LATIN RESOURCES LIMITED
ACN: 131 405 144

Unit 3, 32 Harrogate Street,
West Leederville, WA
6007

P +61 8 6117 4798
E info@latinresources.com.au
W www.latinresources.com.au

18 November 2021

CLOUD NINE HALLOYSITE – RESEARCH AND DEVELOPMENT PROJECT TO REDUCE METHANE EMISSIONS

HIGHLIGHTS

- **Latin Resources has reached a binding agreement with world renowned CRC CARE to research and develop emission reduction technologies, utilising the Company's halloysite mineral from the Cloud Nine deposit in WA.**
- **The three year, $3.2M project, led by Professor Ravi Naidu will commence in January 2022.**
- **Latin Resources intends on funding the project with existing cash, investments, R&D funding and LRSOC options.**
- **The project will focus on modifying Latin Resources' halloysite/kaolinite minerals to develop material-based emission reduction technologies, including feed supplements for cattle, spreadable material and halloysite shale for inhibiting and adsorbing methane.**
- **The agreement affirms the commitment of Latin Resources to its Environmental, Social and Governance (ESG) credentials.**

"US president Joe Biden and European Commission president Ursula von der Leyen announced at the UN COP 26 climate summit in Glasgow that over a hundred countries have pledged to cut total methane emissions by at least 30pc by 2030 as part of efforts to tackle climate change.

The EU's von der Leyen said methane is the "lowest hanging fruit" in the fight to cut global emissions. The EU will introduce measures to report and verify methane emission levels because "only what gets measured, get done, she said.[1]"

Latin Resources Limited (ASX: LRS) ("**Latin**" or "the **Company**") is pleased to announce it has secured an agreement with CRC CARE Pty Ltd ("**CRC CARE**") to develop innovative methane reduction technologies to exploit the clay mineral halloysite from the Company's Cloud Nine project in Merredin, WA.

CRC CARE is an independent organisation that works with end users to perform research, develop technologies and provide policy guidance for assessing, cleaning up and preventing contamination of soil, water and air. Previous collaborators include BHP, Rio Tinto and the Australian Department of Defence. CRC CARE scientists have extensive experience in clay research, leading to environmental products with commercial applications.

Under the agreement reached with CRC CARE, complementary to its current activities that include exploration for halloysite at its 100% owned Cloud Nine deposit in WA, Latin will fund two key research projects running in parallel to the extent of $3.2m over a three year period. The $3.2m is the maximum exposure of Latin over the three year period in terms of the funding of the research projects with payments staggered over the three year period linked to a series of agreed milestone deliverables. Latin has the right to cease funding either or both research projects at any time in the absence of the key deliverables.

[1] www.argusmedia.com/en/news/2269763

The research results and all intellectual property rights associated with and derived from the research results will be owned 100% by Latin.

The research projects to be undertaken by CRC CARE are designed to develop applications that are superior to those of other natural materials including:

- **Microbial intervention**: use of halloysite in feed supplement formulation to influence methane producing rumen microbes.
- **Nutrient and methane adsorption in the cattle industry**: real-time capture and desorption of animal gas emissions for energy conversion as well as capturing nutrients from animal excreta (Figure 1).
- **Carbon capture**: adsorption at various pressures (industrial uses) and conversion of the captured carbon into fuel or the whole adsorbent into value-added material such as building material or fertiliser (Figure 2).
- **Low-cost precise purification of halloysite nanotubes** ("**HNT"**): from variants of halloysite and kaolinite mixtures (pure HNT can generate double the revenue of HNT/kaolinite mixes).

HALLOYSITE FOR METHANE EMISSION REDUCTION IN THE CATTLE INDUSTRY

Rather than expect cattle farmers globally to cull their herds to reduce methane gas emissions, a concept which is unpalatable to the global cattle industry despite growing pressure to do just that, an objective of the research and development is it allows those farmers to achieve the same outcome by feeding their cattle organic feed supplements. It is these feed supplements that Latin is aiming to help produce via the funding of its research project with CRC CARE to develop this exciting and cutting-edge project.

Methane expelled from cattle rumen is a significant unsolved problem in reducing overall Green House Gas emissions. Furthermore, the stockpile of cattle excreta is another source of methane in the cattle farm and feedlots industry. The research project aims to modify the Cloud Nine halloysite/kaolinite minerals to develop material-based emission reduction technologies, including feed supplements for cattle, spreadable material and halloysite shale for inhibiting and adsorbing methane in this growing industry.

