

MINISTRY OF WORKS
and Development

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Inquiries to

Date 4 October 1985

Our ref 92/12/67/39

Your ref

Mr A McNab
C/- Post Office
TOKAANU

*for
Arthur Grace.*

Dear Mr McNab

TOKAANU FLOOD SPILLWEIR

Thank you for your letter of 27 September and for your hospitality on Thursday, 26 September. I thought the discussions very useful, and enjoyed meeting you.

In reply to your two requests, I advise as follows:

(1) Spill at the weir: Water level was recorded continuously for a period of approximately 21 months, from 6 October 1976 until 5 July 1978. I am enclosing a copy of the tables showing the daily mean water level at the gauge site (just upstream of the station access road bridge - which is a few metres upstream of the weir). Water will spill over the weir when the water level as measured by the recorder is above 940 mm. Hence there was no spill recorded in 1976 or 1978, but spill occurred on 26 days during 1977. The table shows that it occurred on May 23, 24, 26, June 3, 4, 5, 28, 29, 30, July 1, 2, 3, 4, 5, 19, 20, 26, 27, 28, 29, 30, 31, August 1, September 15, 16 and October 8 - these are marked in blue on the table. Note that these results occurred at a time of lower rainfall than normal.

(2) Letter from Secretary of Internal Affairs dated 4 April 1968. I enclose a copy of the whole letter for your records.

Please let me know if we can help further.

Yours sincerely

Rob Aspden

R J Aspden
for Commissioner of Works

Encl.

8493 Alan Cooper



92/12 167/14

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DEPARTMENT OF INTERNAL AFFAIRS
WELLINGTON

CORRESPONDENCE TO BE ADDRESSED—
SECRETARY FOR INTERNAL AFFAIRS,
PRIVATE BAG 1111 WELLINGTON C.I.

TELEGRAMS AND CABLES "INTERNAL"
TELEPHONE 70-279

4 April 1968

The Commissioner of Works,
Ministry of Works,
WELLINGTON.

*Mr. Jacques to see
Director of...*

Attention Mr H.W. Robertson

TONGARIRO FISHERY PROVISIONS

Thank you for the copy of the report of the meeting held at the Internal Affairs offices on 6 March, at which matters relating to the future activity on the Tongariro Power Scheme were discussed. Your report is a fair summary of the position.

I have now received a report from Mr Burstall, the Conservator of Wildlife, Rotorua, and Mr Larsen, Marine Biologist, who is the Marine Department's officer stationed at Turangi, and they comment on various aspects of the Scheme as follows:

"It is not the purpose of this report to set out why these fisheries protective devices are to be built as this has been adequately covered in the past at all levels. In the following statement the Scheme has been divided into four areas together with a general section dealing with broad principles covering the entity.

1. Tongariro River

(a) Flow Regime: Once the scheme comes into operation or when water is taken from the system via the Poutu Aqueduct then the instantaneous minimum flow at the Taupo Turangi main highway bridge should not drop below 1,000 cubic feet per second, and in order to attain this flow the water should be released over the Poutu Aqueduct Intake. It should be only during times when water is not available in the Tongariro System that water should be released via the Poutu Dam. During the period September October the instantaneous minimum flow in the Tongariro River should not fall below 1,300 cusecs, this should also apply during the month of April.

(b) Preservation of the Delta: Concern has been expressed that with the reduced mean flow of the Tongariro River

Robertson, Director of...

that the angling value of the Delta will be greatly lowered. Provision should be made following completion of the Scheme to ensure that the mouths are kept as separate entities. Reasons for this were fully outlined during discussions regarding the location of the Tokaanu Tailrace.

(c) Velocity Barrier Poutu Intake: This barrier is to be constructed in conjunction with the intake structure so as to ensure that spawning migrants proceeding up the Tongariro River from Lake Taupo do not get attracted into the Poutu Aqueduct where they will become a complete loss to the Fishery both in respect to their spawning potential and angling value. There is a strong possibility that in the future there could be large concentrations of fish below this barrier so provision should be made for road access to this site in case fish have to be captured and transferred to other localities where they can spawn.

(d) Removal of Brown Trout between Baggs Fall and Velocity Barrier: During the period between the commencement of operation of the velocity barrier and the first flow discharged down the Poutu Aqueduct provision will have to be made to remove all fish from this area. If this is accomplished and the upper catchment kept free of alien species then the need for extensive screening on the Poutu Aqueduct is not necessary.

