DOUBLE SIDED

ORIGINAL

Decision No. A 178 /2002

IN THE MATTER of the Resource Management Act 199 1

AND

'IN THE MATTER of an appeal pursuant to section 120 of the Act

BETWEEN **D R SAMPSON & OTHERS**

(RMA 741/99)

AND **WAIKATO REGIONAL COUNCIL ASSET MANAGEMENT GROUP**

(RMA 745/99)

Appellants

AND **WAIKATO REGIONAL, COUNCIL**

Respondent.

BEFORE THE ENVIRONMENT COURT

Environment Judge R G Whiting (presiding)
Environment Commissioner AH Hackett
Environment Commissioner I G McIntyre

HEARING at Hamilton on 11, 12 and 13 June, and 17, 18, 19 and 20 June and at Auckland on 1, 2, 3, 4 and 5 July 2002

APPEARANCES

Mr N D Wright for Mr Sampson & others
Mr J M Milne for the respondent
Mr P M Lang for the applicant

DECISION

Introduction

[1] This appeal is part of a continuing dispute between the Waikato Regional Council and a number of landowners who own land on the western bank of the Waikato River opposite Meremere. This land, is generally referred to, as the Mercer West properties. At the heart of the dispute, is the appellants' request for the

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Council to construct a stopbank to reduce the flooding potential of the land, which lies within the flood plains of the Lower Waikato River.

The Lower Waikato/Waipa Control Scheme

[2] The Waikato River is New Zealand's longest river (425kms). It rises from its headwaters to the slopes of Mt Ruapehu and flows in a generally northern direction via Lake Taupo, to the sea at Port Waikato.

[3] The Lower Waikato River is that portion that extends from Ngaruawahia and its confluence with the Waipa River to the Waikato heads. Until it reaches Ngaruawahia the river is generally confined within a well insized channel. The river then becomes wider and slower flowing and the floodplain is low and wide. In its natural state, the Lower Waikato floodplain was dominated by lakes and wetlands.

[4] Today much of this land has been drained and brought into agricultural production. Comprehensive management and drainage of the area followed the establishment of the Waikato Valley Authority in 1956. In the early 1960s a comprehensive river control scheme, designed to provide flood protection and drainage improvements within the floodplains of the Lower Waikato and Waipa Rivers, was developed'.

[5] The flood scheme was commenced under a deed of arrangement signed by the former Waikato Valley Authority, the former constituent counties and drainage boards and the Crown. The function of the authority was to design the flood control scheme but it was the role of the constituent local authorities to undertake the construction works and rate their benefiting areas to fund the local share of the cost of the works. A major review of the scheme, its scope and financing arrangements was undertaken in 1976 and 1977, at which time final decisions were made on those works to be included in the scheme and those to be deleted. The flood scheme primarily consists of stopbanks, pump stations, floodgates, and main river channel improvement works.

Refer "Lower Waikato Waipa Control Scheme Asset Management Plan".

Physical components of the scheme

[6] Mr W M Mulholland, a registered engineer and manager of the Council's River and Drainage Technical Services Unit, described the scheme for us. Relevantly, for present purposes, the scheme comprises:

(i) stopbanks;
(ii) improvements to the main channel of the Waikato River; and
(iii) community works structures including floodgates and pump stations.

Stopbanks

[7] Stopbanks along parts of the Waikato River were constructed to prevent flooding of adjacent land, and at selected critical locations around the margins of the Whangamarino wetland, to enable adjacent land to be economically brought into production and to protect State Highway 1 and the Main Trunk Railway line from all but the most severe floods.

[8] Much of the land in the Mercer west area was originally earmarked for protection by the building of stopbanks but the plans carried the notation "dependent on local demand and further economic appraisal". According to the evidence of Mr Sampson' it was subsequently deleted from the scheme in 1969. According to Mr Mulholland and the documents produced, the Mercer west area was deleted from the scheme for technical and possibly demand reasons. A memorandum dated September 1976 from Raglan County Council and produced by Mr Mulholland confirmed that the Mercer West area had been removed from the schedule.[3]

Main channel works

[9] The scheme provides for river training works and channel improvements to increase the hydrological capacity of the channel. These include willow clearance, removal and future containment of shouldering, improvement of branch channel entrances, partial removal of islands, trimming of main and secondary channels, and improved alignment and widening of the river.

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[2] Sampson, EiC, para 42.
[3] See page 65 of transcript.

[10] More extensive channel training works, within the Mercer to Rangiriri reach, were included as part of the Tongariro offset works, with the object of offsetting the affect of the extra water diverted into the Waikato River from the Tongariro Power Development. Reliance was placed on sand abstraction to achieve the desired improvements from Meremere to Maioro Bay. The training works implemented between Maioro Bay and Rangariri, consisted of groyne construction to narrow the river in locations where it was over wide, and trimming and removal of islands and obstructions where the channel was narrow to achieve desired channel widths.

Community works

[11] A feature of the Lower Waikato River catchment in its natural state was that large areas of flood storage were available in the form of lakes, swamps and flood plains. The effect of these storage areas was to significantly reduce peak flows in the river downstream of Huntly.

[12] The scheme provided for Lake Waikere and parts of the Whangamarino wetland to be retained for flood storage. To make the most effective use of this storage control, structures were constructed and diversions implemented. These included:

(i) The Rangiriri spillway - a low-level spillway at Rangiriri between the Waikato River and Lake Waikere to ensure the flows into Lake Waikere do not commence until flows in the Waikato River reach certain peak values. The spillway is designed to divert up to 15% of the design flow in the Waikato River in flood conditions.

(ii) The Te Onetea gate. The outlet from the Rangiriri Stream to the Waikato River is now blocked. The outlet from the Te Onetea Stream now passes beneath the Rangiriri spillway via a culvert, and flow through this culvert is controlled by a slide gate; the Te Onetea gate. Under normal conditions this gate is left open to allow the movement of eels and fish between the river and the lake. Because of the reduction in the level of Lake Waikere, direction of flow is normally from the river into the lake. In times of flood the gate is closed. This has the effect of causing the river level to rise.

(iii) The Waikere northern outlet gates provided a new outlet from Lake Waikere. Instead of discharging to the Waikato River at Rangiriri via the Te Onetea and Rangiriri Streams, the lake now discharges northwards and into the Whangamarino wetland via the Waikere northern outlet canal. Outflow from the lake into this canal is controlled by radial gates. This change enables the level of Lake Waikere to be lowered, thus creating more flood storage capacity, and improving drainage and flood control around the lake. Overflow from the lake to the Whangamarino wetland in times of flood is now prevented by a stopbank along the northern foreshore of the lake.

(iv) The Whangamarino gate. Backflow from the Waikato River at Mercer into the Wangamarino wetland is prevented by the Whangamarino control structure. This structure consists of twin radial gates situated on the Whangamarino River, immediately upstream of its confluence with the Waikato River. These gates normally remain fully opened, but are closed during a flood, once backflow from the river to the wetland commences. The gates allow flood levels within the wetland to be held below those in the Waikato River. This allowed the design crest levels, for the scheme's various stopbanks protecting land around the edges of the Whangamarino wetland, to be lower than would otherwise have been the case. Reducing flood levels for these stopbanks was an important consideration, as the very poor foundation conditions upon which they were to be situated, limited the height to which they could be economically built. The effect of closing the gate is to cause the Waikato river level to rise.

The need for consents

[13] The various water takes, diversions and discharges associated with the control gates, were originally authorised by the Soil Conservation and Rivers Control Act and subsequently by section 21 of the Water and Soil Conservation Act 1967. Those authorisations were deemed to be water permits and discharge permits as appropriate, by virtue of section 386(1) of the Resource Management Act 1991. These transitional resource consents expired on 1 October 2001 by virtue of section 386(3). Accordingly applications for resource consents for water takes, diversions and discharges associated with the control gates were lodged before that date. The

transitional provisions of the Resource Management Act, have enabled continued existence and operation of the scheme without consents.