The diagrams below show the two projects including nutrient and methane adsorption in Proposed Discovery 1 and carbon capture in Proposed Discovery 2. Each diagram compares the current state and the proposed state by CRC CARE.

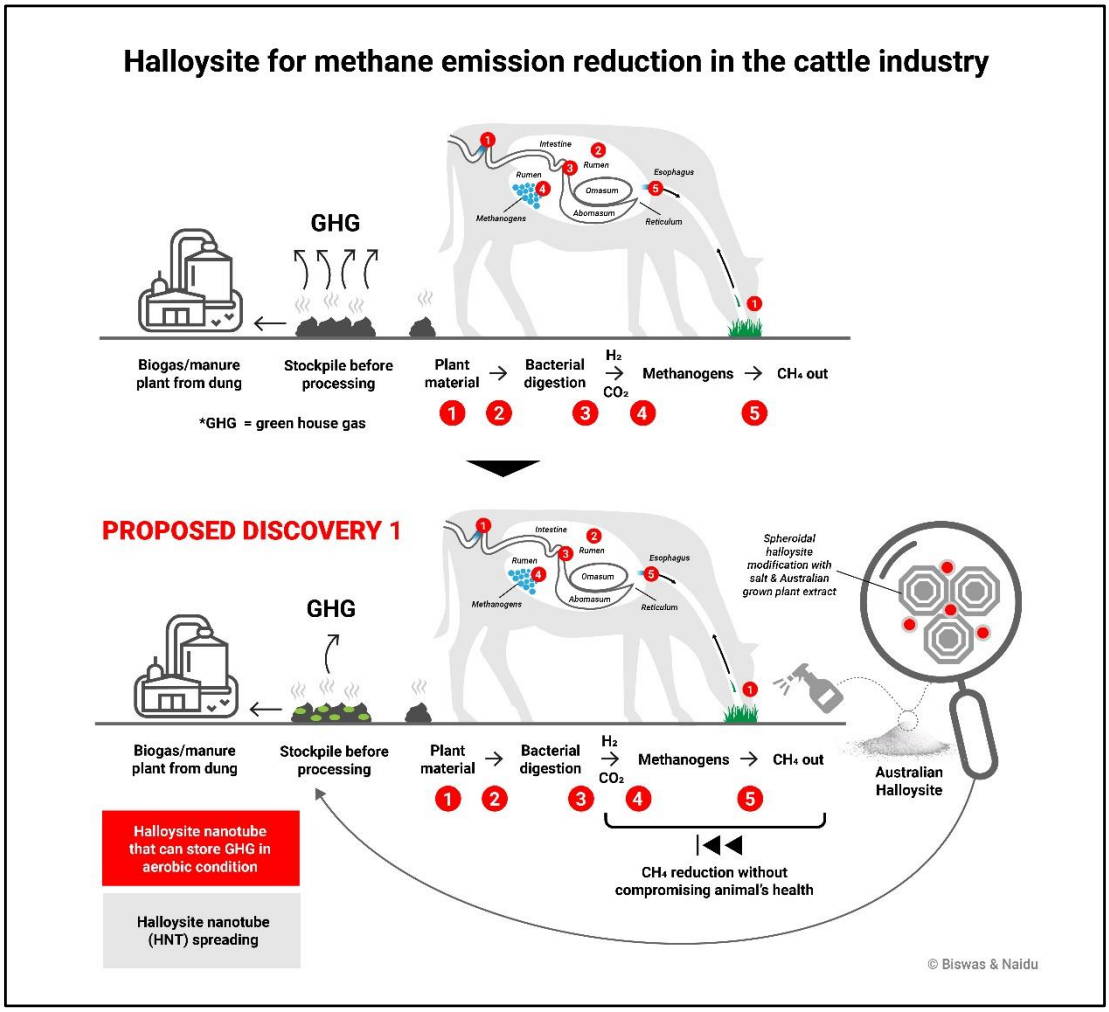


Figure 1: Proposed Approach 1

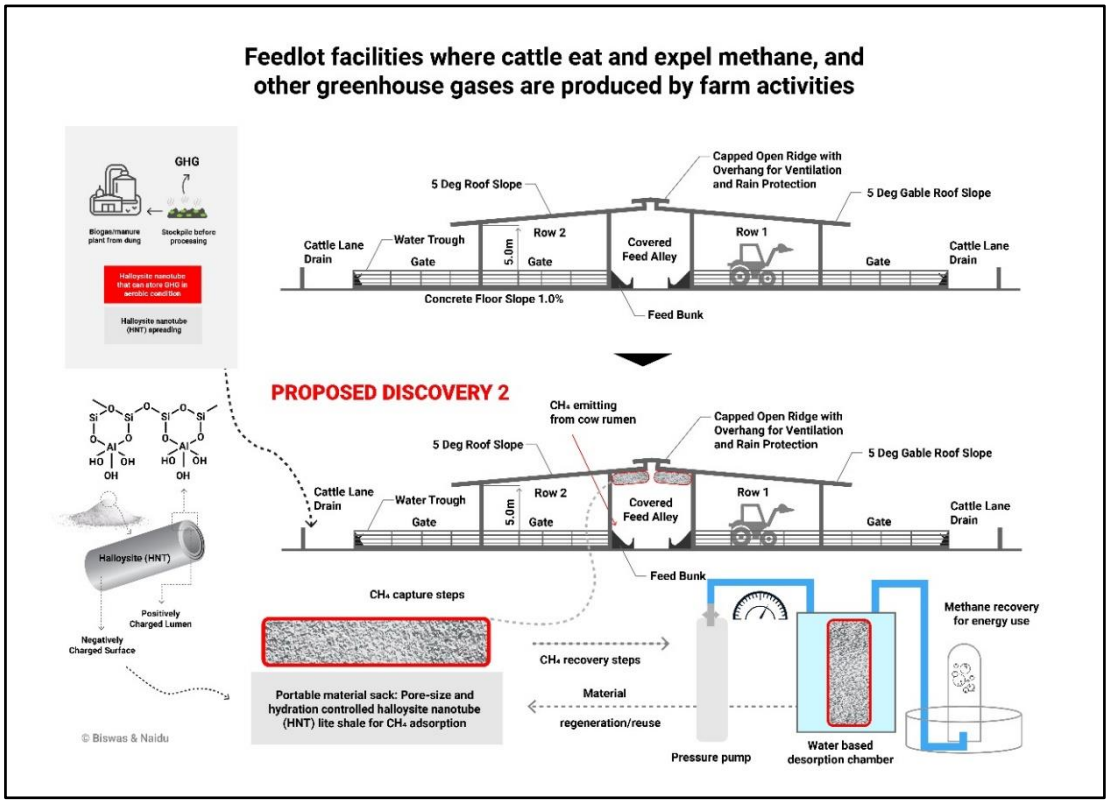


Figure 2: Proposed Approach 2

TOWARDS CLIMATE SUSTAINABILITY

"Cutting back on methane emissions is one of the most effective things we can do to reduce near-term global warming and keep to 1.5°C"[2]. Ursula von der Leyen, European Commission president.

Australia is endowed with large and diverse clay resources, which include deposits of world-class size and purity. These resources are largely underutilised due to poor market transformations, high transportation costs, and limited industry knowledge of clay properties, process methods and markets.

To develop these resources to their full potential, innovative uses of clays need to be assessed, developed and marketed for individual deposits. One promising area for market growth is environmental management of greenhouse gas (GHG) emissions, water purification, waste treatment and the containment of pollutants.

In the past few years, there has been a growing interest in the use of both natural and modified clays for purifying water and cleaning up wastewater and gross contamination (e.g. oil spills) containing organic and inorganic pollutants. This project focuses on using tubular halloysite to target GHG emissions that have been and will continue to be of significant concern globally given the role they play in climate change.

The Australian Government has set a 'Technology Investment Roadmap' to help meet the nation's emission reduction targets. Australian-owned resources and technologies, adopted through public-private partnerships, are a key feature of the roadmap. In concert with adaptive technologies that emit a relatively low amount of GHG, there is great potential to capture carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O) at their point sources.

Materials that can be used for this capture approach are therefore a major focus for innovation. Certain naturally occurring clay minerals, including halloysite nanotubes (HNT), which are low in cost and occur naturally in Australia, show great promise.

In Australia, several geological sources are identified for potential high-grade halloysite, including the Cloud Nine project in Noombenberry, Western Australia. While proven areas of application of halloysite include ceramics and as a fluid cracking catalyst in petroleum, other applications are emerging with great investment potential.

The CRC for Contamination Assessment and Remediation of the Environment (CRC CARE) has been researching halloysite, kaolinite and other related clay applications for more than 15 years. CRC CARE has completed numerous projects on such 'modified clays' and these products have been used to successfully remediate a wide range of environmentally harmful pollutants.

