

Title: **Managed Aquifer Recharge Pilot Project**

Section: Environmental & Regulatory Services

Prepared by: Mark Joblin (Projects & Development Officer)

Meeting Date: 2 August 2017

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Legal     Financial     Significance = Medium

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## Report to ENVIRONMENTAL PLANNING & REGULATIONS Committee for information

### SUMMARY

The purpose of this report is to update the Environmental Planning & Regulations Committee on the Managed Aquifer Recharge (MAR) Trial.

An initial small scale injection of 8800m<sup>3</sup> has been completed and Golders Associates have produced a report which analysed all the information gathered to date. Golder Associates conclude in the report that the full trial 100,000m<sup>3</sup> trial can proceed based on the initial results. The Council project team agreed with Golders Associates recommendation. The trial findings were presented to the Community Liaison Group on 4 July 2017 and there were no objections to Council continuing the trial. Therefore Council has decided to proceed with the full 100,000m<sup>3</sup> trial, which was started 20 July 2017.

Detailed costings have been finalised for all the infrastructure required for the trial. The infrastructure costs are currently about \$113k over budget. This is in part due to additional cost incurred from moving the trial site from Waipaoa Water treatment Plant to Kaiaponi Farms. Staff are investigating additional funding opportunities to cover the shortfall.

The decisions or matters in this report are considered to be of **Medium** significance in accordance with the Council's Significance and Engagement Policy.

### RECOMMENDATIONS

**That the Environmental Planning & Regulations Committee:**

- 1. Notes the contents of this report.**

Authorised by:



Lois Easton  
**Acting Director Environmental Services & Protection**

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**Keywords:** Managed Aquifer Recharge Pilot Project

## **BACKGROUND**

1. The purpose of the Managed Aquifer Recharge (MAR) Pilot trial is to determine if it's possible to use Managed Aquifer Recharge technology to increase the water levels in the Makauri Aquifer.
2. The Makauri Aquifer's water levels are in decline. If Council reduces or restricts irrigator access to the aquifer it will have a considerable impact on the local economy. The aquifer is an essential water source for irrigating crops, worth an estimated \$20M annually to local industry.
3. The Managed Aquifer Recharge (MAR) concept was first introduced to Council at the 2012 NZ Hydrological Society Conference. In 2013, the Freshwater Advisory Group hosted Robert Bower of Golder Associates to introduce the concept of MAR as a management option for the Poverty Bay flats aquifers. Council then began investigating MAR for use in the Makauri Aquifer.
4. The MAR trial is jointly funded by the Eastland Community Trust and the Ministry for Primary Industries.
5. At the 21 April 2016 meeting of the Future Tairāwhiti Committee (Report 16–174), Council approved the use of Waipaoa River at Kaiaponi Farms as the source water and location for the trial.
6. The resource consent for the trial was granted on 14 November 2016.
7. A Community Liaison Group has been set up as part of the resource consent conditions. The group comprises Councillor, Iwi, irrigator users and Council staff representatives. It is based on the stakeholder advisory group which was set up during the consultation phase of the project. The Community Liaison Group held its first meeting on 19 December 2016.
8. Honnor Drilling Limited were selected to construct the injection bore through a competitive tender process and the construction of the injection bore was completed 27 April 2017. Pump testing and the commissioning process for the bore and headworks has been completed.

## **DISCUSSION AND OPTIONS**

Progress to date includes:

9. A constant rate injection test was started on 13 June 2017 with the objective of injecting 10,000 m<sup>3</sup> into the Makauri Aquifer. Due to premature triggering of the shut-down system, the test finished at Monday 19 June. During this time a total of 8,811 m<sup>3</sup> was injected to the Makauri Aquifer.
10. A report summarising the initial trial, including analysis of the results, has been produced by Golder Associates, Council's scientific advisors for the MAR project.
11. Analysis of the injection trial results showed:
  - An injection rate of 15 litres per second was achieved and resulted in a 2.8m raise in the bore water level.
  - Water level raises of 1.3m were observed in the nearby bores GPE010 and GPE030 (Appendix 1). Small responses in other nearby bores may be present but are not obvious in the recorded data.
  - The injected water took a little less than 5.5 hours to radiate outward a distance of 23 m from the injection bore to the monitoring bore. This data will allow predictions to be made on how far the injected water will travel in the larger trial.
  - There were no unexpected changes in the chemical composition of water samples taken from the injection and monitoring bores.