[14] Relevantly, the applications for resource consents are in respect of:

(i) The Te Onetea control gate, which regulates flows between the Waikato River and the Te Onetea Stream which enters Lake Waikere;

(ii) The Lake Waikere control gate, which regulates flows between Lake Waikere and the Whangamarino wetland through the man-made Waikere canal: and

(iii) The Whangamarino control gate which regulates flows between the Waikato River and the Whangamarino River and wetland system.

[15] Resource consents, subject to conditions, were granted by the Waikato Regional Council subject to a number of conditions (RMA 745199). The Regional Council appealed seeking a change to some of the conditions. Agreement has been reached between the two sectors of the Regional Council. A memorandum from counsel and a draft consent order was tiled at the commencement of the hearing. The draft consent order is attached as Appendix 1. Mr Sampson and others also appealed the Council's decision. They sought the decision to be either overturned and the consents refused, or alternatively, the imposition of a condition that the Council erect a stopbank adjacent to the Mercer west properties by way of mitigation, During the course of the hearing, that part of the relief which sought the refusal of the consents was abandoned. Accordingly, the only issue before us is whether a condition should be imposed, requiring the Regional Council to erect stopbanks adjacent to the Mercer west properties for mitigation purposes.

The appellants

[16] The appellants' case was spearheaded by Mr Sampson. He and his wife own a 70 hectare dairy farm, and lease another 50 hectares at Mercer west. Presently they milk 230 cows on their property, which is situated on the west bank of the Waikato River, upstream from Mercer, and approximately opposite, what was formerly, the Meremere Power Station.

[17] Approximately half of the property is comprised of alluvial flats, which slope down and away from the river from a natural higher berm on the riverbank. The low point of the natural berm at "cross-section"[4] 61.1 is RL 5.26 metres.

[18] When the river level reaches RL 5.26 metres, water flows on to the property and floods the alluvial flats which are lower than RL 5.26 metres. Once flooded, natural drainage back to the river does not occur until the river level falls to around 3.7 metres.

[19] When flooding occurs, drainage of the flats often takes around 4 to 5 weeks; long enough to kill the pasture. According to Mr Sampson their property flooded in July 1995, August 1996 and July1998. He told us that he and his wife lost a total of $197,000 in the three floods, through the loss of production and costs, In addition, they are suffering significant ongoing losses due to the fact that they are operating their farm at far lower than optimum levels, in order to safeguard and/or mitigate against the potential impacts of flooding.

[20] Mr Sampson explained to us in quite graphic terms the economic and social impacts that the flood damage has caused. Since the 1995 flood, five families have moved from the area. At times the financial and mental pressure becomes too much to bear he said.

[21] It was the appellants' case that the existence and operation of the Te Onetea gate and the Whangamarino gate raised the flood levels at Mercer west by between 0.34 metres and 0.44 metres and that this represents a serious adverse effect. Hence the relief sought is for the Council to be required to undertake the construction of a stopbank.

[22] We record here that consents for stopbanks have already been sought by the Council and were obtained in late 2000. The reason they have not been built, is because of a failure by the landowners at Mercer west and the Council to reach agreement as to how the costs are to be shared.

[4] **One of a. number of surveyed cross-sections for reference and monitoring purposes, surveyed on** instructions from **the Regional Council.**

The "baseline"

[23] The "baseline" has been authoritatively stated by the Court of Appeal in *Arrigato Investments Limited v Auckland Regional Council*[5]:

> . ..the permitted baseline...is the existing environment overlaid with such relevant activity (not being a fanciful activity) as is permitted by the plan. Thus, if the activity permitted by the plan will create some adverse effect on the environment, that adverse effect does not count in the section 104 and 105 assessments. It is part of the permitted baseline in the sense that it is deemed to be already affecting the environment, . ..it is not a relevant adverse effect. The consequence is that only other or further adverse effects emanating from the proposal under consideration are brought into account."

[24] The question that has been raised by counsel in these proceedings is: what constitutes the existing environment? Mr Wright, for the appellants submitted that the existing environment includes the main channel works carried out as part of the scheme. They have had the effect of improving the hydraulics of the river. This in turn reduces the potential for flooding. While the main channel works are part of the scheme they are not, said Mr Wright, part of the application for resource consents. The resource consents relate only to the specified community structures. Accordingly, any adverse effect of those structures, must be measured against the existing environment which includes the main channel works.

[25] The importance of Mr Wright's argument is highlighted by the uncontested facts in this case. It is accepted that the operation of the gates has the effect of increasing the river levels during flood conditions. This is because the operation of the gates reduces the ponding which would otherwise occur in Lake Waikere and the Whangamarino swamp and wetlands. The resulting effect is to increase the potential for the Mercer west land to flood. On the other hand, the main channel works improve the hydraulic capacity of the main channel, thus lowering the river level and reducing the potential for flooding. The Council maintain (although this is disputed) that the main channel works more than offset the rise in river level caused by the operation of the gates. There is thus a net benefit to the Mercer west land.

[26] Mr Wright submitted that the main channel works, now form part of the environment and are not to be considered as mitigation for the future adverse effects of the activities, being sought by the application for resource consents. He said they cannot be considered to be the direct effects of exercising the resource consent, nor

[5] [2000] 1 NZLR at 323.
[6] See paragraph 29.

to be effects that would inevitably follow from the granting of consent. They are effects which are independent of the activities authorised.

[27] Mr Lang, submitted that while the main channel works may be part of the existing environment, their positive effects should nevertheless be taken as a mitigation measure adopted to mitigate the adverse effects arising from the operation of the gates.

[28] In opening, Mr Lang submitted that the gates have always been operated as part of an integrated scheme, designed so that the various scheme components complement each other and work together to produce an overall benefit. The scheme has already included, and continues to include, channel improvements and maintenance works, to enable the river channel to accommodate the additional flows caused by retention of water within the riverbanks, As a result of the combined effects of the river channel works and the operation of the gates, water levels and therefore flooding at Mercer west are reduced below those which would otherwise occur if the scheme was not in place.

[29] In his closing, Mr Lang set out the basis for his opening submission. Generally, where the Court finds that the exercise of the consent will lead to adverse effects on the environment, consideration must be given to methods of avoiding, remedying or mitigating those effects, in order to comply with section 105. If section 104(l)(a), which requires the Court to consider any adverse effects on the environment, leads the Court to conclude that in this case, the proposed continuing operation of the gates would lead to adverse effects, through increase in river water levels, the Court is entitled to require appropriate and reasonable mitigation measures.

[30] Mr Lang submitted, that where the effects of the activity have already been mitigated by measures carried out in the past, with the intention of mitigating the existing and future effects of the activity, and those mitigation measures are continuing and are to be continued in the future, then the Court is entitled to recognise that the mitigation already provided is intended to continue as mitigation for future effects of the activity. This he said can be considered either under section 104(l)(a) or section 104(l)(i).

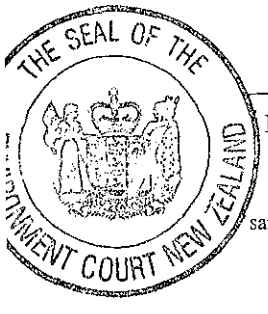
[31] Mr Lang further submitted, that the approach is particularly appropriate where there is an ongoing commitment to monitoring to maintain the effectiveness of those past works. He presented to the Court on behalf of the applicant, a proposed additional condition that requires an ongoing commitment to monitoring. This is attached as Appendix 2.

[32] We are conscious of the Court of Appeal's obiter comment in ***Arrigato*** to the effect that the identification of the relevant environment and relevant effects are matters of fact to be assessed in each case, and not to be overlaid by refinements or rules of law[7].

[33] We are also conscious of the distinction between land use consents, which are granted in perpetuity, and water consents, which are granted for a defined term and not necessarily renewed. In relation to the latter, the existing environment must be determined as the environment that might exist if the existing activity, to which the **water** consents relate, were discontinued.

