

7. Summary of key findings

Based on the 2018 biannual monitoring event, the following summary of key findings is presented:

- The Site is considered to have two hydraulically separate aquifers. The monitoring network comprises 20 existing groundwater wells and eight new wells (at locations GW1, GW5, GW7 and GW9) installed in May-June 2018 by [REDACTED] targeting the shallow and deep aquifers.
- The 2018 groundwater monitoring program comprised bi-annual sampling; March and October 2018 in accordance with the Prescribed Premise Licence No. [REDACTED]. During the March 2018 groundwater monitoring round, only the wells that target the deeper aquifer were able to be sampled due to insufficient water in the shallower wells. During the October 2018 event, both deeper and shallow aquifers (new wells) were sampled.
- Groundwater elevations ranging from approximately 34.7 to 56.25 m AHD in March and 36.30 to 39.92 m AHD in October 2018 for the deep aquifer are consistent with previous investigations and the groundwater is interpreted to flow in a west-north-westerly direction.
- The pH of groundwater at the Site is considered slightly acidic, and was typically less than 6 during the 2018 monitoring period. Highly alkaline values were observed at newly installed wells GW7D and GW9S, however these values are considered to be a result of the recent installation process. It is considered likely that these pH values will stabilise to the expected pH range (pH ranging between 5-7) in future monitoring events.
- Groundwater at the Site is considered relatively fresh, with TDS typically below 300 mg/L and therefore is considered of a suitable quality to potentially be used for potable and non-potable sources on and offsite.
- The analytical suite for the bi-annual monitoring on-site comprised major ions, metals, nutrients and organic analytes. Concentration of metals and nutrients were reported above their respective LORs consistently across the Site with elevated results reported above the irrigation, non-potable and fresh water criteria.
- A large proportion of the monitoring well locations reported detections of PFAS above the LOR during the 2018 monitoring period, with the exception of locations SE9S, SE1D and GW9S. The concentrations of PFAS compounds detected are below the relevant human health and environmental screening values (HEPA, 2018) with the exception of SE10S (October 2018), which recorded a result (sum of PFHxS and PFOS) that is marginally above the drinking water value (HEPA, 2018). It is important to note that the newly installed well GW9S, installed to replace SE9S and SE10S, did not report PFAS concentrations above the LOR during the same monitoring round and the validity of this result is to be monitored through ongoing sampling rounds.
- Concentrations of phenols, PCBs, OCP and OPP were reported below the LOR for both of the biannual sampling events for all samples analysed.
- The data collected during 2018 is consistent with historical data, with some notable increases in concentration in nutrients (nitrogen compounds), certain metals (zinc, manganese, magnesium, iron and aluminium), sodium and chloride concentrations across the Site which are also reflected by the trends observed at the up-hydraulic gradient well location SE5/GW5.
- The historical data shows consistently poor water quality within the up-hydraulic gradient well SE5/GW5 including an upward trend for ammonia and elevated metal concentrations

(iron, manganese and zinc). Given its position in relation to the landfill infrastructure, impacts here are likely not attributable to the Site. Rather, impacts here are indicative of ambient groundwater conditions in the region or an up-gradient source or off-site source. Monitoring well GW5S reported the highest concentrations of iron (142 mg/L), total phosphorus (1.70 mg/L) and elevated levels of TDS (1,350 mg/L), manganese (0.782 mg/L) and zinc (0.076 mg/L) and also reportable concentrations of TRH and PFAS.

- The laboratory analysis of landfill leachate confirmed a geochemistry signature representative of landfill derived leachate source with elevated chloride, alkalinity, ammonia, chemical oxygen demand, potassium, high total dissolved salt concentrations and elevated contaminants of concern. A comparison of the key indicators of landfill leachate, based on its assessed geochemical signature, against the July and October 2018 analytical results from the new groundwater wells (at locations GW1, GW5, GW7 and GW9), indicated that there is limited evidence to draw conclusions that groundwater at the Site has been impacted by landfill leachate.