



Water

Surface, ground, marine and coastal water.

How to use this handbook

This volume is the practitioner (site and technical) reference for the Water factor. It sets out what Water governs, every assessment element with its own process and controls, the Queensland and Commonwealth instruments that apply, and the primary metric for each element. It is decision support, not legal advice or a substitute for a site-specific assessment — confirm every regulatory point against the current instrument and, where a threshold is close or a critical exception applies, obtain specialist and legal review.

FIELD	DETAIL
Volume	01 of 17 — Environmental Knowledge Handbooks
Factor	Water
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Prepared by	Q TEN — Queensland Technical Excellence Network
Review	SME, spatial and legal review before reliance

Executive overview

Water is the factor most likely to determine whether a project is approved, conditioned or refused, and the one where an error is least forgiving — impacts move downstream, cross boundaries and persist. In Queensland the domain spans surface water, groundwater and the marine and coastal environment, governed by the general environmental duty under the Environmental Protection Act 1994, the water quality objectives of the EPP (Water and Wetland Biodiversity) 2019, and the entitlement and works regime of the Water Act 2000. The task for a site manager is to know which waters and values are in play, hold the right authorisations, set trigger and limit values before disturbance, and keep the monitoring evidence that shows the controls worked.

Scope

Water resolves into three secondary factors — Surface Water; Groundwater; Marine and Coastal Environments — and twenty assessment elements. Every element is set out below with its own process and controls and its primary decision metric; identifiers are shared with the companion Knowledge System workbook and the platform calculators.

Assessment elements & process

Each assessment element below carries what it governs and its key pressures, the appropriate site process and controls, and the primary metric that measures it. Work every element that your project engages.

ASSESSMENT ELEMENT	WHAT IT GOVERNS & KEY PRESSURES	PROCESS & CONTROLS
Water Quality <i>Water quality compliance rate</i>	Physical, chemical and biological condition of surface water against its environmental values. Pressures: sediment, nutrients, metals, hydrocarbons, pathogens.	Set WQOs for the receiving values; monitor at compliance points (NATA); apply ESC, treatment and release-to-conditions; investigate and correct exceedances.
Water Quantity <i>Water balance variance</i>	Volume, timing and variability of surface water. Pressures: take, impoundment, diversion, land-use change.	Model the water balance; size storages and releases to entitlements; monitor take and variance; adjust operations to stay in balance.

ASSESSMENT ELEMENT	WHAT IT GOVERNS & KEY PRESSURES	PROCESS & CONTROLS
Water Extraction <i>Authorised take utilisation</i>	Authorised taking of surface water for use. Pressures: over-extraction, unmetered take, cumulative draw.	Confirm the water entitlement; meter and record take; reconcile against the authority; correct any unauthorised take.
Water Discharge <i>Discharge compliance rate</i>	Controlled or uncontrolled release to land, sewer or waters. Pressures: process water, dewatering, sewage, mine water.	Hold the release authority; treat and monitor at the release point; release only to conditions; report and correct exceedances.
Hydrology <i>Hydrologic alteration index</i>	Movement and storage of water across the catchment. Pressures: drainage, dams, culverts, imperviousness.	Assess hydrologic change against pre-development; design drainage to limit alteration; monitor and mitigate downstream effects.
Flooding <i>Expected annual flood loss</i>	Inundation from riverine, overland or local drainage sources. Pressures: extreme rainfall, encroachment, blocked drainage.	Assess flood exposure to current and projected design events; set flood-immune levels; provide capacity and emergency response.
Stormwater <i>Stormwater pollutant load</i>	Runoff from developed, disturbed and impervious areas. Pressures: construction disturbance, spills, litter, poor treatment.	Prepare an ESC plan; model load against SPP targets; install and maintain the treatment train; inspect after rain.
Waterway Stability <i>Unstable reach proportion</i>	Geomorphic stability of beds, banks and riparian corridors. Pressures: clearing, altered flow, crossings, stock access.	Assess reach stability; retain riparian buffers; design stable crossings and outlets; rehabilitate unstable reaches.
Receiving Environment <i>Receiving environment risk score</i>	The environment receiving discharge, runoff and altered flow. Pressures: cumulative load, low assimilative capacity, sensitive receptors.	Assess assimilative capacity and cumulative load; set limits protective of the values; monitor the receiving environment.
Groundwater Quality <i>Groundwater trigger exceedance rate</i>	Chemical and microbiological condition of groundwater. Pressures: seepage, spills, leaching, saline intrusion, well failure.	Establish a bore network and triggers (beneficial-use based); monitor and trend; manage sources; notify on confirmed contamination.
Groundwater Quantity <i>Groundwater drawdown</i>	Stored volume, level and sustainable yield of aquifers. Pressures: abstraction, dewatering, drought, reduced recharge.	Baseline levels and set drawdown triggers; manage abstraction to yield; monitor drawdown; adjust to protect the aquifer and users.
Extraction <i>Groundwater extraction against authority</i>	Authorised taking of groundwater. Pressures: over-extraction, interference with other users, cumulative draw.	Confirm the bore/water authority; meter take; reconcile against the entitlement; manage interference.
Recharge <i>Estimated recharge volume</i>	Replenishment of groundwater systems. Pressures: sealing, land-use change, reduced infiltration.	Estimate recharge; protect recharge areas and infiltration; avoid sealing key zones; monitor response.
Connectivity <i>Connectivity evidence confidence</i>	Hydraulic connection between surface water and groundwater. Pressures: dewatering, take, altered flow.	Assess SW-GW connectivity; account for connected take; monitor both systems where connection is credible.
Groundwater Dependent Ecosystems <i>GDE exposure and condition score</i>	Ecosystems dependent on groundwater. Pressures: drawdown, quality change, altered access to water.	Map GDEs; assess exposure to drawdown and quality change; set protective triggers; monitor condition.
Marine Water Quality <i>Marine water quality objective compliance</i>	Condition of marine and estuarine waters against coastal values. Pressures: land runoff, plumes, dredging turbidity, nutrients.	Set marine WQOs; monitor plumes and turbidity; time works to seasons; manage sediment and release.
Coastal Processes <i>Sediment budget balance</i>	Sediment supply, transport and coastal landform processes. Pressures: structures, dredging, altered supply, sea-level rise.	Assess the sediment budget; design to maintain supply and transport; monitor shoreline and budget response.
Marine Habitat <i>Marine habitat condition and extent</i>	Marine and coastal habitats and their condition. Pressures: dredging, turbidity, physical disturbance, contaminants.	Map habitats; avoid and buffer; control turbidity and disturbance; monitor condition and recovery; offset residual loss.
Dredging <i>Dredging environmental compliance rate</i>	Dredging and its environmental effects. Pressures: turbidity plumes, resuspension, spoil disposal.	Hold approvals; manage plumes with monitoring and windows; dispose of spoil to conditions; verify recovery.

