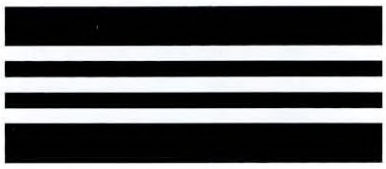

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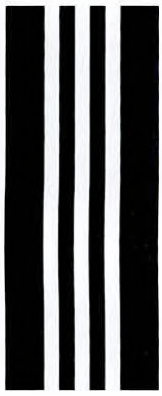

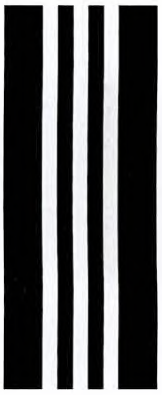

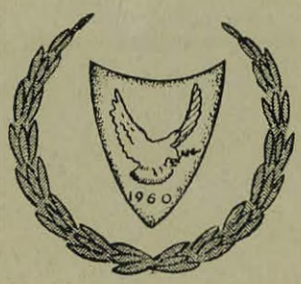

REPUBLIC OF CYPRUS

DEPARTMENT OF WATER DEVELOPMENT

ANNUAL REPORT FOR 1961

Reg. No. 6795

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REPUBLIC OF CYPRUS

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CONTENTS

INTRODUCTION

The engineering and geological side of all Government Water Development Work has been in the hands of the Department of Water Development whose duties include the search for new sources, the conservation and development of supplies for irrigation, domestic and industrial use, and the problems connected with river training, flood protection and land drainage. The administration of village Irrigation Divisions and Associations and Domestic Water Commissions has been supervised by the District Officers. Disputes over water rights have been handled chiefly by the District Officer in consultation with the Law Officers and the Departments of Land Registration and Water Development. Soil Conservation and the Agricultural problems involved in the economic use of water for irrigation are responsibilities of the Department of Agriculture.

The financial year of 1961 was certainly a record year from the point of view of the execution of water development schemes. As it is seen from the table of capital invested in water development projects on page 11 a total expenditure of £1,147,442 was incurred on schemes during the past year.

The winter of 1960/1961 was one of low rainfall. The average precipitation over the whole island was only 17.20 inches or about 86.8 of normal. It was below normal almost everywhere in the island. This low rainfall was reflected by a considerable diminution in the flow of springs during the summer of 1961 and a considerable reduction in the output of wells and chain-of-wells tapping shallow aquifers. Many villages suffered severely from shortage of domestic supplies and irrigation water.

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The department is divided into six technical sections.

(a) Irrigation and Drainage.

(b) Town Water Supplies.

(c) Village domestic water supplies.

(d) Hydro-geology and drilling.

(e) Hydrology.

(f) Workshops.

Other sections dealing with accounts, administration and clerical matters together comprise a head office which serves all the above technical services. There is continuous liaison between all branches so that their work is co-ordinated in the best interests of the over all water supply problems of the island. Thus a source of water may be developed for domestic water supplies in excess of the requirements of a particular village and the surplus may be utilised for irrigation. Where gravity water supplies are not available geological investigations may locate underground sources from which water can be pumped for irrigation or domestic use.

Notes on the work of the irrigation and drainage, town water supplies, villages water supplies and Hydrology sections are given in the Appendices 3, 8, 9, 14 respectively.

DRILLING FOR WATER

The year 1961 was a record year for prospecting drilling for groundwater. During the year the department's drilling plant consisted of 16 rigs at the beginning of the year, and another 4 were taken on loan from Limni Mines in middle of July. At the beginning of the year there were one Ruston-Bucyrus 60 R.L., twelve Ruston-Bucyrus 22 Ws, and two Edecos which together were used for about six months only, and are now held in reserve. The four rigs on loan from Limni Mines consist of 1 Ruston-Bucyrus 33, 1 Ruston-Bucyrus 22 and 2 Mangolds, which have all been in

continual use since September. A privately owned Ruston-Bucyrus type rig was used on contract drilling for a period of two and a half months during summer.

All these rigs are of the percussion type but one 22-W is fitted with a rotary attachment enabling the rig to be used for either percussion or rotary (shot crown or tungstemcarbide crown) core drilling. The normal capacity range of the rigs is 8" to 10" diameter boreholes to depths of up to 500 feet but the 60 R.L. is a much heavier duty rig. Under normal conditions it can drill an 8" diameter borehole to a depth of over 1,000 feet or, alternatively, can be used to drill 18" diameter holes to over 250 feet depth.

The department has also a number of transportable deep-well pumping units for long, continuous test-pumping of wells and boreholes. In addition to several old reciprocating pumping units, there are two diesel-driven turbine pumps of 5,000 and 15,000 gallons per hour capacity respectively, at 100 feet head and three 25 K.V.A. mobile diesel-electric generating sets which are used in conjuction with $7\frac{1}{2}$" diameter electro-submersible pumps. With these units borehole test-pumping may be carried out in the capacity head range of 18,000 gallons per hour from 100 feet to 8,000 gallons from 400 feet. In all 50 long test pumpings, from 48 hours to 663 hours continuous duration, were carried out, involving a total pumping time of 6,760 hours and a total volume of 50.3 million gallons of water. Experience has proved that such exhaustive test-pumping are absolutely essential for proving the reliability of the aquifers.

The number of boreholes drilled during 1961 was 199 with an aggregate footage of 49,681 and an average depth of 245 feet 187 boreholes with a total footage of 47,930 were drilled for water. The average drilling depth for water was 256 feet. The average time taken to complete a borehole, including the time taken to lay casing and to carry out an eight hour test-pumping of a successful borehole was 21.7 days. The average footage drilled per day was 11.5 feet. The total tested yield of boreholes

sunk for water in 1959 was 22,817,000 gallons per day. In addition to new drillings 36 old boreholes were cleaned and renovated, involving 407 drilling days, equivalent to the average time taken to drill 19 new boreholes 54 boreholes were sunk for irrigation of these 37 or 68.5% produced on test an aggregate of 9.73 million gallons per day a quantity which is considered sufficient to irrigate 5,000 donums in summer.

The number of successful irrigation boreholes drilled by Government since 1946 is now 1,303 with a tested output of 270.4 million gallons per day, sufficient to irrigate 135,000 donums of summer crops.

The actual area now being irrigated as a result of these drillings is conservatively estimated to be of the order of 108,500 donums. The census of 1946 estimated that at the time some 53,000 donums of land were being irrigated perennially by pumped water. By the end of 1961 as a result of Water Development Department drilling alone this has been increased by 206% to 162,500 donums.

Apart from the necessity of meeting the continual heavy demand for new boreholes from the highly productive Western Mesaoria, drilling for water has been fairly evenly distributed throughout Cyprus in 1961. By districts, the borehole distributions is as follows:-

Nicosia and Kyrenia	78
Famagusta	28
Larnaca	24
Limassol	26
Paphos	31

125 prospecting boreholes were sunk in 1959. Most of these were drilled for domestic water supply purposes.

In fact the programme of the prospecting drilling for 1961 was so arranged as to secure a source of water supply to a great number of villages which are at the moment in great need of a satisfactory supply. It is considered that a total of about 48 villages will be supplied with a satisfactory domestic water supply from the successful boreholes put down in 1961. The prospecting

drilling of 1961 produced very interesting discoveries. Firstly the seismic survey of 1958 proved once again very helpful in the siting of boreholes in a number of river valleys like the Kourris, Yermasoyia, Dhiarizos, Ezuza and Xeropotamos, where a number of successful boreholes were put down in the deep alluvia of these rivers.

Undoubtedly, however, the biggest find of the year was the Bellapais borehole intended for Kyrenia Water Supply which in the recent years of the low rainfall has been suffering from an acute water supply shortage. The grid reference of this boring is N.83,100 E.98,850 and its surface elevation is 1,145.62 feet, above Mean Sea Level. It was purposely located fairly close to the big thrust plane going east west on the Western side of the Kyrenia range and purposely sited near the Kyrenia - Pass Bellapais road for the easy transport of tools and equipment. The borehole penetrated 692 feet of solid hard Kyrenia Limestone and it took the drilling crew 11 months to reach that depth. A small quantity of water was struck at 263-268 feet but the big quantity of water was struck in a fissure at a depth 650-654 feet. The water immediately shot up to 260'.4" below ground level. The borehole was test-pumped for a total of 370 hours at a rate of 15,000 gallons an hour. This rate was the maximum capacity of the electrosubmersible pump used. The drawdown obtained at the beginning was 316'.10" feet but after pumping was on for three days the working water level rose from 316'.10" feet to 292'.0" feet below ground level indicating that as the pumping went on the fissure allowing the entrance of the water into the borehole was being enlarged. It was interesting to note that the recovery of the borehole was very quick indeed taking only 50-60 seconds for the S.W.L. to come to 260'.4" feet below ground level. The drilling of the borehole was a difficult task for a number of caverns and fissures were penetrated which had to be filled with concrete and then redrilled again. Just above the water table very hard silicified limestone was met and on many working days the daily progress of work was very slow indeed amounting only to very few inches. The borehole, however, proved that the Kyrenia limestone is a very good potential aquifer.

A second small aquifer discovered during the year is the area around Khirokitia and Psematismenos villages. Here two boreholes penetrated coarse grained sediments of the Pakhna series and both boreholes proved very good producers. The borehole near Khirokitia was pumped for 5 days at a rate of 7,000 gallons per hour with a maximum drawdown of 67'.10" feet.

Another very useful find of the year is the Plio-Pleistocene aquifer around Pera village 14 miles south of Nicosia. A prospecting borehole has (N.52,700, E.94,250) penetrated 273 feet of Plio-Pleistocene course grained sediments. Water was struck in three aquifers, the lowest consisted of clean coarse grained gravel. This borehole produced on test-pumping for 8 days 15,000 gallons per hour with a maximum drawdown of 136'.6" feet.

A last but by no means least useful find was a gypsum aquifer east of Athienou village. Here again two boreholes were put down which penetrated about 500 feet of gypsiferous sediments each. The first borehole (Grid Ref. N.55,750, E.23,650) was pumped for 5 days at a rate of 5,000 gallons per hour with a maximum drawdown of 334' feet. The second borehole (Grid Ref. N.56,250, E. 22,900) was also pumped for 8 days at a rate of 22,500 gallons per hour with a maximum drawdown of 40'.4" feet. Although the water struck in these boreholes is highly mineralized containing 427 ppm NaCl and 1,820 ppm total handness it still can be used very usefully for irrigation in this dry part of the country.

There were thirty six privately owned drilling rigs, licensed to drill for water, operating in Cyprus at the end of 1961. Altogether they drilled 83 new boreholes all for water with an aggregate footage of 22,140. Unfortunately there were quite a number of illegal drillings of which no information is available. Of these legal boreholes 85% were successful and gave an estimated total output of 541,300 gallons per hour. Twenty five are locally made some of them quite well constructed, but they are of a rather light type generally only suitable for

drilling in favourable rock conditions. There has been a tendency towards the use of imported drilling rigs by private contractors. In 1961 in addition to 25 locally made rigs there were seven Ruston-Bucyrus 22W, one Ruston-Bucyrus 60 R.L. and 3 Swedish made rigs. As in previous years the majority of boreholes have been sunk in the Famagusta and Larnaca districts where drilling is comparatively easy and wells may be sunk without casing; there has, however, been increased activity in the Nicosia district during 1961 where drilling rigs were operating near Nicosia and 3 in the vicinity of Morphou.

By law, private drilling contractors are obliged to give notice of drilling, to keep records of depth of boreholes and static water levels and to retain borehole samples for inspection by an officer of the Water Development Department. Test pumpings are not normally carried out but from information received it is possible to arrive at an approximate figure of the total water yield of these private drillings. As many of the boreholes were drilled in the bottom of existing wells the increase in yields is somewhat conjectural but it is conservatively estimated that the increase in perennial irrigation as a result of these drillings is of the order of 2,700 donums in 1961.

The average cost of departmental drillings in 1961 was £293 per borehole or £1.175 mils per foot of drilling. These costs are inclusive of the expenses of laying casing pipes and of an eight hour test pumping of successful boreholes. They are exclusive of the purchase price of borehole casing pipes and the capital cost and installation charges of permanent pumping plant. They include the wages of the drilling crews, fitters and blacksmiths, and the cost of workshop maintenance, fuel and lubricating oils, bit sharpening and repairs and replacement of drilling tools and equipment. They do not include depreciation of drilling plant and the salaries and expenses of the supervisory staff.

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No subsidized boreholes were drilled in 1961 for no funds were made available for subsidized drilling. 74 boreholes were drilled entirely from Government funds. Provision for an additional number of observation boreholes is absolutely essential but unfortunately no funds were made available in 1961.

