



Lutra.

Water Process Engineering

Process Engineering Capability Statement

Commissioning proves your plant meets consent

Water suppliers across New Zealand and Australia face the same issues: ageing treatment plants, tightening drinking-water standards, rising chemical and energy costs, and stretched budgets and crews. Getting safe, compliant water from existing assets is harder than ever.

Lutra designs, upgrades, optimises and commissions drinking water treatment plants of every scale, making treatment more reliable and compliant and even cutting chemical and energy costs, often before any capital is spent.

“Our experience with Lutra has been great. They've been very helpful and technically competent, and we couldn't have asked for a better consultant to help us with this project.”

Ian Smith, Project Manager Three Waters, Thames Coromandel District Council

Lutra's Experience Extends Beyond Process Engineering

Optimisation & Training

Improved process performance, chemical usage and more. Backed by Lutra's training options.

Commissioning

From planning, and workshop facilitation to wet and dry onsite commissioning.

Investigations & Audits

Against performance targets or compliance requirements.

Tender Support Services

Tender document writing and technical advisory support during the tender evaluation stage.

Masterplanning

Long-term master planning for water and wastewater treatment plants.

Data Management

End-to-end data management via Lutra ID, can also be used by our engineers for detailed optimisation.

2006

Founded

39

Engineers & specialists

3

Offices, NZ & Australia

100+

Plants Improved

We Work From Top to Bottom Through the Process and the Country

01

Investigate

Raw water characterisation, treatment targets, options study and MCA

02

Pilot (optional)

On-site pilot trials to confirm treatment performance on real raw water

03

Design

Detailed process design, P&IDs, functional descriptions, cost estimate

04

Deliver

Procurement support, contract administration, commissioning

05

Optimise

Setpoint tuning and ongoing performance monitoring via ID and Compass



Case Study: Online Cyanobacteria/Blue Green Algae Monitoring & Predictive Control

Kāpiti Coast District Council / Waikanae WTP, 2024 – Key Engineers – Jonathan Church, Cassandra Yang

The Waikanae River, source for a supply serving around 41,000 people, is high risk for benthic algae and cyanobacteria, including toxin-producing species, and taste and odour compounds. The primary health barrier is powdered activated carbon (PAC) dosing, which is costly and has historically relied on visual and smell assessments and delayed laboratory results.

Lutra partnered with KCDC and TriOS to trial two direct-measurement fluorometers for phycocyanin and chlorophyll-a, integrated the sensor data with plant and environmental data in Lutra's Infrastructure Data (ID), and, with Automation For Industry as our automation subcontractor, developed a PLC control algorithm that automates PAC dosing to minimise cyanotoxin risk.



\$200k

Annual PAC chemical spend the system helps manage and reduce

2 sensors

TriOS microFlu V2 fluorometers (phycocyanin & chlorophyll-a)

Year-round

Risk visibility and prediction, previously ad-hoc

Lutra's Role

- Trialed and validated the fluorometers against laboratory biovolume and cyanobacterial cell count data.
- Built predictive cyanobacteria, algae and river-health models in ID from plant and environmental data.
- Developed and deployed automated PAC dosing control, delivering cost savings while maintaining cyanotoxin risk mitigation.
- Extended monitoring beyond summer, enabling proactive year-round risk management.

This work marks a major advance in managing cyanotoxin risk at an operational level and has been presented at industry conferences.

For more information on this project watch our Lutra TV episode on the project: [Watch the Episode.](#)

Case Study: CO₂ Dosing Optimisation

Wellington Water / Te Marua & Wainuiomata WTPs, 2023 – Key Engineers – Cassandra Yang, Ivan Ottenheijm

During the 2023 national CO₂ shortage, Wellington Water faced rising cost and supply risk for the CO₂ used, alongside lime, to lift alkalinity and pH across its metropolitan supply. Holding alkalinity near 25 mg/L as CaCO₃ keeps the network non-corrosive without causing hardness or scaling, so the council needed to understand exactly where CO₂ was being used and how to safely reduce it. Lutra was engaged to investigate and optimise CO₂ dosing at the Te Marua and Wainuiomata plants.

