STDC Waiinu Beach Settlement

Monitoring Programme

Annual Report

2020-2021

Technical Report 2021-24

Working with people | caring for Taranaki

Taranaki Regional Council

Taranaki Regional Council
Private Bag 713
Stratford

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Executive summary

The South Taranaki District Council (STDC) operates a wastewater treatment system located at the Waiinu Beach Settlement, in the Waitotara catchment. This report for the period July 2020 to June 2021 describes the monitoring programme implemented by the Taranaki Regional Council (the Council) to assess STDC's environmental and consent compliance performance during the period under review. The report also details the results of the monitoring undertaken and assesses the environmental effects of STDC's activities.

STDC holds one resource consent, which includes a total of 16 conditions setting out the requirements that STDC must satisfy. This resource consent was renewed early on 1 December 2017, as STDC was in the process of upgrading the wastewater treatment system. The upgraded system was installed and commissioned in December 2019. The consent allows them to discharge treated domestic wastewater from the Waiinu Beach Wastewater Treatment Plant to land.

During the monitoring period, South Taranaki District Council demonstrated an overall high level of environmental performance.

The Council's monitoring programme for the year under review included three site inspections of the wastewater treatment system, which included bacteriological and groundwater sampling. Four additional seasonal groundwater sampling surveys were also carried out.

The monitoring showed that the wastewater treatment system was well maintained. As in previous years, the monitoring indicated that the discharges from the wastewater treatment system had no adverse effects on coastal water quality. There were no unauthorised incidents recording non-compliance in respect of this consent holder during the period under review.

During the year, STDC demonstrated a high level of environmental and administrative performance with the resource consent.

For reference, in the 2020-2021 year, consent holders were found to achieve a high level of environmental performance and compliance for 86% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 11% of the consents, a good level of environmental performance and compliance was achieved.

In terms of overall environmental and compliance performance by the consent holder over the last several years, this report shows that the consent holder's performance remains at a high level in the year under review.

This report includes recommendations for the 2021-2022 year.

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1 Introduction

1.1 Compliance monitoring programme reports and the Resource Management Act 1991

1.1.1 Introduction

This report is for the period July 2020 to June 2021 by the Taranaki Regional Council (the Council) describing the monitoring programme associated with a resource consent held by the South Taranaki District Council (STDC). STDC operates a wastewater treatment system situated at the Waiinu Beach Settlement in South Taranaki.

This report covers the results and findings of the monitoring programme implemented by the Council in respect of the consent held by STDC that relates to the discharge of treated sewage effluent to land in the Waitotara catchment. This is the 28th annual report to be prepared by the Council to cover STDC's water discharges and their effects.

1.1.2 Structure of this report

Section 1 of this report is a background section. It sets out general information about:

- consent compliance monitoring under the *Resource Management Act 1991* (RMA) and the Council's obligations;
- the Council's approach to monitoring sites though annual programmes;
- the resource consent held by STDC in the Waitotara catchment;
- the nature of the monitoring programme in place for the period under review; and
- a description of the activities and operations conducted in the Waiinu Beach Settlement.

Section 2 presents the results of monitoring during the period under review, including scientific and technical data.

Section 3 discusses the results, their interpretations, and their significance for the environment.

Section 4 presents recommendations to be implemented in the 2021-2022 monitoring year.

A glossary of common abbreviations and scientific terms, and a bibliography, are presented at the end of the report.

1.1.3 The Resource Management Act 1991 and monitoring

The RMA primarily addresses environmental 'effects' which are defined as positive or adverse, temporary or permanent, past, present or future, or cumulative. Effects may arise in relation to:

a. the neighbourhood or the wider community around an activity, and may include cultural and social-economic effects;
b. physical effects on the locality, including landscape, amenity and visual effects;
c. ecosystems, including effects on plants, animals, or habitats, whether aquatic or terrestrial;
d. natural and physical resources having special significance (for example recreational, cultural, or aesthetic); and
e. risks to the neighbourhood or environment.

In drafting and reviewing conditions on discharge permits, and in implementing monitoring programmes, the Council is recognising the comprehensive meaning of 'effects' in as much as is appropriate for each

activity. Monitoring programmes are not only based on existing permit conditions, but also on the obligations of the RMA to assess the effects of the exercise of consents. In accordance with Section 35 of the RMA, the Council undertakes compliance monitoring for consents and rules in regional plans, and maintains an overview of the performance of resource users and consent holders. Compliance monitoring, including both activity and impact monitoring, enables the Council to continually re-evaluate its approach and that of consent holders to resource management and, ultimately, through the refinement of methods and considered responsible resource utilisation, to move closer to achieving sustainable development of the region's resources.

1.1.4 Evaluation of environmental and administrative performance

Besides discussing the various details of the performance and extent of compliance by the Company, this report also assigns them a rating for their environmental and administrative performance during the period under review.

Environmental performance is concerned with actual or likely effects on the receiving environment from the activities during the monitoring year. Administrative performance is concerned with the Company's approach to demonstrating consent compliance in site operations and management including the timely provision of information to Council (such as contingency plans and water take data) in accordance with consent conditions.

Events that were beyond the control of the consent holder and unforeseeable (that is a defence under the provisions of the RMA can be established) may be excluded with regard to the performance rating applied. For example loss of data due to a flood destroying deployed field equipment.

The categories used by the Council for this monitoring period, and their interpretation, are as follows:

Environmental Performance

High: No or inconsequential (short-term duration, less than minor in severity) breaches of consent or regional plan parameters resulting from the activity; no adverse effects of significance noted or likely in the receiving environment. The Council did not record any verified unauthorised incidents involving environmental impacts and was not obliged to issue any abatement notices or infringement notices in relation to such impacts.

Good: Likely or actual adverse effects of activities on the receiving environment were negligible or minor at most. There were some such issues noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party but these items were not critical, and follow-up inspections showed they have been dealt with. These minor issues were resolved positively, co-operatively, and quickly. The Council was not obliged to issue any abatement notices or infringement notices in relation to the minor non-compliant effects; however abatement notices may have been issued to mitigate an identified potential for an environmental effect to occur.

For example:

- High suspended solid values recorded in discharge samples, however the discharge was to land or to receiving waters that were in high flow at the time;
- Strong odour beyond boundary but no residential properties or other recipient nearby.

Improvement required: Likely or actual adverse effects of activities on the receiving environment were more than minor, but not substantial. There were some issues noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent minor non-compliant activity could elevate a minor issue to this level. Abatement notices and infringement notices may have been issued in respect of effects.

Poor: Likely or actual adverse effects of activities on the receiving environment were significant. There were some items noted during monitoring, from self-reports, or during investigations of incidents reported to the Council by a third party. Cumulative adverse effects of a persistent moderate non-compliant activity could elevate an 'improvement required' issue to this level. Typically there were grounds for either a prosecution or an infringement notice in respect of effects.

Administrative performance

High: The administrative requirements of the resource consents were met, or any failure to do this had trivial consequences and were addressed promptly and co-operatively.

