1937.

NEW ZEALAND.

DEPARTMENT OF LANDS AND SURVEY.

DRAINAGE OPERATIONS IN HAURAKI PLAINS.

REPORT FOR THE YEAR ENDED 31ST MARCH, 1937, TOGETHER WITH STATEMENTS OF ACCOUNTS.

Presented to both Houses of the General Assembly pursuant to Section 20 of the Hauraki Plains Act, 1926.

Department of Lands and Survey, Wellington, 1st August, 1937.

SIR,—

I have the honour to present herewith the report of the Chief Drainage Engineer on operations carried out during the past year on the Hauraki Plains in accordance with the provisions of the Hauraki Plains Act, 1926.

I have, &c.,
W. ROBERTSON,
Under-Secretary for Lands.

The Hon. Frank Langstone, Minister of Lands.

REPORT OF CHIEF DRAINAGE ENGINEER.

SIR,—

I have the honour to submit the twenty-ninth annual report on the Hauraki Plains reclamation and development works. The report covers the work done during the fiscal year ending 31st March, 1937.

The settlers throughout the district have generally experienced an excellent production season, and have been encouraged by the return of more normal prices for farm-produce. Many of the difficulties experienced in the past are disappearing with the progressive development of the reclaimed swamp lands. The idea, once generally accepted, that the Hauraki Plains land is only suitable for fattening or dairying is fast disappearing as more settlers find improved security and returns in more diversified types of farming. One result of this tendency is apparent in the remarkable increase in the number of pigs disposed of during the year. The recorded pig-sale returns exceeded £50,000, and the total value of the recorded production from the Hauraki Plains, given in detail below, was approximately £771,571. These produce returns are compiled from figures kindly supplied by the large trading concerns handling most of the produce of the district, and, though the figures are by no means complete, they give an indication of the value of the asset that has been created from waste land. The production figures for 1936–37 are given below, with the 1935–36 figures shown in parentheses:—

	Tons.	Tons.
Butter	3,629	(3,350)
Cheese	2,702	(2,305)
Flax	825	(566½)
Lime	19,750	
Casein	107	
	Number.	**Number.**
Pigs	24,031	(9,846)
Calves	24,219	(24,874)
Miscellaneous stock	27,384	(8,205)

Cargo received and despatched from the Piako River wharves, excluding road-metal, amounted to 7,609 tons.

Reviewing the returns from the district over a period of years, the decrease in flax-production is very noticeable. This is due to several causes, including the destruction of flax on land now used for farming and the low market-value of fibre during recent years. Now that steps are being taken under the Industrial Efficiency Act to rehabilitate the flax industry, attention should be directed to the scope for development in this direction in the Hauraki Plains district. For some miles above Kaihere Landing the river-bank lands on both sides of the Piako River are more suitable

for flax-growing than any other purpose. Here the flax grows naturally where it is not destroyed by fires or stock. There are to-day areas of several hundred acres of millable flax, and these areas could be economically extended by drainage and fire-prevention.

The rainfall at Kerepeehi in 1936 was below the average for the district. Rain fell on 150 days, well distributed throughout the year, and there were no flood-producing storms. The rainfall records for Kerepeehi since 1916 are as follows:—

RECORDS OF DAILY PRECIPITATION, KEREPEEHI, HAURAKI PLAINS.

