



FACT SHEET

Low Level Ammonia in Fresh and Seawater

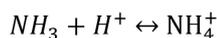


Ammonia

Ammonia is a toxic chemical that exists in both fresh and seawaters. Whilst research suggests that ammonia in fresh and seawater comes primarily from natural sources, anthropogenic sources of ammonia include runoff from agricultural sites containing fertilizers, sewage treatment effluent discharge, households using ammonia cleaning products and runoff from industrial processes. Industrial applications of ammonia include mining and oil refineries, production of plastics, papers, rubber and refrigeration equipment as well as in the processing of food. When anthropogenic discharges of ammonia are not controlled, the ammonia can find its way into the local rivers and coastal areas. This increase in nutrients such as ammonia along with environmental conditions are often linked to excess growth of aquatic plants, algal blooms (eutrophication) and subsequent decrease in marine life and water quality related problems.

Toxicity to marine organisms

Ammonia also referred as 'total ammonia-N' exists in the water as two primary forms: un-ionised ammonia (NH_3) and ionised ammonium ion (NH_4^+).



The occurrence of the two forms of ammonia is pH dependant. At the pH typical of seawater, approximately 95% of ammonia is in the form of NH_4^+ . However, at higher pH ammonium ion converts to un-ionised ammonia. The un-ionised form (NH_3) is recognised to be the more toxic of the two forms. At elevated concentrations it can damage gills, hamper oxygen delivery to tissues, disrupt metabolism, reduce feeding and slow growth. Thus, low level ammonia monitoring becomes critical for freshwaters, low-land freshwaters, lakes, wet lands (palustrine), estuaries and marine – inshore and offshore. Further, some regions with high ecological value, the 20th, 50th and 80th percentile water quality objectives for ammonia can be <2 µg/L.

NMI's Response

The National Measurement Institute (NMI) is Australia's peak measurement body responsible for biological, chemical, legal, physical and trade measurement. Among its broad range of nutrients testing services, the NMI offers testing for low level ammonia in fresh and seawaters. This includes ammonia testing for potable, surface, ground, saline, brackish and domestic waters as well as agricultural runoffs, rivers and seawaters. NMI's capabilities for ammonia testing also covers mining waste as well as industrial effluent testing. The NMI also offers comprehensive nutrient testing packages for monitoring programs.

NMI capabilities include:

- Advanced **low level detection** instrumentation for ammonia analysis;
- **NATA accreditation** for low level testing of ammonia in fresh and seawater;
- Highly skilled and experienced staff committed to providing **quality results**; and
- **Rapid/scheduled** turnaround times for monitoring programs.

Limits of Reporting

AMMONIA-N	LOR (µg/L)
Freshwater (surface, rivers, potable, ground, industrial, agricultural)	< 1.0
Seawater (saline, brackish)	< 1.0

Sampling, Storage and Transportation

As sampling, storage and transportation are critical for analysis, NMI clients should refer to appropriate sampling guidelines for ammonia analysis where possible. In summary, samples should be collected with care. NMI provides 1 x 125 mL HDPE bottles for water samples. Samples bottles are provided with preservation and need to be chilled with ice bricks following sampling. Samples should be transported in eskies with ice bricks as soon as possible.

For more information on storage and transportation, please contact the NMI or refer to <http://www.measurement.gov.au/Services/EnvironmentalTesting/Documents/NMI-Preservation-and-holding.pdf>.

For More Information

Phone: 1300 722 845

Email: customerservice@measurement.gov.au

Website: www.measurement.gov.au