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Evidence-Based Critique of DR AS 3633:2026

Why the draft should be corrected, independently reviewed and reissued before finalisation

Prepared by Watertech Services International Pty Ltd / Enviroswim

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Prepared for the DR AS 3633:2026 public-comment record

AUSTRALIAN GOVERNMENT CHEMICAL SECURITY VIDEO: Central evidence concerning chemical diversion and deliberate misuse. Direct link: https://www.youtube.com/watch?v=-7LQImWtrJg

Purpose, scope and legal caution

This document provides a public-interest critique of the text published as DR AS 3633:2026, Residential and public pools - Water quality. It draws on the draft, Enviroswim's earlier correspondence and formal submissions, the responses received, and authoritative pool-water efficacy sources. It is intended to assist public scrutiny and the Standards Australia public-comment process.

> **Good-faith statement:** This review does not allege corruption, dishonesty, collusion, improper motive or personal bad faith. It does not assert that committee members lack qualifications, that every chlorine system is ineffective, or that every alternative system is safe or suitable. It does not ask Standards Australia to endorse Enviroswim. It identifies document defects, evidence questions, internal contradictions and foreseeable practical consequences and asks for independent, reasoned resolution.

Where this review discusses practical market exclusion, regulatory adoption or competition effects, those matters are presented as documented experience, concerns or reasonable inferences. Where it discusses APVMA records, the controlled proposition is that the efficacy material requested by Enviroswim was not identified or provided in the responses reviewed; this document does not assert that no other evidence exists. The APVMA's 2020 cancellation decisions applied to the specified products and labels listed in that decision. This review does not convert those product-specific decisions into an unsupported conclusion about every possible formulation or use of hydrogen peroxide or PHMB.

Executive conclusion

DR AS 3633:2026 should not be finalised in its present form.

The draft contains constructive language about performance-based regulation and innovation, but central normative provisions remain chlorine-centred, internally inconsistent and unequal in their evidentiary treatment. A supposedly microbiological table contains no microbiological criteria. A novel validation pathway is imposed only on alternatives, uses incomplete methods and relies partly on inapplicable or superseded sources. Detailed by-product assessment is applied to alternatives while recognised chlorination by-products are not treated equivalently. For outdoor pools the draft promotes cyanuric-acid stabilisation without connecting nominal free chlorine to demonstrated field efficacy under Australian sunlight, bather waste, organic demand and biofilm.

The evidence problem is no longer abstract. APVMA's current guidance says laboratory and actual-use field components are both important, while the draft does not identify the reports and full-scale field trials supporting its conventional benchmark. APVMA also cancelled the registrations and labels of specified hydrogen-peroxide and PHMB pool/spa products in 2020, yet the draft makes favourable statements about those chemistries without explaining the regulatory history. These are objections to a draft that seeks primary national and regulatory authority before its conformance criteria, evidence

pathways and internal logic are settled. The sound course is correction, disclosure, independent review and renewed public comment.

1. Why this public record matters

The final paragraph of the draft Introduction states that the document is intended to influence legislative and regulatory requirements and that regulators and industry are expected to look to AS 3633 as the primary technical reference. That statement is important. It confirms that foreseeable use extends well beyond optional guidance between willing private parties.

Australian Standards may be formally voluntary unless adopted through law, contract or specification. In practice, designers, engineers, certifiers, councils, facility owners, insurers, consultants and procurement officers often rely on them as the safest professional and liability position. Enviroswim has raised this practical gatekeeper effect for months. The draft now expressly anticipates regulatory influence, making evidence traceability, technology neutrality and internal consistency matters of direct public importance.

2. Enviroswim's standing and evidence

Watertech Services International Pty Ltd developed and manufactures Enviroswim, a multi-barrier pool-water treatment system using controlled copper and silver ionisation, electronic oxidation and ultrasonic treatment. The system is not properly described as a generic mineral pool or as ionisation operating in isolation. Enviroswim has operated for approximately 25 years in residential, commercial and public-pool settings and has been exported internationally.

The evidence previously offered includes independent Tweed Laboratory efficacy testing, NSF/ANSI 50 certification, public-pool field monitoring, long-term operating records and technical reports by Dr Simon Toze, an experienced water microbiologist. This material does not entitle Enviroswim to automatic approval. It does entitle the evidence to a transparent, technically competent and equal assessment against criteria that are also applied fairly to incumbent technologies.

3. Prior engagement before publication of the draft

The present criticism did not arise after seeing an unfavourable draft. Enviroswim raised the same principles before publication and offered assistance. The following chronology is drawn from the correspondence and submissions retained by Enviroswim.

> **11 March 2026 -** Enviroswim wrote to Standards Australia offering Dr Simon Toze as an independent scientific resource and raising unequal evidentiary treatment of legacy and newer sanitation technologies.
>
> **25-26 March 2026 -** Standards Australia acknowledged the revision and described its intended direction as performance-based, with public comment to follow.

April 2026 - Meetings and correspondence addressed scientific expertise, the practical use of standards, disinfection by-products, workplace exposure and the need for transparent public scrutiny.

1 June 2026 - Enviroswim sent a structured set of questions concerning the evidence relied upon for chlorine, the APVMA record, committee capability, international guidance and the practical quasi-mandatory effect of AS 3633.

