.93	55.12	62.60	68.84	60.01	89.99	103.74	93.61	96.77	77.10	59.58	877.18	49.93	73.10	103.74	1.78	3.43
1975	58.67	49.32	70.13	82.06	95.29	69.39	60.74	58.00	50.88	54.23	57.46	58.44	764.61	49.32	63.72	95.29	1.68	3.43
1976	57.84	48.59	53.68	81.05	95.23	72.38	61.56	54.94	51.99	56.42	57.36	61.39	752.43	48.59	62.70	95.23	1.72	3.43
1977	58.11	48.12	53.16	93.67	106.40	100.22	73.87	96.30	90.80	95.12	102.97	105.79	1024.53	48.12	85.38	106.40	1.71	3.43
1978	103.75	88.08	99.84	102.97	106.40	92.39	67.70	96.05	90.84	98.41	85.86	65.17	1097.46	65.17	91.45	106.40	1.79	3.43
1979	63.17	94.51	99.74	102.14	106.40	102.97	98.12	98.28	91.91	95.49	89.59	63.89	1106.21	63.17	92.18	106.40	1.88	3.43
1980	58.66	63.94	92.73	67.86	77.74	65.21	59.56	56.04	89.68	94.60	102.97	81.84	910.83	56.04	75.90	102.97	1.73	3.43
1981	83.68	86.87	98.80	102.97	106.40	100.08	67.46	95.81	91.50	97.01	73.53	62.08	1066.19	62.08	88.85	106.40	1.84	3.43
1982	58.92	49.17	86.23	79.02	105.77	102.80	72.71	97.01	91.89	103.01	100.54	102.58	1049.65	49.17	87.47	105.77	1.75	3.43
1983	101.93	88.12	95.81	90.68	106.40	95.84	66.63	95.97	91.68	95.59	70.41	59.12	1058.18	59.12	88.18	106.40	1.85	3.43
1984	59.40	49.48	60.54	61.48	68.25	56.71	58.32	54.54	52.07	64.51	78.75	72.95	737.00	49.48	61.42	78.75	1.73	3.03
1985	61.69	49.93	55.97	90.37	106.36	96.60	63.44	94.58	90.94	93.99	62.09	59.28	925.24	49.93	77.10	106.36	1.74	3.43
1986	57.98	48.56	53.65	70.47	106.32	102.86	71.88	94.59	90.60	93.49	72.68	73.60	936.68	48.56	78.06	106.32	1.73	3.43
1987	61.12	68.79	92.64	79.80	90.02	80.71	63.67	70.65	96.70	94.31	67.15	63.36	928.92	61.12	77.41	96.70	1.76	3.43
1988	58.22	48.34	81.52	98.73	106.40	98.40	66.60	96.17	91.83	97.41	102.97	96.71	1043.30	48.34	86.94	106.40	1.72	3.43
1989	94.26	89.81	95.77	97.49	105.53	92.27	61.56	90.92	90.85	100.01	98.23	97.62	1114.32	61.56	92.86	105.53	1.80	3.43
1990	106.40	90.74	103.41	102.97	106.40	99.71	68.41	96.84	92.22	98.90	92.62	74.95	1133.57	68.41	94.46	106.40	1.88	3.43
Min.	52.23	43.57	49.03	51.70	62.44	54.79	53.67	51.63	47.10	54.23	57.36	53.38	688.85	43.57	57.41	75.42		
Avg.	72.33	66.51	80.05	83.68	95.12	85.24	70.26	82.34	82.56	91.43	80.00	72.23	961.75	54.23	80.15	101.83		
Max.	106.40	95.85	103.41	102.97	106.40	102.97	105.22	105.91	100.28	105.24	102.97	106.40	1210.92	87.16	100.91	106.40		
Daily Min.	1.64	1.55	1.55	1.62	1.68	1.68	1.66	1.63	1.55	1.56	1.67	1.60					1.55	
Daily Max.	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43	3.43						3.43

Table D-7 Kindaruma Power Simulation Results (1995 Abstraction)

(Unit:MW)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.	Avg.	Max.	Daily Min.	Max.
1957	31.97	31.17	29.38	30.95	40.62	39.83	19.59	28.26	28.99	29.27	26.30	25.27	19.59	30.13	40.62	17.01	43.93
1958	19.90	17.12	29.44	24.53	40.20	43.69	40.49	35.72	32.00	31.65	23.82	19.35	17.12	29.83	43.69	16.94	43.93
1959	18.49	17.08	27.61	22.69	28.76	22.36	21.43	19.81	24.82	30.91	21.20	19.31	17.08	22.87	30.91	16.44	42.78
1960	18.43	16.91	17.67	22.21	25.61	21.68	19.93	17.41	16.32	20.06	23.65	19.46	16.32	19.95	25.61	15.99	41.18
1961	17.80	16.10	17.08	20.55	24.64	19.79	22.46	20.66	23.98	39.99	43.93	43.93	16.10	25.91	43.93	15.99	43.93
1962	43.93	36.72	33.70	35.55	43.67	38.16	24.37	32.70	32.53	33.39	26.11	19.60	19.60	33.37	43.93	18.45	43.93
1963	19.66	24.67	30.05	34.35	43.93	43.93	32.67	32.95	31.36	30.78	24.57	24.80	19.66	31.14	43.93	17.15	43.93
1964	37.35	30.81	32.67	40.46	43.93	39.43	24.68	34.01	31.72	35.19	28.05	21.43	21.43	33.31	43.93	19.77	43.93
1965	26.86	31.14	30.05	27.18	21.44	21.32	18.85	18.80	16.25	30.39	29.61	22.63	16.25	24.54	31.14	16.01	43.93
1966	25.43	31.06	31.78	41.16	43.75	34.77	22.79	31.83	31.98	32.99	35.31	18.25	18.25	31.76	43.75	16.63	43.93
1967	18.36	21.68	23.92	23.83	42.30	43.87	34.40	35.81	35.53	39.54	43.58	38.84	18.36	33.89	43.87	16.50	43.93
1968	34.20	32.47	34.93	40.44	43.93	43.93	39.03	37.61	33.60	34.54	38.22	43.60	32.47	38.04	43.93	18.53	43.93
1969	38.76	38.04	34.67	37.38	28.96	20.61	19.41	23.60	32.44	32.10	22.30	20.36	19.41	29.05	38.76	17.28	43.93
1970	19.66	18.00	18.03	36.45	43.67	38.47	22.92	32.72	32.23	32.27	23.39	19.29	18.00	28.09	43.67	16.88	43.93
1971	18.66	16.74	16.37	21.34	28.03	23.18	21.72	21.18	31.16	30.92	20.64	18.81	16.37	22.40	31.16	15.99	43.93
1972	19.04	18.42	17.34	18.34	24.76	24.41	20.31	18.13	18.51	28.79	41.39	35.86	17.34	23.77	41.39	16.01	43.93
1973	34.87	33.23	32.55	33.65	28.50	24.61	21.37	19.81	23.13	31.91	25.16	21.99	19.81	27.56	34.87	18.67	40.22
1974	20.75	19.39	19.34	21.96	23.09	21.36	30.33	35.88	32.46	32.47	26.89	20.66	19.34	25.38	35.88	19.32	39.59
1975	20.40	19.18	24.00	30.20	32.04	24.08	20.99	20.20	18.57	19.07	20.60	20.32	18.57	22.47	32.04	18.38	42.74
1976	20.15	18.94	18.90	29.49	31.98	24.95	21.17	19.28	18.40	19.73	20.57	21.18	18.40	22.06	31.98	18.06	41.43
1977	20.23	18.78	18.74	36.04	43.93	40.23	24.90	32.36	31.44	31.90	42.36	41.01	18.74	31.83	43.93	18.68	43.93
1978	35.59	32.81	33.70	43.22	43.93	34.26	22.97	32.27	31.46	33.95	32.09	22.15	22.15	33.20	43.93	19.45	43.93
1979	21.85	35.65	33.60	40.92	43.93	43.93	35.82	33.03	31.84	32.02	32.30	21.78	21.78	33.89	43.93	20.25	43.93
1980	20.39	24.23	31.05	23.76	25.93	22.72	20.65	19.62	31.09	31.73	41.72	27.40	19.62	26.69	41.72	18.89	43.93
1981	28.37	32.26	34.86	43.93	43.93	40.09	22.86	32.23	31.69	32.63	25.60	21.25	21.25	32.48	43.93	19.90	43.93
1982	20.47	19.13	29.02	27.36	42.01	42.78	24.58	32.69	31.83	39.16	39.08	40.75	19.13	32.41	42.78	19.09	43.93
1983	34.52	32.76	32.14	32.75	43.93	37.13	22.56	32.29	31.76	32.06	24.47	20.52	20.52	31.41	43.93	20.00	43.93
1984	20.61	19.24	21.02	21.84	22.95	20.37	20.29	19.16	18.18	22.18	27.26	24.37	18.18	21.46	27.26	18.16	31.48
1985	21.21	19.39	19.57	32.34	42.63	37.96	21.69	31.80	31.49	31.50	22.09	20.57	19.39	27.69	42.63	19.00	43.93
1986	20.19	18.93	18.90	25.11	41.62	42.54	24.34	31.81	31.37	31.32	25.37	24.91	18.90	28.03	42.54	18.87	43.93
1987	21.13	25.96	31.03	27.60	30.09	27.84	21.70	24.10	33.75	31.61	23.36	21.58	21.13	26.65	33.75	19.16	38.06
1988	20.26	18.85	27.52	37.57	43.93	38.40	22.62	32.31	31.86	34.25	42.29	32.91	18.85	31.90	43.93	18.80	43.93
1989	32.30	33.51	32.14	35.82	42.68	34.96	21.21	30.66	31.46	34.93	38.03	36.54	21.21	33.69	42.68	19.53	43.93
1990	42.52	34.24	39.24	43.93	43.93	39.56	23.44	32.84	32.15	34.79	33.94	25.69	23.44	35.52	43.93	20.55	43.93
Min.	17.80	16.10	16.37	18.34	21.44	19.79	18.85	17.41	16.25	19.07	20.57	18.25	16.10	19.95	25.61		
Avg.	25.42	25.14	27.26	31.32	36.45	32.86	24.37	28.05	28.75	31.47	29.86	25.78	19.52	28.89	39.70		
Max.	43.93	38.04	39.24	43.93	43.93	43.93	40.49	37.61	35.53	39.99	43.93	43.93	32.47	38.04	43.93		
Daily Min.	17.07	15.99	15.99	16.80	18.22	18.22	18.05	16.97	15.99	16.14	17.85	16.63				15.99	
Daily Max.	43.93	43.93	43.93	43.93	43.93	43.93	43.93	39.59	43.93	43.93	43.93	43.93					43.93

