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CYPRUS

WATER SUPPLY AND IRRIGATION DEPARTMENT

ANNUAL REPORT FOR 1953

BY

I. L. WARD, B.E., M.I.C.E., M.INST. W.E.

Water Engineer

NICOSIA

PRINTED AT THE CYPRUS GOVERNMENT PRINTING OFFICE

1954

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WEIGHTS, MEASURES AND CURRENCY.

WEIGHT :	400 drams	=	1 oke.
	1 oke	=	2 4/5 lbs.
	44 okes	=	1 kantar.
	180 okes	=	1 Aleppo Kantar (carobs).
	800 okes	=	1 ton.
CAPACITY :	1 Cyprus litre	=	2 4/5 quarts.
	1 kile	=	1 bushel.
	1 kouza	=	9 quarts } wine.
	16 kouzas	=	1 load }
LENGTH :	1 piç	=	2 feet.
AREA :	1 evlek	=	3,600 sq. feet.
	1 donum	=	14,400 „
	3.025 donums	=	1 acre.
CURRENCY :	1 piastre	=	1⅓ penny.
	9 piastres	=	1 shilling.
	20 shillings	=	1 pound.

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CONTENTS

Annual Report of the Water Supply and Irrigation Department for the Year 1953.

The engineering and geological side of all Government water supply work is in the hands of the Water Supply and Irrigation Department whose duties cover the whole range of water supply, including the search for new sources and the development of supplies for irrigation, domestic and industrial purposes. The administrative problems of village Irrigation Divisions and Associations and of Domestic Water Commissions are dealt with by the District Commissioners. Disputes over water rights are handled chiefly by the Commissioners in consultation with the Law Officers, the Department of Land Registration and the Water Supply and Irrigation Department. The agricultural problems involved in the economic use of irrigation water are the responsibility of the Department of Agriculture.

2. During 1953 the Water Supply and Irrigation Department further increased its activities. The main features of the year's work were good progress on the new town water supplies and a record output of village water supply schemes. More than 250 miles of pipes were laid during the year. Irrigation works and drilling for water continued at the pace set in recent years. There was no falling off in the number of requests from village communities for irrigation works and village water supplies, and from private persons for boreholes under the subsidised drilling scheme. This demand is a sure indication of the benefits that are being derived from schemes already completed.

3. The year was one of almost average rainfall with no special demands upon the department for either drought relief works or for flood damage repairs. The Paphos earthquake of 10th September caused practically no damage to waterworks but the flow of many springs in the earthquake area became abnormal after the main shock. Some springs increased in volume while a few decreased but by the end of the year most had returned to normal. Diversion of staff to assist in the reconstruction work caused a slackening in some branches of the department's activities in October, November, and December.

4. For efficient working the department is divided into four chief branches: (1) Irrigation Section, (2) Drilling Section, (3) Village Domestic Water Section and (4) Town Water Supply Section. There is continuous liaison between these branches so that their work is co-ordinated in the best interests of the over-all water supply problems of the island. Thus where the Domestic Water Section may develop a source of water in excess of the requirements of a particular village, the surplus may be utilised for irrigation or vice versa, or, where gravity water supplies are not available, investigations by the Drilling Section may locate underground sources from which water can be pumped.

5. The work of the Irrigation Section deals chiefly with gravity irrigation from springs, rivers, infiltration galleries; with storage in reservoirs and, to a lesser extent, with pumping schemes for the distribution of irrigation water for rural communities from boreholes and wells. As in previous years, the policy of the department has been to undertake many small schemes rather than a few large ones. These small schemes have become very popular and a steady flow of proposals for new irrigation works is coming in. The total number of irrigation schemes completed during the year was 72 providing sufficient water to irrigate 9,900 donums, of which 3,600 donums can be irrigated perennially. Eighteen more schemes were in hand at the end of the year and a further 65 have been prepared and still remain to be carried out.

6. The rate of progress in irrigation since the commencement of the Ten-Year Programme of Development in 1946 is shown in the following table :—

	Gravity Irrigation		Mechanical Irrigation (i.e. Pumped)	Total
	Perennial	Seasonal		
	Donums	*Donums*	*Donums*	*Donums*
1946 Census..	59,409 say 59,500	284,977 say 285,000	53,131 say 53,000	397,517 say 397,000
Estimated at end of 1952 ..	77,500	328,500	85,000	491,000
New Irrigation, 1953	3,500	6,000	8,000	17,500
Estimated totals at end of 1953	81,000	334,500	93,000	508,500
Percentage increase since 1946 census and commencement of Ten-Year Programme of Development	36%	17%	76%	28%

7. The Drilling Section is largely occupied in sinking subsidised irrigation boreholes for private individuals. It also sinks prospecting boreholes for Government and full cost boreholes for irrigation, domestic water and industrial purposes for public bodies and commercial companies. The total number of boreholes sunk during the year was 230 of which 70% were successful. 44 of the boreholes were for the purpose of prospecting for water in new areas and of these 50% were successful. The benefits of the perennial irrigation resulting from recent boreholes in drilling areas is clearly visible in the marked changes that are taking place in the agricultural development of these areas. Where previously the summer landscape was bare and arid, citrus groves and vegetable gardens are being extended year by year and the agricultural economy of these districts thereby greatly improved. These beneficial results are reflected in the continuing demand for subsidised and full-cost boreholes both in these areas and elsewhere throughout the island. This demand is maintaining a waiting list of applications which seldom falls below 50 in spite of the continued high rate of drilling.

8. The work of the Village Domestic Water Section is confined to water supplies for villages and rural municipalities. Sources of water are examined, measured, and where suitable, developed. Supply and distribution pipe lines are laid and storage tanks and public " fountains " erected. A " fountain " is a combined public standpipe, trough and drainage soak-pit. With the exception of certain of the larger villages no house connections are made. The sources may be springs, infiltration galleries, boreholes or wells.

9. During the year 80 village water supply schemes have been completed. This figure includes 30 schemes for villages which had previously no piped supply and 50 schemes for the improvement of existing inadequate supplies. This raises the total of new schemes and improvements completed since 1946 to 366 and it is now estimated that of the total of 627 villages named in the census of 1946 the number with piped supplies is 460 or 73%. Of these 314 (50%) may be considered to be satisfactory and 146 (23%) need fundamental repairs or replacements. The 167 villages still without piped supplies are, on the whole, situated far from reliable sources and the cost and difficulty of supplying them with piped water will in most cases be greater than in past schemes. Moreover, a higher standard of living is becoming evident and an increased quantity of water and a greater number of " fountains " per unit of population is now sought.

10. *Town Water Supplies.*—The Town Water Section has been very fully occupied during the year both with the planning and the construction of the new schemes for the Water Boards of Nicosia, Limassol and Famagusta. Owing to further deterioration of the quality of the water in the old town wells at Famagusta it became necessary to begin the second phase of the new scheme for that town at a time when staff were already fully occupied with Nicosia and Limassol. The diversion of other staff to assist in earthquake relief measures at Paphos added more difficulties and towards the end of the year it became necessary to reduce the rate of working in Limassol and to a less extent in Nicosia. Nevertheless, in spite of staff difficulties good progress has been made during the year and water from the new schemes is now in daily use in both Nicosia and Limassol.

11. *Nicosia Water Supply.*—In brief, the present Nicosia Water Supply Scheme entails the conveyance of water through pipe lines from different sources within a ten-mile radius of Nicosia, the construction of a central service reservoir, and the laying of new distribution pipes. The water is for the present Water Board Area which is slightly larger than the Municipal Area but is less than Greater Nicosia since it excludes the suburbs of Strovolos, Engomi, Ay. Dhometios, Orta Keuy, Trakhonas and part of Omorphita. The scheme will provide 1,000,000 to 1,250,000 gallons per day.

12. Good progress has been made during the year and the following works are now virtually completed.

(*a*) Ayii Trimithias pumphouse and pipe line.
(*b*) Kokkini Trimithia pumphouses (2) and pipe line.
(*c*) Laxia pumphouse and pipe line.
(*d*) Repairs to Makedonitissa chain-of-wells, construction of tank, pumphouse and pipe line.
(*e*) Upper Arab Ahmet pipe line.
(*f*) Covered Service Reservoir (800,000 gallons), water tower, pumphouse, reception tank, and chlorinators.
(*g*) One-third of the distribution system.

In all, some 55 miles of pipes have been laid.

13. The first part of the scheme came into operation in 1952 when the Laxia boreholes were used to relieve the Platy water supply system. The new service reservoir was first filled in August, 1953, and connections were made to the pipes of the former water companies at the same time. Since then the reservoir has been in constant use. The first of six distribution areas was completed on 7th September and the second on 8th December. Work is now proceeding on the third.

14. The Nicosia Water Board, following a notice in the *Gazette* of 2/7/53, acquired the ten chief water companies that formerly supplied Nicosia with water. Since then it has been supplying all consumers within the Water Board Area either by means of the acquired waterworks or by the new scheme which is coming into full operation by stages as the new pipes are laid.

15. The scope of the scheme has been enlarged slightly since work began and it is now to provide more street distribution pipes, and also water meters for all consumers. The revised estimated cost of construction is £532,000 (May, 1953) exclusive of the cost of acquisition of the companies.

16. A scheme to provide water for the expanding population of Greater Nicosia, including the adjoining villages, is being prepared.

17. In Nicosia three Government water supply systems, viz. the Government House—English School Supply, the supply for the Government Offices and Hospital, and the supply to the Prison and the houses of Government Officers, are run by the Department.

18. *Limassol Water Supply.*—The sources are three springs, namely Kephalovryso, Kria Pighadia and Mavromata. Their waters are collected and gravitated through 18 miles of steel pipes to the new 800,000 gallon reservoir outside Limassol. From the reservoir a ring main runs round the town with seven outlets, each of which supplies a distribution area. A connection is made in the town to the 100,000 gallon water tower which acts as a balancing tank and serves to keep up pressure at peak periods. Emergency supplies can be pumped if necessary from the old Chiftlikoudhia chain-of-wells in which the water is now sweet, having been artificially re-charged with surplus from the new supply. The springs will supply 800,000 to 1,250,000 gallons daily.

