

1922.
NEW ZEALAND.

DEPARTMENT OF LANDS AND SURVEY.

DRAINAGE OPERATIONS IN HAURAKI PLAINS.

REPORT FOR THE YEAR ENDED 31st MARCH, 1922, TOGETHER WITH STATEMENT
OF ACCOUNTS.

Presented to both Houses of the General Assembly pursuant to Section 10 of the Hauraki Plains Act, 1908.

SIR,— Department of Lands and Survey, Wellington, 21st September, 1922.

I have the honour to submit herewith the report on the drainage operations in the Hauraki Plains for the past year, in accordance with the provisions of the Hauraki Plains Act, 1908.

The total area opened for selection to date is 42,166 acres, sold at £307,630, but at present-day values worth considerably more. It is hoped to open 2,600 acres, valued at £35,000, during the coming year.

The detailed report of the Acting Chief Drainage Engineer is attached, together with a statement of accounts and balance-sheet.

I have, &c.,

J. B. THOMPSON, Under-Secretary.

The Hon. D. H. Guthrie, Minister of Lands.

REPORT OF ACTING CHIEF DRAINAGE ENGINEER.

SIR,—

I have the honour to submit this report of the progress of the work on the Hauraki Plains drainage scheme for the year ended 31st March, 1922.

Activity in agricultural productiveness is indicated by the fact that the value of stock-sales held at Ngatea, Waitakaruru, and Patetonga yards was approximately £27,000. Cheese produced on the plains amounted to 1,812,700 lb., and butter to 2,535,700 lb. The amount of tonnage carried to and from the Piako River by the steamship companies trading direct to Auckland was approximately 5,700 tons, in addition to which the trade between Thames and the plains comprised some 40 tons of cargo, 50,000 ft. of timber, 1,000 posts, and 10,000 bricks. These figures justify an optimistic forecast of the prosperity which will result from the development of the unsurpassed resources of this area.

A rainfall of 46.34 in. for the year was recorded at Kerepeehi. Rain fell on 127 days during the year, and was the cause of frequent interruptions in development-works; but one gratifying feature has been the entire absence of any flooding in the reclaimed areas.

The following is a summary of the main features of the year's work:—

DREDGES.

The arrival of new and improved types of dredges has established new standards of progress. Three of the new machines have been operating for some time, and a fourth, the Rood Construction Company's walking dredge, has just been erected and undergone successful trials. Depreciation due to long service has not prevented the three Priestman dredges from doing good service.

The No. 19 Michigan walking dredge was erected, and on the 10th November commenced the construction of a drain and stop-bank on the Piako River. 30,069 cubic yards have been excavated, the cost per cubic yard being 5.58d. In common with all the new machines, excavating-costs have fallen rapidly as the operators become more experienced, and the present cost is 4.45d. per cubic yard.

The No. 15 Bucyrus drag-line excavator has been in commission since the 4th January, 1922, and is constructing a stop-bank on the eastern bank of the Piako River near Kerepeehi. This machine is operating in a forest of willow-stumps, using an extension boom of 50 ft. with half-yard bucket,

and is transporting spoil 100 ft. at a cost of 5·63d. per cubic yard, pit measurement. The total quantity excavated to date is 16,411 cubic yards, the cost per cubic yard being 8·79d.

The No. 16 Bucyrus drag-line excavator commenced work on the 1st February, 1922, and is constructing a stop-bank road along the northern side of the Ngarua Canal. As this machine is in firm country, two ten-hour shifts are being worked daily. A total of 9,376 cubic yards of spoil has been excavated to date, the cost being 13·73d. per cubic yard. The excavating-cost at the present time is 10·62d. per cubic yard. A 35 ft. boom and 1-yard bucket is being used on this machine.

The No. 1 Priestman dredge is operating in the Waitoa River, and has made good progress. Improvements consisting of new channels to cut off the bends, and the dredging of intervening portions of the old channel, have now been carried out for a distance of 260 chains. The full effect of the work will not be felt until the dredge has completed the Kaikupenga cut, of which there is still some 20 chains to be done. This dredge has excavated 45,684 cubic yards during the year, the material being generally hard clay and heavy timber. The dredge is now 3 miles 20 chains from the starting-point at junction of Waitoa and Piako Rivers.

