

Russek, Noel (1989)

The Kaikohe water right appeal

Kaikohe Water Right Appeal

N. Russek

1989

KAIKOHE WATER RIGHT APPEAL

1. Newspaper advertisement.

Without the quick action of one affected farmer this water right appeal would never have been heard.

2. Correspondence between publicly formed objection committee and the Northland Regional Council (the controlling body for the Northland Catchment Commission).

3. Procedure to formal hearing.

Copy of official applications.

Copy of Report to Northland Regional Council by A.G. Phipps Senior investigating officer N.R.C. Included in Report is a recommendation by Phipps to N.R.C.

4. Copy of official objection on behalf of Water Right objection Committee.

5. Report of Standing Tribunal and Tribunal's recommendation.

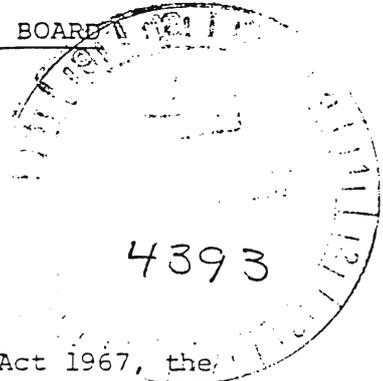
6. Decision by N.R.C. to application in respect of Natural Water. Water Rights No. 4393.

7. Appeals from Kaikohe Borough Council and Objection Committee.

8. Conclusion: Letter to Kaikohe Borough Council from Maori trustees of Rangihamama Block.

N. Russek

APPLICATION FOR RIGHT TO TAKE NATURAL WATER



To:
 The Secretary
 Northland Regional Water Board
 PO Box 886
 WHANGAREI

PURSUANT to section 21 (3) of the Water and Soil Conservation Act 1967, the undersigned:

Surname _____ Christian Names _____

or Company or Organisation Name CARRYER & ASSOCIATES LTD

Address BOX 15483, AUCKLAND 7 Occupation GEOLOGIST

hereby applies for the right to TAKE WATER as specified in the Schedule hereto:

ATTN: MR I C THOMPSON
 Address for Service of documents BOX 15483, AUCKLAND 7

Dated at NEW LYNN this 30 day of JUNE 19 87

SCHEDULE

Purpose for which water is to be taken (describe fully) MUNICIPAL SUPPLY

Full description of works to be constructed 205mm DIAMETER BORE, DRILLED TO A DEPTH OF 75 METRES, CASSED TO 43 METRES.

Source of water GROUNDWATER

Quantity of water per day to be taken: 2300 litres or cubic metres

Locality and site plan of place of taking 118 metres WEST OF RANGIHAMAMA ROAD, X3A BLOCK, KAIKOHE, C.R. P56/827411

Legal description and names of owners and occupiers of land at site of taking and place of usage RANGIHAMAMA X3A BLOCK, OWNER - BOARD OF MAORI AFFAIRS

Time from grant of right within which construction will commence IMMEDIATELY

Time for construction of works ONE WEEK

Business No (09) 872463 AUCKLAND

Phone No _____

[Handwritten Signature]
 Signature of Applicant or Authorised Agent

Fee and deposit to be enclosed with this application

Fees and Deposits	Appn fee \$30	Appn fee \$ 30	Appn fee \$ 30
New Applications	Deposit \$60	Deposit \$150	Deposit \$250
	Total \$90	Total \$180	Total \$280
Taking of water including industry and thermal	up to 100 000 l/d	up to 1 million l/d	over 1 million l/d
Taking for irrigation			
Run-of-stream	up to 5 ha	up to 15 ha	over 15 ha
Bores	..	up to 5 ha	over 5 ha
Replacement Rights:	Application fee \$30	Deposit \$60	Total \$90

**NORTH LAND
CATCHMENT
COMMISSION AND
REGIONAL WATER
BOARD**

**Applications
For Right In
Respect Of
Natural Water**

In the matter of sections 21 and 24 of the Water and Soil Conservation Act 1967 **Public Notice** is hereby given, pursuant to section 24 (3) of the Water and Soil Conservation Act 1967, that the following applications in respect of natural water have been received by the Northland Regional Water Board:

Ward G.A. & L.H.: To take up to 20 cubic metres of natural water per day from an existing dam in the catchment of Whakapai Stream for irrigation of horticultural crops on their property at Newton Road, Maungatapere Map Reference: N20/742932 (4394).

Kaikōhe Borough Council: To take up to 2300 cubic metres of natural water per day from a bore in the catchment of Tokakopura Stream for public water supply for Kaikōhe Borough Map Reference: N15/303316 (4393).

Van Noort W.C.: To take up to 15 cubic metres of natural water per day from the Waipao Stream for irrigation of horticultural crops on his property at Draffins Road, Poroti Map Reference: N19/640963 (4391).

Gibson N.S.: To discharge up to 1 cubic metre of piggery waste per day to pasture from a spray tank in the catchment of the Waikawa Stream on his property at Diggers Valley Road, Kaitaia Map Reference: N10/826616 (4390).

Rolston S. & E.: To dam an unnamed tributary of Kirikiritoki Stream and take up to 240 cubic metres of natural water per day from the impounded area for irrigation of pasture on

metres of natural water per day from the impounded area for irrigation of horticultural crops on his subdivision Map Reference: N11/388547 (4382).

Whangaroa County Council: To replace an existing right on expiry of term to discharge up to 34 cubic metres of treated domestic waste per day from an extended aeration sewage treatment plant and pebble filtration system to the Whangaroa Harbour by means of a submarine outfall at Whangaroa Map Reference: N11/247779 (2649).

Malcolm J.L.: To replace an existing right on expiry of term to take up to 16.5 cubic metres of natural water per day from the Waiere Stream, a tributary of the Waihirore Stream for irrigation of horticultural crops on his property on Waimate North Road, Ohaeawai Map Reference: N15/388449 (2533).

Metcalfe G.N.A. (White Swan Inn): To replace an existing right on expiry of term to take up to 45 cubic metres of natural water per day from Kaeo River for domestic needs in Tavern and adjoining flats on his property at Main Road, Kaeo Map Reference: N11/284714 (2463).

Clotworthy N.E. & S.M.: To replace an existing right on expiry of term to take up to 150 cubic metres of natural water per day from the Whangai Stream for irrigation of horticultural crops on their property on Wiroa Road, Kerikeri Map Reference: N11/360507 (2450).

Rowe J.C. & R.R.: To replace an existing right on expiry of term to take up to 20 cubic metres of natural water per day from the Werowero Stream for stock, domestic, and glasshouse irrigation on their property on Hupara Road, Moerewa Map Reference: N15/494419 (2317).

Hand K.J. & J.P.: To replace an existing right on expiry of term to discharge up to 2.5 cubic

The Engineer
Northland Catchment Commission
P O Box
WHANGAREI

12 August 1987

Objection Council
c/o Howard A Clark
P O Box 164
KAIKOHE

re Water Right Objection to Kaikohe Borough Council application

Dear Sir

As a result of a public meeting a sub-committee has been formed to act on behalf of some 50 concerned users of water in the Kaikohe catchment. This sub-committee wishes to lodge an objection to the Kaikohe Borough Councils application to withdraw water from bores in the catchment of the Tokakopura Stream on behalf of these users.

We list below our areas of concern and the actions we feel should be carried out in dealing with this application.

- (i) That a comprehensive resource survey be carried out within the catchment to determine what water is available for existing users, and rights, what is left that can be granted rights to. Until this survey has been completed no commercial application be considered.
- (ii) Land within the Kaikohe catchment is generally zoned or regarded as being suitable for Horticulture. This use should have first right on the natural water available to develop the land to its full potential.
- (iii) Council has been put in a pressure position as a result of the loss of water from Lake Omapere and the short term right of extraction from the Kopanui Stream. It is the feeling of the group that considerable surface water runs to waste in the Punakitere and other streams. This is the form of water an urban area should be obtaining their supply from. Accordingly all bores for local authority use should be declined and cancelled due to the limited supply available from the source.

Council should be given time to explore all sources of free flow water as a long term arrangement that will be to the betterment of the whole region rather than a short term stop gap at the easiest option which is what is currently happening. Since considerable water usage from the borough supply is within the county it would appear that the responsibility is jointly both authorities concern.

- (iv) The granting of a water right of the size applied for or anywhere within that scale must over a period of time materially lower the subteranean water level to the detriment of existing users.
- (v) Presently due to weather conditions significant numbers of springs and bores within the Kaikohe Catchment have dried up or are at consierably reduced water flows. The report to council on the bores to which this application pertains is conclusive that significant water flows from the upper to the lower acquifer.

With the above two factors it must alternatively be to the detriment of other users and those with existing rights to allow the extraction of a major quantity of water from thew lower acquifer.

The resource which appeared to be consierable to those involved in this objection is now seen to be anything but as a result of dry weather and additional extraction over the last few years and no guarantee exists to protect their present source of supply. In the event of their rights being interferred with it is their responsibility rather than other users to retain their right at cost.

- (vi) The applicant has previously had an application to the commission in July 1973 for bore water turned down on the grounds that the rate of extraction will detrimentally effect the quifer and springs in the area. If this was the conclusion at that time then due to events that have occured in the intervening period a similar or more detrieved situation must now exist to the detriment of existing users.

As required in the add for Councils right we state hear that the group over which this objection is made wish to be heard at such time as a hearing takes place.

Please find enclosed deposit cheque for thirty dollars (\$30.00) as required.

Yours faithfully

Howard A Clark
SECRETARY

Northland Catchment Commission and Regional Water Board

P.O. BOX 886

TELEPHONE 484 639 (4 Lines)

2 KAKA STREET,
WHANGAREI, N.Z.

All Communications to :
The Secretary

14 August 1987

Objection Council
C/- H A Clark
PO Box 164
KAIKOHE

Dear Sir

WATER RIGHT APPLICATION NO 4393
KAIKOHE BOROUGH COUNCIL

I acknowledge receipt of your formal objection to the above application and payment of \$30.00 deposit. I note you wish to be heard in this matter.

A copy of the objection will now be sent to the applicants who then have 14 days to advise us whether they wish to have the objection referred to a Special Tribunal. If they do not, the matter will be dealt with by a Board ... Tribunal. Please refer to the enclosed explanatory note on both types of Tribunals.

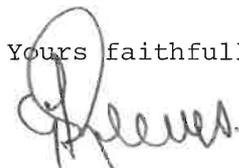
... Also enclosed for your information is the appropriate extract from the Water and Soil Conservation Act 1967 dealing with the water right procedure. Your attention is drawn specifically to Section 2 which deals with costs.

You will note that the Regional Water Board may allocate these costs among the various parties or leave them where they fall. It is current policy to allocate the costs.

It is not possible at this stage to accurately estimate the costs of a hearing but the minimum costs of say an average three hour hearing would be approximately \$1000. These costs are additional to the Commission's normal costs of investigating an application which must be done irrespective of whether or not an objection is received. These costs vary greatly according to the type of application being dealt with and are highest where the application is to take water from an underground source where flow rate testing is necessary or where wastes are to be discharged to sensitive receiving waters.

If an applicant or an objector requires a more likely estimated cost of the whole application, including a hearing, they should forward a request to me.

Yours faithfully



GF Reeves
SECRETARY

Encls

TRIBUNALS APPOINTED BY THE NORTHLAND CATCHMENT COMMISSION

STANDING TRIBUNAL

The Water and Soil Conservation Act 1967 provides for the Regional Water Board to appoint Tribunals to hear objections to applications for water rights.

The Standing Tribunal consists of four Commission members appointed by the Commission to serve for periods of six months. The Standing Tribunal meets monthly and deals with all uncontested water right applications and contested applications where the applicant has not requested the appointment of a Special Tribunal.

The Standing Tribunal also deals with variations to existing water rights and transfers of rights.

SPECIAL TRIBUNAL

Where there are objections to an application the applicant may demand a Special Tribunal of not more than five members, in which case both applicant and objectors are given the opportunity to nominate members, or the Board may itself decide to appoint a specialist to the Tribunal. The Board is not obliged to make any appointment as nominated but will naturally consider nominations.

24. Applications in respect of natural water, and objections thereto—(1) Any Council, the Regional Water Board of the same or any other region, any public authority, or any officer or employee at the direction (whether general or special) of any of them, or any person whatsoever, may apply in writing in the prescribed form to the Regional Water Board for the region in which the natural water or soil affected by the application exists for any right under subsection (3) of section 21 of this Act.

(2) The reasonable expenses and costs of the Board and of the applicant and other parties to the application, shall be borne as the Board may direct or left where they fall:

Provided that the Board may, if it thinks fit, require payment of a deposit against expenses and costs before dealing with any application, and may reserve its decision in respect of final allocation of expenses and costs for separate consideration and decision when ascertained.

(3) Subject to the provisions of this Act and of any regulations made thereunder, the Board shall publicly notify the receipt and nature of every application made to it under this section or under section 21 of this Act, including the natural water resource affected or proposed to be affected, and state in the notice the time and last day when and the place where written objections or submissions concerning the matter, supported in appropriate cases by statutory declaration, will be received.

(4) Any Council, Board, public authority, or person may, at any time within 28 days after the date of the public notification of any such application, lodge with the Board an objection to the application on the ground that the grant of the application would prejudice its or his interests or the interests of the public generally.

(5) Every application and every objection thereto made under this section or under section 21 of this Act, and every other matter brought before the Board or any Tribunal under this section or under section 21 of this Act, shall be in writing setting out the grounds upon which the applicant or objector relies, and, unless dispensed with by the Board, shall be supported by a statutory declaration verifying the contents thereof.

(6) Every applicant and every objector to an application shall have the right to be heard in person or by counsel in respect of the application if his application or objection claims that right and his application or objection complies in every other respect with the requirements of this Act and of any regulations made thereunder; and, whether the application or objection so claims or not, the Board or Tribunal to which [any matter is referred under this section for report and recommendation] shall have the right to require the attendance of the applicant and of any objector or other person whose evidence might assist the Board or Tribunal; but, unless the applicant or objector asks in the application or objection to be heard, or the Board or Tribunal requires the attendance of any person, [the Board may determine the matter, or the Tribunal may make a report and recommendation to the Board on the matter] after taking into account any statements in or filed in connection with the application or objection and the local and technical knowledge of its members.

[(7) The Board may at any time constitute, reconstitute, or abolish a standing Tribunal to which matters of pre-determined natures or of minor importance may be referred by the Chairman of the Board without awaiting preliminary consideration by the Board, or the Board may constitute a special Tribunal to which a specific matter or 2 or more specific matters may be so referred.

(8) A Tribunal constituted under this section may consist of not more than 5 members, whether members of the Board or not, chosen by the Board for their knowledge and experience in matters of the nature under examination, of which members one shall be appointed by the Board as Chairman of the Tribunal. The appointment of any person to a standing or special Tribunal shall be no bar to his appointment to any other such Tribunal, and the appointment of any person to a Tribunal by one Board shall be no bar to his appointment to any Tribunal by any other Board or Boards.

(8A) On receiving an objection to an application the Board shall forthwith serve a copy thereof on the applicant who may, within 14 days after receiving it or within such longer period as the Board may allow, serve on the Board a written notice stating that he desires the application and objection to be referred to a special Tribunal.

(8B) On receiving any notice under subsection (8A) of this section, the Board shall, after giving the applicant and the objector 14 days to make representations as to the proposed membership, constitute a special Tribunal under subsection 7 of this section and shall refer the application and the objection to that Tribunal.]

(9) Except as provided in this Act or by regulations made under this Act, the Board may regulate its own procedure and the procedure of its Tribunals in such a manner as it thinks fit, and, subject thereto, every Tribunal may regulate its own procedure as it thinks fit.

(10) The Board, after considering the matter, and the recommendations of the Tribunal where the matter has been referred to a Tribunal, shall issue its decision, and shall cause its decision to be publicly notified and notified to the applicant by notice in writing addressed to him at the address shown in his application. In any case where an application is rejected, the substance of the reason for rejection shall be stated in the written notice to the applicant. The Board shall forthwith notify every objector of its decision by notice in writing addressed to him at the address shown in his objection, and, where the objection is disallowed, the substance of the reason for the disallowance shall be stated in the written notice to the objector.



Postal: PRIVATE BAG Location: 2 KAKA ST. WHANGAREI, N.Z. Telephone: 484 639

Fax: (089) 480 012

All Communications to:
Manager, Corporate Services

FILE: 4393
DLR: JZ

29 August 1988

Mr H A Clark
P O Box 164
KAIKOHE

Dear Sir

KAIKOHE BOROUGH COUNCIL - WATER RIGHT APPLICATION

I acknowledge receipt of your letter of 19 September 1988, expressing concerns about the level of presently available water resource information. Your concerns about the potential needs of all farm users in the region with possible land use changes and fears of the objectors about the potential loss of their existing water supplies if the proposals of the Borough were to proceed as applied for, are recognised.

I agree that the ideal approach to the present uncertainty about priorities of users and the most efficient management of the water resource in the region would be via a comprehensive water management plan. However the consideration of the present applications will not preclude such an approach. I believe that in the meantime the Borough's wish to proceed with its applications would lead to certainty for all parties to these applications. I also consider that there is now enough information available for the applications to proceed. I trust the concerns outlined in your letter will be substantially modified, if not completely met, by the technical information about to be made available to you in the folder containing the evidence of staff of this Council, the applicant, and your consultants. It may well be that the area of debate will then be more precisely known and capable of more easy resolution.

I trust that this will be the case and will be recommending the hearing proceeds unless the applicant requests an adjournment.

Yours faithfully

D L Roke
ASSISTANT MANAGER
ENVIRONMENTAL SERVICES

7

The Secretary
Northland Regional Council
Private Bag
WHANGAREI

19 August 1988

Water Right Objection Committee
c/o Howard A Clark
P O Box 164
KAIKOHE

re Application Rangihamama Ground Water - Kaikohe Borough Council

Dear Sir

After meeting on Friday the 12th of August our committee considered we should write to you in respect of the hearing set down for 19th September 1988.

The objection Committee is representative of a large area covering from Kohewhata, Mangakahia road, Tautoro, Te Iringa, Taheke Road, and covering householders, horticulturalists, and land owners embracing pretty well that whole region encircling Kaikohe and bound by the Punakitere River system.

In order to protect our interests through no fault of our own we now find that we are put in the position of outlaying considerable funds to be properly represented at this hearing at a time when members of the group are in no financial position to do this.

With the publication of a draft Water Management plan for the Wairoro Catchment by the Northland Regional Council, showing recommendations for council to have access to this in the long term as well as the temporary right previously granted surely this source covers any short term need until a full resource survey is completed.

Our objection to the Squires Spring and bore on Monument hill were made with the express view of getting the N.R.C. to complete this survey to tidy up the question of water rights in the whole region. Also it has come to our attention that a new bore has been sunk on Monument hill when in 1973 an objection was ruled on appeal that no more bores should be sunk on the hill by council.

In our objections to both applications by the Kaikohe Borough Council to take water from bores, we have stated that a full water resource survey of the whole area that this will impact on, should be carried out before any application is processed. Since this application is for a large volume of water the impact on outfalls and other users within the aquifer has to be significant. This impact must make it paramount for a full resource study to be carried out by the Kaikohe Borough Council on the Northland Regional Council.

It is our understanding that limited work has been done to this point in time to ascertain the water resource capacity and the impact that the last 2 1/2 years of dry weather has had on outfalls, other user bores and springs throughout the area. Since the Northland Regional Council is the Authority with statutory obligations to allocate water and ensure adequate is left for other users, then your responsibility in this case cannot be denied that a full impact consideration has to be a prerequisite. With the need for time to carry this out we feel that the hearing date is premature and that this should be postponed to a time when the answers we want, and should be supplied, are available. Without a full resource survey being carried out a proper decision cannot be made that will cover all users now and in the future rights.

We already have a case in our area where a right has been granted in respect of a stream and now the lower users out of that stream in the summer have no water for their general use because the right granted is not being fulfilled.

A result like this in this case where considerable land immediately within the aquifer over time must change its use due to economic considerations, cannot be contemplated. Such change of use has to be to a form of land use that will require water use considerably greater than that presently utilised so there is no room for error in the allocation of water at any time.

It is our hope that you see the logic of our request and will carry out the necessary measures to take the rush out of the current application and ensure all users in the long term that their rights are safer, and when they want to use water, it will be there. Our group is sympathetic with councils needs but feel this application is selfish in that the easy option with minimal operating costs to the detriment of the surrounding rural area is all they can see. We all have the right to water so tell us what is there and show to both urban and rural parties that in the long term their needs can be fulfilled or otherwise. Council quite obviously considers access to water which does not need chlorinating to be their only objective irrespective of the social ramifications of the whole region.

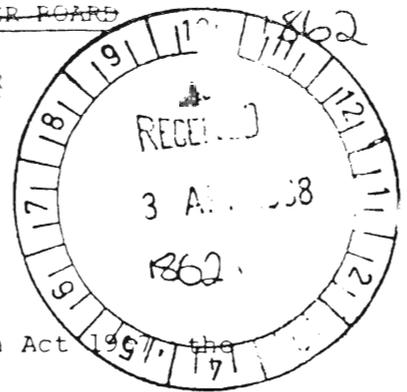
Yours faithfully

Howard A Clark
SECRETARY

APPLICATION FOR RIGHT TO TAKE NATURAL WATER

To:
The Secretary
Northland Regional Water Board
PO Box 886
WHANGAREI

**NORTHLAND REGIONAL
COUNCIL**
PRIVATE BAG
WHANGAREI



PURSUANT to section 21 (3) of the Water and Soil Conservation Act 1967, the undersigned:

Surname _____ Christian Names _____

or Company or Organisation Name KAIKOHE BOROUGH COUNCIL

Address P.O. BOX 246, KAIKOHE Occupation _____

hereby applies for the right to Abstract Natural Water as specified in the Schedule hereto:

Address for Service of documents The Town Clerk, Kaikohe Borough Council
P O Box 246, KAIKOHE

Dated at KAIKOHE this seventh day of April 1988

SCHEDULE

Purpose for which water is to be taken (describe fully) _____

PUBLIC WATER SUPPLY SERVING BOROUGH OF KAIKOHE AND ENVIRONS

Full description of works to be constructed _____

NOT APPLICABLE (RENEWAL OF W.R. 1362)

Source of water 1. Underground aquifer 2. Spring feeding Otangaroa Stream

Quantity of water per ^{month} ~~day~~ to be taken: 33,000 ~~litres or~~ cubic metres

Locality and site plan of place of taking _____

1. Kaikohe Hill Map Ref. N15 294340 2. Squires Springs Map Ref. N15 298336

Legal description and names of owners and occupiers of land at site of taking and place of usage 1. Lot 1 DP 30163 Owner: Dept of Conservation

2. Tuhuna No 8A BLK. Owner: The Maori Owners, P O Box 22, KAIKOHE

Time from grant of right within which construction will commence _____

N.A.

Time for construction of works N.A.

Business No 80-035

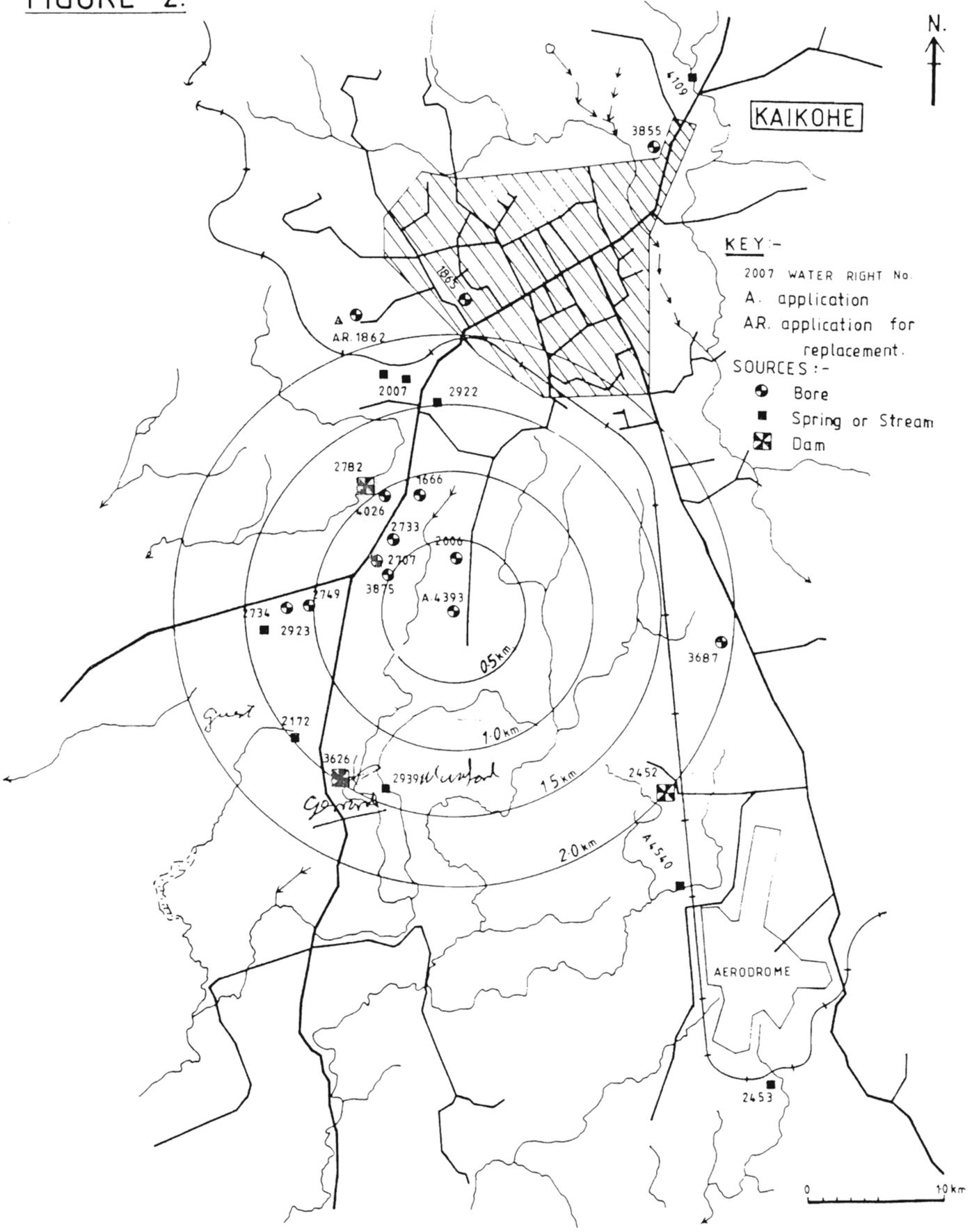
Phone No 80-035

[Signature]
Signature of Applicant or Authorised Agent
Y L Sharp, Town Clerk, Kaikohe Borough Council

Fee and deposit to be enclosed with this application

Fees and Deposits New Applications	Appn fee \$30 Deposit \$60 Total \$90	Appn fee \$ 30 Deposit \$150 Total \$180	Appn fee \$ 30 Deposit \$250 Total \$280
Taking of water including industry and thermal	up to 100 000 l/d	up to 1 million l/d	over 1 million l/d
Taking for irrigation Run-of-stream Bores	up to 5 ha	up to 15 ha up to 5 ha	over 15 ha over 5 ha
Replacement Rights:	Application fee \$30	Deposit \$60	Total \$90

FIGURE 2.



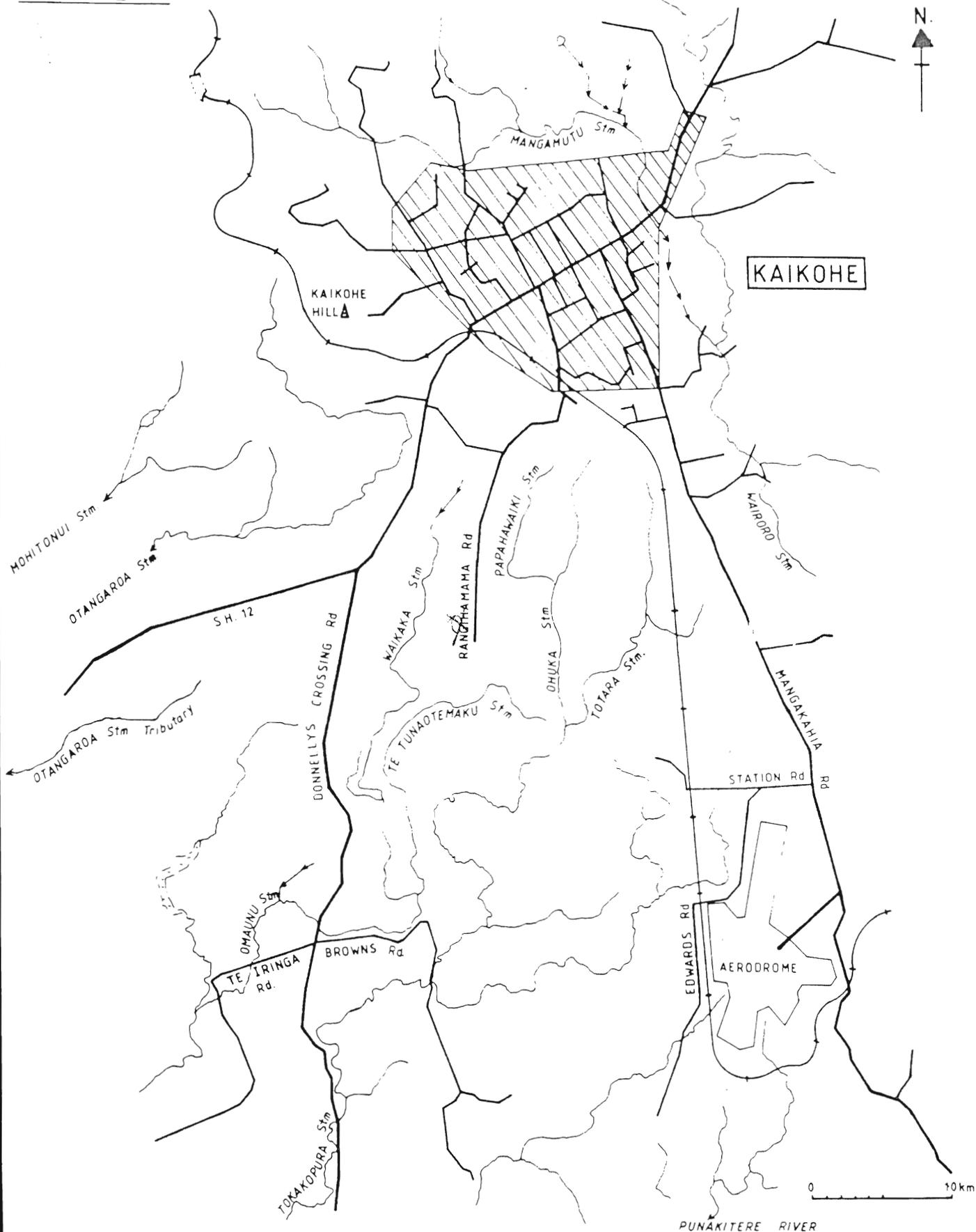
NORTHLAND
REGIONAL
COUNCIL

Location of Water Rights and
Applications to 'Take' Water

Approved
In Role
Drawn
d.p.b.

Plan No.
2431

FIGURE 1.



NORTHLAND
REGIONAL
COUNCIL

KAIKOHE
and Area South.

Approved
D. Robb
Drawn
d.p.b.

Plan No.
2449

NORTHLAND REGIONAL COUNCIL

Application for Right in Respect of Natural Water

IN THE MATTER OF sections 21 and 24 of the Water and Soil Conservation Act 1967 PUBLIC NOTICE is hereby given, pursuant to section 24(3) of the Water and Soil Conservation Act 1967, that the following application in respect of natural water has been received by the Northland Regional Council :

KAIKOHE BOROUGH COUNCIL: To replace an existing right on expiry of term to take up to 33,000 cubic metres of natural water per month from a bore and Squires Spring in the catchment of Otangaroa Stream for public water supply to Kaikohe Borough. Map Reference: N15/294340 (bore), N15/298336 (Squires Spring) (1862)

Written objections detailing the grounds on which the objector relies and accompanied by a deposit against costs of \$30.00 will be received up until 4.00 pm on Thursday, the Sixteenth day of June 1988 at the office of the Council, Kaka Street, Whangarei.

It should be noted that under the terms of the abovementioned Act objectors who require to be heard in person or by Counsel, must claim this right in their written objection. If objectors do not wish to commit themselves in this way, written submissions may be lodged without charge by the above date. Formal objections carry a right of appeal; submissions do not.

The reasonable expenses and costs of the Council, the applicant and objectors, shall be borne as the Council may direct.

Enquiries for further details on the above applications may be made to the Council's office, 2 Kaka Street, Whangarei, Private Bag, Whangarei or Phone 484 639.

The Council in granting water rights, is bound to protect the reasonable interests in water of others, by the imposition of conditions on any water right, or declining the application.

Whangarei 19 May 1988

GF Reeves
SECRETARY

- Northern Advocate
- Northern News
- Northland Age
- Northland Times
- Rodney & Waitemata Times

NORTHLAND CATCHMENT COMMISSION
AND REGIONAL WATER BOARD

Application for Right in Respect of Natural Water

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KAIKOHE BOROUGH COUNCIL: To take up to 2300 cubic metres of natural water per day from a bore in the catchment of Tokakopura Stream for public water supply for Kaikohe Borough Map Reference : N15/303316 (4393)

Written objections detailing the grounds on which the objector relies and accompanied by a deposit against costs of \$30.00 will be received up until 4.00 pm on Thursday, the Thirteenth day of August 1987 at the office of the Board, 2 Kaka Street, Whangarei.

It should be noted that under the terms of the abovementioned Act objectors who require to be heard in person or by Counsel, must claim this right in their written objection. If objectors do not wish to commit themselves in this way, written submissions may be lodged without charge by the above date. Formal objections carry a right of appeal; submissions do not.

The reasonable expenses and costs of the Board, the applicant and objectors, shall be borne as the Board may direct.

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The Board, in granting water rights, is bound to protect the reasonable interests in water of others, by the imposition of conditions on any water right, or declining the application.

Whangarei 16 July 1987

GF Reeves
SECRETARY

- ~ Northern Advocate
- ~ Northern News
- Northland Age
- Northland Times
- Rodney & Waitemata Times

NORTHLAND CATCHMENT COMMISSION AND REGIONAL WATER BOARD

APPLICATION FOR RIGHT TO TAKE NATURAL WATER

To:
The Secretary
Northland Regional Water Board
PO Box 886
WHANGAREI

4393

PURSUANT to section 21 (3) of the Water and Soil Conservation Act 1967, the undersigned:

Surname _____ Christian Names _____

or Company or Organisation Name CARRYER & ASSOCIATES LTD

Address BOX 15483, AUCKLAND 7 Occupation GEOLOGIST

hereby applies for the right to TAKE WATER as specified in the Schedule hereto:

Address for Service of documents ATTN: MR I C THOMPSON
BOX 15483, AUCKLAND 7

Dated at NEW LYNN this 30 day of JUNE 19 87

SCHEDULE

Purpose for which water is to be taken (describe fully) MUNICIPAL SUPPLY

Full description of works to be constructed 205mm DIAMETER BORE, DRILLED TO A DEPTH OF 75 METRES, CASSED TO 43 METRES.

