

40891 Construct and evaluate hydrometric rating curves

Kaupae Level	5
Whiwhinga Credit	30
Whāinga Purpose	This skill standard is for people working in, or seeking skills in, hydrometry and field water monitoring. Learners will be able to evaluate discharge data, develop, apply, and modify rating curves, and store ratings to produce continuous streamflow records, following NEMS and worksite procedures. This skill standard has been developed to align with the New Zealand Diploma in Field Hydrology (Level 5) [Ref: 2344].

Hua o te ako me Paearu aromatawai | Learning outcomes and assessment criteria

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
1. Select and evaluate hydrometric data.	a. Select gaugings and related hydrometric data.
	b. Evaluate gaugings and related hydrometric data.
2. Construct rating curves with hydrometric data.	a. Plot processed gaugings data to a rating curve using hydrometric software or methods to define the relationship between water level (stage) and flow.
	b. Use graphical and mathematical methods to fit rating curves to gauging data.
	c. Review current gaugings to existing rating curves.
3. Evaluate and extrapolate rating curves.	a. Evaluate the fitted rating curves for accuracy, precision, and potential bias.
	b. Extrapolate rating curves to cover the full range of recorded water levels.

Hua o te ako Learning outcomes	Paearu aromatawai Assessment criteria
4. Apply and record rating curves.	a. Determine the applicability period of each rating curve and identify transition periods between curves.
	b. Apply the rating curves to streamflow time-series to compute continuous discharge from measured stages.
	c. Check and confirm the resulting rated discharge series has been applied.
	d. Store and file all rating curves, their attributes and metadata.

Pārongo aromatawai me te taumata paearu | Assessment information and grade criteria

Assessment specifications:

All activities and evidence must meet the requirements of worksite procedures, accepted industry practice, legislation and any subsequent amendments.

Providers must give due consideration to embedding ngā kaupapa (principles) o Te Tiriti o Waitangi when designing delivery activities relevant to this standard. These principles are outlined in [Guidelines for Providers: Embedding Tirohanga Māori](#).

Providers must give due consideration to the needs and values of Pacific peoples and other cultural groups when designing delivery activities relevant to this standard, ensuring practices are inclusive and equitable.

Range

Hydrometric data includes water level and time series data.

The candidate must construct and apply rating curves for a minimum of two sites with differing controls, at least one of which must be a site with shifting control.

The candidate must work with at least 20 gaugings and demonstrate a minimum of four changes in rating.

Definitions

Accepted industry practice refers to approved codes of practice and standardised procedures accepted by the wider industries as examples of best practice.

Hydrometric data describes time-series observations of hydrology variables, such as water level (stage), streamflow (discharge).

Metadata describes data in detail. It has information about how, when, and by whom certain data was collected and the data format.

Rating curve the relation between river stage and discharge at a gauging site. A graphical or mathematical function used to compute discharge from stage.

Stage (Water level) is elevation of the water surface at a monitored site.

Worksite procedures refer to the policies and procedures set out in a verbal or written form by the employer or organisation.

Ngā momo whiwhinga | Grades available

Achieved.

Ihirangi waitohu | Indicative content**Select and Evaluate Data**

- Data sources, manual gauging, ADCP profiles, pressure transducers, hydrographs, stage sensors, field notes, metadata.
- Data quality checks, consistency, anomalies, control transitions.

Construct Rating Curves

- Curve fitting: power-law regression, segmented fits, shifted log–log plots.
- Apply conceptual control models: rectangular, trapezoidal.
- Derive discharge–stage parameters: exponent (B), coefficient (C), offset (e).
- Define discharge–stage relationships: $Q = C(H - e)^B$.

Evaluate and Extrapolate

- Field checks: estimate offsets, detect aggradation, assess vegetation impacts.
- Extrapolation methods, hydraulic grade line, slope–area, bathymetry.
- Validation: back-calculations, anomaly flagging.

Apply and Record Curves

- Calculation tools, NEMS-compliant software (Aquarius, QRev, RRating), spreadsheets.
- Metadata documentation, rating version, date, site, analyst, methods, field photos, channel controls.
- Archiving: store curves, register updates, follow naming conventions.

Rauemi | Resources

Legislation and codes of practice relevant to this skill standard include but are not limited to:

- NZHS [NZHS | The New Zealand Hydrological Society](#).
- Health and Safety at Work Act 2015, Resource Management Act 1991, Public Works Act 1981, Resource Management (National Environmental, Standards for Freshwater) Regulations 2020 [New Zealand Legislation](#).
- National Environmental Monitoring Standards (NEMS) [National Environmental Monitoring Standards » National Environmental Monitoring Standards \(NEMS\)](#).
- National Policy Statement for Freshwater Management 2014 [National Policy Statement for Freshwater Management | Ministry for the Environment](#).

and any subsequent amendments or replacements.

Pārongo Whakaū Kouna | Quality assurance information

Ngā rōpū whakatau-paerewa Standard Setting Body	Muka Tangata – People Food and Fibre Workforce Development Council
Whakaritenga Rārangi Paetae Aromatawai DASS classification	Engineering and Technology > Water Industry > Field Hydrology
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga CMR	0052

Hātepe Process	Putanga Version	Rā whakaputa Review Date	Rā whakamutunga mō te aromatawai Last date for assessment
Rēhitatanga Registration	1	25 September 2025	N/A
Kōrero whakakapinga Replacement information	This skill standard replaced unit standard 28806.		
Rā arotake Planned review date	31 December 2030		

Please contact Muka Tangata – People Food and Fibre Workforce Development Council at qualifications@mukatangata.nz to suggest changes to the content of this skill standard.