



Watertech Services International Pty Ltd
Unit 2/27 Ford Road
Coomera QLD 4209 Australia
A.B.N. 85 096 320 482
A.C.N. 096 320 482
Phone: +61 7 5655 6150

Enviroswim Evidence Case Study for Education Aquatic Facilities

A concise evidence assessment for education authorities facility managers
consultants and procurement decision makers

Executive finding

The available evidence is sufficient to justify serious technical due diligence and a controlled, independently monitored education-sector installation or pilot. It is not sufficient to claim that Enviroswim will replace every treatment system at every site, or that all occupational-air and whole-of-life benefits have already been quantified.

The case rests on several independent and operational layers: Tweed Laboratory Centre efficacy testing, historical NSF and UL certification records, a large municipal-pool field record, third-party microbiological monitoring at the Sleeman Centre, and commissioned scientific review by Dr Simon Toze. Together, these records establish that Enviroswim is a tested multi-barrier treatment system with substantial operating history, not an untested mineral-pool marketing concept.

The decision in practical terms

Education decision-makers do not need to accept Enviroswim on trust. They should require the same measurable outcomes from every proposed system: microbiological control, safe chemical management, reliable operation, verifiable costs and a clear response when conditions depart from specification. On that basis, Enviroswim warrants assessment against the incumbent system under a pre-agreed protocol.

Question	Evidence based answer
Is the system technically defined	Yes. The current ES3 system combines controlled copper and silver ionisation, electronic oxidation and ultrasonics. Filtration, circulation, monitoring and incident controls remain necessary.
Has rapid microbial efficacy been demonstrated	Yes, for <i>Pseudomonas aeruginosa</i> under the reported 2001 and 2004 test conditions. The results do not prove performance against every organism or every operating condition.
Has it operated in substantial public facilities	Yes. Records include Fortitude Valley and Sleeman Centre work. These are valuable field records, although not every dataset was designed as a modern comparative trial.
Are lower chlorine and exposure benefits plausible	Yes. Lower chlorine use reduces the source inventory and formation potential for chlorine-related by-products. The precise airborne-exposure reduction still requires direct measurement.
Is further verification appropriate	Yes. A current, independently governed school-pool pilot would convert the historical evidence into site-specific procurement evidence.

What the Enviroswim system is

Enviroswim should be assessed as an integrated treatment system rather than as a standalone ioniser or ultrasonic device. The ES3 architecture combines three treatment functions:

1. controlled copper and silver ionisation to provide a measurable residual barrier
2. electronic oxidation to assist oxidation of organic contaminants and support treatment performance
3. ultrasonics to assist management of biofilm, algae and deposits

This does not remove the need for sound hydraulics, filtration, water testing, cleaning, competent operators, faecal-incident procedures or compliance with site-specific public-health and workplace duties. The defensible proposition is lower chemical dependence with multiple treatment barriers, not freedom from all chemical or operating controls.

Controlled efficacy evidence

Tweed Laboratory Centre 2001

The Tweed Laboratory Centre, a commercial unit of Tweed Shire Council, compared chlorine-only pool water with copper and silver ionised water containing the same chlorine concentrations. The cited NSW Health new-disinfection criterion was a four-log reduction in *Pseudomonas aeruginosa* within 30 seconds. [1]

Treatment at 30 seconds	Reported log reduction	Result against four log criterion
Chlorine only at 0.5 mg/L	Less than 1.87	Did not meet
Chlorine only at 1.0 mg/L	Less than 1.87	Did not meet
Chlorine only at 2.0 mg/L	Less than 1.87	Did not meet
Copper and silver plus 0.5 mg/L chlorine	2.47	Did not meet
Copper and silver plus 1.0 mg/L chlorine	4.39	Met
Copper and silver plus 2.0 mg/L chlorine	4.87	Met

What this establishes. Under the reported conditions, copper and silver ionisation materially accelerated *P. aeruginosa* reduction compared with chlorine alone at the same chlorine concentrations. It supports a synergistic multi-barrier effect. It is organism-specific laboratory evidence, not proof of universal public-pool performance.

Tweed Laboratory Centre 2004

The ES3 was then tested in two 1,500-litre spa trials. Total chlorine in both treated and untreated spas was reported below 0.01 mg/L before each trial. The treated spa recorded 4.895-log and 4.96-log *P. aeruginosa* reductions at 30 seconds, exceeding the cited four-log criterion. Counts fell below detection by two minutes in the first trial and by five minutes in the second. [2]

What this establishes. The complete ES3 treatment produced rapid *P. aeruginosa* reduction in two controlled trials without a conventional chlorine residual. It does not establish performance against viruses, protozoa or every high-bather-load condition.

Historical NSF and UL assessment

Enviroswim records include certificate 4D640-02 dated 7 May 2009 and state that the ES3 completed an NSF ANSI 50 pathway that considered sanitation efficacy, reliability, electrical safety and resistance to pool-surface staining. [3] This is material third-party due-diligence evidence. It should be described as a historical certification record unless the current listing and exact product scope are verified at the time of procurement. It is not a substitute for Australian site approval or commissioning.