24 June 2026 - Standards Australia advised that further consultation with Technical Committee CS-061 had been undertaken and that a response would follow.

10 July 2026 - Enviroswim submitted a formal complaint under Standards Australia Complaints Policy PO 700 concerning evidence, governance, market effect, complaint handling and the treatment of alternatives.

15 July 2026 - Enviroswim sought escalation and independent review after rejecting closure of the unresolved issues.

7 August 2026 - A governance referral sought independent assurance concerning process, capability, evidence traceability, competing interests, competition safeguards and complaint-review independence, expressly without alleging misconduct.

August 2026 - DR AS 3633:2026 was published for public comment, allowing the earlier concerns to be tested against the actual proposed text.

4. What the draft gets right

A fair review should acknowledge genuine improvements. The draft recognises that treatment should be performance-based, expressly refers to innovation and alternative systems, creates Appendix I, recognises existing data in principle, and requires accredited microbiological analysis for specified results. It also acknowledges several facts often lost in marketing or conventional practice: chlorine residual does not reliably control Cryptosporidium; chlorination creates chloramines and other by-products; indoor-air exposure matters; and so-called magnesium or mineral electrolysis produces chlorine from chloride.

Those acknowledgements are welcome. The problem is that the operative requirements do not consistently follow them. The draft opens an alternative door in principle while several other clauses close it in practice.

5. Critical defect: the microbiological table is missing

Clause 3.1.4 says that microbiological parameters and acceptance criteria in Table 3.1.4 shall be used to assess conformance. The table is titled 'Microbiological criteria for all facilities'. It does not

contain microbiological criteria. It repeats the supplementary-sanitizer table, listing chlorine dioxide, hydrogen peroxide, polyhexamethylene biguanide, UV, advanced oxidation, ozone and ionisation.

This defect is central. Clause 6.3.4 and Appendix I depend on the absent criteria. The public cannot assess whether proposed sampling, detection limits, corrective actions or treatment pathways are appropriate because the controlling limits are simply not present. Correcting the table after public comment without renewed consultation would deny stakeholders the opportunity to comment on a material normative provision.

Required response: Correct Table 3.1.4, audit every dependent cross-reference and reissue the draft for a renewed public-comment period.

6. Performance-based in language, chlorine-centred in operation

Clause 3.1.1 says sanitizers must meet the minimum efficacy of 1.0 ppm free available chlorine. A concentration is not an efficacy outcome. Actual performance depends on organism, contact time, pH, cyanuric acid, organic demand, temperature, hydraulics and the treatment train. If chlorine is to be used as a comparator, the comparison must specify those conditions.

Clause 3.2.2 then requires all residential pools to conform to Table 3.1.2(B), which contains chlorine and bromine concentrations. Clause 3.1.3 requires a primary sanitizer with a measurable residual. Appendix B says ionic purifiers need an undefined 'approved sanitizer'. Clause 8.3.7 first says alternative treatment must support and not replace the required primary residual, then later says replacement may occur if validated.

These provisions make Appendix I uncertain. A manufacturer may complete the new pathway only to be told that chlorine or bromine remains mandatory under another clause. Technology neutrality cannot rest on a general statement of intent; it must be evident in the operative rules and their order of precedence.

7. Unequal evidentiary treatment

Appendix I defines an alternative system by contrast with conventional chlorine or bromine residual and then requires the alternative to complete a 21-day simulated-use assessment, bacterial and viral challenges, protozoan confirmation, toxicological analysis and by-product assessment. Conventional systems are not required by Appendix I to do the same. They receive deemed acceptance because of a stated long-established efficacy record.

Long operating history is relevant evidence, but it is not self-validating. It does not answer how efficacy changes with stabiliser, pH, bather load, equipment failure or biofilm. It also does not answer current questions about chloramines, volatile by-products or occupational exposure. If conventional systems

are exempted, the evidence and operating assumptions supporting the exemption should be published and capable of review.

The asymmetry is particularly clear in Tier 3. Every alternative must assess by-products, inhalation, dermal exposure and genotoxicity. The draft's own notes acknowledge that chlorination produces trichloramine and trihalomethanes, but the same normative assessment is not applied to conventional chlorine pools. Equal risk should attract equal scrutiny.

8. Outdoor chlorine, cyanuric acid and the real-world treatment burden

Sunlight rapidly degrades unstabilised chlorine, so outdoor-pool operation in Australia commonly depends on cyanuric acid. The draft itself says a minimum cyanuric-acid concentration is required for sunlight protection, recommends a 5-50 mg/L range, says stabilised chlorine is less effective than unstabilised chlorine, and warns that high concentrations compromise disinfection. Appendix D goes further: at 30-50 mg/L cyanuric acid, hypochlorous acid may be of the order of only 1% of the measured free available chlorine.

That creates a material distinction between a convenient test reading and the immediately active disinfectant fraction. Fixed free-chlorine bands cannot by themselves demonstrate an equivalent microbial outcome across changing cyanuric acid, pH, temperature, sunlight, organic demand and contamination. The draft should identify the laboratory evidence and Australian-relevant field trials that support its operating ranges and contact-time assumptions.