Over an 18-month sampling and testing regime, Lutra characterised raw and treated water alkalinity and CO₂ demand across the full range of seasonal and weather conditions, using titration (dosing hydrochloric acid to a pH of 4.5) and combining the results with historic plant data in its Infrastructure Data (ID) platform. From this, Lutra's engineers derived optimal, season-aware CO₂ dose rates that hold target alkalinity and stable network pH while using far less CO₂, with downstream processes running more efficiently as a result.



30%

CO₂ reduction achieved at the Te Marua WTP

~40%

Further CO₂ reduction projected at Wainuiomata

~\$700k

Estimated annual chemical cost saving for Wellington Water

Lutra's Role

- Sampled and titrated raw and treated water across varying conditions to quantify alkalinity and CO₂ demand.
- Identified conservative CO₂ dosing and its compounding effect with lime addition.
- Optimised dosing to hold target alkalinity and network pH stability using less CO₂.
- Reduced chemical cost and exposure to CO₂ supply shortages, with no capital works.

A fast, data-driven optimisation that cut chemical cost and supply risk while protecting network water quality, with no capital spend.

For more information on this project watch our Lutra TV episode following a day in the life of a process engineer: [Watch the Episode.](#)

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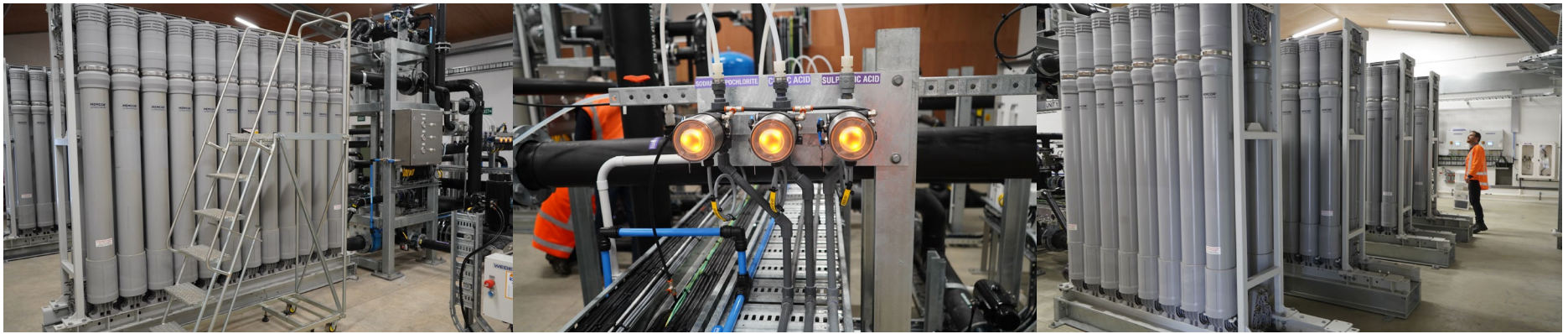
Case Study: District-Wide Membrane Filtration Rollout

TCDC / Ten Membrane Water Treatment Plants, 2017 to Present – Key Engineers - Richard Slight, Jonathan Church, Shaun Hewitt

Since 2018, Lutra has been the process engineering lead for Thames-Coromandel District Council's district-wide water treatment plant upgrade programme, working alongside TCDC staff such as Ian Smith (Engineering Project Manager) as technical partners.

Lutra supported TCDC during the tendering phase, and tender evaluation. After contractor selection Lutra provided technical expertise by reviewing preliminary and detailed process designs and facilitated HAZOPs, Safety in Designs and Software FATs.

As construction commenced Lutra provided support on site, and ensured commissioning and performance testing went smoothly, with technologies including membrane filters, UV disinfection, spin filters, chlorination, adsorption (arsenic, iron and manganese), and more, installed across 10 plants under NZS 3916 design-build contracts.