[34] There is no suggestion, by any party, that in identifying the environment there **are** any activities permitted as **of** right by a plan that should be taken into account. For present purposes we find that the "existing environment" is the Waikato River, its tributaries, streams, wetlands and the catchment configurations that all contribute to the river's hydrological and hydraulic components. This includes the stopbanks and main channel works that have been completed under the scheme. It does not include the community structures which are subject to the consents under appeal.

[35] Mr Wright, submitted that based on the evidence, we should also have regard to likely changes to the existing environment over the 25-year term of the consent. This would include such matters as aggregation of the riverbed. However, we find that such changes as are likely can be accommodated for and met by the monitoring condition (Appendix 2) which imposes standards, the breach of which, will trigger appropriate mitigation action.



[7] Paragraph 38.

[36] In considering effects on the existing environment, we agree with Mr Lang that we should balance any reduction in river level resulting from the main channel works against the rise in river level resulting from the operation of the gates during flood conditions. We so find because to do otherwise would:

(i) Arbitrarily and logically separate the various components of the scheme;

(ii) Separate the works out from part of the purpose they were intended to serve-the main channel works were carried out with the objective; in part, of mitigating the ongoing effects of other scheme components, including the operation of the gates and water management at the Whangamarino wetland.

(iii) Could result in over-mitigation of the effects caused by the operation of the gates.

Factual issues

[37] Accordingly, the following factual issues need to be determined:

(i) The extent to which the operation of the gates (the activities requiring consent) affect river levels during flood conditions; and

(ii) The extent to which the main channel works cause reduction in river levels.

[38] As to the first issue the parties appear to be in agreement that the consented activities are likely to have approximately the following effects on water levels at Mercer west:

(i) With the Whangamarino and Te Onetea gates closed, the proposed operation during flood events, the river level is 180mm higher than it would be with both gates open, in circumstances causing marginal flooding over the appellants' land;

(ii) If the gates are closed the water level is between 240mm and 340mm higher than it would be if the Whangamarino gate was left open and the Te Onetea gate and culvert were not in place – ie the Te Onetea

Stream was allowed to flow without any restriction by the culvert or the gate.

[39] This leaves only the second issue. There appears to be no dispute about the degree of reduction in Waikato River water level as a result of channel works during the period 1960 – 1998. The river level has been reduced by about 1.5 metres at all flows, This was agreed to by expert evidence called by all parties; Mr J I? Waugh for the Council and Mr M B Menzies for the appellants. It was particularly demonstrated by Mr Waugh's figures 1-6 attached to his rebuttal evidence and which Mr Menzies accepted correctly plotted the updated data.[8]

[40] The principal matter of difference is the extent of mitigation provided by the main channel works already undertaken and continued to be maintained. This primary factual issue requires a hydrological and hydraulic comparison between what exists now – ie the operation of the gates and main channel works – and the situation that would exist were those scheme components not presently in place. This can only be done by way of computer modelling.

Computer modelling

[41] The hydrological and hydraulic functions of the Waikato River and catchment are complex. It is difficult to estimate precisely the hydrological response to different rain events. Many variables are involved. The preferred approach for obtaining estimates is to use numerical computer scenario models, Because of its complexity it is not surprising that a considerable part of the hearing time was devoted to this subject.

[42] The modelling is intended to demonstrate the difference between the water levels that are produced in the Waikato River during flood events, with the river in its present state – ie with the scheme components in place ("post-scheme" situation) and the water levels that would be produced in the river if the scheme were not in place ("pre-scheme" situation).

[43] To model the river levels under flood events without the scheme in place the model has been run with the river hydraulics as they were before the scheme was established. The present situation has been modelled on the basis of the existing

[8] Transcript page 254, lines 20-36.

river system with the scheme in place. The same hydrology was used in respect of each simulation.

Evidence of Dr Joynes

[44] The computer modelling was done by Dr S A Joynes, the Principal of Hydraulic Modelling Services Ltd. Dr Joynes has undertaken hydraulic modelling work for Environment Waikato over the past 3 years, the primary purpose of which was to determine the affect the operation of the Whangamarino control gate has on water levels in the Waikato River at Mercer West, during flood events. He contended that the model gave him the information necessary to compare the 'post-scheme' situation with the 'pre-scheme' situation.

[45] The model was set up to calculate flows and water levels from the Karapiro Dam to Port Waikato, as well as the lower reaches of the Waipa River down to Ngaruawahia. It was calibrated against measured flood events, to determine its accuracy, so that it then could be used to generate flows and water levels for designed 3-day rainfall events which are synthetically generated, based on the analysis of historical rainfall within the catchment. The model included all the main tributaries of the Waikato, including those of Lake Waikere and the Whangamarino wetland.

[46] An allowance for an additional $100m^3/s$ was added to allow for diverted flow from the Tongariro Power Development (TPD). Dr Joynes noted, in his supplementary brief, that the TPD diversions are not the result of the control scheme, and would normally be excluded from the model. However, he recognised the importance that may be placed on the diversion and therefore included the allowance of $1\,00m^3/s$. Dr Joynes factored the working model so that this level would never be exceeded, as the flood gates at the outlet of Lake Taupo are closed when the peak flow at Ngaruawahia reaches $850m^3/s$. There was later evidence given that this did not take into consideration the delay of the flood surge reaching downstream areas such as Mercer West.

[47] Two models were constructed: one for the pre-scheme period, and one for the post-scheme period, which included: the stopbanks, the community works, the main channel works, as well as other works associated with the scheme.

[48] As a result of discussions between Environment Waikato, and Mr Menzies, a hydrologist and the Principal of Water Resource Consulting Group, the model was upgraded from time to time such that the evidence presented was the result of the fourth refinement of the model, dated April 2002.

[49] The present model, according to Dr Joynes, is capable of predicting the peak flood levels at the two key points of Mercer and Ngaruawahia to within 215mm and 295mm respectively. He believes that to be an excellent level of accuracy and well within the 500mm free-board built into flood protection schemes.

[50] Dr Joynes and Mr Menzies together spent some time working on four real floods. These were the 1953 ('pre-scheme), 1991, 1996 and 1998 (post-scheme) floods. These were said to have return periods of greater than 50, 8,12 and greater than 50 years respectively. This was done to ensure that the model replicates real flood events. It also enabled the model to be calibrated to establish the hydrological and hydraulic parameters that could be applied to any rainfall event and ascertain its accuracy.

[51] Based on the calibrated model, a number of scenarios were analysed on various features of the scheme, and over a range of return periods, whether in relation to pre and post-scheme differences or on the impact of individual components of the scheme. These included:

(i) the post and pre-scheme flood level during the 1998 flood;

(ii) the post-scheme and pre-scheme comparison of low winter flows;

(iii) the post-scheme and pre-scheme comparison of river performance for designed storm events;

(iv) the post-scheme'and pre-scheme comparison for flood duration during calibrated events;

(v) the post-scheme and pre-scheme comparison of flood level and duration impacts at cross section 61.1;

(vi) the water level profiles along the Meremere-Mercer reach.

[52] The model's predictions were set out in graph form and explained by Dr Joynes. Dr Joynes made the following conclusions from the model's predictions:'

(i) Gate open/gate closed comparison – from the graphs produced the impact of closing the Whangamarino and Te Onetea gates on their own is to raise flood levels by about 220mm at cross section 61.1. This, said Dr Joynes, increases the flood risk from 20 years to 15 years. This takes no account of other changes in the channel;

(ii) Pre-scheme/post-scheme comparison – from the graphs produced the impact of the operation of the scheme has many benefits along the river for those it is meant to protect. At cross section 61.1 the reduction in flooding is in the range of 250mm to 500mm.

