

(3)

IDA VALLEY IRRIGATION SCHEME

NOTES FROM FILES

The following notes, divided into sections, are made for correspondence on the following files:

15/2 Ida Valley Irrigation Scheme
15/2/1 Manorburn Dam
15/2/13 Poolburn Dam
15/26 Irrigation General

Water Requirements and Supply

8 November 1929: Manorburn reservoir storage at 6451 day-heads on 31 October very low and cuts proposed in irrigation supplies for season. These cuts would be by increasing percentages with increase in normal supply and would give a net reduction to 79% of normal consumption (7600 day-heads). The position is shown in tabulation below, figures in day heads:

Average consumption: Ida Valley	7323	Available supply: in storage	6451
Galloway	1200	gain	200
Losses etc.	1056	already supplied	1135
	9579		7786

Reductions approved by Minister 28 November.

5 June 1931: Poolburn dam with height of 83 ft. length of 580 ft and lake area at spill level of 80 ft completed at cost of over £70,000. Alexandra dwg 776 sheet 5 shows storage of various levels. The construction of this dam resulted from shortage of supplies, other suggestions to improve this position being the diversion of the Upper Taieri River into the Manorburn reservoir (29 March 1930) and diversion of the high flows from Maori Creek to the Poolburn being May and November (8 May 1931). Supply from Poolburn was anticipated as 33.2 cusecs for 150 days (4980 day-heads) but later results showed this to be too high.

9 December 1932: Further on supplies: States saving of 520 day-heads at present supplied to Galloway area from Manorburn dam possible when Lower Manorburn is completed and with reduction in flow in Upper Bonanza Race due to this and Poolburn supply race losses could be reduced by 200 day-heads. Poolburn supply after 2 seasons now 23 cusecs for 150 days (3450 day-heads). Present surplus from two reservoirs about 450 day-heads per season, giving possible total available for use of 1170 day-heads

17 February 1934: Diversion of Totara Ok branch of Taieri River to Poolburn reservoir completed at a cost of about £5000 for 2 miles 55 chains of race. This diversion originally proposed 9 December 1932, estimate 3 February 1933, approval 18 March, to provide a total of 500 day-heads per season, the total surplus of 1670 day-heads being proposed for mining.

24 May 1937: Full report and plan of possible Hopes Ok diversions as well as present available supplies for scheme. Hopes Ok proposals summarised in succeeding section. Concerning existing supplies safe draw off from the 2 reservoirs is 12,870 day-heads per season on figures to date. Poolburn net gains as percentage of Manorburn net gains given as 23.1%, 27.9%, 31.8%, 25.0%, 25.8% for seasons 1932/33 to 1936/37 - some variation could be due to varying supplies for Totara Ok. Tabulated figures of present position:

Present supply: reservoirs	12870	Present Demand: Ida Valley (11474ac)	8606
streams	570	Galloway (2618ac)	2994
Lower Manorburn	520	Losses etc:	2250
	13960		13850

Hopes Ck could provide 1347 day-heads from storage and 1320 from flow, the total of 2350 being available for 3500 acres roughly.

24 October 1941: Very little snow the last 2 winters and with 16,953 day heads in storage proposed to cut supplies as 1929/30 season. Average annual supplies available to 30.4.41, average of 23 years for Manorburn, 9 yrs for Poolburn and 12 yrs for streams tabulated below:

Average supply:		Requirements:	
Manorburn	10,340	Ida Valley	9067
Poolburn	2,916	Galloway	2078
Streams	<u>442</u> 13,698	Losses	<u>2421</u> 13,566

Average rainfall for 20 years ending 1940 19.35" at Manorburn dam but 1939 14.38", 1940 17.30" and 1941 (9 months) 11.92". Gain 1.5.40 to 30.9.40 Manorburn 7215, Poolburn 2147 and 1.5.41 to 30.9.41 5809 and 1206 respectively. From 1.10.40 to 30.4.41 Manorburn gained 39 day heads and Poolburn lost 603 (evaporation 936 day-heads). For present season if gains from streams taken as 59 day heads, race losses as 3384 and dam losses as 564 (figures from last season) have 15100 day heads committed. Cuts suggest saving of 1220 day heads. Ministerial approval for cuts 31 October 1941.

11 December 1945: Comments that difference in yields between Poolburn and Manorburn catchments cannot be explained. It appears that Hopes Ck has a better runoff per sq. mile still.

25 June 1948: At end of last season Manorburn very low and at present with level at 25'-10" only 1115 day-heads in storage. Poolburn has 2105 day-heads stored. In 8 of past 18 years net gains from 2 catchments has exceeded 10,000 day-heads between 1 July and 31 December while in 1940 had minimum of 3000 day heads.

