

Waikanae River, Recharge and Borefield Annual Report 2021/22 -Consent WGN130103 [35973, 35974 & 35975]

Prepared for Greater Wellington Regional Council by Kāpiti Coast District Council

[FINAL]

Revision History

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1	T Drewitt	Draft for AMG review	12/12/2022
2	T Drewitt	Final following AMG review	07/03/2023

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Action	Name	Signed	Date
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RRwGW Reporting Chart (Beca 2020)

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Minutes of AMG Meeting

1 Introduction and Compliance Summary

Kāpiti Coast District Council (the Council) holds resource consents (WGN130103 [35973], [35974] and [35975]) to enable the following activities:

- take groundwater from bores within the Waikanae Borefield for the purpose of supplementing public water supply, through Waikanae River recharge or as an emergency public water source
- to take water from the Waikanae River for public water supply
- to discharge groundwater from the Waikanae Borefield to the Waikanae River for the purpose of river recharge and bore trialling.

The groundwater take consent authorises the abstraction of groundwater from eight production wells within the Waikanae Borefield as part of Council's River Recharge with Groundwater (RRwGW) scheme. All eight of these wells were operable throughout the 2021/22 year (1 July 2021 to 30 June 2022). The locations of the eight production wells and monitoring bores are shown in Figure 1.

The consents include the requirement to monitor three ecosystems (Waikanae River, Small Coastal Streams and Wetlands) and the Waikanae Borefield. Requirements for annual reporting are detailed in Appendix A. Periodically, there is additional monitoring activity required:

- The close of the fish species monitoring programme was summarised in the 2019/20 Annual Report (however, the RRwGW Adaptive Monitoring Group (AMG) has recommended readdressing this monitoring in the lead up to the Year-15 Review)
- The three-yearly wetlands monitoring programme, postponed from the 2019/20 Season, is addressed this year and in this Report.

A reference chart of the staged monitoring requirements for this environmental management programme is included in Appendix F.

Operation under the above consents was carried out as agreed with Greater Wellington Regional Council (GWRC) and in accordance with the approved Ongoing Mitigation Plans (OMPs). At the commencement of the 2021/22 all OMPs were approved and operable. This will be the third year of operation under the full RRwGW operating regime.

There are several plans, manuals and reports required by the consent. These key documents are set out in the diagram in Appendix A. Where specialist reports are referred to as supplied with a previous Annual Report these can be found on the Council public website, at the following location, along with previous Annual Reports: https://www.kapiticoast.govt.nz/your-council/forms-documents/reports/water-supply-annual-reports/.

A summary of compliance for the 2021/22 year is set out below, using the symbols shown in the adjacent key. In summary:

- The report at this revision, and the Water Conservation Report, are offered for the 2021/22 RRwGW Season for AMG review and discussion, prior to being finalised.
- The river level/ flow rate has been low enough to require river recharge during this Season
- There have been no transgressions of ongoing environmental triggers
- No changes to operational practice have occurred, nor changes to operational documents made.
- Council undertook action to ensure future resources consents accessing critical aquifers work within the consenting triggers of the RRwGW consent conditions and principles of Te Mana o te Wai.

Table 1: Compliance Summary FY2021/22

Section		Key	
River	River Abstraction		No triggers or actions needed
	River Recharge		Trigger or action
	Downstream River Flows		Exceedance
	River Aquatic monitoring		
Borefield	Abstraction Volumes and Rates	_	
	Back-up wells PW1 and PW5		
	Shallow Aquifer Drawdown Monitoring		
	Deep Aquifer Drawdown Monitoring		
	Saline Intrusion Monitoring		
	Waikanae River Flow Gauging		
Wetlands	Wetlands Monitoring	-	
Small Coastal Streams	Small Coastal Streams Monitoring	-	

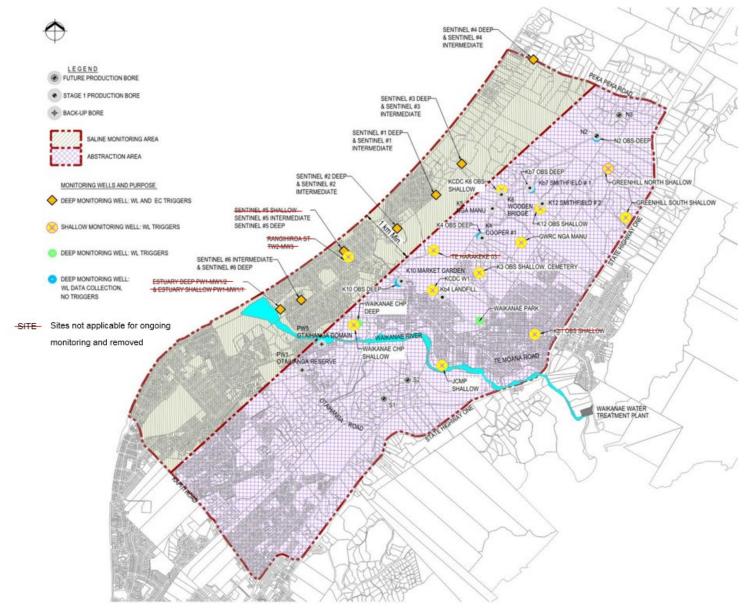


Figure 1: Location Plan - Waikanae Borefield Abstraction Wells and Monitoring Bores

Waikanae River 2

Waikanae River Flows 2.1

The Waikanae River flow is monitored by GWRC at a gauging station approximately 200m upstream of the Waikanae Water Treatment Plant (WTP) intake.

It is noted that Council's SCADA system receives river flow data from GWRC's SCADA system on an approximately 15-minute basis. The river flow data received and stored by Council is used for managing the water supply abstraction, and this data is not back-corrected if GWRC subsequently updates the algorithm for interpreting the level sampling data.

The upstream daily average river flow for the 2021/22 monitoring period is displayed in Figure 2, and the peak and low flow periods for the 2020/21 and 2021/22 monitoring periods are detailed in Table 2, below. As can be seen, river recharge was required during March and April 2022.

Table 2: Upstream Waikanae River Flows

Period	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Peak flow	122,209 L/s on 23 September 2020	139,602 L/s on 6 December 2021
Minimum flow	909 L/s on 5 March 2021	801 L/s on 11 April 2022
Low flow periods when river recharge used	March and April	March and April

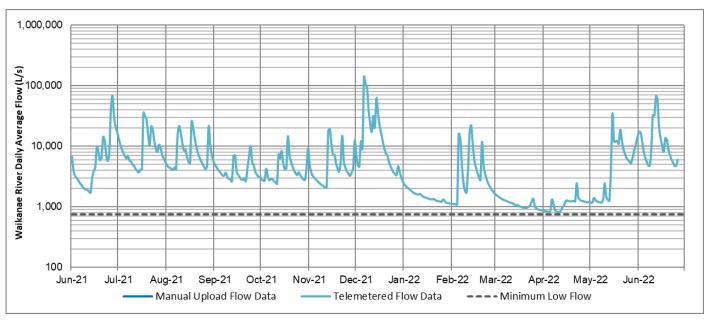


Figure 2: Waikanae River Flow at Water Treatment Plant (July 2021 – June 2022)

The Council instigates river recharge where the river flow would otherwise drop below 750L/s minimum flows. As such, upstream river flows were maintained above 750 L/s for the entire monitoring period.

2.2 **River Abstraction**

No triggers or actions needed

Council measures and records the flow rates and volumes of water abstracted from the Waikanae River by way of a flow meter at the WTP intake. Council regularly submits its river abstraction records to GWRC, as per Condition 13 of consent WGN130103 [35974]; this is done automatically from Council's SCADA to GWRC's Water Use Data Management System (Hydrotel). The instantaneous abstraction rate was always less than consent condition targets.

The daily abstraction volumes for the reporting period are provided in Table 3 and plotted in Figure 3 below. The orange line is the maximum allowable daily take permitted by the consent.

Table 3: Daily and Annual Waikanae River Abstractions

Period	1 July 2019 - 30 June 2020	1 July 2020- 30 June 2021	1 July 2021 - 30 June 2022
Maximum daily abstraction	20,537 m3/day (on 19 June 2020)	17,723 m³/day (on 24 February 2021)	17,590 m³/day (on 1 February 2022)
Maximum allowable daily volume permitted by Condition 5 of consent WGN130103 [35974]	30,700 m³/day	30,700 m³/day	30,700 m ³ /day
Total annual abstraction volume	4,345,261 m ³	4,387,133 m ³	4,552,870 m ³
Equivalent average daily abstraction	11,872 m³/day	12,020 m ³ /day	12,474 m³/day
Maximum total abstraction volume permitted by Condition 5 of consent WGN130103 [35974]	11,174,800 m³/year	11,174,800 m³/year	11,174,800 m³/year

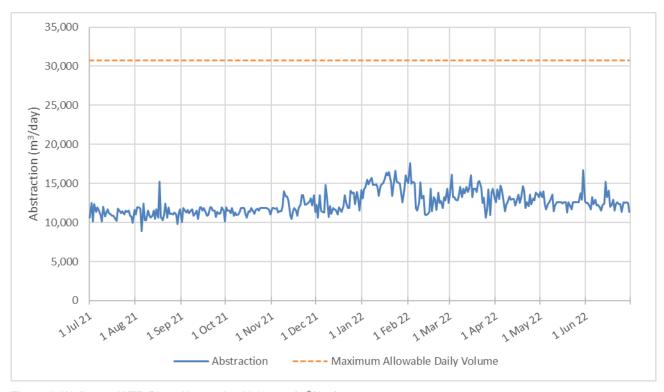


Figure 3: Waikanae WTP River Abstraction Volumes (m³/day)

No daily abstraction volumes exceeded the consent conditions in the 2021/22 period.

The instantaneous rates of abstraction (recorded at 15-minute intervals) for the reporting period are shown in Table 4 and Figure 4 below.

Table 4: Instantaneous rates of abstraction from Waikanae River

Period	1 July 2019 - 30 June 2020	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Maximum abstraction rate	240 L/s on 3 January 2020	240 L/s on 14 October 2020	255 L/s on 1 February 2022
Maximum abstraction rate at time of maximum abstraction permitted by Condition 5 [35974]*	463 L/s	463 L/s	463 L/s

^{* 355} L/s when the river flow is below 1,400 L/s and 463 L/s when river flow is above 1,400 L/s. This is adjustment to maximum abstraction rate is also expressed in Figure 4.

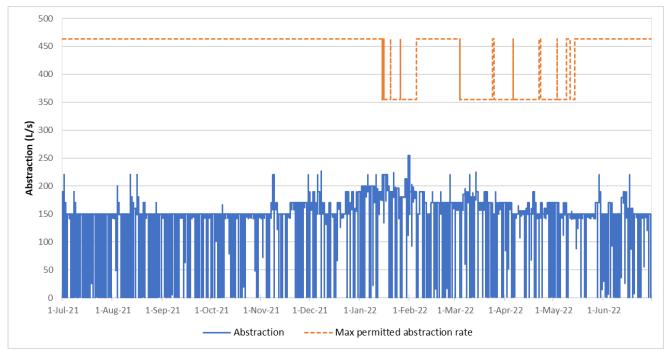


Figure 4: Waikanae WTP River Abstraction Rates (Instantaneous, L/s)

The instantaneous abstraction rate was always less than consent limit conditions.

2.3 River Recharge

No triggers or actions needed

River recharge must be deployed when notified of low flows in the Waikanae River, to maintain the downstream river flow at 750 L/s or at its natural upstream flow rate, if less than 750 L/s. The recharge is undertaken in accordance with the approved Bore Preference Hierarchy Plan (BPHP) and approved Waikanae River OMP. There were instances of the requirement for river recharge in the 2021/22 season.

The trigger for periphyton monitoring and water quality sampling in the river is when discharge of bore water to the river exceeds 225 L/s for at least 48 hours. This trigger was not exceeded during this period.

The daily and instantaneous discharge of groundwater from the borefield to the river are outlined in Table 5 and plotted in Figure 5 and Figure 6 overleaf.

Table 5: River recharge discharges into the Waikanae River

Period	1 July 2019 – 30 June 2020	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Number of days of river recharge	No requirement for river recharge.	4 days - 4th to 6th March, and on 21st April.	25 days between 19 March and 15 April
Maximum river recharge discharge	3,011 m³/day on 21 March 2020 @	4,507 m ³ /day on 5 March 2021	13,244 m³/day on 4 April 2022
Ecological monitoring trigger exceeded? *	Trigger not exceeded	Trigger not exceeded	Trigger not exceeded
Number of days of short duration discharges #	19 days	14 days	54 days above 0 m³/day 29 days above 1 m³/day
Total volume of bore water discharged to the Waikanae River (river recharge and additional short-term discharges)	29,729 m ³	41,400 m ³	179,400 m ³

^{*} recharge exceeds 225L/s for 48 hours or greater.

Due to a dry late-summer and autumn period in the district, river flows during the monitoring period were low and occasionally dipped below the recharge trigger level. Thus, a river recharge response was required, for a short spell each time, on 25 days during March and April. The total volume of bore water discharged to the river includes short-duration discharges for routine bore testing (Short Duration Discharges as defined by Consent WGN130103 [35975]).

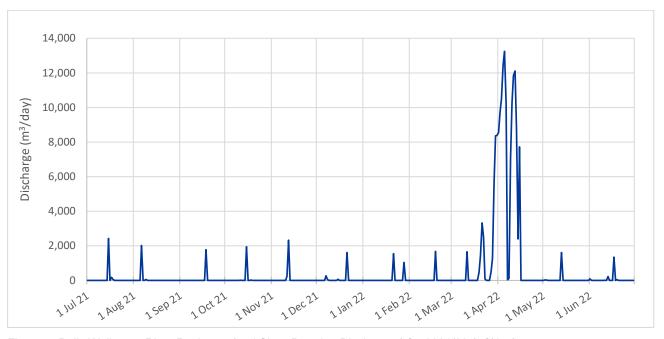


Figure 5: Daily Waikanae River Recharge (and Short Duration Discharges) for 2021/22 (m³/day)

[#] discharge from the Waikanae borefield to the Waikanae River of less than six hours, up to maximum consented take, for bore maintenance, testing and stakeholder consultation (max. cumulative duration is 24 hours over a 30-day period).

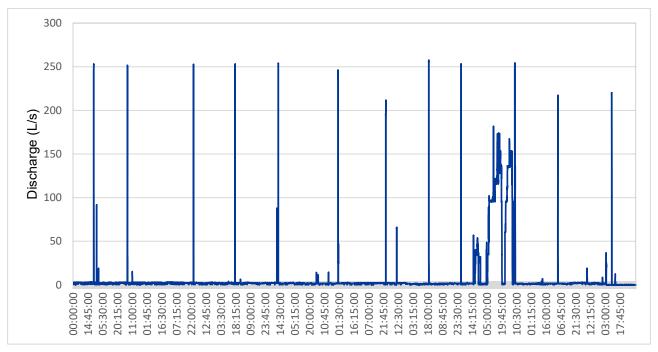


Figure 6: Instantaneous Waikanae River Recharge (and Short Duration Discharges) 2021/22 (L/s)

2.4 Downstream River Flows



No triggers or actions needed

The flow immediately downstream of the Waikanae WTP's river recharge discharge structure is calculated as required by Condition 6 of consent WGN130103 [35974] and Condition 12 of WGN130103 [35975]. During low flow periods, a minimum flow of 750 L/s is to be maintained downstream of the WTP unless the river naturally falls below this level upstream of the river intake to the WTP. The low downstream Waikanae River Flow data is detailed in Table 6.

Figure 8 shows the river flow at the GWRC gauging site upstream of the WTP (grey line), the WTP abstraction (yellow line), the river recharge (purple line) and the resulting calculated flow immediately downstream of the WTP (blue line) during the river recharge season of 2021/22 year. Due to low river flows in March and April 2022, Council abstracted water from the Waikanae Borefield for river recharge for a total of four days. The yellow line depicts an unadjusted river abstraction rate, the purple line depicting the deployment of bore abstraction - in the main for trial runs. The orange line (low river level trigger threshold) and grey line (upstream river flow) never meet, but we see a very brief contact between the blue line (downstream flow) and the orange line.

Table 6: Downstream Waikanae River Flows

Period	1 July 2019 - 30 June 2020	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Lowest downstream river flow	874 L/s on 16 February 2020	780.41 L/s on 1 March 2021 (742 L/s on 25 February 2021)	767 L/s on 13 April 2022
Minimum flow of downstream river in accordance with Condition 6 of consent WGN130103 [35974] and condition 12 of WGN130103 [35975]	750 L/s	750 L/s	750 L/s
Maximum percentage recharge flow of river flow downstream	21%	20%	27%

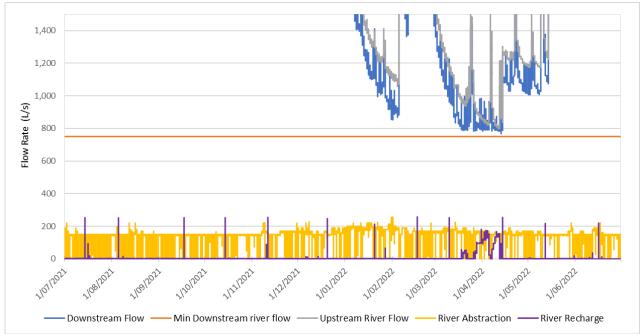


Figure 7: River flow upstream and downstream of WTP during low flow period December 2021 through April 2022

2.5 River Aquatic Monitoring

No triggers or actions needed

Since the recharge of bore water did not exceed 225L/s for 48 hours, periphyton and water quality monitoring was not required over the 2021/22 period.

Periphyton and water quality monitoring in the Waikanae River is required when recharge of bore water exceeds 225L/s for 48 hours. Macroinvertebrates samples are taken when the level of periphyton in the river reaches high or very high levels as defined in the agreed letter. Table 7 shows that river aquatic monitoring has not been required over the past three reporting periods.

Table 7: River aquatic monitoring undertaken

Period	1 July 2019 - 30 June 2020	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Periphyton monitoring	Not required	Not required	Not required
Water Quality Sampling- DRP	Not required	Not required	Not required
Water Quality Sampling- Conductivity	Not required	Not required	Not required
Temperature	Not required	Not required	Not required

Table 8 provides a summary of historical fish surveys undertaken. Surveys were undertaken in the river above and below the Waikanae WTP in prior monitoring periods; the results of this annual monitoring were last documented in the report "Waikanae River Riffle Fishing Report" of 2 May 2019 by Boffa Miskell (included as Appendix B in the 2018/19 report).

A total of 937 fish were caught; summarised below in terms of 10 main indicator species:

- Torrentfish (405)
- Longfin eel (231)
- Shortfin eel (9)
- Redfin bully (138)
- Inanga (4)
- Koaro (2)
- Common bully (2)
- Brown trout (3)
- Bluegill bully (2)
- Banded kokopu (2)

On review of all findings, it was agreed with GWRC that no further surveys were required. However:

- GWRC requested a summary report to cover the total evidence from the three-year period of study
- The 2018/19 Report noted that: based on the results and analysis the AMG considered fish monitoring be re-considered at a future time, and proposed the following for GWRC consideration:
 - The AMG re-consider the inclusion of a fish survey in the years following the triggering of river monitoring activities by river recharge flow and duration events
 - The AMG re-consider the inclusion of a fish survey from year 10 to inform the Performance Assessment Report requirement in the 15th anniversary of the consent.

The Boffa Miskell report "Waikanae River - Riffle Fishing, Concluding Dataset Assessment", prepared for Council on 8 April 2020, was included in the 2019/20 Annual Report. The River OMP now provides that the need for further fish monitoring will be revisited by the AMG at Year 10, being 2022/23. The AMG confirmed that fish monitoring is to be undertaken in 2022/23 summer at the annual AMG meeting on 20 February 2022 (see Section 7.2).

Table 8: Summary of Fish Surveys undertaken

Period	1 July 2017 - 30 June 2018	1 July 2018 - 30 June 2019
Fish Monitoring	4 surveys undertaken February to March 2018.	4 surveys undertaken February to March 2019.

3 Waikanae Borefield

3.1 Abstraction Volumes and Rates



No triggers or actions needed

All individual bore abstractions were below the Stage 1 maximum yield values in Condition 8 of WGN130103 [35973].

Abstraction from each production well (L/s and m³/day) is measured and recorded in accordance with Conditions 13, 14 and 20 of consent WGN130103 [35973]. Council submits full abstraction records automatically via SCADA to GWRC as required by Condition 18. A summary of the abstraction for this reporting period is provided below in Table 9. The total daily abstraction from the Waikanae Borefield is plotted in Figure 8.

