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Committee Secretary
House Standing Committee on Industry, Innovation and Science
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Canberra ACT 2600

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Inquiry into the current state of the Australian tyre industry, and any challenges and opportunities for the industry within the context of a circular economy

The Southern Sydney Regional Organisation of Councils (SSROC) welcomes the opportunity to contribute to the Australian House of Representatives Standing Committee on Industry, Innovation and Science inquiry into the current state of the Australian tyre industry, and any challenges and opportunities for the industry within the context of a circular economy.

SSROC is an association of twelve local councils in the area south of Sydney Harbour, covering central, inner west, eastern and southern Sydney. SSROC acknowledges the traditional custodians of the land on which we work and live, the peoples of the Darug, Dharawal and Eora Nations.

SSROC provides a forum for the exchange of ideas between our member councils, and an interface between governments, other councils and key bodies on issues of common interest. Together, our member councils cover a population of about 1.9 million, one third of the population of Sydney, including Australia's most densely populated suburbs. SSROC seeks to advocate for the needs of our member councils and bring a regional perspective to the issues raised.

The Inquiry and Focus of SSROC submission

The Inquiry has seven areas of focus in the Terms of Reference (ToR). SSROC welcomes the terms and our submission will relate to varying extents to four areas, namely:

- Current practices in tyre reuse, retreading, recycling, and resource recovery, including reviewing federal, state, and local regulations governing tyre production, disposal, and recycling.
- Opportunities to develop high-value uses for waste tyres and tyre-derived materials, including applications in construction, manufacturing, and other commercial sectors.
- The role of commercially viable product stewardship schemes and whether these should be made mandatory, and identifying infrastructure gaps in collection, processing, and recycling facilities.
- Environmental, community, and health and safety concerns related to tyre waste and recycling operations.

In the last five years, SSROC has embarked on Paving the Way initiatives, including the use of end-of life car and truck tyres in rubber modified asphalt for local roads. More details and Inquiry related observations or recommendations are presented below.

Recommendations

1. Federal and State agencies to be pro-active in engaging with councils and other stakeholders working on innovative recycled tyre initiatives, including on validation and endorsement of technical specifications.
2. Engage in consultation with stakeholders, including industry, Tyre Stewardship Australia, relevant agencies and councils towards mandatory accreditation through the Tyre Product Stewardship Scheme.
3. Measures to improve broader use of recycled rubber-modified asphalt need to be holistic and also consider approaches to use the opportunity to leverage on use of other recycled materials for road pavements such as recycled crushed glass.
4. The Australian Government should liaise with peak industry groups such as the Tyre Stewardship Australia and Australian Flexible Pavement Association, State and Local Government stakeholders on approaches to expand and sustain the environmental, economic and social benefits of rubber modified asphalt.
5. Learn from and promote demonstrated models for cross-sector collaboration on rubber modified asphalt project development, materials productions, monitoring and analyses, including the SSROC and related initiative and collaborations.
6. Revamp the Tyre Stewardship Scheme, in part by increasing the disposal cost per tyre, and use the extra funds to ensure the cost of crumb rubber modified asphalt is no higher to the customer. This could also cover seed funding to ensure asphalt plants are adjusted to ensure the product can routinely provide the product.
7. Explore the low-level use of crumb rubber in all asphalts. This will improve access of councils to the high volumes of asphalt manufactured in Australia and ensure councils use all waste tyres.

SSROC's Paving the Way Initiative

In response to China's 2017 National Sword policy, which effectively barred imports of Australia's recyclable materials, and the Coalition of Australian Governments' (COAG) subsequent decision in 2019 to phase in a ban on exports of a range of Australia's unprocessed recyclable materials, SSROC launched the ***Procure Recycled: Paving the Way*** initiative to improve the sustainability of council roads, actively develop local markets for recycled materials, and support the development of necessary infrastructure. The waste tyre export ban came into effect on 1 December 2021.

In partnership with and part-funded by Tyre Stewardship Australia, SSROC coordinated a 12-council demonstration of rubber asphalt across 12 sites in local government areas in Sydney: Bayside, Burwood, Canada Bay, Canterbury-Bankstown, City of Sydney, Georges River, Inner West, Randwick, Sutherland, Waverley, Woollahra, and Northern Beaches. Each council resurfaced a road section using recycled rubber-modified asphalt mix in road resurfacing. These were later evaluated for performance, durability, and environmental benefits of recycled rubber in road pavement.