6 September 1948: Little snow last winter and rain at Alexandra last 8 months 7.43" and 32 months 29.57" (cf 1930-32 33.71"). Inflows to dams average over 15 year period (omitting 1939) 4825 cusec-days 1 September to 31 December, minimum 1940 570 cusec-days. Normally little gain and often loss from 1 Jan to 30 April. Present storage and requirements tabulated below:

Available supply:		Requirements:	
reservoirs storage	5000	Ida Valley (12,185ac)	9135
average gain	4825	Galloway (1700ac)	1925
streams	<u>60</u> 9,885	Race losses	<u>2325</u> 13,385

Cuts proposed to cover 2914 day-heads of the 3500 deficit and this is about as much as can be saved at present. Approval for cuts given 20 September.

12 October 1948: Not possible to say how much net gain would be provided in reservoirs by 1" rainfall. At Manorburn average net gain is 55% of rainfall but varied from 26% to 77% (1947 and 1945 respectively). In 1937 4.08" rainfall 87 day-heads gain 1 October to 31 December - Poolburn slight loss. In 1940 3.9" rainfall Manorburn gain 105 day-heads, Poolburn loss 154 day-heads for same period. During the last month 1.49" rain has produced 790 day-heads runoff from the two catchments. Average annual rainfall at Manorburn 19.2", in 8 months to 30 September 9.35". 5790 day-heads in storage 4 October. Since Poolburn dam came into use in 1931 area served in Galloway and Ida Valley has increased from 13894 acres to 14990 acres.

5 November 1948: In storage 1.11.48 4990 day-heads, a drop of 800 since 4.10.48. Supplied for irrigation to 31.10.48 1700 day-heads, gain from catchments 900 day-heads. On 11.11.48 (see 15 November 1948)

storage had risen to 5370 day-heads with a gain of 440 and draw off of 60 day-heads. Further advice in memos of 15 December, 25 January and 9 February, the full position being shown tabulated below:

In storage	4.10.48	5790				
	1.11.48	4990	draw off	1700	gain	900
	11.11.48	5370		1760		440
	13.12.48	4295		3925		1090
	24.1.49	1570	Manorburn	670	Poolburn	900
	8.2.49	710		210		500

24 May 1949 Report on Hopes Ck diversion proposals gives various flow figures. For Manorburn catchment the average net gains from 1.5.18, mean for 10 years to 30.4.28 10,650 day-heads, 20 years to 30.4.38 10,570 30 years to 30.4.48 10,430. Heavy runoffs 1944/45 1945/46 of 19,195 and 15,730 day-heads respectively. To cope with average annual consumption of 10,790 (28 year average) dam should have been 2 ft higher. Runoffs Manorburn dam 1945 19492, 1946 8804, 1947 3884, 1948 5077 day-heads. Supplementary report of 27 June gives 31 year mean gain at Manorburn as 10,350 d.h. and 17 year mean at Poolburn of 2,660 d.h.

22 September 1949: Storage 2.8.49 (memo of 15 August) Manorburn 6,235 d.h. Poolburn 2,695 d.h. a total of 8,930 d.h. On 15.9.49 Manorburn stood at 8,400 d.h. and on 30.8.49 Poolburn stored 3,100 d.h., a total of say 11,500 d.h. compared with requirement of 14,060 d.h. Cuts proposed to save 1100 d.h. Notes rainfall at Alexandra since 1.1.49 has exceeded average annual of 13 1/2".

30 November 1949: Rainfall at Alexandra Sept 0.24", Oct 0.66", Nov 0.34" (cf same period 1923 1.22" and 1937 0.89") Both dams suffering net loss due to evaporation Manorburn 1 Nov to 30 Nov 450 d.h., Poolburn 1 Nov to 18 Nov 75 d.h. Storage Manorburn 28.11.49 4825 d.h. Poolburn 18.11.49 2592 d.h. Further reports on position are dated 27 January 1950 and 10 February 1950 - position tabulated below:

23.1.50 Manorburn storage	2200	Poolburn storage	710	sold to date	6355
6.2.50	1505		300		7000

On 27 January decided to cut supplies to 8405 d.h. (approved 13 Feb.) leaving 1160 d.h. to cover race and evaporation losses. On 10 Feb. evaporation losses were amounting to 5 dh per day and conditions still remaining dry. On 9 March advised that Poolburn shut down on 18.2.50 with 125 dh remaining. Manorburn on 8.3.50 had 430 dh in storage but to be shut 11.3.50. Reduced quota not supplied.

28 June 1950: Manorburn dam closed down 17.4.50 with 230 dh remaining in storage, on 22.6.50 had reached 540 dh only - the worst position ever (of 22.6.48 1325 dh). Poolburn 18.2.50 to 14.6.50 storage increase of 40 dh with storage now at 165 dh. (cf June 1949 1450 dh). With average gains storage could reach 6580 dh by end of September but with minimum gain would only lift to about 2800 dh. Previous worst situation gave 3495 dh in storage in June 1948 and 5650 dh at end of September.