Table D-8 Kindaruma Energy Simulation Results (1995 Abstraction)

(Unit:GWh/y)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ann.Tot	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	23.78	20.95	21.86	22.29	30.22	28.68	14.58	21.02	20.87	21.77	18.94	18.80	263.76	14.58	21.98	30.22	0.41	1.05
1958	14.80	11.50	21.90	17.66	29.91	31.46	30.12	26.58	23.04	23.55	17.15	14.40	262.07	11.50	21.84	31.46	0.41	1.05
1959	13.75	11.48	20.54	16.34	21.40	16.10	15.94	14.74	17.87	23.00	15.26	14.36	200.78	11.48	16.73	23.00	0.39	1.03
1960	13.71	11.36	13.15	15.99	19.05	15.61	14.83	12.95	11.75	14.92	17.03	14.48	174.83	11.36	14.57	19.05	0.38	0.99
1961	13.24	10.82	12.71	14.80	18.33	14.25	16.71	15.37	17.27	29.76	31.63	32.69	227.58	10.82	18.96	32.69	0.38	1.05
1962	32.69	24.67	25.08	25.59	32.49	27.47	18.13	24.33	23.42	24.84	18.80	14.58	292.09	14.58	24.34	32.69	0.44	1.05
1963	14.63	16.58	22.35	24.73	32.69	31.63	24.31	24.51	22.58	22.90	17.69	18.45	273.05	14.63	22.75	32.69	0.41	1.05
1964	27.79	20.71	24.30	29.13	32.69	28.39	18.36	25.31	22.84	26.18	20.20	15.95	291.85	15.95	24.32	32.69	0.47	1.05
1965	19.98	20.93	22.36	19.57	15.95	15.35	14.03	13.98	11.70	22.61	21.32	16.84	214.62	11.70	17.88	22.61	0.38	1.05
1966	18.92	20.87	23.65	29.64	32.55	25.03	16.95	23.68	23.03	24.54	25.42	13.57	277.85	13.57	23.16	32.55	0.40	1.05
1967	13.66	14.57	21.52	17.16	31.47	31.58	25.59	26.64	25.58	29.42	31.38	28.90	297.47	13.66	24.79	31.58	0.40	1.05
1968	25.45	21.82	25.98	29.12	32.69	31.63	29.04	27.98	24.19	25.70	27.52	32.44	333.56	21.82	27.80	32.69	0.44	1.05
1969	28.84	25.56	25.80	26.91	21.55	14.84	14.44	17.56	23.36	23.88	16.05	15.14	253.93	14.44	21.16	28.84	0.41	1.05
1970	14.63	12.10	13.41	26.25	32.49	27.70	17.05	24.35	23.21	24.01	16.84	14.35	246.39	12.10	20.53	32.49	0.41	1.05
1971	13.88	11.25	12.18	15.37	20.85	16.69	16.16	15.76	22.43	23.00	14.86	14.00	196.43	11.25	16.37	23.00	0.38	1.05
1972	14.16	12.38	12.90	13.21	18.42	17.58	15.11	13.49	13.33	21.42	29.80	26.68	208.48	12.38	17.37	29.80	0.38	1.05
1973	25.94	22.33	24.22	24.22	21.20	17.72	15.90	14.74	16.66	23.74	18.11	16.36	241.14	14.74	20.10	25.94	0.45	0.97
1974	15.44	13.03	14.39	15.81	17.18	15.38	22.56	26.69	23.37	24.16	19.36	15.37	222.74	13.03	18.56	26.69	0.46	0.95
1975	15.17	12.89	17.86	21.75	23.84	17.34	15.62	15.03	13.37	14.19	14.83	15.12	197.01	12.89	16.42	23.84	0.44	1.03
1976	14.99	12.73	14.06	21.23	23.80	17.97	15.75	14.35	13.25	14.68	14.81	15.76	193.38	12.73	16.11	23.80	0.43	0.99
1977	15.05	12.62	13.95	25.95	32.69	28.96	18.53	24.08	22.64	23.73	30.50	30.51	279.21	12.62	23.27	32.69	0.45	1.05
1978	26.48	22.05	25.08	31.12	32.69	24.67	17.09	24.01	22.65	25.26	23.11	16.48	290.69	16.48	24.22	32.69	0.47	1.05
1979	16.26	23.96	25.00	29.47	32.69	31.63	26.65	24.58	22.93	23.82	23.26	16.20	296.45	16.20	24.70	32.69	0.49	1.05
1980	15.17	16.29	23.10	17.11	19.29	16.36	15.37	14.59	22.38	23.61	30.04	20.38	233.69	14.59	19.47	30.04	0.45	1.05
1981	21.11	21.68	25.94	31.63	32.69	28.87	17.01	23.98	22.82	24.28	18.43	15.81	284.25	15.81	23.69	32.69	0.48	1.05
1982	15.23	12.86	21.59	19.70	31.26	30.80	18.29	24.32	22.92	29.14	28.14	30.32	284.57	12.86	23.71	31.26	0.46	1.05
1983	25.68	22.01	23.91	23.58	32.69	26.73	16.78	24.02	22.87	23.85	17.62	15.27	275.01	15.27	22.92	32.69	0.48	1.05
1984	15.33	12.93	15.64	15.72	17.07	14.67	15.10	14.26	13.09	16.50	19.63	18.13	188.07	12.93	15.67	19.63	0.44	0.76
1985	15.78	13.03	14.56	23.28	31.71	27.33	16.14	23.66	22.67	23.44	15.90	15.30	242.80	13.03	20.23	31.71	0.46	1.05
1986	15.02	12.72	14.06	18.08	30.96	30.63	18.11	23.67	22.59	23.30	18.27	18.54	245.95	12.72	20.50	30.96	0.45	1.05
1987	15.72	17.45	23.09	19.87	22.39	20.04	16.14	17.93	24.30	23.52	16.82	16.05	233.32	15.72	19.44	24.30	0.46	0.91
1988	15.08	12.67	20.47	27.05	32.69	27.65	16.83	24.04	22.94	25.48	30.45	24.49	279.84	12.67	23.32	32.69	0.45	1.05
1989	24.03	22.52	23.91	25.79	31.75	25.17	15.78	22.81	22.65	25.99	27.38	27.19	294.97	15.78	24.58	31.75	0.47	1.05
1990	31.64	23.01	29.19	31.63	32.69	28.48	17.44	24.44	23.15	25.88	24.44	19.11	311.10	17.44	25.92	32.69	0.49	1.05
Min.	13.24	10.82	12.18	13.21	15.95	14.25	14.03	12.95	11.70	14.19	14.81	13.57	174.83	10.82	14.57	19.05		
Avg.	18.91	16.89	20.28	22.55	27.12	23.66	18.13	20.87	20.70	23.41	21.50	19.18	253.20	13.92	21.10	29.32		
Max.	32.69	25.56	29.19	31.63	32.69	31.63	30.12	27.98	25.58	29.76	31.63	32.69	333.56	21.82	27.80	32.69		
Daily Min.	0.41	0.38	0.38	0.40	0.44	0.44	0.43	0.41	0.38	0.39	0.43	0.40					0.38	
Daily Max.	1.05	1.05	1.05	1.05	1.05	1.05	1.05	0.95	1.05	1.05	1.05	1.05						1.05

