

Nos. 525/75, 547/75, 579/75, 607/75
& 684/75

IN THE MATTER of the Water and Soil
Conservation Act 1967

and

IN THE MATTER of five appeals under
section 25 of the Water
and Soil Conservation
Act 1967

BETWEEN

ROTORUA CONSERVANCY FISHING
AND SHOOTING FEDERATION
(Appeal 525/75)

ROTORUA COUNTY COUNCIL
(Appeal 547/75)

ROGER HENRY JONES
(Appeal 579/75)

THE SOIL ASSOCIATION OF
NEW ZEALAND INC.
(Appeal 607/75)

KENNETH ROBERT STACEY MORRIS
(Appeal 684/75)

Appellants

AND

NATIONAL WATER AND SOIL
CONSERVATION AUTHORITY

Respondent

AND

MINISTER OF LANDS

Applicant

BEFORE THE NUMBER ONE TOWN AND COUNTRY PLANNING APPEAL BOARD

Messrs A.R. Turner S.M. (Chairman)
A.E. Kennard
G.R. Tutt
R.S. Martin

HEARING at Rotorua on the 18th, 19th & 20th days of August 1976

APPEARANCES: Mr R.M. Weston for Appellant in 525/75
Mr M.S. McKechnie for Appellant in 547/75
Mr R.H. Jones on own behalf - 579/75
Mr J.A.B. Stuart-Menzies for Appellant in 607/75
Mr A.J.F. Gallen for Respondent
Mr L.H. Moore for Applicant

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DECISION

1. The Minister of Lands made application under section 23 of the Act for a right to discharge waste into natural water; more specifically he applied for a right to spray the herbicide diquat on to Lake Rotoma for the purpose of aquatic weed control.

2. The respondent granted the right sought, for a period expiring on 2 October 1983. It specified the rate of discharge as follows:-

"Up to 200 gallons per day at an application rate of 2.75 gallons of commercial diquat per surface acre provided that the commercial diquat is diluted to at least half commercial strength."

The respondent directed that the following special conditions should apply to the right:-

"(n) Steps are to be taken to ensure that public and private water supplies are not contaminated, or if they are, to provide for temporary alternative supplies, and to ensure that in areas sprayed that notices warning not to swim in the water are displayed for a period of 24 hours after spraying.

(o) Spraying operations are to be at all times under the technical direction of the DSIR or its authorised agent."

3. The appellants then brought these appeals seeking that the decision to grant the right be cancelled, and the right refused.

The grounds of the various appeals can be sufficiently summarised as follows:-

- (a) That the discharge of diquat into the lake waters will damage the ecology of the lake waters and accelerate the eutrophication of the lake;
- (b) That the discharge will adversely affect domestic water supplies and will cause a build up of toxic end-products;
- (c) That decomposing weed will adversely affect trout spawning grounds; and
- (d) That there are better methods of controlling lake weed.

At the hearing of the appeals the County limited its case to a variation of the conditions of the right, with the object of giving protection to water supplies and to recreational use of the lake.


4. At this point it is relevant to say something about the status of the several appellants to appeal.

- (a) Rotorua Conservancy Fishing & Shooting Federation: The objects of the Federation are (briefly) to protect and promote the interests of anglers and shooters within the conservancy. This Board held that having regard to what the Minister proposes to discharge into the lake, the Federation could reasonably claim to be detrimentally affected by the decision appealed against, in a manner differentiating it from the general public, and that it had status to appeal: see Water Resources Council v. Southland Skindivers Club Inc. 5 NZTPA 239.
- (b) Rotorua County Council: This appellant is the public authority having responsibility for public water supplies in the district. The responsibilities of this appellant could be detrimentally affected by the decision appealed against. It had status to appeal.
- (c) R.H. Jones: This appellant is the manager of a company which has a general store adjacent to the lake. The company takes water from the lake for its own domestic supply and for a private domestic supply to approximately 36 households in the locality. The Board ruled that this appellant had status to appeal, though perhaps as a matter of strict law the appeal should have been brought in the name of the company.
- (d) The Soil Association of N.Z. Inc.: The Board ruled that the objects and purpose of this society are such that it could not reasonably claim to be detrimentally affected by the decision appealed against in a manner differentiating it from the general public and that it did not have status to bring an appeal.
- (e) K.R.S. Morris: This private appellant does not live at Rotoma and did not demonstrate that he would be detrimentally affected by the decision appealed against in a manner different from the public at large. The Board ruled that he did not have status to bring an appeal.

Although some would-be appellants were without status, there were sufficient appellants with status to enable this Board to review the decision appealed against.