Source of water GROUNDWATER

Quantity of water per day to be taken: 2300 ~~litres or~~ cubic metres

Locality and site plan of place of taking 118 metres WEST OF RANGIHAMAMA ROAD. X3A BLOCK, KAIKOHE, G.R. P56/827411

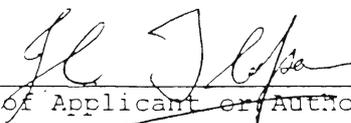
Legal description and names of owners and occupiers of land at site of taking and place of usage RANGIHAMAMA X3A BLOCK, OWNER - BOARD OF MAORI AFFAIRS

Time from grant of right within which construction will commence IMMEDIATELY

Time for construction of works ONE WEEK

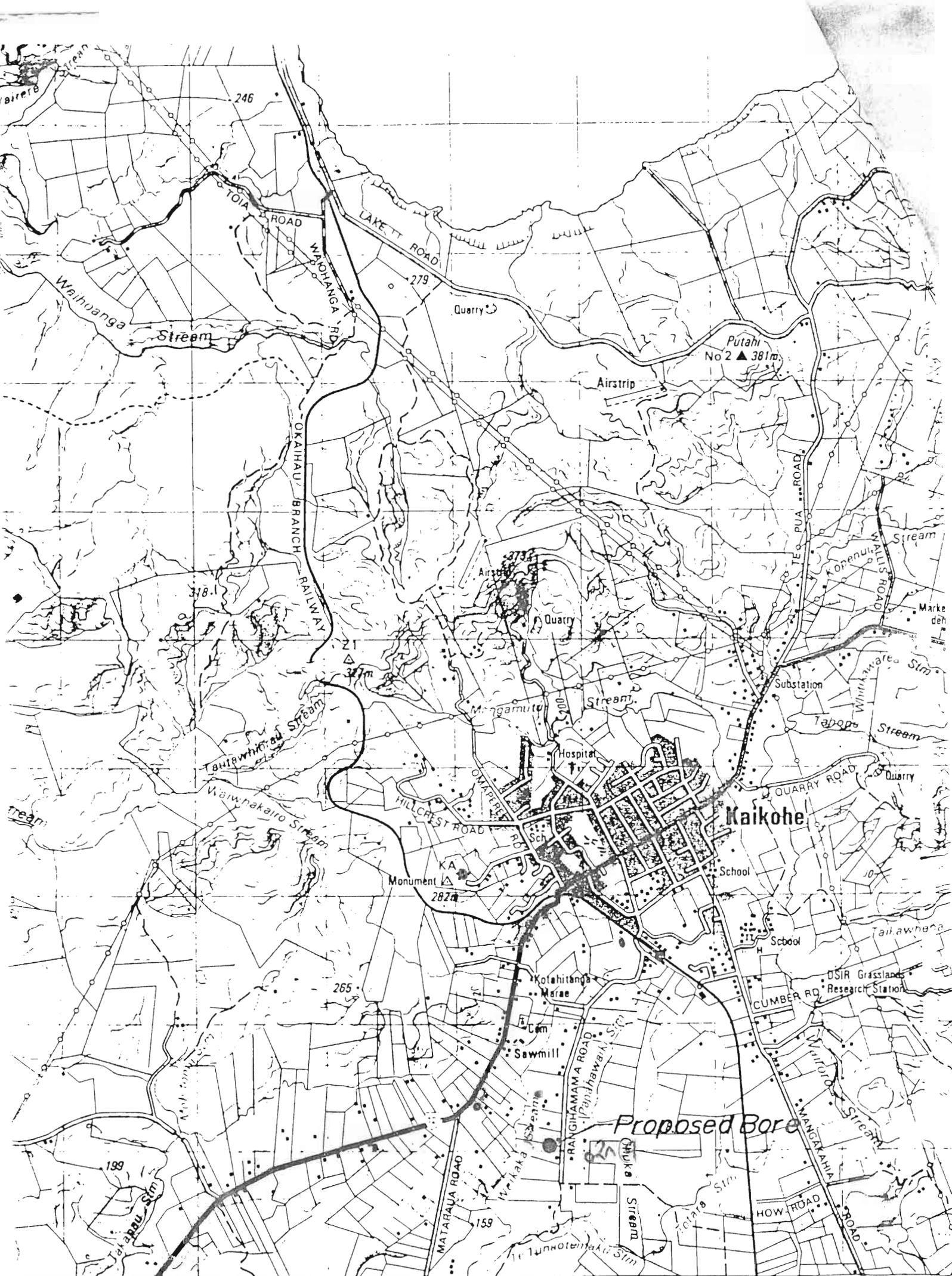
Business No (09) 872463 AUCKLAND

Phone No _____


Signature of Applicant or Authorised Agent

Fee and deposit to be enclosed with this application

Fees and Deposits	Appn fee \$30	Appn fee \$ 30	Appn fee \$ 30
New Applications	Deposit \$60	Deposit \$150	Deposit \$250
	Total \$90	Total \$180	Total \$280
Taking of water including industry and thermal	up to 100 000 l/d	up to 1 million l/d	over 1 million l/d
Taking for irrigation			
Run-of-stream	up to 5 ha	up to 15 ha	over 15 ha
Bores		up to 5 ha	over 5 ha
Replacement Rights:	Application fee \$30	Deposit \$60	Total \$90



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WATER RIGHT APPLICATIONS 1862 AND 4393

APPLICANT KAIKOHE BOROUGH COUNCIL

POSTAL ADDRESS PO Box 246, Kaikohe

APPLICATION AS ADVERTISED

WATER RESOURCES REPORT - AG PHIPPS, SENIOR INVESTIGATIONS OFFICER,
NORTHLAND REGIONAL COUNCIL

1.0 INTRODUCTION

1.1 Application 1862 - For Replacement of Expired Right

This application is for the replacement of recently expired Water Right 1862, to take up to 15 litres per second, 33000 cubic metres per week and 288000 cubic metres per year from the combined sources of Squires Springs and bores on Kaikohe Hill.

Kaikohe Borough Council (KBC) has been taking water for public water supply from 'Squires Spring' at the base of Kaikohe (Monument) Hill (see Fig. 1 & 2) for some forty years. Since 1960 several bores have been drilled near the summit of the hill, to a depth of approximately 85 m, and these were also pumped for public water supply for Kaikohe.

In 1973 the Kaikohe Borough Council applied for water rights to take up to 2273 cubic metres per day from the bores on Kaikohe Hill. There were two objections to the application on the grounds that the objectors use of the water resource would be detrimentally affected. One objector claimed that spring flow issuing from the hill had declined significantly since the bores had been in use. Subsequent to the holding of a hearing a water right was granted for the taking of a reduced quantity of up to 910 cubic metres per day and up to a maximum of 4600 cubic metres per week on the grounds that quantities in excess of those granted were beyond the sustainable yield of the aquifer. The water right was subsequently modified to allow quantities in excess of those granted to be pumped in late summer provided that lesser quantities were pumped during spring and early summer but that an annual total of 240 000 cubic metres was not exceeded.

On expiry of that right in 1975 a new right was applied for again for 2273 cubic metres per day. However the right was again granted for a reduced quantity, less than the previous allocation, of up to 580 cubic metres per day, 4046 cubic metres per week and 210 000 cubic metres annually. The grounds for the reduced allocation were again that quantities in excess of those granted were considered, based on the information available at that time, to be in excess of the sustainable yield of the aquifer.

When that right in turn expired in 1978 the KBC application for a replacement right included Squires Spring as a site of taking and was for a quantity of up to 680 cubic metres per day. There was only one objection to this application. However a number of local people expressed concern to Northland Catchment Commission staff about declining spring flows in the area. The Northland Catchment Commission staff report

regarding the application noted that water levels in the KBC bores had declined markedly over the period 1973-78 and concern about the declining water levels had led to reduced draw offs, to approximately 168 000 cubic metres per year. The KBC had by this stage gained access and a water right to use Lake Omapere as a major water source and were therefore not so reliant on the Kaikohe Hill sources.

FC - yet still reduced flows.
The replacement right (WR 1862) was granted to take up to 15 litres per second, 33 000 cubic metres per month and 288 000 cubic metres per year from the combined sources of the Kaikohe Hill bore(s) and Squires Spring.

It has always been a condition of these rights that the KBC, if required by the Water Board, "produce evidence that stock and domestic needs of users on, and taking water from springs issuing from Kaikohe Hill are met in so far as the springs and streams are affected by abstraction of the KBC".

The replacement of WR 1862, which expires in August 1988, is the subject of this application (1862).

Since the occurrence of the massive algal bloom in Lake Omapere in late 1985 the KBC has been prevented from using the lake for public water supply, which at that stage provided approximately 45% of the KBC requirements. This has meant a greater reliance on the use of the Kaikohe Hill water sources and led the applicant to seek alternative long term water supply sources.

1.2 Application 4393

As a result of the above mentioned loss of the Lake Omapere water source and the growing water demand of the Borough the KBC had its consultants carry out a preliminary investigation and estimate costs of alternatives water sources. The consultants report (Fraser Thomas Partners, 1986) considered springs, streams, rivers, groundwater and potential dam sites. The consultants concluded that the use of the groundwater resource in the vicinity of the Borough would be the least costly provided that the existence of a suitably sized sustainable resource could be proven. Consequently they recommended that the KBC further investigate the groundwater resources.

In late 1986 an electrical resistivity survey was carried out to examine the extent and thickness of the basalt formations, potential aquifers, surrounding Kaikohe and to identify sites for test bores. As a result of the survey (Roberts, 1987) two target areas were identified for investigation drilling and drilling at those sites was carried out in December 1986. The results of the drilling and resistivity (Roberts, 1987 and Carryer and Assoc 1987) indicated that the site with best potential for a production bore was towards the southern end of Rangihamama Road. A three day pumping test was carried out on the test bore in that area.

The KBC applied (No 4393) in July 1987 to take up to 2300 cubic metres per day from a bore at a site on the western side of Rangihamama Road (See Fig. 2).

2.0 SUMMARY OF OBJECTIONS AND SUBMISSIONS

2.1 To Application 1862 Squires Springs and Kaikohe Hill bores

One objection and a submission were lodged against this application.

The objection was lodged by Mr HA Clark on behalf of a 'Water Right Objection Committee' comprising farmers and other residents of the area mainly to the south and immediately west of Kaikohe Borough. The Committee's objection is on the grounds that :-

- i) it considers that the capacity of the water resource is not known and that no allocations should be made until the capacity is known and;
- ii) increased usage of groundwater has caused water shortages for those relying on the small streams flowing from the basalt plateau for farm supplies;
- iii) the groundwater and spring flow in the area should be reserved for irrigation of potential horticultural development and the Borough water supply should come from some other source.

A submission was received from MG Slyfield (since deceased) which opposes the taking from bores considering that such abstractions would reduce water availability to farms in the area.

2.2 Application 4393 - Groundwater - Rangihauama

Eight objections and two submissions were lodged against this application. One of the objections was lodged on behalf of 62 signatories. The following is a summary only of the grounds of the objections. Copies of the objections are enclosed.

Objector	Grounds
(1) Nelson IR	- possible adverse effect on farm water supply spring which is only 120 metres from proposed bore site. - may restrict water availability for potential horticultural development on property.
(2) Johnson Plants Ltd	- may limit water availability for own proposed and existing horticultural developments. - quantity applied for is large and may exceed resource limits during dry periods.
(3) Clarke RL (Kairangi Orchards)	- there is insufficient information on size of resource. - possible adverse effect on own orchard water supply. - quantity applied for may exceed resource limits.

Objector	Grounds
(4) Byers PW & EN	- possible adverse effect on own orchid house supply.
(5) O'Connor MJ & CM	- possible adverse effect on own farm supply from springs. - there is insufficient information on size of resource. - applicant should use other sources.
(6) Ineson HM & KJ	- possible adverse effect on own farm water supply from groundwater. - applicant has alternative sources.
(7) Clark HA & approx 62 others	- there is insufficient information on size and limitations of resource. - existing and potential horticultural development should have priority use of the groundwater and spring flows of the area. - applicant should use other sources. - quantity applied for likely to be in excess of resource limits.
(8) Dept of Maori Affairs	- possible adverse effect on own farm and irrigation supply springs and bores. - insufficient information on size and limitations of resource.
(9) Levondale Farms Ltd (RC Guest)	- possible adverse effect on own farm and irrigation supply springs and bores. - insufficient information on size and limitations of resource.
(10) Reilly SK (submission)	- allocation of the water to the applicant will prevent future horticultural development in area.

3.0 APPLICANTS WATER REQUIREMENTS

The following discussion is included with the objective of comparing the applicants water requirements with its existing water allocations and the applications under consideration.

3.1 Kaikohe Borough Water Use

Reports to the KBC from their engineering consultants Fraser Thomas & Partners in 1986 & 1987 indicated, based on past Borough water use records, that the peak water demand of the Borough would be as follows :

1988	peak week	14700 cubic metres
	average day of peak week	2100 " "
	maximum daily	2450 " "

1998	peak week	16100 cubic metres
	average day of peak week	2300 " "
	maximum daily	2700 " "
2011	peak week	19000 cubic metres
	average day of peak week	2700 " "
	maximum daily	3300 " "

The applicants have based the quantity applied for in application 4393 on their predicted water demand figures for the year 2011. The derivation of the above demand figures is given in the Applicants evidence (Fraser Thomas Partners).

KBC water use records supplied to the Regional Council for the year July 1987 to July 1988 show :

Total water use for year	543400 cubic metres
daily average for year	1490 " "

Based on a population of 4000 for the Borough the figures above indicate the following per capita consumption :

1988	average day	372 litres per capita
	average day of peak week	525 " " "
	maximum daily	613 " " "

3.2 Kaikohe Borough Water Supply Sources

The sources of public water supply currently available to the KBC under existing water rights and those for which they have made application are listed in Table 1. The quantities of water available under those rights are set out and the total water available to the KBC given various conditions and combinations of sources are also given.

3.2.1 Wairoro Stream (WR4109)

Under the Regional Councils Wairoro Stream Catchment Water Management Plan and Water Right 4109 the KBC can take up to 1300 cubic metres per day from the upper Wairoro Stream (Kopenui Stream) until August 1992. After that time allocations in that catchment will be reviewed in light of the stage of horticultural developments in the catchment. Even if the horticultural enterprises in the catchment require their full irrigation allocation the KBC will still be able to take the full 1300 cubic metres per day for a substantial proportion of most years and up to 260 cubic metres per day in any case. If horticultural development has not proceeded to any significant extent the KBC could have the allocation of the 1300 cubic metres per day extended provided no other significant demand of more beneficial use arose in the meantime.

3.2.2 Squires Spring (application 1862)

Squires Spring flows from the south western slope of Kaikohe Hill. The KBC intake structure captures most of the flow from the spring.

*Additional flows in report
withdraw water lower level
12 into D.S.P.*

The amount of water taken by the KBC is dependent on the spring flow. From the KBC records provided the average take appears to be in the order of 280 cubic metres per day with the maximum daily take being in the order of 520 cubic metres per day. During prolonged dry spells such as experienced in 1982/83 and 1986/87 that quantity taken drops to be in the order of 150 cubic metres per day.

The KBC abstraction figures for 1988 show that the spring flow has recovered from the severe 1986/87 dry period and in June 1988 the KBC was again able to take 400-450 cubic metres per day.

3.2.3 Kaikohe Hill Bores (application 1862)

The applicants Kaikohe Hill bores are situated at the highest point of the aquifer system both in terms of topography and head. Five bores have been drilled on the hill for the Kaikohe Borough Council since the first in 1960. However only one bore is now used for abstraction at any one time. The bores which are used for abstraction are approximately 86 m deep from ground levels at 263.0 m above mean sea level (Bore No 2) and 266.5 m above mean sea level (Bore No 5).

KBC water use records show that the quantity taken from the Kaikohe Hill bores has varied significantly throughout time. The average daily use since 1976 has been in the order of 400-450 cubic metres per day.

The currently used bore and pump set-up is capable of pumping in the order of 600 cubic metres per day under normal conditions.

3.2.4 Taraire Hills Dam (EU and application 4046)

This is a small dam in a small catchment immediately to the north east of the Borough. The dam is only capable of supplying approximately 300 cubic metres per day during a prolonged dry period and an average of approximately 460 cubic metres per day, according to the KBC consultants.

3.2.5 Bore(s) in the Rangihamama Area (application 4393)

The applicants consultants consider that the quantity applied for (2300 cubic metres per day) can be supplied from bores in the vicinity of 'Test Bore No 2' in the Rangihamama Road area. (The possible effects of such an abstraction are discussed below in Section 5).

Table 1 Actual and Potential Allocations (m³/day)

Source	Water Right No	Current +A1862	Current +A1862 in Dry Summer	Potential (1998)	Potential in dry summer (1998)
Taraire Hills dam	EU, A4046	460	300	460	300
Squires Spring	AR 1862)	1100	550	1100	550
Kaikohe Hill bore(s)	AR 1862)				
Wairoro Stream	4109	1300	1300	1300	260
Rangihamama Bore(s)	A4393	-	-	2300	*(2300)
Total Allocation		2860	2150	5160	1110 (3410)

Shortfall Relative to Various Levels of Demand (m³/day)

Demand					
1988	average daily (1500)	0	0	-	-
	average daily peak week (2150)	0	0	-	-
	maximum daily (2400)	0	300	-	-
1998	average daily (1600)	0	0	0	490 (0)*
	average daily peak week (2300)	0	150	0	1190 (0)*
	maximum daily (2700)	0	550	0	1590 (0)*

* figure in () include allocation of 2300 cubic metres per day from Rangihamama bore(s).

3.3 Allocations versus Demand

From Table 1 it can be seen that without the use of the Squires Spring and Kaikohe Hill bore sources, subject of application 1862, the KBC would not be able to supply current water demands. Even with the use of those sources supply could not meet current peak demand figures during a prolonged dry spell.

When potential allocations and predicted demand for 1998 are compared it can be seen that if the Wairoro Stream allocation is reduced (see 3.2.1) and there was no allocation made from any additional source such as the Rangihamama bores, the allocations would be well short of demand during any prolonged dry spell. Even with the use of the full 1300 cubic metres per day from the Wairoro source peak demands would not be able to be met.

4 OTHER USES OF THE RESOURCE

4.1 Existing Uses

The groundwater resource of the Kaikohe basalt aquifers and the springs and small streams which discharge from the aquifers are utilised and relied on, for domestic and farm water supplies and horticultural irrigation.

A summary of the existing consumptive water uses of the resource is given in Table 2 below.

Table 2 Summary of Existing Consumptive Water Use.

Public water supply (KBC incl AR 1862)	1100 cubic metres per day
other communal water supply	42 " " " "
irrigation	2090* " " " "
industrial	135 " " " "
farm supplies ** (domestic & stock)	190 " " " "
Total existing daily use	3557* " " " " (41.2 litres per second)

* Approximately 600 cubic metres per day comes from storage reservoirs.

** based on an area of 30 km² relying on the Kaikohe basalt resource for farm water supply, an average of 11 stock units per hectare and a water requirement of 5.7 litres per stock unit.

A list of current water rights, and applications, to take water from this resource is given in Table 3. The location of the sites of taking are shown in Figure 2.

Further detail regarding existing and some potential water demands is contained in the objectors evidence.

*All this
is
indicated
in
the
table
above*

District 10 litres / su.

4.2 Potential Future Water Uses

Apart from the predicted future water use of the KBC (see 3.1) the only other significant increase in water demand in the area would arise if current pastoral farmers wished to diversify into horticultural cropping, or substantial water using industry such as timber processing were to be established.

There is a significant area of soils, approximately 2000 hectare (from NZLRI Worksheets), associated with the Kaikohe basalts that are suitable for intensive horticultural development. If that area were to be fully developed it would have an irrigation requirement of the order of 36 000 cubic metres per day (413 litres per second).

A number of the objectors have indicated that they may wish to diversify into horticultural development at some unspecified future time. No development proposals have been presented nor Water Right applications made. It is therefore not possible to assess potential water requirements at this stage.

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so why not consider to some

Table 3 Existing Water Rights and Applications to Take from the Basalt Aquifer Resource
(listed in order from north to south as shown in Fig 2).

WR No	Name	Water Source	Purpose	Quantity (m ³ /day)
4109*	Kaikohe Borough Council	Wairoro Stream	public supply	1300
3855	Garner	bore - Mangamutu Stm	irrigation	72
1865	Johnsons Plants	bore - Mangamutu Stm	"	38
AR1862	Kaikohe Borough Council	bore(s) & spring - Otangaroa Stm	public supply	1100
2007	Te Kotahitanga Marae Trustees	spring - Otangaroa Stm	"	20
2922	McGrath	spring - Waikaka Stm	irrigation	6
2782	Johnsons Plants	dam - Otangaroa Stm	"	182
4026	Johnsons Plants	bore - Otangaroa Stm	"	100
1666	Rowsell	bore - Waikaka Stm	industrial	35
2733	Jenkins	bore - Waikaka Stm	"	12
2006	Kairangi Orchards	bore - Waikaka Stm	"	50
2707	Johnsons Plants	bore - Waikaka Stm	"	10
3875	Johnsons Plants	bore - Waikaka Stm	"	100
2734	Johnson	bore - Otangaroa Stm	"	38
2749	Mackie	bore - Otangaroa Stm	"	16
A4393	Kaikohe BC	bore(s) - Waikaka Stm	public supply	2300
2923	Mahi Kia Mohio Trust	spring - Otangaroa Stm	irrigation	30
3687	Ineson	bore - Totara Stm	"	25
2172	Levondale Farms	spring - Omaunu Stm	"	100
3626	Gerrard	dam - Waikaka Stm T	access	0
2939	Munford	Te Tunaotemaku Stm	irrigation	90
2452	Dept Maori Affairs	dam/spring - Tokakopura Stm T	"	1200
A4540	Kaikohe Abbatoir	" " " "	industrial	100
2453	O'Conner	spring - Punakitere RT	irrigation	20

A - application for new proposal

AR - application for replacement of expired right

* - not from basalt aquifer resource, but relevant to applications under consideration.

5 ESTIMATION OF WATER RESOURCE AVAILABLE

This section contains a summary and discussion of the results of the investigations of the Kaikohe volcanic aquifer groundwater resource carried out largely by the applicants consultants. The detailed results of the investigations are given in the applicant's evidence and reports.

5.1 Short Term

The investigation drilling and pumping test of the investigation bore No 2, in area of the proposed Rangihamama abstraction, by the applicants consultant (Carryer and Assoc, 1987) showed that in the short term two suitably constructed bores would be able to supply the quantity applied for ie. 2300 cubic metres per day. (Note: the application 4393 is for only one bore).

However the pumping test only involved 3 days pumping at a rate of 400 cubic metres per day and could not show that pumping at the 2300 cubic metres per day would be sustainable. The test pumping had little effect on water levels observed in other bores in the area, although analysis of the test results showed that a significant proportion (24% by the end of the test) of the water being pumped was coming from leakage from shallow groundwater or from 'delayed yield' (lowering of the water table). The pumping test results on their own are not sufficient to indicate precisely the magnitude of long term pumping on water levels and spring flows. They did show however that there would likely be some measurable affect on nearby bores and springs.

5.2 Long Term - Sustainable Use

5.2.1 Groundwater Recharge

If the level of use of a groundwater resource is to be sustainable the average annual total of abstractions and discharges may not exceed average annual recharge (volume of water entering) of the aquifer(s).

The applicants consultants (see evidence of Mr IC Thompson) estimate recharge of the Kaikohe basalt aquifer system to average between 5500 cubic metres and 22000 cubic metres per day for the period September 1987 to March 1988 or 7200 cubic metres per day to 29000 cubic metres per day (2.6 to 10.6 million cubic metres per year).

A second method of estimating groundwater recharge outlined in Appendix A, gave a range varying from an average daily recharge of 3900 cubic metres for the drought year of 1986 to a high of 31500 cubic metres per day for 1981 ie. 1.4 to 11.5 million cubic metres per year, with an average for that period of 6.5 million cubic metres per year.

The period March 1986 to October 1987 was on extreme prolonged dry spell. A drought such as experienced over that period has an estimated return period, based on historical rainfall records (see Appencix B), of greater than 100 years. The monthly rainfall totals for Kaikohe for 1986, 87 and 88 are given in Appendix B as are those for the 1945/46 drought for comparison.

The total existing use of groundwater plus that which would likely result from granting of these applications would be approximately 0.7 million cubic metres per year, or up to 50% of the annual recharge in a drought year and approximately 10% in an average year.

From a comparison with the similar Whatitiri groundwater resource (see Appendix C) the mean annual outflow (groundwater discharge) from the Kaikohe basalt groundwater resource is estimated at 161 litres per second or 5.1 million cubic metres per year. The 1 in 5 year low flow groundwater discharge is estimated at 87 litres per second. Peak water demand of all existing uses of the resource plus these applications total approximately 67 litres per second or 77% of that estimated low flow.

The above figures indicate that the abstractions of the quantities which would likely result from the granting of these applications would be sustainable in relation to the total available resource. However the effects of any major abstraction will inherently be locally more severe and the above calculations do ^{not} address that question.

5.3 Estimation of Effect on Other Users of the Resource

5.3.1 Kaikohe Groundwater Model

As an aid to assessing the impact of the applicants proposal on other bore and spring users the applicants consultants (see evidence of Groundsearch Geophysics Ltd) developed a computer simulation of the Kaikohe volcanic aquifer. The model used is the widely used United States Geological Survey MOD FLOW groundwater model. Such models are now commonly used as predictive and resource management tools. The model predicts groundwater levels for given aquifer dimensions, hydraulic characteristics, rainfall recharge inputs and abstractions. The model was calibrated using rainfall data for the Kaikohe area, measured water levels from existing water bores and the KBC investigation bores, aquifer characteristics estimated from the pump test and water level records and stream flow gauging data.

The predicted impacts on water levels and spring flows are detailed in the evidence and report of Mr G Roberts (of Groundsearch Geophysics). With the information available to date the model predictions indicate possible significant lowering of groundwater levels and spring flows in the immediate area (within 250-500 metres) of the proposed abstraction bores. With lesser, and diminishing but still possibly significant lowering of groundwater levels further away from the bores.

The model is considered "not sufficiently refined to estimate exactly which spring might flow under pumping conditions". However Mr Roberts considers the model to be conservative and that "the actual effects observed will probably not be as large as what the model predicts".

It is evident that further monitoring of spring water levels and stream flows is required to refine the model and to more accurately predict the impacts of groundwater abstractions.

5.3.2 Effect on Existing Users of Proposed Rangihamama Bore abstractions (4393)

It is predicted, with the use of the previously discussed groundwater model, that shallow wells and bores (less than 25 m deep) and water table springs within 250 to 500 m of the proposed Rangihamama bores may suffer large water level drawdowns and even dry up. Within that area are a spring and bore which are part of the Department of Maori Affairs Rangihamama Block farm water supply up to approximately 25 cubic metres per day and Kairangi Orchards bore (WR 2006, to take up to 50 cubic metres per day) and a small number of low volume domestic and stock supplies.

Deeper bores within that area which penetrate all or most of the total saturated thickness of the basalt flow will experience the same significant loss of head (drop in water levels) but should still have sufficient available drawdown to continue providing for the existing authorised supplies.

It is considered by the applicants consultants that water levels in bores and spring flows at a distance of greater than 500 m may be affected by the proposed pumping to a measurable, and noticeable, amount but that such effects will not be so large as to prevent existing authorised users from exercising their rights. However there is a sufficient level of uncertainty involved in the estimation of such effects to warrant a conservative approach to the allocation of any large quantity of groundwater from this resource.

5.3.3 Effect of Continued Use of Kaikohe Hill Bores and Squires Spring

The applied for abstractions from the Kaikohe Hill bore(s) was included in the groundwater modelling discussed above.

As outlined in Section 1 these sources of water have been used for public water supply for many years. Although there have been objections to previous applications there has not been any formal complaint or conclusive evidence of adverse effects on other water users due to the use of the Kaikohe Hill bores. The taking of water from Squires Spring must directly reduce the flow in the Otangaroa Stream. However during a prolonged dry spell the natural flow in the upper Otangaroa Stream (upstream of Jordan Road) is very small and would not be a reliable water supply source. The taking of the small quantities, 100-200 cubic metres per day, available from Squires Spring during a prolonged dry period would not significantly affect the viability of the stream as a reliable farm water supply.

A communal/rural water supply for the rural area immediately south of Kaikohe would be a more efficient use of the available resource.

5.4 Effect of Proposals on other Potential Water Uses

The allocation of any groundwater to the applicant directly reduces the quantity of water available for irrigation of any future horticultural developments in the Rangihamama area. The 2300 cubic metres per day applied for would be sufficient to provide irrigation for approximately 77 hectares. If the application were granted, any further significant horticultural development in the Rangihamama area would need to utilise water storage or some more distant source.

Any major horticultural development in the area shown in Figure 1 ie. the development of large portions of the soils suitable for intensive horticultural cropping would require the development of a major water source and most likely a communal irrigation scheme regardless of the result of this application.

6 POLICY

6.1 Water Allocation Principles and Policies

In lieu of any specific water management plan or policies for the water resource of the Kaikohe basalt flows the Council must look to the more general principles expressed in the Water and Soil Conservation Act 1967 and in other Council policy and water management plans.

The Water and Soil Conservation Act 1967 states in Section 20(5)(c) that the Council (Board) "shall promote the protection of water supplies of local authorities and conservation and most beneficial use of natural water". Applications 1862 and 4393 are for water supplies of a local authority and are a beneficial use of the resource. The preservation of the resource for some as yet unspecified future horticultural developments may also be considered a beneficial use of the resource.

It is Council policy in allocating water to weigh up the various competing uses and allocate water to the most beneficial use.

It is also Council policy to protect community and stockwater supplies and that community and stockwater supplies will generally be afforded priority over other consumptive uses.

7 CONCLUSIONS

7.1 Application 1862

It is considered that this application could be granted on similar terms to that of the previous expired right without having any significant detrimental effect on the resource or other authorised users.

The use of the sources of water the subject of application 1862 are required to meet the applicants current water requirements.

7.2 Application 4393

7.2.1 Applicants Water Needs v Quantity Applied For

The quantity applied for 2300 cubic metres per day is the applicants predicted peak daily water requirement from this source at the end of a 25 year planning period. However after considering the applicants projected water requirement figures and existing and potential allocations from current supply sources it is concluded that the applicants water needs from this source at the end of a ten year forward planning period would be approximately 500 cubic metres per day on average, 8400 cubic metres per week for a peak week and 1600 cubic metres per day for a peak day.

7.2.2 Water Availability

The quantity applied for could be supplied in the short term from suitably constructed bores in the area proposed and would likely be sustainable in relation to the total available resource.

7.2.3 Effect on Existing Authorised Uses of the Resource

It is predicted that the proposed abstraction would cause lowering of groundwater levels and reduction of spring flows in the immediate area (within 500 m) of the bores that could prevent the authorised use of shallow bores and springs. I consider that such uses should be protected by provision for an alternative water supply as a condition of any right (if granted) and/or by contract between the affected parties and the KBC.

Bores and springs associated with the resource but at a greater distance from the proposed bore(s) will likely experience lesser and diminishing effects the further away they are. It is predicted that the effects should not prevent any existing authorised use. However given the level of uncertainty in the predictions of effect it is considered that any allocation should be conservative in quantity. Further if granted the term of the right should be no more than five years to allow for a review after further monitoring of the resource.

7.2.4 Effect on Other Potential Water Uses

The granting of this application would mean that any further significant horticultural development in the Rangihamama area would need to utilise runoff collection and storage or some more distant source of water for irrigation.

7.3 Resource Monitoring

Given the high level of existing and potential demand on the water resource associated with the Kaikohe basalt flows it is important that resource monitoring be continued and that further investigations be made to more accurately quantify the effects of major groundwater use. This would also enable resource management policies for the whole resource to be formulated in due course.

Appln 1862

Recommendation

That a right be granted to KAIKOHE BOROUGH COUNCIL

To take natural water from :

- 1 a bore in the catchment of the Otangaroa Stream on Lot 1 DP 30163, Blk XV Omapere SD, Map Reference : N15/294340, and
- 2 Squires Spring, a tributary of the Otangaroa Stream, on Tuhuna No 8A Block, Blk XV, Omapere SD Map Reference : N15/298336

for the purpose of public water supply to Kaikohe Borough and environs subject to the following conditions :-

- 1 The total quantity taken shall not exceed 1300 cubic metres per day, 33000 cubic metres per month nor 288000 cubic metres per year.
- 2 That total quantity taken from the bore shall not exceed 180000 cubic metres per year.
- 3 The Grantee shall keep a record of :
 - (i) the quantity of water taken from both bore and spring each week;
 - (ii) the water level in an observation bore on Kaikohe Hill, the location and construction of which has prior approval of the Council, at least weekly.
- 4 The Grantee shall supply to the Council the records kept under Condition 3 by 1 May each year for the previous year ending 31 March, or on written request from the Council.

EXPIRY DATE : 31 August 1998

Appln 4393

Recommendation

That a right be granted to KAIKOHE BOROUGH COUNCIL

To take natural water from a bore in the catchment of the Tokakopura Stream on Rangihamama X3A Block Blk III Punakitere SD Map Reference : N15/303316 for the purpose of public water supply to Kaikohe Borough and environs subject to the following conditions :-

- 1 The total quantity taken shall not exceed 1600 cubic metres per day, 8400 cubic metres per week nor 218000 cubic metres per year.
- 2 The Grantee shall measure and keep a record of :
 - (i) the quantity of water taken from the bore each week;
 - (ii) the water level in existing observation bores shown as No 1, 7, 8 and 9 on Northland Regional Council Plan No ... at least weekly.
- 3 Records collected as per Condition 2 shall be supplied to the Council by 1 May each year for the previous year ending 31 March, or on written request from the Council.
- 4 If any person's lawful taking of natural water from groundwater or springs within 750 metres of the bore, the subject of this right, is affected by the exercise of this right to the extent that they can no longer obtain the quantity of water to which they have a right, the Grantee shall make available to them the quantity of water which they have been prevented from taking.
- 5 The supply of water under Condition 4 is confined to such purposes and upon such lands as it was being lawfully used prior to 1 August 1988.

EXPIRY DATE : 31 August 1993

September 1988

REFERENCES

- 1 Fenemor A 1985. The Water Balance Models for Calculating Rainfall Recharge to Groundwater. Water & Soil Science Centre, Christchurch, MWD. Report No WS982.
- 2 Fraser Thomas Partners 1986. Kaikohe Borough Council Water Supply - Alternative Sources of Supply. Preliminary Report. unpublished report to Kaikohe Borough Council.
- 3 French AC 1980. Mapping of Concealed Catchment Areas in Basalts, Whangarei, Northland, unpublished MSc thesis, University of Auckland.
- 4 Martin GN and Waugh JR 1972. Assessment of Drought from Rainfall Data. an unpublished MWD, Water & Soil Division internal report.
- 5 Northland Catchment Commission 1983. The Water Resources of the Maunu-Maungatapere-Whatitiri Area. Publication No 1983/2.
- 6 Roberts GW 1987. Kaikohe Resistivity Survey. an unpublished report to Kaikohe Borough Council. Groundsearch Geophysics Ltd Job 164, April 1987.
- 7 Thompson IC 1987. Kaikohe Groundwater Survey - Report on a Pumping Test Carried Out on Bore 2 Rangihamana Road. unpublished report to Kaikohe Borough Council. Carryer and Associates Ltd Ref. No 360/0823.

Appendix A

Estimation of Groundwater Recharge

A method of estimating the size/quantity of the groundwater resource is to estimate the amount of recharge the aquifers receives from rainfall. Abstraction of groundwater in excess of recharge would be in effect mining the resource, which if carried on for long periods could lead to temporary or even long term loss of the resource.

Recharge of the basalt aquifer(s) at Kaikohe have been estimated using the method described in Fenemor, 1985, a soil moisture budgeting model in which drainage from the base of the soil profile is computed. Kaikohe daily rainfall, raised pan evaporation data from Kerikeri, and a soil water holding capacity of 100 mm were used in the model calculations. A surface runoff quickflow loss is included in the model to account for the proportion of rainfall that is quickly lost due to surface runoff and rapid subsurface flow to drains and streams during and immediately after rainfall events. The quickflow loss used in the Kaikohe simulations was calculated from rainfall and stream flow records for the Waipao Stream (Whatitiri catchment).

The recharge simulation was carried out for the years 1979 to 1986 inclusive. The mean annual rainfall for that period was 1479 mm and the mean annual recharge was computed to be 500 mm. The results of the simulation are summarised in the table A1.

A mean annual recharge of 500 mm is equivalent to a mean annual groundwater flow of 207 litres per second (17,870 cubic metres per day).

The period 1979-86 includes both the second driest (1986) and second wettest (1979) of the 66 years of record, with the average annual rainfall for that period being a little less (by 10 mm) than the average for the full 66 years.

Table A1

Estimation of Groundwater Recharge - From Soil Moisture Budgeting Model (Fenemor, 1985).

Year	Rainfall (mm)	Estimated Recharge (mm)
1979	2105	875
1980	1879	739
1981	2010	883
1982	1173	334
1983	1335	391
1984	1096	253
1985	1401	465
1986	880	110
mean	1479	506
Quickflow loss:	rainfall (mm/day)	% runoff
	0-20	12
	20-80	24
	80+	40

Appendix BAssessment of Drought Severity from Rainfall for Kaikohe Area

An assessment of the severity and estimate of the return period of prolonged dry spells has been made for the Kaikohe area based on the method of Martin and Waugh (1972).

A continuous record of monthly rainfall totals was constructed for the period 1922 to 1988 from the combined records of sites A53471, A53481 and A53482. A summary of the results of the drought assessment based on those rainfall figures is listed in Table B1 and plotted on Figure No B1.

It can be seen that the drought of 1986/87 was by far the most severe on record, given this method of assessment, with an estimated return period of 120 years. The monthly rainfall totals for the period 1986 to June 1988 for site 534483 (Kaikohe, Ministry of Works & Development) are given in Table B2, as are the mean monthly totals for the period 1922-1988 for the combined Kaikohe sites. 1986 and 1987 are the two driest years of the 67 years of record.

However the 1945/46 drought has the lowest rainfall total for any four month period with 106 mm (November-February) with the 1986/87 drought having 124 mm (November-February) being the second driest four month period of the record. For 1986/87 the months prior to and following the summer had significantly lower rainfalls than those for the 1945/46 summer (see Table B2).

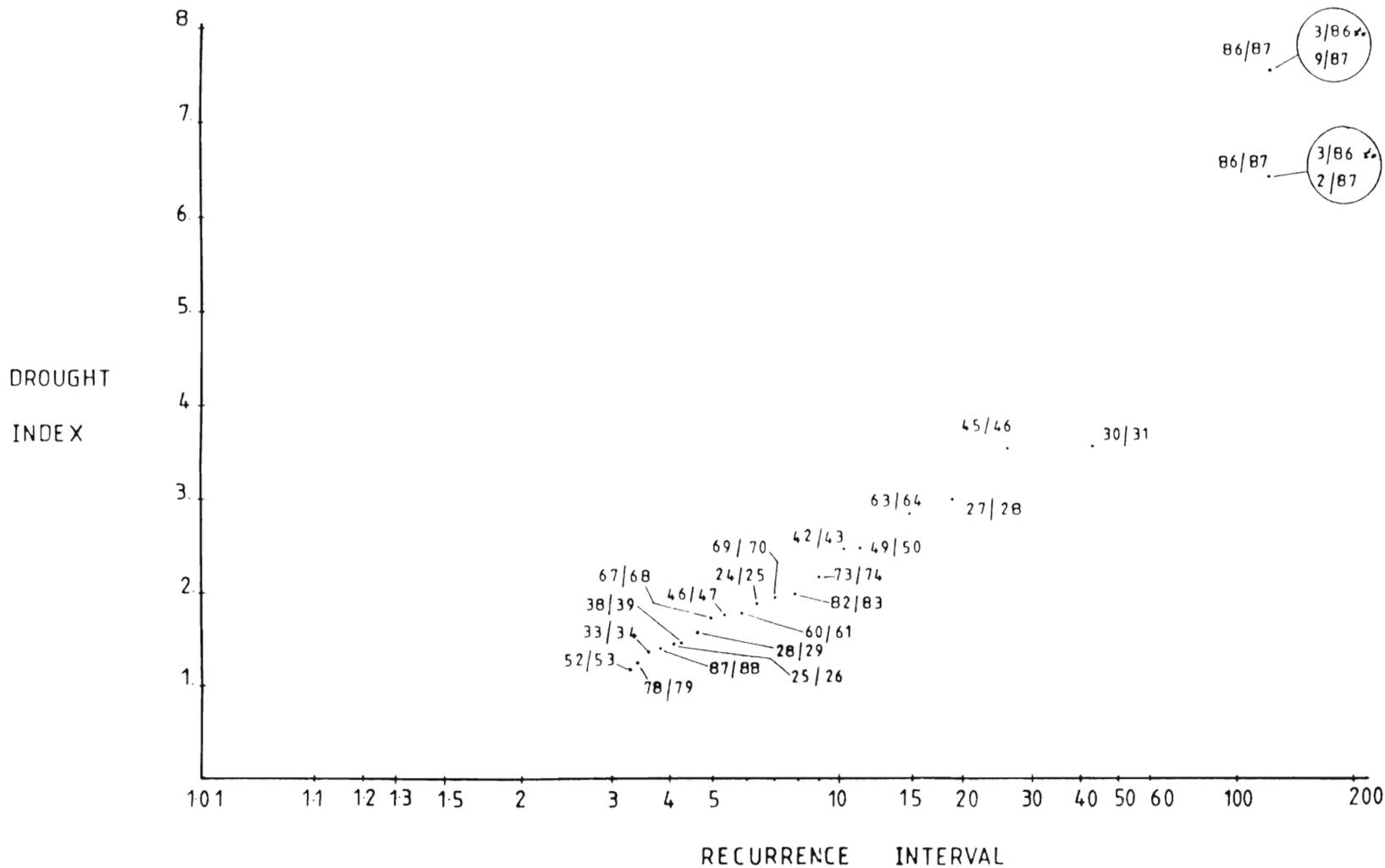
Table B1

Assessment of Drought Severity from Rainfall for Kaikohe area. (Rainfall from sites A53471, A53481, and A53482 used).