Table D-9 Kiambere Power Simulation Results (1995 Abstraction)

(Unit:MW)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	140.21	139.64	138.21	137.17	139.70	140.37	140.27	139.63	138.14	136.58	137.04	139.77	136.58	138.89	140.37	135.93	140.38
1958	139.45	137.54	135.81	135.30	139.26	140.38	140.37	140.37	140.02	139.17	138.07	137.97	135.30	138.64	140.38	134.90	140.38
1959	137.72	137.06	135.66	135.01	137.52	140.16	140.36	139.64	138.22	137.19	136.36	137.43	135.01	137.69	140.36	134.64	140.38
1960	137.56	136.90	135.60	134.91	137.47	138.83	139.24	138.88	137.79	136.60	136.70	137.54	134.91	137.34	139.24	134.49	139.29
1961	137.14	136.13	134.90	134.96	136.42	137.29	137.92	138.88	138.25	138.97	140.38	140.38	134.90	137.64	140.38	134.35	140.38
1962	140.38	140.38	140.38	140.38	140.38	140.37	140.37	140.34	140.26	139.96	139.58	139.28	139.28	140.17	140.38	138.84	140.38
1963	139.19	137.72	136.36	136.71	140.38	140.38	140.37	140.32	139.70	138.70	137.83	139.52	136.36	138.93	140.38	135.38	140.38
1964	140.37	139.94	139.21	139.95	140.38	140.37	140.37	140.37	139.98	139.65	139.88	140.01	139.21	140.04	140.38	138.95	140.38
1965	139.68	139.02	137.70	136.66	137.45	138.11	138.32	138.19	137.29	136.64	137.46	139.47	136.64	138.00	139.68	136.17	140.38
1966	139.62	138.84	137.80	138.77	140.38	140.37	140.37	140.19	139.49	139.18	140.31	140.28	137.80	139.63	140.38	137.50	140.38
1967	139.40	137.61	135.97	135.33	139.52	140.38	140.37	140.38	140.38	140.38	140.38	140.37	135.33	139.20	140.38	134.83	140.38
1968	140.38	140.20	140.30	140.38	140.38	140.38	140.38	140.38	140.35	140.02	140.28	140.38	140.02	140.32	140.38	139.73	140.38
1969	140.38	140.38	140.38	140.38	139.98	140.20	140.37	139.79	139.45	138.92	137.81	140.19	137.81	139.85	140.38	137.32	140.38
1970	139.45	137.54	135.62	137.06	140.38	140.37	140.37	140.25	139.94	139.30	138.32	137.90	135.62	138.87	140.38	134.66	140.38
1971	137.70	137.01	135.60	134.71	137.45	139.90	140.37	139.65	138.61	137.48	136.50	136.30	134.71	137.61	140.37	134.29	140.38
1972	136.19	135.84	135.18	134.38	134.85	137.74	138.59	138.41	137.79	136.94	139.43	140.37	134.38	137.14	140.37	134.12	140.38
1973	140.38	140.31	139.98	139.72	139.57	140.37	140.38	139.63	138.17	137.26	137.18	138.85	137.18	139.32	140.38	136.55	140.38
1974	139.17	137.54	135.61	135.10	136.98	138.05	139.80	140.38	140.13	139.58	138.95	139.20	135.10	138.37	140.38	134.62	140.38
1975	139.21	137.54	135.74	135.84	139.00	140.37	140.38	139.63	138.10	136.57	135.96	136.45	135.74	137.90	140.38	134.86	140.38
1976	136.69	136.69	135.61	135.62	138.89	140.37	140.38	139.63	138.10	136.57	135.96	136.63	135.61	137.60	140.38	134.62	140.38
1977	137.09	137.02	135.61	136.36	140.25	140.37	140.37	140.21	139.57	138.69	139.87	140.38	135.61	138.82	140.38	134.62	140.38
1978	140.38	140.38	140.38	140.38	140.38	140.37	140.37	140.23	139.64	138.94	139.84	140.29	138.94	140.13	140.38	138.72	140.38
1979	139.46	139.35	139.72	140.20	140.38	140.38	140.37	140.32	139.85	139.11	139.34	140.36	139.11	139.90	140.38	138.67	140.38
1980	139.45	137.67	136.61	135.72	137.51	139.68	140.34	139.63	138.59	137.66	139.56	140.37	135.72	138.57	140.37	135.39	140.38
1981	139.81	139.45	138.93	140.35	140.38	140.37	140.37	140.28	139.75	138.97	138.49	139.06	138.49	139.68	140.38	137.98	140.38
1982	139.21	137.54	136.02	135.96	139.24	140.38	140.37	140.35	139.90	139.86	140.37	140.37	135.96	139.13	140.38	135.10	140.38
1983	140.38	140.26	139.81	139.12	140.35	140.37	140.37	140.28	139.77	139.00	138.15	138.59	138.15	139.70	140.38	137.62	140.38
1984	138.87	137.54	135.64	134.89	136.64	137.46	137.77	137.85	137.50	136.59	137.93	140.37	134.89	137.42	140.37	134.70	140.38
1985	139.45	137.54	135.61	136.00	139.48	140.37	140.37	140.21	139.60	138.68	137.47	137.85	135.61	138.55	140.37	134.62	140.38
1986	138.15	137.52	135.61	135.19	139.70	140.38	140.37	140.26	139.69	138.75	137.91	140.13	135.19	138.64	140.38	134.62	140.38
1987	139.45	137.79	136.88	136.36	138.89	140.37	140.37	139.65	139.31	138.70	137.69	138.79	136.36	138.69	140.37	135.72	140.38
1988	139.08	137.54	135.91	136.85	140.38	140.37	140.37	140.20	139.63	138.97	140.34	140.37	135.91	139.17	140.38	135.16	140.38
1989	139.96	140.25	139.86	140.06	140.37	140.37	140.37	140.19	139.59	139.07	140.38	140.38	139.07	140.07	140.38	138.91	140.38
1990	140.38	140.38	140.38	140.38	140.38	140.38	140.37	140.37	140.37	140.33	140.30	140.38	140.30	140.36	140.38	140.19	140.38
Min.	136.19	135.84	134.90	134.38	134.85	137.29	137.77	137.85	137.29	136.57	135.96	136.30	134.38	137.14	139.24		
Avg.	139.16	138.35	137.31	137.24	139.14	139.89	140.06	139.85	139.20	138.50	138.59	139.29	136.67	138.88	140.32		
Max.	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.30	140.36	140.38		
Daily Min.	136.04	135.52	134.53	134.14	134.12	136.53	137.52	137.78	136.68	135.83	135.79	136.23				134.12	
Daily Max.	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38	140.38					140.38