Table 9: Total daily and annual volumes pumped from the production bores

Period	1 July 2019 - 30 June 2020	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Total annual volume pumped	30,366 m³	41,211 m ³	45,600 m ³
Annual permitted volume (Condition 8 of WGN130103 [35973])	2,300,000 m³/year	2,300,000 m³/year	2,300,000 m³/year
Maximum total daily take volume and date	3,359 m³/day on 23 October 2019	3,867 m³/day on 30 October 2020	13,200 m³/day on 21 March 2022
Maximum daily take permitted by Condition 6 of WGN130103 [35973]	23,600 m³/day	23,600 m³/day	23,600 m³/day

River Recharge and Bores Monthly Flow Data

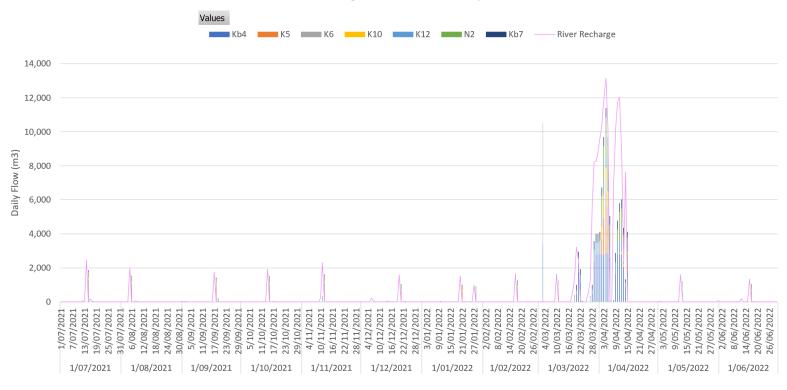


Figure 8: Daily Abstraction Volumes from Production Wells

The abstraction rates from the production wells are shown in Tables 10 and 11 and are plotted in Figure 9.

Table 10: Total instantaneous abstraction rate from production wells

Period	1 July 2019 - 30 June 2020	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Maximum combined abstraction	252 L/s for 15 minutes on 23 October 2019.	261 L/s for 15 minutes on 12 May 2021	256 L/s for 15 minutes on 17 February 2022
Maximum instantaneous abstraction permitted by Condition 8 of WGN130103 [35973].	273 L/s	273 L/s	273 L/s

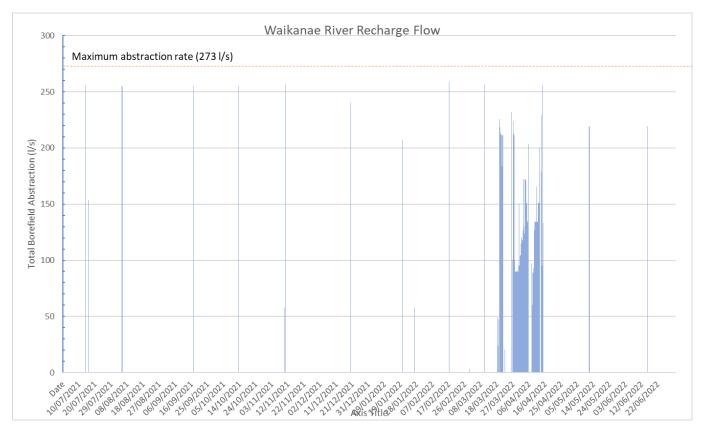


Figure 9: Total Instantaneous Abstraction from Production Wells

The combined instantaneous abstraction from the Borefield was below the maximum abstraction authorised by Condition 8 of WGN130103 [35973] during the 2021/22 period. The maximum instantaneous abstraction rates for the individual production bores are detailed in Table 11 below. Please note that no water was running in K4 bore at the times the meter logged the 77l/s flows. The WTP's Supervisor inspected the data and suspects air in the pipe caused a false reading.

Table 11: Maximum Instantaneous abstraction rates for the individual production bores.

Maximum instantaneous abstraction	Stage 1 Maximum yield (Condition 8 of WGN130103 [35973])	1 July 2020 - 30 June 2021 *	1 July 2021 - 30 June 2022 *
K10	17 L/s	17 L/s	17 L/s
Kb4	35 L/s	35 L/s	35 L/s
K4	65 L/s	65 L/s	77 L/s

Maximum instantaneous abstraction	Stage 1 Maximum yield (Condition 8 of WGN130103 [35973])	1 July 2020 - 30 June 2021 *	1 July 2021 - 30 June 2022 *
K5	36 L/s	36 L/s	36 L/s
K6	58 L/s	58 L/s	58 L/s
Kb7	6 L/s	6 L/s	6 L/s
K12	8 L/s	8 L/s	8 L/s
N2	25 L/s	25 L/s	25 L/s

^{*} The apparently identical nature of values shown for 2019/20 thru 2020/21 seasons (three season) is due to rounding and similarity of operating regimes; it correctly reflects historic data for these periods.

3.2 Flow Gauging



No triggers or actions needed

Measurement of Waikanae River flows at Jim Cooke Memorial Park is undertaken when the borefield abstraction exceeds 23,000 m³/day for a three-day period as outlined in approved River and Borefield OMPs.

This trigger for additional flow monitoring was not reached during the 2021/22 period.

Table 12: Flow gauging of the Waikanae River

Period	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Flow Gauging Trigger Status	Borefield abstraction of 23,000 m³/day for a three-day period was not exceeded.	Borefield abstraction of 23,000 m³/day for a three-day period was not exceeded.

3.3 Back-up Wells PW1 and PW5



No triggers or actions needed

Council holds a separate resource consent WGN050025 [33147] for two groundwater bores in Otaihanga (PW1 and PW5) for back up water supply.

The Back-up wells PW1 and PW5 were not connected to the reticulation and therefore were not used for back up water supply in the 2021/22 period.

Table 13: Combined abstraction from wells PW1 and PW5 for back up public water supply to the surrounding communities

Period	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Combined abstraction from wells PW1 and PW5	Wells not used for back up water supply	Wells not used for back up water supply
Maximum combined abstraction permitted by Consent WGN050025 [33147].	7,000 m³/day	7,000 m³/day

Borefield Monitoring Programme 3.4

The Borefield Monitoring Programme is set out in the approved Borefield OMP.

3.4.1 **Shallow Aquifer Drawdown Monitoring**



No triggers or actions needed

Table 14 below lists the shallow aquifer monitoring sites, the applicable trigger levels and the minimum water level (daily average) recorded during the reporting period compared to prior years. There were no minimum level trigger events.

There were few alarm triggers notified during this monitoring period for all monitoring bore levels; with one for the Shallow Aquifer Monitoring (16 April 2022) occurring during river recharge season (but not during recharge), and only due to equipment/system anomalies.

Table 14: Shallow Aquifer Drawdown Monitoring Wells and Trigger Levels

			Trigger Le	evel	Min level reporting	Min level reporting	Min level this
Well Name	GWRC Bore Number	Alert (mm AMSL)	Action (mm AMSL)	Cease (mm AMSL)	period 2019/20 (mm AMSL)	period 2020/21 (mm AMSL)	reporting period 2021/22 (mm AMSL)
KCDC K6 Obs Shallow	R26/6992	2180	1980	1780	3319	3314	3504
GWRC Nga Manu	R26/6991	7138	6938	6738	7885	7801	8049
KCDC W1	R26/7025	4350	4150	3950	5116	4970	4931
Waikanae CHP Shallow	R26/6916	1445	1245	1045	2227	2259	2389
K12 Obs Shallow, Smithfield Rd	R26/6300	5035	4835	4635	5674	5714	5820
JCMP Shallow, Jim Cooke Memorial Park	N/A	6641	6441	6241	7411	7409	7433
K3A Obs Shallow, Cemetery	R26/6290	6964	6764	6564	7776	7868	8010
Greenhill North Shallow, Greenhill Rd North	N/A	6387	6187	5987	6996	7071	7146
Greenhill South Shallow, Greenhill Rd South	N/A	11829	11629	11429	12621	12732	12988

Table 15 summarises trigger and notification information. Further analysis of all bore monitoring automatic notification events (all of which were short-term monitoring equipment failures or anomalies) is included in Section 3.4.4.

Table 15: Shallow Aquifer Triggers

Period	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Total number of notifications	3	20
Total number of actual triggers	0	0

Deep Aquifer Drawdown Monitoring



No triggers or actions needed

There were no level trigger events during this monitoring period for Deep monitoring bore levels.

Table 16 lists the deep aquifer monitoring sites, the applicable trigger levels and the minimum water level (daily average) recorded during this year's reporting period compared to prior years.

Table 16: Deep Aquifer Drawdown Monitoring Wells and Trigger Levels

Well Name	GWRC Bore Number	Alert [mm AMSL]	Trigger Lev Action [mm AMSL]	rel Cease [mm AMSL]	Min Level reporting period 2019/20 (mm AMSL)	Min level reporting period 2020/21 (mm AMSL)	Min level this reporting period 2021/22 (mm AMSL)
Sentinel #1 Deep, Rutherford Drive	R26/6378	-1537	-3787	-5475	3399	3388	2065
Sentinel #1 Intermediate, Rutherford Drive	N/A	-2526	-4776	-6463	2029	2080	1663
Sentinel #2 Deep, Hodgkins Rd	N/A	-898	-2698	-4048	2897	2952	2466
Sentinel #2 Intermediate, Hodgkins Rd	N/A	-1757	-3557	-4907	1832	1839	1436
Sentinel #3 Deep, Old WWTP	R26/6776	-2090	-4490	-6290	3052	3203	1553
Sentinel #3 Intermediate, Old WWTP	N/A	-2547	-4947	-6747	2466	2603	2317
Sentinel #4 Deep, Peka Peka Rd	N/A	1832	932	257	3984	4033	3778
Sentinel #4 Intermediate, Peka Rd	N/A	284	-616	-1291	2128	2230	2290
Sentinel #5 Intermediate, Taiata St	R26/6955	-393	-1443	-2231	1840	1907	1876
Sentinel #5 Deep, Taiata St	N/A	19	-1031	-1819	2139	2200	2089
Sentinel #6 Deep, Tamati Place	N/A	560	-190	-752	2175	2155	2202
Sentinel #6 Intermediate, Tamati Place	N/A	599	-151	-714	2109	2161	2176
Waikanae CHP Deep	R26/6594	540	-510	-1298	2722	2755	2634
Waikanae Park	R26/6284	4611	2511	936	8751	8814	8818

Table 17: Deep Aquifer Triggers

Period	1 July 2019 - 30 June 2020	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Total number of notifications	4	6	15
Total number of actual triggers	0	0	0

A small number of automated notifications of trigger values from Deep monitoring were received by Council and GWRC during the 2021/22 year. River recharge was not underway during these times. All events were due to monitoring system anomalies. Table 17 summarises the overall situation. Further analysis of all bore monitoring automatic notification events (short-term monitoring equipment failures or anomalies) is included in Section 3.4.4.

NB: several events automatically notified by the SCADA system are "cascade" events, where the three alarm levels (Alert, Action, Cease) have the same time-and-date stamp, and so are assumed one Notification.

3.4.3 Saline Intrusion Monitoring



No triggers or actions needed.

Table 18 lists the saline intrusion monitoring sites, the applicable trigger levels and the maximum electrical conductivity (daily average) recorded during this year's reporting period compared to last year. Conductivity is used as a surrogate for salinity intrusion into the aquifer waters.

Table 18 shows two instances of high conductivity readings exceeding the "cease" trigger level, on 23 August 2021 and 22 May 2022. Both instances are outside the river recharge season. In both situations, the high conductivity readings were caused by faulty CT2X conductivity instruments. These instruments have since been repaired and are recording accurate readings.

Table 18: Saline Intrusion Monitoring Wells Electrical Conductivity Trigger Levels

			Trigger Lev	/el	Max this reporting	Max this reporting
Well Name	GWRC Bore Number	Alert (µS/cm)	Action (µS/cm)	Cease (µS/cm)	period 2020/21 (µS/cm)	period 2021/22 (µS/cm)
Sentinel #1 Deep, Rutherford Drive	R26/6378	1500	1875	2188	933	2361
Sentinel #1 Intermediate, Rutherford Drive	N/A	521	651	760	461	467
Sentinel #2 Deep, Hodgkins Rd	N/A	1532	1915	2234	1397 (5094)	1195
Sentinel #2 Intermediate, Hodgkins Rd	N/A	1699	2124	2478	879	840
Sentinel #3 Deep, Old WWTP	R26/6776	1342	1677	1956	1303	1026
Sentinel #3 Intermediate, Old WWTP	N/A	2789	3486	4067	530	1094
Sentinel #4 Deep, Peka Peka Rd	N/A	866	1082	1262	712	707
Sentinel #4 Intermediate, Peka Peka Rd	N/A	761	951	1110	732	870
Sentinel #5 Intermediate, Taiata St	R26/6955	3642	4553	5311	3318	3261
Sentinel #5 Deep, Taiata St	N/A	5818	6518	7218	5066	5109
Sentinel #6 Deep, Tamati Place	N/A	8693	9393	10093	7583	7844
Sentinel #6 Intermediate, Tamati Place	N/A	1684	2105	2455	1514	1467

^{*} The value for maximum conductivity at the "Sentinel #2 Deep, Hodgkins Rd" monitoring point has been amended from the erroneous data point offered in raw data, as explained in this Section.

Operations and maintenance activities caused several alarm notifications which were automatically repeated to GWRC and followed up on during the year. The number of actual triggers from the alarm notifications is shown in Table 19.

NB: several events automatically notified by the SCADA system are "cascade" events, where the three alarm levels (Alert, Action, Cease) have the same date-stamp, and so are assumed one notification.

Table 19: Saline Intrusion Monitoring Triggers

Period	1 July 2018 - 30 June 2019	1 July 2019 - 30 June 2020	1 July 2020 - 30 June 2021	1 July 2021 - 30 June 2022
Total number of notifications	7	4	0	12
Total number of actual triggers	1	0	0	0

These notification examples are reminders of the harsh environment found at these depths of immersion in the Sentinel bores. Council commissioned a trialling exercise during FY2019/20, involving weather-proofed above-ground mounting of a conductivity monitoring instrument, with pumped sample waters from the example bore. To date these trials have not been adequately successful, offering inconsistent results, and the market for this specialist item was found to be very narrow when canvassing a wider selection of equipment suppliers.

3.4.4 Analysis of Monitoring Bore Notification Alerts (Monitoring Equipment Outages)

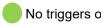
The Council received a total of 47 notifications of a trigger event for the RRwGW monitoring wells during 2021/22. Of these, 27 notifications were received during the river recharge season (1 December to 30 April). Table 20 summarises these notifications, including the date, monitoring point and alert level In all cases a Council or GWRC monitoring asset was found to have failed, or it had been affected by a maintenance or power outage event.

Table 20: Summary of Notified Monitoring Point Failure Events

Date	Monitoring Point	Alert Level
26-Jan-22	GWRC Nga Manu	Level 1 Alert
26/01/2022	GWRC Nga Manu	Level 2 Action
26/01/2022	GWRC Nga Manu	Level 3 Cease
19/12/2021	K10 Obs Deep - Te Moana Road	Level 1 Alert
20/12/2021	K10 Obs Deep - Te Moana Road	Level 2 Action
20/12/2021	K10 Obs Deep - Te Moana Road	Level 3 Cease
19/12/2021	K10 Obs Deep - To Moana Road	Level 2 Action
18/01/2022	kb1 Obs Shallow	Level 1 Alert
18/01/2022	Kb1 Obs Shallow, Ngaio Road	Level 2 Action
18/01/2022	Kb1 Obs Shallow, Ngaio Road	Level 3 Cease
19/01/2022	KCDC W1	Level 3 Cease
19/01/2022	KCDC W1	Level 1 Alert
19/01/2022	KCDC W1	Level 2 Action
30/03/2022	KCDC W1	Level 1 Alert
30/03/2022	KCDC W1	Level 2 Action
26/01/2022	Nga Manu Wetland	Level 1 Alert
26/01/2022	Nga Manu Wetland	Level 2 Action
10/01/2022	Sentinel #4 Deep, Peka Peka Road	Level 1 Alert
18/01/2022	Sentinel #4 Deep, Peka Peka Road	Level 2 Action
18/01/2022	Sentinel #4 Deep, Peka Peka Road	Level 3 Cease
18/01/2022	Sentinel #5 Deep, Taiata Street	Level 1 Alert
18/01/2022	Sentinel #6 Deep, Tamati Place	Level 1 Alert
18/01/2022	Sentinel #6 Intermediate, Tamati Place	Level 1 Alert

* The levels of trigger alerts are: (1) Alert, (2) Action, (3) Cease. As can be seen, most events cascade to "Cease".

3.5 **Bore Water Quality Monitoring**



No triggers or actions needed

3.5.1 Production Bores

Following the approved BoMM:

- Bore water quality samples are taken from production bores at the start of the abstraction season.
- Water quality sampling is compulsory at the conclusion of the monitoring season if the abstraction from the borefield reaches 23,000m³/day for three consecutive days or reaches a volumetric measure of 540,000m3 or more.

Bore water quality samples were taken from production bores at the start of the 2021/22 season. Bore Water Quality Sampling results from Eurofins' analysis of samples can be found in Appendix D. No non-compliance indicators are noted.

The abstraction from production bores during the 2021/22 season did not exceed 23,000m³/day for three consecutive days or reach 540,000m³ or more, meaning monitoring at the conclusion of the season was not required.

3.5.2 **Blended Bore Water**

Blended Bore Water sampling is no longer required going forward, as per the approved Borefield OMP.

3.6 **Potentially Affected Existing Private Wells**

Condition 7 of consent WGN130103 [35973] requires work to be undertaken to identify potentially affected existing authorised wells (and actions (b)-(d) listed in the condition) prior to implementing each stage of the project as referenced in Condition 6. GWRC confirmed on 21 July 2016 that Council has met all requirements of Condition 7 for Stage 1.

A website provides education information, live groundwater level monitoring information and has contact details if private well users wish to discuss issues arising or make complaints. KCDC upgraded this website for 2020/21 year; now hosting live operating data, with geospatially represented bore information, on Council's own platform (it was operated for Council by consultant Beca, in the past).

Refer to the web pages found at the following address:

https://www.kapiticoast.govt.nz/services/a-z-council-services-and-facilities/waters/water-supply/where-itcomes-from/private-bores/

3.7 **Complaints**

There were no complaints received alleging adverse effects from, or related to, abstraction from the Waikanae Borefield in the 2021/22 year.

Condition 45 of consent WGN130103 [35973] requires Council to maintain an on-going record of any complaints received alleging adverse effects from, or related to, abstraction from the Waikanae Borefield, including complaints of any adverse effects on private bores. The Complaints Record is attached in Appendix E. This Appendix is empty if there were no complaints.

Table 20: Complaints Record

Period	1 July 2020- 30 June 2021	1 July 2021 - 30 June 2022
Number of complaints	0	0

Wetlands Monitoring 4



No trigger or action needed

As required by the approval of the Wetland OMP, wetland triggers are applicable to Nga Manu wetland for Stage 1. No trigger was reached in the 2021/22 period for the wetlands operating water level.

A graph presenting the Nga Manu wetland groundwater levels for the season is presented in Figure 9, below. NB: This includes regression analysis of the trigger levels, based on district-wide shallow groundwater effects, which is now automatically applied by Council's control system (SCADA).

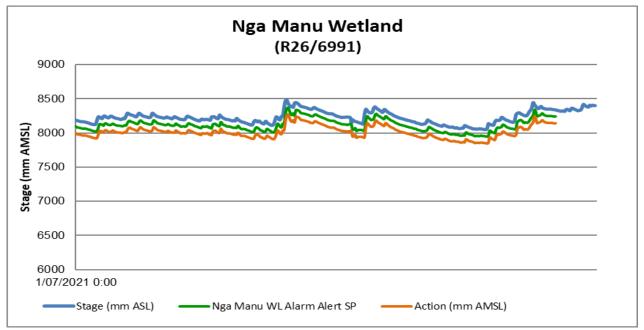


Figure 10: Nga Manu Wetland Levels and Trigger Regression Analysis

Te Harakeke wetland is to be included in an updated Wetland OMP if access can be regained. GWRC is to be advised when access is regained, and Council will implement triggers and environmental monitoring in accordance with requirements at the stage when access is regained.

The Consent requires the Council to carry out a three-yearly review of the environmental conditions in the wetlands (including an aerial imagery survey of species) during mid-late summer. This fell in year 2019/20 but, due to access problems during COVID-19 restrictions, the monitoring activity to the next summer season. The wetland conditions assessment was undertaken in February 2021, and the report was attached in Appendix D to the 2020/21 annual report. The report concluded: "In summary, the Nga Manu Wetland has not shown any concerning or unexpected ecological change since the baseline monitoring surveys. As such, the next Stage 1 monitoring round for the RRwGW consent should occur in three years' time in summer 2024". Wetland condition monitoring is therefore scheduled for next summer.