Year.	Number of Days, with given Daily Precipitation in Inches.												Total Days.	Total Fall.	Wettest Month.		Driest Month.	
	0·00 to 0·49.	0·50 to 0·74.	0·75 to 0·99.	1·00 to 1·24.	1·25 to 1·49.	1·50 to 1·74.	1·75 to 1·99.	2·00 to 2·49.	2·50 to 2·99.	3·00 to 3·99.	4·00 to 4·99.	5·00 to 5·99.	6·00 to 7·00.					
1916 ..	109	12	9	7	2	3	..	1	..	..	1	..	..	144	52·19	Nov.	6·65	Feb.	1·05
1917 ..	131	11	4	4	3	..	1	1	1	..	..	..	..	156	45·61	Feb.	6·26	Jan.	0·65
1918 ..	145	14	6	4	..	1	..	..	1	..	..	..	..	171	44·06	Oct.	7·47	May	2·24
1919 ..	122	9	1	3	2	..	..	..	..	..	..	..	..	137	27·36	July	4·52	Dec.	0·89
1920 ..	85	7	10	3	1	1	3	2	..	..	..	..	..	112	43·16	Feb.	6·10	July	1·73
1921 ..	93	12	5	3	2	..	..	1	..	..	..	..	..	116	34·41	Oct.	5·89	Feb.	0·72
1922 ..	101	17	9	3	..	1	1	..	1	..	..	..	..	133	42·81	Feb.	6·62	April	1·73
1923 ..	151	6	5	4	..	1	1	..	..	..	..	..	1	169	47·04	April	9·76	Mar.	1·72
1924 ..	132	8	10	5	2	5	1	1	..	2	..	..	..	166	60·37	April	8·55	July	1·87
1925 ..	142	15	4	2	..	..	..	1	..	..	..	..	..	164	37·64	June	6·67	April	0·84
1926 ..	149	15	6	4	5	2	2	..	..	..	..	..	..	183	55·53	May	8·86	Feb.	1·79
1927 ..	159	10	6	5	..	4	..	..	..	..	..	..	..	184	45·33	July	6·29	April	2·01
1928 ..	125	7	9	2	3	2	2	1	..	..	..	..	..	151	47·30	May	7·52	Jan.	0·01
1929 ..	124	19	8	3	1	..	..	..	..	..	..	..	..	155	41·05	April	5·09	Feb.	0·74
1930 ..	131	4	2	2	3	..	2	2	..	..	..	..	..	146	37·72	Jan.	6·87	Dec.	0·80
1931 ..	144	10	7	..	4	..	..	..	..	2	..	..	..	167	43·23	July	7·80	Mar.	0·98
1932 ..	126	7	5	4	..	1	..	..	..	..	..	..	..	143	32·05	Feb.	4·95	Nov.	0·93
1933 ..	152	13	1	4	3	..	..	1	..	..	..	..	..	174	38·93	Feb.	6·54	Mar.	1·20
1934 ..	138	11	6	5	2	2	..	1	..	1	..	..	..	166	43·23	June	6·15	Oct.	2·05
1935 ..	163	15	6	4	2	2	..	1	..	1	..	..	..	194	53·42	July	9·56	Jan.	0·93
1936 ..	127	11	6	3	..	1	..	..	..	2	..	..	..	150	40·62	Feb.	5·83	May	1·63
1937* ..	16	3	2	3	..	..	1	..	..	..	..	..	..	25	11·71	Jan.	5·84	Feb.	0·51

* First three months of year only.

Average annual rainfall over twenty-one years is 44·03 in.

The Departmental construction forces have completed a great deal of valuable work during the year, and more is in progress. Maintenance activities have been more or less normal, calling for no special mention, with the exception of the acquisition of a weed-cutting launch which will apparently be a means of reducing the cost of cleaning growth from the canals and larger drains. Construction activities have been resumed on several undertakings abandoned during the years when all available funds were conserved for the relief of unemployment or continuation of essential services.

A brief description of the principal works carried out during the year is given hereunder:—

DREDGES.

No. 15 Bucyrus drag-line excavator has been enlarging the Reservoir Canal, which is the main drainage channel for the Kerepeehi Block. Working first on one side of the canal and then on the other, this machine during the year traversed 138 chains of canal-bank, and, using a half-yard Page bucket and 50 ft. boom, excavated 54,716 cubic yards, at a unit cost of 8·8d.

No. 16 Bucyrus drag-line excavator was at the end of March, 1936, shipped by barge from Patetonga to Kerepeehi. The opportunity was taken to overhaul the machine while it was at Kerepeehi depot, and it was used to dredge metal and silt from the wharf berthage and slipway. On 28th April the machine was transported by barge to Waitakaruru and commenced work enlarging the Waitakaruru–Maukoro Canal. Working from the left bank of the canal, the machine has traversed 247 chains of canal-bank. At a point 3 miles 74 chains up-stream from the junction of the Maukoro Canal and Waitakaruru Stream, the machine will cross the canal at a temporary dam and work down-stream on the right bank, building a new roadway and widening the canal. The year's output from this machine was 54,638 cubic yards, and the unit cost 9·37d.