(iii) By interpretation of the results of the modeled scenarios Dr Joynes deduced that the risk of flooding at cross sections 61.1 has been reduced horn 5 to 15 years

(iv) Overall benefits of the scheme for Mercer West – there can be no doubt, according to Dr Joynes, that the closing of the Whangamarino and Te Onetea gates raised an increase in flooding for the existing operation of the scheme. However, it is just as clear, in his opinion, that when the full scheme is considered there has been a net benefit to landowners in Mercer West. This he said quantifies as a flood level reduction of 500mm to 1 000mm for major floods.

[53] The relevance and importance of Dr Joynes' findings is that the raising of flood levels by about 220m at cross section 61.6 is more than offset by the main channel works.

Appellants' criticism of the model

[54] The robustness of the model is important. Mr Wright submitted that if "fundamental flaws" in the model and its analysis can be established, then the Council has not laid a proper foundation to establish that the main channel works do and will offset any adverse effects that arise from the operation of the community

Joynes, EiC, paragraph 9.

structures. The only feasible option, therefore, is to proceed to assess the application against the environment as it exists.

[55] As Mr Wright pointed out, the cost of modelling is such, that the appellants did not have the financial resources to develop their own sophisticated model. They did as already referred to employ the services of Mr Menzies, an experienced engineer, specialising in water resources engineering. Mr Menzies is also a specialist in mathematical modelling of water resource systems. He carried out an extensive and thorough assessment of Dr Joynes' modelling and the results obtained therefrom.

[56] The "fundamental flaws" to the model and Dr Joynes' analysis, alleged by the appellants, through cross-examination and evidence were:

(i) A failure to account for "relative error";

(ii) A variance between modelled pre-scheme and post-scheme water levels and actual events;

(iii) A failure to account for increased runoff arising' from land development effects;

(iv) A failure to account for water level rises over the life of the consent;

(v) A failure to accurately reflect the influence of the Tongariro Power Development flows;

(vi) The use of 3 day rainfall event for modelling; and

(vii) The model predictions do not accord with anecdotal evidence

We deal with each in turn

(i) The alleged failure to account for relative error

[57] Dr Joynes told us, that as a result of the model calibration, peak flood levels at Mercer could be predicted to within 215mm. This relates to an error percentage in terms of depth of 3.7%. It was his opinion, that in engineering terms, such a level of accuracy is excellent.

[58] Mr Menzies concluded, that based on the information he received, the calibration of the model was as good as could reasonably be expected. He noted Dr Joynes' predicted accuracy. This, he said, is the accumulation of all the individual sources of error within the model, over the full range that it operates. This error is significant in respect of the frequency of flooding on the appellants' land, and represents a difference in water levels between a IO-year flood and a 15-year flood, a difference that could have significant economic consequences.

[59] Mr Menzies then went on to highlight what he called "relative error", being the error applied to successive model runs exploring the same scenario. An error he claims was not factored by Dr Joynes. It is the difference in, say, two runs of a scenario where the hydraulic aspects are unchanged. This error will not be zero because of inherent uncertainties in the hydraulic conditions at different water levels. Mr Menzies estimated that this error is in the range of 50-100mm. In cross-examination he told us that this figure was essentially a judgement call based on his experience in similar situations where the error is divided between hydrological and hydraulic components.

[60] In rebuttal evidence, Dr Joynes stated that he had done his own assessments and believes that the maximum "relative error" is between 25 and 50mm, being maximum in a major flood and lower in less severe flood conditions. Notwithstanding, Dr Joynes was entirely satisfied with the accuracy of the model and believed that the modelled comparison of the 'pre-scheme' and 'post scheme' Waikato River levels for various flood events are reliable.

(ii) Variance between modelled 'pre-scheme' and 'post-scheme' water levels and actual events

[61] Mr Menzies also found fault in the modelling when comparing the pre-scheme and a "current" flood level in two, presumably similar, 50-year events. The variation between the two predictions was 550mm. Similarly, for two events representing an 8-year return period the difference was 5OOmm. Mr Menzies told us there should have been no difference in the levels found, and the findings suggested flaws in the model. The model's overall error was said to be not greater than 0.125m, yet there appears to be considerably larger errors in the modelling results of the 50 and 8 year events. This in turn, said Mr Menzies:

> Casts doubt on the accuracy of the model calibration, and correspondingly on the accuracy of the modelling results presented in Dr Joynes evidence.

[62] In rebuttal, Dr Joynes stated that the apparent flaw was due to the fact that a real flood event was being compared with a statistical design event. Also, the 1998 flood (one of those modelled) was' not specifically a 50-year event but somewhere between 50 and 100 years. Moreover, the characteristics of each event are different; for example, the lead in time for the 1998 flood was much longer than the 3-day storm used in the design of the scheme. In fact, the actual measured rainfalls in different parts of the catchment were used to replicate this 1998 event.

[63] Mr Mulholland in his rebuttal evidence supported Dr Joynes. He explained that the events were very different in terms of rainfall duration, which inevitably produces different results when used to compare pre-scheme and post-scheme water levels. He attached to his evidence a series of graphs to explain his point. Mr Waugh, a highly qualified and very experienced hydrologist, also confirmed that in his view the comparisons should not have produced the same results in terms of "pre-scheme" and "post-scheme" comparison and that it would be incorrect to expect the same results.[10]

(iii) Failure to account for increased runoff arising from "development effects"

[64] Mr Menzies considered that a 5% nominal differential in the flow should have been allowed to allow for the increased discharge regime in the current over the "pre-scheme" situation". This figure he said was a "guestimate" to allow for effects such as:

(i) The Waipa River stopbanks;
(ii) Catchment urbanisation;
(iii) Recent planting of willow trees in the Meremere reach of the Waikato River.

[65] As to the first, Dr Joynes acknowledged that he had not included in the model any allowance for Waipa River stopbanking that has been carried out around Otorohanga. This was omitted from the model because it has no measurable contribution to water levels in the Waikato River, due to the extremely small area protected by the stopbanks around Otorohanga Township and the remoteness from the river. This was also confirmed in Mr Mulholland's rebuttal evidence."

[10] Transcript page 133 line 25; page 134 line 5.
Mulholland rebuttal, pages 2 and 10.

[66] As to the second, Dr Joynes, in his rebuttal evidence" made calculations to establish the effects of urbanisation and concluded that any increase in runoff would be in the order of 0.3% or $4m^3/s$. This he considered to be negligible. Further, he explained that the time taken for peak flows in urban areas is much quicker than for the larger rural catchments. Therefore, not only is the flow negligible, but it has passed through the system well before the main flood flows in the large rural catchments. Mr Waugh was of a like mind. In his rebuttal evidence he told us that urbanisation will have only a minute effect on today's hydrology since yesterday's and today's hydrology were essentially the same.

[67] As to the third, the appellants contend that the planting of some willow trees in the Waikato River have not been taken into account in the model. The willow planting was considered when the authorisation for Transit New Zealand works was considered and it was concluded that those planting would have no significant effects on river water levels.[13]

(iv) A failure to account for water level rises over the life of the consent

[68] Dr Joynes' modelling results were further criticised by Mr Menzies on the grounds they were based on data specifying riverbed levels. He believed that the results were seriously impaired by not taking into consideration the way in which river levels might change over the 35-year life of the consents. Indeed, he contended that the nett effect of the scheme will quickly become negative as the natural siltation process continues.

[69] We were left in some doubt as to how this discrepancy might be taken into consideration at this time, as he contended that a full new survey of the river cross sections was required as well as long-term plotting of the river levels. He referred us to a graph, (an appendix to his brief of evidence), that appeared to show the effect that dredging had in lowering water levels in the Waikato River from 1960 to about 1993. However, the graph showed that since 1994 the trend has apparently reversed, indicative of renewed siltation since the cessation of dredging. The effect of this siltation said Mr Menzies has been to raise water levels by about 84mm between the period 1994 -- 1998. He said, it seems logical to assume that this will have the effect of more frequent inundation of the appellants' land.