19. Good progress has been made during the year. Water from the springs was turned into the old distribution pipes on 27th April, since when the new works have been in continuous operation. They were officially opened by His Excellency the Governor on 31st May. The laying of the pipes of the new distribution system is continuing and at the end of the year this part of the scheme was about one-third finished. The completed portion includes the part of the town around the bye-pass which formerly had no piped water.

20. The estimated cost of the scheme is £400,000 including the cost of water meters for all consumers.

21. *Famagusta Water Supply.*—The scheme is being carried out in three stages. The first comprises four pumping installations on boreholes at Phrenaros, an 8" pipe line to Famagusta and a 200,000 gallon covered storage tank. Water from this part of the scheme was used in Famagusta in the summer of 1952 and all details were finished early in 1953. Authority to proceed with the second and third stages was given at the end of August and a start was accordingly made in September. These comprise the installation of four pumps on new boreholes at Phrenaros (two miles away from the first group), a 9" pipe to Famagusta, the construction of two covered 220,000 gallon storage tanks, and the laying of a completely new pipe distribution system. The full scheme will provide about 1,000,000 gallons daily.

22. Orders for all materials were placed by the end of the year and the excavation of 5 miles of pipe trenches, mostly in rock, from Phrenaros to Famagusta was almost finished. Work is in progress on four pumphouses at Phrenaros, two small collecting tanks, the two large tanks at Stavros, and a permanent store building.

23. The estimated cost of construction of the full scheme is £400,000.

24. At Larnaca normal maintenance works were carried out. An up-to-date plan of the distribution pipes was prepared and pressure tests were made at different parts of the town to examine the effectiveness of the present " saccoraphi " system of distribution. For the Paphos Municipality a scheme was prepared to provide additional summer water from a new borehole recently drilled at the foot of the escarpment north of the town. For Kyrenia the department was successful in locating some artesian water in the Boghaz-Pass. An initial surface flow of about 40,000 gallons per day was obtained from a depth of 134 feet without pumping.

25. *Irrigation.*—The gravity irrigation works carried out by the department may be classified in the following groups :—

(*a*) Schemes developing small springs by excavation at their source, by lining channels in masonry or reinforced concrete to prevent loss of water, and by constructing masonry tanks for night storage.

(*b*) Schemes involving the diversion of seasonal or perennial flow from rivers and water courses by means of weirs and channels.

(*c*) Irrigation from infiltration galleries constructed in slow yielding acquifers, in fissured rock, or in river gravels either by gravity or by pumping.

(*d*) Water conservation in reservoirs for periods of a few days to several months.

26. The chief development in gravity irrigation in the last year or so has been the increased demand for concrete irrigation channels. Although masonry channels have been built in Cyprus since ancient times it is only recently that improved technique has caused reinforced concrete to become so popular. The Cyprus villager now realises that much water can be saved in this way and used for irrigating new land and that less labour is required for cleaning and maintenance. The construction of concrete channels has been in progress in many places during the year, notably at Lapithos (£42,000), Dhikomo (£14,000), Phini (£12,000), Vrecha (£7,000) and Evrykhou (£5,000). Other schemes have been prepared from Phlasou (£9,000), Bellapais (£5,500), Tembria (£4,000) and Milari (£3,500). The total length of channels lined during the year was 32 miles.

27. The typical small hill scheme which involves works as at (*a*) above is another favourite and a considerable number of these works has been executed during 1953. In the Pitsillia, the hill area in the centre of the island, every village has at least one of these irrigation schemes and some may have as many as 30 or more. Among the places where works of this sort have been carried out this year are Ay. Theodhoros, Ay. Ioannis, Kyperounda and Palekhori.

28. Only one small dam, at Kandou, has been built during the year. This is only 15 feet high but it is designed so that it can be heightened to 40 feet if experiments show that the soft limestone rock of which the reservoir is comprised remains water-tight. Two other water storage schemes have been under investigation—the first at Trimiklini where a scheme for a dam 95 feet high, costing £30,000 has been prepared and the second at Perapedhi for a dam 60 feet high, costing about £16,000.

29. Schemes involving pumped irrigation from boreholes or wells and canalisation have been in progress at Mamonia (£12,900), Prastio-Nikitas (£13,000) and Ghaziveran (£3,150). Channels from pumps on existing wells were lined at Psomolophou (£4,000). An experimental overhead irrigation plant demonstrating four different types of sprinkler was installed for the Department of Agriculture at the Morphou experimental farm.

30. *Village Domestic Water Supplies.*—The total of 80 village water supply schemes is a record. It compares with 77, 68, 52 and 32 in the years 1952, 1951, 1950 and 1949 respectively. At the end of the year a further 17 schemes were in progress. Investigations for new schemes are keeping pace with construction and 64 are ready to be started as soon as money is available and formalities are settled.

31. The tendency of village communities to seek more facilities for their domestic water supplies continues. They are now asking for more water per person than formerly and they seek a greater number of fountains per unit of population. It frequently happens that following the completion of a scheme the village Water Commission asks for additional fountains although the number installed was according to its original wish. On an average, one fountain is now provided for every 10 houses.

32. On the plains there are relatively few springs available for use in village water supplies by gravity. In the past it has been customary for villagers to draw their water from open wells with hand-pumps but they now tend to ask for engine driven pumps or sometimes windmills, together with the usual distribution system of pipes and street fountains. Five pumped village water supplies were completed in 1953 and investigations were made regarding a further 10.

33. The most important village water supply of the year was a regional scheme that may eventually supply a group of some 23 villages in the Paphos District from the Appidhes springs. These springs were excavated and built in 1951, pipe laying commenced in August, 1952 and the first stage of the scheme was finished by May, 1953, and supplied ten villages. The cost was £82,000 including a special Government grant of £18,200 to provide pipes large enough to supply other

villages in the future. Four more villages are now being connected and applications from a further nine villages are receiving attention. The scheme, which involved the laying of 62 miles of small diameter pipes in mountainous country in the first stage, is described in Appendix 9.

34. Domestic water for the " dry " villages of the Eastern Mesaoria remains an unsolved problem and all efforts to secure a large new source of supply both from drilling and from springs, have so far failed. A proposal was made to acquire 3% of the waters of the Kythrea spring for the 10 villages of Angastina, Marathovouno, Mousoulita, Yenagra, Pyrga, Chatos, Mora, Petra-tou-Dhiyeni and Kourou Monastir. The Kythrea irrigators were to be compensated for the loss of this part of their water by improvements to some of their earth channels which were to be lined in concrete to prevent the losses that now occur. Although more than the 3% would be saved by this means the Kythrea villagers were united in their objections and eventually the scheme was shelved. An alternative proposal is now under study. This consists of supplying the following villages as shown :—

(*a*) Marathovouno and Yenagra from a new chain-of-wells at Kythrea. The water would have to be pumped to the surface and could then gravitate to these two villages ;

(*b*) Pyroi, Tymbou, Mora, Angastina and Mousoulita by a gravity scheme from the Athanassi chain-of-wells which lies at some distance from Potamia village in Nicosia District. Pyroi and Tymbou are new in the scheme ;

(*c*) Petra-tou-Dhiyeni and Kourou Monastir from three small springs in the southern foothills of the Northern Range.

(*d*) Chatos from a borehole at Ayios Khariton, a village higher up on the hills to the North of Chatos.

A preliminary estimate of the cost of these schemes, excluding compensation payments, is £66,000.

35. Successful boreholes were drilled for the village water supplies of Pano Lefkara, Gaidhouras and Prastio (F), Chatos, Sinda and Pyrga, Yialousa, Prastio (M), Orounda, Ayii Trimithias and Paleometokho, and Kokkini Trimithia.

36. The following table shows the work done on village water supplies during the year.

VILLAGE WATER SUPPLIES 1953.

Size of Pipe	¾"	1"	1¼"	1½"	2"	2½"	3"	4"	Total
Miles laid ..	11.7	23.0	26.3	22.5	23.5	32.8	21.3	10.4	171.5

Storage Tanks : 84 Fountains : 668 Distribution Boxes : 62.

37. *Drilling for Water.*—Twelve drilling rigs were in operation in the field almost continuously throughout the year, except for minor breakdowns and necessary overhauls, and for a short period there were 13. In February 1953 two new Ruston-Bucyrus W-22 rigs arrived in Cyprus and two old machines (a Toronto and a Star) which had both been in use for over 25 years, were withdrawn from service. The Toronto was overhauled and subsequently employed mainly on borehole cleanings. In December, 1953, three additional new Ruston-Bucyrus W-22 rigs were received and put into service. The Toronto was then withdrawn so that at 31st December, 1953, the department's drilling plant consisted of thirteen modern rigs of which ten were Ruston-Bucyrus W-22 and three were Edecos.

Five of the ten Ruston-Bucyrus rigs are on loan from the Army. In addition three old rigs (two Stars and the Toronto) remain in the department stores. While these are rather antiquated in design and uneconomical in use, in emergency they can be sent out to the field at short notice.

38. Three transportable deep-well reciprocating pumping units were in almost constant use throughout the summer and autumn on long continuous test pumpings. Their total number of working hours was in excess of 4,600.

39. The total number of boreholes sunk during the year was 230, the total footage was 44,563 and the total tested yield 22,187,520 gallons per day. The number of boreholes is twelve fewer that in 1952 but the difference may be accounted for by the time taken in drilling several boreholes in extremely difficult conditions in the Kyrenia range. One borehole near Dhikomo, which was sunk through hard fissured limestone to a depth of 234 feet, occupied the time of one drilling rig for 3½ months. The Army also had the use of a drilling rig for a period of 45 days in connection with test pumping, during which no drilling was carried out. The total footage drilled during 1953 exceeds the previous year's figure by some 3,500 ft.

40. A total of 148 boreholes was sunk for irrigation, of which 110 or 74.3% produced on test, water in excess of 1,000 gallons per hour and may be classified as successful. The aggregate tested output of these boreholes was 16.5 million gallons of water per day, sufficient to irrigate 8,200 donums in summer.