Table D-10 Kiambere Energy Simulation Results (1995 Abstraction)

(Unit:GWh/y)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ann.Tot	Min.	Avg.	Max.	Daily Min.	Max.
1957	101.76	93.63	102.76	88.68	103.70	98.46	62.52	94.90	98.32	99.26	59.77	66.23	1069.99	59.77	89.17	103.70	1.88	3.36
1958	74.74	62.15	100.17	62.14	89.39	100.76	103.09	104.12	100.55	103.37	76.15	59.01	1035.64	59.01	86.30	104.12	1.86	3.36
1959	58.90	52.94	97.26	58.37	58.81	60.01	64.88	72.72	81.37	102.12	62.02	58.77	828.17	52.94	69.02	102.12	1.86	3.34
1960	58.83	52.88	66.05	56.19	58.79	57.46	59.55	59.39	57.03	69.37	57.97	58.82	712.33	52.88	59.36	69.37	1.86	3.28
1961	58.65	52.58	57.69	57.24	58.34	56.82	58.98	60.39	84.06	99.99	100.76	104.12	849.62	52.58	70.80	104.12	1.85	3.36
1962	104.12	94.05	104.12	100.76	104.12	99.49	77.49	102.19	100.69	103.86	86.77	59.56	1137.22	59.56	94.77	104.12	1.92	3.36
1963	66.07	79.26	101.60	84.47	104.12	100.76	92.83	102.64	100.35	103.07	73.49	62.79	1071.45	62.79	89.29	104.12	1.87	3.36
1964	104.12	93.80	103.39	100.51	104.12	99.51	76.49	102.95	100.53	103.67	89.42	60.55	1139.06	60.55	94.92	104.12	1.92	3.36
1965	92.18	93.28	102.44	80.34	58.78	57.16	59.15	59.10	56.82	95.04	68.83	59.64	882.76	56.82	73.56	102.44	1.88	3.34
1966	83.28	93.17	102.50	99.79	104.12	95.23	70.28	100.66	100.22	103.37	99.07	61.79	1113.48	61.79	92.79	104.12	1.93	3.36
1967	68.47	72.39	101.35	61.46	92.37	100.76	99.47	102.95	100.76	104.12	100.76	103.15	1108.01	61.46	92.33	104.12	1.86	3.36
1968	104.12	93.95	104.08	100.76	104.12	100.76	104.00	104.12	100.75	103.90	100.71	104.12	1225.39	93.95	102.12	104.12	3.23	3.36
1969	104.12	94.05	104.12	100.76	95.73	59.50	60.96	79.73	100.20	103.21	71.44	68.67	1042.49	59.50	86.87	104.12	1.89	3.36
1970	75.77	64.34	69.11	89.90	104.12	97.90	70.81	101.98	100.50	103.45	77.58	58.97	1014.43	58.97	84.54	104.12	1.86	3.36
1971	58.89	52.92	62.79	56.09	58.78	60.71	68.43	73.72	99.69	102.30	63.78	58.29	816.39	52.92	68.03	102.30	1.85	3.33
1972	58.24	52.47	57.83	56.40	57.67	57.01	59.27	59.19	59.99	87.80	100.19	100.85	806.91	52.47	67.24	100.85	1.85	3.36
1973	102.92	94.01	103.88	100.36	86.40	73.20	67.00	70.64	78.05	102.16	64.71	59.38	1002.71	59.38	83.56	103.88	1.88	3.36
1974	68.06	65.57	69.84	56.38	58.58	57.13	78.29	103.10	100.61	103.62	82.96	59.53	903.67	56.38	75.31	103.62	1.86	3.36
1975	67.91	64.95	81.64	72.84	87.37	72.91	65.87	71.83	67.04	69.54	56.66	58.35	836.91	56.66	69.74	87.37	1.86	3.32
1976	58.46	52.80	70.87	64.89	74.77	74.23	66.35	71.13	66.46	70.31	56.65	58.43	785.35	52.80	65.45	74.77	1.86	3.29
1977	58.63	54.89	70.93	85.94	104.04	99.40	76.67	101.66	100.28	103.06	100.45	104.12	1060.07	54.89	88.34	104.12	1.86	3.36
1978	104.12	94.05	104.12	100.76	104.12	92.79	71.35	101.67	100.31	103.22	91.88	69.38	1137.77	69.38	94.82	104.12	1.92	3.36
1979	80.13	93.46	103.71	100.66	104.12	100.76	97.37	102.75	100.44	103.33	93.93	68.27	1148.93	68.27	95.74	104.12	1.93	3.36
1980	75.65	75.60	101.76	68.48	58.81	57.81	62.26	70.90	97.46	102.42	100.26	85.47	956.88	57.81	79.74	102.42	1.87	3.36
1981	91.97	93.52	103.22	100.75	104.12	99.26	71.67	100.71	100.38	103.24	78.49	59.47	1106.80	59.47	92.23	104.12	1.90	3.36
1982	67.90	64.78	95.18	65.04	100.40	100.76	76.38	100.83	100.48	103.80	100.06	99.27	1074.88	64.78	89.57	103.80	1.86	3.36
1983	104.12	93.98	103.77	100.00	104.10	95.56	70.37	100.73	100.40	103.26	75.48	59.27	1111.04	59.27	92.59	104.12	1.90	3.36
1984	63.94	65.11	73.45	58.60	58.43	56.89	58.92	58.95	56.91	77.68	60.75	80.41	770.04	56.89	64.17	80.41	1.86	3.27
1985	80.58	66.51	70.79	76.21	101.76	95.97	67.78	100.60	100.29	103.06	69.54	58.95	992.04	58.95	82.67	103.06	1.86	3.36
1986	59.08	62.52	71.23	56.37	102.29	100.76	77.67	100.78	100.35	103.10	69.72	80.09	983.96	56.37	82.00	103.10	1.86	3.36
1987	82.27	79.95	101.92	73.17	69.81	82.06	68.01	83.21	100.12	103.07	69.63	59.35	972.57	59.35	81.05	103.07	1.87	3.34
1988	65.59	64.45	92.54	90.48	104.12	98.19	70.00	101.63	100.31	103.24	100.74	100.08	1091.37	64.45	90.95	104.12	1.92	3.36
1989	103.70	93.98	103.80	100.57	104.12	92.00	67.11	97.40	100.29	103.30	100.76	104.12	1171.15	67.11	97.60	104.12	2.01	3.36
1990	104.12	94.05	104.12	100.76	104.12	100.76	81.97	102.06	100.76	104.09	100.20	98.92	1195.93	81.97	99.66	104.12	1.94	3.36
Min.	58.24	52.47	57.69	56.09	57.67	56.82	58.92	58.95	56.82	69.37	56.65	58.29		52.47	59.36	69.37		
Avg.	79.75	75.65	90.12	80.18	87.90	83.91	73.04	88.86	91.55	98.63	81.22	73.77		60.65	83.71	100.60		
Max.	104.12	94.05	104.12	100.76	104.12	100.76	104.00	104.12	100.76	104.12	100.76	104.12		93.95	102.12	104.12		
Daily Min.	1.88	1.87	1.86	1.85	1.85	1.88	1.90	1.90	1.89	1.88	1.87	1.88					1.85	
Daily Max.	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36	3.36						3.36