No. 19 Dredge completed widening the Piako River between the 13 miles 5 chains peg and 14 miles 45 chains (Kaihere Landing) and was laid up in November, 1936, after the 100 ft. boom had been dismantled. This machine has now completed the work for which it was specially designed and reconstructed on the works—that is, enlarging the river-channel to a width of 170 feet. Working from the river-bank, the machine in one operation excavated and transported the material 200 feet. The total volume of material handled by the plant was 294,012 cubic yards, and the cost was 11·2d. per cubic yard. This figure includes, in addition to the usual operating and overhead charges, the cost of a costly reconstruction of the superstructure after the machine had been idle for over two years, and also the cost of moving the dredge by barge from Ngatea to Kaihere. Between March and November, 1936, the machine handled 14,137 cubic yards, at a unit cost of 8·63d.

No. 23 Steam Dipper Dredge, after being laid up in the Elstow Canal since May, 1934, was recommissioned after an extensive overhaul in January, 1937, when the crew from No. 19 Dredge were transferred to this plant. After the dredge had been working seven weeks removing silt from

the upper Awaiti and lower Elstow Canals, it was found necessary to reinstall a temporary dam in the Awaiti Canal to prevent excessive bank-caving, and this work caused some delay. 14,137 cubic yards of material was excavated from 190 chains of canal at a cost of 10·94d. per cubic yard.

No. 29 Bay City Light Drag-line Excavator is a valuable addition to the excavating plant made during the year. The machine weighs about 10 tons and operates a $\frac{3}{8}$ yard drag-line bucket on a 30 ft. boom. In addition to caterpillar traction, it is provided with a pneumatic-tired trailer for road transport. After being assembled at Kerepeehi, the machine commenced work on the 11th January, building a small stop-bank on the Waihou River at Orongo. On 16th February it was transported by barge to Waitakaruru and thence by road to complete the stop-banking of the Waitakaruru Stream above the Mahuta Road Bridge. During the period of forty-six days that the machine was actually excavating, the material built into the stop-banks was 13,729 cubic yards, and the cost, including plant-moving costs and all charges, was 3·39d. per cubic yard.

The following table shows the total quantities excavated each year during the past sixteen years :—

Year.	Cubic Yards.	Cost per Cubic Yard.
1921–22	246,022	7·29d.
1922–23	440,092	8·20d.
1923–24	508,654	7·27d.
1924–25	822,286	5·86d.
1925–26	856,653	6·32d.
1926–27	647,182	7·42d.
1927–28	652,413	7·32d.
1928–29	619,911	6·54d.
1929–30	595,565	6·25d.
1930–31	536,692	8·32d.
1931–32	390,611	7·99d.
1932–33	200,954	8·00d.
1933–34	116,224	5·96d.
1934–35	52,517	10·02d.
1935–36	164,046	8·26d.
1936–37	171,717	8·69d.

Kerepeehi District.

A working party of ten to eighteen men has been camped on the Awaiti Canal and engaged throughout the year on presettlement land-development work on the Kerepeehi Extension Blocks. The work comprised the cleaning of 1,157 chains of field and boundary drains, excavating 10,054 cubic yards of material in the construction of 321 chains of new drains, and improving 94 chains of existing drains, clearing scrub and rushes, burning and sowing with grass 104 acres, also road-work and noxious-weed control. Other works carried out in the Kerepeehi district include cleaning 1,334 chains of main drains by manual labour, 592 chains with weed-cutting launch, and 542 chains at Orongo. Road formation and metalling was completed for a distance of 85 chains on Wani Road ; a top course of metal was laid for a distance of 21 chains of the same road and 17 chains of Pukahu Road. The Awaiti Canal Road was formed for a distance of 80 chains and base-course metal was laid for a distance of 69 chains. A 20 ft. span hardwood bridge was built on pile abutments at the junction of the Awaiti Canal and Otakawe Roads, and a similar bridge commenced on one of the inlets of the Reservoir Canal.

Operating from the depot and workshops at Kerepeehi, the staff has been busily engaged receiving and distributing stores, material, and fuel for the widely dispersed works, providing camp accommodation for workmen, and repairing machinery, buildings, and plant.