41. The number of successful irrigation boreholes drilled since the beginning of the Ten-Year Development programme in 1946 is now 535, with a tested output of 86 million gallons per day, sufficient to irrigate 43,000 donums of summer crops. If an allowance is made for some of the boreholes not having come into production, the actual area irrigated from the new boreholes may be assumed to be about 40,000 donums in summer. The census of 1946 gave an estimation of 53,000 donums of land irrigated perennially by pumped water. By the end of 1953, as the result of departmental drilling, this area has been increased by nearly 76% to 93,000 donums.

42. The majority of the boreholes was drilled in the Pleistocene/Pliocene formations which occur mainly in the southern half of the Mesaoria and as in previous years these rocks have again provided most of the water. In the Western Mesaoria 72 out of 76 boreholes proved successful with a total tested yield of 12.7 million gallons per day. In this excellent water-producing area 517 boreholes have been drilled since 1925 yielding in all 69 million gallons per day. In the Eastern Mesaoria the most successful drilling was around Xylotymbou where 28 out of 30 borings produced on test 2.6 million gallons per day and in the Kouklia–Makrasyka area where seven successful boreholes yielded 0.9 million gallons per day. Drilling in other areas of the island was on the whole less satisfactory but out of 101 boreholes drilled 44 were successful in providing additional supplies of water where it was badly needed. A high percentage of all these boreholes was sunk for private individuals or companies either on repayment or as subsidised drillings. Details of boreholes and production are given in Appendices 3 and 4.

43. During 1953 the number of prospecting boreholes sunk was 44 as compared with 9 in 1952. Most of these were drilled in an effort to solve domestic water supply problems. Twenty prospecting boreholes were sunk, and prolonged test pumpings carried out on the most successful drillings, to prove the most suitable sources for additional water for the rapidly expanding population of greater Nicosia. The acute domestic water supply problem of the " dry villages " of the Eastern Mesaoria also received particular attention. Ten prospecting boreholes were sunk along the southern slopes of the Kyrenia range but unfortunately with little success. Two of these boreholes did, however, find moderate quantities of water in shallow gravel beds near Kythrea. This was subsequently developed by a system of wells and tunnels and proved capable of providing a minimum supply of about 40,000 gallons per day. It is proposed to pipe this water to the most needy

villages. In other areas prospecting met with considerable success. A borehole drilled on the hills near Pano Lefkara discovered an excellent supply of water in the chalks and marls which will be used for the domestic supply of this large village. The elevation at which this borehole was drilled is 2,000 ft. above sea level, equal to the greatest height at which a drilling has been successful in Cyprus. It is, however, unlikely that there is any extensive undeveloped acquifer in this locality. South of Lysi a borehole, drilled in a so far unexplored area, yielded over 4,000 gallons per hour and will probably be used for the domestic supplies of Sinda and Pyrga. Prospecting boreholes have also discovered adequate supplies with which to provide domestic water for Ayii Trimithias, Paleometokho, Kokkini Trimithia and Orounda.

44. Reference has been made above to the difficulties encountered in the prospecting borehole sunk on the southern flank of the Kyrenia hills near Dhikomo. This borehole eventually struck water, of excellent quality and apparently in good quantity, at a depth of 200 feet. It occurs along with fine sand in fissures and cavities in hard crystalline limestone. Unfortunately it was found impossible to maintain this borehole vertical and this, together with the depth at which the water was found, prevented a satisfactory test pumping. An open well has now been sunk to a depth of 70 feet through the most difficult drilling zone and a new borehole has been started from the bottom of this shaft. Another interesting and successful boring was sited in the Kyrenia hills for Kyrenia Municipality in St. Catherine's Pass (Boghaz). When water was struck at 134 feet it was found to be under sufficient hydrostatic head to raise it to 21 ft. above ground level. This is not a high yielding borehole but with an initial surface flow of over 40,000 gallons per day it is providing a welcome additional supply for Kyrenia.

45. In continuation of the prospecting carried out during 1952 in the Kourris River valley, west of Limassol, two out of three boreholes sunk in 1953 were successful and indicate that there are further undeveloped underground water resources in this area which can provide considerable quantities of water for perennial irrigation. A successful prospecting boring was also made between Paramali and Evdhimou yielding over 5,000 gallons per hour in an area where up to the present the lack of water has prevented the growing of summer crops.

46. *Hydrological.*—Two new observation boreholes were sunk during 1953 one at Phrenaros and the other at Ayios Memnon. Another disused borehole at Ayios Memnon has been cleaned out and is now being used for the same purpose. This brings the total of the observation boreholes to 24. Regular monthly measurements of water levels are taken and records thus provided allow a study of the seasonal and annual variations and will provide a warning of any likelihood of a particular area being over-pumped. Figures of the average and minimum water levels recorded during the years 1951–1953, together with an analysis of the results to date, are given in Appendixes 1 and 2.

47. In continuation of the work started several years ago the flow of a large number of springs situated all over the island was measured regularly throughout the year. The total number of which records are now kept is 130. Of these 9 are measured monthly, 90 bi-monthly and the remainder every three months. In addition numerous flow measurements of other springs were taken for investigation in connection with applications from villages for their use for domestic supply or irrigation works. Pump test measurements of wells, during the season of minimum yield, were also carried out for the same purpose.

48. Hundreds of samples of water from boreholes, wells and springs have been taken and sent to the Government Analyst for analysis during the year to test their suitability for domestic or irrigation purposes. The results are systematically recorded together with the results of regular periodic sampling of many domestic supplies and they enable a close check to be maintained on variations in quality of water.

49. Two new automatic water level recorders were installed during 1953 one on the Xeros River at Karavostasi and the other on the Marathasa at Lefka. Four others, installed in previous years, were in operation on the Pedieos at Nicosia, the Yialias at Nisou and the Serakhis and Ovgos at Morphou. Continuous flood discharge measurements are thus being obtained on all six rivers.

50. The artificial re-charge of aquifers was carried out on a small scale in the Ayios Memnon and Stavros quarters at Famagusta and at Chiftlikoudhia, Limassol. The results were successful in each case and are described in Appendix 1. A larger scheme involving a mile of tunnels and an earth dam impounding 30,000,000 gallons has been planned for the Ayios Lucas quarter, Famagusta.

51. A test to determine the seepage rate of water through the clay surface soil of the Syrianokhori Marshes was made for the Department of Agriculture. A pond one donum in area, contained by a consolidated earth bank, and drained by a surrounding ditch in which the water level was kept at five feet below ground was filled with water and allowed to stand for 17 days, during which time the loss of water was carefully observed. The level fell at the rate of 0.54 inches per day, excluding an allowance of 1/8 inch per day for evaporation. Most of the fall was due to percolation through clearly defined seepage zones around the roots of vegetation, not directly through natural interstices of the soil.

52. *Legislation.*—The only notable addition to the water laws of Cyprus during the year was the Wells (Amendment) Law, 1953. This provides for the licensing of drillers and the compulsory submission by them of drilling samples to the Water Engineer. It becomes an offence to use or possess an illegally constructed well in a controlled area or elsewhere. The amendment was necessary in view of the difficulties experienced in detecting illegally sunk wells within the former prescribed period of six months and the need for Government to possess geological records of all water boreholes drilled in Cyprus.

53. *Financial.*—The following is a summarised statement of the expenditure of the Water Supply and Irrigation Department in 1953 :—

Nature of work	Government		Contributions from Beneficiaries	Totals
	Colonial Development and Welfare Grants	Cyprus Funds		
	£	£	£	£
1. Gravity Irrigation Schemes ..	—	124,000	45,500	169,500
2. Village Water Supplies ..	56,000	81,000	119,000	256,000
3. Subsidised Drilling	—	13,800	4,000	17,800
4. Prospecting for Water	—	13,600	—	13,600
5. Drilling upon Repayment ..	—	—	9,700	9,700
6. Purchase of Drilling Plant ..	—	18,000	—	18,000
7. Nicosia Water Supply	—	—	148,000	148,000
8. Limassol Water Supply ..	—	—	74,000	74,000
9. Famagusta Water Supply ..	—	—	13,000	13,000
10. Miscellaneous works upon repayment	—	—	2,000	2,000
11. Departmental and Maintenance	—	50,200	—	50,200
Totals ..	56,000	300,600	415,200	771,800

54. Included in the above statement are :—

	£
1. Personal Emoluments	32,000
2. Wages for Labour (approx.)	235,000
3. Travelling and Subsistence	6,050
4. Government controlled Irrigation Works	11,250
5. Pump testing	1,000
6. Value of Casing Pipes fixed in boreholes	5,900
7. Total cost of drilling excluding items 5 and 6 above	25,000
8. Maintenance of Government Water Supplies ..	5,500

55. A sum of £8,300 has been collected as departmental charges for works carried out for the Water Boards, for drilling upon repayment, and for miscellaneous works upon repayment.

56. The average cost of a new borehole increased during 1953 from £93 to £109, which may be accounted for chiefly by a greater average depth. The average cost per foot drilled has increased slightly from £0.55 to £0.57. These costs do not include permanent pumping plant or borehole casing pipe, and they are also exclusive of depreciation of drilling plant, and salaries and expenses of the supervisory staff. They include the wages of the crews, transport of drilling plant, repairs and minor replacements of drilling tools and equipment.

57. Village contributions towards the cost of gravity irrigation works vary from one-fifth to one-third according to the type of work, the lower fraction being for flood or spate irrigation schemes, and the latter for perennial irrigation. Payment by the villagers is made in cash, in free labour (capitalized in the above statements) or by Government loans at low rates of interest. Village domestic water schemes are paid for half by Government, and half by the village, the village contribution being either in cash or by Government loan. Boreholes under the Subsidised Drilling Scheme are carried out for private irrigators at a fixed price to them of £32.10.0 per borehole and the balance which, in 1953 has on the average amounted to about £80 is paid by Government. Private individuals requiring boreholes for purposes other than irrigation are charged the actual cost in full including departmental charges. Municipal Corporations, Companies, etc., also usually pay the full cost and departmental charges.