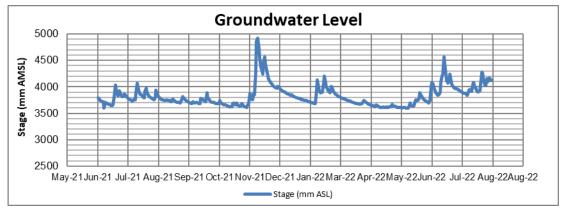
Continuation of periodic monitoring seems prudent; as the Report indicates: "While the slight increase in pressure and decrease in condition is expected (as pressure and condition scores are catchment wide measures, not focused at the wetland scale), any further declines related directly to the wetland at the wetland scale would be of concern in future monitoring rounds".

Small Coastal Streams Monitoring 5

No triggers or actions needed

There were no triggers notified for the Ngarara coastal stream in this period.

One small coastal stream site, Ngarara Stream has been monitored this year as defined in the Small Coastal Stream OMP. The required monitoring period is from 1 December 2021 to 1 May 2022. The ground water and stream level for the small coastal stream are shown in Figure 11, below.



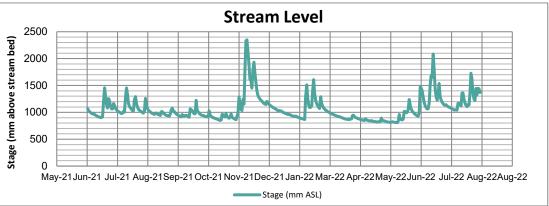


Figure 11: Groundwater & Stream levels for Ngarara Small Coastal Stream

Trigger levels apply from the 25 February 2019 approval of the Small Streams OMP. These are outlined below in Table 22. Triggers use data from both the stream and groundwater measurement points - those from the prior monitoring period are included here. The notes to Table 22 indicate that statistical conditioning, based on historical data, is to apply to the measured values. For 'Action' and 'Cease' levels the caveat "assuming at least one correlation exercise has been undertaken for the current "event" with the measured 35th percentile depth" is noted.

Table 22 Historic Trigger Levels for Small Coastal Streams

	Trigger Le	evel (from 201	3/19 Y ear)	Min Value this reporting
Location	Alert (mm -)	Action (mm -)	Cease (mm -)	period 2021/22 (mm -)
Ngarara Groundwater Level (mm AMSL)	2550.19 *			3,599
Ngarara Stream Level (mm above stream bed)		300 #	150 ⁺	808

^{* 200}mm below the lowest recorded shallow groundwater level for historic monitoring results minus 15% of the range in water levels recorded.

The approved OMP indicates an adaptive management approach to assessment of applicable triggers, which applied this year. Trigger levels calculations benefit from the broader data set acquired from a further 24 months of field data since the 2018/19 report ("historic data" is considered as that commencing from the first viable historic data point collected; date-stamped 00:00hrs 18/06/2018). In Table 23 historic data is used to calculate the actual trigger level to be applied for this data series for this period.

Table 23 Analysis of Adaptive Management Trigger Levels - Small Coastal Streams 2021/22

				Refi	ined Trigger	Level	Min or Recalculated ²
Location	Minimum Level ¹ (mm -)	Maximum Level ¹ (mm -)	35 th Percentile ² (mm -)	Alert ³ (mm -)	Action (mm -)	Cease (mm -)	Value for period 2021/22 (mm -)
Ngarara Groundwater Level (mm AMSL)	2940.34	4473.01		2510.44			3,610
Ngarara Stream Level (mm above stream bed)	610.98	2043.19	739		300	150	867

- 1. Data was taken from the SCADA archive for period 00:00hrs 18/06/2018 thru 23:00 30/06/2020
- 2. The 35th Percentile is calculated by ranking all data values in the set noted above, in order, then assessing the data point at which 35% of all points are of lesser value.
- 3. Trigger levels as described in Table 22 notes.

[#] 35th percentile stream depth is less than 300mm determined from staff gauge measurement.

⁺ 35th percentile stream depth is less than 150mm determined from static staff gauge measurement.

6 **Operations**

6.1 **Operations Log and Maintenance Undertaken**

Council has confirmed that its existing SCADA system together with the NCS system are an 'electronic data management system' which records and stores the information required by Condition 20 of consent WGN130103 [35973] and Condition 18 of consent WGN130103 [35974]. Borefield abstraction, river abstraction and river recharge data are automatically transmitted from Council's SCADA system to GWRC's Water Use Data Management System. Council has implemented WaterOutlook as a system to store and report data and operational information relating to the Waikanae Borefield. Council is also using WaterOutlook to store and report data and operational information relating to the Waikanae River take and recharge.

A copy of the operational maintenance visit site logs for each production bore, as stored on the SCADA system, is included in Appendix C. Further operational maintenance records can be sought, from the main operational logs held on SCADA at Waikanae WTP.

6.2 **Operation and Maintenance Manuals**

6.2.1 **Approved Documents History**

The Waikanae Borefield Operation and Maintenance Manual (BOMM) and current Waikanae River Take Operations and Maintenance Manual (ROMM) have been approved by AMG & GWRC and were last updated on 19 December 2018.

The following have also been approved by GWRC:

- Borefield OMP (dated 29 November 2018),
- Wetland OMP (dated 9 March 2018),
- Small Coastal Streams OMP (dated 21 February 2019), and
- River OMP (dated 15 October 2018).

Updated Documents 6.2.2

Council offers no document updates in this 2021/22 Season.

7 Mitigation/Adaptive Management

The Adaptive Management Group (AMG) for the RRwGW scheme comprises members who include representatives of GWRC, Council, and Te Āti Awa ki Whakarongotai. AMG members meet annually to discuss the performance of the RRwGW programme.

The 2021/22-year monitoring activities have been completed in accordance with the approved OMPs. The AMG annual meeting was held on 20 February 2023.

7.1 **Mitigation Plan Considerations**

7.1.1 **Operating Documents and Consent - active**

The consents and the related operating documents were deployed as unchanged for the 2020/21 season, in the now normalised operating mode. No new consent amendments are proposed.

Operating Documents - revision control 7.1.2

7.1.2.1 Operation and Maintenance Manuals

There have been no revisions to documents this season (including BoMM, RoMM, O&M Manuals, and so on).

7.1.2.2 Operation Management Planning

Council offers no new operations management amendments for review.

7.1.3 Reports

The AMG reviewed and provided recommendations on the draft Annual Report and Water Conservation Report, before these reports were finalised.

7.1.4 **Recommendations of the Adaptive Management Group**

The AMG met in February 2023. The AMG made the following recommendation:

- Fish surveys should be undertaken in the summer of 2022/23 in accordance with the methodology used for previous fish surveys.
- The results should then be compared to the results from the previous surveys as reported in the 2019 report to establish whether there is any change to the baseline outlined in that report.
- The AMG would then consider the results and analysis at the next AMG meeting in August 2023 and determine whether to continue fish surveys the following summer.
- The Council has engaged a consultant to undertake this work during March/April 2023.

Appendix A

Consent Requirements and Documents

An annual Waikanae River, Recharge and Borefield report is required by Condition 42 of consent WGN130103 [35973], Condition 24 of consent WGN130103 [35974] and Condition 26 of consent WGN130103 [35975]. This report to Greater Wellington Regional Council (GWRC) covers the period from 1 July 2021 through to 30 June 2022. The requirements of these conditions are listed in the tables below (Table 23, Table 24, and Table 25) with cross-references to the relevant sections in this report.

Table 23: Requirements for Annual Waikanae River report

Со	ndition 24 of Consent WGN130103 [35974]	Section in this Annual Report
	e consent holder shall, by 30th September each year, submit an Annual Waikanae er report to the Manager, or by another date as agreed with the Manager.	
	e annual Waikanae River report shall report on the year 1 July to 30 June inclusive, d include the following information:	
a)	Records of the instantaneous rate of take (L/s), and total daily volumes (m³);	Section 2.2
b)	Flow and river recharge information to demonstrate compliance with Condition 6 (Waikanae River low flow);	Sections 2.1, 2.3 and 2.4
c)	Provide information to demonstrate compliance with Condition 18 of this consent	Sections 2.1, 2.2 and Section 6.1
d)	Results of all monitoring undertaken that year required by Condition 21 of this consent (if applicable), including a comprehensive analysis of the monitoring results, assessment against any relevant guidelines and comparison with previous years' results (i.e. trend analysis); *	Section 2.5
e)	Details of any trigger levels or compliance limits that were reached (if occurred that year);	Section 2.5
f)	Details of any actions and/or mitigation/adaptive management taken in response to trigger levels or compliance limits being reached, including an assessment of the effectiveness of these actions and/or mitigation/adaptive management;	Section 2.5
g)	Any recommendations for changes to the Waikanae River Baseline Monitoring Plan or the On-going Mitigation Plan (as relevant), including triggers, compliance limits or actions and/or mitigation measures or changes to the operations and maintenance manual, including recommendations of the Adaptive Management Group (referred to in Condition 26 of this consent);	Section 6.2 and Section 7.
h)	A discussion on any mitigation/adaptive management that may be required in the coming year;	Section 7
i)	Summary of any maintenance undertaken.	Section 6.1
	e annual Waikanae River report can be combined with the annual River Recharge ort required by the conditions of discharge permit WGN130103 [35975].	Refer www.kapiticoast.govt.nz
Co	e annual Waikanae River report shall be made available to the public on the Kāpiti ast District Council website no later than 30 September each year, or by another e as agreed with the Manager.	
cor	te: The consent holder is only required to report on the listed requirements of this ndition if they have occurred during that compliance year (1 July to 30 June lusive).	
tim the dra	te: The consent holder may request, with the Manager's approval, an extension of e to submit the annual report to the Manager and make it available to the public on website, if the Adaptive Management Group requires more time to consider the ft annual report and provide their recommendations as required by part (g) of this ndition.	

^{*}Conditions 19 and 20 due to completion of Baseline monitoring

Table 21: Requirements for Annual River Recharge report

Section 2.3
Section 2.3
Section 2.3
Section 2.4
Section 2.5 and Section 3.2
Section 2.5
Section 2.5 and Section 3.2
Section 6.2 and Section 7, 7.1.1 and 7.2
Section 7
Section 6.1
Refer www.kapiticoast.govt.nz

^{*}Condition 22 is not applicable due to completion of Baseline monitoring.

Table 22: Requirements for Annual Waikanae Borefield report

Coi	ndition 42 of Consent WGN130103 [35973]	Section in this Annual Report
	e consent holder shall, by 30 September each year, submit an annual Waikanae refield report to the Manager, or by another date as agreed with the Manager.	
	e annual Waikanae Borefield report shall report on the year 1 July to 30 June lusive, and include the following information:	
a)	A copy of the records to demonstrate compliance with Condition 20 of this consent;	Sections 3.1 and 3.3
b)	Details of the use (including daily and total volumes of groundwater abstracted) and reasons for that use of the water from the Borefield;	Section 3.1
c)	A summary of Waikanae River flow gauging required by Condition 25 of this consent, if undertaken that year; *	Section 3.2
d)	Results of all monitoring undertaken that year required by conditions of this consent (if applicable), including a comprehensive analysis of the monitoring results, assessment against any relevant guidelines and comparison with previous years' results (i.e. trend analysis);	Sections 3, 4 and 5
e)	Results or evidence to demonstrate compliance with Condition 7 of this consent	Section 3.6
f)	Details of any trigger levels or compliance limits that were reached (if occurred that year) and specifically the findings of saline monitoring compared with the 'alert', 'action' or 'cease' triggers;	Sections 3 and 4
g)	Details of any actions and/or mitigation/adaptive management taken in response to trigger levels or compliance limits being reached, including an assessment of the effectiveness of these actions and/or mitigation/adaptive management;	Sections 3, 4 and 5
h)	Any recommendations for changes to the monitoring plan required by conditions of this consent, including triggers, compliance limits or actions and/or mitigation measures or changes to the operations and maintenance manual, required by Condition 19 of this consent, including any recommendations of the Adaptive Management Committee (referred to in Condition 43 of this consent);	Section 6.2, Section 7.1.2, 7.1.3, 7.1.4, and 7.2
i)	A discussion on any mitigation/adaptive management that may be required in the coming year;	Section 7
j)	A copy of the complaints record required by Condition 45 of this consent;	Section 3.7
k)	Summary of any maintenance undertaken.	Section 6.1
Kāp	e annual Waikanae Borefield report shall be made available to the public on the biti Coast District Council website by 30 September each year, or by another date agreed with the Manager.	Refer www.kapiticoast.govt.nz
time the dra	te: The consent holder may request, with the Manager's approval, an extension of e to submit the annual report to the Manager and make it available to the public on website, if the Adaptive Management Group requires more time to consider the ft annual report and provide their recommendations as required by part (h) of this adition.	

^{*} Condition that may change following \$127

In addition to the above consents, Council holds resource consent WGN050025 [33147] to abstract groundwater from two wells (PW1 and PW5) for the purpose of back up water supply for the communities of Waikanae, Paraparaumu and Raumati. Requirements of Condition 15 are discussed in Section 4.6

Appendix B

Operation and Maintenance Logs Intake and Production Bores K10 Operational Bore Log

							Operational Bore Log		
Date FY Filled in log book? Bore Level	above Pump Pump R	Run Hours Ter	mperature Flo	ow Forward Fl	ow Reverse Cabinet Filter	Checked Well-h	ead Compressor Service Due Date Run compressor manually?	Compressor Run Hours Well-head Security Comment	Comments
29/07/2021 2021/2022 Yes	52	4858	14.3	22439	111 2 - Clean	Yes	13/07/2021 Yes	180.00	Service due
12/08/2021 2021/2022 Yes	52	4860	14.3	22582	111 3 - No Action		12/02/2022 Yes	180.00	
19/08/2021 2021/2022 Yes	52	4860	14	22582	111 2 - Clean	Yes	12/02/2022 Yes	108.00	
3/09/2021 2021/2022 Yes	52	4860	14.3	22582	111 2 - Clean	Yes	12/02/2022 Yes	180.00	Compressor was manually turned off at the isolator switch.
9/09/2021 2021/2022 Yes	52	4860	14.3	22582	111 2 - Clean	Yes	12/02/2022 Yes	180.00	
23/09/2021 2021/2022 Yes	52	4862	14.4	22715	111 2 - Clean	Yes	12/02/2022 Yes	181.00 Constant leak from breather. V	l .
30/09/2021 2021/2022 Yes	52	4862	14.3	22715	111 2 - Clean	Yes	12/02/2022 Yes	181.00	
14/10/2021 2021/2022 Yes	51	4865	18.7	22859	111 3 - No Action		12/02/2022 Yes	181.00	
21/10/2021 2021/2022 Yes	52	4865	14.3	22859	111 3 - No Action	Yes	12/02/2022 Yes	181.00	
23/12/2021 2021/2022 Yes	52	4868	14.4	23067	111 3 - No Action	Yes	12/08/2022 Yes	182.00 power and sensor entry to bore	
30/12/2021 2021/2022 Yes	52	4868	14.3	23067	111 3 - No Action	Yes	12/08/2022 Yes	182.00	
6/01/2022 2021/2022 Yes	52	4868	14.3	23067	111 3 - No Action	Yes	12/08/2022 Yes	182.00	
14/01/2022 2021/2022 Yes	52	4868	14.4	23069	111 3 - No Action		12/08/2022 Yes	182.00	
		4870						183.00	
27/01/2022 2021/2022 Yes	52		14.3	23201	111.36 3 - No Action		12/08/2022 Yes		
3/02/2022 2021/2022 Yes	52	4870	14.3	23201.55	111.36 3 - No Action	Yes	18/01/2023 Yes	183.39	
10/02/2022 2021/2022 Yes	52	4870	14.4	23201.55	111.36 3 - No Action	Yes	10/01/2023 Yes	183.00 ok	
17/02/2022 2021/2022 Yes	52	4872	14.7	23321	111 3 - No Action	Yes	18/01/2023 Yes	184.00	
24/02/2022 2021/2022 Yes	52	4872	14.3	23321	111 3 - No Action	Yes	18/01/2023 Yes	184.00	
3/03/2022 2021/2022 Yes	52	4872	14.3	23321	111 3 - No Action		18/01/2023 Yes	184.00	
		4872							
9/03/2022 2021/2022 Yes	52		14.3	23321	111 3 - No Action		18/01/2023 Yes	185.00	
17/03/2022 2021/2022 Yes	52	4875	14.7	23441	111 3 - No Action	Yes	18/01/2023 Yes	185.00	
24/03/2022 2021/2022 Yes	52	4875	14.3	23442	111 2 - Clean	Yes	1/07/2022 Yes	187.00 Ok	
31/03/2022 2021/2022 Yes	52	4875	16.8	23451	111 3 - No Action	Yes	18/07/2022 Yes	188.00	
7/04/2022 2021/2022 Yes	52	4953	14.3	28058.23	111.36 2 - Clean	Yes	1/07/2022 Yes	188.85	
14/04/2022 2021/2022 Yes	50	4966	17.6	28653	111 3 - No Action		1/07/2022 Yes	189.92	
		4966	14.4						
21/04/2022 2021/2022 Yes	52			28653	111 3 - No Action		18/01/2023 Yes	190.00	
28/04/2022 2021/2022 Yes	52	4966	14.4	28653.02	111.36 2 - Clean	Yes	1/07/2022 Yes	190.54	
5/05/2022 2021/2022 Yes	52	4966	14.4	28653.02	111.36 2 - Clean	Yes	5/01/2023 Yes	190.94 OK	
12/05/2022 2021/2022 Yes	51	4968	15.4	28792.98	111.36 3 - No Action	Yes	1/07/2022 Yes	191.00	
19/05/2022 2021/2022 Yes	52	4968	14.4	28792.98	111.36 2 - Clean	Yes	1/01/2023 Yes	192.00 OK	
26/05/2022 2021/2022 Yes	52	4968	14.3	28792	111.36 1 - Change	Yes	1/01/2023 Yes	192.00 OK	
9/06/2022 2021/2022 Yes	52	4968		28792				193.00	
			14.3		111 3 - No Action		18/01/2023 Yes		
16/06/2022 2021/2022 Yes	52	4970	15	28913.11	111.36 3 - No Action		16/01/2023 Yes	194.00 Ok	
23/06/2022 2021/2022 Yes	52	4970	14.3	28913.11	111.36 2 - Clean	Yes	1/01/2023 Yes	194.50 OK	
Date EV Filled in log book? Rore Level	ahove Pump Pump R		KB4 (Operational	Bore Log				
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29/07/2021 2021/2022 Yes 12/08/2021 2021/2022 Yes 19/08/2021 2021/2022 Yes 3/09/2021 2021/2022 Yes 14/10/2021 2021/2022 Yes 14/10/2021 2021/2022 Yes 23/12/2021 2021/2022 Yes 3/012/2021 2021/2022 Yes 3/012/2022 2021/2022 Yes 10/02/2022 2021/2022 Yes 10/02/2022 2021/2022 Yes 10/02/2022 2021/2022 Yes 10/03/2022 2021/2022 Yes 10/03/2022 2021/2022 Yes 11/03/2022 2021/2022 Yes 10/03/2022 2021/2022 Yes 11/03/2022 2021/2022 Yes 11/03/2022 2021/2022 Yes 11/03/2022 2021/2022 Yes 14/04/2022 2021/2022 Yes 21/04/2022 2021/2022 Yes 21/04/2022 2021/2022 Yes 21/04/2022 2021/2022 Yes 12/05/2022 2021/2022 Yes 19/05/2022 2021/2022 Yes	33 33 33 33 33 33 33 33 33 33 32 23 33 3	Run Hours Ter 5578 5580 5580 5580 5580 5580 5582 5582 5582 5585 5590 5590 5590 5592 5592 5594 5594 5594 5594 5596 5596 5596 5596 5693 5735 5867 5996 599	KB4 (mperature File 14.6 14.7 14.6 14.7 14.6 17.3 14.7 14.9 14.8 14.8 14.8 14.8 14.9 15.3 14.8 14.9 15.3 14.8 14.9 15.1 14.7 14.7 14.6 14.7 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7	Operational I Dow Forward FI 284328 284626 284625 284625 284625 284905 285206 285206 285206 285800 285800 286966 28694 286344 286344 286344 286345 286592 286592 290355 300826 317284 332660 333091 333091 333091 333091 333091 333091 333091	Bore Log ow Reverse Cabinet Filter 5454 2 - Clean 5587 3 - No Action 5503 2 - Clean 5603 2 - Clean 5603 2 - Clean 5605 2 - Clean 5701 2 - Clean 5701 3 - No Action 5703 3 - No Action 5703 3 - No Action 5916 3 - No Action 6015 3 - No Action 6048 3 - No Action 6048 3 - No Action 6048 3 - No Action 6103 3 - No Action 6104 3 - No Action 6104 3 - No Action 6105 3 - No Action 6106 3 - No Action 6107 3 - No Action 6108 3 - No Action 6109 3 - No Action 6100 3 - No Action 6100 3 - No Action 6101 2 - Clean 6117 3 - No Action 6143 3 - No Action 6140 2 - Clean 6177 2 - Clean 6177 2 - Clean 6171 1 - Change 6227 1 - Change	Checked Well-h Yes	level sensor not completely seal nil Ok OK OK OK		
29/07/2021 2021/2022 Yes 12/08/2021 2021/2022 Yes 19/08/2021 2021/2022 Yes 3/09/2021 2021/2022 Yes 3/09/2021 2021/2022 Yes 23/09/2021 2021/2022 Yes 23/09/2021 2021/2022 Yes 30/09/2021 2021/2022 Yes 14/10/2021 2021/2022 Yes 23/12/2021 2021/2022 Yes 23/12/2021 2021/2022 Yes 30/12/2021 2021/2022 Yes 30/12/2022 2021/2022 Yes 3/02/2022 2021/2022 Yes 1/02/2022 2021/2022 Yes 1/02/2022 2021/2022 Yes 1/03/2022 2021/2022 Yes 1/04/2022 2021/2022 Yes 1/04/2022 2021/2022 Yes 21/04/2022 2021/2022 Yes 21/04/2022 2021/2022 Yes 21/04/2022 2021/2022 Yes 21/04/2022 2021/2022 Yes 1/05/2022 2021/2022 Yes 1/9/05/2022 2021/2022 Yes 19/05/2022 2021/2022 Yes 19/05/2022 2021/2022 Yes 19/05/2022 2021/2022 Yes 16/06/2022 2021/2022 Yes 16/06/2022 2021/2022 Yes 16/06/2022 2021/2022 Yes	33 33 33 33 33 33 33 33 33 33 33 33 33	Run Hours Tel 5578 5580 5580 5580 5580 5582 5582 5582 5585 5590 5590 5590 5590 5592 5594 5594 5594 5594 5596 5643 5735 5663 5795 5696 569	KB4 (mperature Fitce 14.6 14.6 14.7 14.6 14.7 14.6 17.3 14.7 14.9 14.8 14.8 14.9 15.3 14.8 14.9 15.3 14.7 14.7 14.7 14.7 14.7 14.7 14.7 14.6 14.7 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6	Operational I Dow Forward FI 284328 284626 284625 284625 284625 284905 285206 285206 285206 285800 285800 285800 285800 285800 285800 383696 286344 286344 286345 286592 290355 300826 317284 332660 333091 333091 333091 333091 333091 333091 333091	Bore Log ow Reverse Cabinet Filter 5454 2 - Clean 5587 3 - No Action 5603 2 - Clean 5603 2 - Clean 5603 2 - Clean 5605 2 - Clean 5605 2 - Clean 5701 2 - Clean 5701 3 - No Action 5701 3 - No Action 5701 3 - No Action 5916 3 - No Action 5916 3 - No Action 6916 3 - No Action 6015 3 - No Action 6015 3 - No Action 6048 3 - No Action 6084 3 - No Action 6084 3 - No Action 6100 3 - No Action 6101 2 - Clean 6119 3 - No Action 6122 2 - Clean 6123 3 - No Action 6124 3 - No Action 6125 - Clean 6127 1 - Clean 6127 2 - Clean 6127 1 - Clean 6129 1 - Clean 619 3 - No Action 6100 2 - Clean 6101 3 - No Action 6102 3 - No Action 6103 3 - No Action 6104 3 - No Action 6105 - Clean 6171 2 - Clean 6194 3 - No Action 6210 2 - Clean 6217 1 - Change 6227 1 - Change	Checked Well-h Yes	ead Well-head Security Comment Comments level sensor not completely seal nil Ok OK OK OK OK OK OK		
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29/07/2021 2021/2022 Yes 12/08/2021 2021/2022 Yes 13/08/2021 2021/2022 Yes 3/09/2021 2021/2022 Yes 3/09/2021 2021/2022 Yes 23/09/2021 2021/2022 Yes 23/09/2021 2021/2022 Yes 30/09/2021 2021/2022 Yes 14/10/2021 2021/2022 Yes 23/12/2021 2021/2022 Yes 23/12/2021 2021/2022 Yes 30/12/2021 2021/2022 Yes 30/12/2022 2021/2022 Yes 3/02/2022 2021/2022 Yes 10/02/2022 2021/2022 Yes 11/02/2022 2021/2022 Yes 11/02/2022 2021/2022 Yes 10/03/2022 2021/2022 Yes 10/03/2022 2021/2022 Yes 11/03/2022 2021/2022 Yes 11/04/2022 2021/2022 Yes 14/04/2022 2021/2022 Yes 14/04/2022 2021/2022 Yes 11/05/2022 2021/2022 Yes 16/06/2022 2021/2022 Yes 16/06/2022 2021/2022 Yes 16/06/2022 2021/2022 Yes	33 33 33 33 33 33 33 33 33 33 33 33 33	Run Hours Tel 5578 5580 5580 5580 5580 5582 5582 5582 5585 5590 5590 5590 5590 5592 5594 5594 5594 5594 5596 5643 5735 5663 5795 5696 569	KB4 (mperature Fitce 14.6 14.6 14.7 14.6 14.7 14.6 17.3 14.7 14.9 14.8 14.8 14.9 15.3 14.8 14.9 15.3 14.7 14.7 14.7 14.7 14.7 14.7 14.7 14.6 14.7 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6 14.7 14.6	Operational I Dow Forward FI 284328 284626 284625 284625 284625 284905 285206 285206 285206 285800 285800 285800 285800 285800 285800 383696 286344 286344 286345 286592 290355 300826 317284 332660 333091 333091 333091 333091 333091 333091 333091	Bore Log ow Reverse Cabinet Filter 5454 2 - Clean 5587 3 - No Action 5603 2 - Clean 5603 2 - Clean 5603 2 - Clean 5605 2 - Clean 5605 2 - Clean 5701 2 - Clean 5701 3 - No Action 5701 3 - No Action 5701 3 - No Action 5916 3 - No Action 5916 3 - No Action 6916 3 - No Action 6015 3 - No Action 6015 3 - No Action 6048 3 - No Action 6084 3 - No Action 6084 3 - No Action 6100 3 - No Action 6101 2 - Clean 6119 3 - No Action 6122 2 - Clean 6123 3 - No Action 6124 3 - No Action 6125 - Clean 6127 1 - Clean 6127 2 - Clean 6127 1 - Clean 6129 1 - Clean 619 3 - No Action 6100 2 - Clean 6101 3 - No Action 6102 3 - No Action 6103 3 - No Action 6104 3 - No Action 6105 - Clean 6171 2 - Clean 6194 3 - No Action 6210 2 - Clean 6217 1 - Change 6227 1 - Change	Checked Well-h Yes	ead Well-head Security Comment Comments level sensor not completely seal nil Ok OK OK OK OK OK OK	ut on main switch board	