The whole treatment system must also be assessed. Stabilisation may lead to higher free-chlorine targets or reliance on superchlorination, supplementary oxidation, algaecide, pH correction and periodic dilution or water replacement, depending on conditions. The Standard should state when those interventions are expected, record them in efficacy trials, and assess their chemical-handling, disinfection-by-product, cost and water-use consequences. This is not an argument that cyanuric acid should never be used; it is an argument that sunlight protection and microbial inactivation must be evaluated together.

9. The benchmark evidence and APVMA regulatory record must be disclosed

APVMA describes the efficacy of traditional chlorine and bromine sanitisers against different kinds of pathogens as well established. That general statement is relevant evidence, but it is not a substitute for identifying which product, formulation and operating conditions support this draft's precise benchmark. APVMA also says every new pool and spa sanitiser product must demonstrate efficacy, encourages a combination of laboratory and field trials, and says both components are important. Its field guidance calls for independent trials at busy public pools with significant and variable bather

load, under actual-use conditions, for not less than six months. It also calls for reporting stabilised versus unstabilised chlorine, other chemicals, rainfall, daily bather loads, residual, pH and microbiological results.

DR AS 3633:2026 does not identify the efficacy reports or field trials used for chlorine under its prescribed free-chlorine, cyanuric-acid, pH and operating ranges. Nor does it put a conventional chlorine control through the same 21-day degraded-water and biofilm protocol required of alternatives. That omission is especially important because Appendix I itself says residual disinfectants only partially control biofilm, that biofilm-associated bacteria may be 150 to more than 3,000 times more resistant to hypochlorous acid, and that established biofilm may require superchlorination or other remediation.

The draft also requires direct reconciliation with APVMA's final decisions of 28 July 2020. Those decisions cancelled the registrations and labels of specified hydrogen-peroxide and polyhexanide-hydrochloride pool/spa products after findings that the products did not meet applicable safety and labelling criteria. APVMA reported inadequate antibacterial performance for the specified hydrogen-peroxide products and inadequate anti-Legionella performance for the specified PHMB products. Table 3.1.3 and Appendix B nevertheless permit or describe those chemistries favourably without discussing the decisions.

Required evidence response: Publish an evidence map for every conventional or supplementary sanitiser recommendation, including organisms, log reductions, contact times, formulation, pH, cyanuric acid, demand, temperature, controls and full-scale field conditions. Reconcile the hydrogen-peroxide and PHMB provisions with the APVMA 2020 product-specific decisions, including any material differences in concentration, combination, function or claim. Where reports are confidential, provide an independently reviewed non-confidential assessment with sufficient detail for meaningful scrutiny.

10. The bacterial benchmark is materially weaker than the cited pool guidance

Clause I.5.2 requires a reduction of at least 3-log within 60 minutes from a starting bacterial concentration of at least 10^6 CFU/mL. Mathematically, a 3-log reduction can leave 10^3 CFU/mL. The clause does not add a final acceptable concentration tied to the missing Table 3.1.4.

OECD Guidance Document 170 lists 4-log reduction for E. coli, Pseudomonas aeruginosa, Legionella pneumophila and Staphylococcus aureus within 30 seconds, and 4-log Enterococcus faecium within two minutes. It also specifies duplicate trials, controls, accredited independent laboratory work and a full-scale field phase of not less than three months. DR AS 3633:2026 does not reproduce those safeguards while saying its pathway harmonises with OECD guidance.

A slower alternative might be acceptable in a properly evidenced multi-barrier system, but the chosen outcome cannot simply be declared equivalent to chlorine. The draft must show the risk model, comparative data and independent validation supporting the 3-log/60-minute criterion.

11. The Appendix I method is not yet a complete reproducible standard

The 1,000 L, 21-day simulated-use trial may contain useful ideas, including degraded water, repeated challenge and biofilm coupons. However, no validation study, inter-laboratory comparison, precision and bias statement or repeatability and reproducibility data are provided. Critical matters such as mandatory controls, replicate numbers, statistical acceptance, uncertainty, witnessing, data integrity and laboratory scope are incomplete.

The body-fluid analogue expressly contains constituents that bind copper and silver and says it stress-tests ionisation. Yet a conventional chlorine control is not mandatory under the same conditions. A test designed to stress one technology class may still be scientifically justified, but only if comparative controls demonstrate a fair and representative challenge.

The Tier 2 bench method creates another problem. Conditioned water is removed from the rig and transferred to a containment facility. Equipment-bound processes - UV, ultrasonics, electrochemical oxidation and in-line advanced oxidation - may no longer act on the sample. The result may measure residual substances in the water rather than the complete treatment system.

A valid multi-barrier test must preserve hydraulics, energy input, active generation and exposure conditions or use a validated scaled apparatus that reproduces them. Without that, the pathway may disadvantage the very innovative systems it claims to recognise.

12. Protozoan requirements are incomplete and out of context

Clause I.5.3 applies 2-log Cryptosporidium and 3-log Giardia requirements to all alternative systems, including residential pools. It does not adequately specify the organism or surrogate, inoculum, viability method, contact time, per-pass or system-wide basis, replicates, or how filtration and supplementary processes may be combined.