STAFF AND LABOUR

In 1961 the staff of the Department was as follows:-

Assistant Chief Water Development Officer	1
Senior Water Engineers	2
Executive Engineers	4
Superintendent of Works	1
Senior Inspectors of Works	3
Inspector of Works	6
Technical Assistants	26
Foremen	77
Accounts Clerical and Miscellaneous	34

The posts of the Assistant Chief Water Development Officer and the two Senior Water Engineers were filled at the beginning of August, 1961. The post of the Chief Water Development Officer has been vacant since the Declaration of Independence, that is, since the 1st August, 1960. The Department was fortunate in 1961 in being able to secure the services of Dr. B. Lofquist a United Nations expert in the design and construction of dams. Dr. Lofquist arrived in Cyprus at the beginning of October and he is going to stay in Cyprus as an adviser to the Irrigation Section of the Department for a year.

The average number of labourers employed by the Department during the year under review was 1,744 as compared with 871 in 1960. About 22% were classed as regulars while about 42% were skilled employees.

The approximate monthly averages were as follows:-

January	641
February	1,093
March	1,075
April	1,019
May	1,242
June	1,769
July	2,217
August	2,120
September	2,395
October	2,421
November	2,388
December	2,350
Average	1,744

There were no labour disputes or strikes during the year but work could not proceed smoothly due to the delay in the approval of the various schemes schedule for execution in 1961. There were no appreciable variations to the wages structure during the year except the usual annual increases granted to regular employees.

I would like to take the opportunity of recording and acknowledging the devotion to duty and enthusiasm with which the staff of the Department, at all levels, have at all times carried out their work. Indeed if it was not for this devotion and enthusiasm it would have been impossible to achieve so much with so little a staff and with so many administrative difficulties that were in our way.

WORKSHOPS

The department found it necessary in 1961 to operate and maintain a considerable amount of mechanical plant. This was a result of changing labour conditions, rising costs and the considerable increased use of pumping both for irrigation and domestic supplies.

The Workshop Section of the Department attends to the maintenance of all departmental plant and in addition serves all the other sections of the Department in respect of such matters as the building of forms for concrete work, carpentry, the supply of precast concrete products, the

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installation of pumping plant, the fabrication of special pipe connections and steel sluice gates, the cutting of steel reinforcement the slotting and bending perforation of pipes and drilling casing etc. etc.

The workshops and store accommodation of the Department include workshop office, garage, fitters shop plant maintenance bay, precast concrete yard, welders shop, smithy, a small moulding shop, a water-meter testing room and three store buildings. In addition there are two open storage sites one of 1½ donums used mostly for interchargeable timber formwork, and one of 12 donums for pipes.

A list of the chief items of plant now on charge is given in Appendix 16. Other plant is hired from contractors or borrowed from other departments as required. A lot of earth moving machinery was hired for the construction of the Morphou earth dam. Heavy lorry transport is all hired from contractors but some departmental rovers and light "countrymen" vans are used for the transport of personnel, light tools etc.

LEGISLATION

No new law concerned with water was enacted in 1961. The urgent need, however, for the strengthening of the Wells Law in order to stop illegal drilling resulted in the passing by the House of Representatives of an amending bill to the existing Wells Law Cap. 351. This bill came into force as from the 15th November, 1961.

New orders under the Wells Law issued on 27th July, 1961, provided for the control of all new well-sinking permits in the groundwater areas of Pareklishia-Pyrgos-Moni and Monagroulli in Limassol District.

As the problem of controlling, conserving and efficiently utilising the water resources of the island a request for Technical assistance was made to the United Nations in order to secure the services of highly qualified experts in the field of water control and legislation.

The United Nations through its sister agent F.A.O. (Food and Agriculture Organisation) favourably responding to the request of the Republic provided at the end of the

year the services of Dr. N.G. Krausz, Professor of Agricultural Law at the University of Illinois who is expected to stay in Cyprus for about four months. A second water law expert is expected to arrive in Cyprus early in 1962. He is Dr. Dante Caponera a specialist in Moslem Law.

Both these experts are going to study the existing water legislation with the purpose of drafting a new comprehensive water code for Cyprus so that its enforcement may provide for the full development of the water resources of the country.

FINANCE

The following is a summarised statement of the expenditure of the Department of Water Development in 1961.

		Government Funds	Contribution by Beneficiaries	Total
1.	Irrigation & Drainage	£161,159	£93,837	£254,996
2.	Village Water Supplies	281,093	321,343	602,436
3.	Prospecting for water	69,224	-	69,224
4.	Drilling upon repayment	-	14,383	14,383
5.	Greater Nicosia Scheme	2,508	-	2,508
6.	Morphou Bay Scheme	29,117	-	29,117
7.	Town Water Supplies upon repayment	-	17,113	17,113
8.	Hydrological Research	10,640	-	10,640
9.	Purchase of Plant	-	-	-
10.	Miscellaneous Works for Government Authorities	6,716	-	6,716
11.	Maintenance and Running of Greater Nicosia Scheme	34,544	-	34,544
12.	Dept'l. and Maintenance	105,765	-	105,765
		£700,766	£446,676	£1,147,442

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Included in the above statement are:-

1.	Personal Emoluments.	£ 54,033
2.	Wages for labour (Approximate)	432,486
3.	Travelling.	16,494
4.	Pump testing wells and boreholes.	5,656
5.	Value of casing pipes fixed in boreholes.	17,648
6.	Total Cost of drilling and cleaning boreholes excluding items 4 & 5.	61,588
7.	Maintenance of Government water supplies and purchase of water.	9,816

Water Development works are usually assisted by Government grants or loans, or by both grants and loans. Towards the cost of gravity irrigation works the village contribution varies from 20% to 60% according to the type of work and the nature of the ownership of the water where the water is owned collectively as by the members of an Irrigation Division, the usual rate is 20% for spate irrigation and 33.3% for perennial irrigation. In Irrigation Associations there is private ownership of water and the village share is usually higher than for a Division; each case is considered on its merits with the result that the average village contribution over the past year was about 47%. The village share of the cost of a scheme is usually raised by a loan from the Government Loan Commissioners at a low rate of interest but occasionally it is paid partly or wholly in cash or in free labour. In respect of drilling, private individuals are charged the actual cost including 20% departmental charges on works and 25% on the cost of casing pipes. Municipal Corporations companies, etc., also usually pay the full cost and departmental charges at the rate of 20% on labour and 25% on materials. Town water supply works are paid for in full by the respective authorities including departmental charges at the rate of 6% on labour and 10% on materials. The new Greater Nicosia Scheme and the Morphou Bay Scheme are, for the time being, financed wholly by Government. Domestic water schemes for rural municipalities and villages are paid for half by Government and half by the village if no house connections are wanted. If there are house connections the extra cost is borne entirely by the village.

CONCLUDING NOTE

The population of Cyprus as well as living standard of its people are rising fast and of course consequently at the moment there is and there will always be an increase in demand for more and more water both for the domestic supply of villages and towns and for irrigation. Cyprus depends at the moment entirely on the limited amount of rainfall that comes down on its limited surface during the short winter period, and will therefore never be able to meet fully all the needs of its inhabitants. The potential water resources can, however, be developed and exploited to a much greater extent, and for the more efficient use, than at present. To achieve this however there is great urgent and pressing need for a well thought out steady programme of work at the highest possible level of expenditure.

Y. HJI STAVRINOU

Asst. Chief Water
Development Officer

APPENDIX 1.

NUMBER AND FOOTAGE OF BOREHOLES

NUMBER OF BOREHOLES DRILLED

1954 - 1961

Purpose	1946 - 1954	1955	1956	1957	1958	1959	1960	1961
For Private Individuals & Companies	1,158	170	128	202	106	155	165	55
For Government	293	101	55	62	35	9	13	126
For War Department and Air Ministry	144	62	30	29	16	27	10	18
Totals	1,595	333	213	293	157	191	188	199
Aggregate Footage Drilled	302,125	58,437	42,681,	51,420	32,842	48,250	49,887	49,681
Average Depth	189	175	200	175	209	253	265	245

BOREHOLES DRILLED IN 1961.

Purpose	No.	Existing Well Footage	Footage Drilled	% Successful	Total Tested Yield in g.p.d
Irrigation	54	2,017	15,190	68.5	9,732,000
Domestic Water Supply	8	30	1,951	100.0	1,444,800
Prospecting	125	1,428	30,789	52.0	11,640,000
Total for Water	187	3,475	47,930	58.8	22,816,800
Observation	1	-	110	-	-
Technical and Geological	11	-	1,641	-	-
Total Drilled	199	3,475	49,681	-	-

Old Boreholes Renovated : 36.

APPENDIX 2.

BOREHOLES DRILLED FOR WATER IN 1961

SUMMARY OF RESULTS

District	Locality	No. Drilled	No. Successful *	%age Successful	Total Tested output g.p.d.	Average yield per successful borehole g.p.d.
Nicosia	Western Mesaoria	28	26	92.9	7,008,000	269,538
	Lefka-Loutros	4	3	75.0	744,000	248,000
	Kokkini Trimithia-Ay. Trimithias-Airfield.	8	7	87.5	746,400	106,628
	Orounda-Vizakia-Ay. Ioannis	4	-	-	-	-
	Pera	3	2	66.6	460,800	230,400
	Palekythro-Kaimakli	2	2	100.0	304,800	152,400
	Ayia Kebir	2	2	100.0	220,800	110,400
	Dhali	1	1	100.0	144,000	144,000
	Skylloura	1	-	-	-	-
Kyrenia	Dhiorios-Larnaca tis Lapithou-Kormakiti	23	2	8.7	240,000	120,000
	Kyrenia-Boghaz/Bellapais Road	2	2	100.0	434,400	217,200
	C/F.	78	47		10,303,200	1,598,566

District	Locality	No. Drilled	No. Successful *	%age Successful	Total Tested Output g.p.d.	Average yield per successful borehole g.p.d.
	B/F.	78	47		10,303,200	1,598,566
Larnaca	Mari-Maroni-Zyyi	7	4	57.1	518,400	129,600
	Alethrico-Mazotos-Kiti	9	4	44.4	441,600	110,400
	Troulli-Arsos-Athienou	7	3	42.9	669,600	223,200
	Xylotymbou	1	1	100.0	360,000	360,000
Famagusta	Avgorou-Paralimni	6	4	66.6	554,400	138,600
	Kondea-Kouklia	3	3	100.0	885,600	295,200
	Boghaz-Vokolidha-Ephtakomi	10	3	30.0	324,000	108,000
	Rizokarpaso	4	2	50.0	415,200	207,600
	Ay. Andronikos	1	1	100.0	271,200	271,200
	Ay. Khariton	2	2	100.0	247,200	123,600
	Milea	2	-	-	-	-
Limassol	Episkopi-Kandou-Kolossi	6	6	100.0	945,600	157,600
	Polemidhia-Limassol-Yermasoyia	11	7	63.6	2,236,800	319,542
	Cherkez Chiftlik	1	1	100.0	360,000	360,000
	Pyrgos-Pareklisha	8	4	50.0	345,600	86,400
	C/F.	156	92		18,878,400	4,489,508

District	Locality	No. Drilled	No. Successful *	%age Successful	Total Tested Output g.p.d.	Average yield per successful borehole g.p.d.
	B/F.	156	92		18,878,400	4,489,508
Paphos	Kritou Terra-Arodhes	7	2	28.6	134,400	67,200
	Kouklia-Nikoklia-Ay.Varvara	9	6	66.6	2,469,600	411,600
	Prastio-Trakhypedhoula-Kithasi	3	3	100.0	396,000	132,000
	Goudhi-Polis	6	5	83.3	864.000	172,800
	Anavargos-Paphos-Yeroskipos	5	1	20.0	24,000	24,000
	Khoulou	1	1	100.0	50,400	50,400
	Totals	187	110	58.8	22,816,800	5,347,508

* A successful borehole is one that yields on test not less than 1,000 gallons per hour of usable water.

APPENDIX 3.

IRRIGATION AND DRAINAGE WORKS AND INVESTIGATIONS FOR MAJOR IRRIGATION PROJECTS

By C.A.C. KONTEATIS, B.Sc., (Eng.), A.M.I.C.E., A.M.I.W.E.
SENIOR WATER ENGINEER

Although due to administrative difficulties, most works started late in the year, (most of them after June), it was probably the busiest year we ever had on irrigation works.

I. CONSTRUCTION OF IRRIGATION WORKS

In 1961, 49 irrigation schemes at a cost of about £101,000 were completed and for another 19 schemes which were not completed £184,000 were spent. Thus the total expenditure on irrigation works in 1961 amounted to about £285,000. Some hundreds of pounds were also spent on small irrigation works through the American Grain Aid Fund and about £4,000 were also spent on irrigation works from deposits. The land that may be benefited by these works is estimated to be of the order of 5,400 donums of perennial irrigation, 2,200 donums of spring irrigation and 6,600 donums of winter irrigation. This extend of land does not include that which will be benefited by the recharge works carried out at Morphou and Famagusta. It does not also include the land that will be benefited by many small private irrigation works following the drilling of boreholes by Government or by private drillers. It is unfortunate to mention again that a lot of illegal drilling has been going on this year, not only in Famagusta but also in the Morphou aquifer.