7 of 12 District WTPs

Built or planned utilising membrane filtration

0.72 to 8 ML/day

Capacity range across the membrane plants

Memcor Ultrafiltration

Multi-skid pressurised membrane systems

Lutra's Role

- Specimen design, specification development and Principal's Requirements for membrane plant procurement under NZS 3916 design-build contracts.
- Tender documentation, evaluation support, design review and construction monitoring across a concurrent multi-site delivery.
- Commissioning support for each membrane plant.
- Water Safety Plan development and review across the full programme.

Lutra remained the council's preferred process engineering partner for nine years of continuous, multi-site delivery.

Case Studies: Other Water Projects

New Zealand & Australia, 2016 to Present

Lutra has designed, upgraded, optimised and commissioned drinking water treatment plants of every scale. This section highlights Lutra's broader water experience.

Project	Client	Scope	Outcomes
Te Marua WTP Resilience & Operational Support Key Engineer: Jonathan Church	Wellington Water	Masterplanning to Commissioning Multi-year support restoring capacity at a critical metropolitan WTP, from masterplanning and DAF concept design through commissioning oversight and operational support.	Increased resilience and capacity at a critical supply asset (~\$1.8M programme).
District Cyanobacteria Management Plan Key Engineer: Richard Slight	Taupō District Council	Management Plan Prepared and updated the council's cyanobacteria management plan across its supplies.	Clear monitoring and escalation framework aligned to NZ drinking-water guidelines.
Ceramic Membrane Pilot Key Engineer: Andreas Fischer	Waipā District Council	Piloting & Innovation Built and ran a containerised silicon carbide ceramic membrane pilot on Waikato River water, achieving <0.04 NTU and high sustainable flux rates.	Evidence base and business case for ceramic membranes in New Zealand.
Drinking Water Supply Upgrades Key Engineer: Amanda Slater	Hastings District Council	Design & Delivery Programme of drinking water treatment upgrades and containerised plants supporting compliance across small communities.	Restored compliant supply across multiple communities.
Levin WTP Masterplan Key Engineer: Richard Slight	Horowhenua District Council	Masterplanning Masterplan and staged upgrade strategy for the Levin water treatment plant to meet future demand and standards.	A costed, staged pathway for the district's water supply.
Compass Predictive Coagulant Control Key Engineer: Ivan Ottenheim	Tauranga City Council	Process Control & Optimisation Deployed Lutra's Compass predictive coagulant dose-control on water treatment plants to optimise dosing to raw water quality.	Automated, sensor-driven coagulant dosing improving treated water quality and cost.
WTP Desktop Assessment and Optimisation Key Engineer: Ivan Ottenheim	Melbourne Water	Process Control & Optimisation Desktop study looking into some performance issues at Cresswell WTP, several optimisations were found and implemented.	Optimised pH Correction system, automated coagulant control and improved membrane cleaning schedule.
WTP Plant Reviews Key Engineer: Jonathan Church, Cassandra Yang	Masterton District Council	Plant Audit First Lutra assessed the annual DWQAR review and followed this with site visits and assessments.	Several gaps in operations and documentation identified. Lutra worked with council to fill these as cost effectively as possible.
Plus many more New Zealand and Australian projects across all aspects of process engineering... Just Ask			

How we work

Lutra are a team of water and wastewater experts, data analysts and developers who are all working towards Lutra's goal:

To protect water, the environment and people's health by delivering smarter solutions.

We do this by working differently, our engineers own a project meaning we don't need separate project managers, and we use an internal review system to ensure we always deliver the highest quality work.

Our engineers also have access to Lutra's own industry leading data management platform ID, along with our team of data analysts, meaning they can do more easily and usefully interrogate treatment data to inform design and optimisation work.

Meet the team - management

The people behind our water process engineering work



Jonathan Church

Technical Director Water
*MIPENZ, CPEng - BE Civil & Environmental Engineering,
University of Auckland*

15+ years designing, commissioning and operating treatment plants, with a focus on upgrading plants to meet the Drinking Water Standards and optimising existing processes.