The 2-log figure is taken from the US Model Aquatic Health Code secondary-treatment provision for public aquatic venues other than interactive water play. The current 2024 MAHC applies a 3-log per-pass requirement to interactive water play and 2-log per pass to other public aquatic venues, within a broader design and flow framework. Transplanting that number into every alternative residential and public system changes its context.

The draft itself admits that conventional chlorine residual does not control Cryptosporidium. It is therefore difficult to justify a universal protozoan proof burden for alternatives without an equivalent risk-management requirement for conventional systems.

13. Incorrect and superseded external sources

Table I.1 uses US EPA OCSPP 810.2200 as the viral basis. That guideline concerns disinfectants for hard surfaces. The EPA identifies OCSPP 810.2600 as the guideline for disinfectants and sanitizers used in water. A hard-surface reduction criterion is not automatically a pool-water criterion.

The draft also cites the 2023 fourth-edition MAHC. CDC states that the current edition is the 2024 fifth edition and that it replaces all earlier editions. A 2026 Australian draft intended as a primary technical reference should use the current source and accurately preserve its scope.

14. Disinfection by-products and occupational exposure

Sections 7 and Appendix D recognise chloramines, trichloramine, trihalomethanes, respiratory irritation and indoor-air effects. This is an improvement over treating water chemistry as separate from air quality. However, the draft does not establish routine numeric by-product or air-monitoring requirements, and its most detailed toxicological requirements apply only to alternatives.

For indoor pools, worker and bather exposure can occur above the water surface and within plant rooms. Ventilation and personal protective equipment are not substitutes for preventing or reducing hazardous generation where practicable. The Standard should use a hierarchy-of-control approach: minimise formation at source, verify water and air conditions where risk warrants, and then use engineering, operational and personal controls.

Chemical-handling requirements should also extend beyond public-pool employees to pool shops, warehouses, mobile service vehicles and residential service work. Training should mean demonstrated competency, not merely attendance.

15. Chemical security is a distinct risk omitted from the draft

The Australian Government's chemical-security program identifies pool chemicals and bleaches among chemicals of security concern. Its public and retailer materials identify suspicious acquisition without a clear purpose, unusual possession or storage, missing or stolen chemicals, stock discrepancies and suspicious behaviour around chemical stores. The Australian Government video supplied with this submission graphically communicates the possible consequences of deliberate misuse.

Australian Government Chemical Security Warnings video:

https://www.youtube.com/watch?v=-7LQImWtrJg

DR AS 3633:2026 does address accidental chemical hazards. Clauses 4.1.5 and 4.1.7 require no-flow protection and fail-safe dosing; Section 5 requires locked storage, segregation, separate bunding, ventilation, training and emergency procedures. Those are important provisions. WorkSafe Victoria has recorded why they matter: an electrical fault at an aquatic centre caused hypochlorite and

hydrochloric acid to be dosed without flow, producing toxic chlorine gas and injuring employees and patrons.

But accidental incompatibility and chemical security are not the same risk. The draft does not expressly address suspicious acquisition, inventory discrepancies, theft, tampering, diversion, deliberate misuse or security of concentrated chemicals carried in service vehicles. A locked cabinet is useful, but it does not by itself provide stock accountability, escalation or reporting. The draft also gives no reasoned scope statement explaining why this risk category has been excluded.

Required chemical-security response: Add proportionate controls for public pools and pool-industry workplaces: controlled access; inventory accountability scaled to chemical, concentration and quantity; investigation and escalation of unexplained loss, theft or tampering; staff awareness of suspicious behaviour; secure service-vehicle storage; and reporting pathways consistent with Australian Government chemical-security guidance and applicable WHS, dangerous-goods and transport duties. If chemical security is intentionally outside scope, say so expressly and insert a normative cross-reference to the applicable framework.

16. Natural and mineral pools expose further inconsistency

Natural pools are included in scope, but Appendix G is informative and nevertheless says that major normative chemical requirements do not apply. That is structurally unsound. If natural pools are to have a different risk pathway, it should be defined in the normative body with clear microbiological limits and monitoring.

Appendix H is useful in one important respect: it explains that magnesium or potassium chloride electrolysis produces chlorine from chloride. That supports accurate consumer understanding of mineral-pool systems. The same appendix, however, lists improved clarity, reduced skin and eye irritation and enhanced comfort without identifying supporting evidence. A normative Standard should not reproduce marketing-style benefit claims unless they are substantiated.

17. Published committee representation does not resolve the expertise question

The draft lists representation from Accord Australasia, Aquatic Recreation Network Australia, the APVMA, the Australian Swim Schools Association, the Western Australian Department of Health, Royal Life Saving Society Australia and SPASA Australia. This records organisational representation. It does not publish a discipline matrix demonstrating independent capability in water microbiology, toxicology, occupational hygiene, consumer interests, competition effects or alternative multi-barrier treatment.

That observation is not an allegation that individual members lack relevant qualifications. The qualifications have not been demonstrated through the published list. Because the draft creates a

novel biological and toxicological approval pathway and seeks regulatory influence, an independent multidisciplinary review is warranted before major comments are resolved.