The irrigation works carried out by Government for Irrigation Divisions or Irrigation Associations can be classified under one or more of the following groups:-

(i) Impoundment of water on gravity mass concrete and earth dams for the purpose of controlled irrigation.

(ii) Construction of Earth Dams for underground recharge purposes.

(iii) Diversion of river flow into channels or pipelines for the purpose of irrigation or recharge.

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(iv) Lining of channels and laying of pipelines for irrigation purposes.

(v) Construction of concrete or masonry storage reservoirs for irrigation.

(vi) Excavation and building of springs and chain-of-wells for the purpose of increasing the yield of flow and of protecting the source.

(vii) Pumping irrigation schemes from boreholes.

(viii) Antiflood works.

(ix) Repair and improvement works on existing irrigation systems.

The most important irrigation works under construction in 1961 were:-

(i) The Lefka mass concrete gravity dam, which is being built on the Marathassa river near M.P. 38 on the Lefka-Pedhoulas road. The dam is estimated to cost about £119,000 and is to be used for the irrigation of about 600 donums of orange groves in Lefka.

By the end of 1961 £92,500 were spent on the construction of the dam, and it is hoped to complete the construction by April, 1962. The work of the dam this year included the construction of the cut off wall to avoid leakage through the left hand side river terrace abutment. Some rockfill to stabilise this terrace is also being applied both on the upstream and downstream faces.

The rockfill necessitates blasting operations by dynamite and lorries transport the rock to the site.

Bulldozers, traxcavators, draglines, bray loaders, compressors and mixers are amongst the machinery used for the construction. The final stages of the construction necessitates the diversion of the Lefka-Pedhoulas main road which it is hoped the Public Works Department will undertake early in 1962.

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(ii) Morphou Earth Dam. This Dam is being constructed just upstream of Morphou on the Serrakhis river. Work started on this project on the 1st November, 1961, and it is hoped to complete the work early in August. The main purpose of the work is to recharge the most important Morphou aquifer. This it is hoped to achieve through percolation through the river gravels which are in direct contact with the aquifer. The underground flow is not interfered with by the construction of the dam which allows recharge in all directions.

The dam will also be used for winter irrigation and may be some early summer irrigation in good years of flow. The capacity of the reservoir is of the order of 400 million gallons and is estimated to cost £95,000. The construction work includes about 140,000 cubic yards of gravel fill obtained from the site - and a clay core of about 70,000 cubic yards obtained from the left hand side embankment of the river. The maximum height of the dam is about 40 feet and a 250 feet spillway with stepped concrete anti-erosion weirs is provided.

The work is carried out by heavy earth moving machinery.

(a) The gravel fill is carried out in two ways.

1. By scrapers which excavate, carry and compact the material.

2. By traxcavators which excavate the material and load it on tippers which carry the material on the embankment where it is compacted by heavy tractors.

(b) The clay core is carried out by traxcavator excavating and loading the clay on tippers which carry the material to the embankment where it is compacted by sheepfoot rollers.

In all at the end of 1961 10 traxcavators, bulldozers and scrapers as well as 15 tippers were used for the work daily at a cost of about £250 per day.

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(iii) The Famagusta Recharge Works. This is an extension and improvement of the Famagusta Recharge Works which started since 1954.

The new works included:-

1. The construction of an Earth Dam at Pharangas near the church of "Ayios Yeorghios" of capacity of 20 million gallons. Its main operation will be the recharge of the aquifer in the area. In fact by the end of 1961, the reservoir filled twice and emptied through vertical percolation in a few days period.

2. The diversion of the flow of the Phrenaros and Ayia Erini Catchments into an earth reservoir in the Ayios Nicolaos catchment. This was done by a training earth bank some miles long. From the Ayios Nicolaos reservoir the water is conveyed through a tunnel to the Ayios Loucas reservoir. The surplus flows over the spillway to the locality "Mutti-tis-Halis".

3. The diversion works at "Mutti-tis-Halis" include a diversion weir to divert the flow of the "Yialias" river as well as the overflow from "Ayios Nicolaos" through a big canal to the Fresh Water Lake.

4. Improvement works at Ayios Loucas intake to the infiltration gallery, the Fresh Water Lake and various culverts and bridges were also constructed.

5. The infiltration Gallery was repaired in certain damaged parts.

6. Many observation boreholes are being drilled to observe the aquifer conditions.

As it is well known Famagusta suffers from a sea intrusion up to one mile inland which resulted to the abandonment of many orange groves. The recharge works there, are therefore of the utmost importance.

During 1961 about £19,000 were spent on the works and the scheme provided for an expenditure of £25,000. The balance is to be spent in 1962.

(iv) At Syrianokhori a scheme is being carried out estimated to cost £31,000 for lining in concrete the channels of the Irrigation Division.

(v) At Kambos £24,000 are being spent for lining the channels of the Irrigation Division.

(vi) At Palekhori £18,500 have nearly been spent for lining the earth channels of the Irrigation Division.

(vii) At Moutoullas £17,900 have been nearly spent on lining the channels of the Irrigation Division.

(viii) At Kato Amiandos a £16,000 scheme is under construction for laying a 6" steel pipeline and building two intake weirs in the "Loumata" and the "Livadhi" rivers.

(ix) At Karavas nearly £15,000 have been spent for the lining of the "Kephalovrysos" Irrigation Association's channels.

(x) At Polis (Chrysokhous) £13,900 were spent on the lining of the Irrigation Association's channels.

(xi) At Ayios Ioannis (Maloundas) a £12,000 scheme for lining channels and a chain-of-wells has not yet been completed.

(xii) At Bellapais £8,900 were spent on lining channels.

(xiii) At Evretou £8,900 were spent on an irrigation pipeline.

(xiv) At Elea £7,500 were spent for a borehole pumping scheme.

(xv) At Massari £6,800 were spent on a borehole pumping scheme.

(xvi) At Phinicas £3,700 were spent on laying a 12" diameter infiltration concrete pipeline into the bed of the Xeros river.

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(xvii) At Paphos (Ktima) £3,500 are being spent for constructing a tunnel to divert the flood waters away from Ktima.

It was not possible to start work on 14 schemes (see Appendix 6) for which over £110,000 were available in 1961. The reasons were land acquisition difficulties, or not wanted by the villagers, or disputes on village contribution, or arrears on previous loans.

For example Geunyeli earth dam was not constructed because of land acquisition difficulties which have not yet been overcome. The channels at Kythrea were not lined because of the villagers not accepting the contribution of 50% asked by Government, Lefkoniko and Exo Metokhi Earth Dams were abandoned because the villagers did not want them and Ayios Theodhoros (Larnaca) irrigation scheme could not be carried out because of land acquisition difficulties.

II. INVESTIGATIONS FOR MAJOR IRRIGATION PROJECTS

Field work and office design work for major irrigation impounding schemes have continued throughout the year at a limited scale due to the insufficiency of the staff. However by the end of 1961 Dr. Lofquist, a well known International Swedish Dam Designer Expert has been posted to Cyprus as an Adviser of the United Nations to Cyprus. It is very much hoped that the presence of Dr. Lofquist will be of great benefit towards the design and construction of dams in Cyprus.

The schemes investigated during 1961 are the following:-

(i) Pentaskynos Catchment.

More detailed proposals for the dams proposed for construction in this river have been submitted in 1961. Following a soil survey of the Lefkara lands carried out by the Agricultural Department. As a first stage it was proposed to build an earth dam a few miles downstream of Ayios Theodhoros village.

However, the people of Ayios Theodhoros as represented by the Irrigation Division showed no interest in this scheme. It may be, therefore, possible that the dam at Lefkara will be the priority if the people of Lefkara show interest in the scheme.

(ii) Tremithios Catchment.

More detailed proposals for this scheme were also submitted in 1962. The priority dam was considered to be the one upstream of Tersephanou village. This is to serve with irrigation water the villages of Tersephanou, Kiti and Sophtadhes and to help the recharge of the Tremithios aquifer which supplies with domestic water supply Larnaca and some other villages in the Tremithios catchment. This scheme is very much wanted by Kiti and was put forward for construction in 1962 if approved by Government.

(iii) Kourris Catchment.

Preliminary surveys have been carried out for many damsites on this most important river. Damsites have been surveyed for Kato Amiandos, Pelendria, Dhoros and Lania on the Amiandos tributary for Platres, Pera Pedhi, Kilani and Ayios Theodhoros on the Kryos tributary, for Ayios Mamas and Kapilio on the Kapilio tributary and for Erimi, Ypsonas, Kolossi, Kandou and the Akrotiri peninsula on the main Kourris river. The recharge of the important Akrotiri aquifer is also under investigation. It is hoped that in 1962 final proposals will be submitted.

However, the main drawbacks on this river are:-

1. The Amiandos Mines wastes which are discharged in the river. The fine sediments of these wastes are carried in suspension in the river as far as the sea. These particles when deposited on land form an impermeable film layer which prevents any water to percolate either for

irrigation or recharge. This is a very serious problem and suggestions have been put forward by the Government to the Company which it is hoped will eventually level to the clearing of the water.

2. The water rights on this river as it is known is also a serious handicap for development. Some families claim to own the water of this river from "Loumata-tous-Aetous" at Troodos to the sea.

(iv) Emba-Lemba-Kissonerga-Chlorakas area.

This is an area on the north of Paphos which suffers considerably from a water table depression of its aquifer.

Certain small streams and the Mavrokolymbos river have been surveyed with a view of constructing dams for recharge purposes. It is hoped to complete this scheme in 1962.

(v) Magounda Catchment.

The Magounda Catchment in the Tylliria district has been surveyed and the construction of a dam has been proposed for the benefit of Argaka and Magounda villages.

(vi) Yialia Catchment.

The Yialia catchment is also in the Tylliria district east of the Magounda catchment. A survey was carried out and the construction of a dam has been recommended for the benefit of Yialia and Ayia Marina villages.

(vii) Xeros Catchment.

The Xeros river is also in Tylliria and is just east of the Yialia catchment. In this river a 6" diameter pipeline was laid some years ago for irrigation and a dam was proposed for construction. The case was re-investigated in 1961 and it is proposed to build a dam in 1962 if approved by Government. The dam is to benefit lands in Ayia Marina.

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(viii) Livadhi Catchment.

This catchment is just east of the Xeros catchment, in the Tylliria district. The river was surveyed and a dam has been proposed for the benefit of the Pomos village.

(ix) Marathasa Catchment.

Besides the construction of the Lefka dam which is still going on, the construction of a dam for the benefit of Kalopanayiotis is under investigation.

(x) Ovgos Catchment.

The construction of a dam at Ovgos Morphou is being investigated.

(xi) Akaki Catchment.

An investigation has been carried out for building dams on the Akaki tributary of the Serrakhis river, from Palekhori to Akaki. A report has been submitted for building a dam for the benefit of Meniko and Akaki.

(xii) Geunyeli Earth Dam.

A report has been submitted for building an earth dam on the Almyros stream. It is hoped to construct this dam in 1962 if finally approved and there are no administration difficulties.

(xiii) Mia Milea Earth Dam.

A report has been submitted for building an earth dam on the Symeas stream for the benefit of Mia Milea.

(xiv) Chatos Earth Dam.

Investigations for the construction of an earth dam have been completed for the benefit of Chatos on the "Kodja Dere" stream.

(xv) Knodhara Earth Dam.

Investigations for the construction of an earth dam have also been completed for the benefit of Knodhara on the "Yeni Dere" stream.

(xvi) Trikomo Earth Dam.

Investigations for the construction of an earth dam for the benefit of Trikomo have also been completed.

(xvii) Lapathos Earth Dam.

A report has also been prepared for the construction of an earth dam for the benefit of Lapathos, Syngrasis and Ayios Yeorghios.

(xviii) Kanli Keuy Earth Dam.

A report has been prepared for the raising of the small earth dam of Kanli Keuy.

(xix) Paralimni Earth Dams.

A report for building some small earth dams at Paralimni of a height of 10-20 feet, for the recharge of the Paralimni aquifer including an open recharge canal to take water from the Paralimni Lake has been submitted, and it is hoped to carry out this work in 1962.

(xx) Antiflood Scheme Famagusta.

The construction of a long training embankment South of Famagusta Town to serve both for antiflood and recharge purposes is being investigated.

(xxi) Prodhromos Earth Reservoir.