58. *Staff and Labour.*—On 17th May, 1953, Mr. R. S. Wood was appointed Senior Engineer in the Town Water Supply Section. Six vacancies for temporary Senior Inspectors remained unfilled throughout the year. On the 31st December staff was comprised of the following :—

Water Engineer	1
Assistant Water Engineer	1
Senior Engineers	2
Superintendent of Waterworks	1
Assistant Engineer	1
Senior Inspectors of Water Supplies ..	2
Inspectors of Water Supplies	9
Technical Assistants	15
Foremen	82
Accounts, Clerical and Miscellaneous ..	39

59. The average number of labourers employed during the year was 1,740 of whom 140 were unpaid, their work being considered as a contribution to the village share of irrigation works. These figures compare with 1,720 and 90 in 1952. About 11% were classed as " skilled " and 15.5% as " regular " employees. In the months of October, November and December fewer labour was employed because of the diversion of staff to Paphos to assist in earthquake reconstruction works. The approximate monthly averages are as shown :—

Month	Paid Labour	Free Labour	Total
January	1,750	150	1,900
February	1,650	170	1,820
March	1,650	210	1,860
April	1,600	180	1,780
May	1,650	180	1,830
June	1,750	140	1,890
July	1,750	130	1,880
August	1,750	190	1,940
September	1,700	140	1,840
October	1,500	100	1,600
November	1,350	60	1,410
December	1,000	50	1,050
Average	1,600	140	1,740

60. As in other Government Departments a 44-hour week is observed by all labour. From Monday to Friday the working day is 8 hours, but on Saturday 4 hours only. The 4 hours on Saturday is considered a full day, and wages are paid for 8 hours. In drilling for water a bonus system is used, whereby a drilling crew, if it exceeds a certain prescribed monthly output, receives an addition to its normal weekly wages.

61. *Demand for Schemes :* Keen interest in all kinds of water supply work continues. A strong effort has been made to cope with the demand for village water supplies but there is still a long waiting list of applications which can only be attended to as staff become available. The construction of the large town water supply schemes at Nicosia, Famagusta and Limassol has necessitated the transfer of staff from village works to provide the necessary supervision. Requests for irrigation schemes were on the whole met but the demand for more persists. Applications for borings continue at a steady rate and, with the help of the new rigs, recently arrived, the present satisfactory drilling rate can be maintained. In general it may be said that the demand for irrigation works is being satisfied with the existing staff and machinery but the rate to which the domestic water problems can be attended is limited by the availability of suitable technical staff.

I. L. WARD,
Water Engineer.

January, 1954.

APPENDIX 1.

HYDROLOGICAL NOTES.

By D. P. McGregor, B.Sc., *Assistant Water Engineer.*

For Cyprus as a whole the winter of 1952–53 was one of fairly average rainfall. In the mountainous south-west precipitation was considerably above normal. In the centre of the island it was about average, while in the eastern plain and in the Kyrenia Range the rainfall was sub-normal. A feature of the rainfall was its low intensity. Instead of short heavy showers, as is usual in Cyprus, precipitation was spread over longer periods. The result was that in areas favourable to infiltration much of the water was absorbed into the ground and the run-off was low. These conditions were generally suitable for the recharging of underground aquifers.

The flood water flows at the recording sites were in fact so infrequent and low that it was found impossible to obtain a satisfactory discharge curve of the newly installed automatic recording sites on the Yialias at Nisou and on the Ovgos near Morphou. Only on the Pedieos river were satisfactory results obtained. These gave a figure of total run-off of 126 million cub. ft. as against a precipitation of 2,455 million cub. ft. within the catchment area or a percentage run-off of 5.1%. In the previous year when the rainfall was slightly less, but the intensity greater, the run-off figure for the same area was 24.4%.

The general effect of the rainfall of spring flows is reflected in the increased discharges recorded during 1953 in the Paphos district, while in the Kyrenia Range the flows of the springs diminished. An interesting result obtained from the records of spring flows and rainfall measurements in the Kyrenia Range during the past few years shows that, in this area, there is a considerable time lag in the effects of the rainfall on the spring discharges. Indeed the summer flow appears to vary very closely as the sum of the total local rainfall of the previous two winters.

The effect of the earthquake of September 10th, 1953, on the spring flows in the Paphos area is noteworthy. At that time of year the spring discharges are normally diminishing, but out of 17 springs, measured within a week after the earthquake, 9 showed increased yields, varying from 113% to 400% of the previous flow measurements. Five of these springs subsequently diminished below pre-earthquake outputs so that the earthquake effect may have been only a temporary one but at the other four increased yields were sustained throughout the remainder of the dry season. At the springs where the flow measurements immediately after the earthquake had diminished it is impossible to assess whether this was directly due to the earthquake or to normal seasonal effects.

In this area the water, derived directly from rainfall, infilters into, and is retained in cracks, joint planes and fault zones and, where the latter cut the ground surface, it issues as springs. It is quite logical to assume that the effect of the earth movement has been to open up these fissures and release more water. What the long-term effect will be on the spring discharges is however something that only future records over a period of years will decide.

The figures in Appendix 2 show the annual average and minimum variations in underground water tables during the period 1951–1953 in some of the areas which have been fairly well developed by drilling. In the Kokkinitrimithia–Astromeritis area, in the Western Mesaoria (Observation Boreholes Nos. 1–4) there has been a general small depression of the water level of the order of 1.7 ft. per year during the short period in which observations have been taken. This area is being fairly intensively pumped for irrigation and also for Nicosia water supply. Although the lowering in the water level is small it shows that the creation of a Water Conservation Area and a restriction of drilling around Kokkini Trimithia has been

justified. The Morphou coastal area (Observation Boreholes Nos. 5–8) is one of fairly large seasonal variation. Differences of up to 12 ft. have been recorded. The mean annual water level, however, shows little change and it can be said that the position here is very satisfactory and that the potential output of this area is still much in excess of the quantity of water which is at present being extracted. In the south-east of the island, between Pergamos and Xylophagou, the underground water supply position is also quite satisfactory. The very slight depression recorded may more than recover in a season of abnormal rainfall.

In the Phrenaros area conditions are less satisfactory. The control boreholes (Nos. 17–19) situated near the pumping boreholes for Famagusta water supply have shown a persistent lowering of the water level since pumping commenced in August 1952. The average of the measurements of the three observation boreholes shows a depression of 7.5 ft. in 18 months. This shows that the extraction rate is in excess of the re-charge and while there is still a considerable quantity of water available for pumping from this aquifer which may supply Famagusta for many years at the present rate of pumping, and if the water table continues to be lowered, it cannot be considered an inexhaustible supply. Whether Phrenaros North will be similarly affected by pumping remains to be seen.

The results to date show clearly the necessity for these recordings and the advisability of drilling further observation boreholes to cover those areas where at present we have little or no knowledge of water level variations.

The re-charging of the overpumped aquifer in the Ayios Memnon locality near Famagusta, by surface run-off water collected in Paralimni Lake was again carried out during the winter of 1952–1953.

In the previous winter the water from the lake had been discharged into six wells for a period of 52 days. The total quantity re-charged was 3,100,000 gallons, with an average daily absorption rate, neglecting the initial high absorption, of 54,600 gallons per day. Unfortunately the silt bed of Paralimni Lake has a high salt content so that when water is allowed to remain there for any length of time its salinity increases. For its most effective use it is therefore essential to discharge the water from the lake as quickly as possible. With this in view, and in an endeavour to increase the absorption rate, a tunnel, connecting the wells, was driven in porous sandstone, immediately above the water table, 60 ft. below ground level.

Nine hundred feet of tunnelling was completed early in January 1953 and water from the lake was discharged into it during January and February, the volume being measured over a weir. The results were very satisfactory. The total quantity of water absorbed by the tunnel was over 8 million gallons at an average daily rate of 245,000 gallons or 4½ times the 1952 figure. The infiltration rate of the water per square foot of absorption surface, when the wells were filled to ground level, was 12.3 gallons per day. Water samples were taken daily and when the water became too saline it was diverted into the sea. As it happens the winter of 1952–1953 was one of low rainfall and exceptionally low rainfall intensity in the Paralimni area, so that the surface run-off was much less than normal. The beneficial effects of this work are however appreciated by the local citrus farmers and an extension of the tunnel to a total length of 1,900 feet was requested and completed during 1953.

Further re-charge works have been asked for and another scheme, involving the repairing of an old earth dam in the Harangas valley at the Fresh Water Lake, and the construction of a mile of tunnel to the Kato Varosha and Ayios Lucas localities, has been prepared.

Other re-charge operations have been proceeding on the town water supply wells at Famagusta and Limassol. At Stavros in Famagusta about 7 million gallons was poured down the old wells over a period of 4 months. Later in the year about 10 million gallons of sweet water was extracted before the water returned to its former degree of brackishness. At Limassol surplus water, probably up to a maximum of about 200,000 gallons per day is being poured into the Chiftlikoudia chain-of-wells. The effect has not been fully tested but on one occasion the pumps were worked for 48 hours producing sweet water continuously from the wells that were formerly brackish.

Although the total volume of water which is available for re-charge by this means in normal years is unlikely to have any extensive effect on the Famagusta or Limassol coastal area, it is important that run-off to the sea should be prevented, and that all available water should be used to the best advantage. The effects of the re-charging is being carefully watched by periodic measurements of water table level and by analyses of water samples from controlled boreholes and wells.

APPENDIX 2.

WATER LEVELS IN CONTROL BOREHOLES.

FEET ABOVE SEA LEVEL.

(Based on monthly measurements.)