24 August 1950: Tabulated areas under agreement, water sold and rainfall at Moa Ck from 1927/28 season to 1949/50. Shows supplies restricted 1929/30 (10% - 40%), 1930/31, 1941/42 (7 1/2% to 12 1/2%), 1947/48 (15%), 1948/49 (54%), 1949/50 (32%) - reductions in charges made with restrictions. Pumped supply to Galloway area brought in 1944. Area in Ida Valley 1927/28 11,248 acres, 1949/50 12,358 acres.

12 September 1950: Storage as at 8.9.50 2,350 dh (Manorburn 1,870 Poolburn 480). Gains 1 Sept to 31 Dec 1947 4,320 dh, 1948 3,300 dh, 1949 605 dh, 1950 say 1800 dh - could give 4,150 dh for supply and 1000 dh race losses. Rainfall at Alex since 1.1.50 6.60" and since 1.1.49 13.16". On 15 November, 6 December and 19 February 1951 further advice received - tabulated below:

Storage 8.9.50	Manorburn	1870	Poolburn	480		Rain since
30.10.50		1518	"	322	supplied 640	1.1.50 6.60"
6.12.50	Manorburn and Poolburn			700		8.86"
15.2.51	Manorburn	232	Poolburn	nil		

14 July 1954: Figures of supply reductions given 1947/48 15%, 1948/49 54%, 1949/50 32%, 1950/51 83%, 1951/52 18%, 1952/53 33%, 1953/54 20%, Manorburn average yield over 21 years 9900 dh Poolburn 2575 dh.

9 November 1954: When draw-off commenced 9.10.54 water in storage 2962 dh. At 1.11.54 2527 dh in storage and 377 dh supplied. Promised supply for season 2137 dh allowing for losses of 587 dh.

19 September 1957: Irrigators advised that although full quota available saving is important and a rebate of 50% will be allowed on the value of water not used. Early water will be available from stream flow 50% only being debited against quota. Head Office advised 18 October of above and that 24,000 dh at present in storage. Ministerial approval of arrangements given 28 February 1958.

5 August 1958. Notes 1946/47 season full supply available and 4% extra water used, since then percentage of full quota supplied 1947/48 81%, 48/49 45%, 49/50 68%, 50/51 17%, 51/52 81%, 52/53 67%, 53/54 79%, 54/55 33%, 55/56 75%, 1956/57 40%. In 1957/58 full supply offered but with wet season 43% used - payment for 71% of quota.

28 September 1959: Gives storage 1957/58 23000 day heads, 58/59 31250 dh dry season, 59/60 23000 dh dry winter, heavy demand.

13 September 1963: Storage and supply position at 9.9.63 as follows:

Storage Manorburn	12676	Supply	75% quota	10,892	
Poolburn	3277	14953	Annual gain	9,584	1298

The amount required for 100% of quota is taken as 14,524 dh at the reservoirs, and in the same way gains of 4567 dh for the irrigation season and 5027 dh for the off season are standards. A 75% quota for the season is allowed for here.

8 September 1964: Storage and supply position (for 75% quota) at 8.9.64 as follows:

Storage: Manorburn	9766	Supply 75% quota	10892	
Poolburn	2089	11855	Annual gain	9594
		Draw off	1298	
		at 1.9.65	10577	

Storage position has deteriorated due to dry winter months and lack of snow. The average gain 1 May to 1 Sept is 5027 dh, this year has been 2284 dh. Ministerial approval of 75% quota and full rebate on quota water not used dated 23 September.

20 July 1965: Notes requirements for full quota 9252.75 dh in Ida Valley and 1506.5 dh in Galloway, a total of 10,759.25 dh. 3613.25 dh supplied from Poolburn reservoir to 4817 ac.

3 September 1965: Supply position for 100% quota, Manorburn storage at 27.8.65 and Poolburn storage at 3.9.65 as follows:

Storage:	Manorburn	15204		Supply 100% quota	14,524	
	Poolburn	<u>4034</u>	19,238	Average gain	<u>9,594</u>	4,930
	Draw off	4930	<u>4,930</u>			
	at 1.9.66		14,308			

Ministerial approval 14 September for rebate of 50% on value of water not used.

6 September 1966: Supply position for 100% quota and storage at 1.9.66 as follows:

Storage:	Manorburn	14662		Supply 100% quota	14,524	
	Poolburn	3743	18405	Average gain	9,594	4,930
	Draw off		<u>4930</u>			
	At 1.9.67		13475			

On 16.9.66 figures explained as following. Requirement at farms is 10,759 dh which allowing for 25% losses, by wash, domestic and stock-water gives 14,524 dh. Over last 6 years average diverted 13,160 dh, average sold 10,180 dh. With 15% losses requirement at dam is 12,700 dh. Average gain (for 12 months) for 1950/65 period is 11,060 dh but removing wet 1957/58 period drops to 9500 dh. On 13 September approval for 50% rebate on water not used.