Good: Perhaps some administrative requirements of the resource consents were not met at a particular time, however this was addressed without repeated interventions from the Council staff. Alternatively adequate reason was provided for matters such as the no or late provision of information, interpretation of 'best practical option' for avoiding potential effects, etc.

Improvement required: Repeated interventions to meet the administrative requirements of the resource consents were made by Council staff. These matters took some time to resolve, or remained unresolved at the end of the period under review. The Council may have issued an abatement notice to attain compliance.

Poor: Material failings to meet the administrative requirements of the resource consents. Significant intervention by the Council was required. Typically there were grounds for an infringement notice.

For reference, in the 2020-2021 year, consent holders were found to achieve a high level of environmental performance and compliance for 86% of the consents monitored through the Taranaki tailored monitoring programmes, while for another 11% of the consents, a good level of environmental performance and compliance was achieved.[1]

1.2 Process description

The Waiinu Beach Settlement wastewater treatment system was installed in 1992 and replaced in December 2019 by the current Submerged Aerated Filtration (SAF) plant. The plant is designed to service a population of up to 600 campers and 305 residents over the peak holiday period. Primary treatment of wastewater is provided by 21 communal septic tanks. Effluent from the septic tanks is gravity fed to a wet well at the SAF plant which delivers the influent via pumps to the SAF plant. The influent is pumped to the balance tanks and solids removal tank. The balance tank delivers timed doses to the 1st stage primary septic tank which is then gravity feed into the 2nd stage primary septic tank, for the first stage treatment of the wastewater. The septic tanks provide sufficient residence time to ensure sufficient BOD reduction has occurred. Effluent is then gravity fed to the Anoxic Tanks which provide up to 85% of total nitrogen reduction.

After the anoxic tanks the effluent is split evenly into both aeration tanks where fine bubble aeration diffusers are installed at the base of the tanks to ensure efficient oxygen distribution and thus providing a high rate of biomass production for BOD reduction and nitrification. Treated effluent from the aeration tanks flow through to the clarification tanks, where the effluent settles. The treated effluent is transferred into the UV dosing tank before treatment by the UV unit. The wastewater is then treated with ferric chloride for phosphorous reduction. After treatment for phosphorous reduction, the wastewater is stored in irrigation tanks before discharge to the land application field. A flow meter records the discharge to the disposal fields.

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[1] The Council has used these compliance grading criteria for more than 17 years. They align closely with the 4 compliance grades in the MfE Best Practice Guidelines for Compliance, Monitoring and Enforcement, 2018

The shallow groundwater receiving the treated effluent flows more than 200 m toward the beach. The monitoring of groundwater and coastal seawater quality allows the effectiveness of the wastewater treatment system to be assessed (Figure 1). The Waiinu Beach settlement is supplied with water from a 45 m deep bore, to the west of the settlement. There are no other users of shallow groundwater in the area.

Figure 1 Locations of sampling sites and wastewater treatment system at Waiinu Beach Settlement

1.3 Resource consents

STDC holds one resource consent, the details of which are summarised in the table below. Summaries of the conditions attached to each permit are set out in Section 3 of this report.

A summary of the various consent types issued by the Council is included in Appendix I, as is a copy of the permit held by STDC during the period under review.

Table 1 Summary of resource consents held by STDC

Consent number	Purpose	Granted	Review	Expires
Water discharge permits				
3769-4	To discharge treated domestic wastewater from the Waiinu Beach Waste Water Treatment Plant to land	1 December 2017	June annually	1 June 2034

1.4 Monitoring programme

1.4.1 Introduction

Section 35 of the RMA sets obligations upon the Council to gather information, monitor and conduct research on the exercise of resource consents within the Taranaki region. The Council is also required to assess the effects arising from the exercising of these consents and report upon them.

The Council may therefore make and record measurements of physical and chemical parameters, take samples for analysis, carry out surveys and inspections, conduct investigations and seek information from consent holders.

The monitoring programme for the Waiinu Beach Settlement consisted of four primary components.

1.4.2 Programme liaison and management

There is generally a significant investment of time and resources by the Council in:

- ongoing liaison with resource consent holders over consent conditions and their interpretation and application;
- discussion over monitoring requirements;
- preparation for any consent reviews, renewals or new consent applications;
- advice on the Council's environmental management strategies and content of regional plans; and
- consultation on associated matters.

1.4.3 Site inspections

The Waiinu Beach Settlement wastewater treatment system was visited three times during the monitoring period. With regard to the consent for the discharge to water, the main points of interest were plant processes with potential or actual discharges to receiving watercourses. Air inspections focused on plant processes with associated actual and potential emission sources and characteristics, including potential odour, dust, noxious or offensive emissions.

1.4.4 Bacteriological monitoring

The Council undertook routine sampling of the coastal waters at two sites on three occasions during the monitoring year (Figure 1). Samples were analysed for temperature, enterococci and conductivity.

Water quality is of significant interest at this site as Waiinu Beach receives moderate recreational use over the bathing season. In 2003, the Ministry for the Environment (MfE) developed the *Guidelines for Recreational Water Quality* to assess the safety of water for contact recreation. The coastal guidelines focus on enterococci as these bacteria have the ability to survive in marine water, providing the closest correlation with health effects in New Zealand coastal waters (MfE, 2003). 'Alert' and 'Action' guideline levels are summarised in Table 2 and are based on keeping illness risk associated with recreational use to less than 2% of users.

Electrical conductivity, which reflects the total ionic content of water, was measured as a supporting variable as it correlates well with total dissolved solid concentrations (Davies-Colley, 2013).

Table 2 Marine recreational bathing guidelines (MfE, 2003)

	Indicator	Mode		
		Surveillance	Alert	Action
Marine	Enterococci (cfu/100 ml)	No single sample >140	Single sample >140	Two consecutive single samples >280

1.4.5 Groundwater monitoring

The Waiinu Beach Wastewater Treatment Plant Environmental Monitoring Plan (Mott MacDonald, 2020) recommended groundwater monitoring be added to the programme to provide a robust assessment of environmental effects of the new WWTP (upgraded in Dec 2019). Samples from May to October 2020 were collected by STDC, however in October the decision was made for the Council to take over groundwater sampling efforts to ensure that these were performed in accordance with the best practice for groundwater sampling. Sampling was performed in line with each of the summer inspection dates, with additional quarterly monitoring throughout the year (Jan, April, July & October). The sampling by the Council commenced in December 2020.

2 Results

2.1 Inspections

16 December 2020

At the time of inspection there were no odours or visual issues present with the wastewater treatment system.

There were 9 campervans present in the campground.

The sea was a blue/green colour at the time of inspection.

Overall the camp appeared to be operating within its consent conditions at the time of inspection.

11 January 2021

At the time of inspection there were no odours or visual issues present with the wastewater treatment system.

There were 5 campervans and 1 tent present in the campground.

The sea was a brown colour and turbid at the time of inspection.

Overall the camp appeared to be operating within its consent conditions at the time of inspection.

19 February 2021

At the time of inspection there were no odours or visual issues present with the wastewater treatment system.

There were 15 campervans and 1 tent present in the campground.

The sea was a blue-brown colour and slightly turbid at the time of inspection.