ANNEX-D2

MUTONGA DAM

Table D-11 Mutonga Ave. Reservoir Water Level Simulation Results (1995 Abstraction)

(Unit:EL.m)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	549.99	550.00	550.00	549.98	550.00	549.97	549.98	550.00	550.00	550.00	549.98	549.98	549.97	549.99	550.00	549.59	550.00
1958	549.98	549.99	550.00	549.94	550.00	549.99	549.96	549.99	550.00	550.00	549.98	549.98	549.94	549.98	550.00	549.65	550.00
1959	549.99	550.00	550.00	549.93	549.99	549.99	549.93	549.98	549.97	550.00	549.92	549.99	549.92	549.97	550.00	549.50	550.00
1960	549.99	550.00	549.98	549.99	549.99	550.00	549.98	549.71	549.23	549.39	549.97	549.99	549.23	549.85	550.00	548.90	550.00
1961	550.00	549.99	549.76	549.93	549.99	549.99	550.00	549.95	549.97	549.99	550.00	550.00	549.76	549.96	550.00	549.55	550.00
1962	550.00	549.98	549.99	549.99	550.00	549.96	549.96	550.00	550.00	550.00	549.98	550.00	549.96	549.99	550.00	549.66	550.00
1963	549.99	549.98	550.00	549.98	550.00	550.00	549.95	550.00	550.00	550.00	549.98	549.99	549.95	549.99	550.00	549.68	550.00
1964	549.99	549.99	550.00	550.00	550.00	549.97	549.98	549.99	550.00	550.00	549.97	549.99	549.97	549.99	550.00	549.60	550.00
1965	549.97	550.00	550.00	549.97	549.99	549.99	550.00	550.00	550.00	550.00	549.98	549.98	549.97	549.99	550.00	549.53	550.00
1966	549.99	549.99	549.97	550.00	550.00	549.94	549.98	550.00	550.00	549.99	549.98	549.98	549.94	549.98	550.00	549.57	550.00
1967	549.99	549.99	549.99	549.94	549.98	550.00	549.93	549.99	549.98	549.99	550.00	549.99	549.93	549.98	550.00	549.63	550.00
1968	549.99	549.99	550.00	550.00	550.00	550.00	549.97	549.99	549.99	549.99	549.99	550.00	549.97	549.99	550.00	549.79	550.00
1969	550.00	549.99	549.97	549.97	549.97	549.98	549.99	549.99	550.00	549.99	549.95	549.97	549.95	549.98	550.00	549.55	550.00
1970	549.98	549.98	549.99	549.97	550.00	549.95	549.97	550.00	550.00	549.99	549.97	550.00	549.95	549.98	550.00	549.46	550.00
1971	550.00	550.00	550.00	549.94	549.97	549.98	549.99	549.99	550.00	549.99	549.96	549.98	549.94	549.98	550.00	549.60	550.00
1972	549.99	550.00	549.98	549.92	549.97	549.98	550.00	550.00	549.90	549.99	549.94	549.92	549.90	549.96	550.00	549.55	550.00
1973	549.99	549.99	550.00	549.95	549.97	549.98	550.00	549.99	549.99	549.99	549.95	549.98	549.95	549.98	550.00	549.52	550.00
1974	549.99	549.98	549.99	549.88	549.96	549.99	549.98	549.99	550.00	549.98	549.95	549.97	549.88	549.97	550.00	549.47	550.00
1975	549.98	549.99	549.99	549.84	549.92	549.98	549.99	549.99	549.99	549.98	549.93	549.98	549.84	549.96	549.99	549.25	550.00
1976	550.00	549.99	550.00	549.89	549.96	549.98	549.99	549.99	549.99	549.97	549.94	549.96	549.89	549.97	550.00	549.57	550.00
1977	549.99	549.99	549.97	549.97	550.00	549.97	549.94	550.00	550.00	550.00	550.00	550.00	549.94	549.99	550.00	549.43	550.00
1978	549.98	549.98	549.98	550.00	550.00	549.96	549.97	550.00	550.00	549.98	549.98	549.96	549.96	549.98	550.00	549.68	550.00
1979	549.97	549.99	549.98	549.99	550.00	550.00	549.94	549.99	549.99	549.98	549.97	549.98	549.94	549.98	550.00	549.66	550.00
1980	549.99	549.99	549.99	549.93	549.96	549.99	550.00	549.99	549.99	549.98	549.99	549.97	549.93	549.98	550.00	549.53	550.00
1981	549.99	549.99	549.98	550.00	550.00	549.98	549.98	550.00	550.00	549.98	549.92	549.98	549.92	549.98	550.00	549.24	550.00
1982	549.99	549.99	549.99	549.92	549.99	549.99	549.98	550.00	549.99	549.99	550.00	549.99	549.92	549.99	550.00	549.61	550.00
1983	549.98	549.99	549.99	549.99	550.00	549.97	549.98	550.00	550.00	549.98	549.94	549.98	549.94	549.98	550.00	549.33	550.00
1984	549.99	549.99	549.99	549.89	549.96	549.95	549.94	549.91	549.89	549.96	549.92	549.98	549.89	549.95	549.99	549.51	550.00
1985	549.98	549.98	549.98	549.96	549.99	549.97	549.98	550.00	550.00	549.98	549.94	549.96	549.94	549.98	550.00	549.45	550.00
1986	549.99	549.99	549.97	549.95	550.00	549.99	549.98	550.00	549.99	549.98	549.94	549.95	549.94	549.98	550.00	549.65	550.00
1987	549.97	549.99	549.98	549.93	549.97	549.98	549.99	549.99	549.99	549.99	549.94	549.86	549.86	549.96	549.99	549.37	550.00
1988	549.97	549.98	549.97	549.98	550.00	549.97	549.98	550.00	549.99	549.96	549.99	549.97	549.96	549.98	550.00	549.60	550.00
1989	549.96	549.99	549.97	549.97	549.99	549.95	549.98	550.00	549.99	549.90	550.00	550.00	549.90	549.98	550.00	549.39	550.00
1990	549.99	549.98	550.00	550.00	550.00	549.98	549.97	549.99	549.99	549.99	550.00	549.97	549.97	549.99	550.00	549.57	550.00
Min.	549.96	549.98	549.76	549.84	549.92	549.94	549.93	549.71	549.23	549.39	549.92	549.86	549.23	549.85	549.99		
Avg.	549.99	549.99	549.98	549.96	549.99	549.98	549.98	549.98	549.97	549.97	549.97	549.98	549.91	549.98	550.00		
Max.	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	549.97	549.99	550.00		
Daily Min.	549.63	549.74	549.65	549.43	549.53	549.45	549.63	549.51	548.97	548.90	549.24	549.37				548.90	
Daily Max.	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00	550.00					550.00