Agreements. Areas. Etc.

5 October 1928: Returns for 1927/28 season show that the Ida Valley and Galloway areas have 49 and 23 irrigators with 10,519 and 2,230 acres under agreement. Average supply required for a 150 day irrigation season is 52 heads for Ida Valley and 23 heads for Galloway, a total of 11,290 heads. Total revenue £7365.

24 February 1932: A petition from 10 farmers asking for an extension of the scheme along the German Hills side of the valley from the Poolburn forwarded to Dunedin for report. A total of 2440 acres offered by the runholders as irrigable. In report of 18 July R.E. Alex states there would be sufficient water to irrigate 1400 acres, a charge of 10/- per acre being necessary to cover the cost of £11,200 assuming an Unemployment Board subsidy of £5,000. Further correspondence, 1 August 1932 and 9 August 1932, mentions agreement to supply certain irrigators in the Galloway area with free additional water, but if the Lower Manorburn dam went ahead the net saving in Manorburn reservoir would amount to 600 day-heads. Also mentions the available supply from the Poolburn reservoir as 28 heads for 150 days (4200 day-heads) in first season. Memos dated 6.11.31 and 29.10.31 on file 15/26 referred to. R.E. Alex states not unreasonable to consider extensions in Galloway and Poolburn areas.

25 August 1932: Request for report on possibility of supplying water from Manorburn Dam to the Ophir goldfield for mining purposes - 8 cusecs required for which the Unemployment Board would guarantee payment of £1200 per year. Report by R.E. Alexandra, dated 31 August states 12 miles of race required at cost of £2000 (amended 22 November to £2250). This led to further correspondence over a number of years, discussion being over supplies available and likely return from mining. The idea was finally dropped (see 10 November 1936).

10 July 1934: First mention of supply from Hopes Creek on file 15/2, but this memo refers to earlier investigations, involving tunnel to Manorburn, in 1923 (refer file 15/26) and investigation for miningwater earlier in 1934 (file 6/17). Hopes Ck only untapped source of supply but survey needed to confirm or otherwise the present proposal of a storage reservoir and race supply to the Upper Bonanza race.

10 November 1936: Petition similar to that of Feb 1932 but signed by 11 farmers with 4300 acres as an extension to the existing scheme above the German Hills race, it refers in particular to diversion of Hopes Ck as source of supply. Also pointed out is the possibility of bringing in 4000 ac in the Crawford Hills and further Crown Land overlooking Ophir. R.E. Alex replies 30 November referring back to memo of 10 July 1934. No survey has yet been carried out due to dropping of proposal to divert for mining. Authority for survey approved 4 January 1937.

7 October 1947: Further petition from 13 settlers with 3380 acres asking for German Hills extension to be carried out as detailed in previous correspondence. Referred to R.E. Alexandra for report. Reply dated 30 October 1947 gives details of the irrigators and areas, and recommends a meeting of farmers concerned. A meeting of 10 April 1948 passed the resolution that immediate representations about diversion of Hopes Ck which was put before the Minister.

19 December 1947: Report by Irrigation Eng. Methven on increases in charges for Central Otago irrigation schemes. In particular for Ida Valley scheme notes that agreements on No. 1 section at 10/- per acre expire 1.9.74 and nothing can be done while agreements on No. 2 section do come up for consideration. Present agreement gives 18" quota at 14/- per acre, suggests rate increase to 15/- but quota drop to 16". Present (1946/47) O. & M. charge £4517, revenue No. 1 scheme £3943, No. 2 scheme £3700, total £7643. New rates would increase revenue on No. 2 scheme to £3964.

27 January 1949: Area under agreement given as 12318 acres for Ida Valley and 2646 ac for Galloway.

24 August 1950: Tabulated areas under agreement and water sold 1926/27 to 1949/50 for Ida Valley area; 1926/27 10,498 acres, 1949/50 12,358 acres. Notes increase in area comparatively small and only 1085 ac. more than recommended by the Irrigation Commission in 1926. Since then Lower Manorburn and Poolburn dams have been completed, Totara Ck supply has been brought in and Galloway pumping has reduced area supplied by dams.

31 August 1950: New irrigation rates and reduction in quota approved by Cabinet 24 August to come into effect 1 September.

31 January 1951: Report on supplementing of Ida Valley supplies from Manuherikia River. Three proposals looked at; i) diversion of East and West branches to Mt Ida Race, ii) diversion of Manuherikia below forks by race 170' below Mt Ida race, iii) diversion through Blackstone Hill race.