Summer of	Drought Index(s)	Rank(i)	Return Period (RP years)
1924/25	1.89	11	6.4
25/26	1.46	17	4.1
26/27	2.99	4	18.9
28/29	1.53	15	4.6
30/31	3.55	2	43.0
33/34	1.35	19	3.6
38/39	1.47	16	4.3
41/42	1.46	17	4.1
42/43	2.46	7	10.2
45/46	3.51	3	26.2
46/47	1.77	13	5.3
49/50	2.48	6	12.1
52/53	1.18	21	3.3
60/61	1.79	12	5.8
63/64	2.82	5	14.7
67/68	1.71	14	4.9
69/70	1.94	9	7.8
73/74	2.16	8	8.9
78/79	1.22	20	3.4
82/83	1.94	9	7.8
86/87 (3/86-2/87)	6.43	1	119.9
(3/86-9/87)	7.54	1	119.9

Drought Index v Recurrence Interval
for Kaikohe Rainfall (sites 53471; 81; 82; 83)
1922 - 88

Fig. B1



NORTHLAND REGIONAL COUNCIL	KAIKOHE RAINFALL :- Drought Index v Recurrence Interval		Approved	Plan No. 2436
			Drawn D.P.B.	

Return period (plotting position) by Gringorten method :

$$RP = \frac{N + 0.12}{i - 0.44} \text{ where } N = 67 \text{ (years of record)}$$

Drought Index by method of Martin and Waugh (1972) :

$$S = \frac{T \times D + (txd)}{100}$$

Where : T = Duration of drought period (Months)

t = duration of antecedent conditions (months)

D = % deficiency of rainfall from long term average for antecedent period

d = " " " " " " " " " " " " " "

Table B2 Monthly Rainfall Totals for the period 1/86-6/88 for site 53483, Kaikohe MWD.
MEAN MONTHLY Totals for the period 1922-88 for combined Kaikohe sites 53471, 81,
82, and 83.

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Tota
mean	100	118	103	140	163	177	162	158	132	124	99	101	1577
1945	249	96	54	101	216	129	137	165	188	107	20	28	1490
1946	22	36	57	295	166	301	297	244	181	162	109	54	1924
1936 ⁵ 1936 ⁵ 86	151	103	31	45	81	56	130	87	74	57	40	31	886
1987 ⁵ 1987 ⁵ 92	41	12	70	64	24	42	72	51	69	76	131	140	792
1988	0	65	320	29	272	100							

Appendix C

Comparison of Kaikohe with Whatitiri Groundwater Resource

The basalt aquifers which contain the groundwater resource at Kaikohe are of similar type, properties and age to those found in the Whatitiri area of west Whangarei. The Northland Catchment Commission in conjunction with University of Auckland Geology Department carried out an investigation which assessed the extent and properties of the Whatitiri aquifers and the water availability (Northland Catchment Commission 1983, French 1980).

Measurements of the groundwater outflow from the 31.5 km² Whatitiri subsurface catchment were gauged, with mean annual outflow being estimated at 390 litres per second and the 1 in 5 year low flow at 210 litres per second (approximately 54% of the mean annual flow). The estimated mean annual groundwater flow is equivalent to 25% of the mean annual rainfall of the catchment.

The mean annual rainfall for the area of the Kaikohe basalt aquifer(s) is approximately the same as that for the Whatitiri area. The rainfall in both areas varies significantly with altitude, however an areal average of the mean annual rainfalls for both areas is approximately 1550 mm/year.

If the groundwater flow figures from Whatitiri are applied to the Kaikohe Taheke basalt aquifers then the mean annual groundwater flow will be approximately 161 litres per second and the 1 in 5 year low flow will be approximately 87 litres per second.

* Compare Area characteristics
against Kaikohe

5 September 1988

IN THE MATTER OF

The Water & Soil Conservation Act 1967.

AND

Water right applications by Kaikohe Borough Council to abstract water from Kaikohe Hill and the Rangihamama Block.

STATEMENT OF EVIDENCE BY Y.L.SHARP

My name is Yvonne Lesley Sharp. I am the Town Clerk of the Kaikohe Borough and have been in the employment of the Borough for eleven years.

History : In 1973 the Borough raised loan finance and commissioned the work to use water from Lake Omapere for the Borough town supply. In 1985 the lake eutrophied and the Northland Area Health Board directed that the lake, as a source of a town water supply, was banned and that there appeared no prospect of using this source again.

Action Taken : Council then, through its consulting engineers, spent some 19 months investigating possible water supplies to replace Lake Omapere. Exhaustive testing was carried out using the services of the Consultants and a geophysicist and hydrologist, the outcome being a recommendation to Council that the Rangihamama supply was the most promising and a water right should be sought. Council has spent in the vicinity of \$100,000 already on investigations to date.

The Council would categorically state that ^{dry} investigations have been both prolonged and costly and only two wet summers have prevented the Borough being in a serious water shortage situation. The amount of water able to be used from the Kopenui Stream is governed both by the water right and the limited capacity of the filtration plant and attendant storage tanks.

Council has a duty to provide water for over 4,000 users (both in the Borough and surrounding County area) and the denial of the renewal of the Kaikohe Hill application, a source which the Borough has used for over 20 years, would simply mean there would not be enough water for even the immediate winter demand. Even with the water from Kaikohe Hill, if the summer is hot and dry, the Borough could well be in a situation of severe water restrictions.

The Council appreciates the concerns of the objectors but the health and wellbeing of the people it serves, the households, schools, hospital, commercial and business sectors, must be of prime importance.

Without the Kaikohe Hill water the town cannot survive, without the Rangihamama water the Borough continues to exist in perilous circumstances, with insufficient water in drought conditions.

Y L Sharp
Town Clerk

1st September 1988.

IN THE MATTER OF

The Water & Soil Conservation
Act 1967

AND

Water right applications by
Kaikohe Borough Council

No.4393 to abstract water from
the Rangihamama area, and
No.1862 for renewal of an
existing right on Kaikohe Hill.

STATEMENT OF EVIDENCE BY L.R. THOMAS

1.0 INTRODUCTION

1.1 My name is Leslie Rhys Thomas. I am a Director of Fraser Thomas Partners, Consulting Engineers, Registered Surveyors, Architects and Town Planners of Auckland. I am a Chartered Civil Engineer with a Bachelor of Civil Engineering degree and am a Corporate Member of the Institution of Civil Engineers (London) and a Fellow of the Institution of Professional Engineers New Zealand.

1.2 I have been a Consulting Engineer in partnership for 27 years and during that time have been associated with many public health engineering and other related projects for government agencies, local authorities, and private clients.

1.3 I have appeared as an expert witness before a number of Regional Water Boards and Town & Country Planning Tribunals in matters relating to water rights and planning applications.

2.0 EXPERIENCE RELATIVE TO THIS PROJECT

2.1 I have had extensive experience with all aspects of water supply, including water resource planning, assessment of future water demands, stream flow gauging, water quality testing, evaluation of catchments and hydrological studies. I have further been involved with river and lake intake structures, small impounding dams, pumping stations, electrical and mechanical controls, reticulation pressure regulation, water treatment, and water storage structures.

2.2 I have been responsible for my firm's involvement with 8 separate local authorities, a government department and private industry for 15 different water supply schemes.

2.3 I have been involved with Kaikohe's public water supply

system over a period of 30 years, firstly as an employee of Consulting Engineering firm, and later as a Principal of my own firm. I therefore have a wide knowledge of the problems Kaikohe has been faced with maintaining an adequate water supply, and I am conversant with the sources of water supply within the area.

3.0 HISTORY OF BOROUGH'S WATER SUPPLIES

3.1 I will very briefly outline the history of public water supplies for Kaikohe.

It is almost 50 years since the then Town Board of Kaikohe constructed a small water supply intake in the Taraire Hills north of the town to intercept a small spring and convey the water to the township. An earth dam was later constructed to impound a greater volume of water and this source served Kaikohe for many years.

Some years later springs near the base of Kaikohe Hill on its western side were tapped and the water was pumped to a small reservoir near the crater of the hill. A bore was later sunk next to this crater extracting water from the basaltic aquifer and, for a number of years, this was the supplementary water supply.

In the initial stages neither of these sources were treated or filtered and in 1973 a small water treatment plant was constructed at Taraire Hills to filter and chlorinate the water from the dam and a chlorination plant was installed on Kaikohe Hill to disinfect the underground water due to some pollution being detected from Squires Springs.

As demand grew, the underground water source was relied on to a greater extent, but with uncontrolled use, it could affect some other underground water consumers in the vicinity. A water right was obtained limiting the underground abstraction. With this limitation on the supply of bore water, further investigations were undertaken to provide another source of supply.

Council considered acquiring land at Tautoro where springs emanated from an extensive underground source but the capital costs and the pumping costs to convey this water to the town precluded its use at that time.

Investigation showed that it was feasible to abstract water from Lake Omapere which was situated at a much higher elevation than Tautoro and not far distant from the existing dam. Thus, from the end of 1975, water was pumped from the lake to the dam and then treated and gravitated to the Borough. The water treatment plant was extended in capacity at this stage and an assured future supply of water was then considered to be available to the Borough, only requiring the addition of more pumps at the lake and further filters when required.

In 1984 Council commissioned a detailed geotechnical investigation of the dam as it was showing signs of excess

leakage. This recommended that the water level be kept at least 1m lower than the dam level in order to ensure its stability. Council then decided to abandon the dam and proceed with the construction of a larger dam immediately downstream to hold more water for emergency storage.

However during the early summer of 1985, problems were experienced with the eutropication of the Lake Omapere waters which made them unsuitable as a source of potable water supply.

An emergency water supply intake was immediately installed on Kopenui Stream which flows into the Wairoro Stream to the east of the Borough. This was only to be a temporary supply as the stream flows were not sufficient to ensure a permanent supply for Kaikohe in the future.

Council thus commissioned an investigation into alternative sources of supply.

4.0 POSSIBLE SOURCES OF SUPPLY

4.1 Alternative Sources

Council commissioned my firm to investigate all the alternatives that may be available for possible sources of supply both to replace the Lake Omapere source and provide Council with an assured source of water for the next 25 years or more. The following sources of supply were reported on in detail to Council in June 1986.

4.2 Rivers and Streams

Kopenui Stream - This was the stream being used for the emergency water supply and was satisfactory for present needs but would not meet the demand under extreme dry weather conditions. In addition, there were existing water rights on the stream which, if taken up, would lessen the viability of this source for Council use.

Wairoro Stream - The Kopenui and Mangamutu join to form the Wairoro Stream passing down the eastern side of the Borough on the edge of the basaltic lava flow and it picks up additional groundwater as it moves south. There are potential water right allocations on a long term basis for this stream and the Northland Regional Council requirements of a 40% residual after abstraction leaves a very small remainder that could be allocated in the future. There is undoubtedly more water further down the waterway but the economics of constructing a suitable intake, a new water treatment plant, and then pumping the water back to the Borough, does not justify this source at this stage.

Punakitere River - This is the major waterway located at the base of Jacob's Ladder towards Tautoro, into which the Wairoro flows. It would have sufficient water but it is silt laden, prone to extensive flooding, and a full-scale treatment plant with clarification by sedimentation, as well as filtration would be needed, and there would be high

*Punakitere Dist
overly Dist
110x 29km
could be 10/100
Storage*

pumping costs and the economics of this source at this stage is not viable.

4.2 Springs

Kaikohe Hill - There are a number of springs emanating from the basaltic aquifer under Kaikohe Hill, with Squires Springs being one of these. If they were all able to be collected, the total would nowhere near meet the future demand and thus cannot be considered.

Tautoro Springs - These springs originate from a lava flow from the hills to the south and have a very extensive catchment area. The flow of water would meet the immediate future maximum demand as long as downstream water rights did not require a high residual flow. However it does not meet the design maximum daily demand for the distant future and would need supplementary sources added and some restrictions in 25 years in a dry period to meet this demand. Beyond that period, additional resources would definitely be required. It is at an elevation of almost 100m below the level of the centre of the town and in order to pump to the town's reservoirs, a total head of over 200m (static plus friction) would be necessary. This is an alternative source that requires consideration but there could be problems in obtaining a water right for its use and the costs are certainly much higher than for the present proposal.

4.3 Upland Catchment Dams

Tarairae Hills Catchment - The present dam could be enlarged, and this was considered at the time Lake Omapere was being used but due to the small catchment, and without the lake source, a very considerable dam would be necessary to hold and collect the water and it would be a very restrictive supply during seasons of low rainfall.

Larger Dam at Top of Reservoir Road - An inspection indicated that a dam could be safely built in this vicinity, which is further down the catchment than the original dam. However, again the dam would not be large enough to meet the demand within the 25 year planning period.

West of Lake Road - There is a reasonably flat area which would require a long dam which could be satisfactory for the future but would require extensive investigation before it could definitely be recommended. Preliminary costs indicate that it is not worthy of further investigation at this stage.

Taikawhena Stream - This site is on clay hills to the east of Northland College and has a reasonable sized catchment area and a dam could be built in this location. It is not a great distance from the town but consideration would have to be given to a new treatment plant to be located in its vicinity if it was to be a future major source of supply. Preliminary estimates indicate that the cost of this alternative is much higher than that of the present proposal.

4.4 Underground Sources

Kaikohe Hill - This source is used at present and is the subject of a water right application for renewal of existing rights. A limitation had been placed on the earlier water right for the amount of water that could be withdrawn and therefore even if further bores were sunk on the hill the total amount of water extracted could not exceed that allowed for in the right and therefore cannot meet the future demand of the town. However, this is a very valuable resource and the water allowed for under the existing water right is included in the calculations for the future demand and will be used in addition to water that may be extracted in the future from the Rangihamama area.

To the North-East of the Town - Several sites on lava flows immediately to the north-east of the town have been investigated and test bores have been sunk. This includes an area immediately north of S.H.12 opposite the Kaikohe Golf Course, and another area straddling Remuera Road, and again further north. If water could be satisfactorily extracted from these sources, it could be pumped direct to the existing treatment plant on Taraire Hills. Geological advice and initial testing showed that the aquifer did not have the same potential in this area as the proposal south of the town. There is also some doubt as to the chemical composition of the water and a surety that it could be used as a potable water supply without extensive treatment.

Immediately South of the Town - The basalt flow from Kaikohe Hill divides with one branch going south past the aerodrome with another branch in the Rangihamama area going out to the west. A geological study showed that water in quantity was most likely to be found in this area. This source of supply could be tapped reasonably close to the Borough and pumped directly to the Kaikohe Hill reservoirs. This is the source which has been further investigated.

4.5 Council's Decision

The costs of a groundwater supply south of the town would probably not exceed \$600,000 whereas the cost of a major dam and treatment works would be at least double this figure. The annual loan servicing and operating and maintenance cost of the latter including treatment would be almost three times that of the groundwater supply.

After consideration of the report outlining the above sources of supply and consideration of the likely costs, Council recommended that my firm investigate further, utilising geological specialists, the underground source south of the town.

5.0 FUTURE WATER DEMAND

5.1 Estimates of Future Demand

An estimation made in 1986 based on historical useage and future population trends has been projected for the next 25 years. This demand less the present assured supplies was used as the basis of the water right application for the

proposed bores in the Rangihamama area.

Year 1986 - Peak weekly demand recorded in previous years = 14,000m³/week

- Average peak daily demand from above = 2000m³/day

- Maximum daily demand estimated from above and from actual peak useage = 2400m³/day

Escalate forward for a 25-year planning period (trends indicate less than 1% growth over the past 20 years).

Year 2011 - At say 1.25% compounding growth = 3300m³/day

(Peak weekly demand on same basis) 19,000m³/week

Allow for present useage of Kaikohe Hill water resources to continue for the future with the present water right limitations. Peak daily demand obtainable on an intermittent basis at, say 1000m³/day

Then the future requirement from an alternative source required to meet designed daily demand is as follows:-

Year 2011 - Total maximum daily demand = 3300m³/day
Less Kaikohe Hill existing source 1000m³/day

Maximum daily demand requirement from future source = 2300m³/day

(Equivalent to peak weekly demand) 12,000m³/week

The peak daily demand figure of 2,300m³/day has been used in the water right application for the Rangihamama area.

5.2 Subsequent Assessment

Some further consideration has now been given to this maximum daily demand figure as it represented a peak overall daily demand of about 600 litres/head/day. Although this is high for larger local authority domestic supplies, many of the smaller authorities are recorded at higher figures in the MWD Local Authority Water Supply Statistics. It is a peak figure experienced on occasional days during periods of high demand in extremely dry weather conditions in the summer, but if water restrictions are to be avoided it has to be planned for.

Industry figures for small local authorities have a decided effect on per capita consumption, e.g. the milk treatment plant alone at Kaikohe at present consumes water on an average over the summer at a rate of about 80 l/capita/day and on a peak day, this could conceivably be over 100 l/person, which is included in the 600 l/person above. With other major commercial and industrial water useage deducted, the nett domestic per capita figure would be lower again. Industrial use does not have the same impact on many of the authorities with much larger domestic populations, as it does

on a relatively small domestic population such as that of Kaikohe.

The water right figures above were based on an earlier peak demand measurement actually recorded in the Borough in the 1982-85 years when Lake Omapere water was freely available. Some major leaks were discovered and a leak detection programme was instituted which later resulted in an improvement.

Subsequently Council and residents have also been aware of the vulnerability of their water supply since the Lake Omapere source has been discontinued, and a drop in consumption has been achieved due to the publicity and warnings and restrictions which have been placed over the last 2 summers. Also, although dry seasonal periods have occurred, no severe drought period has been experienced. These facts, as well as the reduction in leakage losses, has resulted in less useage. The figures for total demand given below should perhaps be increased to allow for a future non-restricted supply.

In addition, the bores on Kaikohe Hill have shown a reduction in capacity over latter years, and although the water right authorisation was for a peak demand of 1100m³/day this amount has not been able to be achieved. Therefore there is a further demand on the Rangihamama source and this is shown in the tables below.

TOTAL WATER DEMAND - KAIKOHE HILL PLUS RANGIHAMAMA

	<u>Average Weekly Recordings</u>		<u>Assessed on a Daily Basis</u>		
	6mths Summer	Peak Week	6mths Summer	Peak Day	Maximum D.D.
1985/86	9910m ³	12220	1415m ³	1745	2090
1987/88	10600	12050	1514	1721	2065

Revised present maximum daily demand, say 2060m³/d
Escalated forward 25 years @ 1.25% compound 2800m³/d

Kaikohe Hill Extractions (Bores)

1985/86	3320m ³	5687	474m ³	812	934
1987/88	2430	3460	347	494	568

Revised maximum daily useage now available (Bores) 500m³/d

Suggest that in the future this may be less - refer Roberts report on effect of Rangihamama draw-off in the future. It could also have an effect on Squires Springs.

Allow, say (Bores) 450m³/d
(Squires Springs) 150

Total Kaikohe Hill 600m³/d

Rangihamama Supply

Thus maximum daily demand in future	2800
<u>Less</u> Kaikohe Hill source	600

<u>Nett Rangihamama Extraction</u>	2200m ³ /d

This revised assessment is little different from the water right application figure.

5.3 Average Demand

Although the water right application has to take into account the peak demand, the aquifer will not be unduly affected by this peak as it will only occur occasionally. The summer water demand over 6 months is the criteria to be considered.

This can be shown from past records to be (from the above tables) about 1500m³/day.

If this is escalated forwarded over the planning period as above, it amounts to 2050m³/day for the total aquifer and after allowing a nett 600m³/day from Kaikohe Hill for the bores and springs, leaves only about 1450m³/day in the Rangihamama area.

6.0 GROUNDWATER INVESTIGATIONS6.1 Study Undertaken

My firm recommended to Council that they utilise the services of geophysicists, Groundsearch Geophysics Ltd. of Auckland, to carry out a geophysical survey of the basalt areas around Kaikohe to select exploration bore sites. This work was carried out towards the end of 1986 with two areas being selected for exploratory bores, one immediately to the south of the Borough and the other to the north-east. Groundsearch Geophysics co-opted Carryer & Associates of Auckland for the hydrogeological testing and analyses of the test bores and Mr. Thompson of Carryer & Associates provides detailed evidence of this investigation.

7.0 THE PROPOSAL

The proposal for augmenting Kaikohe's water supply to meet the future maximum daily demand of 2300m³/day is to undertake the following work:-

- (a) Construct 2 production bores drilled to approximately 75m and cased to approximately 43m in the Rangihamama area, as indicated from the resistivity survey and exploration bore testing. The boreholes will be 250 dia. with 200 dia. high pressure multi-stage deep bore submersible pumps installed.

- (b) A 225 dia. PVC high pressure pipeline, over a length of about 3000m will be constructed as a rising main to convey the high pressure bore water direct to the reservoirs on Kaikohe Hill. This pipeline will be of sufficient capacity to carry the water from two boreholes pumped simultaneously.
- (c) Three further monitoring boreholes have been constructed so that regular checks on the aquifer can be maintained during all seasons to ensure that other existing bores within the vicinity are not being unduly affected.

8.0 WATER RIGHT APPLICATION

Evidence from a specialist geophysicist and a hydrogeologist is to follow with technical data to support the application No.4393 for a water right which was submitted to the then Northland Catchment Commission, the Regional Water Board, on 30th June 1987. This application was for a maximum daily demand of 2,300 cu.m./day from probably 2 production boreholes to be situated in the Rangihamama area.

The evidence also supports the application No.1862 for a renewal of an existing water right on Kaikohe Hill for 1100m³/day (33,000m³/month) for water from both the bores and the springs.

9.0 CONCLUSION

The 1986 report on alternative sources of water supply prepared by my firm showed that provided initial testing and geological advice could support the proposals for abstracting water from the area south of the town and a water right obtained, Council would have a satisfactory and economically viable source of supply to replace the loss of the Lake Omapere source. Kaikohe has always been able to provide a good and economical source of water for its citizens and industry and if a satisfactory source of water is not found to serve it in the future, its continued growth and development will be severely restricted.

It is recommended that the peak daily demand figure of 2300m³/day be confirmed in the water right, and possibly an average figure of about 1450m³/day over the summer period for the whole catchment could be considered. It is also recommended that the figure of 1100m³/day peak draw-off for Kaikohe Hill be retained. This source will be urgently needed this summer, but will not be so critical in the future if 2300m³/day is granted from the Rangihamama area.

---ooo0ooo---

L.R. THOMAS.



IN THE MATTER OF: The Water and
Soil Conservation Act 1967 and

IN THE MATTER OF: Water Right
Application Numbers 4393 and 1862
by Kaikohe Borough Council to take
water from bores for Town Supply.

Statement of Evidence

1) My name is Ian Curtis Thompson. In 1975 I Graduated from Auckland University with a Master of Science degree in Geology. I have worked as a geologist specialising in groundwater hydrology, well design, construction and testing for ten years. Since 1983 I have been a partner with Carryer and Associates Limited, Consulting Geologists and I am responsible for the groundwater projects undertaken by the company.

2) The aquifer covers an area of 15 square Kilometers extending from Kaikohe Hill, 1.5 Kilometres northwest of Kaikohe town centre, to Kaikohe Aerodrome 5 Kilometres to the south. It is composed of extensively fractured and porous Basalt emplaced in two phases, with the eruption centre located at Kaikohe Hill. Basalt thickness is known where either private boreholes, vertical resistivity soundings, or exploratory wells drilled as part of this study have detected the base of the flows. These indicate a saturated thicknesses ranging from 20 to 50 metres, with the highest figures obtained in between State Highway 12 and Rangihamama Road. This has been interpreted as a northwest /southeast aligned channel infilled with older Basalt lava that flowed southeast along an ancestral valley cut into Tertiary basement rocks. Recharge to the aquifer is by direct infiltration of rainfall. Water flows generally in a southeasterly direction from Kaikohe Hill and drains naturally from the system via a number of springs located at intervals along the eastern and southern edges of the Basalt plateau. Well known springs also occur in the Squires Road area.

3) In April 1987, our firm was engaged by Groundsearch Geophysics Limited to carry out a pumping test on an exploratory well, designated as Bore 2 for this study, drilled 120 metres west of Rangihamama Road during December 1986. The bore was drilled using a combination of percussion and rotary methods to a depth of 80.7 metres, encountering Basalt rock with minor ash layers to 74.9 metres, at which depth mudstones were intersected. A similar geological sequence was encountered in a second bore, drilled 118 metres to the east, adjacent to Rangihamama Road (bore 2A), although the depth to the base of the Basalt was considerably shallower (56.0 metres).

4) On the basis of preliminary work done on these two bores by Carryer and Associates and Groundsearch Geophysics Limited in December 1986, it was known that bore 2 was capable of yielding water from fractures and pores within the Basalt at a rate of approximately 2700 cubic metres per day and that bores 2 and 2A were hydraulically connected. It was also known that the



potential production from bore 2A was likely to be 60% lower than that of bore 2 due to reduction in aquifer permeability and saturated thickness in the direction of the second well.

5) During May 1987, bore 2 was pumped at a constant rate of 400 cubic metres per day for 3 days (12 May to 15 May). Water levels were recorded at regular intervals in the pumped well, bore 2A and five other observation bores (refer Figure 1), four of which are privately owned facilities. Extreme drought conditions were prevalent at the time of the test, with little or no recharge to the aquifer for a number of months. Standing water levels measured prior to the commencement of the test are shown in Figure 2.

6) Results from the pumping test were analysed according to geological information contained in a report prepared by Groundsearch Geophysics in April 1987, and geohydrological data collected by the same firm in October/ December 1987, during preliminary investigation drilling. A report by Carryer and Associates was presented to Council in June 1987, in which it was concluded that the potential daily capacity of bore 2 was 1550 cubic metres.

7) Weekly water level measurements in all bores monitored during the pumping test commenced in October 1987 as a result of recommendations contained in our report. Hydrographs for each of the observation bores are shown in Figures 3, 4 and 5. An automatic recorder was installed on bore 2 by the Northland Regional Council in August 1987. Three additional observation bores, two of which were constructed as multipoint piezometers (referred to as bores 7, 8 and 9) were drilled in March 1988. These were also included in the weekly monitoring programme, with automatic recorders installed on bores 7 and 8 during May.

8) In July 1988, water level and rainfall data were analysed and the May 1987 pumping test was re-appraised using new information obtained from the new observation bores. These showed that the ash layer previously thought to divide the lava flows was not as laterally continuous and as impermeable as indicated by earlier work. Piezometers placed in the "upper" and "lower" flows showed almost no difference in hydraulic head. It was concluded that both flows were part of the same aquifer. A check on aquifer parameters calculated from the test and first estimates of aquifer recharge were made. Estimations of Storage coefficients based on even extremely low proportions of rainfall infiltration (10%) showed that the values obtained the pumping test were conservative and only representative of aquifer behaviour in response to short term stress. Storage coefficients calculated by assuming 10% and 40% infiltration were 0.01 and 0.06 respectively.

9) Recharge volumes were estimated for a range of feasible values of percentage rainfall infiltration. A range of 10% to 40% was felt to be consistent with the observed response of the aquifer to rainfall events shown on the hydrographs. These gave average daily recharge of 5500 cmpd (cubic metres per day) to 22,000 cmpd, using rainfall figures from Kaikohe Aerodrome for the period September 1987 to March 1988. Corresponding



Kaikohe Groundwater Study- Tribunal Evidence...page 3

calculations using a complete year of rainfall normals from the D.S.I.R. Meteorological station for 1956 to 1978, gave a similar range of 7200 cmdpd to 29,000 cmdpd.

10) Existing allocations from the aquifer are 1682 cmdpd, including Council's original Water Right of 1296 cmdpd. Council's new and revised applications would increase this figure to approximately 3300 cmdpd. Based on estimates recharge discussed in paragraph (8) above, the proposed abstraction by Kaikohe Borough Council, plus that of existing groundwater users would therefore be 60% to 15% of recharge during years when rainfall coincides with the annual normal indicated by the D.S.I.R. station data.

11) Analysis of flow nets drawn using water level data recorded immediately prior to the May 1987 pumping test and on 17 May 1988, when the seasonal minimum groundwater level was measured (see Figures 3 and 4), gave an underground flow of 2500 cmdpd. This figure is representative of the flow through the aquifer during conditions of extreme drought when virtually no recharge is being added to storage. It does not indicate total flow as the flow net grid does not cover the entire aquifer area (refer to Figures 2 and 6). Calculations of underground flow using the above method assume that the hydraulic gradient remains constant, whereas the hydrographs show that this is considerably steeper during recharge events. Flow of groundwater is therefore increased during these periods.

I.C. Thompson

31 August 1988

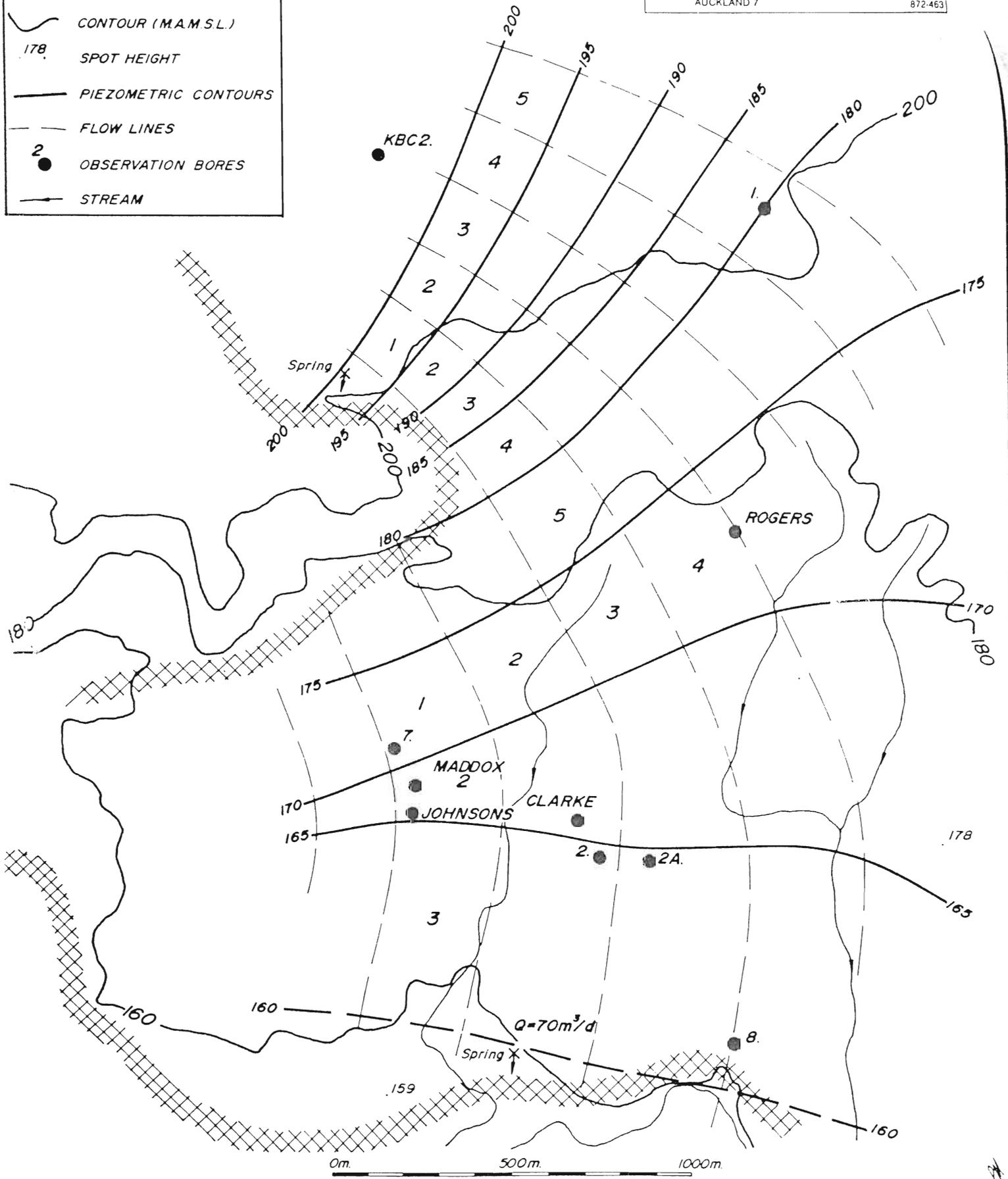
823-31.evd(3)

FIGURE 2

LEGEND

-  EDGE OF BASALT
-  CONTOUR (M.A.M.S.L.)
- 178.  SPOT HEIGHT
-  PIEZOMETRIC CONTOURS
-  FLOW LINES
- 2.  OBSERVATION BORES
-  STREAM