SSROC engaged Australia Flexible Pavements Australia (AfPA) to analyse and gauge the suitability of contractors to meet project objectives, and to develop, in consultation with councils, demonstration asphalt mixes, guidelines, and monitoring parameters based on the expected risks and benefits of crumb rubber in asphalt.

SSROC's Paving the Way (Rubber) project involves incorporating rubber recovered from used tyres into bitumen for asphalt. It aims to:

- improve the sustainability of council roads,
- reduce net capital and operating expenditures by extending road life,
- create a local market for end-of-life car and truck tyres.

The project explored a range of asphalt mixes incorporating varying levels of rubber derived from end-of-life truck and car tyres. The performance of these, in a range of applications and conditions was periodically monitored against control sections to assess performance benefits.

The largest demonstration of recovered rubber asphalt done in Australia, the project initially used about 29 tonnes of rubber – about 3,600 equivalent passenger units (EPU)¹ – sourced from Sydney tyre recyclers. Local market for 264,000 used EPUs per annum could potentially be created if participating councils adopt rubber-modified asphalt as standard beyond the demonstration.

The demonstration sites road pavements using the wet method has been completed and 12-month monitoring and reporting by IMG finalised and AfPA has completed the analysis and evaluation report. The [report](#) is available.

Current practices in tyre reuse, recycling, and resource recovery, including reviewing federal, state, and local regulations governing tyre production, disposal, and recycling

Recovered rubber has been used in roads globally for nearly 40 years, including by Transport for NSW (TfNSW), and has demonstrated superior resistance in both field and laboratory testing to common causes of road failure, such as UV exposure, oxidation, moisture, and traffic load, versus standard asphalt.

Australian councils manage over 75% of Australia's roads. Use of recycled car and truck tyres in rubber-modified asphalt mixes for road pavement or other uses, constitute a huge opportunity for sustainable road and community infrastructure development.

The SSROC initiative in the use of recycled tyres for roads pavement involved close to 29,000 kilograms of crumb rubber and 6,500 tonnes of asphalt incorporating recycled materials. Australia could utilise up to 150,000 tonnes of used tyres in road networks annually, if councils in the country use recycled tyres for roads. This will be enormous environmental benefits as the tyres would otherwise end up in landfills or illegally dumped.

The SSROC project provided an opportunity to trial different applications in specific council road resurfacing sites, including:

- Different rubber sources (passenger car tyres vs. truck tyres)
- Different road applications including full-depth reconstruction and surface treatments
- Different recovered rubber content levels (9%, 15%, and 18%)
- Recovered rubber modified asphalt combined with other recycled materials (recycled glass, RAP)
- Applications in various traffic conditions (residential, busy/light traffic, CBD/suburban roads)

See [TSA's SSROC project case study summary](#) for more information.

¹ An EPU is standard passenger car tyre. The weight of an EPU for an end-of-life standard passenger car tyre is standardised as 8kg. <https://www.tyrestewardship.org.au/reports-facts-figures/epu-ratio/>

Performance

SSROC's Paving the Way (Rubber) initiative showed strong performance benefits. Based on 12 months monitoring by consultants engaged by SSROC, Infrastructure Management Group (IMG), the results are promising. For example:

- Passenger car and truck tyre rubber both performed well, demystifying previous misconceptions that passenger tyre rubber is inferior
- Compared to conventional asphalt, recycled/crumb rubber asphalt performed better or equally well in at least 80% of applications
- Reduction in rutting depth of up to 50% in some applications, significant boost for road durability
- Enhanced flexibility and resistance to reflective cracking when applied over concrete pavements.

The full benefits of use of crumb rubber for pavement of the roads would be more robustly proven over 1-2 decades and SSROC intends to monitor for up to 10 years.

It is notable that the results from the 12-month monitoring are very promising for roads:

- Characterised by high bus traffic intensity;
- Subject to environmental damage and oxidation; and
- in locations that are prone to reflective cracking.

SSROC is working, in collaboration with NATSPEC and other stakeholders, including member council engineers, Transport for NSW, AfPA and Tyre Stewardship Australia and RMIT University, to develop technical specifications for reuse of rubber from end-of-life tyres in road applications. This will require active involvement of relevant agency, in this case, Transport for NSW and possibly NSW Environment Protection Authority in developing specifications that will enable council engineers, tyre recycling and pavement contractors to use rubber-modified asphalt mix for road pavement as part of business as usual.