[13] Paragraph 7.7.
Mulholland rebuttal, page 10.

[70] Mr Waugh, in rebuttal, whilst agreeing that dredging has been discontinued at Mercer and Meremere, made the point that it continues downstream at Tuakau and Puni, where the removal of $300,000m^3$ per year is allowed for the first 7 years of the consent (1997 2004) and a reducing amount thereafter. Removal of material in this location, he told us, will encourage sediment to move downstream, in effect readjusting the bed profile. This was not a concept agreed to by Mr Menzies who believed that dredging downstream would have a negligible effect in the areas of interest.

[71] Mr Waugh did not accept the upturn in water level, as shown in Mr Menzies' graph, as being anything other than a "mere blip in the data". He said it might well reflect a sand bar moving into the section. Only ongoing monitoring will detect any significant long-term trend Mr Waugh told us. While we tend to agree with the evidence of Mr Waugh on this matter it is not necessary for us to resolve this particular disagreement. The possibility of future reduction in the mitigation works through riverbed reduction can be addressed by a review condition (Appendix 2) requiring that river water levels are regularly monitored, and providing a review opportunity when the results of monitoring indicate that the mitigation provided by channel improvement works may be eliminated.

(v) A failure to accurately reflect the influence of the Tongariro Power Development flows

[72] We have already adverted to the fact that Dr Joynes has applied a TPD figure of $100m^3/s$ only up to a "cut off level" Waikato River flow of $850m^3/s$. Mr Menzies contended that this figure should be applied at all flow rates because: even though TPD is shut down once Lake Taupo reaches its maximum control level, the TPD flows take several days to move down the river. Therefore, TPD releases made into Lake Taupo immediately before shutdown often contribute to the flood peak at Mercer.

[73] Mr Menzies' contention was strongly opposed by Mr Waugh. We received compelling evidence from Mr Waugh[14] and partly acknowledged under cross-examination by Mr Menzies[15], to the effect that TPD water at most contributes very small volumes to the Waikato River flows in the flood events that would be critical for the Sampson and the other Mercer West properties. TPD agreements and flood

[14] Waugh, rebuttal, paragraphs 22-37; transcript page 340, line 5; page 341, line 6.
[15] Transcript page 265, line37; page 266, line 4.

management rules for the river are structured with the intention that TPD diversions do not contribute in any significant way to Waikato River floods above $650m^3/s$ at Ngaruawahia. The average TPD diversion flow is about $33m^3/s$ and 1998 flood data records indicate that even during that major flood event, the diversion to Lake Taupo averaged about $33m^3/s$ in the period immediately before the main flood and that diverted water was contained in the lake by using the lake outlet control gate. This said Mr Waugh demonstrates the way in which the diverted water and the water in Lake Taupo are managed to avoid TPD water having any significant effect on larger floods in the river.

(vi) Use of 3-day rainfall event as basis for modelling

[74] It was acknowledged by Mr Menzies that the usual "starting point" for determining the appropriate duration of design rainfall event is the "time of concentration" for the relevant catchment. There appears to be no dispute that the relevant time of concentration for the Waikato River catchment is around 3 days, which is the duration of rainfall event used in the modelling. The suggestion was made on behalf of the appellants that some further investigation could have been carried out to verify the choice of rainfall distribution and timing.

[75] Dr Joynes told us that the choice of a 3-day event is not only the usual approach, but is a conservative approach in the present case. It is the duration event that is most likely to cause the least benefit of the scheme at Mercer West. The 3-day rainfall event was the event used in the original design of the scheme (Scheme Design Report) and confirmed as the "time of concentration" of the catchment in the 1983 Scheme Evaluation Report[16].

[76] In our view there is no evidence before us to indicate that the use of the 3-day rainfall event as the basis of modelling comparisons is anything other than appropriate. There is the suggestion that there may, in theory, be some combination of rainfall distribution and timing not used by Dr Joynes that might produce even more conservative results. The lack of connection between that proposition and reality was made clear by Dr Joynes in the following exchange between he and Mr wright:

> Q. The basis upon which you have chosen not to explore in your model the impact of changing distribution and timing is that you believe an evenly distributed storm to be the likely one?

[16] See page 22, paragraph Al. 1.1.3 Design Rainstorm

A. That's correct.

Q. There is no need to look at any others?

A. That's correct.

Q. And the basis for that is in 1991 and 1953 and 1996 flooding occurred from an evenly distributed storm, is that correct?

A. And in 1998 there were 3 rain bands.

Q. Evenly distributed and instantaneously across all catchments?

A That's right.

Q. Given the importance of the issue, given the changing distribution and timing could have highly significant effects, would it not have been prudent to explore how changes in distribution and timing affect the model?

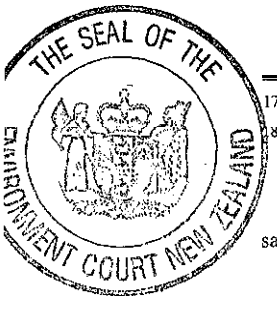
A. No, it wouldn't, because it wouldn't be statistically robust. It would only be theoretical.

Q. So in your view it is not statistically robust to consider as likely any rainfall event in Waikato that is not evenly distributed and instantaneous across all catchments?

A. That's correct.[17]

(vii) The model predictions do not accord with anecdotal evidence

[77] Another matter relied on by the appellants in challenging the reliability of the model is the fact that modelling predicted that flooding of the Mercer West land would occur with an average return period of 3 or 4 years prior to establishment of the scheme. Considerable reliance was placed on the recollection of Mr S Tumai of Ngati Naho who had occupied the area for over 100 years. He stated that between 1943 and 1962 a total of 5 floods occurred, as well as the recorded 1907 flood. On the basis of that "data set" it was suggested that the return period for flooding of the Mercer West land prior to establishment of the scheme was less frequent than 3 to 4-yearly. In fact, the flooding recollected by Mr Tumai indicated an average of 4-yearly flooding during the period 1943 to 1962.[18] Further evidence based on the Ngaruawahia flood recorded from 1924 – 1964 indicated a return period of around 4 years, consistent with the modelled prediction.



[17] Joynes' cross-examination, pages 2-328 transcript.
[18] See transcript page 147.

[78] Mr Sampson's evidence that his land flooded three times between July 1995 and July 1998, appears at first glance to belie the evidence of Dr Joynes when he calculated the reduction in the risk of flooding, as a consequence of the scheme, from 5 to 15 years. However, such statistical predictions are subject to the vagaries of nature and it is the difference in water level that in our view is the important factor in considering the question of effects.

Evaluation and determination

[79] We are grateful to all of the witnesses, particularly the expert witnesses, who gave lengthy evidence and, who in the main, were subjected to lengthy cross-examination. The manner in which they presented their evidence assisted us in understanding and determining the complex hydrological and hydraulic matrix of the Lower Waikato River.

[80] We are mindful of the expertise and experience of Mr Menzies. On some matters, his views were in direct conflict with those of Dr Joynes. To resolve those conflicts has not been easy. Dr Joynes impressed us as a careful and thorough witness. His modelling expertise is not only reflected in his qualifications and experience, but was also apparent from his evidence, both in evidence in chief and cross-examination. The evidence of Dr Joynes was supported by the evidence of Mr Mulholland and Mr Waugb – both very experienced experts.

[81] At the end of the day we prefer the evidence of Dr Joynes, supported as it was by Mr Mulholland and Mr Waugh. We agree with Dr Joynes when he said:

> I believe that the modelled comparison of the "pre-scheme" and "post-scheme" Waikato River levels for various flood events are reliable.. .[19]

[82] We accordingly accept his summary of the overall benefits of the scheme for Mercer West:

> There can be no doubt that the closing of the Whangamarino and Te Onetea gates causes increased flooding for the existing operation of the scheme. However, it is just as clear that when the full scheme is considered that there has been a net benefit to landowners in Mercer West. This quantifies as a flood level reduction of 500-1000mm for major floods.