A big earth reservoir to hold 20 million gallons has been proposed for Prodhromos. It will be built about 2 miles away from Prodhromos on the way to Troodos. It is hoped to build this reservoir in 1962 if approved by Government.

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APPENDIX 4.

IRRIGATION SCHEMES COMPLETED IN 1961.

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
	Nicosia Distr.						
1	Louroujina	Repairing and regrading of the existing chain-of-wells, construction of R.C. channels and one storage tank, laying of pipes and installation of a small pumping unit.	1,908	-	20	10	Improved and new irrigation
2	Pyrgos	Supplementary distribution pipes and ancillary works from the existing dams.	4,574	-	-	-	Completion of Pyrgos impounding scheme.
3	Vroisha	Laying pipes and minor repairs to existing storage tank.	350	-	-	8	Improved and new irrigation
4	Epikho	Construction of Irrigation ports, diversion gates and deepening of channels.	1,200	-	-	-	Improvement works
		C/F.	8,032				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	8,032				
5	Exo Metokhi	Repairing the existing weir.	300	-	-	-	Improvement works
6	Pera	Desilting, regrading and building of the existing cutting, regrading of the tunnel where necessary and lining of channels in reinforced concrete.	5,880	600	120	-	Improved and new irrigation works
7	Oekos	Laying of distribution pipes with the necessary sluice valves, construction of irrigation ports.	1,270	--	10	6	- do -
8	Nikitari	Lining of channels, laying of pipes and construction of irrigation ports.	2,500	380	200	-	- do -
9	Ay. Sozomenos-Potamia	Construction of a groyne intake and lining of channels	1,100	1,000	-	-	- do -
10	Dhali	Regrading of chain-of-wells and lining of tunnel where necessary.	1,600	1,000	-	50	- do -
		C/F.	20,682				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	20,682				
11	Ayios Ioannis (Maloundas)	Excavation of a new tunnel lining of tunnel, desilting regrading and building of cuttings, laying of precast cement pipes, lining of channels and other repair works.	12,000	-	400	100	Improved and new irrigation works
12	Masari	Pumping scheme and lining of channels with ports	6,800	400	-	50	- do -
13	Tembria-Sina Oros	Lining of channels	750	-	-	20	- do -
		Total	£40,232	2,480	750	244	
	Famagusta Distr.						
1	Milea	Construction of irrigation ports	1,000	100	-	-	- do -
2	Lyssi	Installation of a new pump repairing of pump/house.	700	-	-	-	Improvement works
3	Gaidhouras	General improvements on spate irrigation works	3,800	1,500	-	-	Improved and new irrigation
		Total	5,500	1,600	-	-	

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
	Larnaca District						
1	Kiti	Desilting and regrading of channels, construction of silt-trap and other improvement works.	1,320	-	-	-	Improvement works.
2	Ora	Construction of a storage tank and lining of channels.	2,000	80	15	7	Improved and new irrigation
3	Kalavasos	Repairs on existing weir and channels.	4,900	-	-	-	Improvement works
4	Odhou	Lining of channels and minor repairs	480	-	-	-	- do -
		Total	£8,700	80	15	7	

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
	Limassol Distr.						
1	Plataniskia	Lining of channels, laying of pipes and repairs to the existing storage tank.	540	-	8	8	Improved and new irrigation
2	Agros	Lining of channels	450	-	-	20	- do -
3	Ayios Pavlos	Construction of a small weir, intake channel, storage tank and laying of pipes.	1,140	-	-	-	- do -
4	Agridhia	Raising of the weir, construction of a storage tank and laying of pipes	2,000	-	60	20	- do -
5	Phini	Construction of a small weir and laying of pipes	280	-	-	10	- do -
6	Evdhimou	Improvements on existing winter irrigation system	3,000	-	-	-	Improvement Works
7	Athrakos	Lining of channels	150	-	-	6	Improved and new irrigation.
8	Ayios Theodhoros	Minor improvement works to the existing irrigation system.	150	-	-	-	Improvement works
		C/F.	£7,710				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	7,710				
9	Kapilio ✓	Lining of channels	3,000	-	-	70	Improved and new irrigation
10	Polemidhia ✓	Improvement works of the winter irrigation scheme	3,000	-	-	500	- do -
11	Ayios Ioannis ✓	Laying of pipes and lining of channels	780	-	50	50	Improved and new irrigation
12	Ay. Ioannis-Kato Mylos ✓	Lining of channels and general improvements to the existing irrigation system.	1,540	-	-	90	- do -
13	Ay. Georghios ✓	Laying of pipes from existing storage tank	1,050	-	25	10	- do -
14	Paleomylos ✓	Construction of a small weir and laying of pipes	450	-	-	10	- do -
15	Kalokhorio ✓	Laying of pipes, lining of channels and minor repairs.	380	-	-	-	Improvement works
16	Yermasoyia ✓	Repairs on flood damaged works.	1,700	-	-	-	- do -
		Total	£19,610	-	143	794	

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
	Paphos District						
1	Meladhia	Construction of a storage tank and laying of pipes and sluice valves.	1,050	-	4	7	Improved and new irrigation
2	Lyso	Laying of pipes from existing storage tank.	330	-	3	2	- do -
3	Marathounda	Scheme A. Construction of a weir, storage tank and laying of pipes. Scheme B. Construction of a small weir and laying of pipes.	4,400	90	-	90	- do -
4	Philousa	Construction of a weir and laying of pipes.	1,050	20	10	15	- do -
5	Nata-Kholetria	Extension of the existing perforated concrete pipeline.	1,600	-	-	180	- do -
6	Istinjo	(a) Excavation and building of the spring (D.W.S. and irrigation spring). (b) Excavating, building and covering of another spring, lining of channels and laying of pipes.	2,000	20	8	8	- do -
		C/F.	£10,430				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£10,430				
7	Kritou-Terra ✓	Drilling of borehole and pumping installation.	3,000	-	-	-	Improved and new irrigation.
8	Pelathousa ✓	Cleaning and repairing of the spring, construction of storage tank and laying of pipes.	1,550	-	20	9	- do -
9	Ay. Nicolaos (Philousa) ✓	Stage II. Construction of a storage tank and retaining wall. Lining of channels.	1,680	-	-	26	- do -
		Total	£16,660	130	45	337	

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
	Kyrenia Distr.						
1	Lapithos	Excavation and testing of a trial well.	100	-	-	-	Prospecting work
2	Kharcha	Excavation of spring and laying of pipes.	353	-	10	7	Improved and new irrigation
3	Bellapais	Lining of channels	8,900	-	-	80	- do -
4	Kazaphani	Excavation of spring, laying of pipes and improvements.	590	-	5	5	- do -
		Total	£9,943	-	15	92	
		Grand Totals for all Districts	£100,645	5,190	968	1,474	

APPENDIX 5.

IRRIGATION SCHEMES UNDER CONSTRUCTION AT THE END OF 1961 TO CONTINUE IN 1962.

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
1	Limnitis ✓	River training.	2,700	-	-	-	Land reclamation and antiflood works.
2	Moutoullas ✓	(a) Lining of channels.	17,200	-	-	392	Improved and new irrigation
		(b) Improvement of springs	900	-	-	36	- do -
3	Syrianokhori ✓	Lining of channels	31,000	-	700	700	- do -
4	Kambos ✓	Lining of channels and improvements.	24,000	-	-	230	- do -
5	Morphou ✓	Construction of an earth dam.	95,000				To be used for surface irrigation and for the recharge of the Morphou aquifer.
6	Lefka ✓	Construction of a mass concrete dam.	119,185	-	-	550	Continuation of the work.
7	Ay. Andronikos ✓	Pumping scheme and lining of channel	4,500	-	50	80	Improved and new irrigation.
		C/F.	£294,485				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£294,485				
8	Famagusta-Dherinia	Extension of the ex-recharge works include the construction of a conveyor canal to take the flow of the Phrenaros Ayia Erini and Ayios Nicolaos catchments into a proposed dam at Ayios Nicolaos where the water will go into the Ayios Loucas reservoir. The overflow will follow a canal into the Fresh Water Lake and thence into the Ayios Loucas reservoir. A weir at "Mutti-tis-Halis" will divert the overflow of the Yialias river into the Fresh Water Lake. A Dam at Harangas is also to be constructed.	25,000	-	-	-	Extension and improvements on the existing recharge works.
		C/F.	£319,485				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£319,485				
9	Kato Amiandos	Construction of a groyne intake and laying of pipes.	16,000	-	-	500	Improved and new irrigation.
10	Elea	Pumping scheme and laying of pipes.	7,500	-	-	220	- do -
11	Palekhori	Lining of channels	18,500	900	130	-	- do -
12	Karavas	Lining of channels	15,000	-	-	800	- do -
13	Perapedhi	Sluice gate and improvement work.	1,200	-	-	-	Improvement work
14	Trimiklini	Sluice gate and improvement work.	2,000	-	-	-	- do -
15	Polis	Lining of channels	13,900	500	255	255	Improved and new irrigation.
16	Saramas	Construction of a new weir and laying of pipes	3,200	-	-	50	- do -
17	Evretou	Laying of pipes etc.	8,900	32	57	66	- do -
		C/F.	£395,685				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	395,685				
18	Phinikas	Stage I. Laying of a peforated pipeline 12" ϕ in the gravels of the "Xeros" river.	3,700	-	-	-	Land to be irrigated depends on the flow measurements which will be taken in the summer
19	Kithasi	Pumping installations	2,300	-	-	-	
		Total	£411,685	1,432	1,192	3,329	

APPENDIX 6.

IRRIGATION SCHEMES APPROVED TO BE CARRIED OUT IN 1961 BUT NOT UNDERTAKEN

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
1	Politiko	Regrading and lining of the ex-chain-of-wells and lining of channels.	7,200	300	100	-	Disputed
2	Platanistasa	Lining of channels	560	-	20	10	Not wanted
3	Limnitis	Lining of channels	4,000	250	50	-	Scheme to be carried out in 1962. Original scheme not accepted by the villagers.
4	Kambi-tou-Pharmaka	Construction of a storage tank and lining of channels	530	20	19	2	Issue of loan pending (arrears)
41	- do -	Piping of the water from two springs. into a new storage tank to be constructed and laying of pipes.	550	-	-	10	- do -
		C/F.	£12,840				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	12,840				
5	Kythrea and Suburbs.	Supplementary lining of channels.	33,000	-	-	-	Contribution not accepted by villagers
6	Geunyeli	Construction of flood detention dam for controlled irrigation in Winter and Spring.	17,000	700	300	-	Acquisition of land
7	Exo Metokhi-Epikho	Construction of flood detention dam for controlled irrigation and flood protection.	10,400	400	-	-	Contribution not accepted by the villagers.
8	Lefkoniko	Construction of an earth dam.	14,960	700	275	-	Scheme not wanted.
		C/F.	£78,200				

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Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£ 78,200				
9	Vitsadha	Anti-soil erosion and irrigation weir.	3,500	-	-	-	Contribution not accepted by the villagers.
10	Ay.Theodhoros (Larnaca)	Construction of a diversion weir and excavation of earth channels	8,500	2,563	-	-	Objections raised by the owner of land where the weir will be constructed.
11	Aplanda	Repairs to the ex-storage tank.	150	-	-	-	Scheme revised recently for 1962.
12	Pano Koutraphas	Construction of a groyne intake and lining of channels	8,000	-	160	-	Scheme not wanted
13	Phini	Construction of a weir lining of channels, construction of a storage tank and irrigation ports.	2,400	-	-	36	Scheme not wanted
14	Kandou	Pumping scheme and distribution system	7,000	-	-	-	Issue of loan pending (arrears)
			£112,750	4,933	924	1,058	

APPENDIX 7.

IRRIGATION SCHEMES TO BE CARRIED OUT IN 1962.