Public pool case study

Fortitude Valley Aquatic Centre

The Fortitude Valley field record concerns a Brisbane municipal pool with a reported volume of 2.24 million litres. The system was installed on 14 January 2001. The pool retained sodium-hypochlorite dosing and maintained free available chlorine at the Queensland Health guideline level. The field

submission reported comparable bather loads and about 60 per cent less chlorine use than the corresponding operating period in the previous year. Copper and silver levels were generally reported around 0.3 mg/L. [4]

The report also states that coliform bacteria remained controlled and that operators observed more stable chlorine residuals. The central operational finding is therefore narrower, but important: a large municipal pool reportedly maintained the required chlorine residual and recorded bacterial control while materially reducing the amount of chlorine consumed.

Evidence limitation. The submission was prepared by Watertech and was not an occupational-hygiene study. It did not directly measure trichloramine, volatile trihalomethanes or personal breathing-zone exposure. A 60 per cent reduction in chlorine consumption must not be represented as proof of an equal percentage reduction in airborne exposure.

Sleeman Centre monitoring

Third-party laboratory reports from the Major Sports Facilities Authority at the Sleeman Centre provide field evidence across main, community, diving, toddlers, slide and waterjet pools. In the 6 April 2004 sampling round, coliforms, faecal coliforms, *P. aeruginosa* and *Staphylococcus aureus* were below 1 cfu per 100 mL in all nine sampled pool locations. Heterotrophic plate counts were also below 1 cfu per mL in most locations, with results of 6 and 3 cfu per mL in two pools. [5]

A later independent evidence review of the broader Sleeman and Chandler archive identified 208 unique pool-date entries, with all 204 reported *P. aeruginosa* results below 1 cfu per 100 mL. [6] These are strong real-world water-quality records. They do not by themselves prove causation, replace a controlled comparator, or measure occupational exposure.

Scientific assessment

Dr Simon Toze reviewed the scientific literature on chlorine, bromine, ozone, ultraviolet treatment and copper-silver ionisation for Enviroswim in 2023. He found that every treatment approach has strengths and limitations. His assessment notes that chlorine performance can be affected by pH, temperature, sunlight, organic load and cyanuric acid; that chlorine has limited effect on *Cryptosporidium* oocysts; and that chlorine reactions with organic matter produce disinfection by-products. [7]

Dr Toze also reported that copper and silver ions maintain a residual, are not photodegraded in the same way, and are not recorded in the reviewed literature as producing disinfection by-products. He found stronger performance against gram-negative bacteria than gram-positive bacteria, limited standalone viral performance, and an unresolved research gap for *Giardia* and *Cryptosporidium* under pool conditions. His separate scientific opinion concluded that the Enviroswim evidence met and exceeded the minimum chemical criteria he reviewed for public-pool operation. [8]

Disclosure. Dr Toze's work was commissioned by Enviroswim. It is specialist scientific analysis, not a regulator's endorsement. Its value lies in the literature review, stated reasoning and identified limitations.

What the evidence means for education facilities

School, university and aquatic-training pools combine public-health duties with chemical storage, staff exposure, ageing plant, operating budgets and swimmer comfort. The evidence supports five propositions that can be tested at a specific site:

- The ES3 can be assessed as a retrofit alongside serviceable circulation and filtration equipment, reducing unnecessary plant replacement where the existing plant is suitable.

- Substantial reduction in chlorine demand is operationally plausible while microbiological safeguards are retained, as demonstrated historically at Fortitude Valley.
- Rapid *P. aeruginosa* control has been demonstrated in controlled testing, and long-run public-pool records support real-world microbial control.
- Reducing chlorine demand should reduce chemical transport, storage, handling and source material available to form chlorine-related by-products, but the exposure result must be measured rather than assumed.
- Whole-of-life savings are plausible through lower chemical, water, pumping, corrosion and maintenance burdens, but each procurement decision should use a transparent site-specific model rather than a universal percentage claim.

Current education sector relevance

Enviroswim was welcomed into Education Australia's Preferred Suppliers Program in September 2026 and appears in the September 2026 Education Australia Resource Guide. [9] This provides a recognised channel to education decision-makers. It is not technical certification, government approval or a guarantee of procurement. The technical case must continue to stand on the evidence.