Location	Bore-hole No.	Average water level			Minimum water level		
		1951	1952	1953	1951	1952	1953
1. Kokkini Trimithia (Police Station)	90/50	682.9	681.2	679.4	680.1	678.4	676.5
2. Kokkini Trimithia (N. Side)	160/50	681.1	680.2	678.3	679.4	677.1	676.5
3. Kokkini Trimithia (Near culvert 9/2 on Nicosia–Morphou road)	161/50	682.5	680.7	678.7	679.4	676.2	676.5
4. Astromeritis (Katokopia road)	91/50	366.0	363.4	362.4	363.9	362.2	361.0
5. Morphou (N. of Ovgos River)	168/50	86.2	88.7	89.6	83.5	84.9	85.1
6. Morphou (Government Experimental Farm)	92/50	77.0	76.9	76.4	69.9	70.8	71.8
7. Prastio (27 M.P.)	93/50	25.4	25.3	24.9	22.1	23.4	22.7
8. Ghaziveran (between 29–30 M.P.)..	94/50	17.0	17.9	17.6	15.5	16.1	16.7
9. Pendayia (on road to Peristeronari)	95/50	8.7	10.8	11.8	6.8	6.8	9.1
10. Xylophagou (W. of village)	70/51	23.6	22.6	22.2	23.1	19.7	21.3
11. Xylophagou (W. of village)	71/51	17.8	17.0	16.4	16.9	14.2	15.4
12. Xylophagou (W. of village)	72/51	22.2	22.3	22.5	21.0	20.7	21.3
13. Xylophagou (East of village)	73/51	10.9	9.5	9.7	10.3	8.9	8.7
14. Xylophagou (East of village)	74/51	11.0	11.4	11.1	10.9	10.4	10.1
15. Pergamos	86/51	255.1	257.3	255.6	254.3	255.8	253.4
16. Phrenaros (near Famagusta W.S. Boreholes)	51/51	86.7	85.6	79.4	86.5	82.4	76.7
17. Phrenaros do.	52/51	85.5	84.5	79.9	85.3	81.6	78.0
18. Phrenaros do.	53/51	84.9	84.0	81.4	84.8	81.7	79.5
19. Phrenaros do.	67/53	—	—	80.4	—	—	79.1
20. Phrenaros (North)	108/52	—	72.3	71.5	—	71.9	70.6
21. Phrenaros (North)	109/52	—	71.6	70.9	—	71.2	69.9
22. Phrenaros (North)	110/52	—	71.2	70.9	—	70.7	69.5
23. Ay. Memnon (South) ..	69/35	—	—	16.0	—	—	13.3
24. Ay. Memnon (South) ..	50/53	—	—	11.2	—	—	8.9

APPENDIX 3.

NUMBER AND FOOTAGE OF BOREHOLES.

Number of Boreholes drilled.

1946–1953

Purpose	1946	1947	1948	1949	1950	1951	1952	1953
For private individuals and Companies	61	35	92	135	132	157	195	169
For Government ..	3	17	25	46	32	41	21	51
For War Department ..	19	15	—	—	27	32	26	10
Totals	83	67	117	181	191	230	242	230
Aggregate Footage drilled	11,686	12,171	21,397	33,610	40,751	47,766	41,022	44,563
Average Depth	141	182	182	186	213	208	170	194

Boreholes drilled in 1953.

Purpose	No.	Footage Drilled	Percentage Successful*	Total Tested Yield Gals. per day
Irrigation	148	31,616	74.3%	16,510,320
Domestic Water Supplies	12	2,226	66.7%	815,520
Prospecting	44	7,845	50%	767,760
War Department	4	402	100%	842,640
Industrial	8	1,556	75%	3,251,280
Total for water	216	43,645	69.8%	22,187,520
Observation Boreholes (not tested) ..	4	455	—	—
Technical and Geological Boreholes..	10	463	—	—
Total Drilled	230	44,563	—	—

Old Boreholes cleaned : 21.

* A successful Borehole is one that yields on test more than 1,000 gallons per hour of usable water.

APPENDIX 4.

BOREHOLES DRILLED FOR WATER IN 1953.

Summary of Results.

District	Locality	No. of B.Hs. drilled	No. Successful (*)	Percentage Successful (*)	Total tested Output Gals. per day	Average Yield per Successful Borehole Gals. per day.
Nicosia ..	Western Messaoria ..	62	58	93.8%	10,631,040	183,000
	Karavostasi-Limnitis ..	5	3	60%	375,840	125,000
	Kokkini Trimithia ..	14	14	100%	2,080,920	148,000
	Lakatamia-Dheftera ..	5	—	—	—	—
	Dhali–Nisou	7	6	85.8%	1,078,800	180,000
	Nicosia	5	2	40%	207,360	103,000
	Mitsero	4	2	50%	168,720	84,000
	Kythrea..	4	—	—	—	—
Kyrenia ..	Kyrenia–Lapithos ..	6	5	83.4%	346,560	69,000
	Kyrenia Range ..	9	2	22.2%	108,960	54,000
Famagusta ..	Kouklia–Makrasyka ..	9	7	78%	925,440	132,000
	Dherinia–Phrenaros ..	1	1	100%	177,600	177,000
	Karpas	8	2	25%	220,320	110,000
	Mandres–Ay. Khariton	7	1	14.3%	93,720	94,000
Larnaca ..	Xylotymbou-Xylophagou–Ormidhia ..	29	27	93.2%	2,523,360	93,000
	Khirokitia–P. Lefkara–Zyyi	6	5	83.4%	719,280	144,000
	Mosphiloti	1	—	—	—	—
Limassol ..	Phasouri–Kolossi–Kandou	6	5	83.4%	848,880	169,000
	Episkopi	3	—	—	—	—
	Symvoulos	4	4	100%	767,760	192,000
	Evdhimou	1	1	100%	129,600	130,000
	Polemidhia	2	—	—	—	—
Paphos ..	Ktima–Mandria ..	12	2	16.7%	109,440	54,700
	Polis–Argaka	6	4	66.6%	673,920	174,000
	Totals	216	151	69.8%	22,187,520	147,000

(*) A successful borehole is one that yields on test more than 1,000 gallons per hour of usable water.

APPENDIX 5.

DESCRIPTION OF CERTAIN IRRIGATION SCHEMES.

(*A*) *Vrecha.*—This is a canalization scheme carried out for an Irrigation Division comprised of 49 proprietors. These proprietors formerly owned different shares of the waters of three springs but, upon the formation of the Division in 1952, they sold their rights to the Division for £1,058. The water is now the property of the Division as a whole.

Following the formation of the Division, improvement works were put in hand consisting of the building and excavation of the three springs, the construction of a small weir, and 5,710 feet of reinforced concrete channels, and the laying of 1,435 feet of steel piping. The works were started on 13/3/53 and completed on 21/10/53 at a cost of £7,018 of which the villagers paid £2,686.

Before the works were undertaken an area of about 250 donums was irrigated each summer. The increased yield of the springs, 525,000 gallons per day in October, 1953, and the elimination of wastage by the new channels and pipes has now made it possible to irrigate 500 donums in summer and about 1,000 in the spring.

(*B*) *Kandou.*—The Irrigation Association has among its members almost all the male population of Kandou village. It controls the waters of two streams, the Batsouni and the Tapakos.

The new irrigation scheme comprises intake works in the perennial Batsouni stream, a 3,000 foot conveyer channel in masonry and lime concrete running round the hillside to the adjacent Tapakos valley, a storage dam in this latter valley, 5,400 feet of masonry and lime concrete channels, and finally 2,500 feet of earth channels.

The dam in the Tapakos valley has, at this stage, been built to a height of only 15 feet, and is to some extent experimental because it is not known if the rock at this place is sufficiently impervious to hold water. If there is no leakage the dam may eventually be heightened to about 40 feet to store 7½ million gallons of water.

In its present form the scheme will irrigate about 600 donums in winter and 260 in summer. The cost was £7,527 of which the Association paid £1,575.

(*C*) *Mamonia.*—The Mamonia Chiftlik is one of the four large estates in the Paphos District formerly owned by absentee landlords and taken over by the Cyprus Government in 1948 as an Undertaking of Public Utility under the Land Acquisition Laws. The irrigation scheme is part of the general improvements now being carried out to the Chiftliks.

The works comprise repairs and improvements to two old winter and spring irrigation channels, one on each bank of the Dhiarizos River, and two boreholes with pumps discharging into the channels for use in summer only when the river is dry or when the flow is low. New groyne intakes with flood protection walls, will control and protect the upper part of the channels which are lined in lime concrete for 6,000 feet to the extent necessary to prevent the leakage of summer water. In winter when the channels run full, the lined portion is submersed and losses no doubt occur above the lining but since water is plentiful at such times the losses from this cause are not such as to justify the cost of full lining.

The boreholes were sited geophysically and drilled where the gravels were deep on the sides of the river above the level of all floods except the highest. On one of the boreholes a turbine pump produces 15,000 gallons per hour and on the other a horizontal centrifugal pump delivers 10,000 gallons per hour through a rising pipe line 400 feet long.

Of the total area of 2,450 donums in the chiftlik only a small part is irrigable. The scheme provides for the summer irrigation of 453 donums of relatively flat land along the banks of the river of which 350 donums form part of the chiftlik and 103 are privately owned. In winter and spring a much larger area can be irrigated. The total cost will be about £12,900. Work was started in the spring of 1953 and is continuing.

(*D*) *Prastio-Nikitas.*—This scheme is being carried out for the inhabitants of the former forest village of Livadhi who, under the auspices of the Forest Department, have been transferred to a new village on the plains, near Morphou. An irrigation division has been formed to utilise a certain amount of winter and spring gravity water from the Karvounas valley, and pumped summer water from an open well and three boreholes.

The works consist of four adjacent and similar pumping schemes, each independent of the others but sharing the available winter water. In each separate scheme the channels are lined in lime-concrete for a length of 3,000 feet and left unlined for a further 3,000 feet. For three of the schemes new boreholes were sunk while for the fourth it was possible to utilise an old well after cleaning. The three new boreholes have been fitted with turbine pumps delivering 10,000–14,000 gallons per hour and the old well with a centrifugal pump of similar capacity.

The area irrigated in summer will be about 100 donums from each pump or 400 donums in all. In winter and spring there will be sufficient water for about 1,000 donums. The cost is estimated at £13,000 of which the Division will pay one-third. Work commenced in November, 1953, and is expected to finish in the summer of 1954.

(*E*) *Ghaziveran.*—This is a small straightforward pumping scheme carried out for an Irrigation Division.

