APPENDIX D.

ANNUAL REPORT OF THE CHIEF ELECTRICAL ENGINEER.

The Chief Electrical Engineer to the Hon. the Minister of Public Works.

Sir,—

I beg to report on the position of the development of electric power in the Dominion for the past year as follows:—

GOVERNMENT SCHEMES IN OPERATION.

Lake Coleridge Electric-power Supply.

The year under review and ending 31st March, 1924, is the ninth year of operation of this plant, and it is satisfactory to note that the plant has again shown a profit after paying all expenses. Analyses of the results of operation of the scheme will be found in Tables A, B, and C, whilst in Table D is shown a record of the connected load. The growth of load to date is shown in attached Figure 1.

Financial Results.—The capital outlay at the close of the year was £892,801, as against £848,033 at the beginning of the year, representing an increase of £44,768. Details of capital expenditure are shown in Table B. The total revenue for the year was £78,508, being £703 in excess of all charges, including interest at 5·4 per cent., depreciation at 2 per cent., but not including sinking fund. The profit on the year's operation has reduced the accumulated deficiency on the Profit and Loss Account from £23,876 to £23,173. Table A gives particulars of financial results of operation and load records.

The power-house maximum output reached 10,800 kw., an increase of 15 per cent. on the previous year. Units output from the power-house were 50,614,955, as against 44,008,106 for the preceding year, showing an increase of 15 per cent. The annual load factor was 53 per cent., or practically the same as that for last year.

The total costs per unit generated are 0·382d., or 0·03d. greater than the previous year's costs. The increase is accounted for by interest on additional capital outlay and increased depreciation. Operating costs are greater by £1,506, represented chiefly by increased maintenance on transmission and distribution lines. Particulars of operating costs are found in Table C.

Connected Load.—The total connected load at the end of the year was 62,495 kw., representing an increase of over 24 per cent. on that of the year previous. Details of connected load will be found in Table D. The maximum demand on the power-house was 10,800 kw., showing a diversity factor of 5·8.

Interruptions, Christchurch Lines.—During the year there were eight interruptions to service exceeding one minute's duration, the total amount of these being 5 hours 59½ minutes. The longest period of interruption was 5 hours 25 minutes, occurring on Monday, 10th December, at 9.43 p.m., due to insulator failures on both transmission-lines simultaneously. The weather at the time was misty and wet, following immediately on a long dry spell, and the cause of failure can only be assumed to be due to an accumulation of dirt on the insulators. The Tramway Board's standby plant was called on to maintain a temporary service until repairs were effected. In addition to the above there were fifteen interruptions of a momentary nature, due mainly to defective insulators, or to bark, or magpies fouling the lines. The insulators replaced during interruptions totalled thirteen.

Timaru Transmission-line.—The Point-Ashburton section of this line was put into service in August, and the Ashburton-Timaru section in February. There have been a total of forty-six interruptions to service on this line, other than those prearranged for necessary completion of work. Twenty-two of these interruptions were due to trees, bark, wires, or magpies fouling the lines; nine were due to insulator troubles, three to operation, and nineteen to causes unknown. A great deal of trouble has been experienced on the lines by malicious throwing of wires on the power-lines, and also to breaking of insulators by rifle-fire; but, as the culprits in at least one case were dealt with, these troubles should be reduced to a minimum in the future. Steps have been taken to deal effectively with the excessive number of interruptions, and a decided improvement is looked for.

During the year No. 6 unit, 3,000 kw., was put into service, and this enabled the plant to operate without overload throughout the year. After being a few months in service this machine developed a fault which resulted in a rather serious burn-out. As spare plant was available no serious inconvenience was experienced during the few weeks in which repairs were being made. No trouble was experienced with the water-supply, and the lake was maintained at high level throughout the year.

The installation of No. 6 generator brought the station up to 12,000 kw. capacity, the limit of the present tunnel and headworks. Two new banks of transformers, each consisting of three units of 4,000 K.V.A., with one spare unit, were installed at the power-house early in the year, and the two displaced banks, each three units of 1,500 kw. each, were transferred to Timaru and to Addington.

With the completion of Ashburton Substation, supply at 11,000 volts was given to Ashburton Power Board in August. Timaru Substation building was completed and a temporary supply at 11,000 volts was given to Timaru Borough in December, pending the erection of the necessary 66,000/11,000-volt transformers and switching equipment. This work was completed and supply at 66,000 volts was given in February. A duplicate 11,000-volt line from Hororata to Darfield has been erected to supply the Railway Department's signalling service on the Midland Railway, and also the Malvern Power Board.