CARRIER & ASSOCIATES LTD.
 CONSULTING GEOLOGISTS
 PO BOX 15 483
 AUCKLAND 7
 PHONE 871-999
 872-463



PIEZOMETRIC CONTOURS
 ON 12-05-87

JOB NO. 360/0823

DRAWN I.C.T.	CHECKED	SCALE 1-10,000	SHEET
TRACED P.M.	DATE SEP/88		SERIES OF
			REF

Figure 3— Observation bore Water Levels

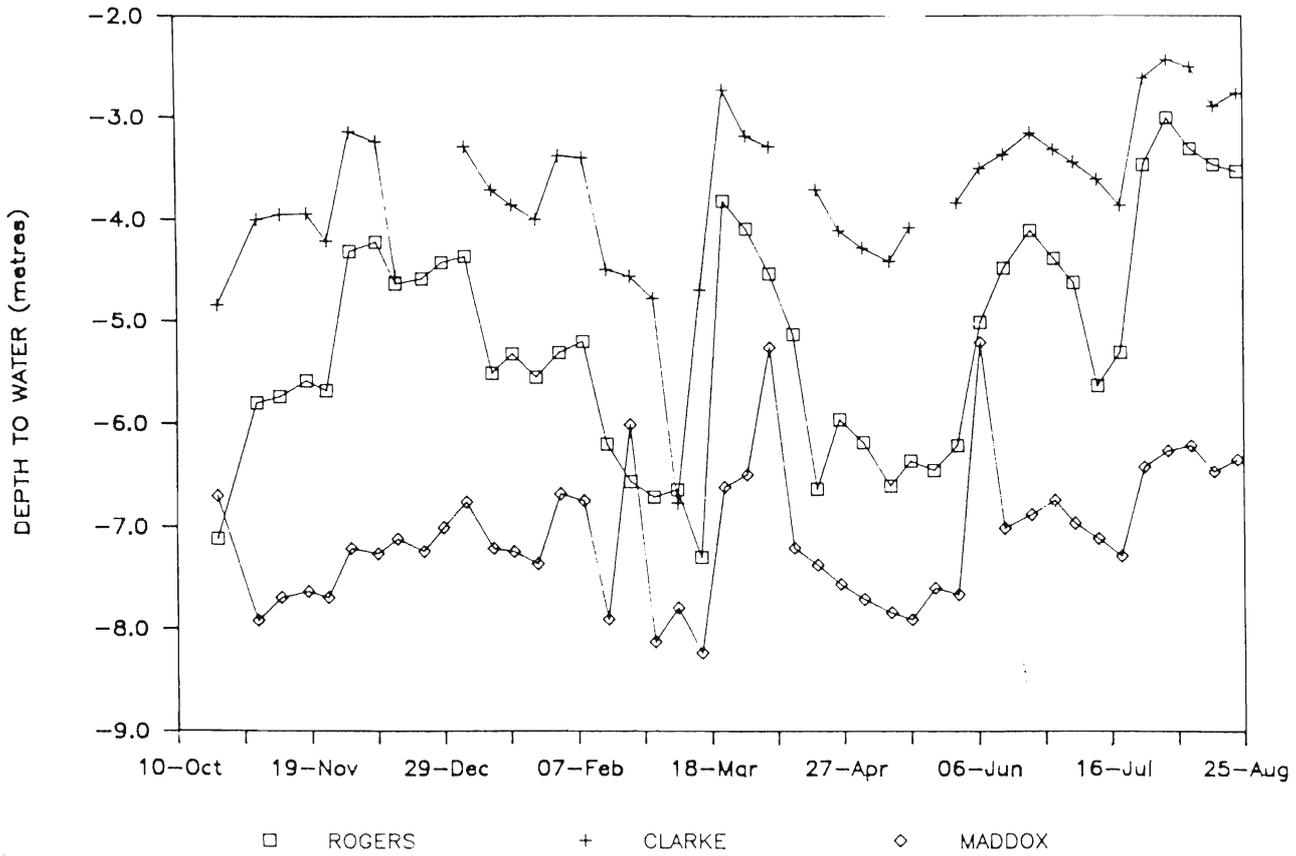


Figure 4— Observation bore Water Levels

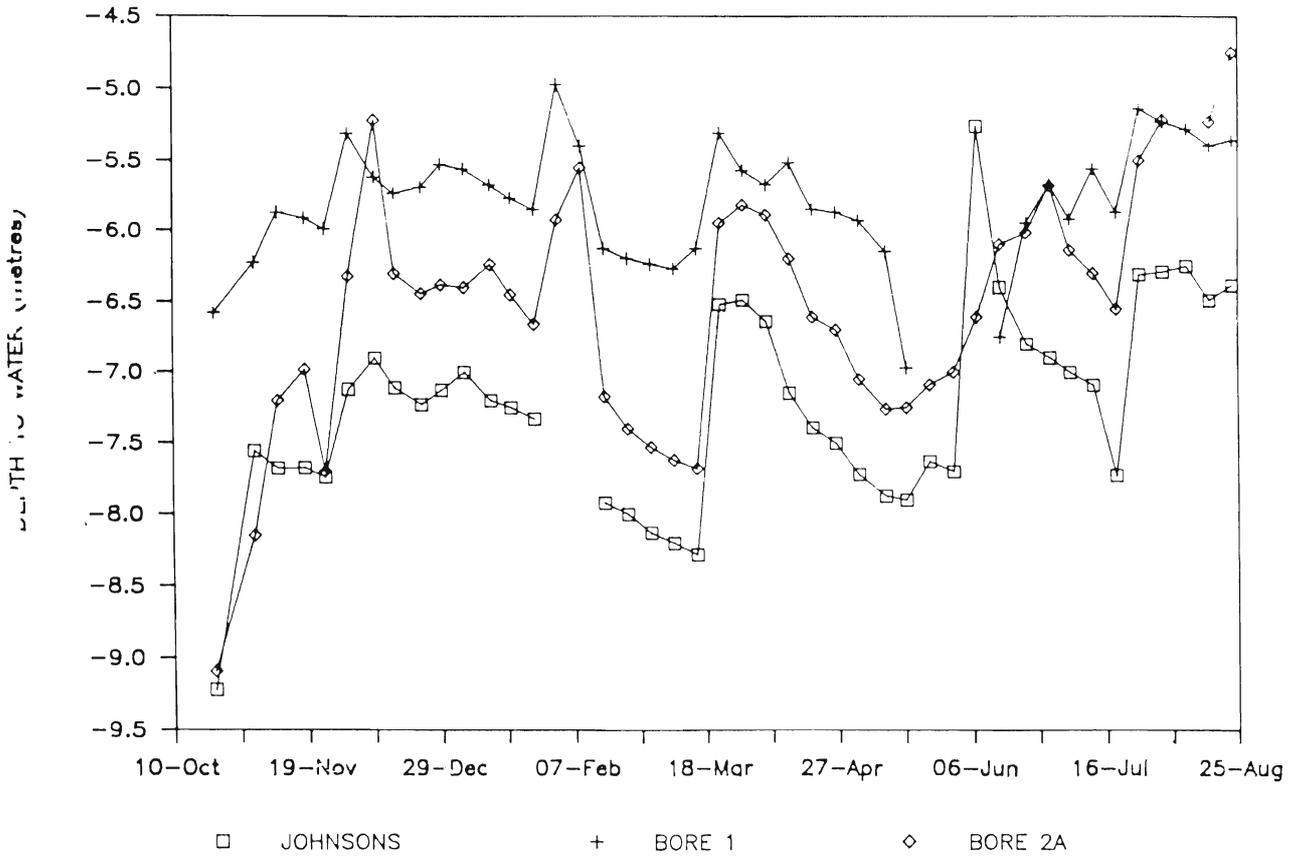


Figure 5— Piezometer Water Levels

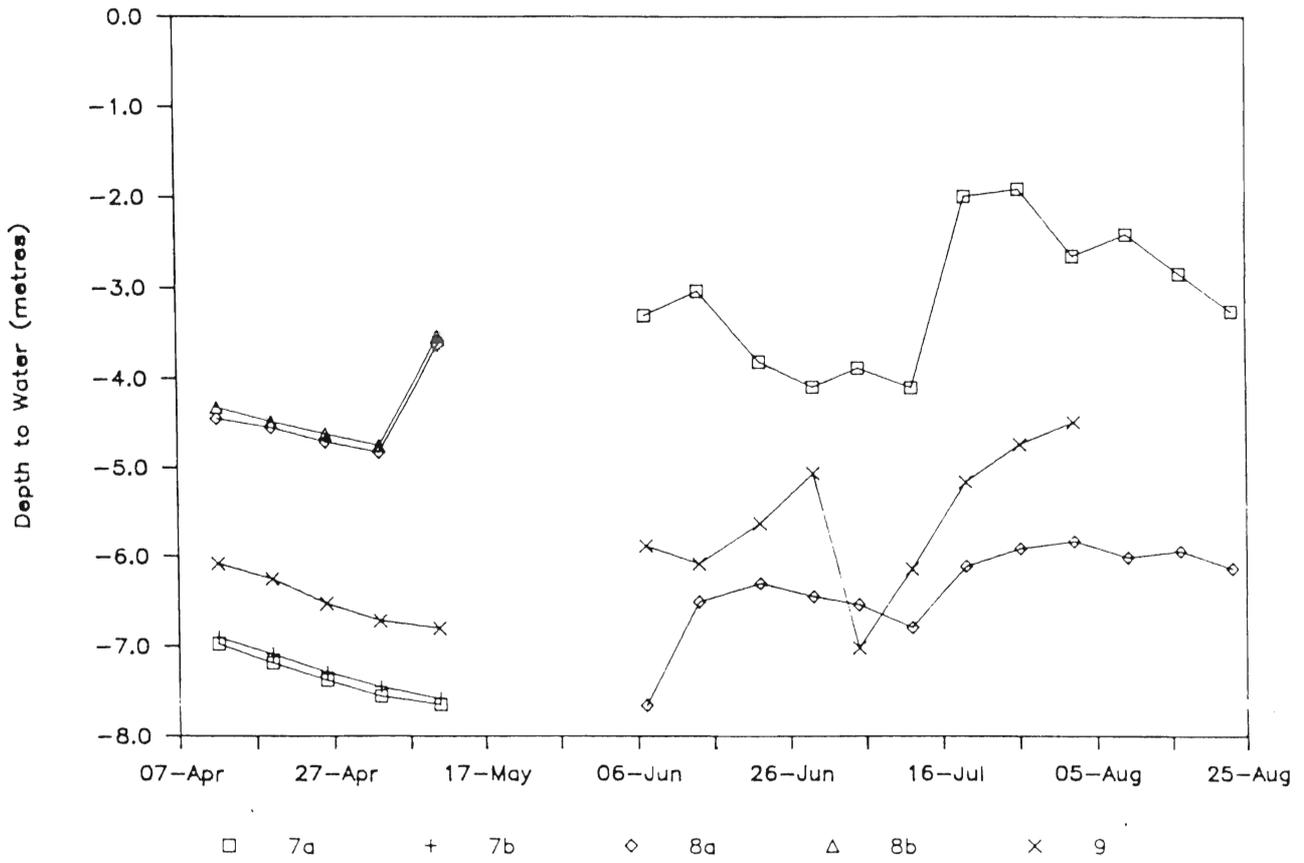
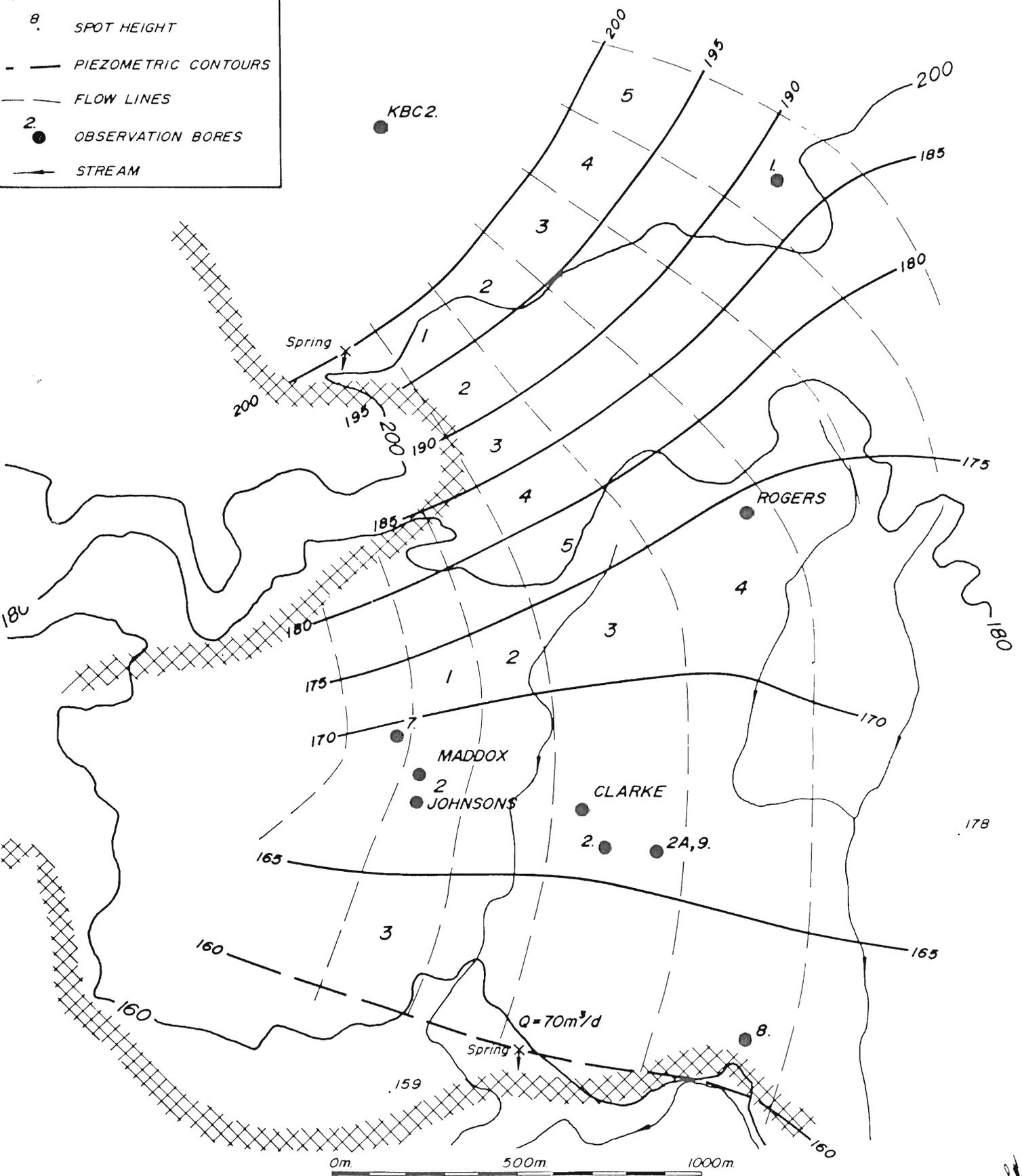


FIGURE 6.

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LEGEND

-  EDGE OF BASALT
-  CONTOUR (M.A.M.S.L.)
-  SPOT HEIGHT
-  PIEZOMETRIC CONTOURS
-  FLOW LINES
-  OBSERVATION BORES
-  STREAM



**PIEZOMETRIC CONTOURS
 ON 17-05-88**

JOB NO. 360/0823

DRAWN I.C.T.	CHECKED	SCALES 1-10,000	SHEET
TRACED P.M.	DATE SEPT 88		SERIES OF REF

IN THE MATTER OF: The Water and
Soil Conservation Act 1967 and

IN THE MATTER OF: An Application
by Kaikohe Borough Council to take
up to 3400 cubic meters per day of
water from bores for a Town Water
Supply.

Statement of Evidence

1.1 My name is Grant Willis Roberts. In 1980 I graduated from University of Auckland with Master of Science (Hons) in Geology and Geophysics. I have worked as an Applied Geologist specialising in Hydrogeology, Geophysical Exploration and Groundwater modelling for 8 years. I have been the principal of Groundsearch Geophysics Ltd, for 4 years. I am the proprietor of the above said company and are responsible for managing and carrying out of work in the company.

1.2 I act as consultant for a number of Public Authorities in New Zealand. I have carried out projects of a similar type in both New Zealand and Australia. I have acted as Geological specialist for this project since 1986.

2.1 I carried out geophysical surveys to determine likely sites for test bores near the borough in 1986. These gave the electrical resistivity profiles in a map form of the area near Kaikohe Borough. This work enabled us to deduce the concealed structure of the old valleys infilled with basalt. The results suggested several sites near the town which might have substantial thickness of Basalt. I then proposed that these sites be test drilled to evaluate their potential for development as production bore sites.

2.2 I, with Mr Thompson of Carryer and Associates entered drilling tenders for the exploration drilling phase of this project. This drilling work was subsequently carried out by Brown Bros of Hamilton and supervised on site by myself. The exploration drilling showed that the thickest area of Basalt was at Rangihamama Rd. The yield from this bore were substantially higher than any other site. The other sites tested were in town near the old Dairy Factory and on the farm owned by Mr Cliff Price.

2.3 I acted as advisor to Mr Thompson during the pumping test phase of this project. Mr Thompson has commented on this in his evidence.

2.4 I was briefed by Mr Ian Thompson and Mr Rhys Thomas to produce a computer simulation of the volcanic aquifer incorporation all the data we have available now.

2.5 The aims of the model were :-

- 1 Develop a groundwater model that matched predicted water levels with existing data.
2. Give the impact of the proposed take on springs in the area and on water levels in the aquifer.

Calibration Runs

3.1 The model was tested and calibrated for a range of transmissivities and storage coefficient greater and less than the value adopted.

Storage Coefficient

3.2 There is a direct relationship between storage coefficient and rainfall infiltration. That as the storage coefficient was increased the percentage of rainfall infiltration needed to be increased in order to match the aquifer response to rainfall.

3.3 The flow out of the edges of the aquifer to the streams was also sensitive to storage coefficient. The lower values of storage give faster movement of water out of the aquifer and lower predicted values of stream flow under summer conditions (low or only small infiltration).

3.4 The best value of storage which fitted all the above criteria was 2.5%. This gives gains in the Wairoro stream of 2500 m³/day between Northland College and the Quarry. NRC carried out stream gaugings over the same area which showed that for a 1 in 5 year drought (what this means for rainfall we have no data for now) the gain over the same interval would be 1500 m³/day.

Head Values

3.5 The gross head values are in good agreement with the field values. There are discrepancies in the town area and at Rogers bore. I think that the reason for these differences are related to departures from the assumption about distribution of transmissivity and storage. Another aspect which will affect this is that several surface streams drain the catchment in the area of Rogers. I think that these are affecting the heads (by the stream draining away head above a certain value). The model in its current form only partly accounts for this effect.

3.6 The head values at the constant head boundary at the Wairoro stream have been modified to partly simulate the effect of surface streams. These heads set below the water level in the stream, closer to the head observed in the bore at Rogers.

Rainfall

7 The infiltration rates for volcanic aquifers given by French (1979) and Roberts (1979) range from 25% to 100%. I adopted values that would be 25% of the average winter rainfall for all

the active areas of the model (on the volcanic aquifer). This is 0.152m of recharge over 180 days of winter with no recharge over summer. The area in on the Hill is assigned a higher recharge of 0.45m over the same time period. This is equivalent to 50% of the winter rainfall (data provided by NRC suggests that the rainfall on the hill is 50 to 60% higher than that observed at Kaikohe Airport).

Conclusions Drawn from the Model Presented

Water Level Changes

4.1 Average water level declines are predicted to be 6 to 10 meters, with the peak decline of 17 meters within 250 meters of the Rangihamama bores. The water level decline is a maximum near the main pumping area. The pumping is modelled as coming from one area with a diameter of 500 meters. This will tend to underestimate the drawdown near each production bore but overestimate drawdown at the edges of the pumped area.

4.2 Peak water decline in the Rangihamama Rd area is predicted to be 19 meters in the area of the production bores or 24 meters below the long term average level.

4.3 Average summer water level decline in the Rangihamama area (below normal summer water level) is predicted to be 13 to 16 meters. The predicted water level decline decreases to about 6 meters at distances greater than 1500 meters from proposed borefield.

4.4 I ran one simulation which approximates a drought where rainfall is one half normal levels. This showed that water level should drop about 6 to 7 meters below normal summer water levels.

4.5 The pumpage figures presented for this model are average figures for over the total summer and Winter seasons. They do not represent a simulation of the maximum daily demand volume applied for. We would anticipate that this maximum daily demand will not effect the water level predictions.

4.6 The effect of pumping the aquifer at reduced rates is shown in figure 3.3. This would simulate the effect of bore pumpage during the earlier part of the borefield life at lower pumpage volumes.

Spring Flow

4.7 Spring flow in the immediate area of the bores is predicted to change markedly but the effect will decrease with distance from the borefield. The water level predictions for the immediate borefield area (within 250 meters of the borefield) suggest that water table springs within this area will cease to flow. The effect farther away is less certain as whether a spring will flow or not depends on the water table height and the height of the

land surface. It is probable that as the predictions for the drought levels are similar, that in the Rangihamama area the spring flow will be similar to that in a severe drought as happened last year.

4.8 The effects on water levels in existing pumped bores are quantified by the water table maps presented. The effect of the proposed new bores will add 10 to 15 meters in the immediate area (250 meter radius) and about 6 meters outside this radius to 1500 meters and then diminishing to zero at the periphery of the aquifer. The predicted water level will likely vary from the observed water level on the finer scale (10 to 500 meter scale) but will agree more closely on the larger scale 500 meters to 1000's meters. These changes should then be used as indicative of the order of change rather than as absolute level changes.

Limitations on Data Available, Unknown Aspects

5.1 One critical feature that is not obtainable now is the way stream flow and spring flow changes over the summer period when rainfall is minimal. If the flow is significantly higher than what we assume here then the model predicts that the impact of pumping will be significantly less. The higher flow would show greater storage volume and hence lessor change in head with pumpage of water from the aquifer.

5.2 The head values at Rogers and for the test bore in town are not adequately fitted by this model. The simulation might be altered, once the stream flow data is available, to better match these heads.

5.3 The model is sensitive to variations in aquifer properties. More information about these properties will help assessment of impact of the takes proposed.

Conclusion

6.1 The proposed borefield is expected to have some impact on springs in the immediate area of the pumped bores, there will also be some effect on existing production bores nearby. These effects are minimal and appear to still enable existing users outside the immediate area of the borefield to have access to groundwater.

6.2 The modelling has been based on conservative estimates of aquifer parameters. The take volumes used as input to the model are projections based on median population growth. There appears to be ample time to review the impact of these bores on the aquifer as the pumpage increases.

6.3 I think that the aquifer can sustain these proposed bores without undue impact. I also think that there remain substantial uncommitted volumes available for other yet unidentified new users of Groundwater.

Grant Roberts

2 September 1988

G R O U N D W A T E R M O D E L O F
T H E K A I K O H E V O L C A N I C
A Q U I F E R

Report on the Finite Difference Model Simulation for the Basalt Aquifers
at Kaikohe, Northland.

for Kaikohe Borough Council and Fraser Thomas Partners Ltd

GROUNDSEARCH GEOPHYSICS LTD

Job 212
September 1988

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Kaikohe Groundwater Model.

1.0 Introduction

1.1 Background

1.1.1 Kaikohe Borough Council are investigating alternative sources of town water supply. Fraser Thomas, Groundsearch Geophysics and Carryer and Associates have reported on the various options for extension of this supply. The council is investigating the feasibility of siting production boreholes at Rangihamama Rd.

1.1.2 Kaikohe is near the middle of the Northland Peninsula about 300 km north of Auckland. Average annual rainfall varies between 1580 and 1776mm per year (based on rainfall normals supplied by Northland Regional Council). The town is situated in a rural area. Farming in the area consists of mixed cattle and sheep to intensive Horticulture. The better areas of soil are tending to be developed into horticulture (or have been). The town has a population of 4000 people. It services an extensive hinterland. The town's population only growing slowly now, however population projections (L.R. Thomas pers comm) suggest a compound growth of about 1% for the next 25 year design period.

1.2 Geology

1.2.1 The topography consists of low rolling hills punctuated by the many old volcanic cones which dot the landscape. Old lava flows have tended to infill the valleys, ridges between the valleys are usually composed of basement clay rocks.

1.2.2 Thermal springs are found to the east at Ngawha Springs. This area has been explored by Ministry of Works to evaluate its potential for Geothermal energy. Several deep bores have been drilled but the Ngawha Point area. This was commented on in a previous report.

1.2.3 Occurrence of Groundwater is limited to the volcanic lava flows and old volcanic cones. These are of higher permeability (compared with the clay basement rocks) and have a high capacity to store water (large porosity).

1.2.4 French (1979) studied volcanics of the same age at Whangarei. He found that transmissivity of this material was between 24 and 4000 m²/day. He noted that the permeability derived from pumping tests was significantly less than that derived from aquifer underflow calculations (derived from spring flow). He concluded that infiltration was between 26% and 53% of rainfall.

1.2.5 Water storage and flow outside main rainfall periods comes from these volcanics. The Wairoro river gains water as it flows past the eastern edge of the volcanic lava (NRC stream gauging data). There are

many springs that begin on the volcanic rock and run over its surface and others that begin on the edge of the rock and form the headwaters of various minor streams. These all suggest that groundwater collects in the volcanic rock during wet periods and then gradually discharges over a more extended period of time. There is some information from the recent drought (1987) that some of these springs dry up during extended periods of reduced rainfall. This might suggest rate of storage drainage and likely effect of increased pumpage to water levels.

1.2.6 Presently users take water from springs and bores on and around the aquifer. The Regional Council supplied us with a list of these water takes. They total 1682 m³/day. Most of the water is used by potential for increase in these takes. This is taken to be 102 m³/day.

1.3 Previous Work

1.3.1 Fraser Thomas Partners have carried out assessments of present demand and projected future use. They investigated several options as part of their brief. These included building water storage dams in nearby catchments, pumping from rivers and streams and development of a borefield. Initial result from this assessment showed that borefield might be the most cost effective way of developing a supply for the town.

1.3.2 Groundsearch Geophysics carried out geophysical surveys to determine likely sites for test bores near the borough (Roberts 1987). This report suggested there were several potential test bore sites and that these should be investigated. These sites were test drilled and a report was entered (Roberts (1986)). Carryer and Associates subsequently carried out pumping tests on one of these sites (at Rangihamama Rd) (Thompson 1987) to determine bore yield. This report concluded that the aquifer permeability varied between 80 and 250 m²/day and that it would be possible to pump a bore at this site a flow of about 2700 m³/day. Thompson/ Roberts(1987) recommended that a monitoring network be established to give information about water level changes in the aquifer. Thompson (1988) reported on work he carried out about comparison of rainfall data and aquifer water level data. He concluded that infiltration might vary between 10% and 40% and recharge to the aquifer would vary between 5500 and 22000 m³/day.

1.3.3 The Council has now decided to apply for a water right to obtain water from several bores tapping this aquifer. To help the assessment of available water and the impact of these takes on the aquifer (springs and water levels) Groundsearch Geophysics has developed a computer simulation of the aquifer.

1.3.4 The aims of the model were :-

1. Develop a groundwater model that matched predicted water levels with existing data.

2. Give the impact of the proposed take on springs in the area and on water levels in the aquifer.

1.3.5 The model represents our appreciation of the aquifer now. More work may be needed to answer questions raised by the model. The model would then be updated to reflect this new information.

2.0 Discussion

2.0.1 Why produce a groundwater model? The model will give us a better understanding of the system, it helps to structure and synthesis our ideas. The model allows us to express our ideas about the system in a concise way. It also focuses effort into a goal (i.e. producing the model). It allows us to examine the "what if" resulting from different choices of action.

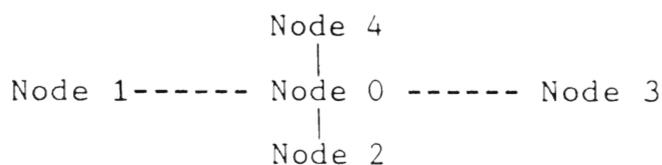
2.0.2 The model the writer have used for this simulation is the United States Geological Survey (USGS) Groundwater Model (Modflow). This is a comprehensive model package incorporating options appropriate for this aquifer system.

2.0.3 The basic flow equation for this model is as follows

$$\begin{aligned} \text{Head in Node} &= \text{Start Head} + \text{Recharge} + \text{Leakage} - \text{Pumpage} \\ &\quad - \text{Flow 1 to 0} - \text{Flow 1 to 2} - \text{Flow 1 to 3} - \text{Flow 1 to 4} \end{aligned}$$

--- Equation 1

Where flow 1 to 0, 1 to 2 etc. follows the notation below



2.0.4 Flow between nodes is according to Darcys laws of flow and is simulated using a finite difference approximation.

2.0.5 The solution is arrived at by making several passes through a mesh of interconnected nodes of the form above, and using the water balance equation shown above that. The solution closes when after recalculating the mesh the changes for one run too the next are fewer than a specified value (usually 0.1 to 1 meter). The model can be extended by adding the effect of layers above and below the layer by making the mesh into a 6 point star rather than the four point star above.

2.0.6 The Transmissivity is substituted into the internode equation, storage is included by saying that as a certain volume is added or withdrawn from the node then the head will change in direct proportion to that storage withdrawal.

2.0.7 The model has a solution when we specify all the storage changes over time and fix the flow or head conditions around the edges of the model. These "edge" nodes have special properties and are conditioned to change in controlled ways in response to storage changes in the model. This model incorporates two boundary types, "a constant head boundary" and a "No Flow boundary." The constant head boundary is conditioned so that means that no matter how much water is or flow out withdrawn the head does not change. This resembles a large tank of water or large sink directly connected to the model. The NO FLOW boundary is what it says, no water is transmitted through this boundary.

2.1 Conceptual Model

2.1.1 The aquifer characteristics are assumed to not vary significantly over the mapped aquifer area. The Transmissivity was assigned as a constant value of 80 m²/day and the storage coefficient was varied between 1% and 10% with a best fit value of 2.5%. This may cause some errors in calculating individual node values, however the writer thinks this will introduce no gross error (that is unless the transmissivity value we have assumed is grossly in error).

2.1.2 The storage coefficient is derived from geologic information. The storage coefficient from the pumping test (Thompson 1988) reflects the response of the aquifer to short term pumping. For long term effects the primary porosity will have a far greater impact. The writer has assumed that this will be between 2.5 and 10 %. The model we present for our primary argument has a porosity of 2.5%. We also have tried other alternative solutions for higher values of storage coefficients (the reader would note however that these also have higher infiltration rates).

2.2 Aquifer Boundary Conditions

2.2.1 The boundaries to the aquifer then give us information about how water flows out of storage in the aquifer to the springs and streams in the area. There were several possibilities for boundary conditions. The boundaries next to streams are assigned as constant head. Two nodes in the south-west and west were also assigned as constant head. These are areas where the basalt flows finish at the head of valleys. The aquifer would likely drain into these valleys. The area at the north of the aquifer (north of the town) was assigned as constant head. This is an area where flow from up valley would likely drain into the aquifer. There was no specific data about this connection. It will act as a source of storage for the aquifer but this flow may be a head dependent flow. The constant head boundary is a simplistic way to model this flow. All other boundaries to the aquifer are assumed to be impervious.

2.2.2 The constant head boundaries type will limit the maximum head the aquifer will rise to under conditions where pumping is minimal. They however may overestimate potential water available where the aquifer is stressed heavily by pumping. The reason for this is that while the stream will act to conduct water out of the aquifer when it overflows, unless there is water in the stream at low flows no water can get into the aquifer. Under these condition the Constant Head boundary will predict an inflow when none will occur.

2.3 Model Concepts

2.3.1 In essence the Kaikohe system is a set of aquifers (acting as one) fed with water from rainfall and discharging water to various springs and streams around the edge of the flow. There will be a head gradient with higher heads in the north (related to the height of the land) and lower in the south (where it discharges to the river).

2.3.2 In its pre-pumped (steady state) regime, the amount of water flowing out of the edges will be equal to that coming from rainfall. We will call this inflow Q_i and the outflow Q_o . If we now extract water from this system (Q_w) at a rate less than Q_i the water level in the area near the wells will decline. Initially water will move from storage near the wells but with continuous pumping the system will stabilize at a new and lower level. This probably will be more water coming from rainfall recharge and less discharge to the streams.

2.3.3 So

Initially	$Q_i = Q_o$	Equilibrium -- Equation 2
Then	$Q_i = Q_o + Q_w$	with pumping -- Equation 3

where

$Q_i =$ Inflow to wellfield from rainfall
 $Q_o =$ Outflow to springs and streams
 $Q_w =$ Pumped volume from wellfield

2.3.4 The amount of water level decline will depend on Q_i and this represents the amount of water that is available from rainfall. We do not at this stage have a definite value for Q_i .

2.3.5 If Q_w is greater than Q_i then we might induce a reversal of flow Q_o to draw water back from the streams. This may appear possible but can only occur when there is flow in the streams from other sources (from farther up in the Catchment). Thus in summer when the stream flow is less or very small there will be no or only minimal water available to maintain the head and the flow at this boundary, but in winter or when stream flow does occur the inflow and recharge would occur very quickly.

2.4 Model Setup

2.4.1 This model is calibrated for conditions of minimal pumping (proportion to available recharge). There is minimal information about what changes might occur when the aquifer is more heavily pumped. Thus any conclusions that are made are opinions of the modeller based on conservative assumptions. One of these assumptions is that no additional recharge will occur as a result of this pumping. If there are heavy drawdowns in summer there will be more storage volume available in Winter and less recharge will be redirected to stream flow. Often where the water table is close to surface allowance would be made for losses due to evaporation from the water surface. This has been incorporated in the percent infiltration factor we have assigned to the model. If the water table drops significantly this evaporation will be less and there will be more water available for pumpage from well and springs downstream.

2.4.2 The first criteria we have for the model is from transmissivities and permeabilities from pumping tests. These establish values used in the model. The water level data gives the dynamic water levels we must reproduce with the model.

2.4.3 The model grid is arranged so that the nodes or block spacing the same over the whole wellfield, 500 meters.

2.4.4 The edges to the model, or the boundaries are put at the edge of the volcanic lava flow or where it appears one can infer a head value.

2.5 Model Time Periods

2.5.1 The modeller adjusted the pumpage periods in the model to match with seasonal variations and pumping period and cycles in the existing wells.

Table 1. Model Time Periods

Stress Period	Time (days)	Pumping Rate (m3/day)	Remarks
1	100,000	None	Equilibrium
2	7,200	750	Wellfield Historic
3	180	1000	Summer Pumpage
3a	5	1000	Cyclone Bola Rain
3b	30	1000	Water level deline after Cyclone Bola
4	180	400	Winter Pumpage

2.5.2 The initial period 1 was to allow the system to come to equilibrium with no stress apart from boundary inflows. The next step was to simulate the development history of the wellfield (ie 20 years prior pumping). This also again gets the system into balance, so that the head changes are smooth or the system is in balance. Stress period

3,4 simulate the effect of the summer to winter pumping cycle. Stress period 3a,3b covers the of water level changes observed when Cyclone Bola affected rainfall.

2.6 Calibration Runs

2.6.1 The model was tested and calibrated for a range of transmissivities and storage coefficient greater and less than the value adopted.

Storage Coefficient

2.6.2 There is a direct relationship between storage coefficient and rainfall infiltration. That as the storage coefficient was increased the percentage of rainfall infiltration needed to be increased in order to match the aquifer response to rainfall.

2.6.3 The flow out of the edges of the aquifer to the streams was also sensitive to storage coefficient. The lower values of storage give faster movement of water out of the aquifer and lower predicted values of stream flow under summer conditions (low or only small infiltration).

2.6.4 The best value of storage which fitted all the above criteria was 2.5%. This gives gains in the Wairoro stream of 2500 m³/day between Northland College and the Quarry. NRC carried out stream gaugings over the same area which showed that for a 1 in 5 year drought (what this means for rainfall we have no data for now the gain over the same interval would be 1500 m³/day).

Head Values

2.6.5 The gross head values are in general in good agreement with the field values. There are discrepancies in the town area and at Rogers bore. The writer thinks that the reason for these differences are related to departures from the assumption about distribution of transmissivity and storage. Another aspect which will affect this is that several surface streams drain the catchment in the area of Rogers. The writer thinks that these are affecting the heads (by the stream draining away head above a certain value). The model in its current and changes in stream flows over a range of head conditions in the aquifer.

2.6.6 The head values at the constant head boundary at the Wairoro stream have been modified to partly simulate the effect of surface streams. These heads set below the water level in the stream, closer to the head observed in the bore at Rogers.

Rainfall

2.6.7 The infiltration rates for volcanic aquifers given by French (1979) and Roberts (1979) range from 25% to 100%. The writer has adopted values of that would be 25% of the average winter rainfall for

all the active areas of the model (on the volcanic aquifer). This 0.152m of recharge over 180 days of winter with no recharge over summer. The area in on the Hill is assigned a higher recharge of 0.4 over the same time period. This is equivalent to 50% of the winter rainfall (data provided by NRC suggests that the rainfall on the hill is 50 to 60% higher than that observed at Kaikohe Airport).

2.6.8 The higher value of infiltration on Kaikohe hill was required to match the predicted model head with the observed head values.

Transmissivity

2.6.9 There was a broad spread of transmissivity values between 20 and 150 m²/day. The value adopted is the value for the transmissivity at the production bore at Rangihamama Rd.

Cyclone Bola

2.6.10 The period of intense rainfall associated with Cyclone Bola gave a set of data where; a large quantity of rain fell in a short time; and there was both precedent and antecedent data available. The average water level rise was 1.7 meters, response time was virtually instantaneous. The rate of water level decline averaged 0.023 meters per day for the 15 days following and then reducing in rate to about 0.015 to 0.020 meters per day.

This event was modelled using existing infiltration percentages (20% of rain) and distribution as for the prior model runs (the rate of infiltration onto Kaikohe hill was 60% of the rainfall). The model predicted a 1.6 meter head rise and following this a decline of 0.02 meters per day.

3.0 Conclusions Drawn from the Model Presented

3.1 Water Level Changes

3.1.1 Average water level declines are predicted (fig 2.0 compared with fig 3.0) to be 6 to 10 meters, with the peak decline of 17 meters within 250 meters of the Rangihamama bores. The water level decline is a maximum near the main pumping area. The pumping is modelled as coming from one area with a diameter of 500 meters. This will tend to underestimate the drawdown near each production bore but overestimate drawdown at the edges of the pumped area.

3.1.2 Peak water decline in the Rangihamama Rd area (fig 2.2 compared with fig 3.2) is predicted to be 19 meters in the area of the production bores or 24 meters below the long term average level (fig 2.0 compared with fig 3.2).

3.1.3 Average summer water level decline in the Rangihamama area (below normal summer water level) is predicted to be 13 to 15 meters. The predicted water level decline decreases to about 6 meters at distances greater than 1500 meters from proposed borefield.

3.1.4 Conditions predicted for a drought are shown in Figure 2.3 (as predicted by the model). These show that water levels should drop about 6 to 7 meters below normal summer water levels.

3.1.5 The pumpage figures presented for this model are average figures for over the total summer and Winter seasons. They do not represent a simulation of the maximum daily demand volume applied for. We would anticipate that this maximum daily demand will not effect the water level predictions.

3.1.6 The effect of pumping the aquifer at reduced rates is shown in figure 3.3. This would simulate the effect of bore pumpage during the earlier part of the borefield life at lower pumpage volumes.

3.2 Spring Flow

3.2.1 Spring flow in the immediate area of the bores is predicted to change markedly but the effect will decrease with distance from the borefield. The water level predictions for the immediate borefield area (within 250 meters of the borefield) suggest that water table springs within this area will cease to flow. The effect farther away is less certain as whether a spring will flow or not depends on the water table height and the height of the land surface. It is probable that as the predictions for the drought levels are similar that in the Rangihamama area the spring flow will be similar to that in a severe drought as happened last year. The model is not sufficiently refined to estimate exactly which spring might flow under pumping conditions. The reader should note however our comments that our predictions are conservative and that the actual effects observed will probably not be as large as what the model predicts.

3.3 Effects on existing pumped bores

3.3.1 The effects on water levels in existing pumped bores are quantified by the water table maps presented. The effect of the proposed new bores will add 10 to 15 meters in the immediate area (250 meter radius) and about 6 meters outside this radius to 1500 meters and then diminishing to zero at the periphery of the aquifer. The predicted water level will likely vary from the observed water level on the finer scale (10 to 500 meter scale) but will agree more closely on the larger scale 500 meters to 1000's meters. These changes should then be used as indicative of the order of change rather than as absolute level changes.

3.4 Limitations on Data Available, Unknown Aspects

3.4.1 One critical feature that is not obtainable now is the way stream flow and spring flow changes over the summer period when rainfall is minimal. If the flow is significantly higher than what we assume here then the model predicts that the impact of pumping will be

significantly less. The higher flow would show greater storage volume and hence less change in head with pumpage of water from the aquifer.

3.4.2 The head values at Rogers and for the test bore in town are not adequately fitted by this model. The simulation might be altered, once the stream flow data is available, to better match these heads.

3.4.3 The model is sensitive to variations in aquifer properties. More information about these properties will help assessment of impact of the takes proposed. This data could then be incorporated in more detailed simulation. Pumping tests to give this data are recommended for all new bores and major older wells.