18. Earlier concerns compared with the published draft

Earlier concern	Draft response	Remaining problem
No genuine pathway for alternatives	Appendix I has been added.	Other normative clauses can still require chlorine/bromine or a conventional primary residual.
Unequal proof burden	Alternatives receive a detailed three-tier test.	Conventional systems are exempted on historical-record grounds and do not face equivalent Tier 3 assessment.
Lack of independent expertise	The draft refers to contemporary science and expert knowledge.	The published committee list does not demonstrate the multidisciplinary capability needed for the novel method.
Chlorine treated as the benchmark without transparent proof	Appendix I states that alternatives must perform like chlorine.	The benchmark is weakened to 3-log/60 minutes and the complete evidence map for conventional deemed acceptance is not published.
Outdoor chlorine depends on stabiliser	The draft recognises sunlight loss and cyanuric-acid effects.	No validated free-chlorine/cyanuric-acid performance relationship or Australian field evidence is identified, and the full secondary-chemical burden is not assessed.
Regulatory efficacy concerns must be reconciled	Hydrogen peroxide and PHMB appear in Table 3.1.3 and Appendix B.	The draft does not address APVMA's 2020 cancellation decisions for the specified hydrogen-peroxide and PHMB pool/spa products and labels.
DBPs and workplace exposure fragmented	The draft acknowledges DBPs, trichloramine and air effects.	Numeric monitoring and equivalent lifecycle assessment for conventional chlorination remain absent.
Chemical-security risk not integrated	The draft requires locked storage and controls accidental mixing.	It does not address suspicious acquisition, missing stock, theft, tampering, diversion, deliberate misuse or security reporting.
Standards operate as practical market gatekeepers	The Introduction now says the Standard is intended to influence legislation and become the primary technical reference.	The draft does not match that intended authority with adequate evidence transparency, consistency and competition safeguards.

Comparison based on Enviroswim correspondence and submissions from March-August 2026 and DR AS 3633:2026.

19. Market access, competition and innovation

A Standard can favour an incumbent treatment model without naming a brand. It can do so through definitions, residual requirements, accepted technology categories, test burdens, deemed-to-satisfy status or the absence of a workable equivalence route. These mechanisms matter because specifiers and procurement bodies frequently treat Australian Standards as the safest defensible position.

Enviroswim has previously reported exclusion from specifications, tenders and projects where chlorine-centred requirements or interpretations of AS 3633 operated as an effective barrier. This review does not make a final damages claim and does not allege an unlawful purpose. It asks Standards Australia to assess foreseeable competitive effects and ensure that equivalent performance receives equivalent treatment.

The appropriate safeguard is not lower public-health protection. It is one transparent standard of proof, proportionate to risk and claimed use, with recognition of reliable existing evidence and reasoned decisions capable of scrutiny.

20. Evidence Enviroswim is prepared to place before the process

Tweed Laboratory ES1 and ES3 efficacy reports, including the reported rapid Pseudomonas results.

NSF/ANSI 50 certification and associated independent testing records.

Dr Simon Toze's technical reports, qualifications and availability for independent scientific engagement.

Historic and ongoing field-monitoring records from public, hospitality and wellness settings.

APVMA correspondence and FOI records showing what evidence was and was not identified in response to Enviroswim's requests.

APVMA's current pool-and-spa efficacy guidance and its final regulatory decisions of 28 July 2020 for the specified hydrogen-peroxide and PHMB products and labels.

Comparative material on chloramines, disinfection by-products, indoor-air exposure, chemical handling, corrosion and operating conditions.

Australian Government chemical-security awareness material and the linked Chemical Security Warnings video, together with pool-industry chemical-security and incident-control submissions made during August 2026.

This material should be assessed for quality, relevance and limitations. Enviroswim does not contend that historic evidence answers every modern question. It contends that accredited, certified and field evidence should not be ignored while less transparent historical acceptance is sufficient for incumbents.

21. Requested corrective action

1. Do not finalise DR AS 3633:2026 in its present form.
2. Correct Table 3.1.4 and every dependent cross-reference, then reissue the draft for renewed public comment.

3. Resolve the conflict between Clauses 1.2 and 1.5, Section 3, Appendix B, Clause 8.3.7 and Appendix I through a clear precedence rule.
4. Replace chlorine concentration as the definition of efficacy with objective, validated performance outcomes.
5. Publish the laboratory and full-scale field evidence used for every conventional benchmark, including performance under cyanuric acid, sunlight, organic demand, bather waste and biofilm conditions and disclosure of secondary chemicals or remediation used.
6. Reconcile Table 3.1.3 and Appendix B with APVMA's 2020 final decisions for the specified hydrogen-peroxide and PHMB products and labels; remove or qualify any claim that is not supported for its exact formulation, concentration, function and use.
7. Apply equivalent efficacy, by-product and lifecycle evidence requirements to conventional and alternative treatment systems, or publish the evidence justifying each exemption.
8. Independently validate Appendix I, including complete-system operation, controls, replication, statistics, uncertainty and inter-laboratory reproducibility.
9. Use current and applicable external sources, including water-specific EPA guidance and the 2024 MAHC, and explain departures from OECD Guidance Document 170.
10. Create risk-scaled pathways for residential, public and high-risk venues and a documented process for recognising existing NATA, ISO 17025, NSF/ANSI 50 and field evidence.
11. Apply disinfection-by-product and occupational-exposure controls consistently and use source reduction as part of the control hierarchy.
12. Address chemical security as a distinct foreseeable risk through proportionate access, inventory, loss, tampering, suspicious-behaviour, transport and reporting controls, or expressly define the scope boundary and normatively cross-reference the applicable Australian framework.
13. Publish a de-identified committee capability matrix and obtain independent multidisciplinary review before resolving critical technical comments.
14. Publish reasoned dispositions for all major public comments and identify the evidence relied upon.