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
1	Kambi Pharmaka	Construction of a storage tank and lining of channels.	530	20	19	2	Improved and new irrigation.
2	- do -	Piping of the water from two springs into a new storage tank to be constructed and laying of pipes.	550	--	-	10	- do -
3	Kythrea and Suburbs	Supplementary lining of channels.	33,000	-	-	1,000	- do -
4	Geunyeli No.2	Construction of an earth dam.	22,000	1,480	610	-	- do -
5	Xerovouno	Pumping installation and delivery pipeline.	4,000	-	-	200	- do -
6	Lapithos	Desilting and regrading of tunnel	1,050	-	-	-	- do -
		C/F.	£61,130				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£61,130				
7	Ay. Amvrosios	Excavation and building of spring, laying of pipes and repair works.	2,540	-	25	20	Improved and new irrigation
8	Elea	Laying of pipes	1,460	-	60	35	- do -
9	Bellapais	Lining of channels and laying of pipes	400	-	-	-	Improvement works
10	Lapithos	Lining of channels	24,400	-	-	1,500	- do -
11	Vassilia	Excavation and building of spring.	500	-	70	25	- do -
12	Ay. Epiphanios	Lining of channels and construction of a storage tank.	750	-	30	15	Improved and new irrigation.
13	Epikho	Construction of a protective wall and irrigation gates.	800	-	-	-	To complete scheme
		C/F.	£91,980				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£ 91,980				
14	Kato Pyrgos	-	1,200	-	-	-	Compensation of land
15	Ay. Georghios (Kafkallou)	Repairs to ex-channels	195	-	-	-	Improvement works
16	Kalopanayiotis	Construction of 2 small dams.	700	-	-	35	Improved and new irrigation
17	Louroujina	Excavation on earth canal	750	-	-	500	- do -
18	Galata-Sina	Excavation of spring	1,200	-	-	25	- do -
19	Patriki	Improvement works on ex-weirs.	800	-	-	-	Improvement works
20	Yenagra	Construction of a weir, earth channels and irrigation ports.	7,500	900	-	-	Improved and new irrigation
21	Knodhara	Construction of a weir and desilting and regrading of earth channels.	1,960	410	-	-	- do -
		C/F.	£106,285				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£106,285				
22	Prastio	Improvement on spate irrigation works.	11,800	1,100	-	-	Improved and new irrigation.
23	Paralimni	Construction of 40 small earth dams.	9,200	- -	-	-	For recharge purposes.
24	- do -	Recharge canal	18,000	- -	-	-	For recharge purposes.
25	Sotira	Construction of an earth dam.	4,000	-	-	-	- do -
26	Gypsos	Construction of weir	480	-	-	85	Improved and new irrigation.
27	Chattos	Improvement work	1,950	-	-	-	Improvement works
28	Ay. Iacovos	Excavation of spring - laying of pipes and lining of channels	1,800	-	-	25	Improved and new irrigation.
29	Aloa	Construction of an earth dam	900	-	-	-	For recharge purposes.
		C/F.	£154,415				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£154,415				
30	Kilanemos	Excavation of spring, lining of channels and laying of pipes.	700	-	-	4	New irrigation
31	Ay. Theodhoros (Larnaca)	Construction of a diversion weir and excavation of earth channels.	8,500	2,563	-	-	
32	Athienou	Improvement works	230	-	-	-	Improvement works
33	Aplanda	Construction of a storage tank.	350	-	-	-	Replacement of the storage tank.
34	Trimithios	Impounding scheme	58,796	-	3,000	-	Part of work only. Improved and new irrigation.
35	Kyperounda	Construction of a weir storage tank and lining of channels	1,750	-	30	35	Improved and new irrigation.
		C/F.	£224,741				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£224,741				
36	Kyperounda	Excavation and building of spring.	250	-	-	-	Land to be irrigated depends on the water to be found.
37	Dhymes	Construction of a storage tank and laying of pipes.	860	-	10	20	Improved and new irrigation
38	Kato Mylos	Laying of pipes, repairs.	430	-	-	8	- do -
39	Khandria	Laying of pipes	360	-	10	1	- do -
40	Ay. Demetrios	Construction of 2 storage tanks, lining of channels and laying of pipes.	1,350	-	-	70	- do -
41	Yerasa	Construction of a weir, laying of pipes.	1,310	50	-	18	Improved and new irrigation.
42	Omodhos	Laying of pipes	880	-	-	26	- do -
43	Prodhromos	Construction of an intake weir, laying of pipes and construction of a big asphaltic reservoir.	72,000	-	-	400	- do -
		C/F.	£302,181				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£302,181				
44	Mandria	Pumping installation	4,000	-	-	140	Improved and new irrigation.
45	Tala	Excavation of springs and laying of pipes.	2,600	80	38	42	- do -
46	Kissonerga	Excavation of springs and laying of pipes.	2,000	-	-	40	- do -
47	Marathounda	Laying of pipes	1,800	-	-	82	- do -
48	Mesakhorio	Construction of storage tank and laying of pipes	1,600	20	9	5	- do -
49	Zakharka	- do -	760	-	-	8	- do -
50	Meladhia	Laying of pipes	540	50	5	7	- do -
51	Istinjo	- do -	500	60	18	10	- do -
52	Ay. Isidhoros Steni	- do -	550	-	20	10	- do -
		C/F.	£316,531				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£316,531				
53	Axylou	Laying of pipes and construction of a storage tank.	380	-	-	-	Improvement work
54	Ay. Marinoudha	Excavation of spring, construction of 2 weirs and storage tank, lining of channels.	1,650	29	7	9	Improved and new irrigation.
55	Ay. Nicolaos	Laying of pipes	340	45	45	14	- do -
56	Episkopi	Construction of a groyne intake and lining of channels	4,000	-	-	400	- do -
57	Galataria	Laying of pipes	1,220	-	20	25	- do -
58	Innia	- do -	1,230	50	25	23	- do -
59	- do -	Excavation of spring and laying of pipes	1,800	-	20	12	- do -
60	Miliou	Construction of a weir, pumping unit and laying of pipes.	2,500	-	-	26	- do -
		C/F.	£329,651				

Ser. No.	Village	Nature of Work	Cost £	Approx. extend of land under irrigation in a normal year of run-off. Donums			Remarks
				Winter	Spring	Perennial	
		B/F.	£329,651				
61	Kholi	Excavation of spring and tunnel.	660	-	-	15	Improved and new irrigation
62	Salamiou	Construction of storage tank and laying of pipes.	1,200	10	6	4	- do -
63	Kilinia	Construction of a weir and laying of pipes.	170	-	-	8	- do -
64	Souskiou	Lining of channels	5,900	-	-	150	- do -
65	Nikoklia	- do -	2,350	-	-	100	- do -
66	Amargeti	Laying of pipes	2,500	-	-	-	
67	Ayia Marina-Nea Dhimmata	Impounding scheme	78,000				
		Total	£420,431				

APPENDIX 8.

TOWN WATER SUPPLIES

By H.S. Suphi, Senior Water Engineer.

NICOSIA AND SUBURBS

After the expiration of the "Nicosia Water Supply, Special Provisions Law" of 1958 the Greater Nicosia Scheme was once again under the control of Water Development Department. The demand for water in the Summer season exceeded the total supply from all sources of the scheme by about 2,000 cubic meters per day. This quantity could not be made available to us in full by the Water Board of Nicosia or from any other source and restrictions in consumption had to be imposed. The supply was turned on to each area for 24 hours in every 48 hours from 19th July to 2nd October.

The emergency installations near Morphou of the Water Board of Nicosia provided, as in the previous year, about 4,500 cubic meters of water per day part of which was consumed in Greater Nicosia Area. The maximum consumption during the summer season was 4,500 cubic meters per day. During the year 14,400 feet of distribution mains were laid for the private developers and 453 house connections were made.

The three reservoirs of the Greater Nicosia Scheme were repaired with a view to stopping the leakage of water through the hair cracks in the mass concrete outer walls which had developed as a result of uneven settlement of the reservoirs. The collecting tank at Dhali was also leaking badly and was repaired.

An apparatus for testing large water meters (3" and above) was constructed in the Government Pumping Station near the Secretariat compound for the benefit of both the Government and the Water Boards.

The construction of the pumping station with the adjoining buildings and the reservoir of the Morphou Bay Scheme was completed by the Public Works Department. All

pumping machinery and the electrical equipment of the pumping station which were on order with Messrs. Harland EngineeringCompany arrived towards the middle of the year. But it was considered advisable not to proceed with the installation of the same, in view of the unfavourable condition of the ground water level in borehole of the scheme. Because of the same reason the contract with the Electricity Authority of Cyprus for the supply of electricity to the Pumping Station could not be finalised.

FAMAGUSTA

To meet the anticipated shortage of water during the summer season a borehole was sunk at the "Phrenaros North" and a pumping unit was installed thereon. As an emergency arrangment and with a view to conveying more water through the pipeline from "Phrenaros North" to Famagusta a new booster unit was provided and the total supply from this station was increased by 1,000 cubic meters per day. The maximum total supply to the Town from all sources was 5,370 cul. meters per day and the restrictions in the consumption could just be avoided.

The Panayia Spring which had dried up as a result of the illegal drilling of the previous years did not yield any water. No water was conveyed through the existing 8" A.C. pipeline to Famagusta during the year.

The Water Supply Scheme of 1956 could not be implemented in view of the lowering of the ground water table of the Xylophagou area where six boreholes of the scheme are situated. Four of these boreholes now lie within the boundaries of the Sovereign Base Areas, but nevertheless they are still owned by the Water Board of Famagusta.

LIMASSOL

The gravity supply from the Kephalovrysos, Krya Pigadhia and Mavrommata springs fell this year again to about 1,545 cubic meters per day in summer and with the supplies of the boreholes in the Garillis River Valley it was possible to avoid restrictions on the consumption. The

pumping of water from the Chiftlikoudhia chain-of-wells continued throughout the peak consumption period providing a maximum quantity of 2,940 cubic meters per day.

Two alternative schemes were prepared for supplying additional quantities of water to Limassol from the boreholes in the Yermasoyia Valley. One of the schemes was designed to provide 6,800 cubic meters per day and the other 13,600 cubic meters per day to be constructed in one or two stages. But no decision could be reached by the Water Board of Limassol during the year as to the scheme to be adopted. The boundaries of the revised area of supply were provisionally agreed upon.

LARNACA

Restrictions on the consumption of water in the Town were again necessary in summer in order that the high lying areas might receive a fair share from the available supply. To begin with the Town was divided into four areas of supply and each area was supplied with water for six hours Adjustments to the duration of the supply were made as and when required to meet the increasing shortage of water. The supply from the Bekir Pasha chain-of-wells in summer was about 1,815 cubic meters per day which was supplemented by a quantity of 1,815 cubic meters per day from the two emergency boreholes of the previous year.

6,200 feet of water mains were laid for private developers and 185 house connections were made and 96 saccoraphia were replaced by water meters.

APPENDIX 9.

VILLAGE DOMESTIC WATER SUPPLIES.

By H.P. Karakannas, M.A.S.C.E., M.I.P.H.E., M.R.S.H., Superintendent of Works.

The work of the Village Domestic Water Supply Section is confined mostly to water supplies for villages and rural municipalities, but it also includes the Towns of Paphos and Kyrenia. Sources are examined measured and where suitable developed. Supply and distribution water mains are laid storage reservoirs and public fountains are constructed, and a house-to-house service is provided in most villages. There is a general demand for house connections and practically in all villages where the available supply is 20 gallons per day per capita, the scheme is designed to include a house-to-house service. The cost for house connections is borne entirely by the consumer and the supply is controlled by means of water meters or through a break pressure and constant Head regulator, at the rate of 100 gallons per day. The daily satisfactory supply per capita is now 20 gallons, but it will have to be raised to 25 gallons as the standard of living rises in the rural areas.

The sources of village water supplies may be springs, boreholes or infiltration galleries. The use of boreholes and wells has been much favoured in places where there are no suitable springs for a gravity supply. Practically all the village supply schemes, executed during this year, in Famagusta, and Nicosia and some other in the other Districts, have been pumped supply schemes, using successful boreholes. The traditional chain-of-wells whereby water was gravitated to the surface, in the form of a spring has now been obsolete. The prevailing drought has greatly affected all springs in the island, and the result was that the big springs decreased substantially and a good number of small springs dried up. During the summer and autumn, it was found necessary to supply water to some dry villages, by tanker. In the case of pumped supplies, turbine pumps are installed, driven by a diesel engine or a motor where electricity is available. Water is pumped into a ground level or elevated re-inforced concrete tank, whose function is not only to provide adequate one day's

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storage, but at the same time to act as a reservoir from where we controlled and uniform quantity of water can be withdrawn.

The year 1961, has been a year of record, in the execution of Village Domestic Supplies Schemes.

The amount allocated was £830,000 which is almost 5 times, the amount spent on domestic supplies in any other previous year during the life of the Department. Never in the history of the Department, so much has been done with so little staff. During the year 106 village water supply schemes serving a population of 75,300 persons were completed. It will be worth noting that 358 miles of pipes were laid, enough to cover the distance from Apostolos Andreas to Akamas, and back two times; 123 reinforced concrete storage tanks, of a total capacity of 1.5 million gallons, 169 public fountains and 23 pump/houses were constructed; 57 of the completed schemes were new and the remaining were complete replacements to existing supplies that were formerly unsatisfactory or completely deteriorated and unserviceable.

It is now estimated that of the total of 627 villages named in the Census of 1956, the number with piped supplies is 558 or 89%. 359 (57.26%) are considered satisfactory and 199 (31.74%) need fundanmental repairs, replacements and supplementary supply. Because of the increase of population, rise in the standard of living and the prevailing drought water supplies that were formerly considered satisfactory are now in need of improvements. The 69 villages without piped supply are on the whole situated far from reliable sources but every possible effort is being made to solve their problem, even if the cost of supplying them from distant sources renders the cost in most cases much greater than in past schemes.