- There was a small increase in the levels of E.coli recorded in water samples taken from the injection and monitoring bores. However, a larger number of samples are required in order to be able to draw any conclusions as to the rate of die off and transport of E.coli in the Makauri Aquifer.
12. The project team meet and discuss the results on the initial injection trial. The project team agreed with Golders recommendation to proceed with the full (100,00m<sup>3</sup>) trial. But with the provision that the E.coli test results will continue to be monitored closely.
  13. The project team presented the results of the initial inject trial to the Community Liaison Group on 8 July and there was no objections to Council continuing the trial but with the understanding that the E.coli test results will continue to be monitored closely.
  14. The full 100,00m<sup>3</sup> injection trial was started 20 July 2017. It is still anticipated that the second half of the trial will involve injecting 50,000m<sup>3</sup> of chlorinated water.

#### **Timeline:**

15. The injection phase of the project is still on schedule to be completed by 30 September 2017 and its anticipated the 100,000m<sup>3</sup> trial will take 77 days to complete.
16. It is still anticipated that the second half of the trial will involve the injection of 50,000m<sup>3</sup> of chlorinated water.
17. Intensive monitoring will continue for a further three months after the injection phase has stopped.
18. The final report detailing the results of the trial will be ready in early 2018.

#### **ASSESSMENT OF SIGNIFICANCE**

<b>Criteria</b>	<b>This Report</b>	<b>The Process Overall</b>
The effects on all or a large part of the Gisborne district	<b>Low</b>	<b>Medium</b>
The effects on individuals or specific communities	<b>Low</b>	<b>High</b>
The level or history of public interest in the matter or issue	<b>Medium</b>	<b>Low</b>
Inconsistency with Council's current strategy and policy	<b>Low</b>	<b>Low</b>
Impacts on Council's delivery of its Financial Strategy and Long Term Plan.	<b>Low</b>	<b>Low</b>

19. This report is part of a process to arrive at a decision that will be of **medium** level in accordance with the Council's Significance and Engagement Policy. This is due to the community interest and the economic significance of the Makauri Aquifer to the horticultural sector.

#### **COMMUNITY ENGAGEMENT**

20. Extensive public engagement has taken place on the MAR project. To date, meetings have been held with groups including the Freshwater Advisory group, water users, Iwi land owning entities, Iwi trusts, individuals and one public meeting.
21. All technical papers on the MAR trial are available on the Council website. A Community Liaison Group has been formed and this group has had four meetings about the project.
22. The matters raised in this report were discussed with the Community Liaison Group on 8 July 2017.
23. Further communications are planned and will be ongoing throughout the project.

## CONSIDERATIONS

### • Financial/Budget

24. The majority of the costs of the MAR trial will be met by external funding: \$200,000 from Eastland Community Trust and \$250,000 from the Ministry of Primary Industries. Staff time and the costs of the resource consenting process have been provided for in the Long Term Plan.

25. Detailed costings have been finalised for all the infrastructure required for the trial. The infrastructure costs are currently about \$113k over budget. This is in part due to additional cost incurred by moving the trial site from Waipaoa Water treatment Plant to Kaiaponi Farms. These include:

- Costs to connect into the Kaiaponi irrigation system
- Chlorination requirements for the second part of the trial.

Additional costs have also been incurred as a result of the resource consent conditions including:

- Additional filtration requirements
- Monitoring requirements to address cultural concerns.

Staff submitted a request to the Ministry for Primary Industries for additional funding of \$113k which was successful. However this still leaves a deficit of \$113K and Staff are investigating additional funding opportunities to cover the shortfall.

### • Legal

26. There are no legal implications.

## POLICY AND PLANNING IMPLICATIONS

27. There is policy support within the Proposed Freshwater Plan for projects like MAR recognising that water storage is an important solution to meet both current and future needs for water. The MAR trial project is identified as a key non-regulatory project in the Waipaoa Catchment Plan.

## RISKS

28. There are no major risks associated with the matters discussed in this report.

## APPENDICES

Appendix 1 – Monitoring bore location

Appendix 1 – Monitoring Bore Location.