Overall the camp appeared to be operating within its consent conditions at the time of inspection.

2.2 Results of bacteriological monitoring

During each inspection, seawater samples were collected at two coastal sites located at either end of Waiinu Beach (Figure 1). A summary of historical bacteriological results from January 1992 to January 2020 is presented in Table 3. The results of the routine bacteriological monitoring undertaken during the 2020-2021 summer monitoring period are presented in Table 4. Enterococci counts were low across all samples collected during the year under review. Over the course of the monitoring period, all of the samples analysed had enterococci counts below the MfE 'Alert' guideline level (Table 2), and were mostly similar to the historical median values.

Table 3 Summary of previous bacteriological results from 1992 to 2020

Site	Western end of beach – SEA907093		Eastern end of beach – SEA907098	
	Enterococci (cfu/100 ml)	Conductivity (mS/m@20°C)	Enterococci (cfu/100 ml)	Conductivity (mS/m@20°C)
Number of samples	83	77	83	77
Minimum	<1	4,020	<1	3,990
Maximum	310	5,400	1,400	5,380
Median	3	4,660	3	4,620

Table 4 Bacteriological monitoring results for Waiinu Beach during the 2020-21 monitoring period

Site	Western end of beach – SEA907093		Eastern end of beach – SEA907098	
	Enterococci (cfu/100 ml)	Conductivity (mS/m@20°C)	Enterococci (cfu/100 ml)	Conductivity (mS/m@20°C)
16 Dec 2020	<10	4,930	31	4,830
11 Jan 2021	20	4,990	<10	4,930
19 Feb 2021	<10	5,190	<10	5,130

2.3 Results of groundwater monitoring

Groundwater was sampled from two monitoring bores ten times between May 2020 and June 2021 (Table 5 and Table 6). Higher than expected *E. coli* counts were measured in June 2020 and August 2020 which was attributed to insufficient decontamination of sampling equipment between sites. The decision was made to transfer sampling responsibility STDC to the Council from December 2020 to ensure robust sampling methodology were being applied. Subsequent sampling found no evidence was found to suggest the WWTP is affecting water quality down gradient of the disposal fields.

On 26 August 2020 and 16 June 2021 Waiinu Beach campground experienced ponding after heavy rain and results showed expected levels of contamination for surface water due to saturation. Groundwater levels in the monitoring bores showed that there was no connection between the ponded areas and the underlying shallow groundwater.

Table 5 Results of groundwater sampling at monitoring bore BH4 (GND2676)

	pH	Conductivity (µS/cm)	Enterococci (cfu/100 ml)	*E. coli* (cfu/100 ml)
21 May 2020*	7.2	-	<1	<1
25 Jun 2020*	7.3	-	<1	17
30 Jul 2020*	7.4	-	<10	<10
27 Aug 2020*	7.2	453	9	20
15 Oct 2020*	6.7	-	1	2
18 Dec 2020	6.5	477	2	<1
11 Jan 2021	7.2	461	<1	<1
29 Jan 2021	6.6	495	<1	<1
19 Feb 2021	7.2	465	<1	<1
16 Jun 2021	7.0	491	<1	<1

* indicates sampling performed by South Taranaki District Council (STDC). All other samples were collected by Taranaki Regional Council.

Table 6 Results of groundwater sampling at monitoring bore BH2B (GND2674)

	pH	Conductivity (µS/cm)	Enterococci (cfu/100 ml)	E. *coli* (cfu/100 ml)
21 May 2020*	7.2	-	<1	<1
25 Jun 2020*	7.7	-	<10	<10
30 Jul 2020*	8.0	-	10	<10
27 Aug 2020*	7.7	629	5	28
15 Oct 2020*	7.5	-	<1	<1
18 Dec 2020	7.0	507	<1	<1
11 Jan 2021	7.4	469	1	<1
29 Jan 2021	7.1	515	<1	<1
19 Feb 2021	7.4	473	2	<1
16 Jun 2021	7.3	561	<1	<1

* indicates sampling performed by South Taranaki District Council (STDC). All other samples were collected by Taranaki Regional Council.

2.4 Provision of consent holder data

South Taranaki District Council has provided daily records of average daily effluent volumes discharged to the soakage field between 1 July 2020 and 30 June 2021 (Appendix II). None of the average daily effluent volumes exceeded the consent limit of 100 m^3 per day.

2.5 Incidents, investigations, and interventions

The monitoring programme for the year was based on what was considered to be an appropriate level of monitoring, review of data, and liaison with STDC. During the year matters may arise which require additional activity by the Council, for example provision of advice and information, or investigation of potential or actual causes of non-compliance or failure to maintain good practices. A pro-active approach, that in the first instance avoids issues occurring, is favoured.

For all significant compliance issues, as well as complaints from the public, the Council maintains a database record. The record includes events where the individual/organisation concerned has itself notified the Council. Details of any investigation and corrective action taken are recorded for non-compliant events.

Complaints may be alleged to be associated with a particular site. If there is potentially an issue of legal liability, the Council must be able to prove by investigation that the identified individual/organisation is indeed the source of the incident (or that the allegation cannot be proven).

In the 2020-2021 period, the Council was not required to undertake significant additional investigations and interventions, or record incidents, in association with STDC's conditions in their resource consent or provisions in Regional Plans.

3 Discussion

3.1 Discussion of site performance

During the three site inspections of the 2020-2021 monitoring period the site appeared to be well maintained and no odours or ponding were detected during the summer months. Ponding was reported by STDC on two occasions after heavy rainfall, but results of sampling showed expected contamination for surface water ponding due to saturation and no indication of this being caused by anything other than surface water runoff.

3.2 Environmental effects of exercise of consents

The operation of the wastewater treatment system at the Waiinu Beach Settlement was not found to have any adverse effects on groundwater quality at Waiinu Beach Settlement during the 2020-2021 monitoring period. Routine bacteriological monitoring continued to return low faecal indicator bacteria counts in seawater samples, which also suggests there is no contamination occurring between the wastewater treatment plant and the coast.

There were no odour issues identified during inspections of the system, nor were any complaints regarding odour recorded by the Council during the period under review.

3.3 Evaluation of performance

A tabular summary of the consent holder's compliance record for the year under review is set out in Table 7. Table 8 sets out a summary of environmental performance by STDC over time.