4.0 Conclusion

The proposed borefield is expected to have some impact on springs in the immediate area of the pumped bores, there will also be some effect on existing production bores nearby. These effects are minimal and appear to enable existing users to be able to still have access to groundwater.

The modelling has been based on conservative estimates of aquifer parameters. The take volumes used as input to the model are projections based on median population growth. Thus the council would not take the maximum average volume in these water rights applied for. There appears to be ample time to review the impact of these bores on the aquifer as the pumpage increases.

Groundsearch Geophysics thinks that the aquifer can sustain the proposed bores without undue impact. The company also thinks that there remain substantial uncommitted volumes available for other yet unidentified new users of Groundwater.

5.0 Recommendations

The work proposed relating to carrying out stream gauging and water balance studies is recommended to proceed at the earliest practical time. We would be happy to discuss with whoever does this work more details of what is required.

It is recommended that the computer simulation and its predictions be upgraded once this additional work has been carried out.

G.W Roberts
August 1988

REFERENCES

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McDonald M.G. and

- Harbaugh A.W. (1984) "A Modular Finite Difference Groundwater Model", report accompanying Fortran source code, prepared by US Department of the Interior.
- Roberts G.W. (1979) "A Geophysical/Hydrological Study of the Mt Wellington Area, Auckland New Zealand", unpublished M. Sc Thesis deposited at University of Auckland.
- Roberts G.W. (1987) "Report to Kaikohe Borough Council on Resistivity Surveys carried out at Kaikohe", unpublished report to Kaikohe Borough Council.
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- Thompson I.C.
Roberts G.W. (1987) "Pumping Tests at Rangihamama Rd", unpublished report to Kaikohe Borough Council.
- Thompson I.C. (1988) "Re-Evaluation of Pumping Test data and construction of Flow nets for water level data collected May 1987 to July 1987", Memorandum to Groundsearch Geophysics Ltd.

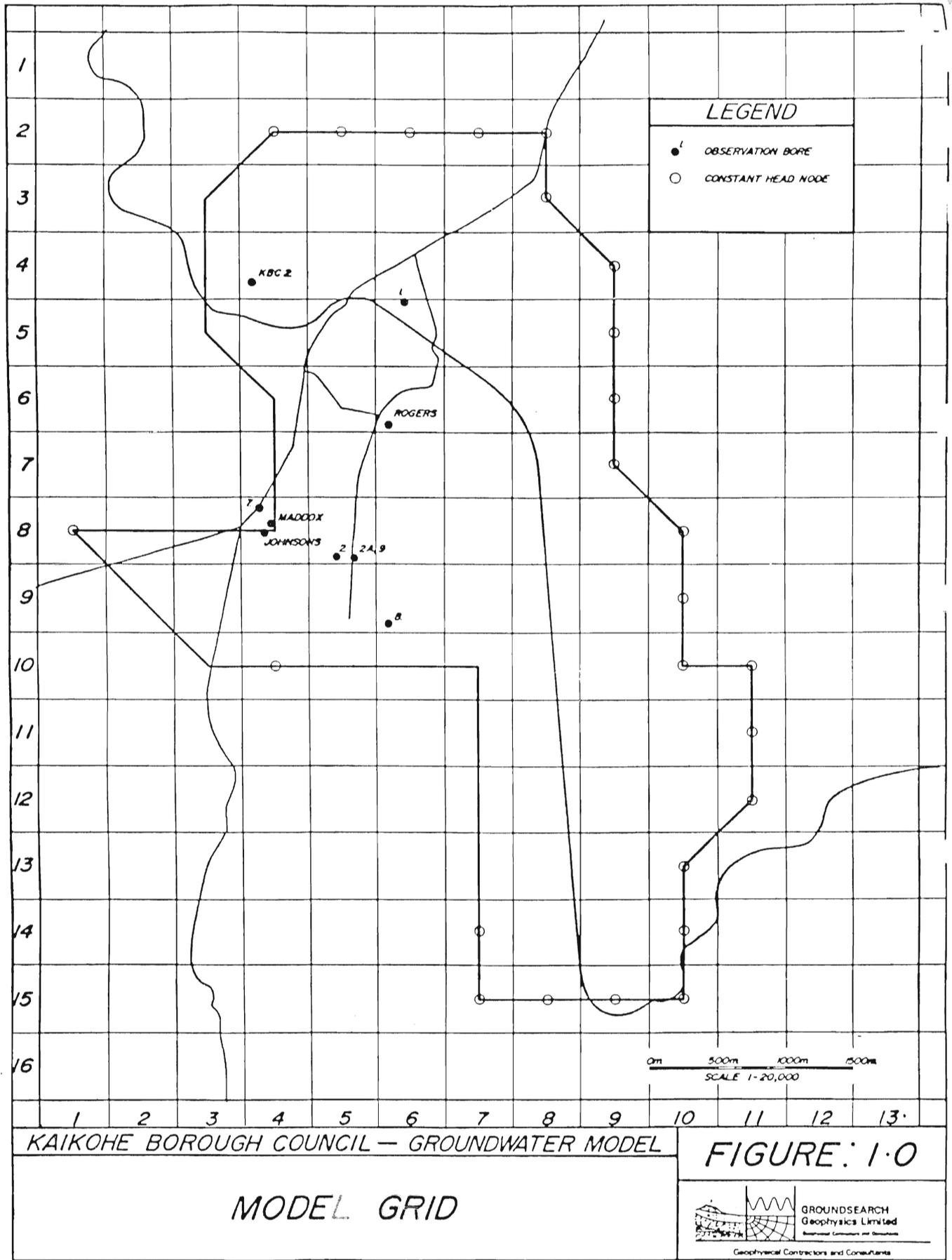
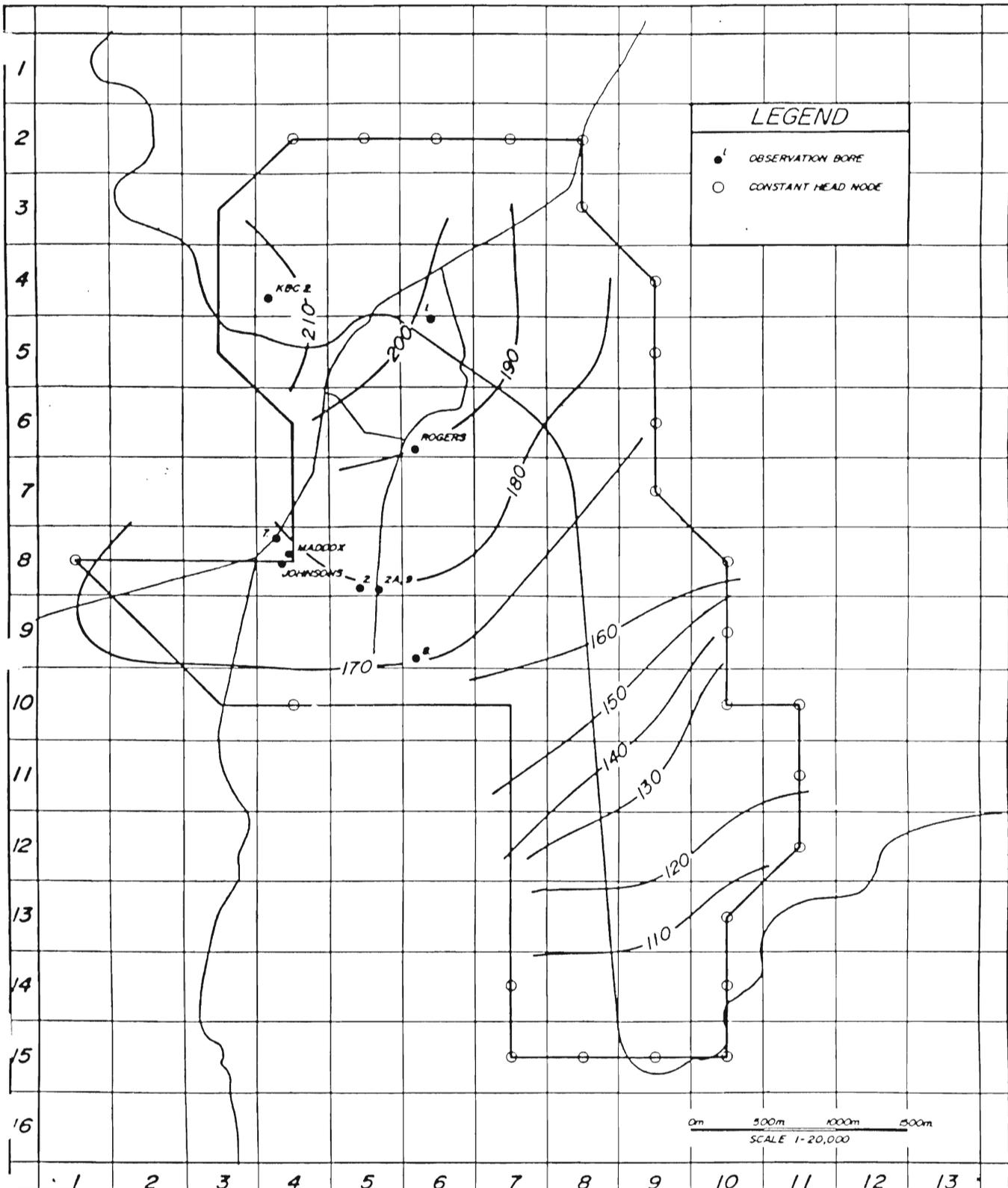


FIGURE: 1.0



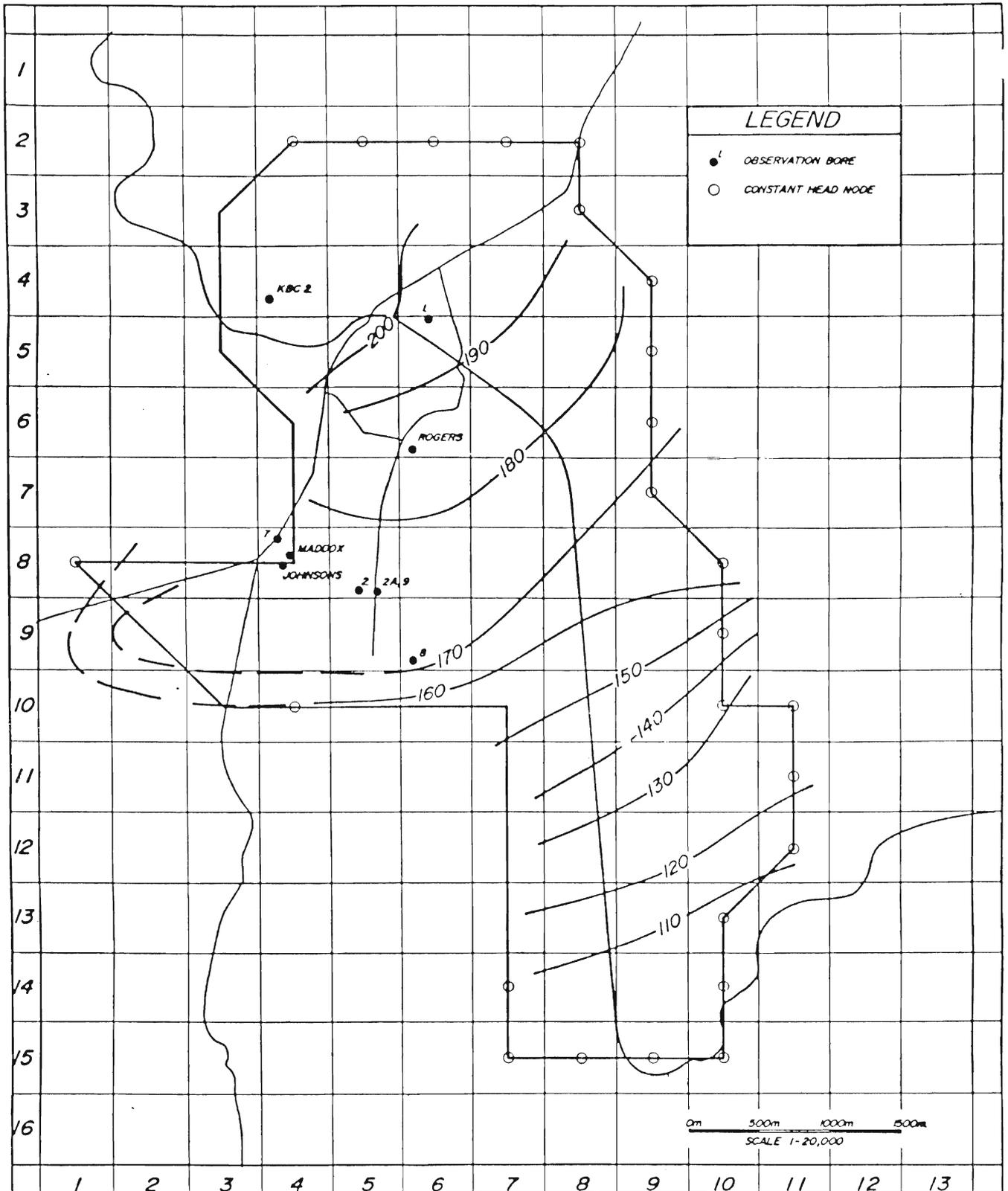
KAIKOHE BOROUGH COUNCIL — GROUNDWATER MODEL

FIGURE: 2.0

CALIBRATION — STEADY STATE AVERAGE

RUN TIME = 7200 DAYS $Q = 750m^3/DAY$
 INFILTRATION — 15% OF TOTAL RAINFALL (45% ON HILL)

GROUNDSEARCH
 Geophysics Limited
 Geophysical Contractors and Consultants

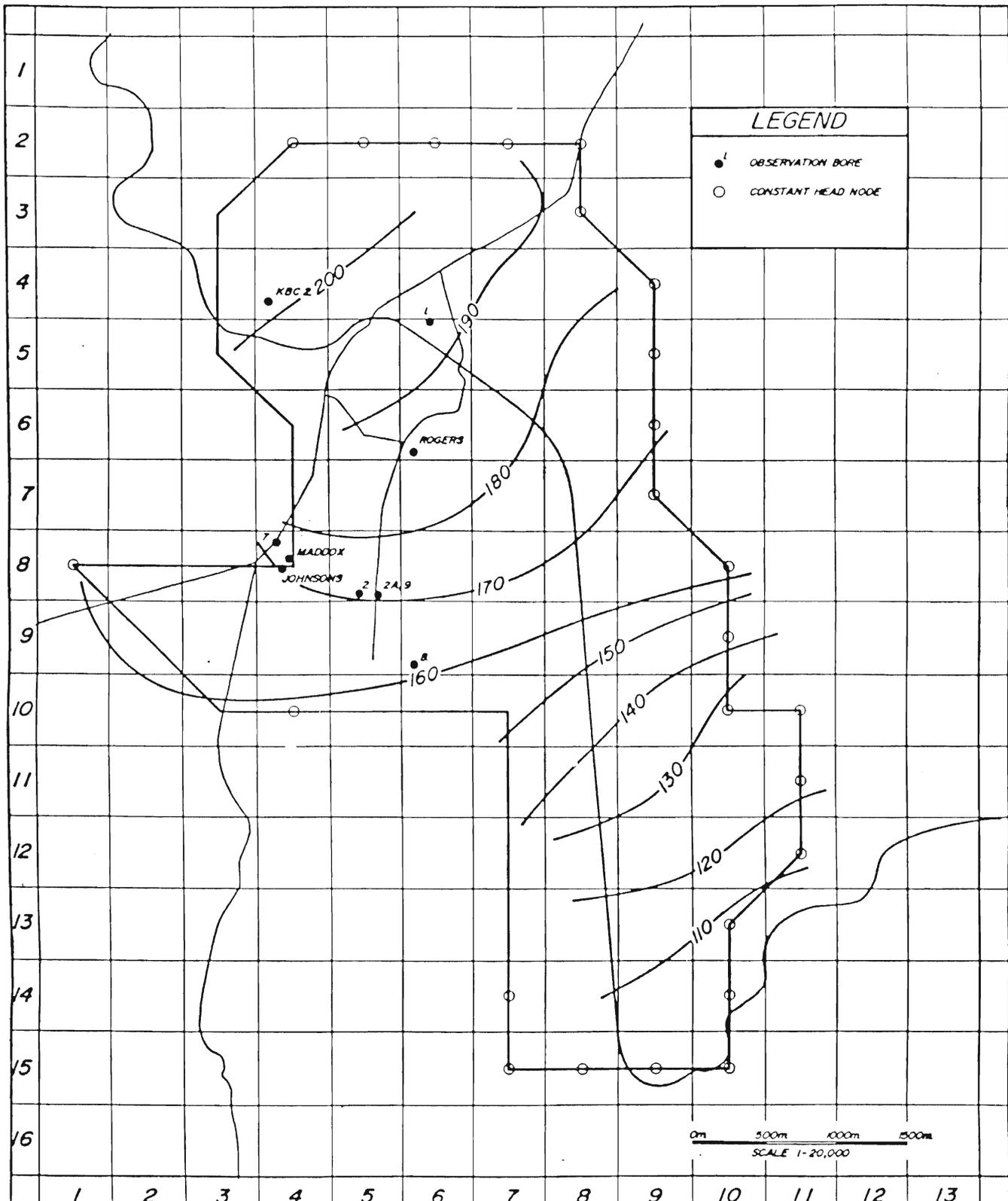


KAIKOHE BOROUGH COUNCIL — GROUNDWATER MODEL

CALIBRATION — WINTER WATER LEVELS
 INFILTRATION IS 25% OF WINTER RAINFALL (75% ON HILL)
 $Q = 460 \text{ m}^3/\text{DAY}$

FIGURE: 2.1

GROUNDSEARCH
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 Environmental Geophysics and Geophysics
 Geophysical Contractors and Consultants



LEGEND

- OBSERVATION BORE
- CONSTANT HEAD NODE

0m 500m 1000m 1500m
SCALE 1-20,000

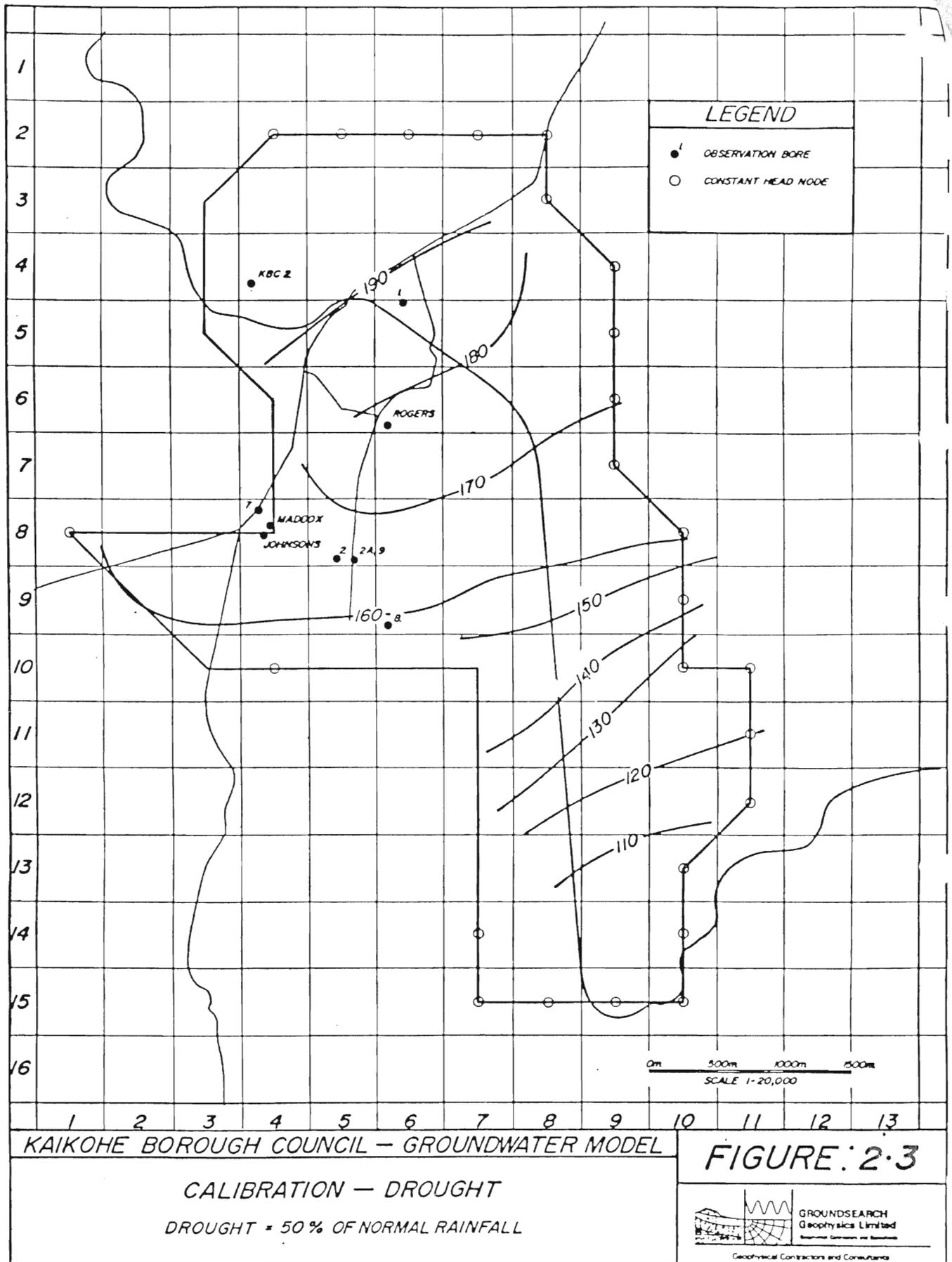
KAIKOHE BOROUGH COUNCIL — GROUNDWATER MODEL

CALIBRATION — SUMMER WATER LEVELS

RUN TIME = 180 DAYS $Q = 1000\text{m}/\text{DAY}$
NO RECHARGE

FIGURE: 2.2

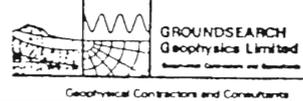
GROUNDSEARCH
Geophysics Limited
Geophysical Contractors and Consultants

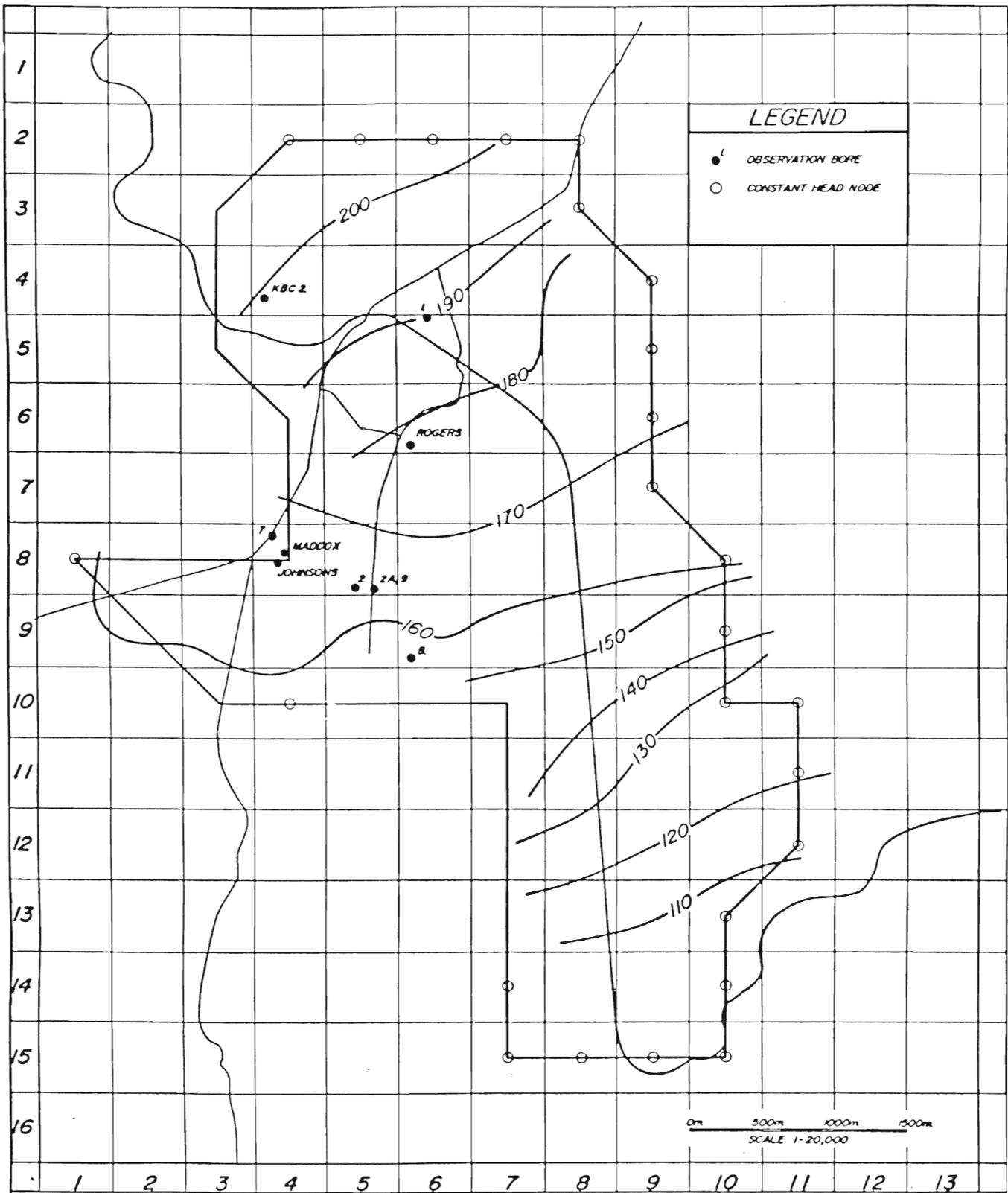


KAIKOHE BOROUGH COUNCIL - GROUNDWATER MODEL

CALIBRATION - DROUGHT
 DROUGHT = 50% OF NORMAL RAINFALL

FIGURE: 2.3



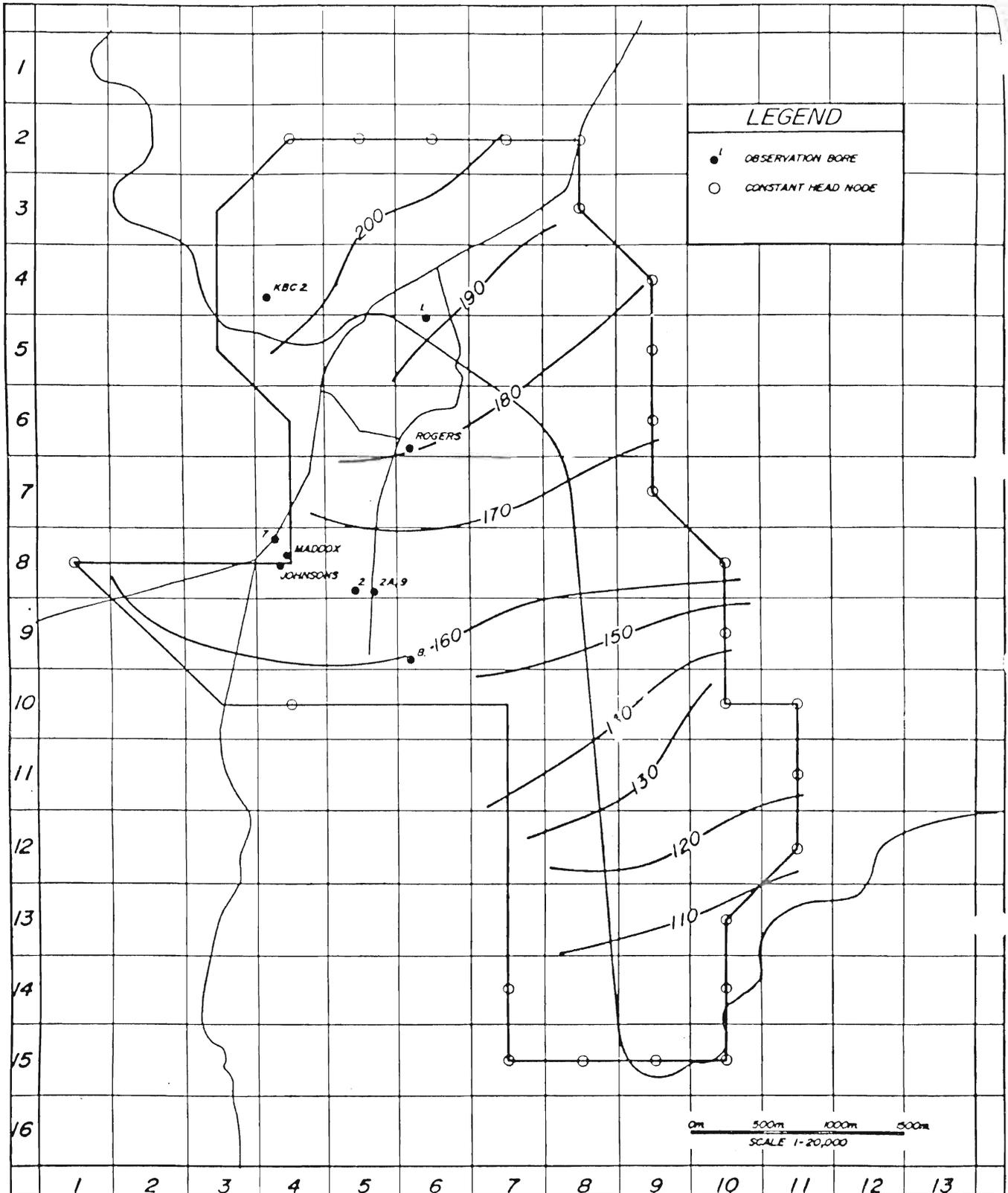


KAIKOHE BOROUGH COUNCIL — GROUNDWATER MODEL

PREDICTIVE RUNS — NEW BORES
 LONG TERM PUMPING — AVERAGE LEVELS
 RECHARGE — 15% OF TOTAL RAINFALL (45% ON HILL)
 $Q = 1800\text{m}^3/\text{DAY}$

FIGURE: 3.0

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 Geophysical Contractors and Consultants
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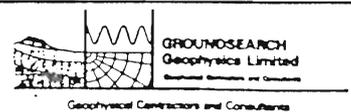


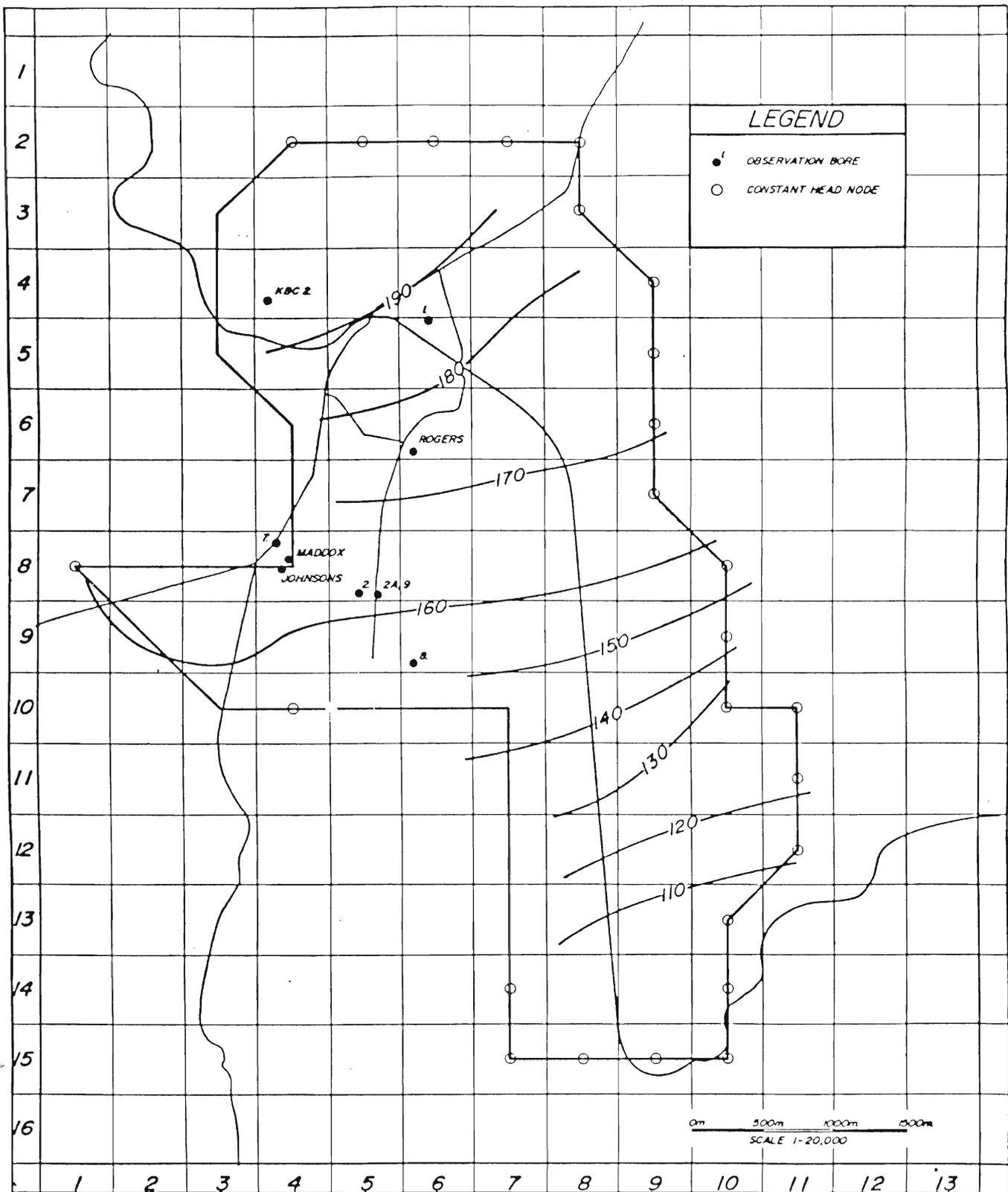
KAIKOHE BOROUGH COUNCIL – GROUNDWATER MODEL

PREDICTIVE RUNS – NEW BORES
WINTER WATER LEVELS

RECHARGE – 25% OF TOTAL RAINFALL (75% ON HILL)
Q = 1500m³/DAY

FIGURE: 3.1



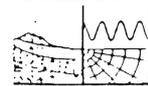


KAIKOHE BOROUGH COUNCIL — GROUNDWATER MODEL

PREDICTIVE RUNS — NEW BORES
 LONG TERM PUMPING — SUMMER WATER LEVELS

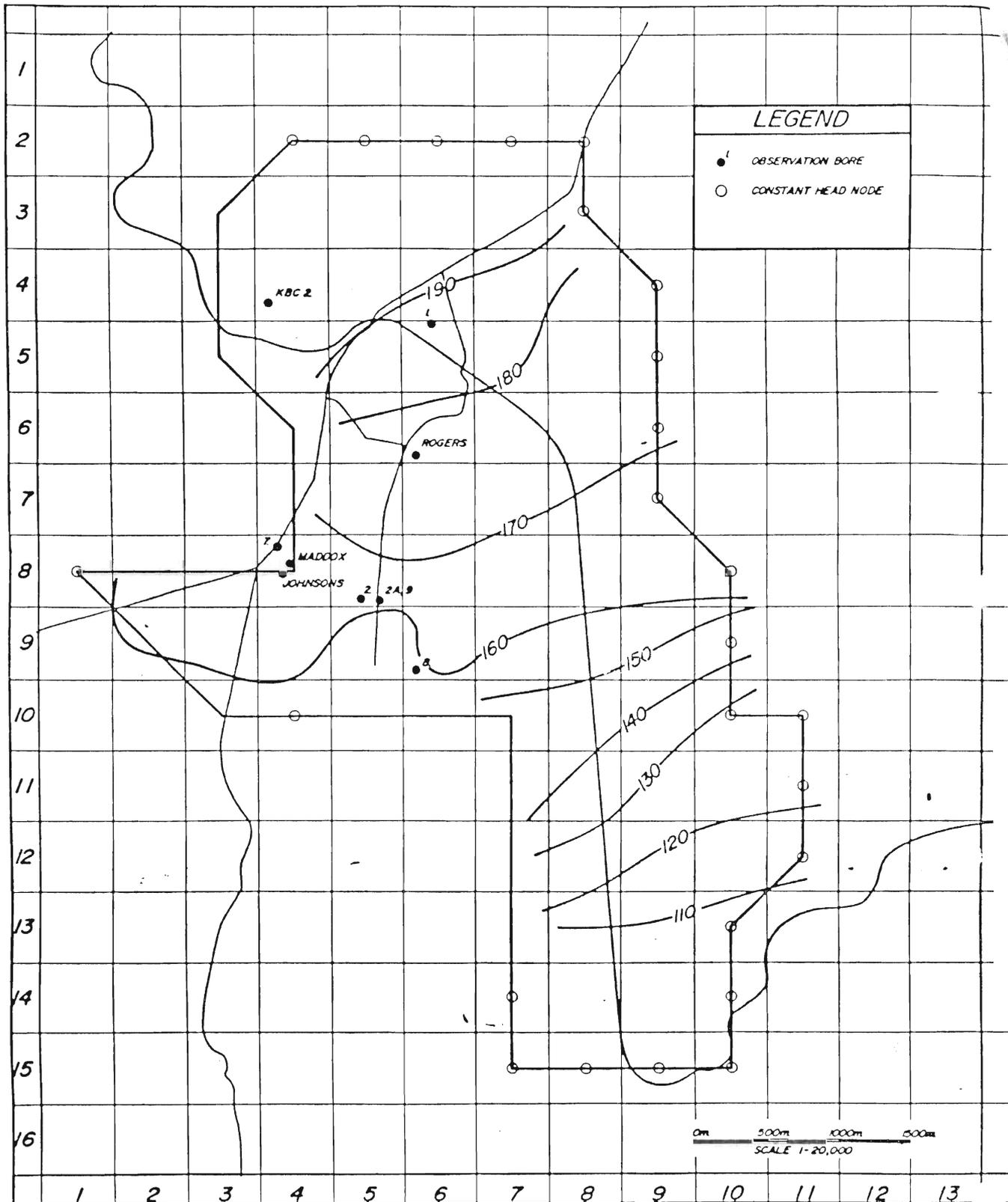
NO RECHARGE (SUMMER) $Q = 2600\text{m}^3/\text{DAY}$

FIGURE: 3.2



GROUNDSEARCH
 Geophysics Limited
 Geophysical Contractors and Consultants

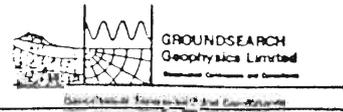
Geophysical Contractors and Consultants



KAIKOHE BOROUGH COUNCIL — GROUNDWATER MODEL

PREDICTIVE RUNS — NEW BORES
 LONG TERM PUMPING — AT LESSER RATE
 RECHARGE — 15% OF TOTAL RAINFALL (45% ON HILL)
 $Q = 1700\text{m}^3/\text{DAY}$

FIGURE: 3.3



The Secretary
Northland Catchment Commission
P O Box
WHANGAREI

13 June 1988

The Secretary
Water Right Objection Committee
c/o Howard A Clark
P O Box 164
KAIKOHE

re Kaikohe Borough Council Water Right Application No. 1862

Dear Sir

The Above committee wishes to make a formal objection to the above application

To take from

- (1) An underground aquifer (Bore)
- (2) A Spring (Squires Spring) in catchment of Otangaroa Stream.