Waitakaruru–Torehape District.

Construction activities in this district have been extensive, and concerned principally with the reclamation of the western portion of the Pouarua area and tract of 11,000 acres of peat land lying to the south of Waitakaruru, and between the settled land bordering on the Piako River to the east and the foothill of the Pataroa Range to the west. The number of men in a camp established some years ago was increased from ten to twenty-five men in May, 1936, and later the camp strength was increased to twenty-eight men, who have been engaged principally on road and drain construction. The work included cleaning 424 chains of drains, excavating 17,909 cubic yards of material in widening and deepening 504 chains of existing drains and 858 cubic yards of material in constructing 35 chains of new drains.

A comprehensive scheme for several miles of road-construction, consisting of clay ballast laid on fascines over a peat subgrade, commenced in this district several years ago, and carried on intermittently when funds were available for the work, was continued this year. The clay ballast is hauled for a distance varying between 1 and $5\frac{3}{4}$ miles on light railways. Owing to past delays in completing the work, it has been necessary to renew a large proportion of sleepers, and this has retarded progress during this year. 5,522 sleepers of willow and other timber were obtained along the banks of the Piako River for renewals and extension of the line, 1,260 fascines were laid under 45 chains of new line, and 4,483 cubic yards of clay ballast hauled an average distance of $4\frac{1}{2}$ miles.

Operating from a camp situated on the Waitakaruru–Maukoro Canal, three miles south of the Waitakaruru Township, a working party varying from eleven to nineteen men has been employed deepening drains in the northern Pouarua area. 553 chains of drain were deepened, 12,930 cubic yards of material were excavated by manual labour in enlarging 551 chains of existing drains, and 321 chains of new drains were constructed involving 9,114 cubic yards of excavation. The raising of the Waitakaruru Stream stop-banks by manual labour, commenced in 1933 as a relief-of-unemployment

measure, was discontinued in June, 1936, when it was decided to complete the work more economically with a mechanical excavator. 2,496 cubic yards of earth were placed with wheelbarrows in raising 17 chains of stop-bank. Tenders were called for cleaning 107 chains of main drains in this district in addition to the maintenance work carried out by co-operative contract parties. Minor undertakings included the erection of a light rolled-steel-joist bridge over the Waitakaruru–Maukoro Canal and noxious-weed eradication.

Patetonga District.

In this district a party of six to ten men has been continuously employed on drain construction and maintenance. 1,645 chains of drain were cleaned and 12,659 cubic yards excavated in enlarging and improving 340 chains of drain. A small co-operative contract party completed 150 chains of drain improvement at Koromatua, involving 7,144 cubic yards of excavation.

A party of six men has been employed with a log-hauler removing willows, previously ringbarked, and scrub from the banks of the Piako River since January, 1936, with an interval of five months, August to December, when work had to be suspended owing to the high-river stage. Both banks have been cleared of heavy growth for a distance of 170 chains. During January, February, and March two working parties were engaged inspecting and treating with poison the willows not killed by previous ringbarking on a 160 chains reach of the Piako River and 520 chains reach of the Waitoa River.

Alteration to the Mangawhero Stream culvert was carried out to prevent damage to the concrete-lined channel by drift timber.

Surveys and Office Work.

Engineering surveys carried out during the year required 200 miles of traverse, 470 miles of levels, 261 river cross-sections, and 99 chains of road location. Land surveys of eighteen rural sections and 3 miles of road were completed. A very considerable amount of routine work was carried out in connection with the measurement of earthwork completed by contractors and the Department's excavating machinery, measurement of area of land cleared and ploughed, and the preparation of plans.

The average number of individual employees shown on the pay-sheets throughout the year was 175; the actual number employed has varied between a maximum of 219 men in May and a minimum of 161 in September, 1936. These figures do not include contractors and their employees engaged on buildings, road-construction, and seasonal drain-cleaning. A large portion of the construction work is carried out on the co-operative contract principal, and all workers are paid fortnightly. This involves a considerable amount of travelling for the office staff in addition to the work of preparing contract vouchers, wages-sheets, and stores management.

The field and office staffs have carried out their duties with zeal and efficiency.

Summary.