Common objections and evidence based answers

Objection	Evidence based answer
It is only an ioniser	Incorrect. The current ES3 is an integrated ionisation, electronic-oxidation and ultrasonic system. It must be assessed as the complete installed system.
The evidence is only manufacturer material	Incorrect, but some evidence is manufacturer-authored. The record also includes Tweed Laboratory testing, historical NSF and UL records, third-party Steeman laboratory reports and Dr Toze's commissioned scientific review.
Lower chlorine must mean lower safety	Not established. The 2001 comparison showed faster <i>P. aeruginosa</i> reduction when copper and silver were added to the same chlorine levels. The 2004 ES3 trials exceeded the four-log criterion with total chlorine below 0.01 mg/L.
The evidence is too old	Age is a limitation, not a reason to ignore the results. The historical evidence establishes technical credibility and justifies a current validation program using the production system and present regulatory criteria.
Chlorine has a longer history	True, but familiarity is not a complete performance comparison. The correct test is current whole-system evidence under comparable conditions.
The air-quality benefit is unproved	Correct. Lower source use makes the benefit plausible, but representative waterline, deck, plant-room and personal breathing-zone monitoring is still required.
Certification settles the question	No. Historical certification strengthens due diligence but does not replace site design, public-health requirements, commissioning or ongoing monitoring.
The operating savings are guaranteed	No. Savings depend on pool size, bather load, climate, existing plant, tariffs, labour and maintenance. A site-specific baseline and whole-of-life comparison are required.

A defensible education sector pilot

The most credible next step is not a broad promise or an argument about banning chlorine. It is a transparent, independently governed comparison at a suitable education aquatic facility.

Workstream	Minimum evidence
Baseline	Pool design, hydraulics, bather load, water chemistry, microbiology, chemical consumption, pump hours, energy, water use, labour, faults, maintenance and ventilation.
Microbiology	Independent accredited sampling for applicable indicator organisms, with predefined limits, corrective actions and reporting of favourable and adverse results.
Water treatment	pH, ORP where relevant, copper, silver, TDS, turbidity, residual chemicals, combined chlorine and operating deviations.
Occupational hygiene	Task-based and personal breathing-zone monitoring for relevant chlorine-related contaminants, supported by fixed-location measurements and ventilation data.
Asset condition	Corrosion-sensitive equipment, surfaces, filters, pumps, controls and maintenance interventions documented before and during the trial.
Economics	Capital, consumables, chemicals, electricity, water, wastewater, labour, servicing, downtime and component replacement using disclosed assumptions.
Governance	Pre-agreed protocol, independent sampling and reporting, clear conflict disclosures, preserved raw data and publication of limitations.

Recommended decision

The evidence does not support dismissing Envirosxim as an unproven concept. It supports placing the current ES3 through a transparent site-specific evaluation against the incumbent treatment pathway. A decision-maker can remain sceptical and still reach the rational conclusion that the evidence deserves independent testing.

The appropriate procurement position is therefore:

- do not rely on generic claims from Envirosxim or any competitor
- verify the current product configuration, certification scope and applicable legal requirements
- compare complete treatment pathways against the same microbial, safety, operational and cost outcomes
- use a controlled pilot where site-specific uncertainty remains
- allow measured performance, including adverse results, to determine the decision

Evidence boundaries

This paper does not claim that Envirosxim eliminates all pathogens, is universally chlorine-free, removes the need for filtration or incident controls, or is suitable for every pool without engineering review. It does not claim that the Valley record measured airborne contaminants, that Education Australia has technically certified the system, or that historical NSF certification proves current Australian site compliance. These boundaries are deliberate. They preserve the credibility of the findings that are supported.

Source register

- [1] Tweed Laboratory Centre, Paul Wright PhD, *Pseudomonas aeruginosa* Disinfection in Swimming Pool Water Laboratory Efficacy Testing, August 2001, especially Experiment B and discussion.
- [2] Tweed Laboratory Centre, Dr PJ Wright, *Pseudomonas aeruginosa* Disinfection in Spa Pools, report dated 6 May 2004.
- [3] NSF and UL certificate record 4D640-02, dated 7 May 2009, and Enviroswim Independent Testing and Accreditation Summary, June 2026. Current listing and precise scope should be checked during due diligence.
- [4] Watertech Services International, Efficacy of Enviro-Swim Systems with Reduced Chlorine Usage on Disinfection and Operation of a Municipal Swimming Pool, Fortitude Valley field-trial submission and retained project record.
- [5] SAS Laboratory, Microbiology Unit Report for Major Sports Facilities Authority, Sleeman Centre, batch 04/03474, sampling 6 April 2004, report 20 April 2004.
- [6] Enviroswim Independent Deep Dive, 3 September 2026, review of the broader Sleeman and Chandler archive and limitations.
- [7] Dr Simon Toze, Urban Water Futures, Evaluation of the Effectiveness and Issues of Different Swimming Pool Disinfection Processes, 30 June 2023.
- [8] Dr Simon Toze, Urban Water Futures, Scientific opinion on efficacy of Copper Silver Ion Disinfection system used in Enviroswim ES3 pool disinfection system, 24 June 2023.
- [9] Education Australia, Welcome to the Preferred Suppliers Program email, 2 September 2026; Education Australia Funding and Resource Guide, September 2026, printed pages 212 to 213; Enviroswim Education Market Review, 3 September 2026.
- [10] Watertech Services International trading as Enviroswim, Supplementary Submission Following WorkSafe Victoria FOI Release, 18 September 2026.

Document status

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