The No. 2 Priestman dredge has worked from Waitakaruru, on the Maukoro Canal, and has reached a point 2 miles 20 chains from the Waitakaruru road-bridge. The country is peat with clay bottom and some timber. The consolidation of the land resulting from the hand-dug drains on the canal route has been remarkable, and the indications are that good progress will be maintained where formerly dredging was impossible owing to deep floating peat. This dredge excavated 82,725 cubic yards of spoil during the year.

The No. 6 Priestman has been constructing the Awaiti Canal, and a cut 30 ft. in width has been excavated to station 1 mile 74 chains. The yardage for the year was 61,757 cubic yards.

The following table shows the amount of spoil dredged and cost per cubic yard for the past ten years :—

				Cubic Yards.	Cost per Cubic Yard.
1912-13	..	..	..	131,902	3·25d.
1913-14	..	..	..	147,740	3·20d.
1914-15	..	..	..	176,196	2·67d.
1915-16	..	..	..	146,905	3·35d.
1916-17	..	..	..	161,674	3·40d.
1917-18	..	..	..	130,664	2·53d.
1918-19	..	..	..	125,196	4·87d.
1919-20	..	..	..	138,310	6·90d.
1920-21	..	..	..	158,865	7·42d.
1921-22	..	..	..	246,022	7·29d.

CENTRAL DISTRICT.

Extensive development-works have been in progress in this district. Preparations are being made for the unwatering of an area of approximately 2,000 acres at the junction of the Piako River and Awaiti Stream. Fascines have been laid, and a contract let for cartage of 14,700 cubic yards of spoil for ballasting 100 chains of the Pouarua Road (southern section). Similar work has been carried out on the Torehape-Puhanga Road, and a further 1,000 cubic yards of clay placed on the Kaihere Road. The deepening of the drains on the peat area west of Kerepeehi has had special attention, and this land is improving rapidly. The stop-bank road, Ngatea, has been metalled for a distance of 60 chains, and 110 chains of the Ngatea-Pipiroa Road remetalled from the Ngatea end. 1,019 cubic yards of metal were used in repairs to the Kerepeehi-Ngatea Road. The metalling of the Kerepeehi-Kopuarahi Road has been completed. 15 chains of the Kerepeehi-Wharepoa Road and 179 chains of the Kerepeehi-Kopuarahi Road have been remetalled. 105 chains of new road formation were completed at Kerepeehi. The filling of the eastern approach to the proposed Awaiti Canal Bridge has been completed, and drainage-construction and the usual maintenance-work carried out. Four new dredges were erected, and a considerable amount of repair work in connection with plant, machinery, and launches has been carried out at Kerepeehi, where a new machine-shop has been erected on the site recently acquired for a permanent depot.

WAITAKARURU DISTRICT.

Forty chains of the Pouarua Road were fascined, and a contract let for cartage of 5,900 cubic yards of spoil. New outlet drains have been constructed and existing drains deepened between the Maukoro Canal and the Pouarua Road, where exceptionally heavy ground timber was encountered. A new wharf was constructed at Waitakaruru Township. A footbridge was erected over the Waitakaruru Stream Canal, and the overseers' dwelling shifted and remodelled. General repairs and maintenance-work to roads, bridges, and drains have been attended to in the district and in the adjoining Waitakaruru Settlement Block.

PIPIROA DISTRICT.

The Pipiroa-Waitakaruru Road has been remetalled for a distance of 145 chains from the wharf to the Ngatea Road intersection, and one mile of metalling completed on the Waitakaruru-Ngatea Road. This completes the metalling of the through road from Wharepoa Ferry to Waitakaruru. Crib work has been placed to protect several flood-gate outlets on the river, and extensive deepening of drains has been carried out with a view to unwatering the peat lands. Maintenance-work, including repairs to stop-banks and roads and cleaning drains, has been continually effected.

AWAITI BLOCK.

The work in this district has been principally maintenance. The metalling of the Awaiti Road was completed to the Pukahu Road intersection, a total distance of 41 chains. In March a commencement was made with the metalling of the Awaiti West Road, 5 chains being completed.

TAHUNA DISTRICT.

Maintenance and repair work have been attended to, and 10,296 cubic yards of spoil have been carted for refilling and forming the Paeroa-Tahuna, West, and Whakahoro Roads.

PATETONGA DISTRICT.