Table 7 Summary of performance for consent 3769-4

Purpose: ***To discharge treated domestic wastewater from the Waiinu Beach Wastewater Treatment Plant to land***		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
1. Exercise of consent to be carried out in accordance with information supplied	Site inspections of system and receiving waters	Yes
2. Consent holder to adopt best practicable option to minimise effects on the environment	Bacteriological sampling and site inspections	Yes
3. Consent holder to advise the Council prior to making any significant changes to the system	Site inspections	Yes
4. Discharge to not exceed 100 m^3 in any 24 hour period ending at midnight	Data provided by STDC	Yes
5. Consent holder to maintain a meter and datalogger at site of discharge. Records to be made available to Chief Executive on request	Data provided by STDC	Yes

Purpose: *To discharge treated domestic wastewater from the Waiinu Beach Wastewater Treatment Plant to land*		
Condition requirement	**Means of monitoring during period under review**	**Compliance achieved?**
6. Records of discharge to be in a suitable format and to be provided within one month after the end of the 12-month period ending 30 June	Data provided by STDC	Yes
7. To be no surface run-off, ponding, or contamination of surface water	Bacteriological sampling and site inspections	Yes
8. Consent holder shall suitably maintain and operate the wastewater treatment system	Site inspections	Yes
9. Disposal field shall be located in accordance with information supplied	Old disposal field currently in use is within consented location. Application for consent variation for new disposal area in progress	Yes
10. There shall be no offensive or objectionable odour beyond the boundaries	Site inspections	Yes
11. Consent holder shall ensure that there is an accessible point where treated effluent can be sampled	Accessible point in upgraded system	Yes
12. Contingency plan to be provided to the satisfaction of Chief Executive	Contingency plan provided 16 June 2020	Yes
13. Site shall be operated in accordance with a 'Management Plan'	Management plan provided 16 June 2020	Yes
14. Consent holder shall report to the Council before 31 July annually, the results of the monitoring undertaken in accordance with condition 13	Provided by Mott MacDonald	Yes
15. Consent holder shall commission a report, making a recommendation about the need for disinfection	UV disinfection installed in upgraded system	N/A
16. Optional review provision regarding environmental effects	Not required	N/A
Overall assessment of consent compliance and environmental performance in respect of this consent Overall assessment of administrative performance in respect of this consent		**High** **High**

N/A = not applicable, as condition relates to redesigned wastewater treatment system that has not yet been instated and therefore cannot be assessed.

Table 8 Evaluation of environmental performance over time

Year	Consent no	High	Good	Improvement req	Poor
2010-2011	3769-3	1	-	-	-
2011-2013	3769-3	1	-	-	-
2013-2014	3769-3	1	-	-	-
2014-2015	3769-3	1	-	-	-
2015-2016	3769-3	1	-	-	-
2016-2017	3769-3	1	-	-	-
2017-2018	3769-3 3769-4	1	-	-	-
2018-2019	3769-4	1	-	-	-
2019-2020	3679-4	1	-	-	-
2020-2021	3679-4	1	-	-	-
Totals		10	0	0	0

During the year, STDC demonstrated high levels of environmental and administrative performance with the resource consent as defined in Section 1.1.4.

3.4 Recommendations from the 2019-2020 Annual Report

In the 2019-2020 Annual Report, it was recommended:

1. THAT in the first instance, monitoring of consented activities at Waiinu Beach Settlement in the 2020-2021 year continues at the same level as in 2019-2020.
2. THAT should there be issues with environmental or administrative performance in 2020-2021, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

These recommendations were implemented in full.

3.5 Alterations to monitoring programmes for 2021-2022

In designing and implementing the monitoring programmes for air/water discharges in the region, the Council has taken into account:

- the extent of information already made available through monitoring or other means to date;
- its relevance under the RMA;
- the Council's obligations to monitor consented activities and their effects under the RMA;
- the record of administrative and environmental performances of the consent holder; and
- reporting to the regional community.

The Council also takes into account the scope of assessments required at the time of renewal of permits, and the need to maintain a sound understanding of industrial processes within Taranaki exercising resource consents.

It is proposed that for 2021-2022, the monitoring programme for the Waiinu Beach Settlement remains unchanged on the grounds that there were no significant adverse effects on the receiving environment during the 2020-2021 monitoring period.

It should be noted that the proposed programme represents a reasonable and risk-based level of monitoring for the site(s) in question. The Council reserves the right to subsequently adjust the programme from that initially prepared, should the need arise if potential or actual non-compliance is determined at any time during 2021-2022.

4 Recommendations

1. THAT in the first instance, monitoring of consented activities at Waiinu Beach Settlement in the 2021-2022 year continues at the same level as in 2020-2021.
2. THAT should there be issues with environmental or administrative performance in 2021-2022, monitoring may be adjusted to reflect any additional investigation or intervention as found necessary.

Glossary of common terms and abbreviations

The following abbreviations and terms may be used within this report:

'Action' mode	Two consecutive single samples greater than 280 enterococci/100 ml.
'Alert' mode	Single sample greater than 140 enterococci/100 ml.
Bacteriological	Micro-organisms selected as indicators of faecal material indicators.
Bathers	Those who enter the water, and either partially or fully immerse themselves.
Bathing season	Generally, the bathing season extends between 1 November and 31 March.
Beach	The shore or any access point to the sea.
BOD	Biochemical oxygen demand. A measure of the presence of degradable organic matter, taking into account the biological conversion of ammonia to nitrate.
cfu	Colony forming units. A measure of the concentration of bacteria usually expressed as per 100 ml sample.
Conductivity	An indication of the level of dissolved salts in a sample, usually measured at 20°C and expressed in mS/cm.
Contact recreation	Recreational activities that bring people physically in contact with water, involving a risk of involuntary ingestion or inhalation of water.
Enterococci	An indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 ml of sample.
Faecal coliforms	An indicator of the possible presence of faecal material and pathological micro-organisms. Usually expressed as colony forming units per 100 ml sample.
Incident	An event that is alleged or is found to have occurred that may have actual or potential environmental consequences or may involve non-compliance with a consent or rule in a regional plan. Registration of an incident by the Council does not automatically mean such an outcome had actually occurred.
Intervention	Action/s taken by Council to instruct or direct actions be taken to avoid or reduce the likelihood of an incident occurring.
Investigation	Action taken by Council to establish what were the circumstances/events surrounding an incident including any allegations of an incident.
Incident Register	The Unauthorised Incident Register – contains a list of events recorded by the Council on the basis that they may have the potential or actual environmental consequences that may represent a breach of a consent or provision in a Regional Plan.
Median	Central value when values are arranged in order of magnitude.
Resource consent	Refer Section 87 of the RMA. Resource consents include land use consents (refer Sections 9 and 13 of the RMA), coastal permits (Sections 12, 14 and 15), water permits (Section 14) and discharge permits (Section 15).
RMA	Resource Management Act 1991 and subsequent amendments.
Temperature	Measured in °C (degrees Celsius).
Water quality	The bacteriological condition of a water body as it relates to human health, measured using indicator bacteria.

For further information on analytical methods, contact a Science Services Manager.

Bibliography and references

Davies-Colley, R. J. (2013). River water quality in New Zealand: an introduction and overview. *Ecosystem services in New Zealand: conditions and trends. Manaaki Whenua Press, Lincoln*, 432-447.

Ministry for the Environment and Ministry of Health (2002): *Microbiological Water Quality Guidelines for Marine and Freshwater Recreational Areas.* Ministry for the Environment, Wellington.

Ministry for the Environment (2018): *Best Practice Guidelines for Compliance, Monitoring and Enforcement under the Resource Management Act 1991*. Wellington: Ministry for the Environment.

Mott MacDonald (2020): *Waiinu Beach Wastewater Treatment Plant Environmental Monitoring Plan July 2020*.

Taranaki Regional Council (2020): *Waiinu Beach Settlement Monitoring Programme Annual Report 2019-2020.* Technical Report 2020-13.