The total length of the subsidiary drains constructed on the Hauraki Plains since the inception of the scheme is now 780 miles 68 chains.

The principal works carried out during the year under review are summarized in the following schedule:—

	Length.	Excavation.
	M. Ch.	Cubic Yd.
Drains cleaned by manual labour	72 2	..
Drains widened and deepened by manual labour	21 15	52,162
Drains, new, constructed by manual labour	7 0	20,643
Stop-banks enlarged by manual labour	0 17	2,496
Total quantity of drainage excavation by manual labour	..	75,301
Drains cleaned with weed-cutting launch	7 32	..
River and canal improvement, machine construction	8 50	171,717
		Metal.
Roads metalled	2 32	4,006
New roads formed	0 42	..
		Ballast.
Clay ballast delivered on peat roads by light railway	..	4,483
		Number.
Sleepers cut and delivered for tramway	..	5,522
Fascines used for road-construction	..	1,260
		Acres.
Area cleared of scrub and rushes	..	124
Willows ringbarked on river-banks	8 40	..
River-banks cleared of willows and scrub	2 10	..
		Number.
Road bridges erected	..	2
20 ft. span hardwood stringers and pile abutments (1)		
45 ft. span rolled-steel joist (1)		

I have, &c.,
R. G. Macmorran, Chief Drainage Engineer.

The Under-Secretary for Lands, Wellington.

HAURAKI PLAINS SETTLEMENT SCHEME.

Rate Account as at 31st March, 1937.

Dr.	£	s.	d.	*Cr.*	£	s.	d.
Maintenance of completed works	1,296	1	3	Balance brought forward	2,111	17	5
Remission of rates	46	8	8	Rates levied	1,612	10	1
Balance	2,381	17	7				
	£3,724	7	6		£3,724	7	6

Receipts and Payments Account for the Year ended 31st March, 1937.

Receipts.	Public Works Fund. £	s.	d.	Consolidated Fund. £	s.	d.	*Payments.*	Public Works Fund. £	s.	d.	Consolidated Fund. £	s.	d.
Rates				1,286	10	2	Drainage works: Stop-banks, clearing channels, and other expenditure incidental to conducting drainage operations (including formation and metalling of roads), materials supplied, &c.	21,641	3	4			
Law-costs				15	10	4	Material and stores	8,863	12	2			
Sales of land	8,701	7	3				Maintenance of completed works				1,363	13	3
Rents and grazing-fees				9,163	3	1	Refund of rent and interest				137	18	3
Interest on sales of land				981	17	5	Refund of miscellaneous receipts				2	0	0
Artesian-well boring—							Discharged Soldiers Settlement Account: Recoupment in respect of merged transactions	4	5	8	20	17	4
Repayment of advances				37	15	9	Kaihere Ferry expenses				245	1	5
Interest on advances				22	11	5	Refund of rates				8	19	3
Instalments on buildings				3	15	0	Transfer receipts to Treasury Adjustment Account				11,597	1	1
Ferry fares				207	14	3	Transfer receipts to Public Works Fund	16,616	7	10			
Credits in reduction of expenditure	7,919	6	3										
Miscellaneous receipts				47	18	6							
Transfer expenditure to Treasury Adjustment Account				1,608	14	8							
Transfer expenditure to Public Works Fund	30,504	15	6										
	£47,125	9	0	£13,375	10	7		£47,125	9	0	£13,375	10	7

Revenue Account for the Year ended 31st March, 1937.

Dr.	£	s.	d.	*Cr.*	£	s.	d.
Interest on Public Works Fund capital	36,447	12	8	Accrued rents	9,076	13	11
Kaihere Ferry expenses	226	9	5	Interest on sales of land	1,337	17	2
Administration expenses	488	1	0	Grazing fees	26	19	0
Remissions of rent	378	16	3	Ferry fares	199	11	3
Remissions of interest	15	19	1	Kaihere Ferry: Half loss charged to County Council	13	9	1
Rebates	665	0	6	Hire of plant	6	19	2
Irrecoverable rents, &c.	19	8	6	Royalties	41	3	4
Premiums on conversion	14	10	0	Net loss carried down	27,553	4	6
	£38,255	17	5		£38,255	17	5
	£	s.	d.		£	s.	d.
Net loss brought down	27,553	4	6	Balance carried forward	283,131	8	5
Balance from previous year	255,578	3	11				
	£283,131	8	5		£283,131	8	5

HAURAKI PLAINS SETTLEMENT SCHEME—*continued.*

BALANCE-SHEET AS AT 31ST MARCH, 1937.