K4 Operation Bore Log

						4 Operation					
Date	FY Filled in lo	og book?	Bore Level above Pump	Pump Run Hours	Temperature	Flow Forward	Flow Reverse Ca	abinet Filter	Checked Well-head	Well-head Security Comment	Comments
29/07/2021	2021/2022 Yes		49	7482	13.7	1546553	90859 2	- Clean	Yes		
12/08/2021	2021/2022 Yes		49	7484	13.7	1547344	91711 3	- No Action	Yes		
			49			1547555	91904 2				
	2021/2022 Yes								Yes		
	2021/2022 Yes		49			1547555	92018 2		Yes		
9/09/2021	2021/2022 Yes		49	7484	13.7	1547759	92067 2	- Clean	Yes		
23/09/2021	2021/2022 Yes		49	7486	13.7	1548522	92270 2	- Clean	Yes		
	2021/2022 Yes		49	7486		1548763	92472 2		Yes		
	2021/2022 Yes		48			1549669		- No Action	Yes		
21/10/2021	2021/2022 Yes		49	7488	13.7	1549884	92752 3	- No Action	Yes		
23/12/2021	2021/2022 Yes		49	7493	13.8	1552846	94040 3	- No Action			
	2021/2022 Yes		49			1553062		- No Action	Yes		
	2021/2022 Yes		49					- No Action	Yes		
						1553349					
14/01/2022	2021/2022 Yes		49		13.8	1553747	95149 3	- No Action	Yes		
27/01/2022	2021/2022 Yes		49	7495	13.8	1555261	96381 3	- No Action	Yes		
3/02/2022	2021/2022 Yes		49	7495	13.7	1555833	97164 2	- Clean	Yes	ok	
	2021/2022 Yes		49			1556378		- No Action			
	2021/2022 Yes		49			1557373	98646 3	- No Action	Yes		
24/02/2022	2021/2022 Yes		49	7497	13.7	1557991	99475 3	 No Action 	Yes		
3/03/2022	2021/2022 Yes		49	7497	13.7	1558659	100392 3	- No Action	Yes		
	2021/2022 Yes		49		14.6	1559698		- No Action			
	2021/2022 Yes		49			1560342		- No Action			
24/03/2022	2021/2022 Yes		49			1561728	104179 2	- Clean	Yes	Ok	
31/03/2022	2021/2022 Yes		37	7568	22.7	1572960	105830 3	- No Action	Yes		
	2021/2022 Yes		49			397377	4910 2		Yes		
	2021/2022 Yes		31			424097		- No Action	Yes		
	2021/2022 Yes		49			424824		- No Action			
28/04/2022	2021/2022 Yes		49			424824	4945 2	- Clean	Yes		
5/05/2022	2021/2022 Yes		49	7761	13.7	424824	4959 2	- Clean	Yes	OK	
12/05/2022	2021/2022 Yes		48	7764	15.2	425359	4973 3	- No Action	Yes		
	2021/2022 Yes		49			425359	4988 2		Yes	OK	
	2021/2022 Yes		49			425359		- Change	Yes	OK	
9/06/2022	2021/2022 Yes		49	7764	13.7	425359	5027 3	 No Action 	Yes		
16/06/2022	2021/2022 Yes		49	7766	15.2	425815	5042 3	- No Action	Yes	Ok	
	2021/2022 Yes		49			425815	5055 2	- Clean	Yes	OK	
	2021/2022 103									OK	
20/06/2022	2021/2021 Vee		40	7766	12.7		F0C0 2	Clean	Vec	alı	
30/06/2022	2021/2022 Yes		49	7766	13.7	425815	5068 2	- Clean	Yes	ok	
30/06/2022	2021/2022 Yes		49	7766		425815		- Clean	Yes	ok	
30/06/2022	2021/2022 Yes		49	7766				- Clean	Yes	ok	
30/06/2022 Date		og book?			K	425815 5 Operation	Bore Log				Comments
Date	FY Filled in lo	og book?	Bore Level above Pump	Pump Run Hours	K Temperature	425815 5 Operation Flow Forward	Bore Log Flow Reverse Ca	abinet Filter	Checked Well-head	ok Well-head Security Comment	Comments
Date 29/07/2021	FY Filled in lo 2021/2022 Yes	og book?	Bore Level above Pump 56	Pump Run Hours 5344	Kee Temperature 14.9	425815 5 Operation Flow Forward 1276	Bore Log Flow Reverse Ca 0 2	abinet Filter - Clean	Checked Well-head Yes		Comments
Date 29/07/2021 12/08/2021	FY Filled in lo 2021/2022 Yes 2021/2022 Yes	og book?	Bore Level above Pump 56 55	Pump Run Hours 5344 5346	Ke Temperature 14.9 14.9	425815 5 Operation Flow Forward 1276 1568	Bore Log Flow Reverse Ca 0 2 - 0.73 3 -	abinet Filter - Clean - No Action	Checked Well-head Yes Yes		Comments
Date 29/07/2021 12/08/2021 19/08/2021	FY Filled in lo 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56	Pump Run Hours 5344 5346 5346	Temperature 14.9 14.9 14.9	425815 5 Operation Flow Forward 1276 1568 1568	Bore Log Flow Reverse Ca 0 2 - 0.73 3 - 0.73 2 -	abinet Filter - Clean - No Action - Clean	Checked Well-head Yes		Comments
Date 29/07/2021 12/08/2021 19/08/2021	FY Filled in lo 2021/2022 Yes 2021/2022 Yes	og book?	Bore Level above Pump 56 55	Pump Run Hours 5344 5346 5346	Ke Temperature 14.9 14.9	425815 5 Operation Flow Forward 1276 1568	Bore Log Flow Reverse Ca 0 2 - 0.73 3 - 0.73 2 -	abinet Filter - Clean - No Action	Checked Well-head Yes Yes		Comments
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021	FY Filled in lo 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 55	Pump Run Hours 5344 5346 5346 5346	Temperature 14.9 14.9 14.9 14.9	425815 5 Operation Flow Forward 1276 1568 1568 1568	Bore Log Flow Reverse Ca	abinet Filter - Clean - No Action - Clean - Clean	Checked Well-head Yes Yes Yes Yes		Comments
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 9/09/2021	FY Filled in Id 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 55 56	Pump Run Hours 5344 5346 5346 5346 5346	Temperature 14.9 14.9 14.9 14.9 14.9	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568	Bore Log Flow Reverse Ca 0 2 0.73 3 0.73 2 0 2 0 2	abinet Filter - Clean - No Action - Clean - Clean - Clean	Checked Well-head Yes Yes Yes Yes Yes		Comments
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 9/09/2021 23/09/2021	FY Filled in Id 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 56 56	Pump Run Hours 5344 5346 5346 5346 5346	Temperature 14.9 14.9 14.9 14.9 14.9 14.9	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1838	Bore Log Flow Reverse Ca 0 2 2 0.73 3 3 0.73 2 2 0 2 2 0 7 2 2	abinet Filter - Clean - No Action - Clean - Clean - Clean - Clean - Clean	Checked Well-head Yes Yes Yes Yes Yes		Comments
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 23/09/2021 30/09/2021	FY Filled in Id 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	log book?	Bore Level above Pump 56 55 56 55 56 55 56 56	Pump Run Hours 5344 5346 5346 5346 5348 5348	Temperature 14.9 14.9 14.9 14.9 14.9 14.9 14.9 15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1838 1838	Bore Log Flow Reverse Ca 0 2 - 0.73 3 - 0.73 2 - 0 2 - 0.73 2 - 0.73 2 - 0.73 2 -	abinet Filter - Clean - No Action - Clean - Clean - Clean - Clean - Clean - Clean	Checked Well-head Yes Yes Yes Yes Yes Yes Yes		Comments
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 23/09/2021 30/09/2021	FY Filled in Id 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 56 56	Pump Run Hours 5344 5346 5346 5346 5346 5348	Temperature 14.9 14.9 14.9 14.9 14.9 14.9 14.9 15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1838	Bore Log Flow Reverse Ca 0 2 - 0.73 3 - 0.73 2 - 0 2 - 0.73 2 - 0.73 2 - 0.73 2 -	abinet Filter - Clean - No Action - Clean - Clean - Clean - Clean - Clean	Checked Well-head Yes Yes Yes Yes Yes		Comments
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 23/09/2021 30/09/2021 14/10/2021	FY Filled in Id 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 55 56 55 56 56	Pump Run Hours 5344 5346 5346 5346 5348 5348 5348	K3 Temperature 14.9 14.9 14.9 14.9 14.9 15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1838 1838	Flow Reverse Ca 0 2 0.73 3 0.73 2 0 2 0.73 2 0.73 2 0.73 2 0.73 2 0.73 2 0.73 2 0.73 3 0.73 2	abinet Filter - Clean - No Action - Clean - Clean - Clean - Clean - Clean - Clean	Checked Well-head Yes Yes Yes Yes Yes Yes Yes		Comments
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Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 3/09/2021 3/09/2021 23/09/2021 24/10/2021 24/10/2021 24/01/2022 14/01/2022 14/01/2022 17/02/2022 17/02/2022 17/02/2022 17/03/2022 17/03/2022 17/03/2022 17/03/2022 17/03/2022 17/03/2022 17/03/2022 17/03/2022 24/03/2022 31/03/2022 27/03/202	FY Filled in Id 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 56 56 56 56 56 56 56 56 56 56	Pump Run Hours 5344 5346 5346 5346 5348 5348 5351 5351 5351 5356 5356 5356 5358 5358 5358 5358 5358	KC Temperature 14.9 14.9 14.9 14.9 14.9 15.16.7 15.15 15 15 15 15 15 15 15 15 15 15 15 15 1	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1568 1838 1838 2128 2128 2683 2683 2683 2683 2683 273.97 2973.97 2973.97 3211 3211 3211 3211 3211 3211 3211 321	Flow Reverse Ca 0.73 3. 0.73 2. 0.73 2. 0.73 3. 0.73 2. 0.73 3. 0.73 3. 0.73 3. 0.73 3. 0.74 3. 0.74 3. 0.74 2. 0.74 2. 0.74 2. 0.74 3. 0.75 3.	abinet Filter - Clean - No Action - Clean - No Action - Clean	Checked Well-head Yes	Well-head Security Comment ok ok	filter cabinet padlock needs CRC same as k4 filter cabinet padlock needs CRC same as k4
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 3/09/2021 3/09/2021 30/09/2021 14/10/2021 23/12/2021 30/12/2021 30/12/2021 3/02/2022 3/02/2022 3/02/2022 3/03/2022 17/02/2022 24/03/2022 10/03/2022 11/03/2022 24/03/2022	FY Filled in Ic 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 56 56 56 56 56 56 56 56 56 56	Pump Run Hours 5344 5346 5346 5348 5348 5351 5356 5356 5356 5358 5358 5358 5358 5358	KX Temperature 14.9 14.9 14.9 14.9 14.9 15 16.7 14.9 15 15 15 15 15 15 15 15 15 15 15 15 15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1838 1838 2128 2128 2683 2683 2683 2683 2683 2683 273.97 2973.97 2973.97 3211 3211 3448 3448 3448 3447 10696.2	Flow Reverse Ca 0 2. 0.73 3. 0.73 2. 0.73 2. 0.73 3. 0.73 3. 0.73 3. 0.73 3. 0.74 3. 0.74 3. 0.74 3. 0.74 3. 0.74 3. 0.74 3. 0.74 3. 0.74 3. 0.75 3. 0.75 3. 0.75 3. 0.75 3. 0.75 3. 0.75 3. 0.75 3. 0.75 3. 0.75 3. 0.75 3.	abinet Filter - Clean - No Action - Clean - No Action - Clean - Clean - No Action	Checked Well-head Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Well-head Security Comment ok ok	filter cabinet padlock needs CRC same as k4
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 3/09/2021 30/09/2021 30/09/2021 14/10/2021 23/12/2021 30/12/2021 4/01/2022 14/01/2022 14/01/2022 14/01/2022 17/02/2022 3/02/2022 10/03/2022 17/02/2022 24/03/2022 17/03/2022 24/03/2022 14/03/2022 14/03/2022 14/04/2022	FY Filled in Id 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 56 56 56 56 56 56 56 56 56 56	Pump Run Hours 5344 5346 5346 5346 5348 5348 5351 5356 5356 5358 5358 5358 5358 5358 5358	KX Temperature 14.9 14.9 14.9 14.9 14.9 15 16.7 14.9 15 15 15 15 15 15 15 15 15 15 15 15 15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1568 1288 2122 2128 2623 2683 2683 2683 2683 2683 2683 26	Flow Reverse Ca 0 2 . 0.73 a . 0.73 2 . 0.73 2 . 0.73 3 . 0.73 3 . 0.73 3 . 0.73 3 . 0.74 3 . 0.74 3 . 0.74 2 . 0.74 2 . 0.74 2 . 0.74 5 . 0.75 3 . 0.8 3 . 0.8 2 . 0.8 3 . 0.8 3 .	abinet Filter - Clean - No Action - Clean - No Action	Checked Well-head Yes	Well-head Security Comment ok ok	filter cabinet padlock needs CRC same as k4 filter cabinet padlock needs CRC same as k4 Nice pine needles on the ground around this bore.
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 3/09/2021 30/09/2021 30/09/2021 14/10/2021 23/12/2021 30/12/2021 4/01/2022 14/01/2022 14/01/2022 14/01/2022 17/02/2022 3/02/2022 10/03/2022 17/02/2022 24/03/2022 17/03/2022 24/03/2022 14/03/2022 14/03/2022 14/04/2022	FY Filled in Ic 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 56 56 56 56 56 56 56 56 56 56	Pump Run Hours 5344 5346 5346 5346 5348 5348 5351 5356 5356 5358 5358 5358 5358 5358 5358	KX Temperature 14.9 14.9 14.9 14.9 14.9 15 16.7 14.9 15 15 15 15 15 15 15 15 15 15 15 15 15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1838 1838 2128 2128 2683 2683 2683 2683 2683 2683 273.97 2973.97 2973.97 3211 3211 3448 3448 3448 3447 10696.2	Flow Reverse Ca 0 2 . 0.73 a . 0.73 2 . 0.73 2 . 0.73 3 . 0.73 3 . 0.73 3 . 0.73 3 . 0.74 3 . 0.74 3 . 0.74 2 . 0.74 2 . 0.74 2 . 0.74 5 . 0.75 3 . 0.8 3 . 0.8 2 . 0.8 3 . 0.8 3 .	abinet Filter - Clean - No Action - Clean - No Action - Clean - Clean - No Action	Checked Well-head Yes Yes Yes Yes Yes Yes Yes Yes Yes Yes	Well-head Security Comment ok ok	filter cabinet padlock needs CRC same as k4 filter cabinet padlock needs CRC same as k4
Date 29/07/2021 12/08/2021 12/08/2021 19/08/2021 3/09/2021 3/09/2021 3/09/2021 14/10/2021 21/10/2021 23/12/2021 6/01/2022 14/01/2022 3/02/2022 14/01/2022 21/02/2022 24/02/2022 24/03/2022 24/03/2022 24/03/2022 17/03/2022 24/03/2022 14/04/2022 21/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022 28/04/2022	FY Filled in Ic 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 56 56 56 56 56 56 56 56 56 56	Pump Run Hours 5344 5346 5346 5346 5348 5348 5351 5356 5356 5356 5356 5358 5358 5358 5358	KX Temperature 14.9 14.9 14.9 14.9 14.9 15 16.7 14.9 15 15 15 15 15 15 15 15 15 15 15 15 15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1568 1288 2122 2128 2623 2683 2683 2683 2683 2683 2683 26	Flow Reverse Ca 0 2 - 0.73 3 - 0 2 - 0 73 2 - 0 73 2 - 0 73 2 - 0 73 3 - 0 73 3 - 0 73 3 - 0 73 3 - 0 73 3 - 0 74 3 - 0 74 2 - 0 74 2 - 0 74 2 - 0 74 3 - 0 75 3 - 0	abinet Filter - Clean - No Action - Clean - No Action	Checked Well-head Yes	Well-head Security Comment ok ok	filter cabinet padlock needs CRC same as k4 filter cabinet padlock needs CRC same as k4 Nice pine needles on the ground around this bore.
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 3/09/2021 3/09/2021 3/09/2021 14/10/2021 23/12/2021 6/01/2022 24/01/2022 3/02/2022 3/02/2022 3/02/2022 17/02/2022 24/03/2022 10/03/2022 11/03/2022 14/04/2022 24/04/2022 22/04/2022 22/04/2022 22/04/2022 22/04/2022 22/04/2022 22/04/2022 22/04/2022 22/04/2022 22/04/2022 25/04/2022 25/04/2022 25/04/2022	FY Filled in Ic 2021/2022 Yes	og book?	Bore Level above Pump	Pump Run Hours 5344 5346 5346 5348 5348 5348 5351 5356 5356 5356 5358 5358 5358 5358 5358	KX Temperature 14.9 14.9 14.9 14.9 14.9 15 16.7 14.9 15 15 15 15 15 15 15 15 15 15 15 15 15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1838 1288 2128 2683 2683 2683 2683 2683 2683 2683 26	Flow Reverse Ca 0 2 0.73 a 3 0.73 a 3 0.73 a 3 0.73 a 3 0.74 a 3 0.74 a 3 0.75 a	abinet Filter - Clean - No Action - Clean - No Action - Clean - No Action - Clean - No Action - Clean - No Action - Clean - No Action	Checked Well-head Yes	Well-head Security Comment ok ok ok	filter cabinet padlock needs CRC same as k4 filter cabinet padlock needs CRC same as k4 Nice pine needles on the ground around this bore. Alarm does not deactivate upon press
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 3/09/2021 30/09/2021 30/09/2021 14/10/2021 23/12/2021 30/12/2021 4/01/2022 14/01/2022 14/01/2022 14/01/2022 17/02/2022 3/02/2022 3/03/2022 17/02/2022 14/03/2022 14/03/2022 14/04/2022 24/03/2022 14/04/2022 25/05/2022 25/05/2022 25/05/2022 12/05/2022 14/04/2022 14/04/2022 14/05/2022	FY Filled in Id 2021/2022 Yes	og book?	Bore Level above Pump 56 55 56 56 56 56 56 56 56 56 56 56 56	Pump Run Hours	KX Temperature 14.9 14.9 14.9 14.9 14.9 15.16.7 14.9 15.5 15.15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1588 1288 2128 2128 2683 2683 2683 2683 2683 2683 2683 26	Flow Reverse Ca 0 2 . 0.73 a . 0.73 2 . 0.73 2 . 0.73 3 . 0.73 3 . 0.73 3 . 0.73 3 . 0.74 3 . 0.74 3 . 0.74 2 . 0.74 2 . 0.74 2 . 0.74 5 . 0.75 3 .	abinet Filter - Clean - No Action - Clean - No Action - Clean - No Action - Clean - No Action - Clean - Clean	Checked Well-head Yes	Well-head Security Comment ok ok ok Ok	filter cabinet padlock needs CRC same as k4 filter cabinet padlock needs CRC same as k4 Nice pine needles on the ground around this bore. Alarm does not deactivate upon press Could not deactivate cabinet alarm
Date 29/07/2021 12/08/2021 19/08/2021 3/09/2021 3/09/2021 30/09/2021 30/09/2021 14/10/2021 23/12/2021 30/12/2021 4/01/2022 14/01/2022 14/01/2022 14/01/2022 17/02/2022 3/02/2022 3/03/2022 17/02/2022 14/03/2022 14/03/2022 14/04/2022 24/03/2022 14/04/2022 25/05/2022 25/05/2022 25/05/2022 12/05/2022 14/04/2022 14/04/2022 14/05/2022	FY Filled in Ic 2021/2022 Yes	og book?	Bore Level above Pump	Pump Run Hours 5344 5346 5346 5346 5348 5348 5348 5351 5356 5356 5358 5358 5358 5358 5358 5358	KX Temperature 14.9 14.9 14.9 14.9 14.9 15.16.7 14.9 15.5 15.15	425815 5 Operation Flow Forward 1276 1568 1568 1568 1568 1838 1288 2128 2683 2683 2683 2683 2683 2683 2683 26	Flow Reverse Ca 0 2 . 0.73 a . 0.73 2 . 0.73 2 . 0.73 3 . 0.73 3 . 0.73 3 . 0.73 3 . 0.74 3 . 0.74 3 . 0.74 2 . 0.74 2 . 0.74 2 . 0.74 5 . 0.75 3 .	abinet Filter - Clean - No Action - Clean - No Action - Clean - No Action - Clean - No Action - Clean - No Action - Clean - No Action	Checked Well-head Yes	Well-head Security Comment ok ok ok	filter cabinet padlock needs CRC same as k4 filter cabinet padlock needs CRC same as k4 Nice pine needles on the ground around this bore. Alarm does not deactivate upon press