23 July 1951: With approval of Hopes Ck diversion one of conditions placed was a voluntary increase in 3/- per acre on No. 1 scheme agreements.

12 March 1953: Refers to No. 1 scheme agreements 37 settlers involved with area of 7238 acres. Agreements signed for term of 42 years to expire 1974. Supplementary agreement allows for increase of 3/- per acre but settlers will not sign. Further on 8 June indicates only No. 1 scheme irrigators would be involved in signing of agreements on 3/- increase. No. 2 scheme irrigators (now paying 14/-) will be required to sign new agreements allowing a 3/3d increase only when supply position returns to normal.

18 May 1953: Notes area supplied from Manorburn dam in 1927 13946 acres, recommended by Irrigation Commission in 1928 13,653 ac., area now supplied from 2 dams 14,277 acres. Poolburn dam supply commenced 1931/32. Lower Manorburn dam supply commenced Jan 1934 and pumping supply to Galloway commenced 1948/49 these supplying 759 acres.

4 December 1953: Ministerial approval for rates to remain as at present for current season even though full quota supplied, but new agreements allowing increase in charge to be signed before next season.

24 March 1954: Irrigators state in petition that they are willing to accept increase in rates of 3/4d conditional on Hopes Ck diversion by tunnel to Manorburn reservoir going ahead. Further on 24 June say 3/3 general increase on expired agreements of No. 2 scheme and 3/- increase on No. 1 scheme, signature on latter required before Hopes Ck goes ahead.

23 September 1954: Decided to bring Hopes Ck diversion costs up to date and at the same time to re-assess the additional area that could be brought in and to look into the actual water usage with particular reference to waste and poor control. Refers 1947 report by Hiddell where it is suggested that 18" quota is too high and could reduce to 16".

30 November 1954: D.S.I.R. and Agriculture Dept advised of research programme for Ida Valley area to include:

- (1) bringing up to date of costs and hydrological data by MOW
- (2) soil investigation by DSIR
- (3) water-usage and farm-economics survey by Ag. Dept
- (4) setting up of demonstration area by Ag. Dept
- (5) hydrological survey of streams by MOW and soil, vegetation and erosion survey by D.S.I.R.

May 1955: Copies of Part II of Report on the Soils of the Ida Valley Irrigation Scheme and Dept of Agriculture Irrigation Survey. The former deals with suitability of soils for irrigation and the effect of irrigation on waterlogging and soluble salts. Part I of report deals with survey data and is not on file. The Ag. Dept. report deals with physical features, land utilisation and management, water usage, production and economics.

5 September 1956; Lists O. & M. expenses compared with revenue from 1935/36 year to 1955/56 year. Up to 1947/48 renewals etc debited against P.W. account not scheme, but listed from 1948/49 onwards. Averages for last 6 years O. & M. £7349, Renewals £15335, Revenue £4269.

7 September 1956; Gives Govt policy re financing of new schemes. Govt must be satisfied the area will show positive returns and that water will be used effectively. In return irrigators must pay for all costs including interest on a quarter of the capital cost. For Ida Valley capital cost to date £260,000 (interest at 3% = £1950), cost of Hopes Ck diversion £409,000 (interest at 4½% = £1730) which with O. & M. cost of £10,000 and a quarter share of major renewals of £1320 gives a running cost of £18000. A charge of 30/- per acre over the 12,357 acres at present under agreement would about cover this. The total development cost is £54 per acre.

12 September 1956; The results of the above 2 reports and J.D. Watts Hopes Creek report were submitted to the Minister 2 August and a reply made to the Member for Central Otago. A summary of the 3 reports is attached to memo of above date along with submission to the Minister.

18 December 1957; For last 10 seasons full quota of water has not been met and this season, although enough water for quota, desirable to save and irrigators will be given a 50% rebate on value of water not drawn. Over years where water has been short the irrigators have been given a rebate to the full value of water not supplied. Notes that of the 12358 acres under the scheme agreements covering 5120 acres expired in 1945, these remaining unrenewed until the results of the current investigations are known. Further explanation of 10 January 1958 says rebate will encourage economic use and no waste of water. Irrigators not likely to sign new agreement for 15" quota when reservoirs are full. Investigations will show what water is required. Ministerial approval of rebate on water charges given in memo of 28 February 1958.

5 August 1958; Report from Alex. Area of 12,338 acres covered by the scheme, 7238 ac at 10/- per acre being covered by agreements expiring in 1974 and 5100 ac at 14/- under agreements expired in 1945. Both allow for 18" quota. In 1951 irrigators circularised (copy attached) for signatures for supplementary agreement covering No. 1 scheme, a 3/- per acre additional charge being involved. Replies from 15 irrigators (2119 ac) agreed to charge, 5 (1310 ac) refused charge and 15 (3809 ac) did not reply. In June 1952 No. 2 scheme irrigators were advised of new agreements (copy of circular attached) a choice of 17/3 net rate per acre for 18" supply or 14/3 per acre for 15" quota, (extra water 24/- per day head in both cases) being offered. In reply 11 irrigators (794 ac) asked for 18" quota, 2 irrigators (550 ac) for 15" quota and 26 irrigators (3776 ac) did not reply. Copy of agreement attached. Ministerial approval given 15 September for 50% rebate as for last year.