Most of the main outlet drains in this district have been deepened and the usual maintenance-work attended to. 4,519 cubic yards of spoil were carted to complete the Patetonga Road. Fascines have been laid for a distance of 32 chains on the Mangawhero Road, and 3,980 cubic yards of spoil carted to form the road-bed. Other undertakings included the construction of two road-bridges and the approaches to the concrete bridge at Kaihere, maintenance and running of the Patetonga Tramway, and the extension of the line for a distance of half a mile to new spoil-pit. A concrete apron has been placed to arrest the scour at the Waikaka Road Bridge. The amount of £533 was received during the year for freights on the Patetonga Tram.

ROADS.

The main roads through the district now carry a concentrated and ever-increasing traffic. Daily automobile services have been inaugurated, and heavy fast-moving motor-lorries ply regularly. The problem of road-maintenance for this class of traffic is nowhere more difficult than in swamp country, and during the past year it has been necessary to remetal five miles and a half of road, in addition to using a fairly large quantity of metal for repair work. A regular supply of good broken metal is now being obtained from Thames, and is being delivered by the Department's punts and steam-tug. The total length of the metalled or gravelled roads is now 51 miles 26 chains—3 miles 26 chains having been completed during the past year. 30,916 cubic yards of spoil were carted for the construction and maintenance of roads through the peat area, fifteen miles of clay roads regraded, and three miles and a half of fencing completed.

The following is a schedule of roads metalled or remetalled during the year:—

New metalling—						M.	ch.
Netherton-Awaiti Road ..	..	..	..	..	..	0	41
Ngatea-Pipiroa Road ..	..	..	..	..	..	1	0
Kerepechi-Kopuarahi Road ..	..	..	..	..	..	1	0
Ngatea-Puhanga Stop-bank Road..	..	..	..	..	..	0	60
Awaiti West Road ..	..	..	..	..	..	0	5
						—	—
						3	26
Remetalling roads—						M.	ch.
Waitakaruru-Pipiroa Road ..	..	..	..	..	..	1	65
Kerepechi-Kopuarahi Road ..	..	..	..	..	..	2	10
Kerepechi-Wharepoa Road ..	..	..	..	..	..	0	15
Ngatea-Pipiroa Road ..	..	..	..	..	..	1	30
						—	—
						5	40

The total amount of metal received was 18,413 cubic yards (Kauaeranga, 5,827; other sources, 12,586).

Roads—						M.	ch.
New peat roads clayed ..	..	..	..	..	..	3	59
Reclaying roads ..	..	..	..	..	..	1	47
						—	—
						5	26

Fascines supplied for roadworks, 19,104.

The following metalling programme for the year 1922-23 is proposed: Kerepechi-Ngatea Road (remetalling); Orchard East Road; Awaiti West Road (continuation).

DRAINAGE.

New drains of a total length of 25 miles 2 chains were constructed during the year, making a total of 508 miles 34 chains of drains constructed on the Hauraki Plains to date.

WORK PERFORMED DURING THE YEAR.

Drains.

By piecework contract—						M.	ch.
Cleaning drains ..	..	..	..	..	..	115	10
Widening and deepening (100,941 cubic yards spoil) ..	..	..	..	..	..	58	72
New drains ..	..	..	..	..	..	20	63
						—	—
						194	65
						—	—

By day labour—								M.	ch.
Cleaning drains	..	..	..	..	..	..	..	90	79
Widening and deepening (23,279 cubic yards spoil)	..	..	..	..	..	..	..	16	30
New drains	..	..	..	..	..	..	..	4	19
								111	48
Repairs to stop-banks	..	..	..	..	..	..	..	3	73
<i>Dredges.</i>								Cub. yd.	
Spoil excavated by No. 1 dredge	..	..	..	..	..	..	..	45,684	
„ No. 2 „	..	..	..	..	..	..	..	82,725	
„ No. 6 „	..	..	..	..	..	..	..	61,757	
„ No. 15 „	..	..	..	..	..	..	..	16,411	
„ No. 16 „	..	..	..	..	..	..	..	9,376	
„ No. 19 „	..	..	..	..	..	..	..	30,069	
								246,022	

Artesian Boring Plant.

The number of bores sunk during the year was thirty, making a total of 213 to date. The cost of the year's operations was £1,625 11s., making a total expenditure to date of £6,834 15s. 5d., practically the whole of which is recoverable. The sum of £125 18s. 1d. was received during the year. A schedule of bores sunk is attached hereto.

Buildings.