Utilising its proven expertise and facilities, CRC CARE will investigate enhanced use of halloysite for GHG abatement and, using the knowledge generated, develop practical technologies that will enable Latin to mine halloysite for diverse applications and increased value while directly contributing to technology-driven GHG emission reduction targets.

Any product developed as a result of this work has potential to be commercialised by Latin Resources.

LATIN AND ESG

Importantly, the commitment of Latin to funding these key research projects affirms the commitment of Latin to its ESG credentials and to keeping ESG issues atop of its business agenda going forward.

As is well known, the ESG acronym refers to a trio of business measures that are now more and more used by environmentally and socially conscious investors to identify and vet investments. Implementing programs that can help Latin achieve compliance against the ESG measures will enable it to make a vital start on implementing a suitable framework for ESG and a move towards sustainable growth.

[2] https://www.newscientist.com/article/2295810

The agreement with CRC CARE is a huge business opportunity for Latin that will allow it not only to contribute in a material way to better the global society now and in the future, but to also achieving solid financial returns.

According to Bloomberg, ESG funded assets significantly outperformed the market in the wake of the COVID-19 pandemic. Triggered and prodded by investor and shareholder demand, it is not in dispute that the value of ESG-type assets is growing exponentially.

Fundamental to the task of investors in the current market will be an understanding of science and technology so they can reach an informed assessment of the likely contribution of a company to the ultimate goal of net zero emissions. Latin aims to be one of these companies and the agreement with CRC CARE is an important step on its journey to do so.

AUSTRALIAN HALLOYSITE FOR GREENHOUSE GAS CAPTURE AND UTILISATION

While laboratory-grade HNT-assisted material has shown promise for GHG adsorption, the net benefit of such technologies depends largely on capturing GHGs and utilisation of the captured gas in another application as part of a circular economy.

Achieving this, while ambitious, is practically feasible with science-backed material technologies. Australian origin halloysite is a material of interest, but extensive research is required to realise its full potential in GHG capture and utilisation. This project aims to modify halloysite for adsorption, desorption, restoration and post-capture alternative use of specific GHG molecules.

LATIN RESOURCES AND CRC CARE SUMMARY OF TERMS AND CONDITIONS

- The Research Results and all Intellectual Property Rights associated with the Research Results will upon their creation be owned solely by Latin.
- Latin may pursue patent protection of any invention resulting from the Research Project in Australia and in other countries under the Patent Co-operation Treaty (1970).
- The filing, maintenance, renewal prosecution and defence of the patents will be conducted and paid for by Latin.
- Latin will retain title to any patent or other Intellectual Property Rights in any invention resulting from the Research Project.
- Latin reserves the right to license its interest in any invention resulting from the Research Project.
- Latin agree that CRC CARE will be entitled to receive a royalty calculated as a percentage of Commercialisation Income received by Latin or any Related Body Corporate of Latin arising from Commercialisation of the Research Results, which percentage shall be 7.5% of all Commercialisation Income earned.
- CRC CARE acknowledges that it is in the process of filing an International Patent Application ("**IPA**") in relation to technologies being developed by it and agrees to include in this IPA details regarding the proposed methane emission reduction project that are reasonably required so as to support protection of the proposed Intellectual Property in this Research Project.
- Latin can cease funding either or both research projects at any time if the key deliverables are not delivered by the agreed milestone dates.

Related Budget – Sub-Project - Australian halloysite for greenhouse gas capture and utilisation:

- Year 1 - $200,000
- Year 2 - $280,000
- Year 3 - $422,000

Related Budget – Sub-Project - Australian halloysite/kaolinite for methane emission reduction in the cattle industry:

- Year 1 - $600,000
- Year 2 - $780,000
- Year 3 - $900,000

Latin Resources intends on funding the CRC CARE research and development by utilising existing cash and investments, government R&D technology funding as well as the exercising of the currently strongly in-the-money LRSOC options that expire in December 2022, which will net Latin over $4,000,000 in cash in the event they are all exercised.

COMMENT

Latin Resources' Executive Director, Chris Gale, commented:

"*The capture and utilisation of greenhouse gases, including methane and carbon dioxide, is an increasingly important issue for governments and communities globally in terms of mitigating the impacts of climate change.*

The decision announced by Ursula von der Leyen at the COP 26 climate summit in Glasgow confirming over 100 countries will participate in the methane reduction program, displays the potential reach with the environmental products, if the R&D project proves to be successful.

