

**Table 1 Possible well contaminants and their sources<sup>8,23-28</sup>**

Contaminant type	Sources and possible indicators	Health or operational concern
<b>Microbiological contaminants</b>		
<b>Iron bacteria</b>	Naturally present in groundwater; may cause buildup of <a href="#">slime</a> , and cause odour and taste issues.	Not a direct health concern but may affect water palatability and well operation.
<b>Sulphate-reducing bacteria (SRB)</b>	Naturally present in groundwater; may be indicated by sulphurous odours.	Can cause corrosion of equipment; sulphate >500 mg/L may produce a laxative effect and could cause dehydration.
<b>Pathogenic bacteria</b> (e.g., <i>E. coli</i> , <i>Campylobacter</i> , <i>Legionella</i> .); <b>protozoa</b> (e.g., <i>Giardia</i> , <i>Cryptosporidium</i> ) <b>or viruses</b> (e.g., norovirus, rotavirus, hepatitis A)	Animal or human waste (e.g., septic tanks, sewer overflow), compost, floodwaters. Turbidity or sewage odours may indicate contamination, but often no sensory indicators.	Acute gastrointestinal illness (AGI), and a wide range of illnesses caused by fecal or opportunistic pathogens.
<b>Chemical contaminants</b>		
<b>Arsenic (As):</b>	Naturally present in some groundwater and levels may be elevated during drought conditions. <sup>29</sup> No sensory indicators.	Carcinogen, adverse developmental/birth outcomes; other systems (e.g., GI, pulmonary, cardiovascular, endocrine, etc.).
<b>Manganese (Mn)</b>	Naturally present in some groundwater sources. Can appear as brown discoloration.	Neurological and behavioural effects (infants, young children at greatest risk).
<b>Iron (Fe)</b>	Naturally present in some groundwater sources. Can appear as discoloration, metallic taste.	Primarily an aesthetic concern.
<b>Other metals</b> (e.g., Cd, Cu, Fe, Pb, U)	Natural (geogenic), anthropogenic, or premise plumbing related (e.g., Pb, Cu). Some undetectable, some may introduce colour or staining of fixtures.	A range of acute and chronic toxicity for various metals.
<b>Organic contaminants</b> (e.g., PAH, PFAS, VOCs, pesticides etc.)	Leaching from military, industrial, or agricultural sites, landfills, spills, burnt surfaces, sewage/septic leachate, underground storage tanks, improper disposal. Some undetectable, some hydrocarbons are indicated by a sheen or fuel smell.	A range of possible acute and chronic toxicity including cancer, reproductive/developmental issues.
<b>Nitrate and nitrite</b>	Fertilizers, decomposing organic matter, sewage or animal waste. Turbidity or sewage odours may indicate contamination, but often no sensory indicators.	Methemoglobinemia (blue baby syndrome) leading to serious illness or death. Precursor for formation of carcinogens in the body, thyroid disease.
<b>Fluoride</b>	Naturally present in some groundwater sources.	Skeletal fluorosis, tooth discoloration and pitting.
<b>Radionuclides</b>	Radon, uranium, or radium naturally present or released from mining, nuclear power production. No sensory indicators.	Toxic effect on kidneys, increased risk of cancer.