A borehole was drilled and fitted with a diesel driven turbine pump which discharges about 14,000 gallons per hour into new channels. The total length of the new channels is about 5,000 feet of which 3,000 are lined in lime concrete and the remainder are in earth only.

The area irrigated in summer will be about 120 donums and the cost was £3,406 of which the Division paid £1,116 by a loan from Government. Work started in June and was completed by November.

This is a simple scheme that is much appreciated by the villagers. It is a good example of irrigation by pumped borehole water, shared by a village community.

APPENDIX 6.

IRRIGATION SCHEMES COMPLETED IN 1953.

Serial No.	Location	Nature of Construction	Donums Commanded New Irrigation		
			Winter or spring	Summer	Total
1	Ayios Yeoryios (Ll) : Mousa	Weir and piping	—	10	10
2	Famagusta : Harangas	Re-charge scheme, construction of a weir and channel	—	—	—
3	Arsos (Ll) : Ayios Yeoryios ..	Lining of channels	—	25	25
4	Ayii Vavatsinias : Mylos	Irrigation tank and channels ..	—	20	20
5	Yeri : Almyros Kokkinos ..	Weir and channels..	1,200	20	1,220
6	Paralimni : Ayios Memnon ..	Re-charge scheme	—	—	—
7	Phiti (in the village) ..	Construction of an irrigation tank	—	7	7
8	Theletra : Vrysi tou Khoriou ..	R.C.C. channels	—	50	50
9	Yerasa : Lithosura	Additional channelling	—	45	45
10	Paleomylos : Kharchi water ..	Lining of channels	—	40	40
11	Akhelia Nursery Garden	Irrigation tank and Distribution system	—	50	50
12	Asomatos (outside village)	Irrigation tank	—	9	9
13	Ayios Theodhoros (Ll) : Yannitsis	Masonry channels and piping ..	—	6	6
14	Ayios Ioannis (Ll) : Yerambelia	Masonry channels	—	40	40
15	Meniko : Mylos Kourkousa ..	Channels, tunnels improvements..	200	60	260
16	Kyperounda : Kountourka	Irrigation tank and channels ..	—	25	25
17	Nikoklia	Pipe-crossing	50	50	100
18	Chakistra : Plaki	Irrigation tank and piping ..	—	22	22
19	Palekhori : Angoulos	Lining of channels in masonry ..	—	20	20
20	Sarandi : Pyrgos	do.	—	9	9
21	Palekhori (Orinis) : Sklidhros	Weir, channels and pipe-crossing	800	20	820
22	Agridhia : Kaloyiros	Masonry channels and irrigation tank	—	9	9
23	Agridhia : Pano and Kato Limni	Irrigation tank and channels ..	—	24	24
24	Ephtagonia : Koumenis	Lining of channels in lime/cement/ concrete	—	40	40
25	Aghirda : Punar Suyu	Excavation and building of spring	—	15	15
26	Sarandi : Dexameni-tou-Khoriou	Irrigation tank	—	19	19
27	Morphou Exp. Farm ..	Irrigation tank	—	—	—
28	Kaliana : Yiannitika	R.C.C. channels	—	35	35
29	Kazaphani-Bellapais : Vassiliki	R.C.C. channels and repairs to irrigation tank	—	90	90
		Carried forward ..	2,250	760	3,010

Serial No.	Location	Nature of Construction	Donums Commanded New Irrigation		
			Winter or spring	Summer	Total
		Brought forward ..	2,250	760	3,010
30	Kato Mylos : Angoulos-Dhipotamia	Lining of channels in masonry ..	—	24	24
31	Kyperounda : Vassilikon	Weir, irrigation tank and channels	—	30	30
32	Anoyira	Irrigation tank and piping ..	—	20	20
33	Prodhromos	Pipe crossing	—	—	—
34	Kyperounda : Stremmata Koutsinas	Piping	—	—	—
35	Tseri	Repairs to apron, wingwalls, etc.	—	—	—
36	Kouka	Irrigation tank and piping ..	—	8	8
37	Knodhara	Control-gates, retaining walls ..	500	—	500
38	Arakapas : Skolli	Lining of channels	—	8	8
39	Akrounda	do.	—	35	35
40	Yialia Pano and Kato	Irrigation tank and piping ..	—	15	15
41	Mandria : Leofantis	Weir and piping	—	15	15
42	Dhierona	Minor repairs	—	—	—
43	Lapithos	Sphinarkotiko	—	300	300
44	Dhikomo, Pano & Kato	R.C.C. channels	700	200	900
45	Arakapas : Perasma-Koutsis ..	Lining of channels in lime/cement/concrete	—	13	13
46	Evrykhou : Athasia	R.C.C. channels	—	120	120
47	Geunyeli : Almyros	Repairs, lining of channels ..	—	—	—
48	Sandalaris	Intakes and channelling	800	—	800
49	Moutoullas : Pano Avlaki	Weirs and R.C.C. channels ..	—	114	114
50	Chatos : Zeytun Kolu ..	Weirs and channels	500	—	500
51	Chakistra : Haji Stavrinou ..	Laying of pipes	—	—	—
52	Vrecha : Kephalovrysos ..	R.C.C. channels	500	250	750
53	Philousa : Kelokedhara-Yerondas	Exploratory works	—	18	18
54	Mousoulita : Pedhieos River ..	Diversion-gates	—	—	—
55	Apsiou	Repairs	—	—	—
56	Phini : Dhimma-tou-Mylou	R.C.C. channels	—	290	290
57	Loutros : Stavroti	Exploratory works	—	—	—
58	Psomolophou	Lining of channels in lime/cement/concrete	500	120	620
59	Angastina : Louria	Repairs	—	—	—
60	Pelendria : Potamoulia	Lining of channels	—	23	23
61	Kalokhorio (Ll) : Livadhia	Weir, channels and tank	—	14	14
62	Nata-Kholetria : Xero River	Lining of channels in lime/cement/concrete	—	200	200
63	Yermasoyia : Phinikaria	Repairs to masonry channels ..	—	—	—
		Carried forward ..	5,750	2,577	8,327

Serial No.	Location	Nature of Construction	Donums Commanded New Irrigation		
			Winter or spring	Summer	Total
		Brought forward ..	5,750	2,577	8,327
64	Ghaziveran	Pumping scheme, channels in lime/cement/concrete	100	150	250
65	Potima	Repairs, intake channel	—	—	—
66	Agridhia, Pano & Kato : Leftina	Irrigation tanks, weirs & channels	—	66	66
67	Kandou : Batsouni River ..	(1st Stage) Construction of a dam, channels and river-crossing ..	420	180	600
68	Kritou Marottou ..	Piping	—	1	1
69	Morphou Experimental Farm.	Overhead irrigation	—	—	—
70	Kaimakli : Vathys ..	Construction of weir and repairs ..	—	—	—
71	Geunyeli : Jinnar Dere	Repairs, channelling	—	—	—
72	Lapithos : Kephalovrysos Stage II	R.C.C. channels, irrigation ports	—	700	700
		Totals	6,270	3,674	9,944

APPENDIX 7.

IRRIGATION SCHEMES IN HAND AT THE END OF 1953.

Serial No.	Location	Nature of Construction	Donums Commanded New Irrigation		
			Winter or spring	Summer	Total
1	Lefka : Marathasa	Groyne intake, lining of channels in lime/cement/concrete ..	—	500	500
2	Kato Platres	Groyne intake, R.C.C. channels ..	—	68	68
3	Theletra : Vrysi Khoriou ..	Excavation of spring, etc... ..	—	12	12
4	Prastio : Baradji lands (Nikitas)..	Pumping schemes, lining of channels	400	400	800
5	Ayios Memnon ..	Re-charge scheme, extension of tunnels	—	—	—
6	Omodhos : Ayiasma	Exploratory works, construction of irrigation tank	—	36	36
7	Orounda : Limni water ..	Tunnelling, lining of channels, etc.	80	50	130
8	Pharmakas : Kokkinos water ..	Spring, R.C.C. channels	74	40	114
9	Meniko : Kalokerino	Lining of channels in lime/cement/concrete	1,000	250	1,250
10	Argaka–Magounda ..	do.	2,500	—	2,500
11	Pedhoulas	Springs, R.C.C. channels ..	—	248	248
12	Pano Platres	R.C.C. channels	—	94	94
13	Lapithos, Stage III ..	Additional lining of channels in R.C.C.	—	300	300
14	Ayios Theodhoros (Ll.)	Channelling and irrigation tank ..	—	170	170
15	Mamonia	Groyne intake, pumping schemes, lining of channels	—	400	400
16	Kalokhorio (Ll.) ..	Irrigation tank and lining of channels	—	20	20
17	Zoopiyi	Tunnelling (spring)	—	18	18
18	Tymbou	Groyne intake and lining of channels	671	—	671
		Totals	4,725	2,606	7,331

APPENDIX 8.

IRRIGATION SCHEMES READY FOR CONSTRUCTION AT THE END OF 1953, BUT NOT YET STARTED.