26/05/2022										
., ,	2021/2022 Yes 2021/2022 Yes	55 56	5443 5443	14.9 14.9	11393.4 11393	0.8 2 - Clean 0.8 3 - No Action	Yes	ОК		
	2021/2022 Yes 2021/2022 Yes	53	5445	15.6	11637.15	0.8 3 - No Action	Yes	Ok		
	2021/2022 Yes	56	5445	14.9	11637.15	0.8 2 - Clean	Yes	OK		
30/06/2022	2021/2022 Yes	56	5445	14.9	11637.15	0.8 2 - Clean	Yes	ok		
Date	FY Filled in log book?	Dava Laval abava Duma	Duman Dum Hause Tr		Operation B		Charled Wall has	d Compressor Service Due Date Run compressor manually?	Well-head Security Comi	Comments
	2021/2022 Yes	50	7190	emperature ri 14.5	582986	265633 2 - Clean	Yes	44390 Yes	well-flead Security Colli	Power cycled controller
	2021/2022 Yes	50	7192	14.5	583479	265641 3 - No Action	Yes	44604 Yes		Tower cycled controller
19/08/2021	2021/2022 Yes	50	7192	14.5	583479	265642 2 - Clean	Yes	44574 Yes		
., ,	2021/2022 Yes	50	7192	14.5	583479	265645 2 - Clean	Yes	44604 Yes		
	2021/2022 Yes	50	7192 7194	14.5	583479	265647 2 - Clean	Yes	44604 Yes 44604 Yes		Deldes settles seeded
	2021/2022 Yes 2021/2022 Yes	50 50	7194	14.5 14.5	583929 583929	265651 2 - Clean 265653 2 - Clean	Yes Yes	44604 Yes		Bridge getting repaired
	2021/2022 Yes	48	7197	18.2	584417	265657 3 - No Action	Yes	44604 Yes		
	2021/2022 Yes	50	7197	14.5	584417	265661 3 - No Action	Yes	44604 Yes		
	2021/2022 Yes	50	7203	14.6	585704		Yes	44785 Yes		
	2021/2022 Yes	50	7203	14.5	585704		Yes	44574 Yes		
	2021/2022 Yes 2021/2022 Yes	0.5 50	7203 7203	14.5 14.5	585704 585704	266182 3 - No Action 266182 3 - No Action	Yes Yes	44574 Yes 44574 Yes		compressor due for service
	2021/2022 Yes	29	7207	28	363704	3 - No Action	Yes	44944 Yes		compressor due for service
	2021/2022 Yes	50	7208	14.5	586660	266185 3 - No Action	Yes	44936 Yes		
	2021/2022 Yes	50	7210	15.2	587053	266185 3 - No Action	Yes	44944 Yes		
	2021/2022 Yes	50	7210	14.5	587053	266186 3 - No Action	Yes	44944 Yes		
	2021/2022 Yes 2021/2022 Yes	50 49	7210 7212	14.5 15.3	587054 587460	266186 3 - No Action 266187 3 - No Action	Yes Yes	44944 Yes 44944 Yes		
	2021/2022 Yes 2021/2022 Yes	50	7212	14.5	587460	266187 3 - No Action	Yes	44944 Yes		
	2021/2022 Yes	50	7212	14.5	587460	266188 3 - No Action	Yes	44743 Yes	Ok	
31/03/2022	2021/2022 Yes	49	7212	17.8	587501	266188 3 - No Action	Yes	44944 Yes		
	2021/2022 Yes	49	7228	14.6	589805	266188 2 - Clean	Yes	44743 Yes		
	2021/2022 Yes	47	7231	17.1	590462		Yes	44743 Yes		
	2021/2022 Yes 2021/2022 Yes	50 50	7231 7231	14.5 14.5	590462 590462	266190 3 - No Action 266190 2 - Clean	Yes Yes	44944 Yes 44743 Yes		Cabinet alarm does not deactivate. Cabinet fan not working (temp controlled?)
	2021/2022 Yes	50	7231	14.5	590426	266191 2 - Clean	Yes	44927 Yes	ОК	Could not deactivate cabinet alarm
	2021/2022 Yes	49	7234	15.9	590948		Yes	44743 Yes		
	2021/2022 Yes	50	7234	14.5	590948	266192 2 - Clean	Yes	44927 Yes	OK	Could not deactivate cabinet alarm. Turned on wall heater in compressor shed
	2021/2022 Yes	50	7234	14.5	590948	266193 2 - Clean	Yes	44927 Yes	OK	
	2021/2022 Yes 2021/2022 Yes	50	7234	14.5 16.4	590948 591356	266193 3 - No Action 266193 3 - No Action	Yes Yes	44944 Yes 44942 Yes	Ok	Signs of flooding
	2021/2022 TeS					200193 3 - INO ACTION	162			signs of flooding
	2021/2022 Yes	49 50	7236 7236			266193 2 - Clean	Yes	44927 Yes	OK	
30/06/2022	2021/2022 Yes 2021/2022 Yes	50 50	7236 7236 7236	14.5 14.5	591356 591356	266193 2 - Clean 266193 2 - Clean	Yes Yes	44927 Yes 44956 Yes	OK ok	
30/06/2022		50	7236	14.5 14.5	591356 591356	266193 2 - Clean				
	2021/2022 Yes	50 50	7236 7236	14.5 14.5 KB7	591356 591356 Operation I	266193 2 - Clean Bore Log	Yes	44956 Yes		
Date	2021/2022 Yes FY Filled in log book?	50 50 Bore Level above Pump	7236 7236 Pump Run Hours Te	14.5 14.5 KB7 emperature Fl	591356 591356 Operation I	266193 2 - Clean Bore Log ow Reverse Cabinet Filter	Yes Checked Well-hear	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50	7236 7236	14.5 14.5 KB7	591356 591356 Operation I ow Forward F 17127	266193 2 - Clean Bore Log	Yes	44956 Yes	ok	
Date	2021/2022 Yes FY Filled in log book?	50 50 Bore Level above Pump 40	7236 7236 Pump Run Hours Te 1849	14.5 14.5 KB7 emperature Fl 14.1	591356 591356 Operation I	266193 2 - Clean Bore Log ow Reverse Cabinet Filter 94 2 - Clean	Yes Checked Well-hear	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40	7236 7236 Pump Run Hours Tr 1849 1851 1851	14.5 14.5 KB7 emperature FI 14.1 14.1 14.1	591356 591356 Operation I ow Forward F 17127 17178 17179 17179	266193 2 - Clean Bore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean	Yes Checked Well-hear Yes Yes Yes Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40	7236 7236 Pump Run Hours Tr 1849 1851 1851 1851	14.5 14.5 KB7 emperature FI 14.1 14.1 14.1 14.1	591356 591356 Operation I ow Forward F 17127 17178 17179 17179 17179	266193 2 - Clean Bore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean	Yes Checked Well-hear Yes Yes Yes Yes Yes Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40	7236 7236 Pump Run Hours Te 1849 1851 1851 1851 1851 1851	14.5 14.5 KB7 emperature FI 14.1 14.1 14.1 14.1 14.1	591356 591356 Operation I ow Forward F 17127 17178 17179 17179 17179 17231	266193 2 - Clean Sore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean	Yes Checked Well-head Yes Yes Yes Yes Yes Yes Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40	7236 7236 Pump Run Hours To 1849 1851 1851 1851 1851 1854	14.5 14.5 KB7 emperature FI 14.1 14.1 14.1 14.1 14.1 14.1 14.1 14.	591356 591356 Operation I ow Forward F 17127 17178 17179 17179 17179 17231 17232	266193 2 - Clean Bore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean	Yes Checked Well-hear Yes Yes Yes Yes Yes Yes Yes Yes Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40	7236 7236 Pump Run Hours Te 1849 1851 1851 1851 1851 1851	14.5 14.5 KB7 emperature FI 14.1 14.1 14.1 14.1 14.1	591356 591356 Operation I ow Forward F 17127 17178 17179 17179 17179 17231	266193 2 - Clean Sore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean	Yes Checked Well-head Yes Yes Yes Yes Yes Yes Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1854 1854 1854 1856 1856	14.5 14.5 KB7 emperature Fi 14.1 14.1 14.1 14.1 14.1 14.1 14.1 14.1 14.1 14.1	591356 591356 Operation I ow Forward F 17127 17178 17179 17179 17231 17232 17275 17275 17392	266193 2 - Clean Bore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 95 3 - No Action 95 3 - No Action 95 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1854 1854 1856 1856 1861	14.5 14.5 KB7 emperature FI 14.1 14.1 14.1 14.1 14.1 14.1 15 14.1 14.1 15 14.1	591356 591356 Operation I ow Forward F 17127 17178 17179 17179 17231 17232 17275 17275 17392 17392	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action	Yes Checked Well-hea Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 Pump Run Hours To 1849 1851 1851 1851 1854 1854 1856 1856 1861 1861	14.5 14.5 KB7 emperature FI 14.1 14.1 14.1 14.1 14.1 14.1 14.1 14.	591356 591356 Operation I ow Forward F 17127 17178 17179 17179 17231 17232 17275 17275 17392 17392 17392	266193 2 - Clean 30re Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 3 - No Action 95 3 - No Action 95 33 - No Action 95 33 - No Action 95 33 - No Action	Yes Checked Well-hea Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1854 1854 1856 1856 1861	14.5 14.5 KB7 emperature FI 14.1 14.1 14.1 14.1 14.1 14.1 15 14.1 14.1 15 14.1	591356 591356 Operation I ow Forward F 17127 17178 17179 17179 17231 17232 17275 17275 17392 17392	266193 2 - Clean 30re Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 3 - No Action 95 3 - No Action 95 33 - No Action 95 33 - No Action 95 33 - No Action	Yes Checked Well-hea Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1854 1854 1856 1856 1861 1861 1861	14.5 KB7 Emperature FI 14.1 14.1 14.1 14.1 14.1 14.1 14.1 15 14.1 14.2 14.3 14.1 14.2	\$91356 \$91356 Operation I ow Forward F 17127 17179 17179 17179 17179 17231 17232 17275 17392 17392 17392 17392 17393	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 3 - No Action 95 3 - No Action 95.31 3 - No Action 95.31 3 - No Action	Yes Checked Well-hea Yes	44956 Yes Well-head Security Comment Comments	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1854 1854 1856 1856 1861 1861 1861 1861 1863	14.5 K87	\$91356 \$91356 Operation I 17127 17178 17179 17179 17179 17232 17232 1725 17392 17392 17392 17393 17442.55 17442.55	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 3 - No Action 95 3 - No Action 95.31 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	44956 Yes d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1854 1856 1856 1856 1861 1861 1861 1861 1863 1863	14.5 14.5 KB7 KB7 KH7 14.1 14.1 14.1 14.1 14.1 15 14.1 14.2 14.3 14.1 14.2 14.1 14.2 14.1	\$91356 \$91356 Operation In 17127 17128 17179 17179 17179 17231 17232 17275 17275 17392 17392 17393 17442.55 17442.57 17442.57	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 3 - No Action 95 3 - No Action 95 31 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	44956 Yes d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 7236 Pump Run Hours To 1849 1851 1851 1851 1854 1854 1856 1861 1861 1861 1861 1863 1863 1863	14.5 KB7 KB7 KB7 KB7 KB7 KB7 KB7 KB	\$91356 \$91356 Operation I in the forward of the following of the followi	266193 2 - Clean 30re Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 3 - No Action 95 3 - No Action 95.31 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	44956 Yes d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1854 1854 1856 1856 1861 1861 1861 1863 1863 1863 1865	14.5 KB7 KB7 KB7 KH14.1 14.1 14.1 14.1 14.1 14.1 14.2 14.2 14.2 14.4 14.1 14.2	\$91356 \$91356 Operation I 17127 17178 17179 17179 17179 17232 1725 17392 17392 17392 17392 17393 17442.55 17442.57 17486 17486 17486	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 31 3 - No Action 95 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	44956 Yes d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 7236 Pump Run Hours To 1849 1851 1851 1851 1854 1854 1856 1861 1861 1861 1861 1863 1863 1863	14.5 KB7 KB7 KB7 KB7 KB7 KB7 KB7 KB	\$91356 \$91356 Operation I in the forward of the following of the followi	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 95 3 - No Action 95 3 - No Action 95 3 - No Action 95.31 2 - Clean 95.31 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	44956 Yes d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1851 1854 1856 1856 1856 1861 1861 1861 1863 1863 1863 1865 1865 1865	14.5 KB7 KB7 KH97 Emperature FI 14.1 14.1 14.1 14.1 14.1 14.1 14.2 14.2 14.4 14.1 14.2 14.4 14.4 14.2 14.4 14.1 14.2 14.4	\$91356 \$91356 Operation I 17127 17178 17179 17179 17231 17232 1725 17392 17392 17392 17392 17392 17442.55 17442.57 17442.59 174486 17486 17486 17486 17486 17529 17529 17823	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 95 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	44956 Yes d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 80re Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 7236 7236 7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1851 1854 1856 1856 1861 1861 1861 1861 1863 1863 1863 186	14.5 14.5 KB7 KB7 KH1 14.1 14.1 14.1 14.1 15 14.1 14.2 14.3 14.1 14.2 14.4 14.1 14.2 14.4 14.2 14.4	\$91356 \$91356 Operation I 17127 17178 17179 17179 17231 17232 17275 17392 17392 17392 17393 17442.55 17442.57 17442.57 17442.59 17486 17486 17486 17486 17486 17529 18923 18923 18923 21141	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 31 3 - No Action 95 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 8 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 7236 7236 7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1854 1854 1854 1854 1856 1861 1861 1861 1863 1863 1863 1865 1865 1867 1932 2034	14.5 K87 K87 K87 L4.1 L4.1 L4.1 L4.1 L4.1 L4.1 L4.1 L4.2 L4.2 L4.4 L4.2 L4.2 L4.2 L4.2 L4.2 L4.2 L4.2 L4.2 L4.4 L4.2 L4.2 L4.4 L4.2 L4.2 L4.4 L4.2	\$91356 \$91356 Operation I 17127 17178 17179 17179 17179 17232 17275 17275 17275 17275 17275 17392 17392 17392 17392 17392 17392 17392 17392 17442.55 17442.59 17446 17486 17486 17486 17529 18923 21141 24031.88	266193 2 - Clean 30re Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 31 - No Action 95 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes 2021/2022 Yes	50 50 80re Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 7236 7236 7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1851 1854 1856 1856 1861 1861 1861 1861 1863 1863 1863 186	14.5 14.5 KB7 KB7 KH1 14.1 14.1 14.1 14.1 15 14.1 14.2 14.3 14.1 14.2 14.4 14.1 14.2 14.4 14.2 14.4	\$91356 \$91356 Operation I 17127 17178 17179 17179 17231 17232 17275 17392 17392 17392 17393 17442.55 17442.57 17442.57 17442.59 17486 17486 17486 17486 17486 17529 18923 18923 18923 21141	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action 95 31 3 - No Action 95 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	d Well-head Security Comment Comments Alarm unable to be turned o	ok	
Date	2021/2022 Yes FY Filled in log book? 2021/2022 Yes	50 50 8 Bore Level above Pump 40 40 40 40 40 40 40 40 40 40 40 40 40	7236 7236 7236 7236 7236 7236 Pump Run Hours Tr 1849 1851 1851 1851 1851 1854 1856 1856 1866 1861 1861 1861 1863 1863 1863 186	14.5 14.5 K87 K87 K87 K87 K87 K87 K87 K8	\$91356 \$91356 Operation I 17127 17178 17179 17179 17231 17232 17255 17275 17392 17392 17392 17392 17392 17442.55 17442.57 174486 17486 17486 17486 17486 17486 17486 17486 17486 17486 17486 17488 17482 18923 21141 24031.88 27027.32	266193 2 - Clean 3ore Log ow Reverse Cabinet Filter 94 2 - Clean 94 3 - No Action 97 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 94 2 - Clean 95 3 - No Action	Yes Checked Well-hearyes Yes Yes Yes Yes Yes Yes Yes Yes Yes Y	d Well-head Security Comment Comments Alarm unable to be turned o	ok	