In addition to the 106 schemes completed in 1961, a further 20 schemes were under construction but incomplete at the end of the year. Plans have been prepared for a further 130 schemes, estimated to cost £1,122,000.

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The following table gives the outline of the work done during the year.

LENGTH OF PIPES LAID IN 1961
(Galvanized mild steel pipes).

Size	¾"	1"	1¼"	1½"	2"	2½"	3"	4"
Nominal Diameter length in Miles	5.007	68.270	60.857	43.655	54.075	19.278	36.403	34.954

(Asbestos cement pressure pipes)

Size	2"	3"	4"	6"
Nominal Dimater length in miles	3.160	13.939	8.747	9.446

Elevated re-inforced concrete:-

Tanks	10	
Ground Tanks	113	
Pump/houses	23	
Fountains	169	
Distribution boxes	12	
House connections	41	villages.

7. The schemes completed may be classified as shown below:-

"Village Standard" means that the distribution of the water is effected by means of street fountains only, and not by house connections.

A public fountain with trough and proper drainage, is provided to serve 6-10 houses. The house-to-house distribution system is very much favoured by the villages, and it is now implemented in all villages where the supply is adequate.

Lists showing the village schemes completed during the year, those in hand at the end of the year and schemes prepared for execution are given in Appendices 10, 11, 12 & 13.

The successful drilling carried out during the year made it possible to complete the pumped supply schemes for the villages in the Eastern Mesaoria,. Ayia Napa Peninsula, and the central Mesaoria where there was no piped supply at all.

Such schemes are:-

Neta, Ayia Trias (Yialousa), Styllos, Engomi, Liopetri, Akhna, Lysi-Makrasyka, Phylia, Masari, Kokkini-Trimithia, Paleometokho, Ayii Trimithias, Kato Zodhia, etc.

A large village domestic supply waterwork executed during the year, is the combined gravity scheme for Ypsonas, Pano and Kato Polemidhia. Each village has been provided with adequate storage and distribution mains have been laid in all streets for a house-to-house service.

Another large village domestic supply waterwork is the pumped supply scheme for the three villages in the Paphos District, (Ayia Varvara-Timi-Anarita).

The source of supply is a successful borehole in the Ezuza river. Water is pumped into a 100,000 gallons storage tank from where the share of each village is divided through a distribution box, and piped away into a service storage tank in every village.

The drilling of successful boreholes have made it possible to prepare pumping scheme for the supply of domestic water to dry villages in all districts. A pumped supply scheme estimated to cost £100,000 has been prepared for Ktima, and the sources are two successful boreholes in the Xeros river.

The preparation of the domestic supply scheme is now based mostly on the regional system and such regional schemes have been prepared for villages, in the Limassol District.

Villages to be supplied from a borehole in the Yermasoyia river, and a combination of other villages from springs in the Troodos range. In Paphos District a group of 7 villages will be supplied from an infiltration gallery to be constructed in the river just above Ayia Forest Station, and an other group of 9 villages from the Xeropiyi spring near Stavros-tis-Psokas Forest Station.

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APPENDIX 10.

NUMBER AND PERCENTAGE OF VILLAGES WITH PIPED DOMESTIC SUPPLY 31ST DECEMBER, 1961

District	Villages with piped water			Villages with no piped water		Total Villages
	Satisfactory	Needing Improvement	Total			
	No.	No.	No.	No.	%	No.
Nicosia	99	53	152	24	13.64	176
Larnaca	25	26	51	8	13.56	59
Limassol	58	49	107	6	5.31	113
Famagusta	54	27	81	17	17.35	98
Paphos	104	22	126	8	5.97	134
Kyrenia	19	22	41	6	12.77	47
Totals	359	199	558	69	11.00	627
Percentage	57.26	31.74	89.00	11.00	11.00	100.00

Note:-

The above figures are the result of an up-to-date survey and they do not correspond with others given in the annual reports of former years. Some supplies that were previously satisfactory are now considered unsatisfactory, because with an expanded population and higher standard of living more water and more facilities are required.

The prevailing drought for the last 5 consecutive years, has greatly affected all water sources.

APPENDIX 11.

VILLAGE WATER SUPPLY SCHEMES COMPLETED IN 1961.

No.	Village	District	Nature of Work	Date of Completion
1	Kalavasos	Larnaca	/	14th January
2	Kellia	"	/	20th "
3	Palekhori Orinis	Nicosia	/	21st "
4	Kornokipos	Famagusta	/	22nd "
5	Ayios Ioannis	Nicosia	*	28th "
6	Ammadhies	"	*	28th "
7	Limnitis	"	* ⁂	28th "
8	Dhiorios	Kyrenia	*	30th "
9	Alithinou	Nicosia	/	4th February
10	Kalokhorio (Kapouti)	Kyrenia	*	5th "
11	Stroumbi	Paphos	/	11th "
12	Yeroskipos	"	/	21st "
13	Melousha	Larnaca	* ⁂	3rd March
14	Myrtou	Kyrenia	* ⁂	11th "
15	Karpasha	"	* ⁂	11th "
16	Yerani	Famagusta	* ⁂	18th "
17	Vrecha	Paphos	/	19th "
18	Neta	Famagusta	* ⁂	30th "
19	Livadhia	"	/	9th April
20	Xeri	Nicosia	* ⁂	11th "
21	Anayia	"	*	13th "
22	Peristeronari	"	*	16th "
23	Ayia Varvara	"	* ⁂	18th "
24	Neon Khorion Kythreas	"	*	25th May
25	Palekythro	"	*	25th "
26	Voni	"	*	25th "
27	Epikho	"	*	25th "
28	Exometokhi	"	*	25th "
29	Bey Keuy	"	*	25th "
30	Trakhoni	"	*	25th "
31	Kakopetria	"	/	29th "

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No.	Village	District	Nature of Work	Date of Completion
32	Kalogrea	Kyrenia	/	7th June
33	Kandara	Famagusta	/	22nd "
34.	Xylophagou	Larnaca	/	29th "
35	Pano Platres	Limassol	/	1st July
36	Phylia	Nicosia	* ж	8th "
37	Masari	"	*	8th "
38	Ayios Georghios	Paphos	/	15th "
39	Ayia Trias	Famagusta	* ж	26th "
40	Saittas Farm	Limassol	*	28th "
41	Prodhromos	"	/ ж	31st "
42	Kophinou	Larnaca	/	1st August
43	Angolemi	Nicosia	*	11th "
44	Nata	Paphos	* ж	13th "
45	Alektora	Limassol	/	12th "
46	Maratha	Famagusta	* ж	18th "
47	Liopetri	"	* ж	22nd "
48	Ktima	Paphos	/	24th "
49	Ayios Nicolaos	Famagusta	/	24th "
50	Ayios Georghios	Kyrenia	* ж	26th "
51	Styllos	Famagusta	* ж	30th "
52	Engomi	"	* ж	30th "
53	Ayios Amvrosios	Limassol	/	4th September
54	Kokkina	Nicosia	0	7th "
55	Vroisha	"	/	16th "
56	Mesakhorio	Paphos	*	25th "
57	Khlorakas	"	* ж	26th "
58	Pano Koutraphas	Nicosia	/	3rd October
59	Paleometokho	"	* ж	10th "
60	Syrianokhori	"	/ ж	14th "
61	Theletra	"	/	17th "
62	Ayios Thomas	Limassol	0	17th October
63	Athienou	Larnaca	/	1st November
64	Mesoyi	Paphos	* ж	4th "
65	Yerasa	Limassol	/	4th "
66	Galatia	Famagusta	/	6th "
67	Pano Arkhimandrita	Paphos	*	25th "
68	Monarga	Famagusta	/	25th "

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No.	Village	District	Nature of Work	Date of Completion
69	Timi	Paphos	* ✕	26th November
70	Anarita	"	* ✕	26th "
71	Ayia Varvara	"	* ✕	26th "
72	Erimi	Limassol	/	27th "
73	Komi Kebir	Famagusta	/	27th "
74	Ovgoros	"	/	27th "
75	Melamicu	Paphos	*	28th "
76	Ormidhia	Larnaca	* ✕	30th "
77	Tala	Paphos	*	4th December
78	Androlikou	"	* ✕	13th "
79	Armou	"	*	14th "
80	Klirou	Nicosia	/	15th "
81	Kokkini-Trimithia	"	* ✕	18th "
82	Yermasoyia	Limassol	/	19th "
83	Pelendria	"	/	30th "
84	Kato Amiandos	"	/	30th "
85	Ypsonas	"	* ✕	30th "
86	Vounaros	"	* ✕	30th "
87	Pano Polemidhia	"	* ✕	30th "
88	K. Polemidhia	"	* ✕	30th "
89	Akhna	Famagusta	* ✕	30th "
90	Makrasyka	"	* ✕	30th "
91	Lysi	"	* ✕	30th "
92	Dhierona	Limassol	/ ✕	30th "
93	Kornos	Larnaca	* ✕	30th "
94	Silikou	Limassol	/ ✕	30th "
95	Ayios Mamas	Limassol	/ ✕	30th "
96	Ayios Pavlos	"	/	30th "
97	Nikos	Nicosia	/ ✕	30th "

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No.	Village	District	Nature of Work	Date of Completion
98	Vathylakas	Famagusta	* ⋇	30th December
99	Kalokhorio	Larnaca	* ⋇	30th "
100	Kato Zodhia	Nicosia	⁄ ⋇	30th "
101	Petra	"	⁄	30th "
102	Karavostasi	"	⁄	30th "
103	Kolossi	Limassol	⁄	30th "
104	Skoulli	Paphos	⁄	30th "
105	Ayios Theodoros (Tyllirias)	Nicosia	⁄	30th "
106	Vasili	Famagusta	* ⋇	30th "

* New schemes

⁄ Improvement to an existing supply

⁄ Water supply to schools and Police Stations

⋇ House-to-house service

0 Preliminary investigation work.

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APPENDIX 12.

VILLAGE WATER SUPPLY SCHEMES IN HAND AT THE END OF 1961

Serial No.	Village	District
1	Geunyeli	Nicosia
2	Xerovounos	"
3	Galini	"
4	Loutros	"
5	Vasilia	"
6	Ayii Trimithias	"
7	Katydhata	"
8	Phterikoudhi	"
9	Photta	Kyrenia
10	Vouno	"
11	Leonarisso	Famagusta
12	Lapathos	"
13	Sotira	"
14	Kyperounda	Limassol
15	Lemithou	"
16	Kissonerga	Paphos
17	Khrysokhou	"
18	Pano Akourdalia	"
19	Emba	"
20	Lemba	"

/66.

APPENDIX 13.

VILLAGE DOMESTIC SUPPLY

SCHEMES PREPARED AND SUBMITTED FOR CONSIDERATION AND APPROVAL

Ser. No.	Village	Ser. No.	Village
	Nicosia		
1	Apliki	14	Kythrea Town
2	Askas	15	Kythrea Lower Villages
3	Astromeritis	16	Lakatamia Kato
4	Ayios Theodhoros Soleas	17	Lakatamia Pano
5	Dhali	18	Lefka
6	Kalopanayiotis	19	Lythrodontas
7	Kambos	20	Morphou
8	Kannavia	21	Moutoullas
9	Katokopia	22	Polystipos
10	Kokkina	23	Psomolophou
11	Korakou	24	Zodhia Pano
12	Koutraphas Pano	25	Prastio Morphou
13	Koutraphas Kato.	26	Malounda
	Kyrenia		
1	Asomatos	6	Kormakiti
2	Ayios Amvrosios	7	Lapithos
3	Bellapais	8	Larnaca-tis-Lapithou
4	Kambyli	9	Trapeza
5	Kharcha	10	Kyrenia Town
	Famagusta		
1	Ayios Elias	5	Rizokarpaso
2	Ayios Andronikos	6	Knodhara
3	Ayios Symeon	7	Trypimeni
4	Paralimni		

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Ser. No.	Village	Ser. No.	Village
	Larnaca		
1	Vavatsinia	6	Alaminos
2	Psematismenos	7	Skarinou
3	Maroni	8	Avdhelleron
4	Tokhni	9	Mazotos
5	Ayios Theodhoros	10	Pyla
	Limassol		
1	Trimiklini	25	Kato Platres
2	Lania	26	Omodhos
3	Ayios Georghios (Silikou)	27	Potamiou
		28	Mathikoloni
4	Kapilio	29	Akrounda
5	Limnatis	30	Kalokhorio (Zoopiyi)
6	Korphi	31	Kyperounda
7	Dhoros	32	Yerasa
8	Monagri	33	Kouka
9	Mouttayiaka	34	Lophos
10	Armenokhori	35	Ayios Therapon
11	Ayios Tykhonas	36	Pakhna
12	Pareklishia	37	Dhora
13	Monagroulli	38	Tris Elies
14	Ayios Georghios Monastery	39	Alassa
		40	Kaminaria
15	Moni	41	Athrakos
16	Mesayitonia	42	Pissouri
17	Ayios Athanasios	43	Prastio (Evdhimou)
18	Ayia Phyla	44	Sotira
19	Khandria	45	Vasa (Kilani)
20	Agridhia	46	Louvaras
21	Dhymes	47	Agros
22	Potamitissa	48	Souni Zanadja
23	Mandria		
24	Arsos		

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Ser. No.	Village	Ser. No.	Village
	Paphos		
1	Pano Akourdalia	16	Anavargos
2	Amargeti	17	Konia
3	Ayia Marina (Khrysokhou)	18	Kathikas
		19	Phiti
4	Istinjo	20	Kallepia
5	Kholetria	21	Letymbou
6	Kritou Marottou	22	Khoulou
7	Mandria	23	Pitargou
8	Meladhia	24	Kourtakas
9	Melandra	25	Pelathousa
10	Nea Dhimmata	26	Lyso
11	Pomos-Paleambela	27	Peristerona
12	Philousa	28	Peyia
13	Pretori	29	Yialia
14	Skoulli		
15	Zakharia		

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APPENDIX 14.