Recommendation

Federal and State agencies to be pro-active in engaging with councils and other stakeholders working on innovative recycled tyre initiatives, including on validation and endorsement of technical specifications.

The role of commercially viable product stewardship schemes and whether these should be made mandatory

SSROC welcomes the intent of the Inquiry to improve innovation in the Australian tyre industry and facilitate the development of new markets for recycled materials, resulting in improved waste reduction and resource efficiency.

One of the reasonable ways to achieve this could be to promote mandatory accreditation of recyclers through industry-led Tyre Product Stewardship Scheme. The Scheme is currently administered by the Tyre Stewardship Australia (TSA). It increases the recycling of end-of-life tyres and promotes the sustainable use of tyre-derived materials across Australia.

The accreditation for the Scheme by Tyre Stewardship Australia is voluntary at this stage. Accreditation would entail that recyclers and other related industry to commit to meet Scheme requirements, including ethical operations in compliance with relevant regulations. SSROC understands that the Scheme confers considerable environmental and economic benefits through responsible disposal and recycling of end-of-life tyres.

Mandatory accreditation could assist quality and innovations in council collaboration with recyclers and related service providers, in the reuse of tyre-derived materials and tyre-derived products that contain tyre-derived materials. As at 2023-24, approximately 34% of all end-of-life tyres in Australia (184,000 tonnes or 22.96 million passenger tyre equivalents) were not being recovered. Approximately 40% are sent to energy recovery, implying that nearly three-quarters of all end-of-life tyres do not end in circular outcomes such as recycling or reuse². Non-participation in voluntary scheme contributes to the low circular outcomes.³

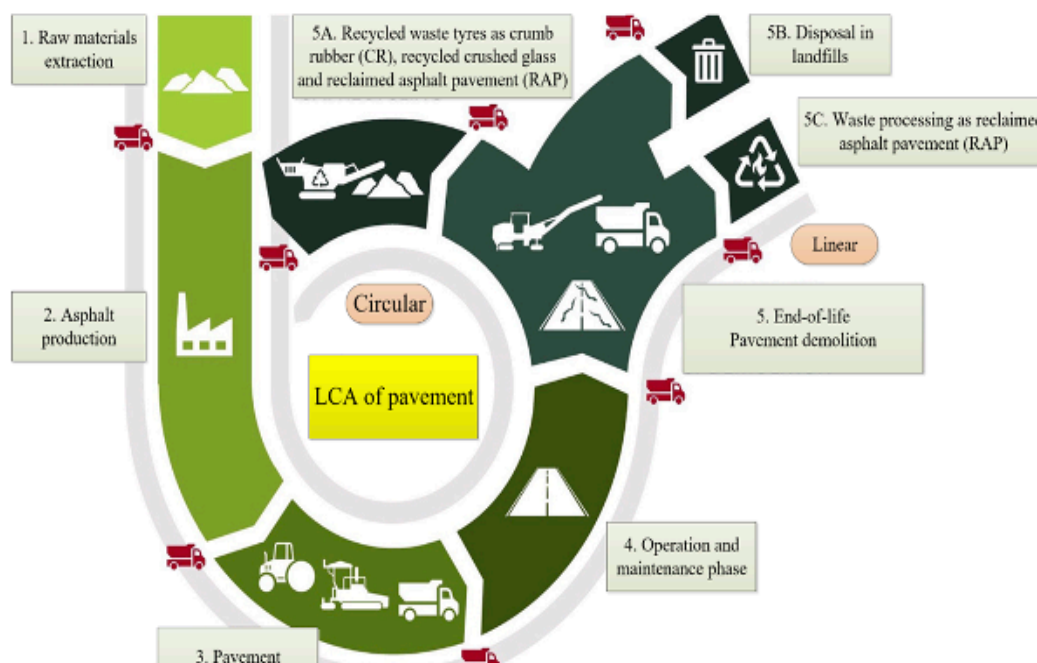
Recommendation

Engage in consultation with stakeholders, including industry, Tyre Stewardship Australia, relevant agencies and councils towards mandatory accreditation through the Tyre Product Stewardship Scheme.