The potential for our Cloud Nine halloysite to be part of the suite of global solutions is significant. We are exceptionally excited by the commercial potential of the CRC R&D opportunity.

Whilst the CRC CARE *research project will investigate a range of potential uses, the reduction in methane emissions from cattle stands out as one where Australian commodities and technology advances could have a global impact*."

CRC CARE's CEO & Managing Director, Professor Ravi Naidu, commented:

"CRC CARE has a proud history of developing environmentally protective technologies that have been adopted by industry and government. We were the first organisation more than 15 years ago to modify natural clay to clean up PFAS contamination and have since built world-leading expertise in the use of modified clay for environmental applications.

As a forward-thinking, scientifically-driven company focused on the circular economy, Latin Resources is a perfect industry partner for CRC CARE's unique collaborative R&D model, which has a proven track record of improved environmental and economic outcomes. With efforts to reduce greenhouse gas emissions becoming increasingly urgent, this halloysite project has enormous potential nationally and globally."

This Announcement has been authorised for release to ASX by the Board of Latin Resources.

For further information please contact:

Chris Gale
Executive Director
Latin Resources Limited
+61 8 6117 4798

Sarah Smith
Company Secretary
Latin Resources Limited
+61 8 6117 4798

info@latinresources.com.au

www.latinresources.com.au

About Latin Resources

Latin Resources Limited (ASX: LRS) is an Australian-based mineral exploration company with several mineral resource projects in Latin America and Australia. The Australian projects include the Cloud Nine Halloysite Project near Merredin, WA, Lachlan Fold gold projects in the NSW, and the Big Grey Project in the Paterson region, WA.

In Latin America the Company has two Lithium projects, one in Brazil and has a JV agreement with Argentinian company Integra Capital to fund the next phase of exploration on its lithium pegmatite projects in Catamarca, Argentina. The Company is also actively progressing its Copper Porphyry MT03 project in the Ilo region of Peru.

About CRC CARE

CRC CARE is an independent organisation that performs research, develops technologies and provides policy guidance for assessing, cleaning up and preventing contamination of soil, water and air.

Forward-Looking Statement

This ASX announcement may include forward-looking statements. These forward-looking statements are not historical facts but rather are based on Latin Resources Ltd.'s current expectations, estimates and assumptions about the industry in which Latin Resources Ltd operates, and beliefs and assumptions regarding Latin Resources Ltd.'s future performance. Words such as "anticipates", "expects", "intends", "plans", "believes", "seeks", "estimates", "potential" and similar expressions are intended to identify forward-looking statements. Forward-looking statements are only predictions and are not guaranteed, and they are subject to known and unknown risks, uncertainties and assumptions, some of which are outside the control of Latin Resources Ltd. Past performance is not necessarily a guide to future performance and no representation or warranty is made as to the likelihood of achievement or reasonableness of any forward-looking statements or other forecast. Actual values, results or events may be materially different to those expressed or implied in this ASX announcement. Given these uncertainties, recipients are cautioned not to place reliance on forward looking statements. Any forward-looking statements in this announcement speak only at the date of issue of this announcement. Subject to any continuing obligations under applicable law and the ASX Listing Rules, Latin Resources Ltd does not undertake any obligation to update or revise any information or any of the forward-looking statements in this announcement or any changes in events, conditions or circumstances on which any such forward looking statement is based.

Attachment 1 - CRC CARE infographic and case studies – October 2021

Economic, environmental and community benefits for Australia

CRCCARE
A safer, cleaner environmental future

The **research, technologies & best-practice strategies** of CRCCARE for *assessing, cleaning up* and *preventing* contamination of

SOIL WATER AIR

have provided:

Nearly 9-fold return on money invested by government and industry

$1 → $9

More than **$5.4 billion** of economic benefit to Australia

Source: Independent economic impact review conducted by Consulting & Implementing Services

CRC CARE's work has unlocked the productive potential of contaminated land while safeguarding human and environmental health

Technologies for analysing and cleaning up PFAS contamination have saved more than

$200 million

through reduced need for remediation

Health screening levels for petroleum hydrocarbon have provided a

$1.3 billion and growing

benefit to industry and government

Research on heavy metalloid exposure has reduced the need for remediation, saving

