

South Australia's Environment Protection Authority

# Small scale desalination: the EPA perspective



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# Regulation of desalination plants

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- Desalination plants must have an EPA licence to operate if:
  - Production capacity >200kL/day
- AND
- Wastewater generated >2ML/year
- Significant restrictions and requirements as part of licence conditions.
- Otherwise “small scale” desalination plants are regulated the same as other activities that pollute or might pollute: **take all reasonable and practicable measures to prevent/minimise environmental harm.**
- Risk-based approach to regulation with site specific considerations rather than prescriptive requirements

# Small scale desalination regulation

- [Environment Protection Act 1993](#)
  - S.25 General Environmental Duty (GED)...“take all reasonable and practicable measures to prevent/minimize environmental harm”
- Environmental harm is defined very broadly as any harm or potential harm that is caused by pollution.
- Pollutant is also broadly defined... as any solid, liquid, gas, noise, heat or anything declared by an [Environment Protection Policy \(EPP\)](#).
- Clause 10 of the WQ EPP says that pollutants cannot be discharged into waters or onto land from which it's reasonably likely to enter waters. Clause 10 then refers to a BIG list of pollutant categories, including the catch all “liquid waste”. Discretion is used when enforcing clause 10.
- The EPP Clause 9 expands on the GED...
  - 9(a) apply the “waste management hierarchy”
  - 9(b) avoid activating the ANZECC Water Quality Guidelines for aquatic ecosystems or primary industries
- No specific EPA guidance on desalination plant design or operation.

# Desal wastewater pollutants: the substances that matter

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- Salinity
- Minor constituents: metals, metalloids (arsenic), nitrogen, phosphorus, selenium...
- Anti-scalants: acids, ion exchange and chelation; preference for non-residual, biodegradable, low phosphorus content.
- Biocides: non-residual preferred; be mindful of possible impacts caused by biofouling removal (organic decay, nutrient release, odours).

# Waste Management Hierarchy

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- **Avoid/minimize**: restrict the need to generate saline wastewater
- **Reuse/recycle**: if wastewater is not highly saline, there may be irrigation or dust suppression uses
- **Treat**: wastewater evaporation lagoons
- **Discharge in an environmentally sound manner**:
  - Discharge to inland surface waters is usually not acceptable, although in some cases saline lakes may be an option.
  - Discharge to marine waters can be viable in coastal areas if reasonable and practicable efforts have been taken to diffuse/disperse the wastewater. High energy marine waters are more suitable.
  - Isolated borehole desalination with in-situ saline discharge.