(e) Tongariro Upper Dam and Rangipo Power Station: As these proposals have not yet been approved serious study has not been given to the possible effects, other than concern is felt of the possibility of varying diurnal flow releases down the Tongariro River. If large fish losses are to be avoided and the status of the lower fishery maintained, then it is essential that there be no artificial fluctuations in flow on a diurnal basis in the system.

(f) Future Minimum Flow Below Poutu Dam: Once the Scheme comes into operation there should be at all times a minimum flow of 20 cusecs released from the Poutu Dam down the Poutu Stream.

(g) Poutu Aqueduct: Provision should be made where the Poutu Aqueduct crosses over the Maungahouhounui and the Waiaruhairiki to ensure that the profile and flow patterns of these streams is not altered. It is proposed that in the future these streams will ultimately become important spawning tributaries of the Tongariro system.

(h) Increased Flow Poutu River: During the period between commencement of operations from the western diversions and the first flow through the Tokaanu Power House there will be a period when the extra water coming into Rotoaira will be discharged down the Poutu River. There could be an additional 1,470 cusecs. This will have a serious impact on the Poutu system and will result in considerable scouring of banks and ultimate sedimentation in the Tongariro River. This will then effect both angling and spawning values in this latter area. Provision will have to be given to considering ways and means of minimising the effects of this increased flow.

(i) Sedimentation above Poutu Dam: Once the Scheme becomes fully operative the question of removing silt from the impoundment

above the Poutu Dam will arise. It is important that this is not released down the Poutu into the Tongariro as both the Poutu and Tongariro with their reduced flows will not have the carrying capacity to convey the sediment quickly to the lake and regardless of the above, even if it could be done, the sedimentation will cause harmful effects on the Fishery.

(j) Poutu Aqueduct entry to Poutu Dam: At the exit of the Poutu Aqueduct a fixed bar screen should be installed so as to stop spawning migrants from Rotoaira proceeding up the aqueduct. The bars should be spaced no wider than $1\frac{1}{4}$ ".

2. Moawhango

(a) It is considered essential that provision be made in the Moawhango River in the lower gorge area approximately four miles downstream of the dam, for a physical barrier to obstruct the upstream migration of trout and eels. This measure to be implemented prior to the filling of the Moawhango Lake.

(b) Provision be made in the planning of the spillway on the Moawhango Dam so that it will be impossible for fish to obtain access to the dam during periods in which the spillway is operating.

(c) Provision should be made for future screening in the pick-up locations on the Wahianoa Aqueduct Intake. Present studies revealed the absence of foreign species but this may not always be the case. It will not be necessary for these screens to be installed (fixed mesh screens $1\frac{1}{2}$ " x $\frac{3}{4}$ ").

(d) Whangashu River: In no circumstances should water from this river (not including tributaries) be incorporated into the Taupo Catchment.

3. Tokaanu Power House:

(a) At the intake structure for the Tokaanu Tunnel provision should be made for fixed bar screens of $1\frac{1}{4}$ " spacing so as to obviate the loss of mature fish from Rotoaira.

(b) Tokaanu Stream Tailrace: Provision to be made for the Tokaanu Stream to be separate from the tailrace and flow in an unrestricted course to its traditional south. Measures will obviously be required in order to convey the stream over the tailrace. In this case care should be exercised to ensure that there is no change in velocity of the stream. If flood flows are to be by-passed into the Tokaanu Tailrace the by-pass should be screened with set mesh screens $1\frac{1}{2}$ " x $\frac{3}{4}$ ". The water should not overflow until after it has risen 2" above normal flow.

(c) Electric Barrier: An electric barrier to be erected just inside the mouth of the tailrace where it enters Tokaanu Bay. The design specifications to be based on the results obtained from the experimental machines operating at the Hatchery and on the Ngongotaha Stream.

(d) Care should be exercised to ensure that the water from the tailrace enters Tokaanu Bay over shallow water. This is so as to avoid conveying cooler water down into the deeper part of the lake, and hence confusing the fish in respect to its proximity to the Delta.

(e) Tokuanu Stream Head Waters: The fullest protection to be given to this locality so as to ensure its continuance as a source of wild rainbow trout ova. This locality has unique features which cannot be duplicated elsewhere in the Fishery, and its value is highly vulnerable to the effects of industrialisation and close urban settlement.

