# Water Quality Summary for Lower Mokau Sub-catchment (SC) - 2021

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| **Site Names** | **Frequency of sampling** | **Number of samples** |
| **KCRC Sites:**  7-Mokau R, above Wairere Dam  8-Paraheka Stm-184 | Quarterly sampling | 8 |
| **WRC Sites:**   * Awakau Rd * Mokauiti Stm-3 Way Motors * Mangaotaki River-SH3 Br * Totoro Rd | Monthly sampling | 48 |
| **Total number of samples in 2021** | | **56** |

***Explanatory notes provided below the Table***

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| **Annual summary** | **Deviation from Sub-catchment (SC) Baselines *Ŧ* & the National Bottom Line (NBL)Φ** | **Seasonal & Geographic Patterns** |
| ***E. coli*˥ and Sediment˩** are the main contaminants of concern in the Lower Mokau.  S**ite 7-Mokau River above the Wairere dam had the best water quality and the Waikato Regional Council sites had the lowest water quality in 2021**. | ***E. coli –*** the National Bottom Line for *E. coli* for swim water quality is 540 cells/100ml. The SC baseline is 5,000 cells/100ml water - significantly exceeding national limits. Four of six sites monitored over 2021 exceeded national limits. No sites monitored in 2021 exceeded the SC baseline for *E. coli*.  **Sediment –** Sediment is estimated by water clarity. The national bottom line for water clarity in the Mokau River is 1.34 m. The SC baseline for water clarity was 0.79 m, well below national limits. Water clarity was low at all sites and only one site, 8-Paraheka stm-184, was within national limits. | ***E. coli* –** Concentrations over 2021 were greatest in summer, autumn and winter. The lowest concentrations were recorded in sumer. The highest concentrations were recorded at Mangaotaki River, followed by Totoro Rd and Mokauiti Stm-3 Way Motors in summer and autumn, respectively. The lowest concentrations were consistently reordered in 7-Mokau R. followed by 8-Paraheka stm.  **Sediment –** The highest water clarity (e.g. lowest suspended sediment) was recorded in 7-Mokau R. in summer followed by 8-Paraheka Stm in summer and Mokauitit Stm, Totoro Rd and Mangaotaki R. in autumn. The lowest water clarity was recorded at Awakau Rd, in winter. |

**Explanatory Notes**

***Ŧ*** **SC** **Baselines** – Have been determined for each sub-catchment using data collected by Waikato Regional Council (WRC) between Jan 2015 up to and including Aug 2020.

**ΦNational Bottom Lines (NBL)** **-** and attribute bands have been defined under the National Policy Statement for Freshwater Management (2020). Attribute bands for sediment and dissolved reactive phosphorus (DRP) have been assigned on the basis of ecological impacts to communities. NBL has been set for DRP.

**˥*E. coli* (*Escherichia coli*) -** A type of bacteria commonly found in the gut of warm-blooded animals and people.  *E. coli*naturally occurs in freshwater and is not usually harmful in itself. However, high concentrations of this bacteria exceeding water quality guidelines indicate faecal contamination which can be harmful to humans. *E. coli* is not in itself a risk to ecological health but can be associated with increased nutrients and lower water clarity which can both negatively impact aquatic communities.

**˧ Ammonia** - Covers two forms of nitrogen: ammonia and ammonium. Animal waste (particularly from humans and farmed animals such as sheep and cows) is the major source of ammoniacal nitrogen in New Zealand waterways. If ammoniacal nitrogen reaches very high concentrations it can become toxic under certain temperature and pH conditions.

**˧ Nitrate -** A highly soluble form of [nitrogen](https://www.lawa.org.nz/learn/glossary/n/nitrogen/) that is both a nutrient and, in excess quantities, a toxic substance. Ammoniacal nitrogen is converted to nitrate nitrogen in soils, from where it can then leach into waterways. Nitrate is a plant fertiliser, however, due to its high solubility in water, it is one of the most common contaminants in rural and urban areas.

**˩Sediment** - Determined as the inverse of water clarity where the higher the clarity the lower the concentrations of suspended sediment and algae. Clarity refers to light transmission through water and has two important aspects: visual clarity and light penetration. Visual clarity can decrease depending on how much sediment, runoff or algae is in the water. Sediment can come from road runoff during rain, or from slips or bank erosion. Algae blooms can also reduce water clarity.

Sediment impacts aquatic life in New Zealand’s streams and rivers, while adapted to short-term seasonal pulses of sediment, excessive and/or chronic sediment loading - particularly fine sediment - is extremely damaging to aquatic ecosystems. Fine sediment clogs animals’ gills and reducing their ability to see and smothers freshwater and marine habitats. Sediment also contains nutrients and other contaminants which can be released into waterways causing other issues.

**ɞPhosphorus** - Is an essential nutrient for plant and animal life. Total phosphorus (TP) includes all concentrations in a sample, whether dissolved, in solid form or bound to sediment in the river. Dissolved reactive phosphorus (DRP) is the portion which is dissolved and can immediately support plant and algae growth. Excess phosphorus in our rivers can cause large amounts of (sometimes toxic) algae to grow, which can harm river health and reduce the recreational and aesthetic value of rivers. DRP can be influenced by external factors like fertilizer application as well as intrinsic catchment qualities like geology.

**General Note** - KCRC and WRC use different laboratories to analyse samples, some differences in techniques may influence the sensitivity of measurements.