Understanding the full lifecycle of a tyre, and how circular economy practices in reuse and resource recovery can be improved

The RMIT University’s Civil and Infrastructure Engineering Professor Giustozzi led the SSROC initiatives’ “Life Cycle Assessment and Potential Environmental Benefits of Crumb Rubber Asphalt using Field Data” study. It explored the environmental impacts associated with incorporating recycled rubber from end-of-life tyres into bitumen for asphalt pavement construction and found that recycled rubber extends pavement service life, reduces demand for raw materials, and lowers environmental impacts.

The graphic illustration below shows the stages and cycle for rubber modified asphalt from end-of-life tyres⁴.



² Source: Tyre Stewardship Australia. Submission to Australia Government Productivity Commission inquiry into Australia’s Opportunities in the Circular Economy. 1 November 2024.

³ Source: Tyre Stewardship Australia. Material Flow Analysis Report 2023-24. Available: <https://www.tyrestewardship.org.au/tools-and-resources/material-flow-analysis-report-2023-24>. June 2025

⁴ Source: Prof Filippo Giustozzi presentation on SSROC’s project life cycle assessment, 28 February 2024

Three of the twelve councils' demonstration sites, in Burwood Council, City of Sydney and Northern Beaches Council areas were selected for an in-depth investigation into the potential environmental benefits of using the rubber-modified asphalt in resurfacing of council roads.

The SSROC project's life cycle assessment found that:

- Incorporating recycled end-of-life tyre material (crumb rubber) into bitumen reduces the demand for virgin materials, lowering the carbon footprint during construction.
- Further environmental gains can be achieved by recovering by-products from end-of-life tyre processing, such as steel fibres, for use in other applications.
- Diverting end-of-life tyres from landfills by incorporating them into asphalt roads as rubber reduces emissions associated with tyre disposal, contributing to lower overall carbon emissions.
- Combined with Reclaimed Asphalt Pavement (RAP) material yields substantial additional environmental savings.
- Recovered rubber-modified asphalt pavements require fewer maintenance activities due to improved durability, weather resistance, reduced rutting, and enhanced cracking resistance.

The project is part SSROC's initiative to procure products with recycled content. The Paving the Way with Rubber is stage 2. Stage 1 established a market for poor quality recycled glass that is unsuitable for recycling into containers, by using it as a substitute for virgin sand in civil works. In the above diagram, stage 5A shows inclusion of recycled crushed glass and reclaimed asphalt in the asphalt mix for the road pavement.

The Life Cycle Assessment [report](#) is available.

Recommendation

Measures to improve broader use of recycled rubber modified asphalt need to be holistic and also consider approaches to use same opportunity to leverage on use of other recycled materials for road pavements such as recycled crushed glass.

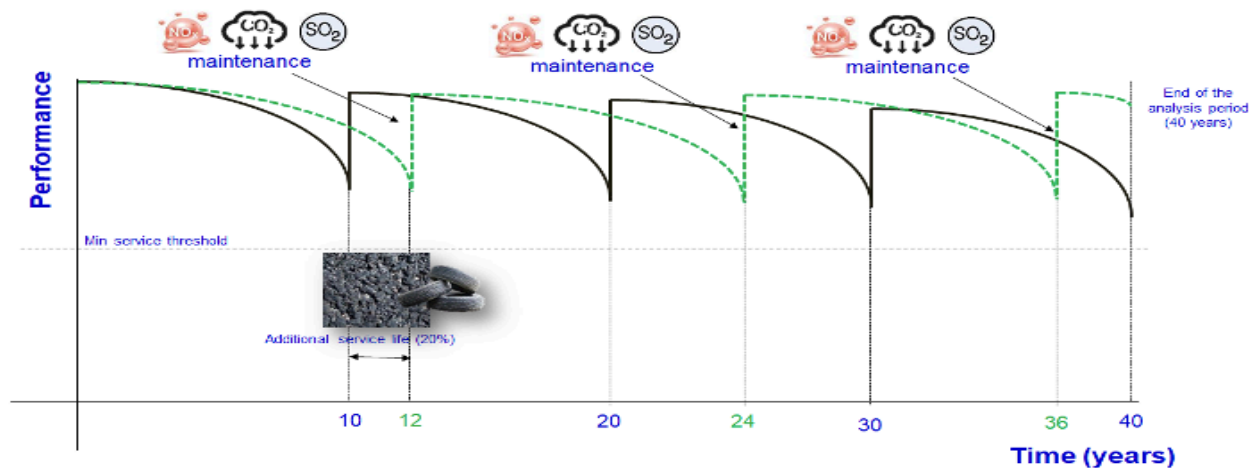
Environmental, community, and health and safety concerns related to tyre waste and recycling operations