22. Conclusion

The draft represents an important opportunity to replace a 1989 document with a national framework suited to modern public health, treatment technology and workplace expectations. That opportunity should not be lost through premature finalisation.

The strongest criticism of DR AS 3633:2026 does not require speculation about motives. It is visible in the document itself: the principal microbiological table is absent; the alternative route conflicts with other normative clauses; conventional and alternative systems face different proof burdens; the claimed scientific harmonisation is incomplete; the outdoor chlorine benchmark is not connected to disclosed cyanuric-acid and field evidence; directly relevant APVMA product decisions are not addressed; recognised chlorination risks are not treated on the same normative basis as alternative-system risks; and chemical security is omitted as a distinct foreseeable risk category.

Standards Australia should correct the draft, expose the evidence and reasoning to proper review, obtain independent scientific assurance and reopen public comment. That would protect public health, strengthen confidence in Australian Standards and ensure that established and innovative technologies compete on demonstrated performance rather than inherited assumptions.

Appendix A - Principal clauses requiring correction

Introduction (p. vi) - Regulatory intent and practical authority: Retain the acknowledgement of intended regulatory use, but add an explicit commitment that prescriptive requirements, exclusions and deemed-to-satisfy pathways are supported by transparent evidence and do not impose unequal burdens on competing technologies. Publish an evidence map for all critical treatment requirements before finalisation.

1.2 and 1.5 (p. 1 and 8) - Make the alternative pathway controlling and effective: Insert a controlling provision: 'Where a system demonstrates conformance under Appendix I, requirements expressed solely as a chlorine or bromine concentration or a conventional primary sanitizer residual do not apply unless Appendix I expressly provides otherwise.' Identify every displaced provision in a normative schedule.

1.4.13 (p. approximately 5) - Strengthen the competent-person definition: Require documented, task-relevant competency and verification. For chemical handling, storage, transport and dosing, identify applicable nationally recognised competency or an objectively equivalent assessment, with refresher and recordkeeping requirements.

2.1.2(c) (p. approximately 9) - Remove the universal residual-sanitizer assumption: Replace the technology-specific assumption with a requirement to maintain the validated control parameter or measurable indicator specified for the treatment system. Where a residual is necessary to the validated design, require it; where another control strategy is validated, allow that strategy.

3.1.1 (p. 18) - Do not define efficacy by chlorine concentration: Replace the sentence with objective microbiological and system-performance outcomes, including specified organisms, reductions, timeframes and validated operating conditions. Chlorine may be used as a comparative control, but not as the definition of efficacy.

3.1.2 and 3.2.2 (p. 18-25) - Prevent Table 3.1.2(B) from nullifying Appendix I: State that Table 3.1.2(B) applies to chlorine- and bromine-based systems. Add a separate row or cross-reference for Appendix I validated systems, requiring operation within their validated range and compliance with the completed microbiological criteria.

3.1.3 (p. 23) - Clarify supplementary-sanitizer requirements: Rewrite the clause so that supplementary processes are optional or required only where the system design, risk category or validated treatment train calls for them. Separate conventional supplementary treatment from Appendix I alternative treatment.

Table 3.1.3 (p. 23) - Remove technology exclusion from Table 3.1.3: Replace categorical acceptance or rejection by technology with a cross-reference to uniform performance and validation requirements. If a limitation is retained, publish the evidence and risk assessment supporting it and explain how a validated multi-barrier system may qualify.

3.1.4 and Table 3.1.4 (p. 24) - Restore the missing microbiological criteria: Withdraw the defective table, insert the intended microbiological criteria with methods, units, sampling rules and actions, conduct a full cross-reference audit, and reissue the corrected draft for a renewed public-comment period.

5.3.5 (p. approximately 36) - Require demonstrated chemical-handling competency: Extend the requirement to all workplace handling of pool chemicals and require documented competency, refresher training, segregation knowledge, spill response and applicable transport controls. Distinguish attendance at a workshop from verified competency.

Section 5 and whole document (p. 32-37 and whole document) - Address chemical security, diversion and deliberate misuse: Add a proportionate, risk-based chemical-security provision for public pools and pool-industry workplaces. Require controlled access, inventory accountability appropriate to quantity and concentration, investigation of unexplained losses or tampering, staff awareness of suspicious behaviour, escalation and reporting arrangements, and security of chemicals in transit or service vehicles. Cross-reference current Australian Government chemical-security guidance and applicable work health and safety, dangerous-goods and transport duties. Clarify that ordinary residential obligations remain proportionate to risk.