Serial No.	Location	Nature of Construction	Donums Commanded New Irrigation		
			Winter or spring	Summer	Total
1	Milikouri : Pateritsa	Excavation of spring, piping and channels	—	15	15
2	Ayii Vavatsinias ..	Spring, channels and piping ..	—	12	12
3	Moniatis	Groyne intakes, channels, river crossings	—	150	150
4	Ayios Therapon ..	Groyne intake, lining of channels	—	10	10
5	Ayios Ioannis (Ayia Marina)	Weir, channels and piping ..	—	114	114
6	Exometokhi	Construction of an overflow spillway	—	—	—
7	Peristeronopiyi ..	Masonry weir and culvert ..	300	—	300
8	Ay. Yeoryios (Kafkalou)	Weir, tank and channels	—	10	10
9	Ay. Irini (Kannavia) ..	Piping additional	—	—	—
10	Akapnou : Livadhia	Lining of channels and repairs to tank	—	15	15
11	Kinousa	Irrigation tank and piping ..	25	25	50
12	Ayios Theodhoros (Tyllirias)	Settling tank and piping	80	—	80
13	Tembria	R.C.C. channels & irrigation ports	—	110	110
14	Ayios Mamas	Channels and two pillars	—	4	4
15	Aredhiou	Lining of channels in lime/cement/concrete	200	—	200
16	Vyzakia	Intake and aqueducts	220	—	220
17	Amargeti : Ammos	Groyne intake, lining of channels	—	200	200
18	Moutoullas	R.C.C. channels	—	66	66
19	Kivisil	Lining of channels..	300	150	450
20	Limnatis	Irrigation tank and channels ..	—	17	17
21	Tala : Milari	Excavation of springs, construction of a weir, etc.	370	60	430
22	Ayios Theodhoros (Ll)	Weir and irrigation tank	—	11	11
23	Agridhia	Spring and piping	—	4	4
24	Pelendria	Excavation of springs	—	12	12
25	Apliki	Irrigation tank	—	3	3
26	Dhierona : Mylos	Sluice gate	—	—	—
27	Kato Amiandos ..	Weir, channels, irrigation tank ..	—	22	22
28	Khrysorroyiatissa : Kritou Marottou ..	Piping and irrigation port ..	—	8	8
29	Hohladjeri	Irrigation tank and piping ..	—	14	14
30	Kouklia Reservoir ..	(E.M.I.W.) Pitching of main embankment	—	—	—
31	Nata Kholetria Stage III	Lining of channels in lime/cement/concrete	—	—	—
32	Ayii Vavatsinias : Chrysomilies ..	Irrigation tank & lining of channels	—	8	8
33	Mitsero	Weir, channels and irrigation tank	—	35	35
34	Moutoullas : Katouris River ..	R.C.C. channels, small weir, tanks	—	50	50
35	Dhymes : Livadhin	Spring and channels	—	30	30
36	Phlasou	R.C.C. channels, irrigation ports, etc.	—	190	190
		Carried forward ..	1,495	1,345	2,840

Serial No.	Location	Nature of Construction	Donums Commanded New Irrigation		
			Winter or spring	Summer	Total
		Brought forward ..	1,495	1,345	2,840
37	Akaki : Avlona–Merika ..	Lining of tunnels and channels ..	—	207	207
38	Pharmakas : Koskinas	R.C.C. channels and piping ..	130	—	130
39	Lysi	Piping and lining of channels in R.C.C.	—	100	100
40	Orounda : Maoutchos	Chain of wells, lining of tunnels and channels	—	288	288
41	Platani : Ayios Yeoryios ..	Repairs and improvements ..	—	—	—
42	Prodhromos	Irrigation tanks and channels ..	—	24	24
43	Dhali	Lining of channels	200	100	300
44	Stavrokono	Irrigation tank and piping ..	—	9	9
45	Kambi Pharmaka ..	R.C.C. channels	—	73	73
46	Kalokhorio : Lefka	Subsurface weir and lining of channels	—	500	500
47	Trimiklini : Kouris River ..	Construction of a dam, channels and piping	200	600	800
48	Gypsos : Vathys	Flood detention dam	600	—	600
49	Alethriko	Irrigation tank	—	12	12
50	Pano Kyrenia	Springs, piping irrigation tank ..	—	213	213
51	Bellapais	R.C.C. channels	—	150	150
52	Amargeti : Lihoni	Excavation of spring, lining of channels	—	120	120
53	Tembria	Irrigation tank and piping ..	—	22	22
54	Pelendria : Korypis	Excavation of spring	—	8	8
55	Dhima	Excavation of tunnelling	—	10	10
56	Kolokasi	do.	—	6	6
57	Ayios Ioannis (Ll.) : Livadhi	Small weir and channels	—	15	15
58	Kapilio	Subsurface weir, piping, lining of channels	—	70	70
59	Pyrgos (Ll.) : Moulos	Subsurface weir, lining of channels	106	66	172
60	Perapedhi : Krios Potamos ..	Construction of a dam	—	200	200
61	Limnatis : Trypes	Spring, lining of channels ..	—	13	13
62	Evretou–Simou–Philousa	Weir and channels..	—	105	105
63	Evretou : Karadjia	Channels, piping and cutting ..	—	240	240
64	Anoyira	Spring, channels and piping ..	—	16	16
65	Kato Zodhia	Lining of tunnels, etc.	500	—	500
		Totals	3,231	4,512	7,743

APPENDIX 9.

DESCRIPTION OF CERTAIN VILLAGE WATER SUPPLY SCHEMES.

(*A*) *Appidhes.*—This is the largest village water supply scheme of its kind in Cyprus. 62 miles of galvanised pipe convey water from the Appidhes springs in the Paphos Forest across some of the most difficult hill country in Cyprus to a number of dry villages. The combined population now served is 4,910 (1946 census); the main pipes are big enough to take the full summer discharge of the springs and to provide water for a further 5,000 persons. Each person will receive water at the rate of 20 gallons per day.

Ten villages now participate in the scheme and 9 more are under consideration for inclusion under a proposed extension. In addition 4 of the villages that had to be moved to new sites following the earthquake are now to receive water from this scheme. The total number of villages that will eventually be served is thus probably about 23.

The springs were excavated and built mostly in the summer of 1951. Pipe laying for the first stage of the scheme commenced in August, 1952, and was completed by March, 1953. The works included 62 miles of pipes, 13 village storage tanks and 74 street fountains.

One of the chief construction problems was the transport of pipes in the mountains. Some 3 miles of motor track and 10 miles of mule track had to be formed. Another problem was caused by a high ridge running across the direct route of the main pipe line from the spring to Panayia. Here a tunnel 280 feet long through hard igneous rock was driven in order to shorten the pipe line by 8,000 feet and to permit a satisfactory gradient.

The following table gives details of the first stage of the scheme :—

STAGE 1.

1. Total number of villages served	10
2. Total population served	4,910
3. Water supplied per person per day	20 gallons
4. Length of pipe lines	62 miles
5. Normal discharge of spring per day	200,000 gallons
6. Capacity of pipe lines per day	200,000 gallons
7. Government reserve for future extensions, per day	100,000 gallons
8. Cost of Scheme :—	
Government contributions to villages	£31,900
Village contributions	£31,900
Government reserve	£18,200
Total	£82,000
9. Average cost to each villager	£ 6.10.0
10. Cost per person, excluding Government reserve	£13. 0.0

11. Villages included :—
Pano Panayia, Asproyia, Phalia, Lemona, Amargeti, Ayia Marina, Simou, Stroumbi, Tsadha, Kili.

The £18,200 Government reserve was given so that the main pipes could be large enough to supply additional villages in the future. Part of this sum will be recovered by Government from the villages in due course when the additional work is undertaken.

Four re-sited earthquake villages, Mamoundali, Anadhiou, Axylou and Eledhiou are now being connected to the scheme at a cost of £11,450. The 9 villages under consideration for the future extension are Dhrousha, Inia, Pano Arodhes, Kato Arodhes, Dhrinia, Dhrymou, Pendalia, Kannaviou and Polemi.

The first stage of the scheme was opened by His Excellency the Governor on 9th May, 1953.

(*B*) *Pyla-Voroklini-Livadhia.*—These three villages combined together for the purpose of this scheme and purchased an old chain-of-wells at Pyla for £1,000. The late summer yield of the chain-of-wells, after improvement, was about 32,000 gallons per day sufficient to provide their combined population (2,560 in 1946) with about 13 gallons per person per day.

The works consisted of improvements and repairs to the tunnels from which the water issues, 1,800 feet of 4″ pipes, 17,000 feet of 3″ and 16,500 feet of 2½″. The usual storage tanks and fountains are provided in each village. In this case most of the main pipes were laid in easy ground and it was possible to use a light trenching machine for digging the pipe trenches.

The total cost was £11,456 or £4.5 per person. Work was commenced in August 1952 and finished in April, 1953.

(*C*) *Katokopia.*—This is a pumping scheme typical of those now being provided for villages on the plains in places where there is underground water.

A new borehole was drilled on the outskirts of the village and fitted with a 2,000 gallon-per-hour plunger pump driven with a 6 horse-power diesel engine. It is housed in a masonry pump room, beside which is a 10,000 gallon masonry storage tank. From the storage tank water gravitates to 32 street fountains in different parts of the village.

The population served is 900 and the cost of the works was £4,680 or 5.2 per person. The borehole was drilled in 1952. The other works were started in June, 1953, and completed three months later.

(*D*) *Lophos and Pakhna.*—These two villages combined to purchase the privately owned Mozeras spring which issues near the main road from Saittas to Kato Amiandos.

A 4″ pipe line, 43,000 feet long is shared by the two villages as far as Lophos, where it bifurcates at a break-pressure tank one branch supplying Lophos and the other, consisting of 34,000 feet of 3″ diameter pipes, going on to Pakhna. The distribution system in Lophos includes three 3,750 gallons storage tanks and 30 fountains and that of Pakhna, two 9,000 gallon tanks and 41 fountains.

The total population served is 3,150 and the average quantity of water per person is about 25 gallons per day. The cost, including £1,445 for the purchase of the spring, was £35,875 or an average of £11.3 per person. Work started in March, 1953, and was finished by September.

(*E*) *Galini-Loutros-Varisha.*—Three unused springs in the Paphos Forest were developed for these three villages in a single combined scheme. The main pipe line is 38,500 feet long and 2″ diameter. Throughout its length it crosses difficult country, from the springs to a point near Varisha. A further 7,500 feet of 2″ pipe, and 7,000 feet of 1½″ pipe take separate parts of the water to Galini and Loutros respectively in separate branches. Each of the three villages has its own storage tank and system of street fountains.

The population served is about 1,330 and the average supply about 20 gallons per person per day. The cost was £16,146 or £12 per person. Work started in June, 1953, and finished in December.

(*F*) *Yermasoyia.*—The water for this village is now taken from the Ayios Photios spring, eight miles away in the hills. The former supply was from an unsatisfactory chain-of-wells near the village.