4. Western Diversions

(a) At the entrance to the Wairehu Canal a screen to be erected with a maximum mesh size of $1\frac{1}{2}$ " x $\frac{1}{2}$ " to stop the downstream movement of fish from the Otamangakau Dam to Lake Rotoaira.

(b) ~~At the entrance to the Wairehu Canal the bed of the canal upstream of the screen be lined with boulders so as to make conditions unattractive for spawning fish and hence minimise the chance of small fish going down the canal, or as an alternative a concrete mat be placed where the water exceeds one foot per second~~

(c) The Wairehu Canal to enter Lake Rotoaira separate from the Wairehu Stream.

(d) That access be made available to the lower Wairehu Canal so that provision can be made for future fish salvage should the area become a bottleneck for spawning migrants from Lake Rotoaira. Consideration may have to be given to the erection of an electrical barrier inside the outlet of the Canal in order to deter spawners entering. The decision on whether or not such a structure should be erected should be reached only after a study of effects following operation of the canal.

(e) Permanent vehicle access be made available to the Wanganui River below the intake structure and to the Whakapapa River below the drop shaft. This access will be required in the event of possible stranding of fish during the future operations of the scheme.

(f) That very close liaison be maintained with the Fishery Personnel at the time of the first discharge of water down the Wairehu Canal so as to minimise harmful effects on Lake Rotoaira. This operation should be timed to take place in the winter.

(g) Provision will have to be made to either blast or poison out fish (mainly eels) from the Wairehu Canal and Wanganui tributaries prior to the first discharge of flow from the Western Diversions.

5. General

(a) During the constructional period care must be exercised to ensure that strict controls are applied to the operators obtaining aggregates. Experience has clearly shown that unless controls are enforced damage can be inflicted on the Fisheries and indirectly on angling values and also future erosion problems can be created.

(b) Care must be exercised in ensuring that wherever new roading works take place that road culverts are constructed in such a way so as they do not impede the upstream movement of spawners. Additionally, in pumice country runoff water should flow into soakage holes adjacent to the highway rather than directly into the streams.

5. fishing

(c) It will be necessary to ensure that in the future the area so encompassed by the hydro operations come under the jurisdiction of a single management organisation. If this is not done and unauthorised fish releases are undertaken, a considerable wastage of money could accrue by the nullifying of protective measures installed.

(d) Wherever possible roading developed for the purpose of constructing the scheme should be made available on the termination of operations as access for the general public to enable them to utilise certain areas for recreation. Exceptions however to this concept will be the Newbange Dam, due to military reasons.

(e) There has been a large increase in angling usage of the Taupo Fishery in recent years which has resulted in the need for more and better service for boat users. The opportunity should be taken while the machinery and equipment is available on site to construct a boat marina in the Tokaanu Area.

(f) Sooner or later money will have to be expended in order to create stop-banks to confine the lower Tongariro to its present course. There is a strong tendency for this river to break out into Stump Bay in the vicinity of Delatours Pool. Consideration should be given to ensuring that the river is contained by stop-banks between this area and the Delta. It is possible that reject material from metal extraction in the area could be used for this purpose and at the same time the bank so created could form the base of an access road for the general public to Stump Bay.

(g) Wherever possible the engineers should consider means of abating the effect of increased runoff into the catchment areas as a result of their operations. This not only applied to dam construction but also servicing areas and roading works.

(h) The dredge constructed for the development of the Tokaanu tailrace should be left in the area after completion of the scheme to be used in order to keep the mouths of the Tongariro River open following the reduce flow.

(i) Washings from tunnel operations should not be discharged directly into streams but should be allowed to settle out sediments.

(j) Otamangakau Lake: As this lake is being constructed by the Crown its future use should be available to the public of New Zealand and should not come under the area controlled by the Rotoaira Board of Trustees.

(k) As project and engineering plans develop and proceed, it is important that both Internal Affairs and Marine Department Officers be kept informed by the Ministry of Works and Electricity Department as quickly as possible."

If there are any matters contained in this report which you would care to discuss in more detail, this can be arranged at any time convenient to you.