	2021/2022 Yes	39	2308	14.2	27095.44	95.33 2 - Clean	Yes	ОК	Alarm OK this time
	2021/2022 Yes	38	2311	14.5	27145.83	95.34 3 - No Action	Yes		
	2021/2022 Yes	40	2311	14.2	27145.84	95.34 2 - Clean	Yes	ОК	
	2021/2022 Yes	40	2311	14.2	27145.85	95.34 2 - Clean	Yes	ОК	Well head flange corrosion requires attention
	2021/2022 Yes	40	2311	14.1	27145.88	95.34 3 - No Action	Yes		
	2021/2022 Yes	39	2313	14.6	27189.41	95.34 3 - No Action	Yes	Rust on bore flange	
	2021/2022 Yes	40	2313	14.2	27189.43	95.34 2 - Clean	Yes	ОК	Corrosion still requires attention
	2021/2022 Yes	40	2313	14.1	27189	95.34 2 - Clean	Yes	ok	
		•						-	
					K12 C	Operational Bore Log			
Date	FY Filled in log book?	Bore Level above Pump P	ump Run Hours Tem	perature Fl	low Forward	Flow Reverse Cabinet Filter	Checked Well-head	Well-head Security Comment	Comments
	2021/2022 Yes	62	834	13.7	23941	54 2 - Clean	Yes		
	2021/2022 Yes	63.4	836	13.7	24010	54 3 - No Action	Yes		
	2021/2022 Yes	63	836	13.7	24010	54 2 - Clean	Yes		
	2021/2022 Yes	63.4	836	13.7	24010	54 2 - Clean	Yes		
	2021/2022 Yes	65	836	13.7	24010	54 2 - Clean	Yes		
	2021/2022 Yes	63.2	838	13.7	24080	54 2 - Clean	Yes		
	2021/2022 Yes	62.9	838	13.7	24080	54 2 - Clean	Yes		
	2021/2022 Yes	60.5	841	14.3	24150	54 3 - No Action	Yes		
	2021/2022 Yes	62	841	13.7	24150	54 3 - No Action	Yes		
	2021/2022 Yes	63	846	13.7	24306	54.49 3 - No Action	Yes	power cable going into borehe	a power cable going into borehead not sealed
	2021/2022 Yes	62.9	846	13.6	24306	54.49 3 - No Action	Yes		
	2021/2022 Yes	63	846	13.6	24306	54.49 3 - No Action	Yes	cable entry to borehole not sea	al
	2021/2022 Yes	63.1	846	13.7	24306	54.49 3 - No Action	Yes		
	2021/2022 Yes	62.6	849	13.7	24371	54.49 3 - No Action	Yes		
	2021/2022 Yes	62.7	849	13.7	24371.21	54.49 2 - Clean	Yes	ok	
	2021/2022 Yes	63.5	849	13.7	24371.21	54.49 3 - No Action	Yes		
	2021/2022 Yes	63.2	851	13.8	24429	54 3 - No Action	Yes		
	2021/2022 Yes	62.7	851	13.7	24429	54 3 - No Action	Yes		
	2021/2022 Yes	63.3	581	13.7	24429	54.49 3 - No Action	Yes		
	2021/2022 Yes								
	2021/2022 Yes	63	853	13.7	24487	54 3 - No Action	Yes		
	2021/2022 Yes	60.8	902	13.7	25901.5	54.49 2 - Clean	Yes	Ok	
	2021/2022 Yes	12.5	976	25.3	28684	54.49 3 - No Action	Yes		
	2021/2022 Yes	56.3	996	13.7	32522.87	54.49 2 - Clean	Yes		
	2021/2022 Yes	12.4	1016	25.6	36466.32	54.49 3 - No Action	Yes		
	2021/2022 Yes	60.3	1016	13.7	36550	64.5 3 - No Action	Yes		
	2021/2022 Yes	61.2	1016	13.7	36550.43	54.5 2 - Clean	Yes		
	2021/2022 Yes	61.6	1016	13.7	36550.43	54.5 2 - Clean	Yes	OK	
	2021/2022 Yes	60.3	1018	13.8	36617.59		Yes		
	2021/2022 Yes	61.9	1018	13.7	36617.59	54.5 2 - Clean	Yes	OK	
	2021/2022 Yes	61.9	1018	13.7	36617.59	54.5 2 - Clean	Yes	OK	
	2021/2022 Yes	62.2	1018	13.7	36617.59		Yes		
	2021/2022 Yes	60	1020	13.9	36675.6	54.5 3 - No Action	Yes	Ok	Rust sighted on bore
	2021/2022 Yes	62.3	1020	13.7	36675.6	54.5 2 - Clean	Yes	OK	
	2021/2022 Yes								
					K10 C	Operational Bore Log			
Date	FY Filled in log book?	Bore Level above Pump P	ump Run Hours Tem	nerature Fl			Checked Well-head	Well-head Security Comment	Comments
	2021/2022 Yes	42.8	548	13	50389	9.95 3 - No Action		,	
	2021/2022 Yes	42.9	548	13	50393	9 2 - Clean	Yes		
	2021/2022 Yes	42.9	550	13	50555		Yes		
	2021/2022 Yes	43.2	554	13	50873	9 2 - Clean	Yes		
	2021/2022 Yes	43.2	556	13	51113	9.95 3 - No Action	Yes		
	2021/2022 Yes	43	556	13	51114	9.95 2 - Clean	Yes		
	2021/2022 Yes	43.3	556	13	51116	9 2 - Clean	Yes		
	2021/2022 Yes	43	556	13	51117	9.95 2 - Clean	Yes		
	2021/2022 Yes	43.2	558	13	51315	9.95 2 - Clean	Yes		
	2021/2022 Yes	43.3	558	13	51316	9.95 2 - Clean	Yes		
	2021/2022 Yes	42.9	561	14.3	51539	9 3 - No Action	Yes		
	2021/2022 Yes	43	561	13	51543	9.95 3 - No Action	Yes		
	2021/2022 Yes								
	2021/2022 Yes	43.3	565	13	52202	9.95 3 - No Action	Yes		
	2021/2022 Yes	43.2	565	13	52269		Yes		
	2021/2022 Yes	43.1	565	13	52346	9.95 3 - No Action			
	2021/2022 Yes	43	567	13	52662	9.95 3 - No Action	Yes		
	2021/2022 Yes	42.9	567	13	52729.9	9.95 2 - Clean	Yes	ok	
	2021/2022 Yes								
	2021/2022 Yes	43	569	13.6	53055	9.95 3 - No Action	Yes		
	2021/2022 Yes	43.1	569	13	53123	9.95 3 - No Action	Yes		

2021/2022 Yes	43	569	13	53195	9.95 3 - No Action	Yes		
2021/2022 Yes								
2021/2022 Yes								
2021/2022 Yes	42.8	571	13	53588.69	9.95 2 - Clean	Yes	Ok	
2021/2022 Yes	42.6	571	13.4	53695	9.95 3 - No Action	Yes		
2021/2022 Yes	41.8	670	13.1	62432.16	9.95 2 - Clean	Yes		
2021/2022 Yes	41.4	726	13.9	68255.53	9.95 3 - No Action	Yes		
2021/2022 Yes	42.4	727	13	68324	9.95 3 - No Action	Yes		
2021/2022 Yes	42.6	727	13	68325.6	9.95 2 - Clean	Yes		
2021/2022 Yes	42.8	727	13	68326.48	9.95 2 - Clean	Yes	OK	
2021/2022 Yes	42.8	729	13.7	68538.11	9.95 3 - No Action	Yes		
2021/2022 Yes	43.2	729	13	68538.72	9.95 2 - Clean	Yes	OK	Well head electrical penetration requires sealing
2021/2022 Yes	43.1	729	13	68539	9.95 2 - Clean	Yes	OK	

Appendix C

Bore Water Quality Sampling Results



ANALYTICAL REPORT

REPORT CODE AR-21-NW-023141-01 REPORT DATE 24/12/2021

Attention Kapiti Coast District Council

Kim Mazur 175 Rimu Road 5032 Paraparaumu NEW ZEALAND

Phone +64275554729 Copy to: Coley (Marcus.Coley@kapiticoast.govt.nz)

Email Kim.Mazur@kapiticoast.govt.nz

Contact for your orders: Lizzie Addis Order code: EUNZWE-00023561

Submission Reference: K bores Purchase Order Number: 356202

SAMPLE CODE **812-2021-00077524**

Client Reference: Bore 1

Sampling Point NW0002254013:Bore N2

Reception Date & Time: 20/12/2021 14:30

Analysis Start Date & Time: 20/12/2021 16:52 Analysis Ending Date: 24/12/2021

	F	RESULTS		LOQ
NW179	Ammonia Nitrogen			
	Ammoniacal nitrogen (N)	0.06	mg/l	0.01
NW303	Anion Sum			
	Anions, sum	3.68	meq/l	0.01
NW583	Arsenic - Soluble			
	Arsenic (As)	<0.001	mg/l	0.001
NW002	Bicarbonate Alkalinity			
	Bicarbonate alkalinity	79	mg CaCO3/I	1
NW455	Boron - Dissolved			
	Boron (B)	0.054	mg/l	0.005
NW009	Bromide			
	Bromide	0.26	mg/l	0.02
NW457	Calcium - Dissolved			
	Calcium (Ca)	25.9	mg/l	0.01
NW304	Cation Sum			
	Cations, sum	3.84	meq/l	0.01
NW007	Chloride			
	Chloride (CI)	69.7	mg/l	0.02
NW023	Conductivity			
	Conductivity	42.9	mS/m	0.1
NW679	Cyanide			
	Cyanide	<0.005	mg/l	0.005
NW193	Dissolved Reactive Phosphorus	•		
	Phosphorus (soluble reactive)	0.132	mg/l	0.005
NW006	Fluoride			
	Fluoride	0.17	mg/l	0.02
NW028	Free Carbon Dioxide			



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		Food	& water	resung
		RESULTS		LOQ
NW028	Free Carbon Dioxide			
	Carbon dioxide	5	mg CO2/I	1
NW029	Hardness			
	Hardness	95	mg CaCO3/I	1
NW351	Hydrogen Sulphide			
	Sulphide	<0.05	mg/l	0.05
NW305	Ion Balance			
	lon balance	2.15	%	0.01
NW460	Iron - Dissolved			
	Iron (Fe)	0.015	mg/l	0.005
NW462	Magnesium - Dissolved			
	Magnesium (Mg)	7.33	mg/l	0.01
NW463	Manganese - Dissolved			
	Manganese (Mn)	0.082	mg/l	0.005
NW084	Mercury - Acid Soluble			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW010	Nitrate-N			
	Nitrate-N	<0.01	mg/l	0.01
NW008	Nitrite-N			
	Nitrite	<0.01	mg/l	0.01
NW195	•			
	pH	7.5		0.1
NW466	Potassium - Dissolved			
NN4/400	Potassium (K)	3.15	mg/l	0.01
NW469	Sodium - Dissolved	40.0		
NIMAGA	Sodium (Na)	42.8	mg/l	0.02
NVV1U4	Soluble Cadmium	10.0000		0.0000
NIW106	Cadmium (Cd) Soluble Chromium	<0.0002	mg/l	0.0002
1444 100	Chromium (Cr)	<0.001	ma/l	0.001
NW108	Soluble Copper	\0.001	mg/l	0.001
1444 100	Copper (Cu)	<0.0005	mg/l	0.0005
NW110	Soluble Lead	10.0000	mg/i	0.0000
	Lead (Pb)	<0.0005	mg/l	0.0005
NW116	Soluble Nickel			
	Nickel (Ni)	<0.0005	mg/l	0.0005
NW119	Soluble Silver		J	
	Silver (Ag)	<0.0005	mg/l	0.0005
NW125	Soluble Zinc		Ü	
	Zinc (Zn)	<0.002	mg/l	0.002
NW011			-	
	Sulphate	19.8	mg/l	0.02
NW199			-	
	•			

+64 4 576 5016



NEW ZEALAND

Eurofins ELS Limited



	RE	SULTS		LOQ
NW199	Sulphide			
	Sulphide	<0.2	mg/l	0.2
NW003	Total Alkalinity			
	Alkalinity total	79	mg CaCO3/I	1
NW207	Total Dissolved Solids			
	Total dissolved Solids	236	mg/l	1
NW189	Total Nitrogen			
	Total Nitrogen (N)	0.05	mg/l	0.002
NW210	Total Non-Purgeable Organic Car	bon		
	Total Organic Carbon	0.2	mg/l	0.1
NW194	Total Phosphorus			
	Total phosphorus	0.133	mg/l	0.005

SAMPLE CODE 812-2021-00077525

Client Reference: Bore 2

Sampling Point NW0002254014:Bore K10

Reception Date & Time: 20/12/2021 14:30

Analysis Start Date & Time: 20/12/2021 16:52 **Analysis Ending Date:** 24/12/2021

RESULTS

NW179	Ammonia Nitrogen			
	Ammoniacal nitrogen (N)	0.24	mg/l	0.01
NW303	Anion Sum			
	Anions, sum	6.96	meq/l	0.01
NW583	Arsenic - Soluble			
	Arsenic (As)	0.001	mg/l	0.001
NW002	Bicarbonate Alkalinity			
	Bicarbonate alkalinity	216	mg CaCO3/I	1
NW455	Boron - Dissolved			
	Boron (B)	0.157	mg/l	0.005
NW009	Bromide			
	Bromide	0.55	mg/l	0.02
NW457	Calcium - Dissolved			
	Calcium (Ca)	49.1	mg/l	0.01
NW304	Cation Sum			
	Cations, sum	7.41	meq/l	0.01
NW007	Chloride			
	Chloride (CI)	121	mg/l	0.02
NW023	Conductivity			
	Conductivity	81.3	mS/m	0.1
NW679	Cyanide			
	Cyanide	<0.005	mg/l	0.005
NW193	Dissolved Reactive Phosphorus			
	Phosphorus (soluble reactive)	0.049	mg/l	0.005



LOQ



		11000	G Water	resumg
		RESULTS		LOQ
NW006	Fluoride			
	Fluoride	0.03	mg/l	0.02
NW028	Free Carbon Dioxide			
	Carbon dioxide	10	mg CO2/I	1
NW029	Hardness			
	Hardness	182	mg CaCO3/I	1
NW351	Hydrogen Sulphide			
	Sulphide	<0.05	mg/l	0.05
NW305	Ion Balance			
	lon balance	3.10	%	0.01
NW460	Iron - Dissolved			
	Iron (Fe)	0.019	mg/l	0.005
NW462	Magnesium - Dissolved			
	Magnesium (Mg)	14.3	mg/l	0.01
NW463	Manganese - Dissolved			
	Manganese (Mn)	0.167	mg/l	0.005
NW084	Mercury - Acid Soluble			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW010	Nitrate-N			
	Nitrate-N	<0.01	mg/l	0.01
NW008	Nitrite-N			
	Nitrite	<0.01	mg/l	0.01
NW195	рН			
	рН	7.6		0.1
NW466	Potassium - Dissolved			
	Potassium (K)	8.97	mg/l	0.01
NW469	Sodium - Dissolved			
	Sodium (Na)	81.2	mg/l	0.02
NW104	Soluble Cadmium			
	Cadmium (Cd)	<0.0002	mg/l	0.0002
NW106	Soluble Chromium			
	Chromium (Cr)	<0.001	mg/l	0.001
NW108	Soluble Copper			
NNA/440	Copper (Cu)	<0.0005	mg/l	0.0005
NW110	Soluble Lead	.0.0005		0.0005
NN4440	Lead (Pb)	<0.0005	mg/l	0.0005
NW116	Soluble Nickel	.0.0005		0.0005
NNA/440	Nickel (Ni)	<0.0005	mg/l	0.0005
1444119	Soluble Silver	-0 000F	ma/l	0.0005
NIMAGE	Silver (Ag) Soluble Zinc	<0.0005	mg/l	0.0005
NVV125		-n nnn	ma/l	0.002
NIMO44	Zinc (Zn)	<0.002	mg/l	0.002
INVVUTT	Sulphate			

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		RESULTS		LOQ
NW011	Sulphate			
	Sulphate	<0.02	mg/l	0.02
NW199	Sulphide			
	Sulphide	<0.2	mg/l	0.2
NW003	Total Alkalinity			
	Alkalinity total	217	mg CaCO3/I	1
NW207	Total Dissolved Solids			
	Total dissolved Solids	447	mg/l	1
NW189	Total Nitrogen			
	Total Nitrogen (N)	0.22	mg/l	0.002
NW210	Total Non-Purgeable Organic	Carbon		
	Total Organic Carbon	0.3	mg/l	0.1
NW194	Total Phosphorus			
	Total phosphorus	0.073	mg/l	0.005

SAMPLE CODE **812-2021-00077526**

Client Reference: Bore 3

Sampling Point NW0002254015:Bore KB4

Reception Date & Time: 20/12/2021 14:30

Analysis Start Date & Time: 20/12/2021 16:52 Analysis Ending Date: 24/12/2021

		RESULTS		LOQ
NW179	Ammonia Nitrogen			
	Ammoniacal nitrogen (N)	0.08	mg/l	0.01
NW303	Anion Sum			
	Anions, sum	10.5	meq/l	0.01
NW583	Arsenic - Soluble			
	Arsenic (As)	<0.001	mg/l	0.001
NW002	Bicarbonate Alkalinity			
	Bicarbonate alkalinity	195	mg CaCO3/I	1
NW455	Boron - Dissolved			
	Boron (B)	0.254	mg/l	0.005
NW009	Bromide			
	Bromide	0.97	mg/l	0.02
NW457	Calcium - Dissolved			
	Calcium (Ca)	38.3	mg/l	0.01
NW304	Cation Sum			
	Cations, sum	11.2	meq/l	0.01
NW007	Chloride			
	Chloride (CI)	257	mg/l	0.02
NW023	Conductivity			
	Conductivity	121	mS/m	0.1
NW679	Cyanide			
	Cyanide	<0.005	mg/l	0.005

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		Food	a vvalei	resung
		RESULTS		LOQ
NW193	Dissolved Reactive Phosphor	us		
	Phosphorus (soluble reactive)	0.033	mg/l	0.005
NW006	Fluoride			
	Fluoride	0.03	mg/l	0.02
NW028	Free Carbon Dioxide			
	Carbon dioxide	6	mg CO2/I	1
NW029	Hardness			
	Hardness	153	mg CaCO3/I	1
NW351	Hydrogen Sulphide			
	Sulphide	<0.05	mg/l	0.05
NW305	Ion Balance			
	lon balance	3.12	%	0.01
NW460	Iron - Dissolved			
	Iron (Fe)	<0.005	mg/l	0.005
NW462	Magnesium - Dissolved			
	Magnesium (Mg)	13.9	mg/l	0.01
NW463	Manganese - Dissolved			
	Manganese (Mn)	0.029	mg/l	0.005
NW084	Mercury - Acid Soluble			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW010	Nitrate-N			
	Nitrate-N	<0.01	mg/l	0.01
NW008	Nitrite-N			
	Nitrite	<0.01	mg/l	0.01
NW195	pH			
	рН	7.8		0.1
NW466	Potassium - Dissolved			
	Potassium (K)	8.09	mg/l	0.01
NW469	Sodium - Dissolved			
	Sodium (Na)	182	mg/l	0.02
NW104	Soluble Cadmium			
	Cadmium (Cd)	<0.0002	mg/l	0.0002
NW106	Soluble Chromium			
	Chromium (Cr)	<0.001	mg/l	0.001
NW108	Soluble Copper			
	Copper (Cu)	<0.0005	mg/l	0.0005
NW110	Soluble Lead			
	Lead (Pb)	<0.0005	mg/l	0.0005
NW116	Soluble Nickel			
	Nickel (Ni)	<0.0005	mg/l	0.0005
NW119	Soluble Silver			
	Silver (Ag)	<0.0005	mg/l	0.0005
NW125	Soluble Zinc			