Environmental benefits

The Life Cycle Assessment of SSROC's project initiative by RMIT University assessed the carbon footprint (kg CO₂- equivalent) and other environmental impacts of production, construction, and maintenance of recycled rubber asphalt pavements. These are then compared to conventional asphalt mix (without rubber-modified bitumen) laid at the same location and exposed to comparable traffic and weather conditions. The study found that incorporating recycled rubber into asphalt mixes using the wet method can reduce environmental impacts during the production and construction phase compared to conventional asphalt. By adding 10% crumb rubber by weight of the total binder (100 grams of crumb rubber to 900 grams of virgin bitumen to manufacture 1 kg of rubber-modified binder) resulted in lower environmental impacts compared to using 1 kg of conventional bitumen, leading to reduced emissions during the construction phase.

SSROC's multi-council demonstration projects used crumb rubber from end-of-life tyres as a polymer (wet method) to enhance asphalt durability, performance, and environmental sustainability. The demonstration sites in Burwood, Northern Beaches, and the City of Sydney councils were subjected to a comprehensive life cycle assessment to compare the carbon footprint of rubber-modified asphalt compared to conventional asphalt.

The life cycle assessment considered existing research that has demonstrated improvements in pavement performance due to rubber-modified asphalt needing fewer maintenance interventions during the service life. See below.



Asphalt incorporating rubber-modified bitumen demonstrates durability and resistance to cracking, rutting, and ageing. This entails less frequent maintenance and longer-lasting pavements. The LCA also included a sensitivity analysis and demonstrated that the material reduces the frequency of planned maintenance activities and results in extended pavement service life, reduced demand for raw materials and thus, lowered environmental impacts. The sensitivity analysis shows significant carbon footprint reductions (5.6% to 27.3%) with a 10-40% extension of pavement service life due to crumb rubber.

Environmental impacts reduction of up to 30% has been associated with the maintenance phase of the road asset. There were also indirect environmental benefits, such as recovering steel from end-of-life tyres during crumb rubber production and diverting waste tyres from landfills. These further decrease greenhouse gas emissions associated with using rubber-modified asphalt.

Professor Filippo Giustozzi who led the lifecycle assessment observed that this can potentially offset the environmental impacts generated by new road construction and ongoing maintenance operations and overall lead to the decarbonization of the road infrastructure.

Conventional asphalt paving relies on non-renewable resources, such as bitumen and quarry aggregate and the manufacturing involves electricity and gas consumption at the plant by specialised equipment like asphalt pavers, rollers, and trucks for transport and placement of the asphalt mixture. One of the ways to minimise environmental concerns is incorporating recycled materials into the asphalt mix. This improves overall performance and reduces dependence on non-renewable resources.

Economic and social benefits

The project has economic and social advantages. The extended service life of the roads over time reduces costs for and this is important for councils that manage 95% of roads in Australia. It helps create a scalable local market for end-of-life car and truck tyres that prior to now does not exist.

Rubber modified asphalt offers significant advantages over the asphalt mixes used on local roads in the past and makes waste tyres a valuable resource, for example for every 1km of road over 1000 tyres could be used. The road surface will last longer because of its improved durability and resilience at high temperatures and ability to resist cracking. Extended life will lower maintenance and asset renewal costs.

The demonstration project promoted confidence and increased awareness among It increases awareness and interest of local councils about road solutions that has environmental benefits. The SSROC project promoted and established a framework for collaboration between councils, State Government agencies, industry peaks, civil works contractors and even research /university institutions.

The Australia Flexible Pavement Association, a peak industry body expressed it distinctly:

“The SSROC demonstration project was a resounding success, showcasing the collaborative efforts of councils, industry associations, asphalt contractors, bitumen suppliers, and product stewardship organisations. This project – undeniably of national significance – stands as one of the few of its kind both in Australia and globally”.