Jonathan.Church@Lutra.com

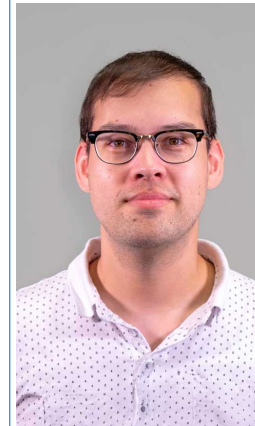


David Romilly

Chief Engineer
*CPEngNZ and CMEngNZ, PE (Oregon-USA)
BSc (Env. Engineering), Penn State University (2002)*

David brings 23 years of professional experience in wastewater treatment, civil, environmental engineering and management. He provides oversight to the engineering team.

David.Romilly@Lutra.com



Ivan Ottenheijm

Water Team Leader
*MSc Chemical Engineering,
Eindhoven University of Technology*

10 years at Lutra, from intern to Team Leader, with deep experience troubleshooting and optimising treatment and filtration performance across the Wellington region.

Ivan.Ottenheijm@Lutra.com

Meet the team -



Amanda Slater

Senior Process Engineer
MIChemE · BE (Hons), Chemical and Materials Engineering, University of Auckland (2012)

With 13 years of experience in both the pharmaceutical and water industries Amanda's process knowledge is extensive, from chemical storage and dosing, to filtration and strategic planning.

Amanda.Slater@Lutra.com



Gian Hatton

Process Engineer
BSc Chemical Engineering (2012) · Grad. Dip. Water & Waste Engineering

Water treatment process engineer with a background at Veolia and Wellington Water, spanning plant operations, optimisation and commissioning.

Gian.Hatton@Lutra.com

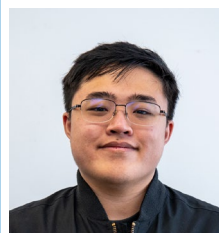


Richard Slight

Principal Process Engineer
CMEngNZ, CPEng · BE(Hons) Civil & Environmental Engineering, University of Auckland

16 years including operational roles at Veolia. Heavy involvement in plant troubleshooting, process improvement, commissioning and compliance monitoring.

Richard.Slight@Lutra.com



Bryan Mah

Process Engineer
CMEngNZ, CPEng, BE(Hons) Food Process Engineering, Massey University

Bryan has 2 years of experience as a water process engineer, getting to chance to use his skills in AutoCad, Matlab and more.

Bryan.Mah@Lutra.com



Cassandra Yang

Senior Process Engineer
CMEngNZ, CPEng, BE(Hons) Food Process Engineering, Massey University

Lutra's cyanobacteria specialist. Lead the Waikanae online monitoring trial and the Lance Creek (AU) risk assessment as well as being instrumental in the Wellington Water CO₂ reduction project.

Cassandra.Yang@Lutra.com



Chelsea Grove

Process Engineer
BSc Chemical Engineering (2012) · Grad. Dip. Water & Waste Engineering

Chelsea has 3 years of experience in the water industry. Chelsea has worked on a variety of projects across the 3 waters, from HAZOPs to P&IDS, right through to commissioning support.

Chelsea.Grove@Lutra.com

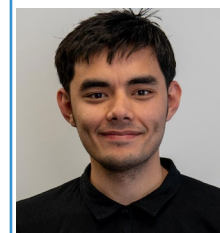


Shaun Hewitt

Senior Process Engineer
BE. Materials and Process Engineering, Waikato University (2017)

8 years of experience as a process engineer in both the dairy and water industry. He provides support from planning and project development, to on-site operations support and commissioning.

Shaun.Hewitt@Lutra.com



James Small

Process Engineer
BE. Materials and Process Engineering, Waikato University (2017)

James graduated from Canterbury University after studying Chemical and Process Engineering. James now utilises the skills and knowledge from his studies in water treatment.

James.Small@Lutra.com

Let's talk

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