5. A very considerable background could be given to the Minister's application. Suffice it to say for the purposes of this decision that in recent years the shallow waters of some of the lakes in the Rotorua area have become infested with the aquatic plant Lagarosiphon Major, an exotic. The growth of the plant became so widespread, and was so vigorous that it was generally considered to interfere with the recreational use of the lakes affected and to detract from the aesthetic qualities of the area. A method of eradicating or controlling the plant was sought, and it was found that the herbicide diquat will kill the plant. The Minister applied for and was granted rights under the Water & Soil Conservation Act 1967 to discharge diquat on to certain lakes for the purpose of controlling the growth of Lagarosiphon. (The grant of those rights was not appealed against.) A formal programme for the control of this plant by the application of diquat has been conducted since 1968; that programme has been under the technical direction of an officer of the Department of Scientific and Industrial Research; and the effects of the programme have been the subject of close scientific study. No more than one application is given per annum, and generally this has been at the rate of 1.0 part per million in the top foot of water irrespective of water depth, but more recently application has been at the rate of 2.0 parts per million.

6. The rights already held by the Minister do not include a right to discharge diquat into Lake Rotoma. It was given in evidence that in recent years Lagarosiphon has appeared in this lake also; and that the Minister considers it prudent that he should have such a right in order that this lake can be included in the control programme. The plant does not grow in water more than about 18 ft deep. The lake has a total area of 2900 acres of which only about 10% is shallow enough to support the plant. The Minister applied for the right to spray up to 200 gallons of commercial diquat on to the lake, intending this to be the maximum annual volume of the herbicide authorised by the right to be discharged into the lake. He intends that the actual volume to be discharged, and the times and places of discharges, be decided upon as



and when and to the extent that future circumstances may require.

(The decision appealed against does not correctly reflect the fact that the application defined a total annual volume of diquat.)

The evidence for the Minister on these appeals was that a right to discharge up to 100 gallons of diquat per annum would be adequate.

7. Diquat is an agricultural chemical, registered under the Agricultural Chemicals Act 1959. It is a herbicide for certain specific aquatic plants, including Lagarosiphon, and has a label claim for use over water. It is soluble in water and is toxic to humans and animals. Thus although the Minister desires to introduce it into the waters of Lake Rotoma for a purpose which he considers will be beneficial, diquat comes within the extended definition given to the word "waste" by Section 2, Water & Soil Conservation Act 1967.

8. As this is the first appeal which this Board has dealt with concerning a proposal to introduce "waste" into natural water for a purpose asserted to be beneficial, it is appropriate that we should first define the issues which arise for determination upon such an application. Having considered the submissions and the provisions of the Act we hold that the Minister's application raises the following questions:-

Whether there is sufficient justification for artificial control over the growth of Lagarosiphon in Lake Rotoma.

If so, whether having regard to the considerations made relevant by the Water & Soil Conservation Act 1967 the application of diquat is an appropriate method of controlling the growth of this plant, or whether its application will have a sufficiently adverse effect that its application should not be authorised.

We are not required to consider the adequacy or appropriateness of other methods of controlling the plant; nor whether any other method would at the same time arrest or slow down the process of eutrophication of the lake. (Though if the control of Lagarosiphon by the use of diquat is likely to accelerate

the process of eutrophication, that would be a relevant consideration.)

9. Having considered the evidence and submissions we answer the first question in the affirmative. From the evidence given of the history of Lagarosiphon in other Rotorua lakes we are satisfied that the plant finds the shallow waters of those lakes a congenial environment, and that its vigorous growth can lead to conditions which interfere seriously with the recreational use of the lakes and that the plant can cause conditions which detract markedly from the aesthetic qualities of the area. Although the growth and extent of Lagarosiphon in Lake Rotoma is not yet a major problem, we are satisfied that the Minister is acting prudently in preparing to control the growth of that plant in Lake Rotoma when that becomes necessary (as appears most likely).

10. Diquat diffuses very rapidly in water and is absorbed rapidly by plants. It brings about its effect on Lagarosiphon by attacking the photosynthetic mechanism. Also it is rapidly adsorbed by the bottom sediments as it diffuses downwards. There is further adsorption as the decaying plants disintegrate into the bottom sediments.

In May 1975 the Agricultural Chemicals Board issued "A Guide for the Use of Herbicides on Weeds in or near Water-courses, Ponds and Lakes." Appendix I to that publication specifies the herbicides the use of which that Board has authorised to control aquatic weeds, and details the conditions under which they may be applied, the approved modes of application and the type of water that may be treated. The following is an extract from that Appendix:-

"1. DIQUAT AND PARAQUAT

These two herbicides may be injected or broadcast over any waterway or standing water subject to the following conditions (condition (i) applies to injection only).

- (i) Application is to be made from a mobile platform only. Mass injection ("slug") treatment must not be made.
- (ii) Application rates to be adjusted so that the maximum concentration in the water after application is 2 mg ai/litre of water (2 ppm).
- (iii) (a) In standing water, treated water should not be used for the following purposes

until the specified time for each purpose after treatment:

.Bathing and human consumption -
24 hours

.Water for fish farming and
livestock watering - 24 hours

.Overhead irrigation - 10 days

(b) In flowing water, water from the lowest point of application and 1 km down the direction of flow should not be used for any purpose specified in (iii) (a) until 1 hour after the completion of the treatment.