R. W. S. Cavanagh
for Secretary for Internal Affairs

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SECRET

DAILY MEANS YEAR=1978
 DSN=WATER9.HAMWEST.DATA

SITE=1543433

ITEM= 1

RATING NOT APPLIED

TIDCDA 16/05/85

VER= 1 03/05/85

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	720	673	670	663	681	671	673	?	?	?	?	?
2	716	674	668	665	677	667	673	?	?	?	?	?
3	714	675	673	663	677	668	671	?	?	?	?	?
4	706	675	672	665	677	667	676	?	?	?	?	?
5	708	681	670	661	678	665	727	?	?	?	?	?
6	704	678	669	662	680	670	?	?	?	?	?	?
7	706	675	668	662	680	674	?	?	?	?	?	?
8	705	676	667	662	678	705	?	?	?	?	?	?
9	710	672	668	662	676	714	?	?	?	?	?	?
10	705	670	665	663	677	701	?	?	?	?	?	?
11	703	668	666	667	677	694	?	?	?	?	?	?
12	700	672	664	657	676	688	?	?	?	?	?	?
13	700	671	662	666	680	684	?	?	?	?	?	?
14	697	672	660	667	717	683	?	?	?	?	?	?
15	695	678	662	667	921	684	?	?	?	?	?	?
16	691	677	661	674	797	681	?	?	?	?	?	?
17	686	686	661	688	128	691	?	?	?	?	?	?
18	684	683	660	712	706	691	?	?	?	?	?	?
19	687	678	661	742	695	685	?	?	?	?	?	?
20	687	675	664	726	689	687	?	?	?	?	?	?
21	687	675	664	689	684	685	?	?	?	?	?	?
22	683	671	662	684	681	695	?	?	?	?	?	?
23	684	673	661	683	679	703	?	?	?	?	?	?
24	681	670	664	679	678	692	?	?	?	?	?	?
25	681	672	661	676	676	699	?	?	?	?	?	?
26	679	670	659	673	674	683	?	?	?	?	?	?
27	676	671	660	673	672	683	?	?	?	?	?	?
28	676	668	663	676	672	681	?	?	?	?	?	?
29	676		667	680	672	677	?	?	?	?	?	?
30	673		667	680	669	676	?	?	?	?	?	?
31	676		664		670		?	?	?	?	?	?
MIN	673	668	659	657	669	665	671	?	?	?	?	657
MEAN	694	674	665	676	693	685	684	?	?	?	?	681
MAX	720	686	673	742	921	714	727	?	?	?	?	921

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	?	?	?	?	?	?	?	?	?	?	?	?
2	?	?	?	?	?	?	?	?	?	?	782	903
3	?	?	?	?	?	?	?	?	?	?	780	876
4	?	?	?	?	?	?	?	?	?	?	777	814
5	?	?	?	?	?	?	?	?	?	?	773	782
6	?	?	?	?	?	?	?	?	?	?	782	769
7	?	?	?	?	?	?	?	?	?	804	776	762
8	?	?	?	?	?	?	?	?	?	830	775	755
9	?	?	?	?	?	?	?	?	?	823	770	750
10	?	?	?	?	?	?	?	?	?	830	774	758
11	?	?	?	?	?	?	?	?	?	821	777	769
12	?	?	?	?	?	?	?	?	?	818	780	753
13	?	?	?	?	?	?	?	?	?	819	772	748
14	?	?	?	?	?	?	?	?	?	813	768	745
15	?	?	?	?	?	?	?	?	?	805	765	773
16	?	?	?	?	?	?	?	?	?	805	760	756
17	?	?	?	?	?	?	?	?	?	806	755	745
18	?	?	?	?	?	?	?	?	?	836	752	748
19	?	?	?	?	?	?	?	?	?	865	750	747
20	?	?	?	?	?	?	?	?	?	855	750	759
21	?	?	?	?	?	?	?	?	?	829	747	762
22	?	?	?	?	?	?	?	?	?	815	744	757
23	?	?	?	?	?	?	?	?	?	815	741	752
24	?	?	?	?	?	?	?	?	?	810	739	750
25	?	?	?	?	?	?	?	?	?	806	764	748
26	?	?	?	?	?	?	?	?	?	799	787	745
27	?	?	?	?	?	?	?	?	?	824	759	743
28	?	?	?	?	?	?	?	?	?	822	749	742
29	?	?	?	?	?	?	?	?	?	803	741	750
30	?	?	?	?	?	?	?	?	?	794	746	745
31	?	?	?	?	?	?	?	?	?	788	915	744
										786		748
MIN	?	?	?	?	?	?	?	?	?	786	739	742
MEAN	?	?	?	?	?	?	?	?	?	816	768	765
MAX	?	?	?	?	?	?	?	?	?	865	915	903

} millimetres.