The reasons for the objection are

- (1) Council already has an application to take other water from springs in the area which this committee has put a formal objection into. In that we felt a water management resource survey be carried out by the commission of the total Kaikohe area. We were led to believe by one of the officers this would be done. Until such time as the capacity of the catchment surely no further allocations should be granted or considered.
- (2) The Kaikohe Borough has previously applied for a water right to extract water in the same general region in 1973. This right was declined. With the considerably increased bores that have been put in in the intervening years and water rights granted some of our members on the lower reaches of this stream have no satisfactory water for their farm use.
- (3) It would appear that the Kaikohe Borough council water supply is fragmented and for a population the size that is their responsibility then a basic supply from a major source should surely be there aim. We have noted previously that considerable water of good quality is available at Tautoro and this would seem to be the more logical place for council to source their supply.
- (4) With the land area surrounding Kaikohe Zoned for potential horticultural development then this would be the more logical use for the subteranean and surface spring water in the district.

We enclose our deposit cheque for \$30.00 as noted in your

advertisement.

Yours faithfully



Howard A Clark
SECRETARY

The Engineer
Northland Catchment Commission
P. O. Box
WHANGAREI

12 August 1987

Objection Council
c/o Howard A Clark
P. O. Box 184
KAIKŌHE

re Water Right Objection to Kāikōhe Borough Council application

Dear Sir

As a result of a public meeting a sub-committee has been formed to act on behalf of some 50 concerned users of water in the Kāikōhe catchment. This sub-committee wishes to lodge an objection to the Kāikōhe Borough Council's application to withdraw water from bores in the catchment of the Tokakopuru Stream on behalf of these users.

We list below our areas of concern and the actions we feel should be carried out in dealing with this application.

- (i) That a comprehensive resource survey be carried out within the catchment to determine what water is available for existing users, and rights, what is left that can be granted rights to. Until this survey has been completed no commercial application be considered.
- (ii) Land within the Kāikōhe catchment is generally regarded as being suitable for horticulture. This use should have first right on the natural water available to develop the land to its full potential.
- (iii) Council has been put in a pressure position as a result of the loss of water from Lake Ōmapere and the short term right of extraction from the Kopanui Stream. It is the feeling of the group that considerable surface water runs to waste in the Punakitere and other streams. This is the form of water an urban area should be obtaining their supply from. Accordingly all bores for local authority use should be declined and cancelled due to the limited supply available from the source.

Council should be given time to explore all sources of free flow water as a long term arrangement that will be to the betterment of the whole region rather than a short term stop gap at the easiest option which is what is currently happening. Since considerable water usage from the borough supply is within the county it would appear that the responsibility is jointly both authorities concern.

- (ii) The granting of a water right of the size applied for anywhere within that scale must over a period of time materially lower the subterranean water level to the detriment of existing users.
- (iv) Presently due to weather conditions significant numbers of springs and bores within the Kairiome Detachment have dried up or are at considerably reduced water flows. The report to council on the bores to which this application pertains is conclusive that significant water flows from the upper to the lower aquifer.

With the above two factors it must alternatively be to the detriment of other users and those with existing rights to allow the extraction of a major quantity of water from the lower aquifer.

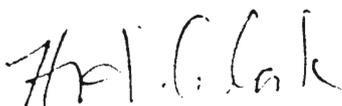
The resource which appeared to be considerable to those involved in this objection is now seen to be anything but as a result of dry weather and additional extraction over the last few years and no guarantee exists to protect their present source of supply. In the event of their rights being interfered with it is their responsibility rather than other users to retain their right at all.

- (vi) The applicant has previously had an application to the commission in July 1973 for bore water turned down on the grounds that the rate of extraction will detrimentally effect the quifer and springs in the area. If this was the conclusion at that time then due to events that have occurred in the intervening period a similar or more deprived situation must now exist to the detriment of existing users.

As required in the add for Council's right we state here that the group over which this objection is made wish to be heard at each time as a hearing takes place.

Please find enclosed deposit cheque for thirty dollars (\$30.00) as required.

Yours faithfully



Howard A Clark
SECRETARY

NAME	ADDRESS
SH Reilly	Thorpe Road, Kaikōhe
T M Rogers	Rangihamama Rd (P.O. Box 38)
W Dalton ✓	Tahere Rd Kaikōhe
R.K. Wellman	R03 Kaikōhe
M.A. WEBSTER	20 TAWANUI RD KNO
Mudete Crump ✓	Tahere Rd. Box 77 Kaikōhe
Manga Lam	Ngāpiti P.O. Box 201
Henry Clarke, + H. Tawhi	Rangihamama Rd Kaikōhe
A. Aoraka H. Parahana	Rangihamama Rd KNO
Martin V. Wastover	" " "
A. J. Woodlot	Tahere Rd Kaikōhe
H. S. J.	Khanoman Rangihamama water committee
THE LEAF	THEREKE ROAD, KAIKŌHE PRIVATE + MARAE 100
I. HYLAND	Russell
Edith W. King	P.O. Box 385, Kaikōhe
Mrs A. Rapataini	P.O. Box 497 Kaikōhe
Mrs G. Bonner	P.O. BOX 139 KAIKŌHE
A. W. Kell ✓	P.O. Box 428 Kaikōhe
E. W. CRUICK	Rangihamama Rd.
R. M. JACKSON	Box 253 KAIKŌHE
R. L. LINDSEY	Box 509. KAIKŌHE
Carl H. Nephel.	Box 148 Kaikōhe.
HEAR BERS	Box 107 KAIKŌHE
E. M. Anderson ✓	Box 193 Kaikōhe
WAR JOHNSON ✓	Box 172 KAIKŌHE
L. M. C. Batters	Box 193 Kaikōhe
Alfred Clark	Box 164 KAIKŌHE
E. Rakete (W. Hamapou) ✓	P.O. Box 597. Kaikōhe.
D. W. TOIA (Representing Rangihamama)	R.D. 1. OKAIHAWA.
William	R03, Kaikōhe.
D. B. KILLIAN	P.O. Box 63 Kaikōhe
E. M. O'CONNOR ✓	P.O. Box 139 KAIKŌHE

Add: Apologies

- Barry Allison
- Warren Johnson
- Aud + Claire Rogers
- Peter Gervard

\$210 collected 3/1/87.

- P. Edmondson
- Joe Puseman
- Bruce Mcintosh.

Name.
 L. W. Kidd Rangitikei 80880
 L. W. Kidd Box 1428 Kaikōhe 80880
 L. W. Kidd Northern News 80123
 H. Rapatakei Mangakaha Rd Kaikōhe 80481
 M. J. Dalton Ngāpiti Rd. Kaikōhe 81353
 M. J. Dalton Takeke Road 81715
 R. Nelson Thorpe 80909
 F. J. Ineson Box 142 Kaikōhe
 M. E. McIntosh Box 193 Kaikōhe
 R. M. Gurnett 483 ...
 T. H. LEAF Takeke Rd. Kaikōhe.
 N. Crump Takeke Rd Kaikōhe
 L. G. Gurnett Rt R.O.3, Waimatenui Rd Kōwhiri 81217
 M. G. Gurnett Box 130 Kōwhiri
 G. Gurnett ✓
 T. B. KILLEN P.O. Box 63 KAIKŌHE 81631
 H. H. Gurnett P.O. Box 160 Kaikōhe 81190.
 G. Gurnett P.O. Box 415 Kaikōhe 81358
 G. Gurnett P.O. Box 415 Kaikōhe 81358.
 M. G. Gurnett P.O. Box 125 KAIKŌHE 81222.
 J. G. Gurnett P.O. Box 125 KAIKŌHE 81222

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LD GERARD DBF LLB

Rathbone Building,
Rathbone Street,
Whangarei, New Zealand
Telephone (089) 482-73
P.O. Box 242, Whangarei
DX 10003
Fax (089) 485-250

YOUR REPLY PLEASE REFER TO

Mr Winter

31 August 1988

The Manager,
Corporate Service,
Northland Regional Council,
2 Māka Street,
WHANGAREI
NEW ZEALAND

Attention: G.F. Reeves

Dear Sir,

Re: Water Right Applications No. 182 and 4394 Kaikohe Borough Council

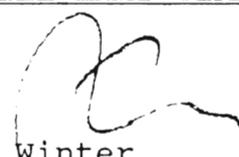
With reference to your letter of 22nd August 1988 and our subsequent telephone conversation of 31st August 1988.

I now enclose an additional "information" pack from the Objectors our firm represents.

As requested we have not bound the information pack, however it is indexed and we would be obliged if the index could be included in your own set of materials for ease of reference.

For your records kindly note that Mr Whiting of this office will be handling the file from here on in and conducting the appearance in Kaikohe when necessary. All future correspondence should be marked for his attention. Thank you.

Yours faithfully,
CONNELL LAMB GERARD & CO

Per: 

G.T. Winter

W31/D42

I N D E X

1. Letter from Richardson Stevens Consultants Ltd
4. Dept of Maori Affairs - Rongihamana Block
6. Sketch Plan of Rangihamama Development Scheme
7. O'Connor Property
8. Punga Properties - H A Clark Family
10. W Dalton
12. McIntosh Property
13. Henwood Property
14. Kairangi Orchards
15. D B & D M Killen - Ross B Killen
16. H F & N Crump
17. R N Jerl
18. N F D & J A JOHNSON - WATER SUPPLY
19. GEORGE SMITH
20. B C ROGERS - TAHAKE ROAD
21. SLYFIELD ESTATE

RICHARDSON, STEVENS CONSULTANTS LTD
CONSULTING CIVIL & STRUCTURAL ENGINEERS



2 SEAVIEW RD
WHANGAREI
PHONE 483 273

Roger L. Richardson,
C. Eng., M.I. Struct. E., M.I.P.E.N.Z.,
Registered Engineer.

Grant Stevens,
B. E., M.I.P.E.N.Z.,
Registered Engineer.

Messrs Connell Lamb Gerard & Co,
P.O. Box 242,
WHANGAREI.

Attention: Mr Winter

Dear Sir,

Re: Water Right Applications 1862 & 4394 Kaikohe Borough
Council

We have been retained by Mr H. Clark on behalf of objectors to these water rights to investigate and comment on possible implications of the right if granted, and we comment as follows:

1. EXISTING AND FUTURE WATER USE

The applicant is seeking to extract water from aquifers within the basalt rocks which underly an area of some 13 square kilometres.

The Kaikohe Borough occupies approximately 35 per cent of this area. The remainder has high quality soil types well suited to intensive agriculture or horticultural use.

With the current down turn in the profitability of pastoral farming further diversification into these more intensive land uses is sure to continue, bringing an increased demand for water, in competition with the current applicants.

We are strongly of the opinion that no future water rights of the magnitude of that under consideration should be granted until a water resource allocation plan for the area is completed. Part of this work is obviously the quantification of the resource, with regard to both surface and ground water and our comments as to groundwater investigations to date are dealt with later in this report.

We note that the applicants intend to proceed with extraction of water "immediately" a water right is granted.

However we understand that while the Borough has no long term guarantee of water from the Kopeni Stream there is at present no competition for this water and thus no possibility that the Borough would be forced to relinquish this right in the immediate future.

We submit that consideration of the water right should be delayed for 9 months which would allow the necessary investigation to be carried out for preparation of a water resources allocation plan.

2. QUANTITY OF THE WATER RIGHT APPLICATION

The water right application for 2300 cubic metres per day is based on a planning period of 25 years with the adoption of an assumed population growth in excess of that actually experienced over the last 20 years. In the face of competition for the resource from other users we do not believe that a 25 year planning period is appropriate.

In our opinion there is no justification for issue of a water right for other than the actual proven use of the water resource unless the projected demands of all other competing users within the study area are accounted for.

In the absence of a water resources allocation plan it would be unreasonable for the water right to cover a planning period of more than five years. Such a period would see the Council's application reduced to a quantity of around 1500 cubic metres maximum daily extraction.

3. EFFECT OF EXTRACTION ON EXISTING WATER USERS

The applicants consultants have to date investigated the geology and the groundwater resource by a number of different methods. The information gained to date indicates that the groundwater resource is contained in two different aquifers at different levels, separated by material of as yet unknown permeability.

It appears that the aquifers are anisotropic, that is, their permeability varies in different horizontal directions. To date, two exploratory bores have been drilled by Council and both of these penetrated the lower of the two aquifers. Only one other of those bores within the study area is into the lower aquifer. We understand that to date only one pump test has been run and this was at a flow rate of approximately 400 cubic metres per day for 3 days.

Given that the aquifer is complex with unknown leakage characteristics between the upper and lower aquifers, it is our opinion that the testing to date is inadequate to fully assess the groundwater characteristics. We believe that further investigation should be undertaken to establish by test, the following:

- a. The characteristic of the aquifer under long term extraction rates of up to 2300 cubic metres per day, that is, a rate of approximately 6 times that tested for to date.

- b. The effect that this extraction rate would have on the upper aquifer and thus on the shallow bores of other users in the study area.
- c. The effect of this extraction rate in directions other than those tested to date i.e. with only two effective observation bores, we believe that the anisotropy of the aquifer cannot be fully assessed.
- d. The effect of extended high extraction rates on the many springs and streams that are sourced in and around the study area. We note here, that it is the belief of farmers along the Otangaroa Stream that, based on their long term observation of the stream, the flows have been seriously reduced by Council's water extraction at Kaikohe Hill. The objectors fear that individual streams may be similarly affected by extraction rates as applied for by Council.

4. OTHER WATER SOURCES

We note that investigation of the underground resource followed the investigation of Messrs Fraser Thomas Partners Preliminary report of 1986. This report looked at alternative sources of supply for the Borough and gave preliminary costings for various alternatives. It is our opinion that there are other sources of supply that may be suitable. We therefore believe that a re-evaluation of all sources of water should be carried out once the full characteristics of the underground water resource is known.

Yours faithfully,

G.R. Stevens
RICHARDSON STEVENS CONSULTANTS LIMITED

Department of Maori Affairs - Rongihamana Block

Existing water supply in existence prior to the Kaikohe Borough Council application:-

1. 1 deep well bore situated approx 300m to the east of the Kaikohe Borough Council bore - off Rangihamana Road.
2. 1 deep well bore approx 1900m to the south west of the Kaikohe Borough Council's bore - off Ngapuhi Road.
3. One deep well bore in the Le Tringa area.
4. One southern cross windmill pump with a capacity of 15m³ daily with 45m³ storage in reservoirs - water pumped from a sump, artesian spring fed. No.1 bore plus the windmill serves 2 houses, 1 shearers quarters, 1 woodshed and stock water for 220ha - carrying a minimum of 250 bullocks and 1000 ewes plus lambs.
5. Horticulture irrigation system serving 28ha of mixed horticulture - predominantly kiwifruit with an existing water right of 840m³ day (30m³ per ha). Horticulture unit an expanding unit up to a max. of 40ha with ultimate water right of 1200m³ daily (applied for and granted on 13/7/88 - no objections).

Irrigation water source is artesian springs with a ponding dam with a capacity of 71000m³.

The inflow into this dam is estimated at less than 6000 gallons/hr = 648m³ daily, and at full potential with the 40ha of orchard developed irrigation extraction would be 30m³/ha = 1200m³ daily = 552m³ in excess of the amount flowing into the ponding dam. Given that it is essential that outflow from the dam (capacity 71000m³) must be maintained, then the dam would hold sufficient water for 59 days irrigation.

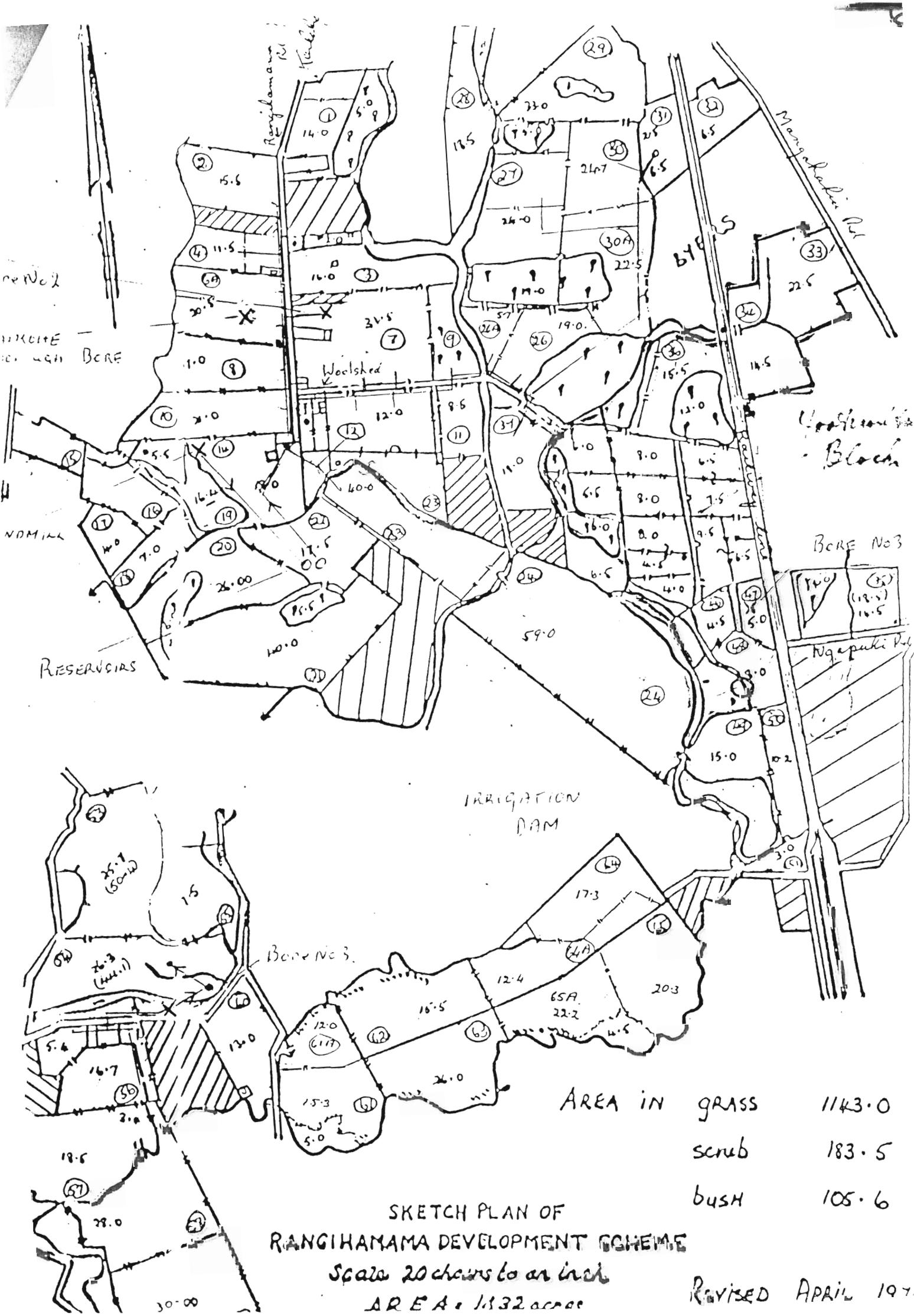
Water rights 100m³ daily for irrigation

4 ha kiwifruit orchard.

Source

1. 1 2500 gal/hr irrigation pump - pumping 4 1/2 hrs/day from a ponding area of approx 1100m³ fed by an artesian spring. Inflow to ponding area is considerably less than outflow (50m³ daily), as ponding area drops at least 6" daily during constant irrigation.
2. An additional 2500gal/hr pump situation much lower down from the artesian spring which feeds No.1 pump. Ample supply here.
3. HP pump domestic and stock water supply from artesian spring.

R.C. GUEST



AREA IN GRASS	1143.0
scrub	183.5
bush	105.6

SKETCH PLAN OF
 RANGIHAMAMA DEVELOPMENT SCHEME
 Scale 20 chains to an inch
 AREA = 1132 acres

REVISED APRIL 1971

O'CONNOR PROPERTY

Our 400 acre cattle farm, which shares a boundary with Kaikohe Aerodrome, was purchased in 1980.

To us, the main attraction was the abundance of spring-fed water flowing through the property. This high-quality water was a big factor in establishing a successful beef-fattening operation. Our neighbours, Antunovics, Edges and Hylands, have all enjoyed both household and stock water from springs rising in our farm. To succeeding years, we have noticed a gradual drop in the flow of these springs during the summer and autumn periods and have attributed this to a lowering of the water table on the volcanic plateau due to the draw-off of additional bores that have been sunk in the area.

We have become very concerned about the water situation in the dry summer and autumn of 1987. A very powerful spring, that supplied water to a neighbouring large-herd dairy unit, dried up. Another spring that would have driven a water ram every seven years previously was down to a trickle. Mr David Roke of the Northland Catchment Commission was contacted and we were informed that the Kaikohe Borough Council had been pumping from a bore in Rangihamama Road during this period. An officer of his department subsequently visited our property and indicated that any water withdrawn from the plateau would adversely effect the flow of the springs around the perimeter.

Without our present waterflow, our farm would be substantially reduced in carrying capacity and value.

We strongly object to the Kaikohe Borough Council taking the easy option which would deprive the elite soil south and west of Kaikohe of its natural water. This would have a detrimental effect on the growth and prosperity of the Kaikohe area.

8

PUNGA PROPERTIES

H.A. CLARK FAMILY
Browns Road, Te Iringa

Farm 160 ha off Browns Road, Te Iringa.

Water use is from spring fed streams coming out of higher Kaikohe Hill plateau.

Of this land area 100 ha is flat volcanic type soil with potential use for horticulture. Rates on this property are of the order of \$4,500.00 per annum and is typical of the rates applicable to most of the land involved in the group objection.

Within the midst of our land areas is the Kaikohe Airport land. This contains the order of 130 ha having the main runway area with surrounding land areas leased to adjoining owners. This is presently leased by the aeroclub but inevitably in the near future will be sold. This land is volcanic flat and potential horticulture with water availability having to be by bore.

Adjoining ourselves in Browns Road is Mr L.Jerkovich having 7 ha flat volcanic land with water source from stream originating out of Kaikohe Hill.

In general the higher land and smaller blocks not adjoining out fall streams originating from Kaikohe Hill rely for their water from bores. The properties out further rely for water from streams spring fed originating out of Kaikohe Hill.

Otangaroa Stream which feeds west from Kaikohe Hill has now got to point where lower users in summer receive no usefull flow. On checking back with older identities state that this stream held a considerable flow in the dry summers. Source of springs at the top of this stream are effected by Councils extraction of water from Squires spring, and bores on Manument hill. I feel we can gather evidence from older identities to show that the present extraction of water is impacting considerably on down stream users in that stream flows are now reduced below N.R.C. criteria.

With this impact from present sources pulling 1000 c/m/day averages any further taking of water further down the aquifer must impact on higher bore users, Councils own bores on Manument hill and outfall springs.

Gerard please find enclosed report from councils application 474 in 1973. This is the application renewal we objected to in July 1988. If you search the N.R.C. file you will find that W. Dalton appealed against the decision and the original ruling was varied. I have seen the result of this appeal but he has lost the letter concerning this section.

A further source of water has been looked at some 24 km out of town which would gravity feed direct into council supply with no need for pumps. This is being shown to Engineers as are all the options covered in Fraser Thomas 1986 report to council obtained from N.R.C.

Currently Council draws:

Kaikohe Hill	1000 cm/day
Tarairi Hills	275 cm/day
Kopunui Stream	259 cm/day
	<hr/>
	1534

Total needs present 2400 cm/day
Long term projections 3300 cm/day

H.A. Clark.

W. Dalton,
Taheke Road,
KAIKOHE.

To whom it may concern I and my son farm approximately 300 acres south of Kaikohe on the Takehe Road. We milk 120 cows and 50 replacement heifers. We also run 6 horses, 2 bulls, 10 pigs, 50 fowls and about 12 steers. The property is composed of 60% volcanic loam and 40% clay. About 60% flat rolling country and 40% hills. We can grow all varieties of vegetables successfully. Our domestic water for 3 houses on the property is taken from a reservoir fed by springs. Since the 1970 we have had critical periods in the summer causing us to shut the pump down until the reservoir has replenished itself. The stock at these critical periods in the summer are dependent on the Otangaroa Stream which is barely flowing and brakish. My sister has had to get a tanker of water to fill her tank at times in the summer. It is sad that the Catchment Commission should permit this to happen as I think it is part of their function that we should all get a fair share of the water available.

W. DALTON

TO WHOM IT MAY CONCERN

Below is a list of the Families that are dependent on the Otangaroa stream in my area. Some have springs that have served them and their ancestors. The list is of the people in my area:

<u>NAME</u>	<u>SOURCE OF DOMESTIC USE</u>
K. Maihi	Tank and artesian
G. Smith	Tank and artesian
T. Harbrow	Tank and artesian
J. Reihand	Spring and tank
M. Reihand	Spring and tank
P. Hita	Tank and Otangaroa Stream
T. Akuhata	Tank and Otangaroa Stream
G. Rakete	Tank and Otangaroa Stream
Reihana	Tank and Otangaroa Stream
G. Rameka	Tank and artesian
E. Wikaera	Tank and artesian
R. Nickolas	Tank and Bore
T. Yukich	Tank and spring
M. Nollander	Tank and spring

To my knowledge these are the sources of their water for their domestic and stock uses.

W. Dalton

MCINTOSH PROPERTY

Mr Clif McIntosh depends solely on bore water for stock, house and garden. He has owned the property for eighteen years and thinks the bore is probably over forty years old. The water supply is adequate at present but would not sustain them if the water level dropped. Mr Bruce McIntosh and Mr and Mrs Keith and Heather Ineson draw water from a twelve year old bore and Inesons use this supply for irrigation. They are very concerned because the water level dropped from five (5) feet to thirty (30) feet - a difference of twenty five (25) feet - during the past two years.

HENWOOD PROPERTY

Situated north of Kaikohe aerodrome, the land was taken up in 1930 by the family of the present owner, Roger Henwood.

There are two bores on the property. The water levels in these bores have dropped ten feet in the past two years - from 15 feet to 25 feet.

KAIRANGI ORCHARDS

Situated approximately 200m north west of proposed bore site on Rangihamama Road.

A seven acre property fully developed in kiwifruit and Nashi.

Have a water right for current and likely future use.

Pump from a bore at a depth of 88 feet. (Now that the property is fully developed we would have a great deal of difficulty in getting machinery in to deepen this well if it were to become necessary).

Have a water requirement at times of over 20,000L per day.

RLC & R.J. CLARKE

D.B. & D.M. KILLEN

224 ha Sheep and Beef
180 ha Potential for horticulture.

Farmed in family since 1911 entirely dependent on spring fed streams for stock and domestic water (3 houses).

ROSS B. KILLEN

63 ha Beef fattending
20 ha Potential for horticulture

Owned since 1979. Previously dairy farm entirely dependent on spring fed streams for stock and domestic water.

H.F. & N. CRUMP

Property Tahuna 23A and 23B

Punaketeire Block

Zoned Horticulture

Current use - domestic and beef stock fattening intended use (very soon) horticulture.

Current water supply - bore (domestic permit only) supplimented with 5.000 gal rainwater tank.

Bore supply consistent and of good quality until towards end of 87' 88' summer when it went dry and on recovery water of poorer quality. Appears to be recovered now.

R.N. JERL

Tahuna 24 Blk III Punakitere S.D

Sit. State Highway Mataruna

Area 4.9915 hectares

This property is ideally suited for horticulture being flat, near to town and with little stone. Until recently the water was pumped from a well 23ft deep but as the level dropped alarmingly in 1986, I changed to an unused bore, and filled in the well. As I am retired, I feel the bore will allow me to hobby farm but doubt if there is sufficient to carry out profitable horticulture.

WATER SUPPLY

N.F.D. & J.A. JOHNSON

Water from bore 4" 52' deep. Details of bore and supply held by Catchment Commission tested for 24 hours at 350 galls per hour. This is my sole domestic supply and serves stock on 15 ha. Surface water is present on my back boundary.

I have a water right for irrigation but as I am not using it I will be letting it lapse.

GEORGE SMITH
Taheke Road,
KAIKOHE

Objection to proceed water reticulation from Kaikohe Hill.

To whom it may concern.

As a resident of Taheke Road, dependent on the artesian supply of water, I must object to the above proposal, which would affect our area.

Part of the development of our property i.e. agriculture and horticulture, would be in jeopardy if the scheme were to go ahead.

Please reconsider the proposal, which would affect our life style and/or livelihood.

GEORGE H. SMITH

B.C. ROGERS TAHAKE ROAD

1. 1 deep well pump serving approx 15ha of potentially prime horticultural land (Kiripaka loan) for household and stock water.
2. Additional 10ha served by Otangoroa stream which now stops running in dry summers.

B.C. ROGERS

SLYFIELD ESTATE

Land area borders Taheke Road Waimatenui Road, containing 45.7 ha of prime horticultural land in 9 separate titles. This block was run as a market garden during the Second World War. With the death of Mrs Slyfield recently it means this property will be up for sale in the several titles at the end of the current grazing lease.

Water supply is currently from two bores, with selling in small blocks each of these will similarly require a like source of supply.

Administration is now solely in the hands of Mr Peter Shultz Guardian Trust, Whangarei.

Ivor R. Nelson
P.O. Box 141
KAIKOHE

10 August 1987

The Manager
Northland Catchment Commission
P.O. Box 886
WHANGAREI

Dear Sir

Re: KAIKOHE BOROUGH COUNCIL (WATER APPLICATION)

I purchased my farm property at Rangihamam Road, Kaikohe in 1966 off Mr Jack Wallace.

When I purchased the property the vendor, who had lived there since 1940, assured me that even in the worst summer drought (1946) the springs on the property had never run dry.

I now find that the sources of water on my property are running down and this autumn one of those supplies ceased. The main spring is still flowing satisfactorily at the present time however I note when fencing that the water table was very low as when I was putting a fence strainer in the ground was very dry at 4'6".

My property is adjacent to the old Kaikohe Dairy Company water supply on Rangihamam Road.

My concerns are:

1. The volume of water being sought by the applicant (Kaikohe Borough Council) would in all probability further reduce water table and my farm could be without water.
2. The proximity of the proposed bore to my property is approxiamtely 120 yards.
3. I am a farmer who relies on this water supply for my farming and house needs.
4. My concern is that our property is well located for horticulture, the soil type is predominanty Kaikohe Volcanic Loam; I have five children and being a farmer must diversify and if there is insufficient water for horticulture use then my property loses its value and my family would not have the opportunity to work the land on a horticultural basis.

I would be pleased to meet with the Commission to state my case in person for water preservation on my property.

Yours faithfully

I.R. Nelson

I. R. Nelson

Kairangi Orchards
P.O. Box 509
KAIKOHE

28 August 1987

The Chief Executive Officer
Northland Catchment Commission
P.O. Box 886
WHANGAREI

Dear Sir

As a commercial user of water and holder of water right number 2006, We, the shareholders of Kairangi Orchard wish to register our objection to the application for water rights as advertised in the Northern News , Thursday 16th July 1987, by the Kaikohe Borough Council.

We object to the granting of this water right on the grounds that:

1. It is clearly indicated in the Kaikohe Ground Water Survey Report that little is known about the hydraulic properties of the two aquifers in the area of the proposed bore site and that only limited information on the characteristics of the lower aquifer were gained from the tests that have been carried out to date.
2. It is apparent that the upper aquifer from which our pump draws could be significantly affected by the lower system. There would be several physical problems to overcome to deepen our well if this was to become necessary.
3. We do not believe that there is any evidence to suggest that this water system can sustain the extraction of such a huge amount of water on a continual basis. In fact we believe that there is some evidence to show that the opposite would apply.
4. We do not believe that the applicant has done sufficient testing of this water resource and that in applying for a right of this magnitude with such undue haste is showing a certain lack of consideration for the many water users in the surrounding area.
5. We are genuinely concerned for all water users in the area and believe that some will be affected in the short term and fear also that our own enterprise will be placed at risk by the granting of this right. In this context we feel that this is only a short term solution to the water supply problems of the applicant and that although we are eager to see a solution to the town's problems we do not believe that, owing to the relatively small local water catchment area, the answer can be found anywhere in the immediate vicinity of the borough without causing difficulties to other users. Further to this we are afraid that once the Borough becomes reliant on this water source then they will not be in any position to show consideration for other

Kairangi Orchards to
Northland Catchment Commission - 2 -

users of this water resource should the supply begin to dry up.

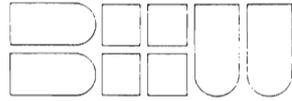
The above briefly outlines some of our objections to the application in question. We would like to claim the right to be heard in person or represented by Council at the Commission hearing.

It may be pertinent to point out that we do not wish to be seen as being unconciliatory in this matter. We are concerned for the town and would be pleased to discover that we could be guaranteed continuation of supply at no further expense to ourselves, but do not believe that sufficient is known about this water resource to achieve this.

Yours faithfully



R.M. Clarke
Kairangi Orchard



BYERS HAYWARD WEBER
CHARTERED ACCOUNTANTS
KAIKOHE & KERIKERI

Peter William Byers B. Com. A.C.A. A.C.I.S.
5 DICKESON STREET P.O. BOX 247, KAIKOHE BAY OF ISLANDS NEW ZEALAND

Maxwell Roy Hayward A.C.A.
TELEPHONE (0887) 81.800 KAIKOHE

11 August 1987

PWB:jwm

Personal Letter

P.W. BYERS.

The Manager
Northland Catchment Commission
P.O. Box 886
WHANGAREI

Dear Sir

re: KAIKOHE BOROUGH COUNCIL
(Application to take water)

We wish to state an objection to the application by the Kaikohe Borough Council for the extraction of water from Rangihamama Road.

Our objection is based on the following grounds:

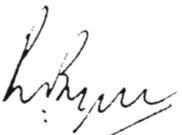
1. We operate an orchid nursery and cut-flower production unit (24,000 sq. ft. of shadehouses) and zantadeschia bulb and cut-flower crops (outdoors on 1 1/2 acres).
2. Our property is sited at Upper Hillcrest Road, Kaikohe. Lot 1 DP 61191 Blk XV Omapere S.D. 16.5365 ha.
3. We purchased the property in November 1982 - the vendor and our neighbour (who has lived there for over 35 years) both stated that they had never seen the back dam, the centre spring and the front spring dry (even in 1946).
4. We applied for a water right in December 1982 (through Kiwi Welldrillers who were drilling for water) for a reliable long term supply of water (copy of application enclosed).
5. Kiwi Welldrillers sunk a bore to 182 feet, obtained excellent water at a rate of 8,000 gallons per hour (est.) and we commenced our project.

Contd...

6. The water supply has been satisfactory for our house horticulture and stock needs since this time until about mid-autumn this year.
7. Around April/May our well water turned murky and muddy and at the time that the Borough were drilling around Kaikohe their geo-physicists inspected our bore site and expressed surprise that we had obtained water at that site. (We are about 400 yards directly north of the Monument Hill source of water for the Borough). We are aware that the Borough have been pumping greater volumes of water from this source since the Omapere Lake water source proved unsatisfactory.
8. The volume and quality of water in our bore has steadily diminished since May to where we are now "dry" (absolutely no water!). Our back dam is down about two metres and the centre spring has stopped. We are trucking in water to keep our livestock and flower production going.
9. We had hoped that with the recent winter rain the bore supply may have been replenished - unfortunately this has not happened.
10. We have a source of water available to us about half-a-mile from our property but we are hesitant to spend further sums of money to capture, store, pump this water when that too may run dry as the source of this stream is in the hills behind our property.

We would be pleased to be heard at the Hearing.

Yours faithfully



P.W. BYERS

for PETER BYERS FAMILY TRUST

for ELAINE BYERS - ORCHIDS.

Encl. ✓

APPLICATION FOR RIGHT TO TAKE NATURAL WATER

KW1

To :
The Secretary,
Northland Regional Water Board,
P.O. Box 886,
WHANGAREI.