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	R	RESULTS		LOQ
NW125	Soluble Zinc			
	Zinc (Zn)	<0.002	mg/l	0.002
NW011	Sulphate			
	Sulphate	1.82	mg/l	0.02
NW199	Sulphide			
	Sulphide	<0.2	mg/l	0.2
NW003	Total Alkalinity			
	Alkalinity total	196	mg CaCO3/I	1
NW207	Total Dissolved Solids			
	Total dissolved Solids	665	mg/l	1
NW189	Total Nitrogen			
	Total Nitrogen (N)	0.08	mg/l	0.002
NW210	Total Non-Purgeable Organic Ca	ırbon		
	Total Organic Carbon	0.1	mg/l	0.1
NW194	Total Phosphorus			
	Total phosphorus	0.027	mg/l	0.005

SAMPLE CODE **812-2021-00077527**

Client Reference: Bore 4

 Sampling Point
 NW0002254016:Bore K4

 Reception Date & Time:
 20/12/2021 14:30

Analysis Start Date & Time: 20/12/2021 16:52 Analysis Ending Date: 24/12/2021

		RESULTS		LOQ
NW179	Ammonia Nitrogen			
	Ammoniacal nitrogen (N)	0.02	mg/l	0.01
NW303	Anion Sum			
	Anions, sum	4.16	meq/l	0.01
NW583	Arsenic - Soluble			
	Arsenic (As)	<0.001	mg/l	0.001
NW002	Bicarbonate Alkalinity			
	Bicarbonate alkalinity	108	mg CaCO3/I	1
NW455	Boron - Dissolved			
	Boron (B)	0.091	mg/l	0.005
NW009	Bromide			
	Bromide	0.29	mg/l	0.02
NW457	Calcium - Dissolved			
	Calcium (Ca)	3.68	mg/l	0.01
NW304	Cation Sum			
	Cations, sum	4.86	meq/l	0.01
NW007	Chloride			
	Chloride (CI)	74.4	mg/l	0.02
NW023	Conductivity			
	Conductivity	48.3	mS/m	0.1

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		1 000	G Water	resting
		RESULTS		LOQ
NW679	Cyanide			
	Cyanide	<0.005	mg/l	0.005
NW193	Dissolved Reactive Phosphoru	ıs		
	Phosphorus (soluble reactive)	0.106	mg/l	0.005
NW006	Fluoride			
	Fluoride	0.22	mg/l	0.02
NW028	Free Carbon Dioxide			
	Carbon dioxide	5	mg CO2/I	1
NW029	Hardness			
	Hardness	27	mg CaCO3/I	1
NW351	Hydrogen Sulphide			
	Sulphide	<0.05	mg/l	0.05
NW305	Ion Balance			
	lon balance	7.78	%	0.01
NW460	Iron - Dissolved			
	Iron (Fe)	0.024	mg/l	0.005
NW462	Magnesium - Dissolved			
	Magnesium (Mg)	4.41	mg/l	0.01
NW463	Manganese - Dissolved			
	Manganese (Mn)	0.142	mg/l	0.005
NW084	Mercury - Acid Soluble			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW010	Nitrate-N			
	Nitrate-N	<0.01	mg/l	0.01
NW008	Nitrite-N			
	Nitrite	<0.01	mg/l	0.01
NW195	pH			
	рН	7.6		0.1
NW466	Potassium - Dissolved			
	Potassium (K)	1.83	mg/l	0.01
NW469	Sodium - Dissolved			
	Sodium (Na)	98.1	mg/l	0.02
NW104	Soluble Cadmium			
	Cadmium (Cd)	<0.0002	mg/l	0.0002
NW106	Soluble Chromium			
	Chromium (Cr)	<0.001	mg/l	0.001
NW108	Soluble Copper			
	Copper (Cu)	<0.0005	mg/l	0.0005
NW110	Soluble Lead			
	Lead (Pb)	<0.0005	mg/l	0.0005
NW116	Soluble Nickel			
	Nickel (Ni)	<0.0005	mg/l	0.0005
NW119	Soluble Silver			





		RESULTS		LOQ
NW119	Soluble Silver			
	Silver (Ag)	<0.0005	mg/l	0.0005
NW125	Soluble Zinc			
	Zinc (Zn)	<0.002	mg/l	0.002
NW011	Sulphate			
	Sulphate	13.6	mg/l	0.02
NW199	Sulphide			
	Sulphide	<0.2	mg/l	0.2
NW003	Total Alkalinity			
	Alkalinity total	109	mg CaCO3/I	1
NW207	Total Dissolved Solids			
	Total dissolved Solids	266	mg/l	1
NW189	Total Nitrogen			
	Total Nitrogen (N)	<0.05	mg/l	0.002
NW210	Total Non-Purgeable Orga	nic Carbon		
	Total Organic Carbon	0.7	mg/l	0.1
NW194	Total Phosphorus			
	Total phosphorus	0.105	mg/l	0.005

SAMPLE CODE **812-2021-00077528**

Client Reference: Bore 5

Sampling Point NW0002254017:Bore K5 Reception Date & Time: 20/12/2021 14:30

Analysis Start Date & Time: 20/12/2021 16:52 Analysis Ending Date: 24/12/2021

		RESULTS		LOQ
NW179	Ammonia Nitrogen			
	Ammoniacal nitrogen (N)	0.35	mg/l	0.01
NW303	Anion Sum			
	Anions, sum	9.68	meq/l	0.01
NW583	Arsenic - Soluble			
	Arsenic (As)	0.001	mg/l	0.001
NW002	Bicarbonate Alkalinity			
	Bicarbonate alkalinity	239	mg CaCO3/I	1
NW455	Boron - Dissolved			
	Boron (B)	0.437	mg/l	0.005
NW009	Bromide			
	Bromide	0.80	mg/l	0.02
NW457	Calcium - Dissolved			
	Calcium (Ca)	30.2	mg/l	0.01
NW304	Cation Sum			
	Cations, sum	10.2	meq/l	0.01
NW007	Chloride			
	Chloride (CI)	203	mg/l	0.02

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	· ·	RESULTS	or Fraction	LOQ
NW023	Conductivity			
	Conductivity	111	mS/m	0.1
NW679	Cyanide			
	Cyanide	<0.005	mg/l	0.005
NW193	Dissolved Reactive Phosphorus	6		
	Phosphorus (soluble reactive)	0.111	mg/l	0.005
NW006	Fluoride			
	Fluoride	0.05	mg/l	0.02
NW028	Free Carbon Dioxide			
	Carbon dioxide	5	mg CO2/I	1
NW029	Hardness			
	Hardness	136	mg CaCO3/I	1
NW351	Hydrogen Sulphide			
	Sulphide	<0.05	mg/l	0.05
NW305	Ion Balance			
	lon balance	2.66	%	0.01
NW460	Iron - Dissolved			
	Iron (Fe)	<0.005	mg/l	0.005
NW462	Magnesium - Dissolved			
	Magnesium (Mg)	14.7	mg/l	0.01
NW463	Manganese - Dissolved			
	Manganese (Mn)	0.069	mg/l	0.005
NW084	Mercury - Acid Soluble			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW010	Nitrate-N			
	Nitrate-N	<0.01	mg/l	0.01
NW008	Nitrite-N			
	Nitrite	<0.01	mg/l	0.01
NW195				
NIM/400	pH	8.0		0.1
NW466	Potassium - Dissolved			
NIMAGO	Potassium (K)	8.48	mg/l	0.01
NVV469	Sodium - Dissolved	407		0.00
NIMAGA	Sodium (Na)	167	mg/l	0.02
NW1U4	Soluble Cadmium	-0.0000		0.0000
NIMAGE	Cadmium (Cd) Soluble Chromium	<0.0002	mg/l	0.0002
NW1U6		-0.004		0.004
NI\A/4 00	Chromium (Cr)	<0.001	mg/l	0.001
NVVTU8	Soluble Copper	<0.000 <i>E</i>	ma/l	0.0005
NIMAAA	Copper (Cu) Soluble Lead	<0.0005	mg/l	0.0005
IAAA LIO		<0.000E	ma/l	0.0005
NW116	Lead (Pb) Soluble Nickel	<0.0005	mg/l	0.0005
1444110	COMMIC MICKEN			





		RESULTS		LOQ
NW116	Soluble Nickel			
	Nickel (Ni)	<0.0005	mg/l	0.0005
NW119	Soluble Silver			
	Silver (Ag)	<0.0005	mg/l	0.0005
NW125	Soluble Zinc			
	Zinc (Zn)	<0.002	mg/l	0.002
NW011	Sulphate			
	Sulphate	0.50	mg/l	0.02
NW199	Sulphide			
	Sulphide	<0.2	mg/l	0.2
NW003	Total Alkalinity			
	Alkalinity total	241	mg CaCO3/I	1
NW207	Total Dissolved Solids			
	Total dissolved Solids	608	mg/l	1
NW189	Total Nitrogen			
	Total Nitrogen (N)	0.31	mg/l	0.002
NW210	Total Non-Purgeable Organic C	arbon		
	Total Organic Carbon	0.3	mg/l	0.1
NW194	Total Phosphorus			
	Total phosphorus	0.150	mg/l	0.005

SAMPLE CODE	812-2021-00077529
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Client Reference: Bore 6

Sampling PointNW0002254018:Bore K6Reception Date & Time:20/12/2021 14:30

Analysis Start Date & Time: 20/12/2021 16:52 Analysis Ending Date: 24/12/2021

		RESULTS		LOQ
NW179	Ammonia Nitrogen			
	Ammoniacal nitrogen (N)	0.50	mg/l	0.01
NW303	Anion Sum			
	Anions, sum	9.82	meq/l	0.01
NW583	Arsenic - Soluble			
	Arsenic (As)	<0.001	mg/l	0.001
NW002	Bicarbonate Alkalinity			
	Bicarbonate alkalinity	279	mg CaCO3/I	1
NW455	Boron - Dissolved			
	Boron (B)	0.693	mg/l	0.005
NW009	Bromide			
	Bromide	0.77	mg/l	0.02
NW457	Calcium - Dissolved			
	Calcium (Ca)	32.3	mg/l	0.01
NW304	Cation Sum			
	Cations, sum	10.5	meq/l	0.01

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		Food	a vvaler	resung
		RESULTS		LOQ
NW007	Chloride			
	Chloride (CI)	184	mg/l	0.02
NW023	Conductivity			
	Conductivity	111	mS/m	0.1
NW679	Cyanide			
	Cyanide	<0.005	mg/l	0.005
NW193	Dissolved Reactive Phosphore	us		
	Phosphorus (soluble reactive)	0.067	mg/l	0.005
NW006	Fluoride			
	Fluoride	0.04	mg/l	0.02
NW028	Free Carbon Dioxide			
	Carbon dioxide	10	mg CO2/I	1
NW029	Hardness			
	Hardness	153	mg CaCO3/I	1
NW351	Hydrogen Sulphide			
	Sulphide	<0.05	mg/l	0.05
NW305	Ion Balance			
	lon balance	3.56	%	0.01
NW460	Iron - Dissolved			
	Iron (Fe)	<0.005	mg/l	0.005
NW462	Magnesium - Dissolved			
	Magnesium (Mg)	17.5	mg/l	0.01
NW463	Manganese - Dissolved			
	Manganese (Mn)	0.083	mg/l	0.005
NW084	Mercury - Acid Soluble			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW010	Nitrate-N			
	Nitrate-N	<0.01	mg/l	0.01
NW008	Nitrite-N			
	Nitrite	<0.01	mg/l	0.01
NW195	рН			
	рН	7.7		0.1
NW466	Potassium - Dissolved			
	Potassium (K)	11.9	mg/l	0.01
NW469	Sodium - Dissolved			
	Sodium (Na)	165	mg/l	0.02
NW104	Soluble Cadmium			
	Cadmium (Cd)	<0.0002	mg/l	0.0002
NW106	Soluble Chromium			
	Chromium (Cr)	<0.001	mg/l	0.001
NW108	Soluble Copper			
	Copper (Cu)	<0.0005	mg/l	0.0005
NW110	Soluble Lead			





	R	ESULTS		LOQ
NW110	Soluble Lead			
	Lead (Pb)	<0.0005	mg/l	0.0005
NW116	Soluble Nickel			
	Nickel (Ni)	<0.0005	mg/l	0.0005
NW119	Soluble Silver			
	Silver (Ag)	<0.0005	mg/l	0.0005
NW125	Soluble Zinc			
	Zinc (Zn)	<0.002	mg/l	0.002
NW011	Sulphate			
	Sulphate	0.44	mg/l	0.02
NW199	p			
	Sulphide	<0.2	mg/l	0.2
NW003	· · · · · · · · · · · · · · · · · · ·			
	Alkalinity total	280	mg CaCO3/I	1
NW207				
	Total dissolved Solids	613	mg/l	1
NW189	3			
NU4/04/0	Total Nitrogen (N)	0.47	mg/l	0.002
NW210	rotal from a arguable organic ou			
NN4404	Total Organic Carbon	0.3	mg/l	0.1
NW194	Total Phosphorus		,	
	Total phosphorus	0.069	mg/l	0.005

SAMPLE CODE **812-2021-00077530**

Client Reference: Bore 7

Sampling Point NW0002254019:Bore KB7

Reception Date & Time: 20/12/2021 14:30

Analysis Start Date & Time: 20/12/2021 16:52 Analysis Ending Date: 24/12/2021

		RESULTS		LOQ
NW179	Ammonia Nitrogen			
	Ammoniacal nitrogen (N)	<0.01	mg/l	0.01
NW303	Anion Sum			
	Anions, sum	6.90	meq/l	0.01
NW583	Arsenic - Soluble			
	Arsenic (As)	<0.001	mg/l	0.001
NW002	Bicarbonate Alkalinity			
	Bicarbonate alkalinity	105	mg CaCO3/I	1
NW455	Boron - Dissolved			
	Boron (B)	0.474	mg/l	0.005
NW009	Bromide			
	Bromide	0.59	mg/l	0.02
NW457	Calcium - Dissolved			
	Calcium (Ca)	17.9	mg/l	0.01

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		11000	G Water	resting
		RESULTS		LOQ
NW304	Cation Sum			
	Cations, sum	6.98	meq/l	0.01
NW007	Chloride			
	Chloride (CI)	173	mg/l	0.02
NW023	Conductivity			
	Conductivity	78.8	mS/m	0.1
NW679	Cyanide			
	Cyanide	<0.005	mg/l	0.005
NW193	Dissolved Reactive Phosphor	us		
	Phosphorus (soluble reactive)	0.029	mg/l	0.005
NW006	Fluoride			
	Fluoride	0.06	mg/l	0.02
NW028	Free Carbon Dioxide			
	Carbon dioxide	3	mg CO2/I	1
NW029	Hardness			
	Hardness	93	mg CaCO3/I	1
NW351	Hydrogen Sulphide			
	Sulphide	<0.05	mg/l	0.05
NW305	Ion Balance			
	lon balance	0.55	%	0.01
NW460	Iron - Dissolved			
	Iron (Fe)	0.017	mg/l	0.005
NW462	Magnesium - Dissolved			
	Magnesium (Mg)	11.7	mg/l	0.01
NW463	Manganese - Dissolved			
	Manganese (Mn)	0.010	mg/l	0.005
NW084	Mercury - Acid Soluble			
	Mercury (Hg)	<0.0005	mg/l	0.0005
NW010	Nitrate-N			
	Nitrate-N	<0.01	mg/l	0.01
NW008	Nitrite-N			
	Nitrite	<0.01	mg/l	0.01
NW195	рН			
	рН	7.8		0.1
NW466	Potassium - Dissolved			
	Potassium (K)	3.19	mg/l	0.01
NW469	Sodium - Dissolved			
	Sodium (Na)	116	mg/l	0.02
NW104	Soluble Cadmium			
	Cadmium (Cd)	<0.0002	mg/l	0.0002
NW106	Soluble Chromium			
	Chromium (Cr)	<0.001	mg/l	0.001
NW108	Soluble Copper			





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		RESULTS		LOQ
NW108	Soluble Copper			
	Copper (Cu)	<0.0005	mg/l	0.0005
NW110	Soluble Lead			
	Lead (Pb)	<0.0005	mg/l	0.0005
NW116	Soluble Nickel			
	Nickel (Ni)	<0.0005	mg/l	0.0005
NW119	Soluble Silver			
	Silver (Ag)	<0.0005	mg/l	0.0005
NW125	Soluble Zinc			
	Zinc (Zn)	<0.002	mg/l	0.002
NW011	Sulphate			
	Sulphate	13.5	mg/l	0.02
NW199	Sulphide			
	Sulphide	<0.2	mg/l	0.2
NW003	Total Alkalinity			
	Alkalinity total	105	mg CaCO3/I	1
NW207	Total Dissolved Solids			
	Total dissolved Solids	433	mg/l	1
NW189	Total Nitrogen			
	Total Nitrogen (N)	<0.05	mg/l	0.002
NW210	Total Non-Purgeable Organic	Carbon		
	Total Organic Carbon	<0.1	mg/l	0.1
NW194	Total Phosphorus			
	Total phosphorus	0.030	mg/l	0.005

SAMPLE CODE **812-2021-00077531**

Client Reference: Bore 8

Sampling Point NW0002254020:Bore K12

Reception Date & Time: 20/12/2021 14:30

Analysis Start Date & Time: 20/12/2021 16:52 Analysis Ending Date: 24/12/2021

		RESULTS		LOQ
NW179	Ammonia Nitrogen			
	Ammoniacal nitrogen (N)	<0.01	mg/l	0.01
NW303	Anion Sum			
	Anions, sum	4.47	meq/l	0.01
NW583	Arsenic - Soluble			
	Arsenic (As)	<0.001	mg/l	0.001
NW002	Bicarbonate Alkalinity			
	Bicarbonate alkalinity	93	mg CaCO3/I	1
NW455	Boron - Dissolved			
	Boron (B)	0.381	mg/l	0.005
NW009	Bromide			
	Bromide	0.33	mg/l	0.02

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		RESULTS		LOQ
NW457	Calcium - Dissolved			
	Calcium (Ca)	16.8	mg/l	0.01
NW304	Cation Sum		J.	
	Cations, sum	4.84	meq/l	0.01
NW007	Chloride		·	
	Chloride (CI)	91.5	mg/l	0.02
NW023	Conductivity		_	
	Conductivity	51.0	mS/m	0.1
NW679	Cyanide			
	Cyanide	<0.005	mg/l	0.005
NW193	Dissolved Reactive Phosphorus	s		
	Phosphorus (soluble reactive)	0.043	mg/l	0.005
NW006	Fluoride			
	Fluoride	0.09	mg/l	0.02
NW028	Free Carbon Dioxide			
	Carbon dioxide	3	mg CO2/I	1
NW029	Hardness			
	Hardness	82	mg CaCO3/I	1
NW351	Hydrogen Sulphide			
	Sulphide	<0.05	mg/l	0.05
NW305	Ion Balance			
	lon balance	3.98	%	0.01
NW460	Iron - Dissolved			
	Iron (Fe)	0.017	mg/l	0.005
NW462	g			
NIM/400	Magnesium (Mg)	9.65	mg/l	0.01
NW463		0.045		0.005
NIVA/OOA	Manganese (Mn)	0.015	mg/l	0.005
1444004	Mercury - Acid Soluble Mercury (Hg)	<0.0005	ma/l	0.0005
NW010	Nitrate-N	<0.0003	mg/l	0.0003
1444010	Nitrate-N	<0.01	mg/l	0.01
NW008		40.01	mg/i	0.01
	Nitrite	<0.01	mg/l	0.01
NW195		0.0.		0.0.
	рН	7.8		0.1
NW466	Potassium - Dissolved			
	Potassium (K)	1.95	mg/l	0.01
NW469	Sodium - Dissolved		-	
	Sodium (Na)	72.5	mg/l	0.02
NW104	Soluble Cadmium			
	Cadmium (Cd)	<0.0002	mg/l	0.0002
NW106	Soluble Chromium			