Taranaki Regional Council (2019): *Waiinu Beach Settlement Monitoring Programme Annual Report 2018-2019.* Technical Report 2019-07.

Taranaki Regional Council (2018): *Waiinu Beach Settlement Monitoring Programme Annual Report 2017-2018.* Technical Report 2018-06.

Taranaki Regional Council (2017): *Waiinu Beach Settlement Monitoring Programme Annual Report 2016-2017.* Technical Report 2017-43.

Taranaki Regional Council (2016): *Waiinu Beach Settlement Monitoring Programme Annual Report 2015-2016.* Technical Report 2016-109.

Taranaki Regional Council (2015): *Waiinu Beach Settlement Monitoring Programme Annual Report 2014-2015.* Technical Report 2015-14.

Taranaki Regional Council (2014): *Waiinu Beach Settlement Monitoring Programme Annual Report 2013-2014.* Technical Report 2014-08.

Taranaki Regional Council (2013): *Waiinu Beach Settlement Monitoring Programme Biennial Report 2011-2013.* Technical Report 2012-61.

Taranaki Regional Council (2013): *Bathing Beach Water Quality State of the Environment Monitoring Report 2012-2013. Technical* Report 2013-17.

Taranaki Regional Council (2011): *Waiinu Beach Settlement Monitoring Programme Annual Report 2010-2011.* Technical Report 2011-04.

Taranaki Regional Council (2010): *Bathing Beach Water Quality State of the Environment Monitoring Report 2009-2010.* Technical Report 2010-08.

Taranaki Regional Council (2010): *Waiinu Beach Settlement Monitoring Programme Annual Report 2009-2010.* Technical Report 2010-07.

Taranaki Regional Council (2009): *Waiinu Beach Settlement Monitoring Programme. Annual Report 2008-2009.* Technical Report 2009-07.

Taranaki Regional Council (2008): *Waiinu Beach Settlement Monitoring Programme Annual Report 2007-2008*. Technical Report 2008-17.

Taranaki Regional Council (2007): *Waiinu Beach Settlement Monitoring Programme Annual Report 2006-2007*. Technical Report 2007-14.

Taranaki Regional Council (2006): *Waiinu Beach Settlement Monitoring Programme Annual Report 2005-2006*. Technical Report 2006-08.

Taranaki Regional Council (2005): *Waiinu Beach Settlement Monitoring Programme Annual Report 2004-2005*. Technical Report 2005-23.

Taranaki Regional Council (2004): *Waiinu Beach Settlement Monitoring Programme Annual Report 2003-2004*. Technical Report 2004-13.

Taranaki Regional Council (2003): *Waiinu Beach Settlement Monitoring Programme Annual Report 2002-2003*. Technical Report 2003-10.

Taranaki Regional Council (2002): *Waiinu Beach Settlement Monitoring Programme Annual Report 2001-2002*. Technical Report 02-31.

Taranaki Regional Council (2001): *Waiinu Beach Settlement Monitoring Programme Annual Report 2000-2001*. Technical Report 01-34.

Taranaki Regional Council (2000): *Waiinu Beach Settlement Monitoring Programme Annual Report 1999-2000*. Council Technical Report 00-29.

Taranaki Regional Council (1999): *Waiinu Beach Settlement Monitoring Programme Annual Report 1998-1999*. Technical Report 99-37.

Taranaki Regional Council (1998): *Waiinu Beach Settlement Monitoring Programme Annual Report 1997-1998*. Technical Report 98-49.

Taranaki Regional Council (1997): *Waiinu Beach Settlement Monitoring Programme Annual Report 1996-1997*. Technical Report 97-17.

Taranaki Regional Council (1996): *Waiinu Beach Settlement Monitoring Programme Annual Report 1995-1996*. Technical Report 96-13.

Taranaki Regional Council (1995): *Waiinu Beach Settlement Monitoring Programme Annual Report 1994-1995*. Technical Report 95-23.

Taranaki Regional Council (1994): *Waiinu Beach Settlement Monitoring Programme Annual Report 1993-1994*. Technical Report 94-5.

Taranaki Regional Council (1993): *Waiinu Beach Settlement Monitoring Programme Annual Report 1992-1993*. Technical Report 93-8.

Appendix I

Resource consents held by South Taranaki District Council

Water discharge permits

Section 15(1)(a) of the RMA stipulates that no person may discharge any contaminant into water, unless the activity is expressly allowed for by a resource consent or a rule in a regional plan, or by national regulations. Permits authorising discharges to water are issued by the Council under Section 87(e) of the RMA.

Discharges of wastes to land

Sections 15(1)(b) and (d) of the RMA stipulate that no person may discharge any contaminant onto land if it may then enter water, or from any industrial or trade premises onto land under any circumstances, unless the activity is expressly allowed for by a resource consent, a rule in a regional plan, or by national regulations. Permits authorising the discharge of wastes to land are issued by the Council under Section 87(e) of the RMA.

Discharge Permit

Pursuant to the Resource Management Act 1991
a resource consent is hereby granted by the
Taranaki Regional Council

Name of Consent Holder:	South Taranaki District Council Private Bag 902 Hawera 4640	
Decision Date (Change):	3 February 2021	
Commencement Date (Change):	3 February 2021	(Granted Date: 1 December 2017)

Conditions of Consent

Consent Granted:	To discharge treated domestic wastewater from the Waiinu Beach Waste Water Treatment Plant to land
Expiry Date:	1 June 2034
Review Date(s):	June annually
Site Location:	Nukumaru Parade, Waiinu Beach
Grid Reference (NZTM)	1749195E-5585813N & 1749460E-5585590N
Catchment:	Waitotara

For General, Standard and Special conditions
pertaining to this consent please see reverse side of this document

General condition

a. The consent holder shall pay to the Taranaki Regional Council all the administration, monitoring and supervision costs of this consent, fixed in accordance with section 36 of the Resource Management Act 1991.

Special conditions

1. The exercise of this consent shall be undertaken generally in accordance with the documentation submitted in support of the original application and any subsequent applications to change conditions. In case of any contradiction between the documentation submitted in support of previous applications and the conditions of this consent, the conditions of this consent shall prevail.

2. The consent holder shall at all times adopt the best practicable option, as defined in section 2 of the Resource Management Act 1991, to prevent or minimise any actual or likely adverse effect on the environment associated with the discharge.

3. The consent holder shall advise the Taranaki Regional Council prior to making any change in the processes undertaken at the site which could significantly alter the nature of the discharge. The advice shall be given by emailing consents@trc.govt.nz.

4. The discharge shall not exceed 100 m^3 in any 24 hour period ending at midnight (New Zealand standard time).

5. From the date that the upgraded Waiinu Beach Township Waste Water Treatment Plant is commissioned the consent holder shall maintain a meter and a datalogger at the site of discharge. The flow meter and datalogger shall be tamper-proof and shall measure and record the rate and volume of the discharge to an accuracy of ± 5%, at intervals not exceeding 15 minutes. Records of the date, the time and the rate and volume the discharge, shall be made available to the Chief Executive, Taranaki Regional Council on request.