(iv) Static or near-static water only may be treated. Running water must not be moving faster than 330 mm/sec over the length of the intended treatment area.

Recommendations when injecting or broadcasting diquat and paraquat:

(i) It is inadvisable to treat turbid or muddy water as the herbicide will be rapidly deactivated by adsorption on to the colloids present.

(ii) Treatments are best made when water levels are lowest and water temperatures are highest."

11. We are satisfied by the evidence that provided the conditions laid down by the Agricultural Chemicals Board are observed, the use of diquat will not present a danger to public health, nor is it likely to have a significant adverse effect upon animal life in the water. We are further satisfied by the evidence that the use of diquat will not have any effect on the ecology of the lake (other than a reduction of Lagarosiphon and its temporary replacement with less competitive native species) and that its use will have no effect on the eutrophication of the lake. On the last point the evidence was that Lagarosiphon does not manufacture the nutrients it requires for growth, but extracts them from the lake water, so that when the plant is killed and decays there is neither a net gain nor loss of nutrient as far as the lake is concerned.

The evidence was that as a result of plant death and decay there is some reduction in the dissolved oxygen level in the water, but not to a serious extent and then essentially only in the actual plant beds. Those beds are in the shallow waters, where stratification cannot occur.

As far as the foregoing is concerned we were considerably fortified in our conclusions by the evidence of the experience with the use of diquat on other Rotorua lakes to control Lagarosiphon and of the results of the scientific studies which have been conducted.


There was no suggestion in any of the evidence that the use of diquat causes a build-up of toxic products in the bottom sediments. But we record that the questions whether and under what conditions diquat is safe to use for plant control, and whether it causes a build up of toxic products, are primarily questions for the Agricultural Chemicals Board.

There is a possibility that the use of diquat on Lagarosiphon offshore from the shallow lake margin could cause plant detritus to be deposited over some trout spawning redds and consequently could cause a high mortality of the deposited eggs. But we have considered that this is a factor to be taken into account in the management of the control programme; and that even if this result does occur, the benefit to be gained from control of the plant will outweigh the detriment to the fishery.

12. Our overall conclusion is that the application of diquat, within the conditions laid down by the Agricultural Chemicals Board, is an appropriate method of controlling the growth of Lagarosiphon, and that its application to the waters of Lake Rotoma will not have sufficiently adverse effects that its application should not be authorised.

13. The Rotorua County Council sought the imposition of conditions requiring specific prior public notice of intention to spray diquat on the lake and the specific definition of the obligation to display notices once spraying has been completed.

We have considered the evidence and submissions and we have concluded that no amendment should be made to the rights on these matters (except on one point) for the following reasons:

- (a) There are practical difficulties in giving specific prior public notice of intention to spray because spraying must wait until favourable weather conditions occur. But the Minister should give the County advance notice in writing of his intention to spray, so that
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the programming of activities on the lake is not upset without warning.

- (b) Condition (n) of the right will require the Minister positively to protect public and private water supplies, quite apart from the question of notice.
- (c) The specific definition of the obligation to give notice to the public not to use the lake for recreational purposes for a temporary period would be better left to an arrangement made direct between the Minister and the County. Preferably such an arrangement should cover all of the lakes to which diquat is applied. An arrangement of that kind can be varied from time to time as circumstances require; a condition of a water right is relatively inflexible. The obligation is on the Minister to give notice, and we presume that he would give effect to the wishes of the local authority.

14. The respondent suggested that some of the conditions of the right are unnecessary and that others should be amended. We have concluded that the intention of the respondent's decision would be better achieved if the conditions of the right are amended in the manner hereinafter appearing.

15. For the foregoing reasons the appeals are dismissed. But pursuant to section 42(3) of the Town and Country Planning Act 1953 this Board orders that the decision appealed against be amended in the following respects:-

- (a) The discharge authorised shall be:
"Up to 100 gallons of commercial diquat per calendar year at an application rate which does not exceed 2.75 gallons of commercial diquat per surface acre provided that the commercial diquat is diluted to at least half commercial strength before application."
- (b) The following shall be added to Condition (b) of the right:
"Before any agent exercises the right on behalf of the holder of the right, the holder shall nominate that person to the grantor of the right, to the Regional Water Board and to the Rotorua County Council."
- (c) Conditions (c) and (d) of the right shall be deleted, and a new Condition (c) imposed as follows:-
"(c) The agent exercising the right on behalf of the holder shall each year give prior notice in

writing to the Rotorua County Council of the period during which it is intended to exercise the right."

- (d) Condition (o) of the right shall be amended to read:
"Spraying operations shall at all times be under the technical direction of an officer of the Department of Scientific and Industrial Research appointed by the permanent head of that department and nominated by him to the grantor of the right and to the Regional Water Board."

DATED this *20th* day of *October* 1976.




Chairman