Table D-12 Mutonga Outflow Simulation Results (1995 Abstraction)

(Unit:m3/s)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	120.25	110.32	107.54	117.63	263.51	194.19	71.22	99.46	105.51	105.90	102.98	127.18	71.22	127.14	263.51	65.00	494.85
1958	98.47	77.26	108.55	86.01	295.34	272.11	138.77	116.27	107.67	107.37	112.36	135.34	77.26	137.96	295.34	65.00	545.44
1959	92.28	71.81	107.69	72.87	105.14	79.44	72.81	76.71	89.07	107.63	95.35	106.85	71.81	89.80	107.69	65.00	122.46
1960	77.90	66.80	78.52	107.51	86.09	69.07	65.30	65.00	65.00	79.85	97.45	81.95	65.00	78.37	107.51	65.00	145.52
1961	71.04	65.42	65.00	98.81	115.22	79.03	67.28	65.35	92.06	292.66	1481.70	723.43	65.00	268.08	1481.70	65.00	2101.84
1962	314.13	143.08	124.09	145.32	412.46	162.83	91.22	111.33	110.86	119.90	110.81	73.80	73.80	159.99	412.46	65.00	698.24
1963	76.54	96.05	110.60	179.90	630.87	283.45	117.59	112.07	110.78	110.57	132.51	150.88	76.54	175.98	630.87	65.00	1061.93
1964	187.18	124.56	120.69	360.47	455.36	163.52	88.83	113.96	111.50	112.04	109.59	128.32	88.83	173.00	455.36	65.00	1015.43
1965	129.97	119.00	113.48	104.49	110.13	79.34	69.94	67.73	67.06	105.71	147.37	104.91	67.06	101.59	147.37	65.00	179.30
1966	101.64	117.81	125.15	204.51	309.31	139.93	89.78	116.07	115.74	129.86	288.54	96.68	89.78	152.92	309.31	68.32	579.86
1967	88.63	92.90	113.50	96.37	473.52	305.40	133.86	128.88	126.58	171.46	335.67	276.43	88.63	195.27	473.52	65.00	696.88
1968	147.22	130.02	182.70	376.56	500.80	286.00	162.35	144.79	124.26	133.38	280.61	643.14	124.26	259.32	643.14	113.91	1360.23
1969	194.07	162.09	158.45	151.91	164.91	94.61	81.99	97.36	117.49	120.83	117.49	105.71	81.99	130.58	194.07	65.00	276.62
1970	99.23	88.79	89.05	222.47	236.98	161.89	92.14	119.17	117.03	120.34	108.69	76.29	76.29	127.67	236.98	65.00	510.41
1971	70.82	67.01	69.74	97.21	123.96	93.36	86.61	90.01	114.83	114.47	88.17	82.97	67.01	91.60	123.96	65.00	176.88
1972	75.79	70.34	68.10	70.37	91.86	84.71	77.69	70.81	67.34	98.08	168.16	144.69	67.34	90.66	168.16	65.00	281.63
1973	137.07	121.30	114.55	127.52	116.54	95.97	77.42	83.14	89.26	115.62	100.15	79.32	77.42	104.82	137.07	65.28	191.82
1974	79.09	83.11	83.60	129.11	102.05	79.38	101.01	125.59	115.06	118.27	131.21	83.87	79.09	102.61	131.21	65.00	258.11
1975	83.07	83.18	91.33	118.13	132.19	95.94	78.57	84.04	76.78	85.72	94.85	79.24	76.78	91.92	132.19	65.00	223.51
1976	68.36	65.81	75.77	84.72	101.34	96.94	77.91	79.33	74.94	81.05	91.70	89.53	65.81	82.28	101.34	65.00	142.28
1977	79.78	74.60	86.04	177.97	325.85	219.96	99.94	115.21	112.30	113.08	243.04	244.76	74.60	157.71	325.85	65.00	518.58
1978	154.01	126.37	164.88	606.50	483.97	151.85	97.45	121.83	117.88	132.17	179.49	159.82	97.45	208.02	606.50	81.21	1038.73
1979	142.21	181.91	144.27	245.54	498.12	370.23	142.96	121.36	117.09	120.83	190.20	105.08	105.08	198.32	498.12	77.35	785.01
1980	100.21	101.75	116.11	96.54	107.52	85.11	77.42	84.57	111.48	115.74	200.77	128.96	77.42	110.51	200.77	65.00	256.37
1981	112.50	117.99	137.69	333.49	495.68	214.77	99.09	120.60	119.34	121.63	123.45	90.93	90.93	173.93	495.68	65.00	663.28
1982	88.00	87.41	107.14	130.88	259.97	258.09	102.97	119.42	118.20	187.79	251.95	247.68	87.41	163.29	259.97	77.45	566.60
1983	149.07	124.26	116.35	158.32	299.17	160.25	90.62	115.93	115.57	121.12	124.72	93.73	90.62	139.09	299.17	65.00	408.88
1984	92.21	91.65	89.34	80.84	76.84	69.20	68.02	66.60	65.81	113.63	127.41	130.01	65.81	89.30	130.01	65.00	189.53
1985	104.94	94.04	94.53	157.20	260.37	179.15	91.52	116.71	116.72	120.72	108.45	92.77	91.52	128.09	260.37	65.00	451.99
1986	78.61	82.96	86.38	99.09	245.34	226.29	97.48	113.84	113.63	118.24	139.97	167.49	78.61	130.78	245.34	65.00	393.27
1987	115.69	107.60	115.29	97.51	96.91	111.44	83.70	96.63	112.35	111.74	110.60	82.30	82.30	103.48	115.69	65.00	143.54
1988	79.67	84.24	114.12	259.88	607.76	173.76	90.17	117.44	116.74	135.59	216.33	181.45	79.67	181.43	607.76	65.00	983.51
1989	161.07	127.21	127.09	166.38	199.95	147.80	87.00	111.68	116.92	164.34	322.90	287.45	87.00	168.31	322.90	79.64	577.88
1990	268.10	131.73	204.23	555.80	438.30	197.51	102.77	123.14	116.07	148.47	206.28	223.75	102.77	226.35	555.80	87.86	712.31
Min.	68.36	65.42	65.00	70.37	76.84	69.07	65.30	65.00	65.00	79.85	88.17	73.80	65.00	78.37	101.34		
Avg.	118.79	102.66	112.10	179.94	271.27	161.25	93.34	103.29	104.97	125.17	198.26	165.49	81.24	144.71	337.55		
Max.	314.13	181.91	204.23	606.50	630.87	370.23	162.35	144.79	126.58	292.66	1481.70	723.43	124.26	268.08	1481.70		
Daily Min.	65.00	65.00	65.00	65.00	65.00	65.00	65.00	65.00	65.00	65.00	65.00	65.00				65.00	
Daily Max.	549.68	323.19	301.99	1038.73	1061.93	631.67	211.52	152.59	139.45	707.08	2101.84	1360.23					2101.84