HYDROLOGICAL NOTES 1960-1961

By N. Chr. Toufexis, Inspector of Works

(This report covers the period from 1st October, 1960 to 30th September, 1961).

Meteorological.

The main characteristics of the total precipitation during the year were:-

(a) The average rainfall over the whole island was 17.20 inches which is about 86.8% of normal. The average rainfall since 1908 is 19.8 inches.

(b) The precipitation during November was normal, while in February it was by 76% more than normal. All other months of the year were very much below normal's level.

(c) Although the net result was an overall below-average rainfall, certain parts of the island in Akamas Peninsula and in Famagusta area experienced normal precipitation.

(d) The highest daily rainfall in the year was 5.7 inches and it occurred in Famagusta on the 26th November, 1960, causing floods in the Kharangas (Kato Varosha) stream.

(e) Some snow fell at the high altitudes of the Troodos mountains in January, February and March.

(f) Temperatures were generally above normal during the winter and summer month, but little below normal in the spring from February to March. The highest temperature measured at Nicosia was 107° on the 16th August.

/70.

Flood Discharges.

The only serious floods reported in 1960-1961 occurred in the valleys of rivers flowing east and south west from the central massif. The highest flood flows were 2,700 cusecs at the Xeros (Paphos) river recorded at the Limassol-Paphos bridge and 2,080 cusecs at the Tremithios river recorded near Ayia Anna on the 7th February. The rainfall on this day was 1.75 inches at Kelokedhara and 1.60 inches at Kornos.

Summary of some of the larger floods and of the maximum rainfalls measured in the catchment on the day of the flood is given in the following table:-

River	Place	Peak flow in cusecs	Rainfall in inches	Place	Date
Pedhieos	Nicosia ex-railway bridge	1,370	2.53	Kionia	26.11.60
"	- do -	1,800	1.70	"	4. 1.61
Kharangas	Kato Varosha	1,460	5.70	Famagusta	26.11.60
Yermasoyia	Nicosia-Limassol bridge	1,660	2.19	Kalo-khorio Limassol	4. 1.61
Dhiarizos	Limassol-Paphos bridge	1,300	1.10	Ayios Nicolaos (Paphos)	7. 2.61
Xeros (Paphos)	"	2,700	1.75	Keloke-dhara	7. 2.61
Tremithios	Ayia Anna	1,760	2.50	Pera-Khorio	26.11.60
"	"	2,080	1.60	Kornos	7. 2.61
"	"	1,800	1.07	Pera-Khorio	5. 5.61

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River Discharges.

The high rainfall intensities experienced over the island during February resulted in high glows in the central massif rivers in spite of the overall below-average rainfall. By the end of the year the total discharge of most of the rivers and streams were above average.

At the end of the hydrological year the following water level recorders were in operation:-

No.	Catchment	Location	Type of Installation
1	Pedhieos	Nicosia Ex-Railway bridge	Water-level recorder.
2	Yialias	Near Kochatis	Water-level recorder on 60 ft. measuring weir.
3	Ovgos	Morphou-Kyrenia bridge	Water-level recorder.
4	Serakhis	Near Morphou	Water-level recorder.
5	Xeros (Nicosia)	Xeros bridge	- do -
6	Marathasa	Lefka-Skouriotissa bridge	- do -
7	Kharangas (Famagust)	Near Kato Varosha	Water-level recorder on 70 ft. irrigation weir.
8	Avgorou	Near Avgorou	Water-level recorder on 40 ft. measuring weir
9	Paralimni	Near Paralimni Lake	Water-level recorder on 40 ft. flume.
10	Pyrgos (Tyllirias)	Near Phileyia	Water-level recorder on 30 ft. measuring weir.
11	Limnitis	Near Limnitis Sawmill	Water level recorder on 30 ft. measuring weir.
12	Ovgos	Near Syrianokhori	Water-level recorder on 6'7" measuring weir.
13A	Kouris	Limassol-Troodos bridge	Water-level recorder on 18 ft. measuring weir.

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No.	Catchment	Location	Type of Installation
13B	Kouris	Near Trimiklini Dam	Water-level recorder on 1' 6" flume.
14	Peristerona	Near Panayia bridge Forest Station	Water-level recorder on 25 ft. measuring weir.
15	Tremithios	Kiti	Water-level recorder on 73 ft. irrigation weir.
16	Yermasoyia	Nicosia-Limassol bridge	Water-level recorder.
17	Kouris (Kandou)	Near Kandou	Water-level recorder on 300 ft. irrigation weir.
18	Kolopanes	Near Kalopsidha	Water-level recorder on 25 ft. measuring weir.
19	Akhna	Near Akhna Police Station	Water-level recorder on 40 ft. measuring weir.
20	Phrenaros	Near Asprovouniotissa Church	Water-level recorder on 40 ft. measuring weir.
21	Kokkini-Trimithia	Near Kokkini-Trimithia	Water-level recorder on 40 ft. measuring weir.
22	Liopetri	Near Liopetri	- do -
23	Akaki	Near Malounda	- do -
24	Skylloura	Near Ayios Vassilios	Water-level recorder on 60 ft. measuring weir.
25	Ak Sou	Near Petra tou Dhigheni	Water level recorder on 30 ft. measuring weir.
26A	Almiros	Near Geunyeli	Water level recorder on 40 ft. measuring weir.
26B	Almiros	Near 25A	Water-level on standing wave flume with 1 foot throat.
27	Khrysokhou	Near Skoulli	Water-level recorder on 40 ft. measuring weir.
28	Evretou	Near Trimithousa Evretou Road Junction	Water-level recorder on 25 ft. measuring weir.

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No.	Catchment	Location	Type of Installation
29	Syrgates	Near Skarinou	Water-level recorder
30	Dhiarizos	Limassol-Paphos bridge	- do -
31	Xeros (Paphos)	- do -	- do -
32	Alakati	Platimatis near Ayios Amvrosios (Kyrenia)	Water-level recorder on 22 ft. measuring weir.
33	Karyiotis	Near Pendayia	Water level recorder on 40 ft. measuring weir.
34	Tremithios	Ayia Anna	Water-level recorder on 40 ft. measuring weir.
35	Elea	Elea Bridge	Water-level recorder

Measured discharges 1960-1961.

The discharges measured at the gauging stations of the previous paragraph are as follows:-

Recorder No.	Catchment	Rainfall 10^6 c.ft.	Run off 10^6 c.ft.	Maximum discharge in a day 10^6 c.ft.	Maximum flow cusecs	Per cent Run-off
1	Pedhieos	1,896	129.0	34.9	1,800	6.8
2	Yialias	1,279	169.5	18.2	760	13.25
3	Ovgos	1,982	3.12	2.2	785	0.15
4	Serakhis	7,022	73.8	16.1	280	1.5
5	Xeros	1,628	13.26	3.5	103	0.8
6	Marathasa	1,299	88.44	5.6	90	6.8
7	Kharangas	189	10.57	6.3	1,460	5.6
8	Avgorou	376	0.06	0.02	1	0.02
9	Paralimni lake outfall	-	0.28	0.15	66	-
10	Pyrgos (Tyllirias)	864	145.3	6.4	93.6	16.8
11	Limnitis	1,225	160.05	10.3	220	13.06
12	Ovgos Summer flow	-	-	-	-	-
13	Kouris	1,389	561.09	25.2	605	40.4

/74.

Recorder No.	Catchment	Rainfall 10^6 c.ft.	Run off 10^6 c.ft.	Maximum discharge in a day 10^6 c.ft.	Maximum flow cusecs	Per cent Run off
14	Peristerona	1,650	506.03	32.5	660	30.7
15	Tremithios (Kiti)	2,084	23.6	10.3	860	1.1
16	Yermasoyia	4,055	110.5	15.2	1,660	2.7
17	Kouris (Kandou)	7,558	318.9	18.7	910	4.2
18	Kolopanes	-	0.86	0.17	2.7	-
19	Akhna	348	0.15	0.13	9.6	0.04
20	Phrenaros	106	2.9	1.3	190	2.7
21	Kokkini-Trimithia	224	-	-	-	-
22	Liopetri	120	8.37	3.3	280	7.0
23	Akaki	1,965	361.9	27.5	654	18.4
24	Skylloura	770	1.28	0.3	10	0.17
25	Ak-Sou	120	13.13	5.5	380	10.9
26	Almiros	288	3.7	2.3	192	1.3
27	Khrysokhou	1,558	178.08	16.5	430	11.4
28	Evretou	2,259	156.3	5.5	186	6.9
29	Syrgates	2,404	140.8	14.4	834	5.85
30	Dhiarizos	59.52	1152.31	67.6	1,300	19.36
31	Xeros (Paphos)	5,225	374.17	21.5	2,700	7.16
32	Alakati	183	5.22	0.15	415	2.85
33	Karyiotis	1,796	14.02	2.4	96	0.78
34	Tremithios (Ayia Anna)	1,287	103.45	16.3	2,080	8.03
35	Elea	3,185	8,5	4.9	337	0.27

Spring Discharges:-

During the hydrological year 1757 spring discharges were measured, giving an average of over 146 measurements each month. 125 springs are now measured regularly, 31 at monthly intervals, 29 every 3 months, 17 every 4 months, 57 every 6 months and 1 every year.

The below normal over-all rainfall for the fifth year in succession resulted in spring discharges being nearly everywhere below average and in certain parts the yields were the lowest ever measured. Only very few springs on the highest altitude of the Troodos Mountains kept their rate of flow on average because of the replenishment of the substrata by the snow which fell during the wet months.

The springs used for the water supply of Troodos were yielding 26,000 gallons per day in September which is by 1,000 gallons per day more than last year. Similarly, the Kannoures spring were flowing, during the same period, at the rate of 59,000 gallons per day compared with 44,000 gallons per day previous year.

At the lower altitudes in Kouris valley near Khalassa, the discharge of Kephalovrysos, Kria Pighadhia and Mavrommata springs, feeding Limassol town were down to an aggregate flow of 292,000 gallons per day in October compared with 304,000 gallons per day last year. This yield is extremely below average and the lowest for several years.

On the south-western slopes of the Troodos mountains the combined discharge of the Klimataria, Kourgas, Kalamos and Mesoyi springs used for the water supply of Ktima dropped to 40,000 gallons per day in January, the lowest measurement ever taken for this month since 1950, but the above normal rains fell in Paphos during February and March resulted in improving and raising their yield to higher level than last year.

In the lower part of the Tremithios valley the rainfall was less than 70% of normal and the yield of the Bekir Pasha chain-of-wells feeding Larnaca during the summer was the lowest since systematic measurements commenced in 1956. At the end of October its rate of flow was only 165,000 gallons per day.

In the Nicosia area chain-of-wells suffered very much from the considerable low rainfall. The Upper Arab Ahmet chain-of-wells was following in October at the rate of 78,000 gallons per day, the lowest on record. The same behaviour was observed in springs.

In the Kyrenia range where the rainfall was by 25% less than normal spring discharges maintained their low rate of flowrearly throughout the year without having the usual seasonal increase. The Kephalovrysos at Karavas was flowing most of the year at the rate of 550,000 gallons per day and it is the only spring in the island with a very constant flow. On the contrary, the Kephalovrysos Kythrea has shown a steady decline for the last five years. Its discharge in September was 1,730,000 gallons per day, the lowest on record.