COPY FOR YOUR
INFORMATION

PURSUANT to section 21 (3) of the Water and Soil Conservation Act 1967, the undersigned :

Surname BYERS Christian Names PETER WILLIAM

or Company or Organisation Name * ELAINE NANCY

Address UPPER HILL CREST ROAD, Occupation FLOWER PRODU.

hereby applies for the right to EXTRACT WATER as specified in the Schedule hereto :

Address for service of documents P.O. BOX 47 KAIKOHE

Dated at KAIKOHE this 3 day of DECEMBER 1982

SCHEDULE

Purpose for which water is to be taken (Describe fully) IRRIGATION - OF ORCHID PLANTS / LILIES / LIVESTOCK

Full description of works to be constructed WELL TO LOCATE WATER EST @ 200 MT. (- 24000 sq. Ft. GREENHOUSE - LILIES GROUND GROWN)

Source of water WELL

Quantity of water per day to be taken : SEE OVER litres or cubic metres

Locality and site plan of place of taking UPPER HILL CREST ROAD, KAIKOHE

Legal description and names of owners and occupiers of land at site of taking and place of usage NOEL BRIAN BIRCHALL * COLIN RAYMOND CLARKE AS TRUSTEES FOR PETER BYERS FAMILY TRUST

Time from grant of right within which construction will commence KUNI WISUORAUAS - OKATHAN - SOMETIME IN 01/83

Time for construction of works 01 and 02 1983

Phone No 1093 KATO [Signature]

Signature of Applicant or Authorised Agent

Fee and deposit to be enclosed with this application

Fees & Deposits New Applications	Appn fee \$30 Deposit \$30 Total \$60	Appn fee \$ 30 Deposit \$120 Total \$150	Appn fee \$ 30 Deposit \$220 Total \$250
Taking of water including industry and thermal	up to 100 000 l/d	up to 1 million l/d	over 1 million l/d
Taking for irrigation Run-of-Stream Bores	up to 5 ha	up to 15 ha up to 5 ha	over 15 ha over 5 ha
Replacement Rights :	Application fee \$30 Deposit \$30 Total \$60		

P.O. Box 142

KAIKŌHE

10-8-87

NTHLAND CATCHMENT COMMISSION

WATER RESOURCES

D. L. ROSE

Dear Sir,

We wish to express our concern about the KAIKŌHE BOROUGH COUNCILS desire to take water for the township from the RAUHEHEHE RIVER bores.

We farm on Mangakahu Rd, 3 kilometres from Kaitiaki. The water for our stock and house comes from a bore and is our only source of supply. There is no alternative for us.

Yours Faithfully

H. M. Ineson

K. J. & H. M. INESON

P.O. Box 139,
KAIKOHE.

11th August, 1987.

Mr. G.F. Reeves,
Secretary,
Northland Catchment Commission and Regional Water Board,
P.O. Box 286,
WHANGAREI.

Dear Sir,

WATER RIGHT OBJECTION: M.J. & C.H. O'CONNOR - OBJECTORS.

We wish to lodge an objection to the Kaitike Borough Council's application to take up to 2,300 cubic metres of natural water per day from a bore in the catchment of Tokakopura Stream for public water supply for Kaitike Borough Map Reference: N15/303316 (4393).

Our properties are situated on Mangakahia Road and Edwards Road, Kaitike with the Kaitike Aerodrome and the Punakitere River as boundaries.

Our objections are as follows:

1. Our existing water supplies were at a precariously low level over the last summer period for household and stock.
2. The Punakitere River which is on the boundary of our properties has been badly polluted. The water has not been suitable for human or animal consumption, hence the importance of the springs that discharge from the perimeter of the Kaitike plateau onto our properties. Our neighbours also rely on this source of water for households and stock.
3. Until there has been a water resources survey completed and the rainfall returns to normal, we consider no further natural water rights should be granted in the Kaitike Catchment area and that existing commercial bore water rights should be reviewed.
4. We consider the Kaitike Borough Council can fill their water requirements from other sources.

We claim the right to be heard in person as per sections 21 and 24 of the Water & Soil Conservation Act 1967.

Enclosed please find our cheque for \$30.00 being a deposit against costs.

Yours faithfully,

M.J. O'Connor

C.H. O'Connor

Mrs. C.H. O'Connor
Mr. M.J. O'Connor

ENCL. 1

R.D. 3
KAIKOHE

10 August 1987

Secretary
Northland Catchment Commission
P O Box 886
HANGAREI

Dear Sir

re: KAIKOHE BOROUGH COUNCIL APPLICATION FOR WATER RIGHTS

On behalf of Levondale Farms Ltd I hereby lodge an objection to the Kaikohe Borough Council's Application to take up to 2300 m³ daily from a bore situated in the catchment of Tokakopuru stream.

We have an existing water right (No. 2172) which permits us to take 100 m³ daily from two storage reservoirs on a spring-fed tributary of Omaunu stream, approximately 1500m south west of the Kaikohe Borough Council's bore.

The inflo of one of our artesian spring-fed reservoirs from which we irrigate part of our orchard, is barely sufficient to cope with our needs. Any reduction in the inflo to this reservoir would necessitate a very expensive relocation of a major portion of our irrigation system.

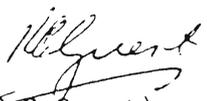
In view of this the grounds for our objection are as follows :

- (1) The extraction of 2300 m³ daily could adversely affect the underground water table which in turn would cause reductions in the output of local artesian springs to the detriment of existing water users.
- (2) We contend that there is no evidence that can confirm that the extraction of such a quantity of bore water can be sustained without permanently affecting existing water resources in the area.

In lodging these objections we confirm that we wish to be heard in person or by legal counsel at the application hearing.

Please find attached a cheque for \$30.00 for fees.

Yours faithfully


(R.C. Guest)
Director
Levondale Farms Ltd



Our reference:.....28/2/2.....

Your reference:.....

DEPARTMENT OF MAORI AFFAIRS

Telephone: KHO 80076

P O Box 263
KAIKOHE

10 August 1987

The Secretary
Northland Catchment Commission
P O Box 886
WHANGAREI.

Tena koe

re: OBJECTION TO KAIKOHE BOROUGH COUNCIL WATER RIGHT APPLICATION

The Department of Maori Affairs, acting on behalf of the Maori owners of the Rangihamama X3A block, hereby lodges an objection to the Kaikohe Borough Council's application to draw up to 2300m³ of water daily from a bore situated on Rangihamama block and in the catchment of the Tokakopuru stream.

The grounds for this objection are as follows :-

- (1) The extraction of 2300 m³ daily could result in a substantial lowering of the subterranean water levels which would seriously affect the efficiency of our existing reticulated stock and domestic water supply serviced by three separate bores.
- (2) Any lowering of the water table could have an equally serious impact on existing local artesian springs from which the Rangihamama block is very dependant for the following :-
 - (a) stock and domestic water supply reticulated to a major portion of the block by windmill from an artesian spring situated approximately 500 m to the south of the Borough bore.
 - (b) our existing irrigation scheme which services 28 ha of established mixed horticulture. This scheme is serviced from an artesian spring-fed dam situated approximately 1900 m to the south-east of the Borough's bore.
- (3) Until a full water resources survey is completed we contend that there is insufficient scientific or technical evidence available which can confirm that the daily extraction of such a quantity of water would not result in serious long-term effects on the natural water resources of the elevated plateau to the south west of Kaikohe borough.

In lodging this objection we confirm that we wish to be heard in person or by legal counsel at the application hearing.

Attached is a cheque for \$30 for application fees.

Kia ora

A handwritten signature in cursive script, appearing to read "R C Guest", with a horizontal line underneath the name.

(R C Guest)
Field Officer

Thorp Road
Karkite

12-8-57

The Secretary
Northland Catchment Commission
Private Bag
Whangarei

Dear Sir

I wish to object to the Karkite Borough taking water from a bore in Rangihamama block for town purposes.

I believe that this would be a short sighted expedient as if the water was taken it would prevent its use for horticulture in the future. Land in the vicinity is designated prime horticultural soil and is regarded as being better than Kerikeri soils & the numerous small holdings will be forced to turn to other uses than grazing in the near future both for economic & rating reasons. It should be noted that effect of irrigation schemes at Kerikeri has had a beneficial effect on the area both from a landowner's point of view & an employment situation which has generated a greater pros-

PO Box 73
KAIKOHE

10 June 1988

The Manager
Corporate Services
Northland Regional Council
Private Bag
WHANGAREI

Dear Sir

I wish to vigorously object to the Kaikohe Borough Council's application to take water from a bore (or bores).

My main concern is the effect it will have on the water supply to my farm of 90 acres and two houses, and any future dairying or horticulture. It is known that local water bores have dried up during prolonged dry spells.

This whole area is of rich volcanic soil, and flat, and is very suitable for use in the many branches of horticulture, already there are growers of macadamia nuts, kiwifruit and nursery plants here.

If water is taken and the area becomes reliant only on small streams and rain Kaikohe Borough itself will suffer from loss of valuable income and employment.

Yours sincerely

M. G. Slyfield

M.G. Slyfield

WATER AND SOIL MANAGEMENT COMMITTEE

FILE : 4393

REPORT OF STANDING TRIBUNAL

WATER RIGHT APPLICATION 4393 - KAIKOHE BOROUGH COUNCIL

To take up to 2300 cubic metres of natural water per day from a bore in the catchment of Tokakopura Stream for public water supply for Kaikohe Borough.

Hearing before the Standing Tribunal appointed by the Northland Regional Council comprising Cr WE Redwood (Chairman), Cr EJ Oaks and Cr D Fagan held in the conference room of the Northland Motor Inn, Broadway, Kaikohe on Monday 19 September 1988.

Objections were received from :-

- Water Right Objection Committee
- Johnson's Plants Ltd
- IR Nelson
- RL Clarke
- Peter Byers Family Trust & Elaine Byers - Orchids
- DM & MJ O'Connor
- Dept of Maori Affairs
- Levondale Farms Ltd (RC Guest).

Submissions were received from :-

- * - SK Feilley
- * - K & MH Ineson

Appearances and Witnesses :-

For the Applicant :-

- Mr G Mathias - Legal Council
- Mrs Y Sharp - Town Clerk
- Mr LR Thomas - Civil Engineer
- Mr IC Thompson - Geologist
- Mr G Roberts - Geologist.

For the Objectors :-

- Mr G Whiting - Legal Advisor for Water Right Objection Committee and Dept of Maori Affairs
- * Mr DB Killen - for Water Right Objection Committee
- ? Mr MJ O'Connor - for " " " " & CM & MJ O'Connor
- * Mr WW Dalton - for " " " "
- * Mr HA Clark - for " " " "
- Mr RL Richardson - for " " " " - Engineer.
- * Mr RC Guest - Dept of Maori Affairs
- Ms H den Ouden - " " " " - Planner
- Mr DS McKenzie - " " " " - Conservation Officer
- * Mr P Byers - Peter Byers Family Trust & E Byers - Orchids
- * Mr RL Clarke - RL Clarke.

*members of Ted James. **

WATER AND SOIL MANAGEMENT COMMITTEE

Report of Standing Tribunal - Water Right Application 4393 continued

Not Represented :-

Johnson Plants Ltd
IR Nelson.

For the Northland Regional Council :-

Mr DL Roke - Assistant Manager Environmental Services
Mr AG Phipps - Senior Investigations Officer.

In Attendance :-

Mr DH Alderton - Administration Officer.

Report of Standing Tribunal - Water Right Application 4393 continued

The Tribunal Recognises that :

- 1 That it is a function of the Regional Council to supervise and guide as seems best in the public interest the settlement of competing demands in respect of natural water, and in doing so ensure that adequate account is taken of, among other things, the needs of primary and secondary industry, community water supplies, all forms of water based recreation, fisheries and wildlife habitats, and of the preservation and protection of the natural characteristics of streams.
- 2 It is a function of the Regional Council to promote the protection of water supplies of local authorities and the conservation and most beneficial uses of natural water.
- 3 It is Council policy to protect community and stockwater supplies and that community and stockwater supplies will generally be afforded priority over other consumptive uses.
- 4 That the Council has no water management plan specific to the water resources associated with the Kaikohe basalt aquifers.
- 5 The applicant proposes by this application to take groundwater from the fractured, porous basalt aquifer system which underlies an area of approximately 15 km² comprising Kaikohe Hill (Monument Hill) and the plateau extending south west and south of Kaikohe.
- 6 The headwaters of a number of small streams including the Otangaroa, Waikaka, Papahawaiki, Te Tunaotemaku, Omaunu & Totara Streams originate as springs emanating and running off the Kaikohe basalt flows.
- 7 The quantity applied for, 2300 cubic metres per day is based on the applicant's predicted maximum daily demand for 25 years hence.
- 8 The current water demand of the applicant is :

daily average for year	: 1500 cubic metres per day
average day of peak week	: 2100 cubic metres per day
peak day	: 2400 cubic metres per day
- 9 The applicants predicted water demand based on 1.25% growth per year is :

Year	1998	2013
daily average for year	: 1600 m3	2050 m3
average day of peak week	: 2300 m3	2700 m3
peak day	: 2700 m3	3300 m3

Report of Standing Tribunal - Water Right Application 4393 continued

- 10 a The capacity of the applicant's existing water supply sources is:

Source	Maximum Quantity
Taraire Hills Dam	460 m ³ /day
Wairoro (Kopenui) Stream	1300 m ³ /day
Squires Spring (subject of Appln 1862)	1100 m ³ /day
Kaikohe Hill bore (subject of Appln 1862)	

- b During a prolonged dry spell the quantity of water available from Taraire Hills Dam is reduced to approximately 300 cubic metres per day.
- c The applicant's water right (No 4109) to take up to 1300 cubic metres per day from the Wairoro (Kopenui) Stream expires in 1992.

In line with the Northland Regional Council Wairoro Stream Catchment Water management Plan 1040 cubic metres per day of the 1300 cubic metres per day is allocated to the applicant in Water right 4109 in lieu of that quantity not being currently used by existing horticultural irrigation water right holders to which it was previously allocated. The allocations will be reviewed in light of the horticultural irrigation requirements of those right holders in 1992.

- d The maximum quantity that the applicant can actually take from the combined Kaikohe Hill bore and Squires Spring sources during a prolonged dry spell is approximately 550 cubic metres per day.
- 11 It is reasonable and proper for the applicant as a Local Authority responsible for the provision of public water supplies to plan for and make provision for predicted future public water supply needs.
- 12 The applicant's current water supply sources, including those the subject of Water Right Application 1862, are insufficient to meet the applicant's existing needs during a prolonged dry spell without the imposition of water use restrictions. Those sources will be insufficient to meet the applicant's predicted peak week water requirements for a ten year planning period by up to 1200 cubic metres per day depending on the applicant's allocation from the Wairoro (Kopenui) Stream source (see 10c above), and by up to 2200 cubic metres per day for a 25 year planning period.
- 13 The applicant's consultants have carried out geophysical and hydrogeological investigations of the the Kaikohe basalt groundwater resource including :
- a) an electrical resistivity survey to determine the dimensions of the basalt flows and locate favourable drilling sites;

Report of Standing Tribunal - Water Right Application 4393 continued

- b) drilling of test bores in several locations including the location the subject of this application;
 - c) a pumping test of the test bore at the proposed site of a production bore, at a pumping rate of approximately 400 cubic metres per day for three days;
 - d) the measuring of groundwater levels in existing bores in the Rangihamama area and in the investigation bores on a weekly basis since October 1987;
 - e) the drilling and construction of multilevel piezometers at three sites in the Rangihamama area in March 1988.
 - f) production of a computer simulation of the basalt aquifer using a finite difference type groundwater model with the aims of matching predicted and existing groundwater level data and then predicting the impact of the proposed abstraction by the applicant on groundwater levels and spring flows.
- 14 The applicant's consultants concluded from their investigations that :
- a) a suitably constructed bore at the proposed take site would be capable of yielding approximately 1550 cubic metres per day;
 - b) there would be some reduction of flow from springs in the immediate area of the proposed pumped bores and lowering of groundwater levels in nearby production bores, but that these effects would be "minimal" and would still allow other users outside of the immediate area of the proposed abstraction to have access to groundwater;
 - c) the aquifer can sustain the proposed abstraction.
- 15 The results of the groundwater modelling indicate that :
- a) water table springs within 250 metres of the proposed abstraction bore(s) may cease to flow but the effect on springs farther away is less certain;
 - b) that groundwater levels within 250 metres of the proposed bores could be lowered by 10 to 15 metres, at 250 metres to 1500 metres distance about 6 metres lowering could occur with lowering diminishing to zero at the periphery of the aquifer.
- 16 The predicted changes to groundwater levels are indicative of the order of change rather than absolute level changes and that there is a significant degree of uncertainty involved in the predictions.

Report of Standing Tribunal - Water Right Application 4393 continued

- 17 Basalt aquifer systems, and their associated springs, are complex and likely to be heterogeneous and anisotropic (variable) in nature and it is thus technically difficult to precisely predict the effect of the applicant's proposed abstraction on individual spring flows and groundwater levels at a particular bore site.
- 18 The collection of further summer stream and spring flow data and pumping test data would be required if the groundwater model and its predictive ability are to be refined.
- 19 The groundwater model was based on a conservative estimate of aquifer parameters.
- 20 The basalt aquifer system is recharged directly by infiltration of rainfall. Recharge of the aquifer system has been calculated to be equivalent to approximately 500 mm/year on average (17870 cubic metres per day).
- 21 The maximum daily total of existing consumptive water uses from the Kaikohe basalt groundwater resource and related streams is approximately 3000 cubic metres per day including Kaikohe Hill and Squires Spring water supplies.
- 22 Eight objections and two submissions were lodged against this application.
- 23 That the OBJECTIONS were on the following grounds :
 - i) that there is insufficient information on the size and limitations of the resource;
 - ii) that the objectors existing farm water supplies or horticultural irrigation supplies will be detrimentally effected;
 - iii) the water available from the resource should be allocated to future potential horticultural developments;
 - iv) the quantity applied for is large and may exceed the resource limits;
 - v) there are alternative sources available to the applicant.
- 24 That many of the objectors rely on, to various extents and for various quantities, water from spring fed streams running off or bore water abstracted from the Kaikohe basalt flows to meet their farm water supply or horticultural irrigation requirements.

WATER AND SOIL MANAGEMENT COMMITTEE

Report of Standing Tribunal - Water Right Application 4393 continued

- 25 That objectors wish their existing water supply sources to be protected should a right be granted to the applicant.
- 26 There is a significant area of soils, approximately 2000 ha, associated with the Kaikohe basalt flows that are suitable for intensive horticultural development.
- 27 A number of the objectors indicated that they may wish to diversify into horticultural development at some unspecified future time. However no development proposals were presented and there are no outstanding water right applications for such uses.
- 28 The quantity applied for, 2300 cubic metres per day, would be sufficient to provide for the irrigation of approximately 77 ha.
- 29 Should the application be granted any further significant horticultural development in the Rangihamama Road area would need to utilise water storage or some more distant source.
- 30 The proposed site of taking is situated on land which is included in the Department of Maori Affairs Rangihamama Development Scheme.
- 31 The Department of Maori Affairs is, apart from the applicant, the major user of the water resource associated with the Kaikohe basalt aquifers having some 28 ha of existing horticultural development a further 12 ha with shelter, 417 ha of pasture for which stock water is required and a proposed abattoir. The irrigation water for the horticultural development is supplied from a spring fed reservoir located some 1900 metres from the applicant's proposed bore site, stock water is taken from various bores and springs some within several hundred metres of the proposed bore site.
- 32 There are some existing lawful uses of springs and shallow bores, including both domestic and stockwater supplies and irrigation, which are within a distance from the applicant's proposed bore site within which significant reductions in groundwater levels and spring flows are predicted.
- 33 Several catchments in the vicinity of the applicant's proposed bore site were surveyed by staff of the Department of Conservation who found:
 - a that the margins of the streams investigated were severely modified as a result of past farming and adjacent horticultural activities;
 - b A number of the small streams which flow from the Kaikohe basalt flows contain remnant wetlands and where the margins of these are forested a greater diversity of bird and plant species is present;

Report of Standing Tribunal - Water Right Application 4393 continued

- c 'Browns road swamp' a site which has been recorded as being of 'potential value freshwater habitat' is located on the Waikaka-Omaunu Stream approximately 2.5 km from the proposed bore site.
- 34 Any significant reduction in stream flow and or the water level in the wetlands could have adverse affects on such wetlands.
- 35 The streams associated with the Kaikohe basalt aquifer resource have in as much as do all natural stream flows, spiritual and cultural value to the Maori people.

The Tribunal Concludes that :

- 1 There is sufficient information available on the capacity of the resource and the likely effect of the applicant's proposal to recommend that a right be granted to the applicant to take groundwater at the proposed site.
- 2 However the level of uncertainty involved in the estimation of the effects of the proposal on spring flows and ground water levels, and hence existing authorised uses of the resource including stream flora and fauna, warrants a conservative allocation until the effects of the proposal can be more precisely defined.
- 3 Given the above mentioned uncertainties the granting of a water right for a 25 year term and for a quantity, based on a 25 year planning period is not appropriate and it is considered that a 7 year term and a quantity in line with the applicant's predicted requirement, taking into account the applicants existing sources, for that period could be granted.
- 4 Existing authorised users of springs and shallow bores within 750 m (ie. the 500 m zone of likely significant effect predicted by the applicant's consultants plus an additional 250 m to cover uncertainty) should be protected by provision for an alternative water supply as a condition of the right.
- 5 Provision should also be made to preserve a minimum flow in the two spring fed streams, the Waikaka and Papahawaiki Streams, that are most likely to be affected, to help maintain all stream life, including the preservation of wetlands, and protect existing downstream authorised uses.
- 6 The applicant's proposed use of the water for public water supply is a beneficial use, and is a more beneficial use than reserving the water for some possible but as yet unspecified future horticultural development.

WATER AND SOIL MANAGEMENT COMMITTEE

Report of Standing Tribunal - Water Right Application 4393 continued

- 7 Outside of the area specified in 4 above other existing authorised users of the groundwater and spring fed streams will not be prevented from exercising their rights, given the allocation of the reduced quantities recommended.

- 8 Given the existing and potential demand for water for public water supply, farm water supplies, horticultural irrigation, industry and instream needs and the limits of the existing knowledge of the resource, a more complete water resource survey should be completed as soon as possible and a water management plan prepared for the Kaikohe basalt aquifer system and associated stream catchments.

Report of Standing Tribunal - Water Right Application 4393 continued

The Tribunal Recommends :

a) That a right be granted to KAIKOHE BOROUGH COUNCIL

To take natural water from a bore in the catchment of the Tokakopura Stream on Rangihamama X3A Block Blk III Punakitere SD Map Reference : N15/303316 for the purpose of public water supply to Kaikohe Borough and environs subject to the following conditions :-

- 1 The total quantity taken shall not exceed 1600 cubic metres per day, 8400 cubic metres per week nor 218000 cubic metres per year.
- 2 The Grantee shall install a meter to measure the quantity taken from the aquifer with an accuracy of +5%.
- 3 The Grantee shall measure and keep a record of :
 - (i) the quantity of water taken from the bore each week;
 - (ii) the water level in existing observation bores shown as No 1, 7, 8 and 9 on Northland Regional Council Plan No 2461 at least weekly.
- 4 Records collected as per Condition 3 shall be supplied to the Council by 1 May each year for the previous year ending 31 March, or on written request from the Council.
- 5 If any person's lawful taking of natural water such as is listed in attached Schedule 1 and which is from groundwater or springs within approximately 750 metres of the bore the subject of this right, is affected by the exercise of this right to the extent that they can no longer obtain the quantity of water to which they have a right, the Grantee shall make available to them the quantity of water which they have been prevented from taking.
- 6 The supply of water under Condition 5 is confined to such purposes and upon such lands as it was being lawfully used prior to 1 August 1988.
- 7 Notwithstanding the above allocation the Grantee shall not take more than 550 m³/day when:
 - (i) the flow in the Waikaka Stream at site A (Map Reference : N15/302323), as indicated on Northland Regional Council Plan No. 2461, is below 2.5 litres per second;

WATER AND SOIL MANAGEMENT COMMITTEE

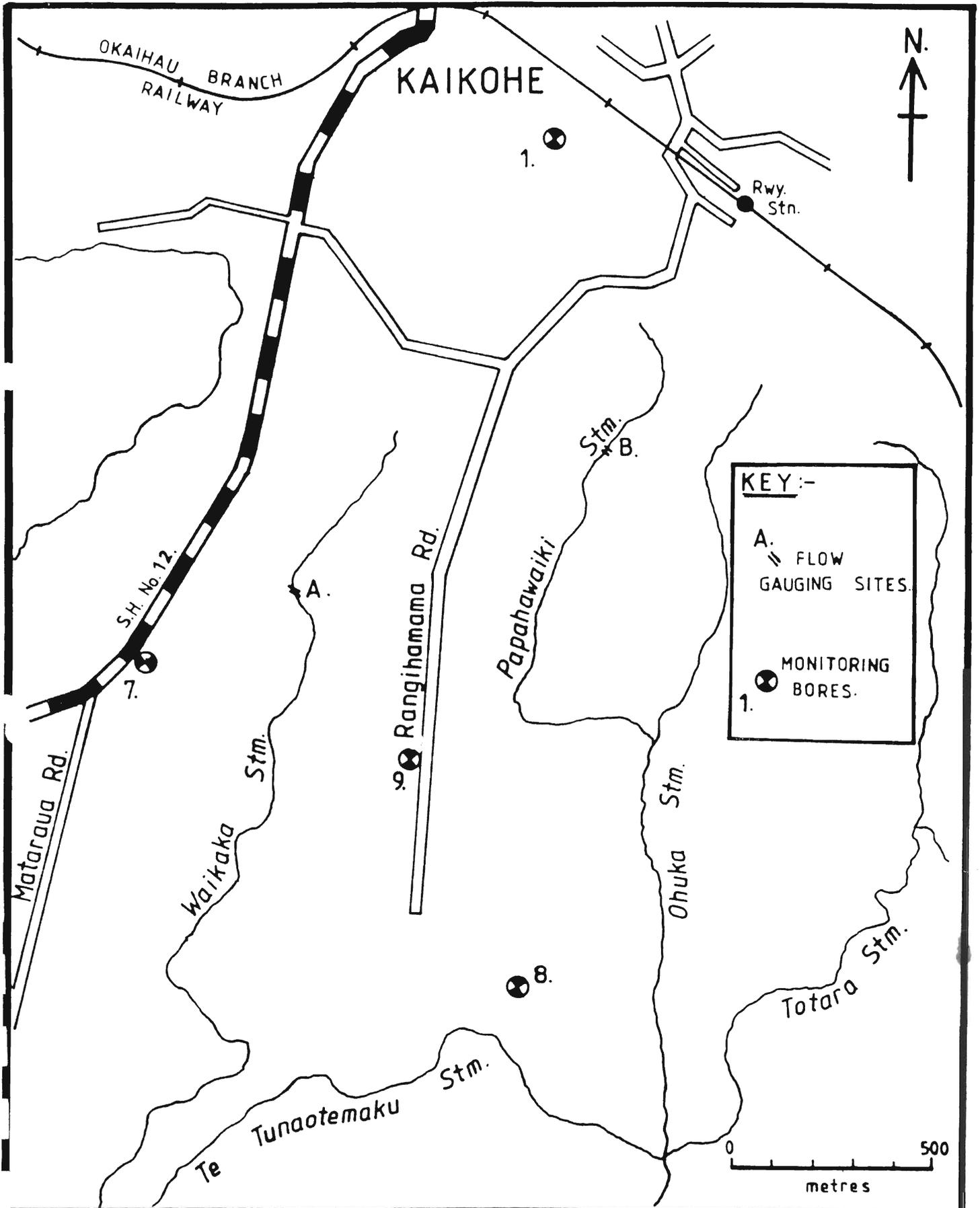
Report of Standing Tribunal - Water Right Application 4393 continued

- (ii) the flow in the Papahawaiki Stream at site B (Map Reference : N15/308326), as indicated on Northland Regional Council Plan No. 2461, is below 5 litres per second.

8 The Grantee shall cease the exercise of this right when:

- (i) the flow in the Waikaka Stream at site A (Map Reference: N15/302323), as indicated on Northland Regional Council Plan No 2461, is below 1.0 litre per second;
- (ii) the flow in the Papahawaiki Stream at site B (Map Reference: N15/308326), as indicated on Northland Regional Council Plan No 2461, is below 2.0 litres per second.

EXPIRY DATE : 31 August 1995



NORTHLAND REGIONAL COUNCIL

Drawn
Traced D.P.B.
Scale G.L.S.

Location of Flow Sites A. & B.
& Ground Water Monitoring Bores.
Water Right No. 4393
KAIKOHE

Approved
M. Roke 10/88
Plan No. **2461**

WATER RIGHT 4393 - SCHEDULE 1

Properties to which the Grantee shall make water available should the exercise of Water Right 4393 prevent the taking of the quantity of water authorised, as at 1 August 1988, from any bore, spring or spring stream within approximately 750m of the Grantees bore.

PROPERTY LEGAL DESCRIPTION (1)	NAME OF OCCUPIER (2)	AREA (HA)	USE OF WATER (3)	MAXIMUM QUANTITY (4) (M3/DAY)
Pt Rangihamama X3	Dept of Maori Affairs	480	domestic/stock	25
Tuhuna 27 28A 36 37A 37B 2B	Slyfield MG (Est)	40.3	domestic/stock	5
Tuhuna 26	Johnson's Plants Ltd	10.4	domestic/stock	
Tuhuna 25	Maddox LJ & GE	3.7	domestic/stock	
Tuhuna 24	Jenkins RN	4.9	domestic/stock & irrigation	15
Tuhuna 17A 20A 20B2 PT19	Rowsell & Rowsell Ltd	6.0	domestic & industrial	35
Tuhuna 6E2	Kidd L (Maori Owners)	12.3	domestic/stock	
Tuhuna 6D2	Pou C & R TeA	6.3	domestic/stock	
Tuhuna 20B1	Mau D	1.0	domestic/stock	
Tuhuna 21	Pou RM (Est)	2.3	domestic/stock	
Tuhuna 22	Maori Trustee	1.4	domestic/stock	
Rangihamama K7	Clarke R & R, C & E	2.4	domestic/stock & irrigation	50
Rangihamama G1	Maori Owners	4.9	domestic/stock	
Rangihamama F1	Stockman SR	0.8	domestic/stock	
Rangihamama L2A1	Hare Ngarama Mahu	0.1	domestic/stock	
Rangihamama L2A2	Harris T	0.1	domestic/stock	
Rangihamama K6C1	Whiu RD	0.2	domestic/stock	
Rangihamama K2B	Hui Te K & P	1.9	domestic/stock	
Rangihamama K3B3A	Pou WW	0.6	domestic/stock	
Rangihamama K3B3	unknown	1.2	domestic/stock	
Rangihamama K3B2	Kihi WA (Est)	0.6	domestic/stock	
Rangihamama K3A	Moka AM (Est)	1.5	domestic/stock	
Rangihamama K4	Kakarana Moengaroa	0.8	domestic/stock	
Rangihamama K6A1	Pou A (Est)	0.2	domestic/stock	

(1) All in Blk III Punakitere SD and or Blk XV Omapere SD.

(2) As defined in Rating Act.

(3) Authorised uses existing as at 1 August 1988.

(4) Where the maximum quantity is not specified it is equivalent to the reasonable domestic and stockwater requirements of the property.

Note :

Site at which water is to be made available is either at the site from which water was being taken prior to 1 August 1988 or at some other mutually agreed site.

WATER AND SOIL MANAGEMENT COMMITTEE

Report of Standing Tribunal - Water Right Application 4393 continued

b) Replies to the Objectors:

The objection of: Water Right Objection Committee
 Johnson's Plants Ltd
 RL Clarke
 DM & MS O'Connor
 Department of Maori Affairs
 Levondale Farms Ltd (RC Guest)

regarding:

insufficient information on size and limitations of resource to make any further allocation is considered to be substantially met by the information that was presented at the hearing and by the proposed restrictions and conditions on the water right.

The objection of: Water Right Objection Committee
 Johnson's Plants Ltd
 IR Nelson
 RL Clarke
 Peter Byers Family Trust & Elaine

Byers - Orchids

DM & MJ O'Connor
Department of Maori Affairs
Levondale Farms Ltd (RC Guest)

regarding:

possible detrimental effect to existing authorised uses of the resource is considered to be met by the protection of such uses that may be substantially affected by the restrictions and conditions on the water right. Those authorised uses that are not specifically protected will not be prevented by the granting of the right as proposed.

The objection of: Water Right Objection Committee
 IR Nelson
 Department of Maori Affairs

regarding:

priority for the use of the water resource being given to future horticultural developments is disallowed on the grounds that the proposed allocation to the applicant for public water supply needs is a more beneficial use of the available resource than reserving the water for some as yet unspecified future horticultural irrigation.

**NORTHLAND
REGIONAL
COUNCIL**



Postal: PRIVATE BAG Location: 2 KAKA ST. WHANGAREI, N.Z. Telephone: 484 639

Fax: (089) 480 012

All Communications to:

Manager, Corporate Services

FILE : 4393
GFR:LJA

20 October 1988

~~Kaikōhe Borough Council~~
~~PO Box 246~~
~~KAIKOHE~~

RC Guest
RD 3
KAIKOHE

Dear Sir

DECISION ON APPLICATION IN RESPECT OF NATURAL WATER

The Northland Regional Council at its meeting held on 12 October 1988 issued its decision in regard to your application, filed under no 4393.

The decision is to grant the right as set out in the attached full decision and recommendation of the Council's Tribunal, which were adopted by the Council.

The decision will be publicly notified and is subject to appeal by the applicant or objector(s), against the decision and the allocation of costs to the Planning Tribunal, Department of Justice, Private Bag, Wellington, within 28 days after the date of this letter, i.e. Thursday, 17 November 1988.

In the case of no appeal having been lodged within the above prescribed period, the Council will proceed to grant the right applied for in accordance with the said decision.

Note : A copy of section 56 of the Town and Country Planning Regulations 1978, which details the schedule to be followed when lodging an appeal, is attached. Please note that a copy of the appeal must be sent to the Regional Council within seven days.

Any grounds for the disallowance of the objection(s) are contained in the attached decision.

Cont.

2

4393

The Council also resolved that the costs in respect of the application be met by you, ie :-

Total	\$10,408.77
Less Application Fee	60.00
Less Deposit	310.00
	<hr/>
Balance to Pay	\$10,038.77
	<hr/>

Please note this includes GST
(GST No 46-655-948)

The Council resolved that the objection deposit of \$30.00 each paid by Johnson's Plants Ltd, IR Nelson, RL Clarke, Peter Byers Family Trust & Elaine Byers - Orchids, CM & MJ O'Connor, Department of Maori Affairs, RC Guest and \$60.00 paid by Water Right Objection Committee be refunded.

The Council has a policy on the supervision of the exercise of water rights and monitoring their effects on the water resources of the area.

At the present time, provided the right is managed correctly, and no offences occur, the Council does not recover the cost of this monitoring except by discussion and agreement with the right holder.

However, the Council has now adopted the principle of 'user-pays' in regard to the costs of overall water resource management and will be considering a policy of cost recovery for these services from holders of water rights. Right holders will be kept informed of developments in this regard.

Yours faithfully



GF Reeves
MANAGER CORPORATE SERVICES

Encl

56. Appeals— (1) Every notice of appeal to the Tribunal under the Act or any other Act shall be in accordance with form N set out in the First Schedule hereto or to the like effect. 115

(2) Any appeal may be from the whole or any part of the decision to which it relates; and, where the appeal refers to part of the decision only, that part shall be clearly defined in the notice of appeal. 120

(3) Every notice of appeal shall give full particulars of the decision appealed against and the subject matter and the grounds of the appeal. A copy of the application or objection to which the appeal relates and of such documents as are necessary for an adequate understanding of all matters in dispute shall be annexed to the notice of appeal and form part of it: 125

Provided that it shall not be necessary to annex a copy of any regional, district, or maritime planning scheme to any notice of appeal. 125

(4) The notice of appeal shall contain sufficient information, including such plans as are necessary, to identify any property or area particularly affected.

(5) Except where the appeal arises under the Act out of an application made without notice, the appellant shall within 7 days after lodging a notice of appeal with the Registrar, or within such further time as the Chairman may allow, serve copies of the notice of appeal on— 130

(a) The applicant (if any);

[(aa) The Council, where the Council is not the respondent:]

(b) The Commissioner of Works;

(c) The District Commissioner of Works;

(d) The united or regional council;

(e) The Maritime Planning Authority, where the appeal is under Part IV of the Act; 135

(f) The National Water and Soil Conservation Authority, where the appeal is under the Water and Soil Conservation Act 1967 and the Authority is not the respondent;

(g) The appropriate regional water board or boards, where the appeal is under the Water and Soil Conservation Act 1967 and the board is not the respondent; and 140

(h) Any objectors:

Provided that the Chairman may on the application of the appellant made within 7 days after lodging notice of the appeal with the Registrar, dispense with service on some or all of the objectors or cross-objectors on such terms as the Chairman thinks fit, if he is of the opinion that such objectors or cross-objectors are not affected by the appeal, or that service on representative objectors will protect the interests of all objectors, or that there is other sufficient reason. 145

(6) When an appeal arises out of an application or objection in respect of which there was a right of objection or cross-objection, the appellant shall, within 7 days after lodging the notice of appeal with the Registrar, serve copies of the notice of appeal on the objectors or cross-objectors. 150

(7) The Chairman may at his discretion direct that copies of the notice of appeal and other relevant documents shall be served by the appellant upon any other body or person or direct that the time and place of the hearing of the appeal and its purport be publicly notified. 155

(8) The appellant shall within 7 days after the date of service advise the Registrar of the date of service on the respondent and on each of the bodies and persons required to be served.

Para. (aa) inserted in subcl. (5) by reg. 9, SR 1981/104.

R.56.01 As to the statement in the notice of appeal of the relief sought by the appellant, see paras. 49.03, 49.05, and 49.06, p. 39-27, *ante*. 160

39—154 (1/6/81) *Town and Country Planning and National Development*

R.56.02 By the notice of appeal, an appellant should give the other parties adequate notice of the matters which he intends to advance, particularly if they are more limited than the grounds for the objection, and bearing in mind that the grounds for objection cannot be extended. *Canterbury RPA v Paparua County D No C25/80 C438*.