6.3.4 (p. approximately 46) - Repair the microbiological-testing cross-reference: Complete Table 3.1.4 and state the required organisms, methods, sampling frequency, detection limits, corrective actions, closure criteria and reopening verification. Revalidate every related cross-reference.

Section 7 and Appendix D (p. 49-58 and 92-99) - Apply by-product and air-exposure controls to all systems: Introduce risk-based source-control and monitoring requirements for disinfection by-products and indoor-air exposure. Apply an equivalent Tier 3 or lifecycle assessment to every oxidative treatment route, including conventional chlorination, with requirements scaled to pool type and indoor exposure risk.

8.3.7 (p. 65) - Resolve the contradiction in alternative-system operation: Rewrite the clause into two unambiguous pathways: supplementary systems that do not replace the primary residual, and Appendix I validated alternative systems that may replace it. Define fallback and alarm requirements for each pathway without assuming chlorine is always the fallback.

Appendix B (p. approximately 74-86) - Remove undefined chlorine-centric language in Appendix B: Replace 'approved sanitizer' with a defined treatment requirement linked to the validated system design. Ensure Appendix B does not impose a blanket rule inconsistent with Clauses 1.2 and Appendix I.

Table 3.1.2(B), Appendix B and Appendix D (p. 18-22, 74-86 and 92-99) - Address cyanuric-acid effects in the operative criteria: Provide an evidence-based operating relationship between free chlorine, cyanuric acid, pH, temperature, organic demand and required

inactivation performance. Identify the supporting laboratory and Australian-relevant field evidence. State when the stabilised-chlorine system is expected to require higher free-chlorine targets, superchlorination, supplementary oxidation, algaecide, pH correction or dilution/water replacement, and assess the resulting chemical-handling, by-product, cost and water-use consequences. Correct the erroneous cross-reference in Clause 3.1.2 Note 3 from Appendix I to Appendix H if mineralised pools are intended.

Table 3.1.3, B.1.3 and B.1.9 (p. 23 and approximately 74-86) - Reconcile hydrogen-peroxide and PHMB statements with APVMA decisions: Identify the exact products, formulations, concentrations, functions and evidence relied upon for each Table 3.1.3 permission and Appendix B claim. Reconcile those provisions expressly with the APVMA 2020 final decisions, including any material differences in concentration, combination, supplementary-only use or claim scope. Remove unqualified hygiene or effectiveness statements unless supported by current, applicable evidence. Clarify that the 2020 decisions concerned the specified products and labels, and state the regulatory status required for any product used under the Standard.

Appendix G (p. 107-112) - Make natural-pool conformance normative and coherent: Move the necessary exemptions and conformance requirements into the normative body, define applicable microbiological limits and monitoring, explain the risk basis for different pathways, and correct the apparent reference from Clause I.8 to Clause G.8.

Appendix H (p. 113-115) - Remove unsupported mineral-pool benefit claims: Retain the clear disclosure that the process is chlorination, but remove or substantiate health, comfort and performance claims. Clarify the status of magnesium-adjusted saturation calculations where Appendix C says no standard LSI adjustment exists.

I.1 and I.2 (p. 116) - Apply equal evidence requirements to incumbents and alternatives: Apply one outcome- and risk-based evidence framework to all treatment systems. If conventional systems receive deemed-to-satisfy status, publish the evidence map, operating assumptions and continuing verification that justify the exemption.

3.1.1, I.2 and I.3 (p. 18 and 116-118) - Disclose the evidence for the conventional benchmark: Publish an evidence map for the conventional benchmark. For each relied-upon product or active system, identify the organisms, log reductions, contact times, pH, cyanuric acid, temperature, demand, formulation, residual, controls and field conditions. Identify Australian or scientifically bridged field trials, including bather load, rainfall, other chemicals and microbiological outcomes. If reports are confidential, provide an independently reviewed non-confidential assessment containing enough methodological and outcome detail for public scrutiny. Do not treat registration, historical use or a generic active ingredient as proof for every operating condition.

I.3 (p. 117-118) - Scale the three-tier pathway by risk and claimed use: Create risk-scaled validation pathways for residential, ordinary public and high-risk public pools. Permit justified

use of existing accredited laboratory data, certification and field evidence to avoid unnecessary duplication while preserving public-health safeguards.

Table I.1 (p. 117-118) - Correct the scientific bases in Table I.1: Use water- and pool-specific sources, including US EPA OCSPP 810.2600 where relevant, the current 2024 MAHC in its proper scope, and OECD Guidance Document 170 with departures clearly identified and justified.

I.4.1-I.4.4 (p. 118-121) - Validate the novel 21-day protocol before making it normative: Subject the method to independent scientific review and validation before publication. Specify negative and positive controls, replicates, acceptance statistics, uncertainty, calibration, neutralisation, test-laboratory scope and reporting requirements.

I.4.3 (p. 119) - Remove or justify test-medium asymmetry: Either require a parallel conventional chlorine benchmark under identical conditions or demonstrate through independent validation that the challenge medium is neutral and representative for all treatment mechanisms. Specify how interfering substances and active concentrations are measured throughout the test.