A three-roomed cottage has been erected at Kerepechi for the dredgemaster of No. 6 dredge, and a five-roomed cottage erected at Waitakaruru for the district foreman. Six portable huts have been built to accommodate dredge crews, and a portable shed built in sections to house the White truck. A fitting-shop, 20 ft. by 40 ft., was erected at Kerepechi, and huts and other buildings kept in repair, and minor alterations and additions made. Other undertakings include housing for machinery of dredges No. 19 and No. 20, pads for dredges No. 15 and No. 16, erecting signposts at all important cross-roads, and the construction of six $1\frac{1}{2}$ -yard side tip trucks, construction of two 20 ft. open road-bridges, and redecking and repairs to bridges.

The numbers of buildings, excluding wharf-sheds, are as follows: Houses and small cottages, 16; double huts, 11; single huts, 25; sheds, &c., 21; quarters, staff and workmen, 3: total, 76.

Wharves.

A new wharf and shed have been placed at the junction of the Waitakaruru Stream and the Maukoro Canal, and the Waitakaruru town wharf and shed repaired. The Kopuarahi Wharf has been redecked and strengthened, and repairs effected to the Hopai Wharf. Life-belts with suitable housing have been placed on all the wharves. The number of wharves at the present time is fifteen.

Plant and Machinery.

One general-service punt, size 28 ft. by 10 ft. by 1 ft. 10 in., has been built on the works, and the whole fleet overhauled and repaired. The plant now comprises—One steamer, seven oil-launches, four metal-punts, four general-service punts, three grab dredgers, two drag-line excavators, and two walking land-dippers.

Concrete Culverts and Flood-gates.

A number of the old wooden flood-gates have been replaced by reinforced-concrete structures, and several new flood-gates and culverts constructed. A reinforced-concrete conduit, 5 ft. 6 in. by 4 ft. 6 in., and 1,100 ft. in length, with overfalls to break grade, has been constructed to take the stream at the Mangawhero Road. The construction of the intake and outlet culverts will complete this undertaking. Twenty culverts and flood-gates were constructed during the year, as follows:—

Flood-gates:—	Number.	Length.
3 ft. (Monier pipes) ..	7	152 ft.
2 ft. 6 in. (Monier pipes) ..	4	112 ft.
2 ft. (Monier pipes) ..	1	32 ft.
4 ft. by 4 ft. ..	2	60 ft.
Road-culverts:—		
3 ft. (Monier pipes) ..	1	24 ft.
2 ft. 6 in. (Monier pipes) ..	2	56 ft.
2 ft. (Monier pipes) ..	3	92 ft.

Surveys and Office Work.

Permanent bench-marks have been established along the Piako River from the estuary to Pate-tonga, and along main roads. The work will be continued as opportunity offers. Engineering surveys comprising 109 miles of levels and 23 miles of traverse have been completed, and the office staff has been working at high pressure preparing plans, contracts, and time-sheets.

Flax Leases.

No new areas were opened during the year and very little cutting was done, operations being practically at a standstill. This is to a large extent accounted for by fires during the previous year destroying large quantities of millable flax. The revenue received during the year was £87 10s.

Valuations.

These remain the same as last year, the total area opened being 42,166 acres. It is hoped to open about 2,600 acres, valued at £35,000, during the coming year. Other areas are well forward, but cannot be opened for selection until peat roads are all clayed.

Grazing-areas.

The total area held under temporary grazing lease is 6,196 acres, divided into eight sections. The annual rent derived from these is £460.

Works Expenditure.

The total expenditure during the year was £126,234, which amount includes the purchase price of the American machinery. The sum of £53,812 was paid out of local Imprest Account, principally on account of wages. Day labour amounted to £32,115, piecework to £23,744, hire of teams £996. The increase in wages is largely accounted for by the charging against the Settlement Account of all metalling and maintenance work which was previously charged to special votes.

FUTURE PROPOSALS.

(1) Continuation of Waitoa River dredging; (2) continuation of Waitakaruru-Maukoro Canal; (3) continuation of Awaiti Canal; (4) draining of large block near Kerepeehi; (5) establishment of depot at Kerepeehi; (6) new areas for settlement; (7) concrete bridges, culverts, and flood-gates; (8) new wharves; (9) general development work.

GENERAL.

During the year a costing system was inaugurated at the Kerepeehi office. This will be a valuable addition to the office records. Under the system all jobs are costed, and the Engineer is able to ascertain from time to time whether a job is costing too much and what is accountable therefor. The costs of completed jobs will be a valuable guide to the Engineer when fixing prices for new works. With this exception all the account-books are kept in the Auckland office, where all vouchers for wages, supplies, &c., are prepared and passed for payment.