25 September 1959; Request to carry out same rebate system as previous 2 seasons. Approved by Minister 16 October.

19 October 1959; Interim report on water requirements of Ida Valley area - figures quoted but no conclusions yet possible. Further report 15 August 1960.

2 May 1960; Further petition from 18 farmers with 6000 acres asking for an extension to the Ida Valley scheme with supply from

Hopes Ck. R.E. Alex notes 11 May that this is a revival of an old question and suggests no action until results of trials known.

16 May 1960: Agriculture report on trials in Ida Valley. Various tabulations attached amongst them list of areas; day-heads supplied, depth of watering and total water for each season 1926/27 to 1959/60. Mean total depth of water applied is 23.74" and mean annual rainfall is 10.00".

13 September 1963: For 1961/62 and 1962/63 seasons 100% quota allowed but with condition that 50% rebate will be made on water not used. See 8 Sept 1961 and 4 Oct 1962. For 1963/64 season storage not as good as has been and the quota reduced to 75% of normal. Ministerial approval for this 1 October and also for full rebate on quota water not used.

18 September 1963: Letter from Federated Farmers states that trials have shown that 18" water is required per annum in the Ida Valley area. As present scheme not able to supply this request made for Hopes Ck diversion by tunnel to be looked at again. This follows on from a further report on the trials where it is suggested that 17" is necessary (see 1 Aug 1963). Ministerial reply of 9 Oct 1963 says results will be reviewed and reported on by Inter-departmental Committee.

29 October 1963: R.E. Alexandra also refers to 18" supply necessary for the area and the inability to reach agreement with the irrigators (5120 acres) in No. 2 scheme area. Not possible to guarantee full seasons quota so irrigators wont have increase in rates. Suggest decision by Inter-departmental Committee.

11 December 1963: Reports by Cossens and Fitzgerald (Winchmore) considered by Inter-departmental Committee, 17" being confirmed as minimum quota. Referred to Head Office with recommendation that 17" - 18" be accepted as quota and asks for further directions on detailed investigations required. Further to Head Office 11 Feb. 1964 and 18 May 1964.

4 September 1964: Submission by Minister to member for Central Otago. Information similar to that 7 Sept 1956 given as capital cost £260,000, revised cost of Hopes Ck diversion £525,000 (total £785,000 or £64 per acre). Interest on capital at 3% (£1950) on diversion at 5% (£26500), O. & M. £12000, major renewals £1000, giving a total operation cost of £21,450 per year. Revenue at 35/- an acre on 12,357 acres would cover this. With 18" quota guaranteed not sufficient water to bring in additional area. Farms not at present making best use of water and as long as water being wasted through deep percolation and excessive surface runoff can not expect Govt to go ahead with diversion.

13 May 1965: Minister to Comm. of Works reporting on meeting with irrigators and asking for re-assessment of the diversion of Hopes Ck and scheme area, charges etc. Alex 20 July 1965 notes areas supplied from 2 reservoirs are 12,337 acres in Ida Valley and 1494 ac in Galloway. Full quota requires 9,252.85 dh in Ida Valley and 1,506.5 dh in Galloway, the latter to supply quotas varying between 19.8" and 30" per acre. 4,817 ac with a net requirement of 3613.25 dh supplied from Poolburn dam, but supplemented from Manorburn supply by diversion of up to 10 cusecs at the Moa Ck weir. Alex 22 October 1965 reports 60 irrigators on the Ida Valley Scheme.

17 August 1965: Report on scheme followed by addendum dated 24 August.

10 December 1965: Meeting of irrigators called 29.11.65. Recommended investigations be taken further.

Hopes Creek Diversion

24 May 1937: First full report on various possible diversions. Several dam sites investigated, the best providing 1347 day-heads storage with 90 ft high structure. No gaugings of stream but discharge as good as Manorburn should provide 1320 day-heads per season from flow. Dam and 20 cusec race would provide about 2330 day-heads at a cost of £80,000, 20 cusec race would provide 1200 dayheads at £40,000 and a 40 cusec race 1630 dayheads at £64,000. All supply proposals would feed into the Upper Bonanza race and include costs of German Hills race. Areas irrigable under the three proposals are 3500 acres, 1600 acres and 2200 acres respectively. Direct supply from Hopes Ck to the Galloway area is suggested as worth investigating but ruled out 13 August 1937 due to very broken nature of country.