I.2 and I.4.1-I.4.4 (p. 116 and 118-121) - Test chlorine under the same degraded-water and biofilm conditions: Require a parallel conventional-chlorine control in the same rig, using the draft's prescribed free-chlorine, pH and cyanuric-acid conditions, and report active residual, chlorine demand, organic loading, biofilm and microbiological outcomes throughout the 21 days. Link the laboratory comparison to independent full-scale field evidence at busy public pools. Record all secondary chemicals and remedial interventions needed to maintain conformance.

I.4.4.3 (p. 120) - Define turnover and post-challenge safety criteria: Set a defined maximum time tied to public-health risk, specify the applicable turnover for every test configuration, require time-series sampling and establish post-challenge water-quality limits. Explain how a 3-log reduction from at least 10^4 CFU/mL relates to the missing Table 3.1.4 criteria.

I.4.5 (p. approximately 122) - Use a water-specific viral method: Adopt a validated water-specific viral protocol, specify organism preparation, disaggregation where relevant, neutralisation, controls, replicates, detection limits and operating conditions, and justify the selected contact time against pool-specific guidance.

I.5.1 (p. 123) - Test the complete operating treatment system: Require the complete validated treatment train to remain engaged during confirmation, or prescribe a validated scaled apparatus that reproduces hydraulic exposure, energy input, active generation and contact conditions. Define how multi-barrier contributions are preserved.

I.5.2 (p. 123) - Reconsider the 3-log-in-60-minutes bacterial criterion: Use the OECD pool-specific target set or publish an independent scientific justification for every departure. Include

Legionella and Enterococcus or explain their omission, define replicate and control requirements, and add a final acceptable concentration criterion.

I.5.3 (p. 123-124) - Fully specify the protozoan pathway and its scope: Define a complete validated method and scale it to the claimed pool category. Apply equivalent protozoan risk-management requirements to conventional systems, acknowledging that the draft itself says chlorine residual does not control Cryptosporidium.

I.6 (p. 124-125) - Apply Tier 3 consistently to conventional chlorination: Move the lifecycle risk framework into the main body and apply it to every treatment route, with recognition of existing high-quality evidence where appropriate. Include exposure minimisation and monitoring for high-risk indoor facilities.

I.7 (p. 125) - Broaden and clarify recognition of existing evidence: List eligible evidence types and establish criteria for relevance, quality, comparability, independence and gap analysis. Require written reasons where existing accredited or certified evidence is rejected. Complete the BPR example.

I.8 (p. 125) - Strengthen independence and accreditation requirements: Use mandatory language for independence-critical steps. Require the laboratory's accredited scope to cover the methods used, independent witnessing or auditing of rig operation and data integrity, predefined statistical analysis, conflict declarations and an independent technical decision-maker with specified qualifications.

Committee composition and finalisation process (p. committee list) - Obtain and publish independent multidisciplinary review: Before resolving critical comments, publish a de-identified discipline and capability matrix and obtain independent review from suitably qualified experts who were not responsible for the disputed drafting. Publish the disposition and reasons for major technical comments.

Whole document (p. multiple) - Complete an editorial and internal-consistency review: Conduct a complete technical-editing and cross-reference audit after the substantive issues are resolved, then publish a clean corrected draft for renewed comment where changes are material.

Appendix B - Sources and supporting record

DR AS 3633:2026, Residential and public pools - Water quality, Project MC-000342-01 04, public-commenting draft.

Watertech Services International Pty Ltd / Enviroswim, Formal Complaint under Standards Australia Complaints Policy PO 700, 10 July 2026.

Enviroswim and Standards Australia correspondence, March-July 2026, including correspondence concerning CS-061, technology neutrality, APVMA evidence and public comment.

Enviroswim governance referral concerning the revision of AS 3633, 7 August 2026, and acknowledgement dated 14 August 2026.

Tweed Laboratory ES1 and ES3 reports; NSF/ANSI 50 certification materials; Dr Simon Toze reports; and field-monitoring records held by Enviroswim.

APVMA correspondence and FOI material held by Enviroswim.

APVMA, Demonstrating efficacy of pool and spa sanitisers, current guidance accessed 19 August 2026.

APVMA Gazette No. 15, 28 July 2020, Final regulatory decisions for certain swimming and spa pool sanitiser products.

Australian Government chemical-security awareness factsheet and retailer brochure, identifying pool chemicals and bleaches as chemicals of security concern.

Australian Government, Chemical Security Warnings, video supplied by Enviroswim with this submission.

WorkSafe Victoria, Swimming pool chemical mixing causes toxic gas, safety alert published 22 April 2021.

OECD Guidance Document 170

US EPA Series 810 Product Performance Test Guidelines

US EPA OCSPP 810.2600 - use in water

CDC current MAHC edition page

2024 Model Aquatic Health Code, fifth edition

APVMA - Demonstrating efficacy of pool and spa sanitisers

APVMA Gazette No. 15, 28 July 2020 - final decisions for specified pool and spa sanitiser products

Australian Government - chemical-security awareness factsheet

Australian Government - chemical-security retailer brochure

Australian Government Chemical Security Warnings video - https://www.youtube.com/watch?v=-7LQImWtrJg

WorkSafe Victoria - swimming pool chemical mixing causes toxic gas