Ground-water used for Town Water Supplies:

Details of the water extracted from underground reserves for the three largest towns of Cyprus are given below:-

Nicosia	Quantity (Million cub. feet)	Percentage
Kokkini-Trimithia	110.9	63
Athalassa	2.0	1
Arab Ahmet	7.6	4
Laxia	9.4	5
Makedhonitissa	2.0	1
Dhali	4.0	2
Sykhari	5.5	3
Morphou	25.8	15
Prodhromos (Approx.) Nicosia	4.0	2
Others (Approx.)	7.0	4
Total Extraction during 1960-1961.	178.2	100
Famagusta		
Phrenaros West	18.5	36
Phrenaros North	28.2	54
Others	5.3	10
Total extraction during 1960-1961.	52.0	100

/77.

Limassol	Quantity (Million cub. feet)	Percentage
Kephalovrysos) Kria Pighadhia (and Mavrommata)	63.5	67
Chiftlikoudhia	13.8	14
Others	17.9	19
Total extraction during 1960-1961.	95.2	100

Ground water levels.

During the year the number of the boreholes and wells used every month for taking measurements of the underground water level has considerably increased from 57 to 94. The records taken from all these observation boreholes and wells show that the water table is continuously declining nearly everywhere and in some coastal areas it has been lowered below sea level as much as minus 8 feet.

In the Western Mesaoria, at Kokkini Trimithia area, which provided Nicosia with more than one half of its 1960-1961 domestic water supply, the average water-level dropped by nearly 7.2 feet. The decrease in level over the last eleven years has been 33 feet, giving an annual average of 3. The year 1960-61 therefore recorded a fall in excess of the average.

In the Morphou Bay coastal area near Syrianokhori the ground water level has been depressed by overpumping to as much as 3 feet below sea level. The continuous high rate of fall is viewed with considerable concern.

In the South-Eastern Mesaoria at Phrenaros area from which water for Famagusta domestic is obtained, the water table continued to drop by about 4 feet during the year. All records indicate that the decline of the water level is higher in the north parts of the area than in the west. As the present average underground water level is about 50 feet above sea level, it is important that careful control of pumping should be retained.

/78.

In the Ayios Memnon coastal area, the water level is about 8 feet below sea level. The replenishment of the depleted aquifers by the recharge operations using the waste-water during the rainy season will improve the situation. Sample of water taken for chemical analysis from observation borehole No. 50/53 has shown the NaCl content as 720 parts per million compared with 977 parts per million in the year 1955.

Appendix15 gives the Water-levels recorded at some observation boreholes after drilling and during the year 1959-60 and 1960-61.

Recharge Activities.

Famagusta:- No recharge operations were carried out in Famagusta during the hydrological year because the water which was collected in the Ayios Loucas and Paralimni lakes during the wet months from the nearby catchments was inadequate to be released through the tunnel for recharging the Kato Varosha and Ayios Memnon areas.

Limassol:- During the winter season the surplus water from the town domestic water supply was fed into the Chiftlikoudhia chain-of-wells to replenish the aquifer in the low-lying coastal area west of Limassol. In summer, when the normal sources of the town supply can not meet the demand water from the Chiftlikoudhia chain-of-wells is then pumped out. The chiftlikoudhia aquifer is therefore used in much the same way as a normal supply reservoir, filling taking place mainly artificially during winter and these reserves being drawn off in summer.

The following quantities of water were recharge into and pumped from the chiftlikoudhia chain-of-wells during the year:-

Total recharge into aquifer 9.9 m.c.ft.
Total extracted from aquifer 13.8 m.c.ft.

/79.

Chemical Analyses.

During the year 1924 samples of water were sent to the Government Analyst for chemical analysis. This number included 2 samples for full chemical analysis from domestic water sources and 815 samples for partial chemical analysis from springs, observation boreholes and irrigation boreholes.

Bacteriological Analyses.

During the year 618 samples of water, taken mainly from town water supplies were analysed by the Government Pathologist.

The total number of samples taken and the number of unsatisfactory are as follows:-

Water Supply.	No. of samples.	No. of unsatisfactory samples.
Nicosia	368	20
Famagusta	106	1
Limassol	55	10
Larnaca	42	2
Paphos	47	9
Total	618	42

At Nicosia most of the unsatisfactory samples came from the Bernera and Arab Ahmet chain-of-wells. Water from these sources tends to be generally unreliable in summer. All chlorinated samples at all reservoirs were satisfactory.

The unsatisfactory samples at Limassol, Famagusta, Larnaca and Ktima were usually of unchlorinated water. All chlorinated samples at the main reservoirs were satisfactory.

Special Investigations.

In order to study the effect of the recent expansion of pumping upon the natural underground water reservoirs, the hydrolgoical investigations were greatly extended during the year to cover the following areas:-

/80.

		Area
a)	Western Mesaoria (From Morphou Bay coastal area to as far as Kokkini-Trimithia area)	= 145 square miles
b)	South-Eastern Mesaoria (From South West of Famagusta to as far as Phrenaros - Xylophagou areas)	= 24 " "
c)	Kyrenia area (From Vavilas to as far as Ayios Epiktitos area)	= 42 " "
d)	Akrotiri-Phasouri areas	= 52 " "
		263 square miles

The preliminary results appear to indicate that there is an enormous excess of extraction over recharge in all areas. Especially in some parts of the Western Mesaoria, (Morphou Bay coastal area near Syrianokhori) the water table has been lowered below sea level to as much as minus three feet and there is the danger of sea water being penetrated inland and wells becoming saline and useless if drastic measures are not taken immediately for the reduction of pumping and the restriction of sinking any new well or borehole.

/81.

APPENDIX 15.

WATER LEVEL IN CONTROL BOREHOLES.

(Feet above sea level)

Ser. No.	Place	Borehole No. and year	Maximum water level			Minimum water level		
			Year after drilling	59-60	60-61	Year after drilling	59-60	60-61
1	Kokkini-Trimithia	90/50	685.8	662.1	658.0	681.2	658.3	656.8
2	Kokkini-Trimithia	160/50	682.7	663.4	658.5	679.8	657.9	654.9
3	Kokkini-Trimithia	161/50	686.0	657.4	650.7	680.2	649.5	627.3
4	Astromeritis	91/50	370.4	350.6	340.7	365.1	337.0	334.8
5	Morphou	168/50	89.2	68.4	66.0	84.1	64.1	62.8
6	Morphou	92/50	83.7	49.6	40.6	69.9	36.5	12.6
7	Prastio	93/50	27.1	10.0	4.3	22.1	1.7	- 1.7
8	Prastio	11/57	25.0	10.7	6.2	13.4	3.1	0.5
9	Ghaziveran	94/50	18.5	8.2	6.3	16.2	5.0	3.4
10	Pendayia	95/50	10.6	5.1	4.8	8.0	2.0	2.2
11	Syriano-khori	150/54	9.7	5.9	3.9	8.4	4.7	2.0
12	"	151/54	9.3	5.3	0.8	8.1	4.4	0.5
13	"	152/54	7.2	2.7	1.6	5.2	1.1	0.0
14	"	153/54	4.3	1.7	0.7	3.4	0.5	0.0
15	"	1/55	23.1	8.7	3.6	17.7	0.2	- 3.5
16	"	23/55	20.9	-	0.1	17.4	-	- 3.0
17	"	201/56	17.2	7.0	2.1	12.2	0.3	- 3.6
18	"	209/56	16.1	7.7	3.8	11.5	- 0.1	- 3.6
19	"	195/57	6.0	4.6	1.6	4.2	0.7	- 0.2
20	"	209/57	3.4	1.9	0.4	2.3	1.0	- 0.2
21	"	212/57	3.7	2.2	1.4	2.9	0.9	0.4
22	"	248/57	9.6	4.1	1.7	5.4	1.3	- 0.6
23	"	253/57	9.5	4.6	2.0	5.8	1.7	- 0.5
24	Xylophagou	70/51	19.1	12.5	11.0	15.9	10.8	8.9
25	"	71/51	13.1	4.4	2.2	10.6	0.6	- 2.7
26	"	72/51	18.5	11.7	12.5	14.7	9.4	9.6
27	"	73/51	6.0	5.0	5.0	3.7	4.0	3.3
28	"	74/51	6.9	4.9	3.8	4.5	3.2	2.4
29	Ormidhia	189/57	- 1.6	- 1.4	- 1.5	- 2.3	- 2.5	- 2.5

/82.

Ser. No.	Place	Bore hole No. and year	Maximum water level			Minimum water level		
			Year after drilling	59-60	60-61	Year after drilling	59-60	60-61
30	Ormidhia	227/57	0.7	0.3	0.2	0.4	- 0.2	- 0.4
31	"	246/57	-0.8	- 0.5	- 0.5	- 1.2	- 1.7	-1.7
32	Makrasyka	48/54	117.0	99.1	97.2	110.7	89.9	88.6
33	"	49/54	120.1	110.2	106.0	117.4	106.4	102.9
34	Kalopsidha	54/54	68.5	53.3	47.7	60.3	43.1	40.6
35	"	55/54	73.9	64.3	60.0	72.4	60.3	56.5
36	"	56/54	75.3	67.7	64.0	74.4	64.1	61.0
37	Pergamos	86/51	256.6	242.2	239.8	254.7	237.2	232.8
38	Phrenaros West	51/51	87.0	65.4	63.0	86.6	62.3	61.2
39	"	52/51	85.8	62.7	60.2	85.4	59.4	57.1
40	"	53/51	85.2	67.6	52.1	84.9	50.9	43.3
41	"	67/53	81.1	67.8	64.0	80.4	64.1	60.7
42	Phrenaros North	108/52	72.2	51.6	47.2	71.3	47.4	43.2
43	"	109/52	70.6	51.4	47.0	67.0	47.3	43.2
44	"	110/52	70.2	51.9	47.5	66.6	48.0	44.1
45	"	76/56	58.1	50.4	46.3	57.8	46.4	42.5
46	"	77/56	64.1	61.1	59.2	62.6	59.4	58.0
47	"	78/56	65.6	58.6	55.1	65.3	55.8	51.5
48	"	79/56	72.7	68.3	64.1	70.8	64.4	57.5
49	Ayios Nicolaos (Famagusta	89/56	29.4	27.5	27.1	28.5	26.3	26.2
50	Ay. Memnon	69/38	- 1.2	- 2.7	- 3.6	- 5.0	- 9.5	-8.3
51	"	50/53	3.2	0.1	- 1.5	0.2	- 3.7	-5.7
52	Kolossi	88/54	16.0	8.0	5.5	12.0	2.0	1.0
53	Laxia	208/55	672.2	654.8	652.2	666.3	650.6	646.5
54	Ephtakomi	163/55	496.4	464.5	462.1	490.2	462.6	460.6
55	Khalassa	23/58	547.6	547.3	547.6	544.2	543.7	542.7
56	Ayios Andronikos	247/55	391.3	391.0	389.1	390.6	389.1	387.2
57	"	322/55	386.2	386.3	384.6	385.7	384.7	383.5

APPENDIX 16
MECHANICAL PLANT
(as on 31/12/61)

MOBILE PLANT:-	No.
Ruston Bucyrus Drilling rigs 22W.	11
Ruston Bucyrus Drilling rigs 60RL.	1
Water Dev. Department (1959) drilling rigs. ..	1
Edeco Drilling Rigs.	2
Cheshire earth boring machine.	1
Allen Trencher 12"-21'.	2
Avelling-Barford Trencher.	1
Caterpillar Traxcavators 955.	3
Caterpillar Traxcavators HT4.	1
Caterpillar Bulldozer.	1
International Bulldozer.	1
Ruston Bucyrus Excavator RB10	1
Ruston Bucyrus Excavator RB19	1
Compressors.	11
Morrison diesel alternator on trailer. ..	2
Turbine deep-well test pumping units. ..	2
Plunger deep-well test pumping units. ..	2
Centrifugal pumping units.	4
Portable works pumps.	18
Sheepfoots roller.	1
Cranes.	2
Hoists	3
Concrete mixers	28
Vibrators	10
Low loader	1
Austin Countryman Vans	6
Land Rovers.	6
Fordson Lorry 3 ton.	1
Humber Utility Vans	2
Thornycroft Tractive Unit for Low Loader. ..	1
Aveling Barfor Dumpers.	2
Bray Loader.	1
WORKSHOP PLANT:-	
Lathes.	4
Shaping machine.	1
Screwing machine.	1
Drilling machine.	3
Planning Timber Machine.	1

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	No.
Bandsaw timber.	1
Bar Bender.	1
Bar Cutter.	1
Electric Welders	3
Forges.	3
Pipe slotting machine oxy-acetyline. ..	1
Vibrating table.	1
Water Meter Testing Plant.	1
Concrete block making machine.	2
Compressor air (Tecalemit)	1
Milling machine.	1
Grinding machine.	2
Hack-saw Electrical	1
Concrete testing machine	1