6. The records of discharge shall:
   a) be in a format that, in the opinion of the Chief Executive, Taranaki Regional Council, is suitable for auditing; and
   b) for each 12-month period ending on 30 June, be provided to the Chief Executive, Taranaki Regional Council within one month after end of that period.

7. There shall be no surface run-off, ponding, or contamination of surface water resulting from the discharge of treated wastewater to land.

8. The wastewater treatment system shall be operated and maintained according to the manufacturer's guidelines and/or operations management plan (whichever is most appropriate).

9. The disposal field shall be located within the boundaries shown in Appendix 1 and in accordance with the information submitted in support of this application and subsequent information provided with the *S127 RMA application (9 October 2020)*.

10. The discharge authorised by this consent shall be treated by UV disinfection.

11. There shall be no offensive or objectionable odour beyond the boundaries of the subject property shown in Appendix 1.

12. The consent holder shall ensure that there is a point where the treated effluent can be sampled before it is discharged to the effluent land application area. The consent holder shall provide access for the Taranaki Regional Council to enable a sample to be taken as required.

13. From the date that the upgraded Waiinu Beach Township Waste Water Treatment Plant is commissioned the consent holder shall prepare, maintain and regularly update a 'Contingency Plan' which details measures and procedures that will be undertaken to prevent and/or to avoid environmental effects from a spillage or any discharge of contaminants not authorised by this consent. The plan and any amended versions shall be provided to the Chief Executive of the Taranaki Regional Council and Te Kaahui o Rauru.

14. From the date that the upgraded Waiinu Beach Township Waste Water Treatment Plant is commissioned the site shall be operated in accordance with a 'Management Plan' prepared by the consent holder and approved by the Chief Executive, Taranaki Regional Council, acting in a certification capacity. The Management Plan shall detail how the site is to be managed and monitored and shall include as minimum:

    a) monitoring the wastewater effluent quality and rate of the discharge;
    b) management of the wastewater treatment system;
    c) general housekeeping; and
    d) reporting.

    The consent holder shall provide a copy of the current Management Plan to Te Kaahui o Rauru.

    Advice note: The Management Plan may include other information that the consent holder considers appropriate, such as how cultural matters are being addressed in the management of the Waste Water Treatment Plant.

15. The consent holder shall report to the Taranaki Regional Council before 31 July annually detailing results of the environmental monitoring undertaken in accordance with condition 14 above. The consent holder shall provide a copy of the annual environmental monitoring to Te Kaahui o Rauru.

16. In accordance with section 128 and section 129 of the Resource Management Act 1991, the Taranaki Regional Council may serve notice of its intention to review, amend, delete or add to the conditions of this resource consent by giving notice of review during the month of June annually for the purposes of:

    a) ensuring that the conditions are adequate to deal with any adverse effects on the environment arising from the exercise of this resource consent, which were either not foreseen at the time the application was considered or which it was not appropriate to deal with at the time; and/or
    b) requiring any data collected in accordance with the conditions of this consent to be transmitted directly to the Taranaki Regional Council's computer system, in a format suitable for providing a 'real time' record over the internet.

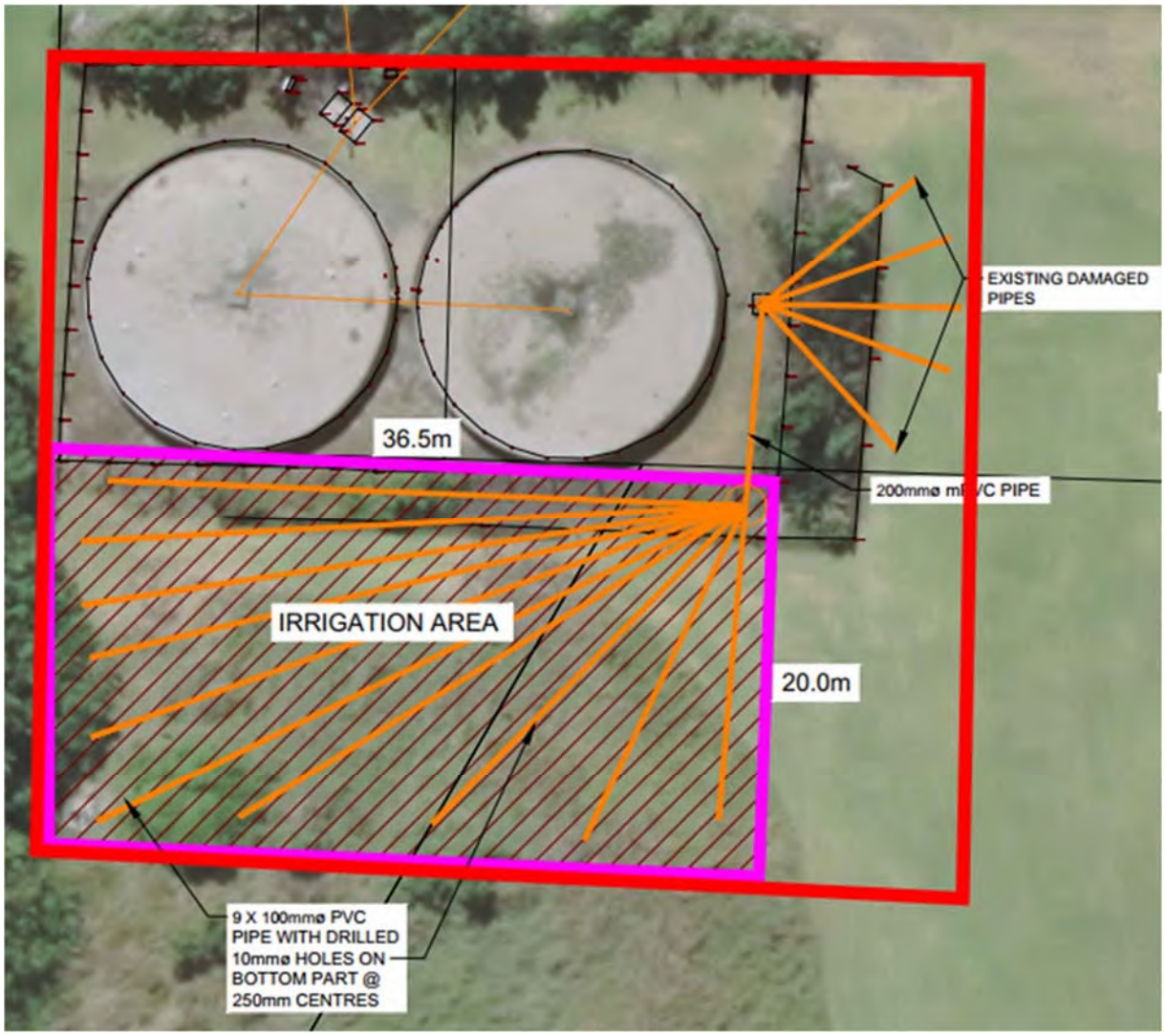
Signed at Stratford on 3 February 2021

For and on behalf of
Taranaki Regional Council

_____

A D McLay
Director - Resource Management

Appendix 1: Site boundary of WWTP within red lines



Appendix II

Daily effluent flow data provided by South Taranaki District Council for 2020-2021