The main pipe line is 40,000 feet long, 2″ diameter, and is laid across very difficult country. There are three storage tanks in the village of 10,000, 2,000 and 1,500 gallons capacity respectively and a distribution system which includes 20 fountains.

The population of Yermasoyia was 1,002 in 1946, on which basis the water available is about 30 gallons per person. There has, however, been a big increase in population since the 1946 census and the actual quantity may be about 20 gallons per person. The cost of the scheme, including £1,250 for the purchase of the water, was £11,849, or £11.8 per person of the 1946 population. Work was in progress from August to December.

(*G*) *Pendayia.*—This village, although on the plains in an area where most water is pumped, has been fortunate enough to acquire a gravity water supply. A daily quantity of water of 16,460 gallons from the Kritikos chain-of-wells which is owned by the Kykko Monastery was purchased and now forms the source of water for the new scheme.

The water is conveyed to the village in a 10,300 foot pipe line of which the upper 3,000 feet is of 2½″ diameter and the lower 7,300 feet of 2″ diameter. The difference in size is necessary because the upper part of the pipe runs on a flat gradient. The storage tank at the village is of the new circular pattern, of 10,000 gallons capacity. There are 28 street fountains. The population was 736 at the time of the 1946 census but may now be considerably more. Calculated on the 1946 basis the water per person per day is 22 gallons. The cost including £2,000 for the purchase of the water was £6,984 or £9·5 per person. Work was in progress from August to November, 1953.

(*H*) *Karavostasi.*—A group of springs that formerly ran to waste in the Paphos Forest was developed by excavation for this village to which the water is now conveyed through 42,000 feet of 2½″ pipes. Above the village two 3,000 gallon storage tanks of the new circular type have been built and from these the water gravitates to 43 fountains in the village.

The population was 1,760 in 1946 but may now be more. The flow of the spring varies considerably but an average minimum will give a supply of about 13 gallons per person of the 1946 population. The cost was £18,183 or £10.3 per person. Work commenced in May, 1953, and was completed by October.

Since the completion of the work a request has been received for house-to-house connections in part of the village.

APPENDIX 10.

NUMBER OF VILLAGES WITH PIPED DOMESTIC WATER.

31st December, 1953.

District	Villages with piped water			Villages with no piped water	Total Villages
	Satisfactory	Needing improvement	Total		
Nicosia	79	35	114	63	177
Larnaca	32	10	42	17	59
Limassol	70	29	99	14	113
Famagusta	34	18	52	45	97
Paphos	77	38	115	19	134
Kyrenia	22	16	38	9	47
Totals	314	146	460	167	627
Percentage ..	50	23	73	27	100

Note.—The above figures were obtained from a new survey and they do not quite correspond with others given in the annual reports of former years. Some supplies that were formerly satisfactory are now considered to be unsatisfactory because, with an expanding population and higher standards of living, more water and more facilities are required.

APPENDIX 11.

VILLAGE WATER SUPPLY SCHEMES COMPLETED IN 1953.

No.	Village	District	Nature of Work	Date of Completion
1	Prastio	Paphos	*	14th January
2	Ayia Marina (Kelokedhara)	,,	†	14th February
3	Lemona	,,	*	14th ,,
4	Kili	,,	†	14th ,,
5	Amargeti	,,	†	17th ,,
6	Phalia	,,	†	19th ,,
7	Tsadha	,,	†	20th ,,
8	Prastio Evdhimou	Limassol	*	26th ,,
9	Pyla	Larnaca	†	1st March
10	Meladhia	Paphos	*	4th ,,
11	Zakharia	,,	*	4th ,,
12	Voroklini	Larnaca	†	9th ,,
13	Arkhimandrita, Kato	Paphos	*	23rd ,,
14	Silikou	Limassol	*	31st ,,
15	Vasilia	Kyrenia	†	1st April
16	Vouno	,,	†	1st ,,
17	Kato Koutraphas	Nicosia	†	1st ,,
18	Phasli	Paphos	†	1st ,,
19	Livadhia	Larnaca	†	18th ,,
20	Psevdhas	,,	*	24th ,,
21	Phrenaros	Famagusta	*	24th ,,
22	Ora	Larnaca	*	9th May
23	Agridhaki	Kyrenia	†	14th ,,
24	Vroisha	Nicosia	*	16th ,,
25	Ayios Iakovos	Famagusta	†	21st ,,
26	Ayios Nikolaos	Paphos	†	23rd ,,
27	Kithasi	,,	†	23rd ,,
28	Pano Kividhes	Limassol	*	25th ,,
29	Koma-tou-Yialou	Famagusta	†	28th ,,
30	Ayios Theodhoros	,,	†	1st June
31	Kato Kividhes	Limassol	*	3rd ,,
32	Ayii Vavatsinias	Larnaca	†	3rd ,,
33	Kolossi	Limassol	†	4th ,,
34	Kalopsidha	Famagusta	*	10th ,,
35	Khirokitia	Larnaca	†	17th ,,
36	Geunyeli	Nicosia	†	27th ,,
37	Alona	,,	†	29th ,,
38	Yialousa	Famagusta	†	2nd July
39	Xyliatos	Nicosia	*	8th ,,
40	Ayia Marina (Xyliatou)	,,	*	8th ,,
41	Ay. Epiphanios Soleas	,,	*	9th ,,
42	Prodhromos	Limassol	†	10th ,,
43	Kalopanayiotis	Nicosia	†	18th ,,
44	Kyperounda	Limassol	†	20th ,,
45	Episkopi (Paphos)	Paphos	†	22nd ,,
46	Episkopi (Limassol)	Limassol	†	23rd ,,
47	Yialia	Paphos	*	10th August
48	Aredhiou	Nicosia	*	10th ,,
49	Kambi (Pharmaka)	,,	†	10th ,,
50	Kokkina	,,	*	11th ,,
51	Aradhippou	Larnaca	†	20th ,,
52	Katokopia	Nicosia	*	22nd ,,
53	Ayios Vasilios	,,	†	22nd ,,
54	Ayios Photios	Paphos	†	4th September
55	Ay. Marina Skyllouras	Nicosia	†	10th ,,
56	Panayia	Paphos	†	16th ,,
57	Skoulli	,,	†	16th ,,
58	Ayios Tykhonas	Limassol	*	25th ,,
59	Lophos	,,	*	29th ,,

* New scheme where previously there was no piped supply.
† Replacement or improvement of an old supply.

No.	Village	District	Nature of Work	Date of Completion
60	Pakhna	Limassol ..	*	29th September
61	Lythrodhonda	Nicosia ..	†	29th ,,
62	Arsos	Limassol ..	†	2nd October
63	Dhrousha	Paphos ..	†	14th ,,
64	Karavostasi	Nicosia ..	*	14th ,,
65	Letimbou	Paphos ..	†	19th ,,
66	Varisha	Nicosia ..	*	3rd November
67	Pendayia	,, ..	†	12th ,,
68	Bellapais	Kyrenia ..	†	13th ,,
69	Galini	Nicosia ..	*	23rd ,,
70	Loutros	,, ..	*	11th December
71	Moni	Limassol ..	*	13th ,,
72	Kellia	Larnaca ..	†	14th ,,
73	Steni	Paphos ..	†	17th ,,
74	Boghaz	Famagusta ..	†	18th ,,
75	Lefkoniko	,, ..	†	19th ,,
76	Kato Zodhia	Nicosia ..	†	20th ,,
77	Yermasoyia	Limassol ..	†	21st ,,
78	Asha	Famagusta ..	*	22nd ,,
79	Goudhi	Paphos ..	†	31st ,,
80	Kissousa	Limassol ..	†	31st ,,

* New scheme where previously there was no piped supply.
† Replacement or improvement of an old supply.

APPENDIX 12.

VILLAGE WATER SUPPLY SCHEMES IN HAND AT THE END OF 1953.

Serial No.	Village	Serial No.	Village
1	Lyso	10	Kapedhes
2	Sarandi	11	Mitsero
3	Dherinia	12	Ayios Konstantinos
4	Pakhyammos	13	Akrounda
5	Arakapas	14	Polemi
6	Prastio-Livadhi	15	Yiolou
7	Kilani	16	Theletra
8	Vouni	17	Armenokhori
9	Phinikaria		

APPENDIX 13.

VILLAGE WATER SUPPLY SCHEMES READY FOR CONSTRUCTION AT THE END OF 1953, BUT NOT YET STARTED.

Serial No.	Village	Serial No.	Village
1	Ayios Theodhoros	7	Sykopetra
2	Yerakies	8	Tembria
3	Ayios Theodhoros (Soleas)	9	Skarinou
4	Pyrga	10	Alaminos
5	Kelokedhara	11	Ayios Theodhoros (L)
6	Avgolidha	12	Yerovasa
		13	Evretou
	Nos. 1–13 have already provided their share in the cost of the work.		
14	Ephtakomi	19	Vavatsinia
15	Dhavlos	20	Ayios Ioannis
16	Pyrgos	21	Salamiou
17	Xylophagou	22	Topju Keuy
18	Evdhimou	23	Omodhos
	Nos. 14–23 have applied for loan to cover their share in the cost of the work.		
24	Palodhia	44	Ayios Epiphanios Orinis
25	Paramytha	45	Paralimni
26	Spitali	46	Piyenia
27	Ayios Ermolaos	47	Kouklia
28	Klepini	48	Polemidhia, Pano
29	Palekhori	49	Polemidhia, Kato
30	Alekhtora	50	Knodhara
31	Petra	51	Mandres
32	Goshi	52	Lemithou
33	Mandres (Morphou)	53	Lymbia
34	Ayios Yeoryios (Soleas)	54	Karakoumi
35	Tersephanou	55	Yeroskipos
36	Pyla	56	Kato Dhrys
37	Akhna	57	Ayios Sozomenos
38	Karavas	58	Ayia Phyla
39	Lefka	59	Kanli Keuy
40	Ayios Yeoryios (K)	60	Akanthou
41	Yerolakkos	61	Ayia Kebir
42	Kalavasos	62	Peyia
43	Kondemenos	63	Pelathousa
		64	Perakhorio
	Nos. 24–64 schemes submitted for approval.		