Table D-13 Mutonga Power Simulation Results (1995 Abstraction)

(Unit:MW)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	59.20	59.21	59.21	59.18	59.21	59.17	59.19	59.21	59.21	59.20	59.18	59.19	59.17	59.19	59.21	58.63	59.21
1958	59.19	59.20	59.21	59.13	59.21	59.19	59.15	59.19	59.21	59.21	59.18	59.18	59.13	59.19	59.21	58.71	59.21
1959	59.19	59.20	59.20	59.10	59.19	59.20	59.12	59.18	59.16	59.21	59.10	59.19	59.10	59.17	59.21	58.50	59.21
1960	59.20	59.21	59.18	59.20	59.19	59.20	59.18	58.80	58.12	58.34	59.17	59.20	58.12	59.00	59.21	57.62	59.21
1961	59.20	59.19	58.87	59.11	59.19	59.20	59.21	59.14	59.17	59.19	59.21	59.21	58.87	59.16	59.21	58.57	59.21
1962	59.21	59.18	59.20	59.20	59.21	59.15	59.15	59.21	59.21	59.21	59.17	59.21	59.15	59.19	59.21	58.73	59.21
1963	59.20	59.18	59.21	59.19	59.21	59.20	59.14	59.21	59.21	59.21	59.18	59.19	59.14	59.19	59.21	58.75	59.21
1964	59.19	59.20	59.21	59.21	59.21	59.17	59.17	59.20	59.21	59.21	59.17	59.20	59.17	59.19	59.21	58.65	59.21
1965	59.17	59.20	59.21	59.17	59.19	59.20	59.21	59.21	59.21	59.21	59.18	59.18	59.17	59.19	59.21	58.54	59.21
1966	59.20	59.20	59.17	59.20	59.20	59.13	59.19	59.21	59.21	59.19	59.18	59.18	59.13	59.19	59.21	58.61	59.21
1967	59.19	59.19	59.20	59.12	59.18	59.20	59.11	59.19	59.19	59.19	59.21	59.20	59.11	59.18	59.21	58.68	59.21
1968	59.19	59.20	59.20	59.21	59.21	59.21	59.17	59.20	59.20	59.19	59.20	59.21	59.17	59.20	59.21	58.92	59.21
1969	59.20	59.20	59.17	59.17	59.17	59.18	59.19	59.20	59.21	59.19	59.14	59.17	59.14	59.18	59.21	58.57	59.21
1970	59.19	59.18	59.19	59.17	59.21	59.14	59.17	59.21	59.21	59.19	59.16	59.20	59.14	59.18	59.21	58.45	59.21
1971	59.20	59.21	59.20	59.13	59.16	59.18	59.19	59.19	59.21	59.19	59.16	59.18	59.13	59.18	59.21	58.64	59.21
1972	59.20	59.21	59.17	59.10	59.16	59.18	59.21	59.20	59.06	59.20	59.12	59.09	59.06	59.16	59.21	58.57	59.21
1973	59.19	59.20	59.20	59.14	59.16	59.18	59.20	59.20	59.20	59.19	59.14	59.18	59.14	59.18	59.20	58.52	59.21
1974	59.19	59.18	59.19	59.04	59.16	59.20	59.17	59.19	59.20	59.17	59.14	59.16	59.04	59.17	59.20	58.46	59.21
1975	59.19	59.19	59.19	58.98	59.10	59.18	59.20	59.20	59.20	59.18	59.11	59.18	58.98	59.16	59.20	58.14	59.21
1976	59.21	59.20	59.20	59.05	59.15	59.18	59.20	59.20	59.20	59.16	59.13	59.16	59.05	59.17	59.21	58.60	59.21
1977	59.19	59.20	59.17	59.17	59.21	59.16	59.12	59.21	59.20	59.20	59.21	59.21	59.12	59.19	59.21	58.40	59.21
1978	59.18	59.19	59.18	59.21	59.21	59.16	59.16	59.21	59.21	59.18	59.18	59.15	59.15	59.18	59.21	58.75	59.21
1979	59.16	59.19	59.17	59.20	59.21	59.21	59.12	59.20	59.20	59.19	59.16	59.18	59.12	59.18	59.21	58.73	59.21
1980	59.20	59.20	59.20	59.11	59.15	59.20	59.20	59.20	59.20	59.19	59.20	59.16	59.11	59.18	59.20	58.54	59.21
1981	59.20	59.20	59.18	59.21	59.21	59.18	59.18	59.21	59.20	59.18	59.10	59.19	59.10	59.19	59.21	58.13	59.21
1982	59.20	59.20	59.20	59.10	59.20	59.19	59.18	59.20	59.20	59.20	59.21	59.20	59.10	59.19	59.21	58.65	59.21
1983	59.18	59.20	59.20	59.19	59.21	59.17	59.18	59.20	59.20	59.19	59.12	59.18	59.12	59.18	59.21	58.26	59.21
1984	59.20	59.20	59.19	59.06	59.15	59.13	59.13	59.08	59.05	59.16	59.10	59.18	59.05	59.14	59.20	58.52	59.21
1985	59.19	59.18	59.18	59.15	59.19	59.17	59.18	59.20	59.20	59.18	59.13	59.16	59.13	59.18	59.20	58.44	59.21
1986	59.20	59.19	59.16	59.14	59.21	59.19	59.17	59.20	59.20	59.18	59.12	59.14	59.12	59.18	59.21	58.71	59.21
1987	59.17	59.19	59.19	59.12	59.16	59.17	59.19	59.19	59.20	59.19	59.12	59.00	59.00	59.16	59.20	58.31	59.21
1988	59.17	59.18	59.17	59.17	59.21	59.17	59.18	59.20	59.20	59.15	59.19	59.17	59.15	59.18	59.21	58.65	59.21
1989	59.15	59.20	59.17	59.17	59.20	59.14	59.19	59.20	59.20	59.07	59.21	59.21	59.07	59.17	59.21	58.35	59.21
1990	59.20	59.18	59.21	59.21	59.21	59.18	59.17	59.20	59.19	59.20	59.21	59.17	59.17	59.19	59.21	58.61	59.21
Min.	59.15	59.18	58.87	58.98	59.10	59.13	59.11	58.80	58.12	58.34	59.10	59.00	58.12	59.00	59.20		
Avg.	59.19	59.19	59.18	59.15	59.19	59.18	59.17	59.18	59.16	59.16	59.16	59.17	59.08	59.17	59.21		
Max.	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.17	59.20	59.21		
Daily Min.	58.69	58.84	58.72	58.40	58.54	58.44	58.68	58.51	57.75	57.62	58.13	58.31				57.62	
Daily Max.	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21	59.21					59.21