Date	*Flow from Wetwell (m^3/day)*	Irrigation Flow (m^3/day)
	m^3/day	m^3/day
1/07/2020	26.0	28.1
2/07/2020	23.1	26.0
3/07/2020	25.0	27.0
4/07/2020	32.4	33.0
5/07/2020	27.0	30.0
6/07/2020	28.5	30.7
7/07/2020	31.2	34.0
8/07/2020	35.0	38.0
9/07/2020	27.7	29.4
10/07/2020	26.8	28.0
11/07/2020	30.7	33.7
12/07/2020	29.6	31.9
13/07/2020	29.2	31.5
14/07/2020	27.0	27.2
15/07/2020	29.2	32.0
16/07/2020	28.0	30.0
17/07/2020	26.3	27.9
18/07/2020	33.3	35.8
19/07/2020	32.8	34.0
20/07/2020	29.9	33.0
21/07/2020	33.4	36.3
22/07/2020	31.2	32.1
23/07/2020	23.0	27.0
24/07/2020	23.4	25.1
25/07/2020	25.2	26.0
26/07/2020	27.0	30.0
27/07/2020	26.6	28.6
28/07/2020	24.8	26.0
29/07/2020	27.0	30.1
30/07/2020	22.5	32.5
31/07/2020	23.7	26.0
1/08/2020	27.0	27.0
2/08/2020	31.0	31.4
3/08/2020	30.8	34.0
4/08/2020	28.1	30.2
5/08/2020	29.0	31.0
6/08/2020	27.5	30.0
7/08/2020	33.9	36.9
8/08/2020	31.0	35.0
9/08/2020	33.0	35.7
10/08/2020	31.0	34.0
11/08/2020	28.0	30.0
12/08/2020	30.8	32.8
13/08/2020	26.1	29.8
14/08/2020	23.0	24.0
15/08/2020	28.0	31.0
16/08/2020	27.0	28.0
17/08/2020	24.0	26.5
18/08/2020	24.3	26.0
19/08/2020	23.0	29.0
20/08/2020	25.4	27.3
21/08/2020	26.8	27.4
22/08/2020	28.5	30.0
23/08/2020	28.2	30.0
24/08/2020	28.0	31.6
25/08/2020	28.0	28.7
26/08/2020	27.3	30.0
27/08/2020	26.8	30.0
28/08/2020	27.6	29.0
29/08/2020	26.9	30.8
30/08/2020	26.9	28.0
31/08/2020	24.0	26.0
1/09/2020	23.9	20.7
2/09/2020	28.7	29.0
3/09/2020	22.5	32.0
4/09/2020	25.4	21.6
5/09/2020	28.4	35.9
6/09/2020	32.0	34.0
7/09/2020	26.0	29.0
8/09/2020	24.7	28.0
9/09/2020	22.8	19.9
10/09/2020	24.3	26.0
11/09/2020	28.0	34.8
12/09/2020	29.0	35.8
13/09/2020	28.0	28.0
14/09/2020	29.0	31.1
15/09/2020	27.0	29.0
16/09/2020	24.5	27.0
17/09/2020	25.0	20.0
18/09/2020	30.1	33.0
19/09/2020	44.5	48.1
20/09/2020	28.2	29.0
21/09/2020	25.4	27.2
22/09/2020	24.4	26.3
23/09/2020	22.7	25.0
24/09/2020	25.8	28.0
25/09/2020	25.6	29.5
26/09/2020	31.2	34.4
27/09/2020	35.8	42.7
28/09/2020	48.7	56.0
29/09/2020	26.4	30.0
30/09/2020	26.7	29.4
1/10/2020	25.0	27.1
2/10/2020	28.0	30.0
3/10/2020	28.7	31.2
4/10/2020	31.4	35.0
5/10/2020	28.6	30.5
6/10/2020	26.0	28.0

Date	*Flow from Wetwell (m^3/day)*	Irrigation Flow (m^3/day)
	m^3/day	m^3/day
7/10/2020	25.5	29.3
8/10/2020	23.2	26.9
9/10/2020	24.5	27.0
10/10/2020	29.7	32.1
11/10/2020	31.8	34.1
12/10/2020	32.1	35.0
13/10/2020	29.2	34.9
14/10/2020	28.4	31.0
15/10/2020	29.7	32.0
16/10/2020	32.4	37.4
17/10/2020	36.4	40.0
18/10/2020	28.8	32.0
19/10/2020	31.2	33.0
20/10/2020	24.6	28.0
21/10/2020	25.9	30.5
22/10/2020	26.7	28.9
23/10/2020	30.8	31.3
24/10/2020	37.9	39.1
25/10/2020	40.1	45.0
26/10/2020	36.4	41.6
27/10/2020	30.5	33.0
28/10/2020	28.0	34.0
29/10/2020	30.6	34.0
30/10/2020	27.9	30.8
31/10/2020	30.7	33.0
1/11/2020	34.0	37.7
2/11/2020	29.7	33.0
3/11/2020	28.0	33.0
4/11/2020	28.6	32.0
5/11/2020	29.4	32.0
6/11/2020	29.2	33.1
7/11/2020	34.3	36.3
8/11/2020	30.5	35.9
9/11/2020	37.9	41.2
10/11/2020	30.2	34.1
11/11/2020	16.0	19.1
12/11/2020	30.9	26.3
13/11/2020	30.3	36.2
14/11/2020	32.7	36.0
15/11/2020	36.3	37.1
16/11/2020	30.0	35.3
17/11/2020	28.2	40.9
18/11/2020	33.9	37.0
19/11/2020	30.8	34.8
20/11/2020	29.4	34.2
21/11/2020	29.0	31.2
22/11/2020	33.8	36.8
23/11/2020	27.5	34.7
24/11/2020	25.0	30.0
25/11/2020	42.7	45.8
26/11/2020	35.0	39.5
27/11/2020	34.1	39.6
28/11/2020	34.0	39.0
29/11/2020	37.7	41.0
30/11/2020	32.9	36.0
1/12/2020	31.0	35.9
2/12/2020	33.5	38.4
3/12/2020	33.8	37.0
4/12/2020	33.3	36.5
5/12/2020	39.1	43.3
6/12/2020	37.2	43.0
7/12/2020	32.8	38.0
8/12/2020	37.2	39.9
9/12/2020	36.1	40.4
10/12/2020	41.9	45.5
11/12/2020	38.5	42.1
12/12/2020	42.4	46.1
13/12/2020	43.1	47.4
14/12/2020	37.7	45.0
15/12/2020	36.0	39.2
16/12/2020	36.4	41.0
17/12/2020	32.6	36.9
18/12/2020	32.5	36.0
19/12/2020	36.7	39.6
20/12/2020	39.5	40.6
21/12/2020	34.0	35.8
22/12/2020	43.6	51.5
23/12/2020	36.1	36.4
24/12/2020	43.7	47.1
25/12/2020	43.4	47.9
26/12/2020	43.7	50.0
27/12/2020	43.0	49.0
28/12/2020	46.1	50.0
29/12/2020	45.1	50.8
30/12/2020	51.7	57.4
31/12/2020	62.8	63.6
1/01/2021	53.6	63.9
2/01/2021	51.8	62.7
3/01/2021	57.0	63.5
4/01/2021	52.4	60.3
5/01/2021	46.5	55.3
6/01/2021	43.0	50.7
7/01/2021	35.0	38.4
8/01/2021	36.6	41.8
9/01/2021	40.8	47.0
10/01/2021	37.0	45.6
11/01/2021	36.8	43.9
12/01/2021	35.4	43.3
13/01/2021	34.5	40.9
14/01/2021	34.0	40.6
15/01/2021	37.0	43.3