R.56.03 Subclause (5) is not applicable to service of the notice of appeal on the respondent, and therefore the power conferred by the subclause on the Chairman to allow further time for service does not extend to time for service on the respondent (as to which, see para. R.55.01, *ante*).

R.56.04 In *Stresspan v Otaki Borough D No W74/80 C1702* the appeal was dismissed for want of jurisdiction where the notice of appeal did not identify the full extent of the land whose zoning was in issue.



FEDERATED FARMERS OF NEW ZEALAND (INC.)

Agriculture House, 12 Johnston Street, P.O. Box 715, Wellington. Telephone (04) 737-269, Fax (04) 731-081

21 December 1988

Mr H A Clark
Secretary
Water Right Objection Committee
P O Box 164
KAIKOHE

Dear Mr Clark

Attached please find copies of the respondents reply to the appeal lodged on your behalf and that lodged by the Kaikohe Borough Council.

You will note that the Northland Regional Council denies all of the grounds of appeal lodged by you. As a result the issue of whether a water right ought properly to have been granted in the circumstances will depend on the evidence which you are able to produce to dispute the conclusions reached by the Tribunal convened by the Northland Regional Council.

I wish to discuss this evidence with you at the earliest possible opportunity in the New Year.

Of necessity, the evidence will need to be supported by sound hydrological information. Your appeal centres on the needs of downstream users, i.e. surrounding farmers and recreational users. It is unlikely that the Planning Tribunal will uphold your appeal unless proof is provided of the effects on existing users.

It is for this reason that I believe that your Committee needs to be thoroughly briefed in the consequences of lodging an appeal. You will be aware that the Planning Tribunal has the ability to award costs against any party who brings a frivolous appeal. This should not arise in this case given that an appeal has also been lodged by the Kaikohe Borough Council.

We should also investigate the possibility of co-ordinating witnesses with the Northland Regional Council in order to make savings on the cost of appeal.

Could you please liaise with me early in the New Year on these matters. I shall be in the office from Monday 9 January, 1989.

At this stage I am not able to give you an indication as to when the matter will be set down.

Yours sincerely

A handwritten signature in dark ink, appearing to read 'Ewan Chapman', with a stylized flourish extending to the right.

Ewan Chapman
LEGAL ADVISER

IN THE MATTER of the Water & Soil
Conservation Act 1967

A N D

IN THE MATTER of an appeal pursuant
to Section 25 of that
Act

BETWEEN THE WATER RIGHT
OBJECTION COMMITTEE an
unincorporated
committee comprising
90 householders and
landowners who live in
the area of land
subject to this appeal

Appellant

A N D

THE NORTHLAND REGIONAL
COUNCIL

Respondent

REPLY BY RESPONDENT

TAKE NOTICE that the Northland Regional Council ("the Respondent")
HEREBY REPLIES to the Notice of Appeal by the Water Right Committee
("the Appellant") from a decision of the Respondent delivered on the
20th day of October 1988 and relating to an application by the Kaikohe
Borough Council to take 2,300 cubic metres of groundwater per day for
public water supply.

IN REPLY to the Appeal the Respondent says:-

1. IT admits paragraphs 1, 2 and 3 of the Notice of Appeal

2. IN respect of the grounds on which the Appeal is based set out in paragraph 4 of the Notice of Appeal the Respondent:-

- (a) Denies the statements of the Appellant set forth in subparagraph (a).
- (b) Denies ground (b) of the Notice of Appeal.
- (c) Denies ground (c) and says that sufficient evidence was presented to it at the hearing to justify a grant of a water right, as granted, for a lower quantity of water than that sought by the Applicant.
- (d) Denies ground (d) and says that the water right, as granted, will preserve stream flows sufficient to ensure the preservation of amenities, fresh water fisheries and cultural values.
- (e) Denies the statements of the Appellant set forth in subparagraph (e) of the Notice of Appeal

3. THE Respondent asks that its decision be confirmed and this Appeal be disallowed.

4. OTHER parties which are in the opinion of the Respondent affected by this Appeal are as detailed in the Schedule hereto.

DATED at Whangarei this 16th day of *December* 1988.

SIGNED for and on behalf of the)
Respondent by the Respondent's)
Solicitor and authorised agent)
PETER WILLIAM MAHOOD:-)

Peter Mahood

This reply is filed by Peter William Mahood, Solicitor for the Respondent, whose address for service is at the offices of P.W. MAHOOD, Solicitor, Mansfield House, 127 Bank Street, P.O. Box 1750, Whangarei. Ph: (089) 485-075

SCHEDULE

Department of Maori Affairs, WHANGAREI

Department of Conservation, Private Bag 8, Newton, AUCKLAND

P. Byers (Peter Byers Family Trust, E. Byers) P.O. Box 247, KAIKOHE

R.L. Clarke, Rangihamana Road, KAIKOHE

Johnson's Plants Limited, Tawanui Road, KAIKOHE

I.R. Nelson, Station Road, KAIKOHE

M.J. and C.M. O'Connor, Mangakahia Road, KAIKOHE

R.C. Guest, Waimatanui Road, R.D.3, KAIKOHE

S.K. Reilly, Thorpe Road, KAIKOHE

K.J. and M.H. Ineson, Mangakahia Road, KAIKOHE

Kaikohe Borough Council, C/o Messrs. Thomson Wilson, Solicitors,
P.O. Box 1042, WHANGAREI

IN THE MATTER of the Water and Soil
Conservation Act 1967

- and -

IN THE MATTER of an Appeal pursuant
to Section 25 of that
Act

BETWEEN THE KAIKOHE BOROUGH
COUNCIL

Appellant

A N D THE NORTHLAND REGIONAL
COUNCIL

Respondent

NOTICE OF APPEAL UNDER SECTION 25
OF THE WATER AND SOIL CONSERVATION ACT 1967

TAKE NOTICE that the KAIKOHE BOROUGH COUNCIL HEREBY
APPEALS against the decision of THE NORTHLAND REGIONAL
COUNCIL delivered on the 20th day of October 1988.

1. THE decision was made on an application for a
water right to take 2300 cubic metres of water per day at
Rangihamama Road, Kaikohe for the purpose of a municipal
water supply. The Appellant was the applicant for the
water right. A copy of the application is attached
hereto.

2. THE property from which the Appellant sought to
extract water in terms of its application for a water
right is described as Rangihamama X3A Block.

3. THE full text of the decision in respect of which
this appeal is made and the reasons given for the decision
as conveyed to the Appellant by the Respondent is annexed
hereto.

4. THE grounds on which this appeal is based are:

- (a) The term of the water right granted is insufficient.
- (b) The quantum of the water right granted is insufficient having regard to the Appellant's requirements, the uses to which the water is to be put and the extent of the resource from which the water is to be extracted.
- (c) The restriction of the right granted to take water from a bore is unreasonable and inappropriate.
- (d) The grant of the right sought would have a minimal impact upon existing water users and can be met from the resource available.
- (e) It would be wrong to preserve the water resource available for horticultural development as the extent of the resource would be insufficient for that purpose.
- (f) The grant of the right sought would have no environmental impact upon the district.
- (g) The grant of the right sought would have no effect upon existing wetlands within the district.
- (h) The grant of the right sought would have no effect upon the spiritual and cultural values of the Maori people.
- (i) Environmental and/or Maori spiritual and cultural values should not be issues of concern as such were not advanced as objections to the application for the right under appeal.
- (j) There is no uncertainty in the estimation of the

effects of the proposed extraction for the right sought on spring flows and ground water levels in the district.

(k) There is no level of uncertainty on stream flora and fauna within the region which would warrant the refusal of the right sought.

(l) There is no need to restrict the grant of a water right to the Appellant in order that some water resource survey could be completed at some future date.

(m) There is no need for provision to be made to preserve minimum flows in the Waikaka and Papahawaiki Streams.

(n) As to the conditions proposed by the Respondent the Appellant contends that:

(i) Condition 1 should be amended to read:

The total quantity of water taken shall not exceed 2300 cubic metres per day.

(ii) Condition 5 should be amended by the addition of the following proviso:

Such water as is to be made available by the Grantee shall not form part of the quantities permitted to be taken pursuant to this right.

(iii) Conditions 7 and 8 should be deleted.

(o) (i) The allocation by the Respondent of its total costs on the water right application under appeal to the Appellant is

inappropriate and wrong; and/or

- (ii) The manner in which and the work for which the Respondent has fixed the costs to be paid by the Appellant on its water right application is wrong and such costs as are claimed are excessive.

5. THE Appellant seeks the following relief:

- (a) The upholding of the grant by the Respondent to the Appellant of a water right in terms of its decision of 20 October 1988 subject to the following amendments:

- (i) The deletion of the restriction that the water for which the right is granted be taken from "a bore".

- (ii) The total quantity taken shall not exceed 2300 cubic metres per day.

- (iii) The amendment of Condition 5 by the addition of a proviso stating that such water as is to be made available by the Appellant to other water right holders and water users as are listed shall not form part of the quantity of water that the Appellant is authorised to take pursuant to such right granted.

- (iv) The deletion of Clauses 7 and 8.

- (v) The extension of the expiry date of the right to 31 August 2013.

- (vi) A reduction in the amount of the costs to be

paid by the Appellant.

DATED at Whangarei this 17th day of November 1988

THE KAIKOHE BOROUGH COUNCIL by
its solicitors and duly
authorised agents Messrs Thomson
Wilson.

Per: G. J. Mathias
G.J. Mathias

Address for Service: The offices of Messrs Thomson
Wilson, Solicitors, Crosby's
Building, Rust Avenue, (PO Box
1042), Whangarei.

Telephone Number: Whangarei 484-039.

Annexures:

1. Application
2. Decision of Respondent
3. The names of all persons, all local or public
authorities, who or which appeared or were
represented at the hearing giving rise to this
appeal are as follows:
I.R. Nelson
Johnson Plants Limited
R.L. Clarke
P.W. & E.N. Byers
M.J. & C.M. O'Connor
H.M. & K.J. Ineson
H.A. Clark and others (Water Right Objection
Committee)
Department of Maori Affairs

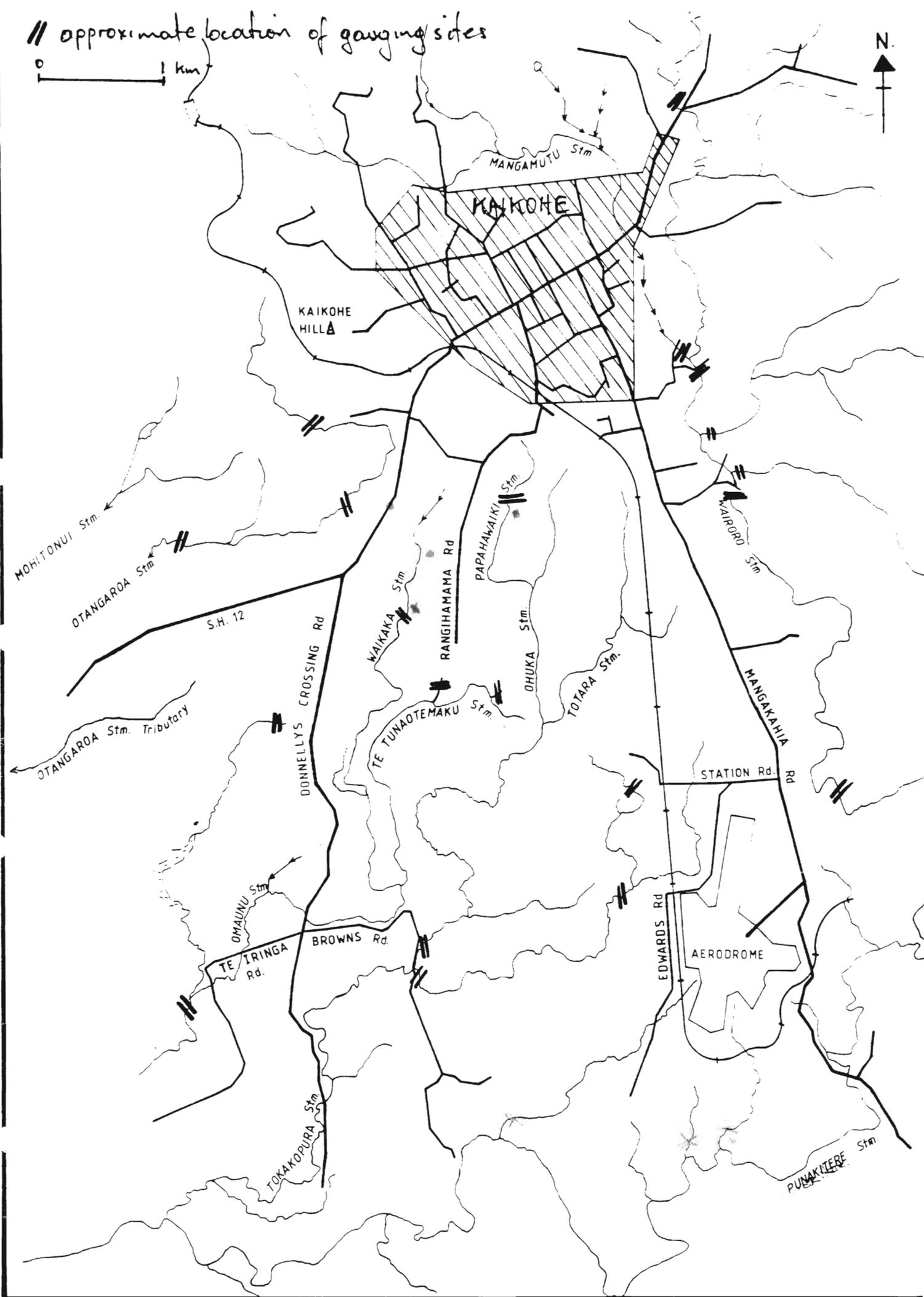
Elvondale Farms Limited
S.K. Reilly

KAIKOHE CATCHMENTS WATER MANAGEMENT PLAN PROJECT

// approximate location of gauging sites



N.



IN THE MATTER of the Water and Soil
Conservation Act 1967

- and-

IN THE MATTER of an Appeal pursuant
to Section 25 of that
Act

BETWEEN THE KAIKOHE BOROUGH
COUNCIL

Appellant

A N D THE NORTHLAND REGIONAL
COUNCIL

Respondent

REPLY BY RESPONDENT

TAKE NOTICE that the NORTHLAND REGIONAL COUNCIL ("the Respondent")
HEREBY REPLIES to the Notice of Appeal lodged by the KAIKOHE BOROUGH
COUNCIL ("the Appellant") against the decision of the Respondent
delivered on the 20th day of October, 1988 in respect of an
Application by the Appellant for a water right to take 2,300 cubic
metres per day at Rangihamana Road, Kaikohe, for the purposes of a
municipal water supply which was granted in the reduced amount of
1,600 cubic metres per day and on other conditions now subject to this
Appeal IN REPLY to the Appeal the Respondent says:-

1. IT admits paragraphs 1, 2, and 3 of the notice of Appeal.

2. IT denies each and every one of the grounds set forth in
paragraph 4 of the Notice of Appeal and following the identification
of the paragraphs in paragraph 4 of the Notice of Appeal further
says:-

- (a) The seven year term of the right is considered sufficient bearing in mind:-
 - (i) The level of knowledge, presently available, of this resource, and
 - (ii) The anticipated impact of the proposal.
- (b) The quantity granted is adequate for the Appellant's needs bearing in mind:-
 - (i) Other resources available to the Appellant
 - (ii) The present knowledge available of the resource
 - (iii) The potential impact of the right granted on the resource and
 - (iv) The present and anticipated needs of the Appellant.
- (c) The restriction to confine the water right to bore water is both reasonable and appropriate.
- (d) (i) The Appellant did not establish that the full water right sought would have only a minimal impact upon existing authorised water users: and further
 - (ii) The evidence adduced by the Appellant as Applicant indicated potential locally significant impact upon existing authorised water users.
- (e) (i) The decision of the Respondent did not preserve the water resource for horticultural development
 - (ii) The specific finding of the Respondent in this regard was

that "the proposed allocation to the Applicant for public water supply needs is a more beneficial use of the available resource than reserving the water for some as yet unspecified future horticultural irrigation."

- (f) On the evidence adduced at the hearing granting the right in full could cause some local springs to dry up and reduced stream flows all of which are matters the Respondant must take into account.
- (g) The evidence adduced at the hearing established that existing wetlands would be adversely affected by the exercise of the right as sought.
- (h) On the evidence adduced at the hearing abstraction of ground water in the quantity sought could cause significant reduction in the flow of small streams in the area thus having an adverse effect upon perceived spiritual and cultural values of the Maori people.
- (i) (i) Environmental and/or Maori spiritual and cultural values are matters which were raised by objectors at the hearing and

(ii) Are matters which the Respondent is obliged to take into account in considering such an application.
- (j) The matter raised in paragraph 4(j) of the Notice of Appeal is contrary to the evidence advanced by the Appellant.
- (k) (i) The water right was not refused but was granted for a reduced amount, and

(ii) Such reduced amount properly took into account the evidence presented to the hearing and the requirement that

the Respondent address environmental and other concerns in considering a water right application.

- (l) The approach adopted in considering this application is a reasonable and proper one bearing in mind the duties of the Respondent in considering such applications, the proven needs of the Appellant and the limited knowledge of the resource.
- (m) (i) Evidence adduced by the Apellant established that flows in springs feeding the Waikaka and Papahawaiki Streams could be significantly reduced, thereby reducing flows in those streams, particularly in long dry spells
- (ii) It is reasonable and proper in those circumstances to restrict the right sought by the Appellant to an amount which will preserve minimum flows in those streams sufficient to protect existing authorised uses and stream life.
- (n) The Respondent denies that the amendments sought to the conditions imposed in granting this water right are necessary or appropriate bearing in mind the statutory responsibilities of the Respondent and the evidence adduced at the hearing.
- (o) (i) The allocation of the costs in this matter is in accordance with the general policy of the Respondent and is appropriate in all the circumstances in this matter.
- (ii) The costs fixed by the Respondent are the actual and reasonable costs attendant upon deciding the Appellant's application.
- (iii) The Respondent has not acted capriciously in awarding costs in this matter but in accordance with established practice and as such the discretion of the Respodent should not be

interfered with on Appeal.

(iv) All parties were invited to make written submissions on the subject of costs to the Standing Tribunal of the Respondent and none did so

(v) At the hearing Counsel for the Applicant (now Appellant) acknowledged that the Kaikohe Borough Council would pay all costs apart from the \$30.00 fee lodged by objectors.

3. THE Respondent asks that its decision be confirmed and this Appeal disallowed.

4. OTHER parties which, in the opinion of the Respondent, are affected by this Appeal, are detailed in the Notice of Appeal.

DATED at Whangarei this 16th day of *December* 1988.

SIGNED for and on behalf of)
the Respondent by the)
Respondent's Solicitor and)
authorised agent PETER)
WILLIAM MAHOOD:-)



This Reply is filed by Peter William Mahood, Solicitor for the Respondent, whose address for service is at the offices of P.W. MAHOOD, Solicitor, Mansfield House, 127 Bank Street, P.O. Box 1750, Whangarei. Ph: (089) 485-075



FEDERATED FARMERS OF NEW ZEALAND (INC.)

Agriculture House, 12 Johnston Street, P.O. Box 715, Wellington. Telephone (04) 737-269, Fax (04) 731-081

24 January 1989

COPY FOR YOUR
INFORMATION

Thomson Wilson
Barristers & Solicitors
P O Box 1042
WHANGAREI

Attention: Mr G.J. Mathias

Dear Sirs

RE: APPEALS: WATER RIGHT OBJECTION COMMITTEE V
NORTHLAND REGIONAL COUNCIL
APPLICANT: KAIKOHE BOROUGH COUNCIL

Thank you for your letter of 24 January 1989. The formula proposed therein is acceptable to the Water Right Objection Committee.

I advise that the Water Right Objection Committee is prepared to withdraw its appeal conditional upon the withdrawal of the appeal by the applicant.

I have already advised the Registrar verbally of this course of action and enclose a copy of my letter confirming same.

I trust this concludes this matter to the mutual satisfaction of all parties. I thank you for your co-operation in this regard.

Yours faithfully

J. Chapman
DVISER

Letter to the Editor
KAIKOHE WATER APPLICATION

The main group which opposed councils application to extract water from Rangihamama Road and the renewal of the rights on monument hill did so for the following reasons:

- (1) Over the years the council has progressively taken more water off the hill and the result environmentally is that the stream flowing westward from this hill is now a dry stream bed in mid summer. Water which came originally from Squires Spring and numerous other springs around Monument Hill now does not run so the fast flowing stream with clean water has gone and those people living down this stream have had to organise water for stock from another source.
- (2) Withdrawing significant water from underground has no guarantee as to its impact on where it will effect on other springs. Borough Councils consultants acknowledge in their reports that extraction will impact on other water users and springs.
- (3) Any significant water use be it rural or town should be from one of the many surface sources of water going to waste that abound in this region. Whilst the cost is extra the impact on streams and other users is more readily controlled. Maori access to eels and watercress in these streams are not affected and the character of this surrounding land is retained for all to enjoy.

After all the work and analysis we have done over this case we consider that the county and borough should be working together to provide water from a source that will allow growth in the town and the country over the next period of years. If this means those of us in the surrounding rural belt paying a bit more on our rates, we are prepared to do this. We thank the paper for allowing us this space to show our position which we consider has been distorted to this point in time.

Water Right Objection Committee.

G C N Z Consultants

Groundwater and Civil New Zealand Consultants Ltd
Water and Environmental Engineers and Geoscientists.



10 - 14 New North Road, Auckland
Postal: P.O. Box 8441, Symonds Street, Auckland 3

Ph: (09) 399 477 or 771 388
Fax (09) 399 702

16 December 1988

2479.01

Water Right Committee
C/- H A Clark
PO Box 164
KAIKOHE

Dear Sir,

RE COST ESTIMATES FOR PROVIDING TECHNICAL EVIDENCE FOR YOUR APPEAL

We are aware that the Water Right Committee has limited funds available and consequently we have examined the work programme to see where cost savings can be made. There are two approaches to providing evidence at this appeal:

- 1) To present a thorough and reasoned technical argument as evidence as a means to show that the work done by the respondents was insufficient
- 2) To provide evidence which discredits the respondents work and rely on cross examination to expand on technical matters.

Our estimate of costs for the first approach is given in Appendix A and is summarised below:

i) Obtaining and Reviewing Data	\$1580.00
ii) Preparation of Evidence	\$3952.00
iii) Attendance at Hearing	\$2400.00
plus site visit and initial data evaluation	\$977.87
SUB TOTAL	\$8909.87
GST	\$890.99
TOTAL	\$9800.86

A member of the A.G.C. Consulting Group.

OFFICES: Auckland, Wellington, Sydney, Melbourne, Brisbane, Adelaide, Perth, Darwin, Malaysia
PRINCIPALS: N.Z. C. H. Kidd, F. G. Bartley, P. J. Riddell, M. A. W. Taylor, W. J. Russell

Our estimate of costs for the second approach, which is in our view the minimum that should be done, is given in Appendix B and is summarised below:

i) Obtaining and Reviewing Data	\$900.00
ii) Preparation of Evidence	\$2250.00
iii) Attendance at Hearing	\$1280.00
plus Site Visit and initial data evaluation	\$977.87
	SUB TOTAL \$5407.97
	GST \$540.80
	TOTAL \$5948.77

These cost estimates are an indication of what we believe is required to conclude your appeal. You will appreciate that the very nature of appeals makes precise estimates difficult.

Cost Recovery

If the appeal is successful then the Committee may be able to recover a substantial portion of the costs. This may be the case if it could be demonstrated to the Judge's satisfaction that initial technical evaluation was not sufficient.

If your appeal fails, experience suggests that costs will be left where they fall. It is unlikely that the Committee will have to pay the respondent's costs. This is generally only done if the Judge considers an appeal vexatious. Your appeal is certainly not that.

Your legal advisor would be better able to advise you of your likely costs or cost recoveries.

Please advise which course of action you wish to pursue so that we can finalise arrangements. Should you wish further detail or wish to discuss these cost estimates please contact Wayne Russell at our Auckland office.

Yours faithfully,
GCNZ CONSULTANTS

per Wayne Russell

P J RIDDELL
MANAGING DIRECTOR

APPENDIX A**Cost Estimate - Full Technical Argument**

This cost estimate covers the programme of work to provide detailed technical evidence along the lines outlined in our previous letter.

Rates used in these estimates are as follows:

Senior Hydrogeologist	W Russell	\$80/hr
Draftsman		\$46/hr
Word Processor		\$40/hr
Computer		\$35/hr

1. **OBTAINING AND REVIEWING DATA**

This activity involves writing to the Northland Regional Council and probably the Kaikohe borough Council to obtain relevant reports and data. It is anticipated that these organisations will charge for copying. These reports and data will be reviewed to complete our initial assessment. Liaison with the Committee is also included in this estimate.

Cost Estimate

Fees

Snr Hydrogeologist	16 hrs @ \$80/hr	\$1,280
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Expenses

(Wordprocessor, Copying, Tolls, Report Copies)	Allow \$300
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TOTAL	\$1,580.00
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2. **PREPARATION OF EVIDENCE**

Our experience is that comprehensive and thorough technical evidence takes above 5 days to prepare. Liaison with the barrister is also included in this estimate and can be a major variable depending on his initial understanding of the case.

Fees

Snr Hydrogeologist	40 hrs @ \$80/hr	\$3,200
Draftsman	12 hrs @ \$46/hr	\$552

Expenses

(Wordprocessor, Computer, Copying, Tolls, Facsimiles)	Allow \$200
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TOTAL	\$3952.00
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3. COURT ATTENDANCE

This item will cover travel to site presentation of evidence, plus attendance at hearing to review other witnesses evidence and to provide technical assistance to the barrister for his cross-examination and summing up.

Fees

Snr Hydrogeologist	25 hrs @ \$80/hr	\$2,000
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Expenses

Travel and Accommodation	Allow \$400
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TOTAL	\$2,400.00
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APPENDIX BCost Estimates - Limited Technical Option

This cost estimate covers a programme of work to review reports, provide evidence which will seek to nullify the evidence of the other witnesses and rely on cross examination to expand on technical matters. The basis of this cost estimate assumes that the Water Committee obtains the required reports and arranges the transport and accommodation for Mr Russell's attendance at the hearing.

The rates stated in Appendix 1 are applicable.

1. OBTAINING AND REVIEWING DATA

This will involve Mr Russell advising the Committee of which reports are required, the Committee obtaining these reports and forwarding to Mr Russell for review. Time involved in liaising with the Committee is included in this item.

Fees

Snr Hydrogeologist	10 hrs at \$80/hr	\$800
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Expenses

(Tolls, Wordprocessor)	Allow	\$100
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TOTAL FOR ITEM	\$900.00
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2. PREPARATION OF EVIDENCE

This activity will involve a final review of any new data obtained, writing evidence and liaising with the barrister on the nature and extent of evidence.

Fees

Snr Hydrogeologist	25 hrs at \$80/hr	\$2000
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Expenses

(Wordprocessor, Tolls, Facsimile)	Allow	\$250
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TOTAL FOR ITEM	\$2250
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3. PRESENTATION OF EVIDENCE

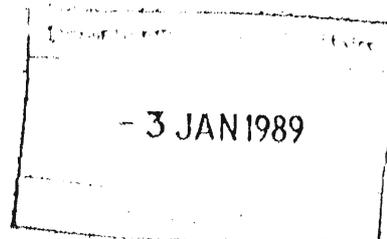
This item covers travel to and from site, delivery of evidence and providing technical assistance to the barrister for his cross-examinations and summation. No travel and accommodation or meal costs are included.

Fees

Snr Hydrogeologist	16 hrs at \$80/hr	\$1280.00
--------------------	-------------------	-----------

21 December 1988

~~Town Clerk~~
Kaikohe Borough Council
PO Box 246
KAIKOHE



Tena koe

RANGIHAMAMA BLOCK : WATER EASEMENT

In response to an urgent request from your Council in December 1986, the District Maori Land Advisory Committee held an emergency meeting on 23 December 1986 at which, under Section 371 of the Maori Affairs Act 1953, they agreed to grant your Council an easement facilitating the boring of a production well on Rangihamama Development Scheme.

This approval was subject to certain conditions one of which explicitly implied that any costs relating to either the establishment of a bore or relating to water rights, would be borne by the Kaikohe Borough Council and not the Rangihamama owners.

A second condition confirmed that any water extracted would be restricted solely to use by the borough and Rangihamama blocks.

At a recent meeting of the trustees of the Rangihamama block, the proposed water supply was discussed at length and serious concern was expressed at the major impact any lowering of the underground water table would have on existing artesian springs and streams and on overall production and the management of the Rangihamama block.

While the trustees expressed total opposition to the granting of any water right on Rangihamama the condition imposed by the Standing Tribunal limiting compensation for loss of water to within a 750m radius of the proposed bore, to reimbursement of water to any one or all of 23 neighbouring landholders within this area, is untenable. The condition imposed by the District Maori Land Advisory Committee in December 1986, restricting the use of water to the borough and the Rangihamama block is contrary to this Standing Tribunal condition.

Being aware of the heavy capital investment channelled into the 40 hectare horticulture block and the nearby beef fattening unit, both of which are situated outside the 750m compensation area, the trustees expressed grave concern for the future of these enterprises if the borough proceeded with its water right.

Deposited
 Reference: 18/24 JAN 1989
 Letter: Kaikohe Borough Council
 21 December 1988
 KAIKOHE

- 3 JAN 1989
 KAIKOHE

After considering all aspects of the Kaikohe Borough Council's proposed water supply, the Rangihamama Trustees concluded that in proceeding with this project the Council could not comply with the conditions imposed by the District Maori Land Advisory Committee on 23 December 1986, when originally approving the easement. Consequently the trustees unanimously resolved to request the District Maori Land Advisory Committee to rescind the 1986 decision to approve the easement.

It is with regret that I have to inform you that on 5 December 1988 the District Maori Land Advisory Committee complied with this request and resolved to rescind their 23 December 1986 decision to approve the easement.

Kia ora



W P Cooper
 for District Manager

→ KAIKOHE

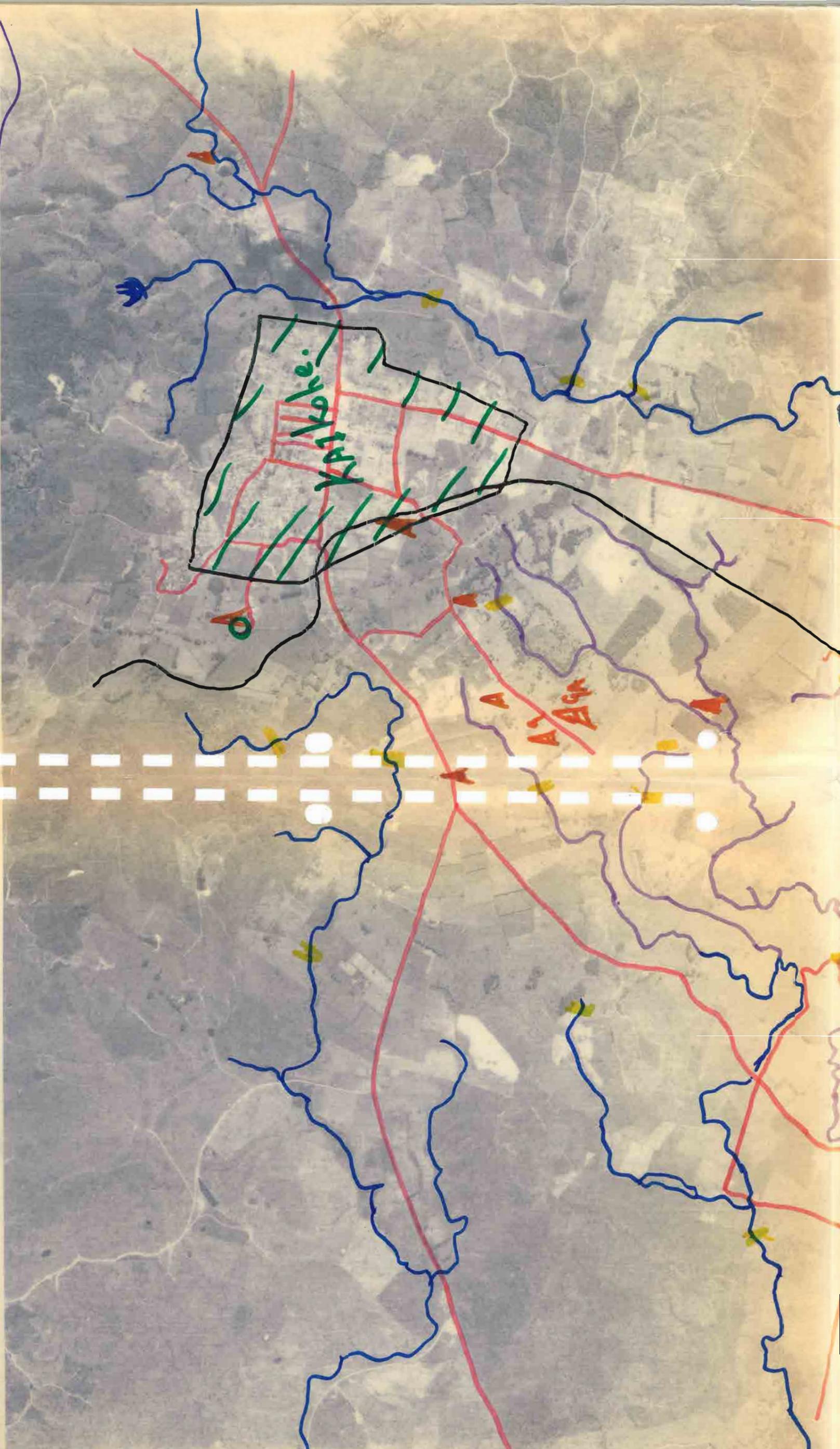
Attention: FO Guest

For your information.

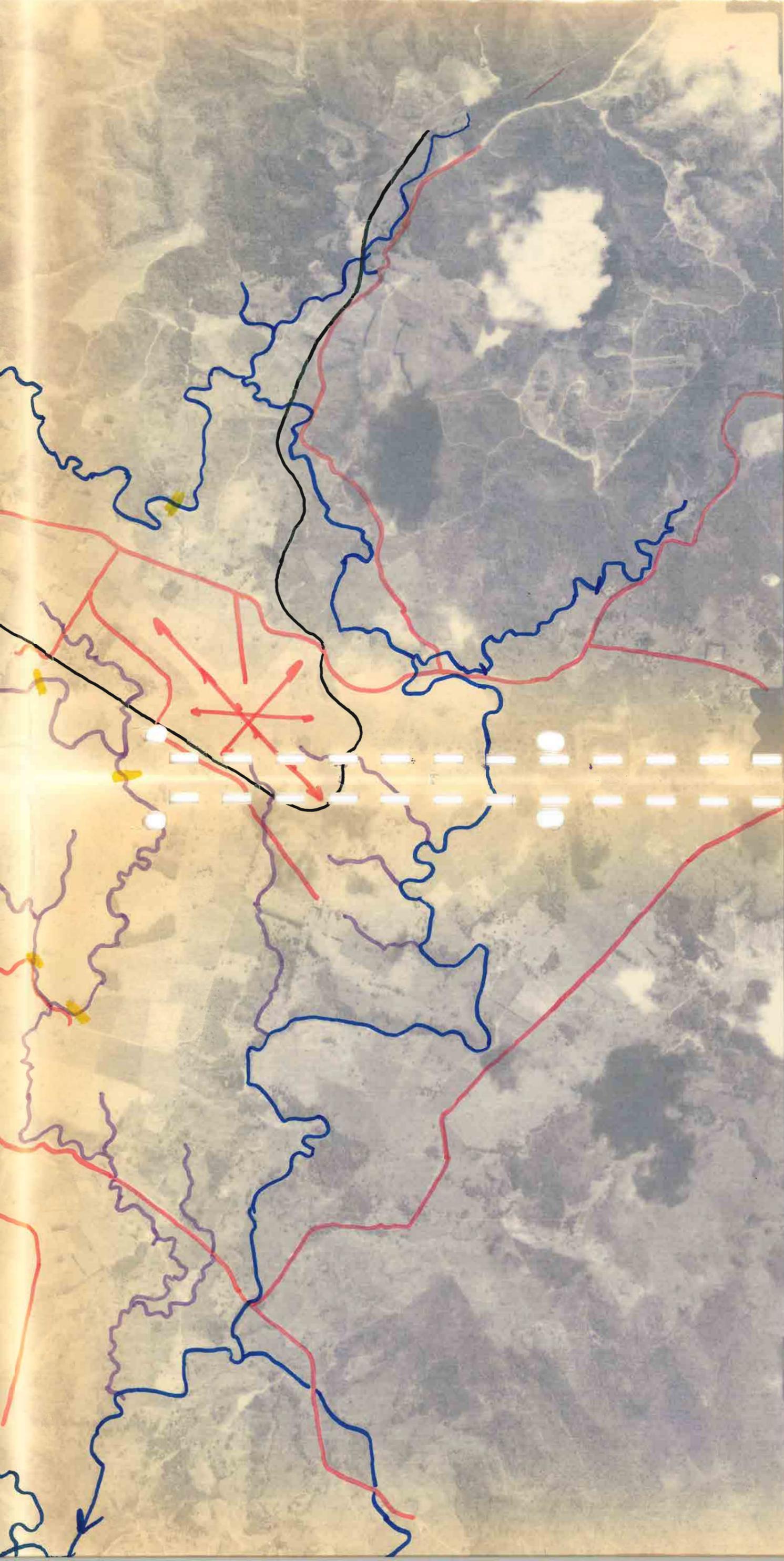


W P Cooper
 for District Manager
 WHANGAREI

North
LAKE



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