29 December 1937: Further report on above proposals following more detailed survey. Dam as proposed not very favourable as 12,000 cu.yd concrete needed to store 134 dayheads at a cost of £60,000 (cf. £33,000). Gaugings made of Hopes Ck show discharge can be taken as equal to net gain at Manorburn dam. Best proposal now is 25 cusec race diverting 1400 dayheads per season into Upper Bonanza race (cost £19,000). The German Hills race would be 13 1/2 miles long and cost £23,000 (total cost £42,000). Acreage charge 13/6 to provide revenue of £4215 and 1.66% interest on full capital. On 6 May 1938 and 18 May 1938 authority of £36,250 was issued for this work, however, due to the non-commencement of work the authorities were cancelled 3 March 1939.

12 September 1944: Hopes Ck diversion proposals again examined as a result of a request from Head Office. Notes that previous scheme involved diversion by 25 cusec race to Upper Bonanza race, the water to be used in the Ida Valley and Galloway areas. New race to be constructed from Poolburn above existing German Hill race to command additional area of 1800 acres. Scheme turned down as settlers would not subdivide. Present estimated cost is £57,500 to be covered by 2000 acres at 14/-.

30 October 1947: Further report follows petition and request for information, 7 October. Details given are much as previously but total cost of diversion and German Hills extension now £65000. A meeting of farmers decided to press for this diversion to be carried out (10 April 1948) and passed the request to the Minister. The resulting report from R.E. Alex dated 25 June 1948 gave detail as previously given.

25 November 1948: Although Hopes Ck diversion mentioned at various times over last 12 months, the first real information comes with this memo enclosing correspondence between Minister and Member for Central Otago. Minister says cannot approve construction of Hopes Ck diversion where will only be of use every 15 years and some limitations to supply would apply as at present to any increased area. Possibility of supplying Galloway-Crawford Hills area brought up and memo asks for report on this instead of German Hills extension.

31 March 1949: Refers to report on dams in Hopes Ck, raising of Manorburn dam and connecting tunnels dated 17 November 1923 on file 15/26. Asks for a report on same lines as this one.

24 May 1949: Full report and plan of various diversion proposals for Hopes Ck. The various proposals investigated are summarised below:

1. Upper bonanza Race - Lining: Concrete lining for 5 miles of race at cost of £35,000 to prevent loss of 1000 dayheads per

season. Not recommended due to short working season.

2. 9 miles of 25 cusec race to Upper Bonanza race diverting summer flows only. Cost £32,000 for net 1140 dayheads.
3. New dam below Manorburn and new race abandoning 5 miles of Upper Bonanza race - cost £45,000. Dam at J.H. Dobson's site (1912) crest 2400' stream bed 2335'.
4. Dam with crest level 2448' in Hopes Ck and 11,000 ft tunnel to Manorburn reservoir - cost £255,000. Dam 110' high and with storage of 1575 dayheads with tunnel at 2400' invert level. Alternative site 2 miles upstream gives dam 75' high with 250 dayheads storage and 16000 ft tunnel invert level 2415' - cost £217,000.
5. 90' high dam below Stone Hut tunnel and race to relocated Bonanza race, storage with intake 25' below crest 2,350 dayheads. Cost of dam and 8650 ft of tunnel £185,000, cost of Bonanza race relocation £57,500.

The various proposals are compared, the last being viewed as the most favourable. Additional water thus provided, conservatively taken as 5000 dayheads, could be used in the Crawford Hills-Galloway area and in the higher German Hill lands.

8 June 1949: Head Office comments on above report. Comparison of proposals necessary on basis of acre-feet supplied. Makes various suggestions concerning complete control of the 2 catchments from the Manorburn with new dam here if necessary - asks if a dam could be built at Dobson's site to crest level of 2460'. Asks if dam in proposal 5 could be made larger to provide full regulation of Hopes Ck.

27 June 1949: Supplementary report on Hopes Ck diversion proposals. New Manorburn dam to provide mean flow with no loss (av. 10,350 dayheads over 31 yrs) would have capacity of 27,250 dh, and crest at 2455' - cost £96,200. Dobson's site not suitable would have to go just below existing dam. Large dam could not readily be built at site below Stone Hut. Scheme using new Manorburn dam, diversion from Hopes Ck by tunnel and relocation of Upper Bonanza Race would cost about £386,000 or £45 per acre, compared with £212,000 and £44 per acre for proposal 5.

15 July 1949: Further supplement to reports dealing with flows, storage and use of water.

7 December 1949: Request from Head Office for installation of a weir and recorder at lower dam site in Hopes Ck and similar set up at Tunnel mouth. On 23 February R.E. Alexandra advised temporary weirs installed and staff gauge readings being taken. Permanent weir surveyed and construction to commence shortly. Further memo of 14 March 1950 mentions difficulty of access to the weir at the tunnel mouth, so permanent weir to record to 225 cusecs to be installed at the Stone Hut.