ASSESSMENT ELEMENT	WHAT IT GOVERNS & KEY PRESSURES	PROCESS & CONTROLS
Shoreline Stability <i>Shoreline change rate</i>	Stability and change of the shoreline. Pressures: erosion, structures, altered sediment supply, storm and sea-level rise.	Assess shoreline change; design for coastal processes and setbacks; monitor change rate; adapt to maintain stability.

Regulatory mapping

The instruments most often engaged for Water. Confirm currency and application to the specific site and activity before relying on any entry.

INSTRUMENT	JURIS.	WHAT IT DOES	TYPICAL TRIGGER
Environmental Protection Act 1994	Qld	General environmental duty; environmental-harm offences; environmental authorities.	Any activity that may cause environmental harm to waters.
Environmental Protection Regulation 2019	Qld	Prescribed ERAs and standard conditions for water-relevant activities.	Carrying out a prescribed ERA (e.g. STP, dewatering).
EPP (Water and Wetland Biodiversity) 2019	Qld	Environmental values and water quality objectives (WQOs).	Discharge to, or impact on, a scheduled water.
Water Act 2000	Qld	Water entitlements and take, bores, and watercourse/aquifer works.	Taking water, or interfering with a watercourse or aquifer.
Planning Act 2016 & State Planning Policy	Qld	Development assessment; stormwater and water-quality outcomes.	Assessable development affecting waters.
Fisheries Act 1994	Qld	Waterway barrier works, marine plants and fish habitat areas.	Barrier works, or works in fish habitat.
Coastal Protection and Management Act 1995	Qld	Tidal works and coastal processes.	Works within the coastal management district.
EPBC Act 1999	Cth	Matters of national environmental significance — Ramsar wetlands, water resources.	Likely significant impact on an MNES.

Assurance & evidence

- **Source currency.** Confirm the instruments, criteria and trigger values cited are current and correctly applied to the site and activity.
- **Records.** For each element engaged, retain the assessment, the controls applied, monitoring against the metric, and any statutory notifications — the evidence that the process was followed.
- **Independent review.** Interpretations, threshold decisions and critical exceptions are reviewed by a suitably qualified person before reliance.

TALK TO QTEN

Managing water on a live project? QTEN helps Queensland clients turn this handbook into a defensible, evidence-backed position — scoping, assessment, controls, approvals and review. Bring us your site and we will help you get it right, and prove it.

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