

1XXXXX Construct hydrometric rating curves

Kaupae Level	5
Whiwhinga Credit	20
Whāinga Purpose	<p>People with this skill standard will be able to construct rating curves from hydrometric data. Learners will evaluate discharge data, develop, apply and modify rating curves, and store ratings to produce continuous streamflow records. The standard follows the national environmental monitoring standards and worksite procedures.</p> <p>This skill standard has been developed to align with the New Zealand Diploma in Field Hydrology (Level 5) [Ref: 2344].</p>

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 gauging's and related hydrometric data, field notes and site metadata.
	b. Evaluate gauging's and related hydrometric data, field notes and site metadata.
2. Construct rating curves with hydrometric data	a. Plot processed gauging's 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 gauging's 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. Compile and assign metadata for each rating curve.
	c. Apply the rating curves to streamflow time-series to compute continuous discharge from measured stages. Apply the rating curves to streamflow time-series to compute continuous discharge from measured stages. 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.

All activities relevant to this standard should reflect ngā kaupapa (the principles) o te Tiriti o Waitangi.

All activities should, as relevant to candidates and/or this standard, reflect the peoples of other cultures, and their world views.

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 gauging's and demonstrate a minimum of four changes in rating.

Definitions

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

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

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.

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

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 & Evaluate Data

- Gather sources: manual gauging's, ADCP profiles, pressure transducers, hydrographs, stage sensors.
- Assess data quality: check consistency, identify anomalies and control transitions.

Construct Rating Curves

- Fit curves using power-law regression, segmented fits, and shifted log–log plots.
- Apply conceptual control models (rectangular, trapezoidal) to derive exponent (B), coefficient (C) and offset (e).
- Use $Q=C(H-e)^B$ to define discharge–stage relationships.

Evaluate & Extrapolate

- Perform field-based checks: estimate offsets visually, detect aggradation or vegetation impacts.
- Extrapolate beyond data range using hydraulic grade line, slope–area or bathymetric methods.
- Validate fits with back-calculations and anomaly flagging.

Apply & Record Curves

- Use NEMS-compliant software (Aquarius, QRev, RRating) or spreadsheets for calculations.
- Document metadata: rating version, date, site, analyst, methods, and field photos.
- Archive curves and register updates in audit-ready storage with clear naming conventions.

Rauemi | Resources

Legislation relevant to this skill standard includes but is not limited to:

- NZHS [NZHS | The New Zealand Hydrological Society](#)
- Health and Safety at Work Act 2015 [Health and Safety at Work Act 2015 No 70 \(as at 05 April 2025\), Public Act Contents – New Zealand Legislation](#)
- National Policy Statement for Freshwater Management 2014 [National Policy Statement for Freshwater Management | Ministry for the Environment](#)
- Resource Management Act 1991 [Resource Management Act 1991 No 69 \(as at 05 April 2025\), Public Act Contents – New Zealand Legislation](#)
- Public Works Act 1981 [Public Works Act 1981 No 35 \(as at 05 April 2025\), Public Act Contents – New Zealand Legislation](#)
- Resource Management (National Environmental Standards for Freshwater) Regulations 2020 [Resource Management \(National Environmental Standards for Freshwater\) Regulations 2020 \(LI 2020/174\) \(as at 01 January 2025\) Contents – New Zealand Legislation](#)

- Freshwater Farm Plans [Freshwater farm plans | Ministry for the Environment](#)
- National Environmental Monitoring Standards (NEMS) [National Environmental Monitoring Standards » National Environmental Monitoring Standards \(NEMS\)](#)

and any subsequent amendments or replacements.

Pārongo Whakaū Kōunga | 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	Water Industry > Field Hydrology
Ko te tohutoro ki ngā Whakaritenga i te Whakamanatanga me te Whakaōritenga CMR	0232

Hātepe Process	Putanga Version	Rā whakaputa Review Date	Rā whakamutunga mō te aromatawai Last date for assessment
Rēhitatanga Registration	<type here>	[dd mm yyyy]	[dd mm yyyy]
Arotakenga Review	<type here>	[dd mm yyyy]	[dd mm yyyy]
Kōrero whakakapinga Replacement information	This skill standard will replace Unit standard 28806 Construct, apply, evaluate and store hydrometric rating curves		
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.