6 March 1951: Report on Hopes Ck diversion to the Crawford Hills - Galloway area. Below the Stone Hut Hopes Ck follows a deep broken gorge and any intake would require long lengths of tunnelling and siphon. To cover 3,650 acres, including the 1400 at present supplied from Manorburn dam, storage of 4000 dayheads would have to be provided. Cost for 1½ miles tunnel, 2500 ft siphon, race, dam, etc., £230,000 minimum. Other proposal is to follow proposal 2 of report of 24.5.49 but to cross the Manorburn lower down - on cost alone would be better to follow the original scheme. In the past season runoff at the Stone Hut only amounted to 100 dh so storage essential - best site at mouth of tunnel in scheme 4 (b) where 50 ft dam gives 800 dh storage.

7 March 1951: Six dam sites surveyed in Hopes Ck, four in 1937. Best site for storage is below Stone Hut (survey 1949) where dam of 80 ft would provide 2700 dh storage. At proposed tunnel intake, scheme 4b, 50 ft dam at good site would provide 750 dh storage (survey 1951) but suffers due to inaccessibility of site. Flow at Stone Hut does not now seem quite as good as Manorburn gain - reduction by 16% necessary. Details schemes again, 1949 costs and average annual gain, the cost of Scheme 2 allowing for the 50 ft high dam mentioned above

Scheme 4a	£255,000	3350 dh	£38 /ac.ft.
4b	£217,000	3350 dh	£32.4
5	£242,000	3350 dh	£36
2	£52,000	2000 dh	£13

28 July 1951: Encloses submissions to Ministers of Works and Finance dated 5 July pointing out that Hopes Ck is only additional source of supply and recommends £55,000 be provided for construction of a dam in Hopes Ck and race to the Upper Bonanza, and £20,000 for repairs to the latter race. Treasury concurs subject to charges being increased to a reasonable level and in particular that the settlers agree to a contribution towards the above of 3/- per acre per year. Approved by Cabinet 11 July (CM (51) 46).

1 December 1952: Settlers reject proposals approved by Cabinet above resolutions being passed by the Irrigation Advisory Council asking for full investigation of 2 tunnel proposals. On 10 March 1953 Head Office advised Member for Central Otago would try to get agreements signed despite apparent preference for a more major scheme.

24 March 1954: Head Office encloses petition from Irrigators to Minister asking for dam in Hopes Ck and tunnel to Manorburn and extension of scheme along German Hills for which they are willing to pay an additional charge of 3/4 per acre. Asks for up to date report and whether sufficient water would be available to cover a further 2000 acres. A further letter from Head Office on 24 June states irrigators not willing to agree to any general increase of rates until Hopes Ck diversion completed.

25 June 1954: R.E. Alex reported on general course of negotiations since Cabinet approval of 1951 and settlers present requirements. It now seems that flow at Stone Hut about 88% of Manorburn gain. In a further report of 14 July 1954 tabulated figures of Hopes Ck flows at Stone Hut given 1.2.50 to 30.4.51 4700 dh, 1.5.51 to 30.4.52 10,230 dh, 1.5.52 to 30.4.53 5,080 dh, 1.5.53 to 31.10.53 4,275 dh.


29 August 1955: Request that Mr J.D. Watt be employed in a consultant capacity to perform a full investigation into Hopes Ck. Order of reference attached. Approved 8 September 1955. Draft report forwarded from Alexandra 2 December 1955 and final report 10 February 1956.

11 May 1960: Revival of Hopes Ck diversion by petition from irrigators to Minister asking for water on area not at present commanded with supply by dam and tunnel from Hopes Ck. 18 signatories with 6000 acres. Ministerial reply of 8 June states proposal uneconomic at present and does not warrant further consideration.

21 June 1963: Refers to Hopes Ck gaugings and records from installed Kent water level recorder and asks if it is necessary to continue this work. Recorder range 20'. Reply of 14 August 1963 indicates that at least a further 10 years of records would be desirable.

25 September 1963: Request from Federated Farmers that as trials have proved that 18" per acre per annum supply is required and the present supply cannot cope with this, that the cost of additional supply from Hopes Ck by tunnel be put before the farmers. Reply from Minister of 9 October says will be considered by Inter-department Committee.

12 May 1965: Reassessment of advantages of bringing in Hopes Ck to be made on basis of 18" quota. This resulted in a report dated 17 August and addendum dated 24 August. The final result after a certain amount of correspondence was the distribution of a summary to irrigators 3 November 1965 and the calling of a meeting on 29 November 1965. This meeting was reported on 10 December 1965.


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Dunedin
22 November 1966