Date	*Flow from Wetwell (m^3/day)*	Irrigation Flow (m^3/day)
	m^3/day	m^3/day
16/01/2021	41.4	46.4
17/01/2021	33.3	39.5
18/01/2021	29.9	36.0
19/01/2021	31.7	34.9
20/01/2021	29.8	35.0
21/01/2021	28.0	32.0
22/01/2021	28.8	33.0
23/01/2021	34.5	36.3
24/01/2021	34.7	38.1
25/01/2021	36.0	40.7
26/01/2021	28.6	34.0
27/01/2021	28.0	31.0
28/01/2021	25.7	29.9
29/01/2021	27.8	30.4
30/01/2021	30.5	34.2
31/01/2021	30.8	34.8
1/02/2021	27.0	30.0
2/02/2021	27.6	29.8
3/02/2021	23.7	27.0
4/02/2021	23.2	24.3
5/02/2021	28.0	23.7
6/02/2021	35.3	40.0
7/02/2021	36.4	39.0
8/02/2021	36.7	40.0
9/02/2021	25.6	29.7
10/02/2021	26.5	23.3
11/02/2021	26.0	28.6
12/02/2021	28.0	30.0
13/02/2021	31.9	34.0
14/02/2021	34.0	36.0
15/02/2021	35.0	37.0
16/02/2021	30.0	32.0
17/02/2021	26.9	30.4
18/02/2021	26.0	30.0
19/02/2021	26.0	31.0
20/02/2021	35.0	36.2
21/02/2021	33.6	38.9
22/02/2021	27.0	32.0
23/02/2021	25.3	28.0
24/02/2021	23.9	25.7
25/02/2021	25.0	24.0
26/02/2021	26.3	23.4
27/02/2021	32.4	40.0
28/02/2021	35.0	42.9
1/03/2021	25.4	30.0
2/03/2021	22.8	26.0
3/03/2021	24.0	24.5
4/03/2021	24.9	23.3
5/03/2021	23.0	22.0
6/03/2021	29.6	29.1
7/03/2021	28.2	33.0
8/03/2021	24.0	27.0
9/03/2021	25.3	24.5
10/03/2021	24.8	24.7
11/03/2021	28.8	29.0
12/03/2021	24.4	26.0
13/03/2021	31.3	31.8
14/03/2021	33.8	35.0
15/03/2021	27.5	27.0
16/03/2021	25.2	26.6
17/03/2021	25.7	25.5
18/03/2021	26.6	26.3
19/03/2021	24.6	22.8
20/03/2021	28.0	26.0
21/03/2021	27.7	28.0
22/03/2021	24.6	29.8
23/03/2021	22.7	20.5
24/03/2021	24.0	29.0
25/03/2021	25.5	26.0
26/03/2021	24.0	21.6
27/03/2021	30.4	30.0
28/03/2021	30.0	29.8
29/03/2021	35.9	34.5
30/03/2021	22.0	21.0
31/03/2021	37.7	39.6
1/04/2021	32.4	32.1
2/04/2021	32.7	31.0
3/04/2021	31.3	31.6
4/04/2021	36.7	36.0
5/04/2021	36.9	35.3
6/04/2021	26.8	27.0
7/04/2021	26.3	23.7
8/04/2021	26.1	25.1
9/04/2021	25.9	24.0
10/04/2021	35.0	32.4
11/04/2021	30.8	29.3
12/04/2021	25.2	23.0
13/04/2021	23.0	24.0
14/04/2021	23.0	23.0
15/04/2021	25.0	20.1
16/04/2021	24.1	23.8
17/04/2021	26.5	27.5
18/04/2021	28.0	27.6
19/04/2021	25.1	24.0
20/04/2021	25.9	25.4
21/04/2021	28.9	29.0
22/04/2021	25.5	26.0
23/04/2021	29.6	29.0
24/04/2021	27.4	28.1
25/04/2021	24.4	24.0
26/04/2021	25.5	24.4

Date	*Flow from Wetwell (m^3/day)*	Irrigation Flow (m^3/day)
	m^3/day	m^3/day
27/04/2021	26.4	25.4
28/04/2021	23.3	25.0
29/04/2021	31.6	30.3
30/04/2021	24.4	25.5
1/05/2021	26.4	26.0
2/05/2021	28.7	27.5
3/05/2021	22.6	22.3
4/05/2021	24.7	23.9
5/05/2021	22.4	21.0
6/05/2021	22.4	22.0
7/05/2021	22.7	22.0
8/05/2021	25.6	24.9
9/05/2021	26.0	26.0
10/05/2021	24.0	23.0
11/05/2021	22.2	22.0
12/05/2021	22.0	21.0
13/05/2021	21.4	20.0
14/05/2021	22.5	22.7
15/05/2021	23.4	23.0
16/05/2021	27.8	26.9
17/05/2021	24.6	24.7
18/05/2021	22.5	23.0
19/05/2021	20.2	19.2
20/05/2021	22.6	22.1
21/05/2021	22.7	23.0
22/05/2021	23.8	23.0
23/05/2021	21.9	21.8
24/05/2021	20.2	19.7
25/05/2021	20.9	19.0
26/05/2021	19.4	19.0
27/05/2021	19.3	18.1
28/05/2021	18.8	17.0
29/05/2021	21.0	18.3
30/05/2021	22.9	19.0
31/05/2021	19.5	19.0
1/06/2021	16.5	17.0
2/06/2021	18.0	16.3
3/06/2021	21.3	19.8
4/06/2021	22.4	21.0
5/06/2021	27.0	26.0
6/06/2021	28.1	28.2
7/06/2021	26.4	25.3
8/06/2021	19.0	18.4
9/06/2021	23.7	23.0
10/06/2021	19.5	18.4
11/06/2021	22.0	22.0
12/06/2021	31.2	30.7
13/06/2021	27.5	27.0
14/06/2021	20.9	18.0
15/06/2021	18.8	18.0
16/06/2021	20.0	19.0
17/06/2021	20.2	21.0
18/06/2021	18.0	18.0
19/06/2021	25.6	26.9
20/06/2021	23.6	23.0
21/06/2021	21.0	19.7
22/06/2021	20.5	18.6
23/06/2021	20.8	21.0
24/06/2021	19.0	18.9
25/06/2021	22.0	21.0
26/06/2021	26.4	24.0
27/06/2021	33.9	32.0
28/06/2021	24.8	25.0
29/06/2021	24.7	25.0
30/06/2021	22.6	20.0