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		RESULTS		LOQ
NW106	Soluble Chromium			
	Chromium (Cr)	<0.001	mg/l	0.001
NW108	Soluble Copper			
	Copper (Cu)	<0.0005	mg/l	0.0005
NW110	Soluble Lead			
	Lead (Pb)	<0.0005	mg/l	0.0005
NW116	Soluble Nickel			
	Nickel (Ni)	<0.0005	mg/l	0.0005
NW119	Soluble Silver			
	Silver (Ag)	<0.0005	mg/l	0.0005
NW125	Soluble Zinc			
	Zinc (Zn)	<0.002	mg/l	0.002
NW011	Sulphate			
	Sulphate	15.5	mg/l	0.02
NW199	Sulphide			
	Sulphide	<0.2	mg/l	0.2
NW003	Total Alkalinity			
	Alkalinity total	94	mg CaCO3/I	1
NW207	Total Dissolved Solids			
	Total dissolved Solids	280	mg/l	1
NW189	Total Nitrogen			
	Total Nitrogen (N)	<0.05	mg/l	0.002
NW210	Total Non-Purgeable Organi	c Carbon		
	Total Organic Carbon	<0.1	mg/l	0.1
NW194	Total Phosphorus			
	Total phosphorus	0.042	mg/l	0.005

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NW002	Bicarbonate Alkalinity: APHA 4500-CO2 D	NW003	Total Alkalinity: APHA 2320 B
NW006	Fluoride: APHA 4110 B	NW007	Chloride: APHA 4110 B
NW008	Nitrite-N: APHA 4110 B	NW009	Bromide: APHA 4110 B
NW010	Nitrate-N: APHA 4110 B	NW011	Sulphate: APHA 4110 B
NW023	Conductivity: APHA 2510 B	NW028	Free Carbon Dioxide: APHA Method 4500-CO2 B
NW029	Hardness: APHA 2340 B	NW084	Mercury - Acid Soluble: APHA 3125 B mod.
NW104	Soluble Cadmium: APHA 3125 B mod.	NW106	Soluble Chromium: APHA 3125 B mod.
NW108	Soluble Copper: APHA 3125 B mod.	NW110	Soluble Lead: APHA 3125 B mod.
NW116	Soluble Nickel: APHA 3125 B mod.	NW119	Soluble Silver: APHA 3125 B mod.
NW125	Soluble Zinc: APHA 3125 B mod.	NW179	Ammonia Nitrogen: APHA 4500-NH3 H
NW189	Total Nitrogen: APHA 4500-NO3- I	NW193	Dissolved Reactive Phosphorus: APHA 4500-P G
NW194	Total Phosphorus: APHA 4500-P G / APHA 4500-P B	NW195	pH: APHA Method 4500-H B
NW199	Sulphide: APHA 4500-S²- B C F	NW207	Total Dissolved Solids: Internal Method, Calculation
NW210	Total Non-Purgeable Organic Carbon: APHA 5310 B	NW303	Anion Sum: calculated
NW304	Cation Sum: calculated	NW305	Ion Balance: calculated





١	NW351	Hydrogen Sulphide: calculated	NW455	Boron - Dissolved: APHA 3120 B mod.
١	NW457	Calcium - Dissolved: APHA 3120 B mod.	NW460	Iron - Dissolved: APHA 3120 B mod.
١	NW462	Magnesium - Dissolved: APHA 3120 B mod.	NW463	Manganese - Dissolved: APHA 3120 B mod.
١	NW466	Potassium - Dissolved: APHA 3120 B mod.	NW469	Sodium - Dissolved: APHA 3120 B mod.
١	W583	Arsenic - Soluble: APHA 3125 B mod.	NW679	Cyanide: APHA 4500-CN C & E

Signature

Sharon Van Soest Business Unit Manager

EXPLANATORY NOTE

- ◆ Test is not accredited
- Test is subcontracted within Eurofins group and is accredited
- Test is subcontracted within Eurofins group and is not accredited
- ☐ Test is subcontracted outside Eurofins group and is accredited
- Test is subcontracted outside Eurofins group and is not accredited
- ☐ Test result is provided by the customer and is not accredited.
- ▲ Tested in the field by Eurofins and is not accredited

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The tests are identified by a five-digit code, their description is available on request.

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N/A means Not applicable

Not Detected means not detected at or above the Limit of Quantification (LOQ)

LOQ means Limit of Quantification and the unit of LOQ is the same as the result

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END OF REPORT





Appendix D

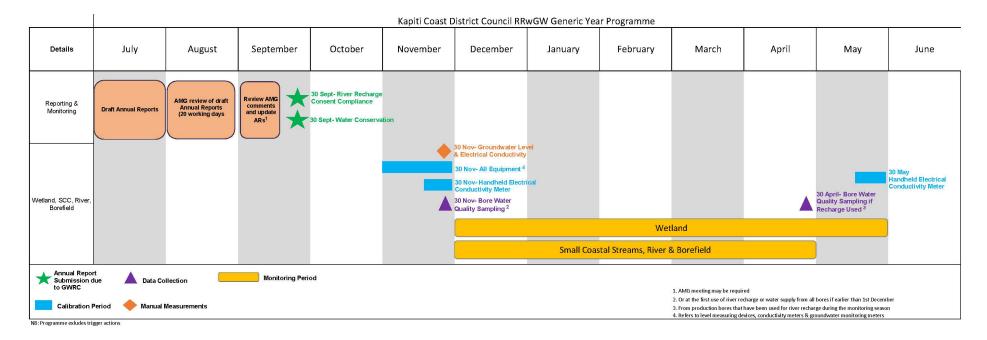
Complaints Record

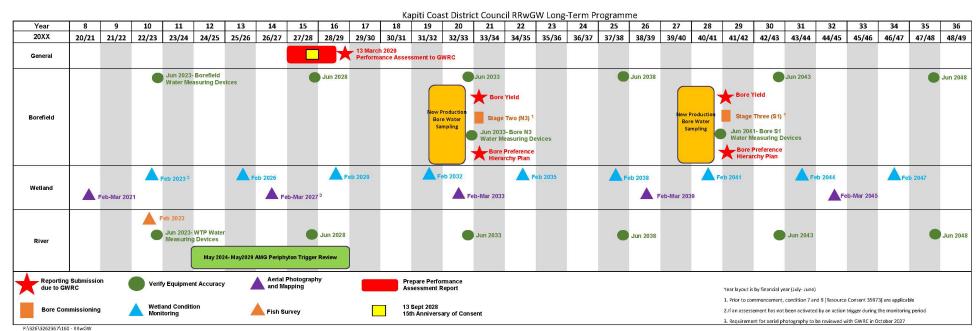
Appendix E

RRwGW Reporting Chart (Beca 2020)

Please Note:

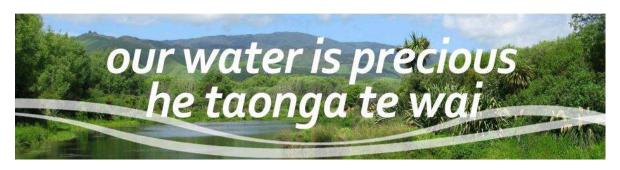
There is no insertion for this section, as there were no complaints during this reporting period.





Appendix F

Minutes of AMG Meeting



Minutes of Meeting

Waikanae River Recharge and Borefields Annual Adaptive Management Group Meeting 20 February 2023

Held: 14:00hrs, 20 February 2023, Kāpiti Coast District Council Chambers & Zoom remote.

Present:

Tess Drewitt (KCDC)
Nick Urlich (KCDC)
Ramesh Pillai (KCDC)
Bruce Nesbitt (KCDC)
Lyndon Dearlove (GWRC)
Madie Davy (Te Āti Awa ki Whakarongotai)
Jess Cooper (Regional Public Health)
Feriel Falconer (Friends of the Waikanae River)
Phil Teal (Wellington Regional Fish and Game)
Steve Bielby (Department of Conservation)

Apologies:

Wayne Cameron (Kapiti Fly Fishing) Pip Parkin (Regional Public Health) Sean Mallon (KCDC) Ramesh Sharma (KCDC)

Distribution: RRwGW AMG

Item		Action
1	Mihi / Welcome/ Introductions	
	 TD welcomed everyone to the meeting. 	_
	 TD was introduced as compliance manager in water and wastewater infrastructure at the Council, on a secondment role from Pattle Delamore Partners (PDP) 	
	 NU was introduced as Senior Asset Planner for Water Infrastructure, NU has been working at the Council since April 2022. 	
	 RP was introduced as Acting Water and Wastewater Infrastructure Manager, sitting in for Ramesh Sharma currently on leave. 	
	 LD introduced as Resource Advisor at GWRC having replaced Claire McKevitt in this role, managing compliance for TLA water supply infrastructure. 	
	MD, FF, and PT roles unchanged since previous meeting.	
	 JS attending on behalf of RPH in place of PP, who was unavailable to attend the meeting. 	
	SB introduced as DoC community ranger for Kapiti/Wellington. SB involved in Waikanae ki Uta ki Tai, which is seeking a coordinated restoration of the catchment mountains to sea, partnering with KCDC, GWRC and Te Āti Awa ki Whakarongotai. SB not previously involved in the RRwGW project but glad to be involved in the AMG going forward.	
2	Matters arising from previous meetings	-
	 TD acknowledged on behalf of the Council that the AMG annual meeting is typically run in August/September after the end of the financial year. The 2023/23 	



meeting is set to be held late August 2023, and draft annual reports will be circulated prior to the meeting.

3 Review of annual reports

3.1 Overview (TD)

- The 2021/22 Season represents the fourth season for RRwGW under the full operating regime.
- The river level/ flow rate has been low enough to require river recharge during this Season, but there have been no transgressions of ongoing environmental triggers.
- The draft RRwGW Annual Report and Annual Water Conservation Report were offered for the 2021/22 RRwGW Season for AMG review, prior to the planned AMG Meeting. Comments raised by AMG members are discussed further in Section 4.
- No changes to operational practice have occurred, nor changes to operational documents made.
- No trigger exceedances.
- GWRC to complete annual Compliance Assessment for 2021/22 following delivery of the final Annual Reports.

3.2 River and Borefield report 2021/22 (NU)

- Annual Report shows Waikanae River flows at highest on 6 December 2021, and lowest on 11 April 2022 at 801 L/s. River recharge was instigated during periods of low flow in March and April.
- PT queried why recharge was required if minimum flows did not go below 750L/s during March and April. BN clarified that the river recharge scheme is instigated in anticipation of flows going below 750L/s. This approach provides some buffer to ensure that flows never go below the 750L/s minimum flow required by the resource consent conditions.
- Maximum daily abstraction from the river during the year was 17,590m³/day on 1 February 2022. This is well below the maximum allowed by the resource consent of 30,700m³/day. Total Annual abstraction of 4,552,870m3 also below the 11,174,800m³/year allowed by the consent.
- River recharge requirements:

Table 1: River recharge discharges into the Waikanae River

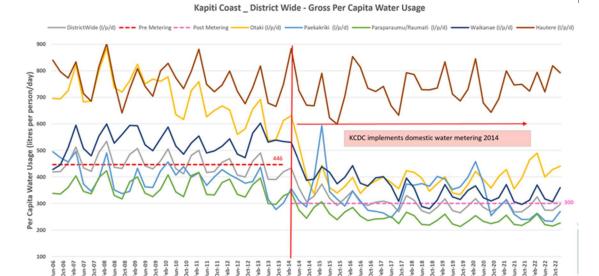
Criterion	1 July 2021 - 30 June 2022
Number of days of river recharge	25 days between 19 March and 15 April
Maximum river recharge discharge rate	13,244m3/day on 4 April
Number of days of short duration discharges	54 days above 0m3/day 29 days above 1m3/day
Total volume of bore water discharged to the Waikanae River (river recharge and additional short-term discharges)	179,400 m3

- Downstream flows were maintained above 750L/s throughout the year, with the lowest flow 767 L/s on 13 April 2022.
- Where environmental performance triggers were notified to Council and GWRC during the year, these were automated examples triggered by false readings, and most were not during the RRwGW season.
- AMG to consider whether fish surveys should recommence, also noted that Wetland Condition surveys to be undertaken in summer 2023/24.



3.3 Water conservation report 2021/22 (NU)

 The District-wide peak demand target of 490 lites-per-preson-per-day (I/p/d) was achieved, with 383 being recorded in WPR for 2021/22.



- Water metering is having a significant influence on water conservation across the district. Council's focus for the next year will be to continue locating and repairing leaks, water mains and lateral renewals programme, supporting the community with rebates etc. A total of \$2,735,000 funding allocated for water conservation activities.
- Regarding leak detection, PT queried what the losses are for Waikanae and whether the allocated budget is enough to identify leaks and address water conservation. PT specifically interested in long-term planning, for example the proposed damming of water, when more focus should be on water conservation.
- NU agreed there is room for improvement in Waikanae. Paraparaumu/Raumati Water Zone had about 12% water losses in 21/22 and the entire WPR (Waikanae WTP supplied zone) had about 18% water losses. Waikanae Zone was about 26% water losses. The Council could increase funding here, but leak detection contracts can be hard to secure, there's not enough resourcing available. This may in turn force prices up, resulting in increased investment requirements. The network is reasonably young, but when leaks start to go they can quickly increase losses. Trend in the graph shows per capita usage, the need for a dam or increased storage is still some way off.
- TD queried how the Council tracks against other Councils. RP said KCDC has an International Leakage Index (ILI) of 2.5, which is better than other councils. RP noted that the budget currently looks over, but the Council could explore an increase in scope.

RP

4 Stakeholder Observations / feedback (TD)

 No specific observations or feedback provided. TD agreed any further feedback could be provided after the meeting.

JC

 JC on behalf of RPH noted that they had not yet reviewed the reports. Asked for additional time to review, TD agreed reports could be finalised in 2 weeks from meeting date (i.e. by 6 March 2023).



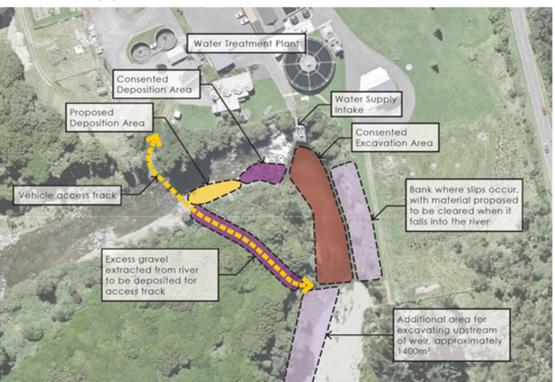
5 Operating document updates (TD)

No updates top operating documents or reports commissioned in 2021/22.

6 Consent Amendments (TD)

Management of the Waikanae Riverbed

- TD outlined the need for the Council to remove gravel upstream of the weir. The Council currently extracts gravel from a smaller area and deposits this gravel downstream of the weir. The Council does this activity to maintain river flows into the Waikanae River intake structure and to manage debris entering the intake.
- The Council proposes to extract greater volumes of gravel than currently consented (increase from 800m2 to 1,400m2) but less frequently than currently authorised (2-3 times a year). The methodology would be similar to the current methodology, the Council would reuse some gravel to create a track to move sediment downstream. The consent would expire 1 July 2048.
- The activity is potentially restricted by the fact that the track would cross through Department of Conservation covenanted land. A track currently exists, but forming the track with gravel could require DoC permissions. SB said that if the request was sent to him about what needed to be done and the potential effects he could get it to the right person.
- The Council has met with GWRC and MD on site to discuss the proposal. GWRC generally happy with the Council chipping away at the gravel island so long as appropriate management measures are in place.
- A consent application has been drafted but the Council is still finalising the proposal. MD on behalf of Te Atiawa will be consulted directly once the draft application is ready. No specific timeframe was provided but will be before the end of 2023.





TD

TD

7 Fish Surveys

- Fish surveys were last undertaken in the Waikanae River in associated with the RRwGW recharge consents from 2017-2019. The fish surveys were to address concerns around the effects that the scheme might have on fish migration. 10 surveys were undertaken in 2017, 2018 and 2019. The surveys were reported in "Waikanae River Riffle Fishing Report A River Recharge monitoring component prepared for KCDC", Boffa Miskell, 18 June 2019.
- The fish surveys found no measurement in significant differences in fish densities above and below the discharge outlet. The report concluded that recharge records and fish surveys do not show a pattern of effect of the recharge on fish presence. The Annual Report and AMG in 2018/19 agreed that the requirement for fish surveys would be reconsidered at Year 10, being 2022/23.
- PT specifically noted that the habitat in the river has changed over the past 10 years and the numbers of native fish are also understood to be changing. Trout are still present and spawning, but there are less pools for maintain habitat diversity for eels in the river. PT therefore considers it will be worth getting a snapshot of whether there have been any changes to fish diversity and whether the recharge is having an effect on this.
- SB agreed with PT, but queried what other fish monitoring work is being done within the catchment. The Waikanae ki Uta ki Tai working group is hoping to, over the next couple of years, have a coherent picture of what is happening in the catchment. SB therefore encourages KCDC to not only view this as one project but complementary to other work that is being done in the catchment. SB mentioned fish passage work that GWRC is currently undertaking, as well as wetland assessments as part of the Whaitua process (undertaken by PDP). TD committed to investigating other work within the catchment so KCDC can take a coherent approach to monitoring.

Following the discussion, the AMG agreed:

- Fish surveys should be undertaken in the summer of 2022/23 in accordance with the methodology used for previous fish surveys.
- The results should then be compared to the results from the previous surveys as reported in the 2019 report to establish whether there is any change to the baseline outlined in that report.
- The AMG would then consider the results and analysis at the next AMG meeting in August 2023 and determine whether to continue fish surveys the following summer.
- TD has since engaged BECA / Boffa Miskell to undertake the fish surveys in March/April. TD to confirm timing for the fish surveys once scheduled.
- Later on in the meeting, SB raised the question of fish passage, noting that GWRC has been doing some assessments of fish passage and structures across the region, and there was a question mark about whether the weir provides for fish passage. SB recommended the Council follow up with GWRC in this regard (Jakob Lechner).

8 Any other matters

Removing debris from inlet (BN)

The Council had a significant debris removal exercise this year when a large tree lodged itself in the inlet. The Council had to use speciality equipment to remove the debris from the inlet under the emergency provisions of the Resource Management Act 1991 (RMA). The Council removed everything over a 3-4 day



TD

TD

TD

- period, following the usual procedures in terms of effects management (clean machinery, not refuelling adjacent to the river, etc).
- The works were a considerable cost but fortunately there was no infrastructural damage. The works reiterated the need to keep gravel from entering the inlet and causing blockages.
- Given the current environment, PT queried what the risk is of slash coming down from the wider catchment and blocking the inlet in a significant flood event. BN said his team has been asking similar questions, and the Council will no doubt look at the wider issues once the recovery effects on the east coast have settled down. BN noted that slash up on the hill will definitely be a problem in any future "weather bomb" event.

Source Water Protection Update (NU)

- The Council is required to have source water protection in place for the Waikanae Borefield. A Kapiti Aquifer Management Team has been established with support from Rebecca Morris at GWRC.
- Following the issues that came up with the Summerset application, it was thought that the Council needed to have a better understanding of the protection requirements around the bores and needed to have input in the establishment of protection zones.
- The Council's bores are deep and unlikely to be impacted by most land use activities, however they are potentially impacted by new bores targeting the same aquifer.
- The Council will provide an update on this work at the next meeting.

Outcome of Summerset (NU)

- FF queried the outcome of the Summerset application. NU said that iwi had required cultural impact assessments, and KCDC sought conditions around making sure the bores had appropriate protections. The volumes sought were considered to be low (5L/s) over a season.
- NU understands the resource consent was ultimately granted and the consent holder has to abide with KCDC's trigger levels for the recharge system. Under the first trigger level, they have to stop taking water. KCDC consent is prioritised. NU subsequently checked status of the Summerset consent and confirms it was granted.

Taumata Arowai (NU/BN)

- Under the Water Services Act 2021, the Council had to register as a drinking water supply and prepare a new Water Safety Plan, Source Water Risk Management Plan and comply with new standards for source, treatment and reticulation.
- BN confirmed that all plans were submitted on time and noted that some water suppliers submitted their old plans and di not update them to meet TA requirements. Therefore, it will take while before the Council's plans are reviewed. The plans do not get made public given they include sensitive information.

Upgrades at the WTP (NU)

 NU briefly addressed upgrades at the WTP. Work is required for seismic resilience. NU will be able to provide an update at the next meeting. NU

NU



9 Next Steps		t Steps	
		Issue meeting minutes for comment.	TD
	•	Final comments from AMG on draft annual reports to be provided by 6 March and final reports submitted to GWRC and published on the Council's website by 10 March.	TD
	•	The Council to confirm fish surveying programme with its consultants.	TD

Minutes by: Tess Drewitt, KCDC