Table D-14 Mutonga Energy Simulation Results (1995 Abstraction)

(Unit:GWh/y)

	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Ann.Tot	Min.	Avg.	Max.	Daily Min.	Daily Max.
1957	29.11	25.44	27.38	27.63	43.97	37.17	17.42	24.88	25.91	26.41	24.42	30.71	340.45	17.42	28.37	43.97	0.52	1.42
1958	24.22	16.71	27.36	20.03	42.00	41.69	33.60	28.62	26.54	27.33	26.26	33.02	347.38	16.71	28.95	42.00	0.52	1.42
1959	22.72	15.81	26.94	17.27	25.81	18.54	17.50	18.30	20.86	27.41	22.51	26.78	260.45	15.81	21.70	27.41	0.51	0.95
1960	18.91	14.89	18.78	26.27	21.04	16.40	16.17	16.00	15.31	19.18	23.21	19.77	225.93	14.89	18.83	26.27	0.51	1.18
1961	17.35	14.63	16.02	23.35	28.28	18.57	16.58	16.16	21.45	34.75	42.63	44.05	293.82	14.63	24.48	44.05	0.52	1.42
1962	44.05	32.25	29.98	32.99	44.05	36.14	22.01	28.00	27.40	29.81	26.12	17.91	370.71	17.91	30.89	44.05	0.52	1.42
1963	18.36	21.25	28.23	31.46	44.05	42.58	29.01	28.16	27.38	28.24	31.13	36.24	366.09	18.36	30.51	44.05	0.52	1.42
1964	40.76	27.27	28.83	39.06	44.05	36.15	21.35	28.21	27.54	28.56	25.41	30.94	378.13	21.35	31.51	44.05	0.52	1.42
1965	31.32	25.77	28.91	24.98	27.41	18.59	17.12	16.67	16.00	26.30	34.91	25.89	293.87	16.00	24.49	34.91	0.52	1.42
1966	24.31	25.66	30.42	39.73	43.91	32.10	21.86	27.54	27.68	29.54	42.20	23.62	368.57	21.86	30.71	43.91	0.54	1.42
1967	21.32	20.20	28.69	21.32	42.74	42.62	32.19	31.12	29.57	37.18	42.63	43.75	393.33	20.20	32.78	43.75	0.52	1.42
1968	36.77	28.39	43.67	42.40	44.05	42.63	39.79	36.06	29.12	31.64	42.05	44.05	460.62	28.39	38.39	44.05	0.90	1.42
1969	43.72	35.71	39.45	36.69	39.49	22.54	19.54	23.05	27.20	28.94	26.67	26.04	369.04	19.54	30.75	43.72	0.52	1.42
1970	24.21	19.30	20.76	40.18	44.05	36.66	22.27	28.41	27.54	29.33	25.26	18.39	336.36	18.39	28.03	44.05	0.52	1.42
1971	17.27	14.92	16.95	21.80	30.02	22.01	20.83	21.47	27.43	28.49	20.34	19.90	261.43	14.92	21.79	30.02	0.52	1.41
1972	18.28	15.51	16.62	16.33	21.62	19.72	18.67	17.27	15.96	23.34	35.18	33.33	251.83	15.51	20.99	35.18	0.52	1.42
1973	33.35	26.31	28.51	29.43	28.24	22.72	18.64	19.83	20.86	28.24	22.95	18.89	297.97	18.64	24.83	33.35	0.52	1.41
1974	18.94	17.75	19.74	27.81	24.72	18.39	24.16	30.20	27.63	29.20	30.42	19.71	288.67	17.75	24.06	30.42	0.52	1.42
1975	19.87	17.91	22.02	26.22	31.11	22.64	18.85	20.09	17.83	20.01	21.09	18.98	256.62	17.83	21.38	31.11	0.51	1.42
1976	16.79	14.66	18.19	19.20	24.35	22.93	18.72	18.91	17.43	18.94	20.36	21.13	231.61	14.66	19.30	24.35	0.52	1.14
1977	19.11	16.22	20.21	36.95	44.05	40.71	23.63	27.73	27.59	28.58	41.39	44.05	370.22	16.22	30.85	44.05	0.52	1.42
1978	38.36	27.39	39.00	42.63	44.05	35.00	23.29	29.13	27.71	30.46	40.92	38.54	416.48	23.29	34.71	44.05	0.55	1.42
1979	33.43	38.35	35.47	40.31	44.05	42.63	33.98	29.08	27.27	29.41	37.06	25.90	416.94	25.90	34.75	44.05	0.54	1.42
1980	24.89	22.04	28.90	22.29	25.67	19.95	18.61	20.22	26.90	28.77	40.86	32.13	311.23	18.61	25.93	40.86	0.52	1.42
1981	27.30	25.75	33.55	42.54	44.05	39.77	24.52	28.91	27.64	29.66	28.09	22.07	373.85	22.07	31.15	44.05	0.52	1.42
1982	21.32	19.06	26.49	28.42	43.56	41.64	25.30	28.55	27.47	36.19	42.63	43.28	383.91	19.06	31.99	43.56	0.56	1.42
1983	37.30	27.07	28.45	31.76	44.05	35.36	22.04	27.48	27.50	28.96	28.16	22.54	360.67	22.04	30.06	44.05	0.52	1.42
1984	22.50	20.23	21.34	18.60	18.30	16.26	16.68	16.41	15.71	26.43	29.57	31.75	253.78	15.71	21.15	31.75	0.51	1.42
1985	26.15	20.65	22.19	34.16	43.21	37.03	22.25	27.69	27.39	29.45	24.89	22.31	337.37	20.65	28.11	43.21	0.52	1.42
1986	18.84	17.79	20.38	21.83	43.54	40.89	23.74	27.34	27.58	28.98	29.61	39.29	339.81	17.79	28.32	43.54	0.52	1.42
1987	28.26	23.43	28.58	22.64	22.97	26.41	20.20	23.12	27.29	27.93	24.77	19.18	294.78	19.18	24.57	28.58	0.51	1.15
1988	18.87	18.02	26.81	39.25	44.05	36.71	21.93	27.80	27.59	31.72	40.94	41.77	375.46	18.02	31.29	44.05	0.52	1.42
1989	38.32	27.92	30.25	37.22	44.04	33.37	20.97	26.45	27.57	36.11	42.63	44.05	408.90	20.97	34.08	44.05	0.52	1.42
1990	43.82	29.18	39.50	42.63	44.05	39.83	25.29	29.49	27.47	33.52	42.63	42.38	439.79	25.29	36.65	44.05	0.61	1.42
Min.	16.79	14.63	16.02	16.33	18.30	16.26	16.17	16.00	15.31	18.94	20.34	17.91	225.93	14.63	18.83	24.35		
Avg.	27.06	22.45	27.02	30.16	36.61	31.07	22.61	24.95	24.98	28.79	31.76	30.07	337.53	18.99	28.13	39.37		
Max.	44.05	38.35	43.67	42.63	44.05	42.63	39.79	36.06	29.57	37.18	42.63	44.05	460.62	28.39	38.39	44.05		
Daily Min.	0.52	0.52	0.52	0.51	0.52	0.52	0.52	0.51	0.51	0.51	0.51	0.51					0.51	
Daily Max.	1.42	1.42	1.42	1.42	1.42	1.42	1.42	1.24	1.12	1.42	1.42	1.42						1.42