Liabilities.	£ s. d.	£ s. d.
Capital Account—		
Public Works Fund	864,374 4 4	
Value of Crown land set apart under Act	45,000 0 0	
		909,374 4 4
Employment Promotion Fund capital		8,593 15 5
Discharged Soldiers Settlement Account: Merged transactions under section 20, Discharged Soldiers Settlement Act, 1923		405 0 3
Sundry creditors—	£ s. d.	
Miscellaneous	282 4 7	
Departmental	41 16 6	
		324 1 1
Rent charged in advance		2,246 10 0
Rate Account		2,381 17 7
Payments in advance—	£ s. d.	
Rent	176 19 4	
Rates	1 17 0	
Instalment principal on deferred-payment sales	3 4 0	
Instalment interest on deferred-payment sales	10 2 8	
Interest on well-boring	1 6 0	
		193 9 0
Suspense Account		1 12 11
Writings-off in suspense		3,048 14 0
Deposits by lessees: Surety against drain damage		10 0 0
Treasury Adjustment Account		284,170 6 6
		£1,210,749 11 1

Assets.	£ s. d.	£ s. d.
Improved lands handed over to Land Board for settlement—		
Leased	171,288 19 11	
Unleased	11,490 17 0	
Unpaid purchase-money for land sold on deferred payment	19,433 19 11	
		202,213 16 10
Unimproved-value land not disposed of		41,908 3 11
Improvements on adjoining Crown lands		7,710 0 0
Permanent reserves		8,851 0 0
Works in progress: Expenditure on land in course of reclamation, including formation and metalling of roads		599,633 16 10
Capital expenditure: Employment Promotion Fund		8,593 15 5
Artesian wells—	£ s. d.	
Crown tenants, Hauraki Plains	308 16 7	
Permanent reserves and Crown lands	216 10 9	
		525 7 4
Buildings		4,652 9 0
Wharves		320 0 0
Machinery and plant		29,382 2 1
Live-stock		20 11 0
Loose tools		628 0 10
Stores		5,725 19 1
Stamps on hand		0 1 0
Sundry debtors—	£ s. d.	
Rent	3,255 1 5	
Rates	3,515 15 0	
Instalments of principal on deferred-payment sales	60 15 0	
Instalments of principal on buildings	1 18 11	
Interest on well-boring	101 18 0	
Interest on deferred-payment sales	168 5 3	
Law-costs	144 8 7	
Tram freights and ferry fares	21 14 6	
Grazing	32 5 2	
Miscellaneous	4,955 13 8	
Departmental	639 4 7	
		12,897 0 1
Postponed rent (Land Act, 1924)		892 8 0
Postponed rent (Mortgagors and Tenants Relief Act, 1935)		61 10 3
Postponed interest (Land Act, 1924)		194 7 0
Losses in suspense		3,048 14 0
Interest accrued but not due		262 0 0
Premiums on conversion		87 0 0
Cash in Deposits Account		10 0 0
Revenue Account: Balance forward		283,131 8 5
		£1,210,749 11 1

W. ROBERTSON, Under-Secretary for Lands.
WM. E. SHAW, Chief Accountant.

I hereby certify that the Rate Account, the Revenue Account, and the Balance-sheet have been duly examined and compared with the relative books and documents submitted for audit, and correctly state the position as disclosed thereby, subject to the explanatory notes dealing with departmental Accounts generally as appearing at commencement of parliamentary return [B.–I, Pt. IV]. The following comment is appended: The balance of the Works in Progress Account—viz., £599,633 16s. 10d.—appearing in the Balance-sheet greatly exceeds the value of lands the control of which has not yet been transferred to the Land Board.—J. H. FOWLER, Controller and Auditor-General.

pproximate Cost of Paper.—Preparation, not given; printing (690 copies), £9.

By Authority: E. V. PAUL, Government Printer, Wellington.—1937.

Price 6d.]