[19] Joynes, rebuttal, paragraph 7.1.0.

[83] The consequences of our finding is that the community works, for which the said consent is required, will have an adverse effect on the land of the appellants, But the positive effects of the main channel works will more than offset any adverse effects, such that there will be a nett benefit. The main channel works are part of the overall flood protection scheme. They were implemented for the purpose of reducing the overall potential for flooding of flood-prone land in the Lower Waikato – including the land of the appellants. They are accordingly a mitigation measure, designed to more than offset any adverse effects arising from the operation of the gates. As there is a nett benefit, there is no adverse effect caused by the operation of the gates to require mitigation.

[84] Having so found, it would not be appropriate for us to impose a condition as sought. The power contained in section 108 is to grant consent "on any condition that the consent authority considers appropriate". This is a very wide power, but of course, any condition must nevertheless be reasonable: ***Housing New Zealand v Waitakere City Council*** [2001] NZRMA 202, applying ***Newbury District Council v S'ecretay of State for the Environment*** [1981] AC578, [1930] 1 ALL ER 731. To impose a condition, requiring an applicant to take measures beyond what is required to mitigate effects caused by anactivity, would in our view be unreasonable.

[85] We have considerable sympathy for the appellants, particularly Mr and Mrs Sampson, who valiantly farm their land while having to contend with the ravages of floods. It is clear from the evidence that a stopbank would lessen the potential for their land to flood. This is recognised by the Council. Hence, the Council has designed the structures, and sought and obtained the necessary resource consents. The parties cannot agree on their respective funding contributions. That is not ***a*** resource management matter. It is a policy decision for the Council. While it is not a matter for us, we would strongly urge the parties to endeavour to reach agreement on what is a manifestly important issue for Mr and Mrs Sampson.

[86] The appeal is dismissed save for the imposition of a condition as set out in Appendix 2. Costs are reserved but it is our tentative view that costs should lie where they fall.

[87] The appeal by the Council is allowed to the extent that the consent order (Appendix 1) is affirmed save for the addition of the condition set out in Appendix 2.

DATED at **AUCKLAND this** 2nd day of September **'2002.**

For the Court:

R Gordon Whiting
Environment Judge

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APPENDIX 1

BEFORE THE ENVIRONMENT COURT

RMA. 745/99

IN THE MATTER	**OF THE RESOURCE MANAGEMENT ACT 1991**
AND	
IN THE MATTER	**OF AN APPEALS UNDER SECTION 120 OF THE ACT**
BETWEEN	**WAIKATO REGIONAL COUNCIL (ASSET MANAGEMENT GROUP)**
	Appellant (Applicant)
AND	**WAIKATO REGIONAL COUNCIL**
	Respondent
AND	**WAIKATO DISTRICT COUNCIL**
	Section 274 Party

CONSENT ORDER

The Court, having read the Notice of Appeal, the Respondent's Reply and the Consent Memorandum submitted to the Court, HEREBY MARES THE FOLLOWING ORDERS:

1 The terms and conditions of resource consents 101715, 101716, 101718, 101722, 101723, 101724, 101725, 101726, 101728 and 101729 granted by Waikato Regional Council to Waikato Regional Council (Asset Management Group) in respect of the Lower Waikato Waipa Control Scheme Community Gates

shall be amended by deleting all the terms and conditions of those consents and substituting the terms and conditions that are recorded in the consents attached to this Order.

2 In all other respects the appeal is disallowed.

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3 There shall be no order as to costs.

Dated the day of 2002

.....
R G Whiting
Environment Judge

Resource consent (101715)

Consent type:	Land use consent
Consent subtype:	Channel works
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Place and use a control gate and culvert on the bed of the Te Onetea Stream for water level control
Location:	Te Onetea Stream
Map Reference:	NZMS 260 S13:005-164
Consent duration:	Granted for a period expiring on the 35th anniversary of the date ofcommencem.ent

Conditions:

1. This resource consent shall commence on (Date to be determined).
2. The activity authorised by this resource consent and the operation of the Te Onetea gate shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme – Lake Waikare System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
3. The gate and box culvert shall be inspected as part of an inspection programme undertaken by the applicant, such inspections shall be no less than 3 monthly and specifically after any flood event in the Waikato River that requires the closure of the gate.
4. Inspections carried out under the provisions of condition 3 shall consider the state of the gate and culvert, abutting land erosion and debris collection. Any remedial works required shall be undertaken as soon as practicable and no less than one month from the date of the inspection.
5. Where the gate and/or culvert shows signs of instability or significant degradation a rehab'litation or repair programme shall be developed and implemented by the consent

holder within six months of the date of inspection, no instream works shall however, be undertaken during the period between October and March (peak juvenile fish migration period).

6. The consent holder shall maintain communications with Transit New Zealand, or any similar body established to maintain or upgrade State Highway 1 near this site to establish any plans for significant works to the Highway at the site of this culvert crossing.

7. Where communications in condition 6 determine that significant road works are planned for the site of the culvert the consent holder shall seek the inclusion of a culvert able to pass larger flows than the present facility and more suited to the need to provide Lake Waikare with clean flushing water from the river.

8. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128 (1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

   (i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

   (i) to review the adequacy of and the necessity for monitoring undertaken by the consent holder.

9. The consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act.

Resource consent (101716)

Consent type:	Water permit
Consent subtype:	Dam
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Dam water in Lake Waikare or the Waikato River for flood control purposes
Location:	Te Onetea Stream
Map Reference:	NZMS 260 S13:005-164
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

1. This resource consent shall commence on (date to be determined).
2. The damming of water authorised by this resource consent shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on. 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme – Lake Waikare System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
3. The consent holder shall monitor the Waikato River, at the Te Onetea Stream mouth, and Lake Waikare water levels on a daily basis. Where the water level of the Waikato River at the Te Onetea mouth is below RL 7.00 metres Moturiki Datum and is;
   (i) below the water Level of Lake Waikare, the Te Onetea Gate shall be closed,
   (ii) above the water Level of Lake Waikare, the Te Onetea Gate shall be opened.
4. Where the monitoring of the Waikato River Level at the Te Onetea Stream mouth determines that the river level is at or above RL 7.00 metres Moturiki Datum, the Te Onetea Gate shall be closed until such time as the Waikato River Level at the Te Onetea Stream mouth falls below RL 7.00 metres.

5. Such adjustment or operation of the Te Onetea gate as is required to achieve the outcomes required by conditions 3 and 4 shall be carried out within the following times:

   (i) At any time when a computerised automatic gate is not in operation due to malfunction or programmed maintenance, within 12 hours of the relevant river level information being received by the Consent Holder,

   (ii) At all other times, within 2 hours of the relevant river level information being received by the Consent Holder.

6. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128 (1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

   (i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

   (ii) to review the adequacy of and the necessity for monitoring undertaken by the consent holder.

7. The consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act.

Resource consent (101718)

Consent type:	Discharge permit
Consent subtype:	Discharge to water
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Discharge water from the Waikato River into the Te Onetea Stream
Location:	Te Onetea Stream
Map Reference:	NZMS 260 S13:005-164
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

1. This resource consent shall commence on (date to be determined).
2. The discharge of water authorised by this resource consent shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme -Lake Waikare System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
3. The discharge of water from the Waikato River into the Te Onetea Stream, as authorised by this resource consent, shall not exceed a rate of 6 cubic metres per second at any time.
4. Within 3 months of the commencement of this consent the consent holder shall begin monitoring and recording the total volume of water discharged into Lake Waikare via the Te Onetea Gate on a daily basis. These records shall be made available to the Waikato Regional Council at all reasonable times and all records shall be forwarded to the Group Manager, Resource Use Group, Waikato Regional Council in August each year,

5. Any erosion control works which become necessary as a result of the exercise of this resource consent, shall be undertaken as directed by the Waikato Regional Council at the expense of the consent holder,

6. The consent holder shall monitor and record the suspended sediment concentration of the Te Onetea Stream on a monthly basis. Sampling shall be undertaken from the Te Onetea Stream at a site equidistant from the Te Onetea Gate and Lake Waikare and shall be undertaken only when the discharge authorised by this resource is being exercised.

7. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128 (1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

   (i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

   (i) to review the adequacy of and the necessity for monitoring undertaken by the consent holder.

8. The Consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act.

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Resource consent (101722)

Consent type:	Water permit
Consent subtype:	Surface water take
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Take water from Lake Waikare for operation of a fish pass
Location:	Waikare Gate & Canal
Map Reference:	NZMS 260 S13:060-195
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

1. This resource consent shall commence on (date to be determined).
2. This resource consent shall lapse on the anniversary of 5 years after commencement, unless given effect to before this date.
3. The taking of water authorised by this resource consent shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme – Lake Waikare System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
4. The maximum abstraction rate from Lake Waikare shall not exceed 0.9 cubic metres per second at any time.
5. The taking of water authorised by this resource consent shall not be exercised at any time that the Level of Lake Waikare recorded at the Waikare Flood Control Gate is at or below the seasonal control level specified in condition 4 of resource consent number 101725.
6. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder

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under section 128(1) of the Resource Management' Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

(i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

(i) if necessary and appropriate, to require the holder of this resource consent to adopt the best practicable option to remove or reduce adverse effects on the surrounding environment due to the discharge of water from the fish pass; or

(ii) to review the adequacy of and the necessity for monitoring undertaken by the consent holder.

7. The consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with Section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under Section 360 of the Resource Management Act.

Resource consent (101723)

Consent type:	Discharge permit
Consent subtype:	Discharge to water
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Discharge water into Waikare Canal for fish pass operation
Location:	Waikare Gate & Canal
'Map Reference:	NZMS 260 S13:060-195
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

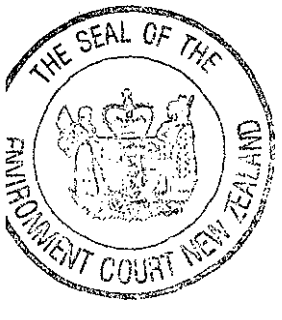
1. This resource consent shall commence on (date to be determined).
2. This resource consent shall lapse on the anniversary of 5 years after commencement, unless given effect to before this date.
3. The discharge of water authorised by this resource consent shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme – Lake Waikare System 'Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
4. The maximum discharge rate from the fish pass shall not exceed 0.9 cubic metres per second at any time.
5. Any erosion control works that become necessary as a result of the exercise of this resource consent shall be undertaken as directed by the Waikato Regional Council.
6. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128(1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

(i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

(ii) if necessary and appropriate, to require the holder of this resource consent to adopt the best practicable option to remove or reduce. adverse effects on the surrounding environment due to the discharge of -water from the fish pass; or

(iii) to review the adequacy of and the necessity for monitoring undertaken by the consent holder.

7. The consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with Section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under Section 360 of the Resource Management Act.



Waikare Radial Gate

Resource consent (101724)

Consent type:	Land use consent
Consent subtype:	Channel works
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Place and use a radial sluice gate and associated structure on the beds of Lake Waikare and Waikare Canal for lake level control purposes.
Location:	Waikare Gate & Canal
Map Reference:	NZMS 260 S13:060-195
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

1. This resource consent shall commence on (date to be determined).
2. The activity authorised by this resource consent shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme -Lake Waikare System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
3. The gate and box culvert shall be inspected as part of an inspection programme undertaken by the applicant, such inspections shall be no less than 3 monthly and specifically after any flood event in the Waikato River that requires the closure of the gate.

4. Inspections carried out under the provisions of condition 3 shall consider the state of the gate and culvert, abutting land erosion and debris collection. Any remedial works required shall be undertaken as soon as practicable and within no more than one month from the date of the inspection.

5. Where the gate and/or culvert shows signs of instability or significant degradation a rehabilitation or repair programme shall be developed and implemented by the consent holder within six months of the date of inspection, not including the period between October and March.

6. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128(1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

   (i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

   (i) to review the adequacy of and the necessity for monitoring undertaken by the consent holder.

7. The Consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act.

Resource consent (101725)

Consent type:	Water permit
Consent subtype:	Dam
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Dam water in Lake Waikare for lake level control & flood protection
Location:	Waikare Gate & Canal
Map Reference:	NZMS 260 S13:060-195
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

1. This resource consent shall commence on (date to be determined).
2. The damming of water authorised by this resource consent shall be carried out in general, accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme -Lake Waikare System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
3. The consent holder shall monitor the Waikato River, Lake Waikare and Whangamarino River water levels on a daily basis. Water levels in Lake Waikare shall be measured at the existing lake level monitoring station.
4. Except as provided for in condition 10, the seasonal ranges within which the consent holder shall manage Lake Waikare are as set out below: (All numbers are in Metres RL to Moturiki Datum).

Period	Target Water Level		
	Control Level	Min	Max
1 st April To 30th September	5.500	5.400	5.600
1st October To 31st December	5.650	5.550	5.750
1st January To 31st March	5.600	5.500	5.700

5. Subject to condition 4 and except as provided for by condition 10, the consent holder shall operate the Waikare Gate according to the following requirements:

From 1 April to 30 September where the Lake Waikare level at the Waikare Gate is:

(i) between RL 5.50 and RL 5.60 and rising, the gate shall be opened sufficiently to ensure compliance with condition 4,

(ii) between RL 5.50 and RL 5.40 and falling, the gate shall be closed.

From 1 October to 31 December where the Lake Waikare level at the Waikare Gate is:

(iii) between RL 5.65 and RL 5.75 and rising, the gate shall be opened sufficiently to, ensure compliance with condition 4,

(iv) between RL 5.65 and RL 5.55 and falling, the gate shall be closed.

From 1 January to 31 March where the Lake Waikare water level at the Waikare Gate is:

(v) between. RL 5.60 and RL 5.70 and rising, the gate shall be opened sufficiently to ensure compliance with condition 4,

(vi) between RL 5.60 and RL 5.50 and falling, the gate shall be closed.

6. Any adjustment or operation of the Waikare gate that is required by condition 5 shall be carried out within the following times:

(i) At any time when a computerised automatic gate is not in operation due to malfunction or programmed maintenance, within 12 hours of the relevant river level information being received by the Consent Holder.

(ii) At all other times, within 2 hours of the relevant river level information being received by the Consent Holder.

7. Where water level monitoring identities that significant marginal flooding around Lake Waikare or the Waikare Canal could occur then the consent holder shall ensure that landowners/occupiers, as the case may be, are advised of the risk as soon as practicable. To this end, the consent holder shall develop and maintain a contact database of the likely

affected landowners and occupiers. A log record of the contact made shall be kept where an event is expected that will result in significant marginal land flooding.

8. The maximum crest height of the Waikare gate shall be no greater than 8.31 metres RL Moturiki Datum.

9. The consent holder shall provide a spillway for the Waikare Gate of at least 70 metres wide and with a crest height of no greater than 7.37 metres RL Moturiki Datum.

10. Where the Whangamarino Gate is closed and the Waikato River is in flood or rising due to high water flows, then the Waikare Gate shall be closed and. shall remain closed until such. time as the Whangamarino gate is re-opened at which time the control levels and operational requirements specified in conditions 4 and 5 shall apply in respect of the Waikare Gate.

11. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128(1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

    (i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from 'the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

    (i) to review the adequacy of and the necessity for monitoring undertaken by the consent holder.