- Australian Flexible Pavement Association, May 2025

Recommendation

- The Australian Government should liaise with peak industry groups such as the Tyre Stewardship Australia and Australian Flexible Pavement Association, State and Local Government stakeholders on approaches to expand and sustain the environmental, economic and social benefits of rubber modified asphalt.
- Learn from and promote demonstrated models for cross-sector collaboration on rubber modified asphalt project development, materials productions, monitoring and analyses, including the SSROC and related initiative and collaborations.

Incentives for Industry and Councils

In Australia, about 67 million end-of-life tyres end up in landfills annually. There is a possibility that due to the high volumes of asphalt and spray sealing done each year in Australia, all crumb rubber from end-of-tyres tyres could be easily consumed if promoted and supported. However, this has not happened, in part because of reasons highlighted below.

Cost

The major impediment is that rubber-modified asphalt is costly to manufacture. The only circumstance where it is cost competitive is when it is used as an alternative to premium for other asphalt products selected for special works such as heavily trafficked roads. However, most of these roads are managed by State Governments. Pavement designs with rubber-modified asphalt may only considered for a small number of situations because of the short-term cost to stretched budgets, even though there is long-term financial justification.

Air emissions

There is a perception, though yet to be proven, that the fumes generated by products with rubber-modified bitumen may be harmful to road workers. As part of its Paving the Way (Rubber) initiative, SSROC is running a request for tender (RFT) to engage experts to review existing case studies, research and published work and compare air emissions from rubber-modified asphalt resurfacing and conventional asphalt. The study will be completed in 2026.

Dry mix vs wet mix options

There are two approaches to adding crumb rubber to asphalt and these are not well understood by clients and lead to mixed outcomes. A “dry mix” approach mixes the crumb rubber at the same times as aggregates and when this occurs the crumb rubber only partially melts into the products. A “wet mix” approach requires the crumb rubber to be separately mixed with bitumen for some time, and then it is later blended with the aggregates.

The dry mix is lower cost and simpler to manufacture but it has less performance characteristics. Conversely, the wet mix is more expensive as it requires more time to prepare and separate blending tanks and equipment.

Manufacturer investment

Adding another product line to an asphalt manufacturing facility is a substantial investment. This is the case with crumb rubber modified asphalt. It may require additional tanks and equipment and perhaps planning approvals. This implies that not all asphalt manufacturers are willing or able to provide the product as it often requires tanks to be temporarily emptied and cleaned of other products as it is treated as a special, low volume production run. There is need for a sustained demand for the product to encourage manufacturers to invest.

Lack of funding

One of the impediments for broad use of recycled rubber modified in asphalt by local governments in Australia is that the cost impact is considerable for councils' capital works budgets. If it were mandated that councils use it, but there was no additional funding, many councils would not be able to cope. Some sort of Federal or State Government incentive would need to be made available.

For councils to source the additional financial cost would necessitate a substantive increase in rates paid by the community. Most councils are already stretched financially, burdened by increasing cost of community services and cost-shifting from State Governments, and are constrained to increase rates because they are pegged. Whilst there is a tyre stewardship arrangement operating in Australia, it is not adequate and it does not cover the cost difference required to routinely use crumb rubber modified asphalt.

Recommendations

- Revamp the Tyre Stewardship Scheme, in part by increasing the disposal cost per tyre and the extra funds can be used to ensure the cost of crumb rubber modified asphalt is no higher to the customer. This could also cover seed funding to ensure asphalt plants are adjusted to ensure the product can routinely provide the product.
- Explore the low-level use of rubber-modified bitumen in all asphalts. Increase the demand for the product would improve access of councils to the high volumes of asphalt manufactured in Australia and ensure councils use all waste tyres.

Conclusion

Thank you for the opportunity to contribute this submission on the Inquiry into the current state of the Australian tyre industry, and any challenges and opportunities for the industry within the context of a circular economy.

In order to make this submission within the timeframe for receiving comments, it has not been possible for it to be formally reviewed by councils or to be endorsed by the SSROC. I will contact you further if any issues arise as it is reviewed. If you have any queries, please do not hesitate to contact me or Dr Vincent Ogu, SSROC Program Manager on 8396 3800.

Yours sincerely

A handwritten signature in black ink, appearing to read 'H Sloan', is positioned below the text 'Yours sincerely'.

Helen Sloan
Chief Executive Officer
Southern Sydney Regional Organisation of Councils (SSROC) Inc