During the year the Engineer in charge, Mr. R. S. Logan, was transferred to the Hikurangi works, and Mr. E. Taylor, M.N.Z.Soc.C.E., was appointed to succeed him.

I have, &c.,

O. N. CAMPBELL,

Acting Chief Drainage Engineer.

The Under-Secretary for Lands, Wellington.

SCHEDULE OF ARTESIAN BORES, 1921-22.

Bore No.	Section.	Block.	Survey District.	Total Depth in Feet.	Running Flow. (Gallons per Hour.)
184	5	XI	Thames	264	400 to 600 (pump)
185	Lot 2, Sec. 3	I	Waihou	378	200
186	4	I	"	264	250
187	7	I	"	366	700
188	21	X	Thames	440	600
189	Lot 2, Sec. 3	I	Waihou	243	1,200
190	Lot 1, Sec. 3	I	"	265	1,000
191	21	X	Thames	374	800
192	30	X	"	341	300
193	27	X	"	341	1,500
194	20	X	"	226	900
195	20	X	"	272	700
196	6	I	Waihou	258	100
197	6	I	"	257	750
198	31	I	"	403	150
199	30	I	"	105	200 (pump)
200	32	I	"	247	500
201	28	I	"	339	300
202	16	I	"	269	200
203	37	I	"	272	700
204	16	I	"	287	400
205	12	II	Kerepeehi Township ..	302	400 (pump)
206	18	X	Thames	334	800
207	18	X	"	443	300
208	6	III	Pipiroa Township ..	104	600 (pump)
209	31	X	Thames	301	600
210	8	I	Waihou	458	600
211	25	X	Thames	104	600 (pump)
212	8	I	Waihou	252	500
213	5	I	"	220	400

HAURAKI PLAINS SETTLEMENT ACCOUNT.

RECEIPTS AND PAYMENTS ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1922.

[illegible]

REVENUE ACCOUNT FOR THE YEAR ENDED 31ST MARCH, 1922.

<i>Dr.</i>		£	s.	d.	<i>Cr.</i>		£	s.	d.
To Interest on loans under Local Bodies' Loans Act, 1908		1,240	0	0	By Rents accrued		12,876	12	8
Interest on debentures issued under Hauraki Plains Amendment Act, 1913		11,160	2	6	Rates		6,703	8	1
Maintenance of completed works		6,932	5	5	Interest—				
Administration expenses		984	0	5	On investments		97	18	6
Rebate of rent		637	1	11	On outstanding accounts		93	18	0
Rents remitted		1,749	9	0					
Artesian wells—Amount written off where bores not effective ..		46	19	11	Tram freights		984	4	6
					Grazing fees		25	16	0
					Hire of truck		0	15	0
					Net loss for year carried down ..		1,967	6	5
		<u>£22,749</u>	<u>19</u>	<u>2</u>			<u>£22,749</u>	<u>19</u>	<u>2</u>
		£	s.	d.			£	s.	d.
Net loss as above		1,967	6	5	Balance forward from previous year ..		28,402	12	10
Balance		26,435	6	5					
		<u>£28,402</u>	<u>12</u>	<u>10</u>			<u>£28,402</u>	<u>12</u>	<u>10</u>

BALANCE-SHEET AS AT 31ST MARCH, 1922.

[illegible]

J. B. THOMPSON, Under-Secretary.
J. H. O'DONNELL, Chief Accountant.

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THAMES

WHAT ARE KAMAZI

WAIHOU

WAITOA

THAMES BORO'
ENDOWMENT
VIII



O. N. CAMPBELL,
DRAINAGE ENGINEER.

PLAN SHOWING LANDS DEALT WITH Under the Provisions of the Hauraki Plains Act, 1908.

REFERENCE.

<i>Boundaries of Haarakai Plains</i>	-	-	-	-
<i>Boundaries of Haarakai Plains rating area</i>	-			
<i>Lands disposed of on optional system to date</i>	-			
<i>Lands being drained, surveyed, and shortly to be opened for selection</i>				
<i>Grazing areas under year-to-year lease</i>	-	-		
<i>Drains now in operation</i>	-	-	-	-
<i>Drains under construction</i>	-	-	-	-
<i>Stop-banks</i>	-	-	-	-
<i>Artesian bores</i>	-	-	-	-

Scale: 80 chains to an inch.