12. The Consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource. Management Act.

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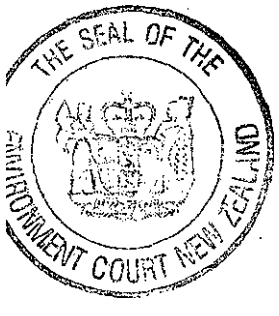
Resource consent (101726)

Consent type:	Water permit
Consent subtype:	Surface water take
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Take & divert water from Lake Waikare for lake level control
Location:	Waikare Gate
Map Reference:	NZMS 260 S13:060-195
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

1. This resource consent shall commence on (date to be determined),
2. The taking and diverting of water authorised by this resource consent shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme – Lake Waikare System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
3. The taking of water from Lake Waikare as authorised by this resource consent, shall not exceed a rate of 53 cubic metres per second at any time.
4. Within 5 years of the commencement of this resource consent the consent holder shall have either carried out or funded a combination of permanent fencing or riparian planting of no less than 20 kilometres (cumulatively) of either:
   (i) The margin of Lake Waikare and the banks of the Matahuru Stream and tributary streams (in particular stream fencing and riparian planting should be carried out between the junction of Matahuru Rd and Hoult Rd and Lake Waikare).

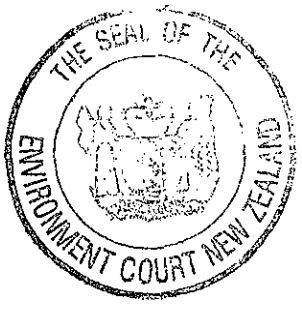


(ii) Where (i) can not be practicably achieved due to circumstances beyond the control of the Consent Holder, the margins of Lakes, Whangape, Waahi, Kopuera, Rotongaro - Rotongaroiti and Ohinewai.

To this end the consent holder shall provide an annual report in August each year to the Group Manager of the Waikato Regional Council's Resource Use Group detailing progress made towards achieving the requirements of this condition.

5. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128 (1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions.

6. The Consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the, Resource Management Act.



Whangamarino Radial Gate

Resource consent (101728)

Consent type:	Land use consent
Consent subtype:	Channel works
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Place and use a radial gate and associated structure on the Whangamarino River bed for water level control purposes
Location:	Whangamarino Gate
Map Reference:	NZMS 260 S12:932-322
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

1. This resource consent shall commence on (date to be determined).
2. The activity authorised by this resource consent shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 22/9/1998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme – Lake Waikare' System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 15/6/99 or any subsequent update of this document, unless otherwise specified in the resource consent conditions below.
3. The gate and box culvert shall be inspected as part of an inspection programme undertaken by the applicant, such inspections shall be no less than 3 monthly and specifically after any flood event in the Waikato River or the Whangamarino River that requires the closure of the gate.

4. Inspections carried out under the provisions of condition 3 shall consider the state of the gate and culvert, abutting land erosion and debris collection. Any remedial works required shall be undertaken as soon as practicable and within no more than one month from the date of the inspection.

5. Where the gate and/or culvert shows signs of instability or significant degradation a rehabilitation-or repair programme shall be developed and implemented by the consent holder within six months of the date of inspection, not including the period between October and March.

6. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128(1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

   (i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the' environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

   (ii) to review the adequacy of and the necessity for monitoring undertaken by the consent holder,

7. The Consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act.

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Resource consent (101729)

Consent type:	Water permit
Consent subtype:	Dam
Applicant:	Waikato Regional Council (Hamilton Office) PO Box 4010 HAMILTON EAST 2032
Activity authorised:	Dam the Whangamarino River for flood control purposes
Location:	Whangamarino Gate
Map Reference:	NZMS 260 S12:932-322
Consent duration:	Granted for a period expiring on the 35th anniversary of the date of commencement.

Conditions:

1. This resource consent shall commence on (date to be determined).
2. The damming of water authorised by this resource consent shall be carried out in general accordance with the document entitled "Consents Application – Lake Waikare Flood Protection Scheme", as lodged with the Waikato Regional Council on 221911998 and the document entitled "Lower Waikato/Waipa Flood Control Scheme – Lake Waikare System Structures Mitigation/Management Plan", as lodged with the Waikato Regional Council on 1516199 or any subsequent update of this document, unless otherwise speoitied in the resource consent conditions below.
3. The consent holder shall monitor the Waikato River, Lake Waikare and Whangamarino River water levels on a daily basis. Where water levels in the Waikato River are above water levels in the Whangamarino River and are rising, the Whangamarino Gate shall. be closed in accordance with the Management Plan, within 12 hours of the relevant water level information being received by the Consent Holder.
4. Where the monitoring in condition 3 identifies that the level of the Waikato River is below the level of the Whangamarino River and falling, the Whangamarino Gate shall be opened in accordance with the management plan within 12 hours of the relevant water level information being received by the Consent Holder.

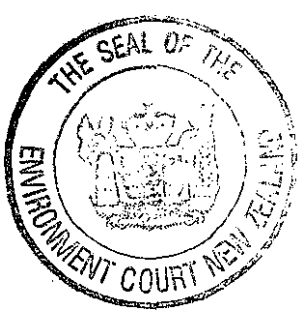
5. Where water level monitoring carried out in condition 3 identifies that significant marginal flooding around the Whangamarino Wetland could occur then the consent holder shall ensure that all potentially affected landowners and occupiers are advised of the risk as soon as practicable. To this end the consent holder shall develop and maintain a contact database of the likely affected parties. A record of the contact made shall be kept where an event is expected that will result in significant marginal land flooding.

6. The Waikato Regional Council may, in August 2003, August 2005, August 2008, August 2013, August 2018, August 2023, and August 2028, serve notice on the consent holder under section 128(1) of the Resource Management Act 1991, of its intention to review the conditions of this resource consent for the following purposes:

   (i) to review the effectiveness of the conditions of this resource consent in avoiding or mitigating any adverse effects on the environment from the exercise of this resource consent and if necessary to avoid, remedy or mitigate such effects by way of further or amended conditions; or

   (i) to review the adequacy of and the necessity for monitoring undertaken by the consent holder.

7. The Consent holder shall pay to the Waikato Regional Council any administrative charge fixed in accordance with section 36 of the Resource Management Act 1991, or any charge prescribed in accordance with regulations made under section 360 of the Resource Management Act.



BEFORE THE ENVIRONMENT COURT

RMA. 745199

IN THE MATTER	**OF THE RESOURCE MANAGEMENT ACT 1991**
AND	
IN THE MATTER	**OF AN APPEALS UNDER SECTION 120 OF THE ACT**
BETWEEN	**WAIKATO REGIONAL COUNCIL (ASSET MANAGEMENT GROUP)**
	Appellant (Applicant)
AND	**WAIKATO REGIONAL COUNCIL**
	Respondent
AND	**WAIKATO DISTRICT COUNCIL**
	Section 274 Party

CONSENT ORDER

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SWARBRICK DIXON
SOLICITORS
HAMILTON
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APPENDIX 2

DRAFT REVIEW CONDITION FOR WATER LEVEL CHANGE

5A The consent holder shall, within 18 months after the date of commencement of this consent and at intervals not exceeding 18 months thereafter, measure the Waikato River Water Level at river cross section 61/1 when the Waikato River water flow is 350 cubic metres per second at Mercer Bridge.

In the event that river flow conditions do not enable the required measurement to be taken within any such 18 month period, the Group Manager of the Resource Use Group, Waikato Regional Council may extend, in writing, that time period to the next reasonably practicable opportunity.

5B Within one month of undertaking a measurement pursuant to condition 5A, the consent holder shall provide a written report of that measurement to the Waikato Regional Council.

5c Within 6 months after receiving any report under condition 5B which indicates that, since the date of commencement of this consent, the Waikato River Water Level at river cross section 61/1 has risen by 0.3 metres or more, the Waikato Regional Council may serve notice pursuant to section 128(1) of the Resource Management Act 1991 on the consent holder of its intention to review the conditions of this consent.

The purpose of such a review is to review the effectiveness of the conditions of this consent to avoid, remedy, or mitigate flooding effects on land at Mercer West and Meremere caused by the operation of the Whangamarino Control Gate and Te Onetea Control Gate.