$60 million

National Remediation Framework expected to deliver at least

5% reduction in total costs

>$200 million to 2026

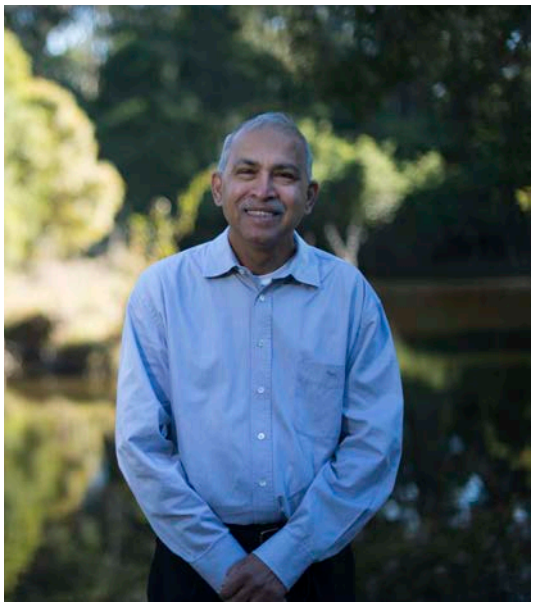
Remediation technologies forecast to provide nearly **$1 billion** of savings for industry and government by 2026

CRC CARE brings together industry, government, science and engineering to prevent, assess and clean up environmental contamination

Laureate Professor Ravi Naidu

Managing Director & CEO, CRC CARE

Founding Director, Global Centre for Environmental Remediation, University of Newcastle



Ravi's work focuses on developing better ways to assess, characterise risks from and remediate contaminated soil, water and air, and the potential impacts of contaminants on environmental and human health. According to the Clarivate™ Highly Cited Researchers list, Ravi is the most highly cited environmental scientist in Australia and among the top 1% environmental scientists in the world.

When Chief Research Scientist at CSIRO Land and Water, Ravi's team was one of the first to modify natural clay minerals. This work included the development of Phoslock®, which was later commercialised and is now a listed company worth in excess of $300 million. Ravi was subsequently approached by the University of South Australia (UniSA), where he led the successful bid for funding for CRC CARE. In this capacity, he patented matCARE™, a modified clay capable of remediating PFAS-contaminated water. The technology now operates at a number of sites in Australia and is set to be spun off as a separate company.

In 2020, Ravi won the University of Newcastle's Global Engagement Excellence Award for his work in leading GCER, which has research partnerships across Australasia-Pacific (including China, India, Bangladesh, South Korea, Fiji, Taiwan, Malaysia and Thailand), North America, UK, Europe and Nigeria. Over the last 10 years, Ravi has also raised over $260 million for collaborative research projects and attracted more than 100 high-calibre international students.

Ravi received his PhD and DSc in environmental science from Massey University, New Zealand. In 2021, he was elected as Fellow Ahurei of the Royal Society Te Apārangi (formerly the Royal Society of New Zealand), and in 2020 he was the sole researcher elected as a Foreign Fellow of the Indian National Academy of Agricultural Science. He is an elected Fellow of the Soil Science Societies of America (2000) and New Zealand (2004), the American Society of Agronomy (2006), the American Association for the Advancement of Science (2013), the Royal Australian Chemical Institute (2017), the Royal Society of Chemistry (2017), and the Australian Academy of Technological Sciences and Engineering (2017). In 2016 he was elected as a member of the European Academy of Sciences and Arts. In 2013, Ravi received an honorary Doctorate of Science from Tamil Nadu Agricultural University for "outstanding contributions to agriculture", and won the Richard Pratt – Banksia CEO Award at the Banksia Sustainability Awards, recognising his contributions towards environmental sustainability. In 2018, Engineers Australia named him as one of Australia's 30 most innovative engineers.

Ravi was the founding director of the UniSA's Centre for Environmental Risk Assessment and Remediation. He is Chair of the International Committee on Bioavailability and Risk Assessment, former Chair of the International Union of Soil Sciences Commission for Soil Degradation Control, Remediation and Reclamation (2002-10), and former President of the International Society on Trace Element Biogeochemistry (2005-07). He has authored or co-authored over 750 journal articles, 100 technical publications and 11 patents, and has co-edited 16 books and 116 book chapters in the field of soil and environmental sciences. Ravi's work has been cited over 54,000 times (Google Scholar). Ravi has also supervised over 50 PhD completions and, of all his achievements, perhaps his most significant is his success as a mentor to the next generation of contamination scientists.

Economic, environmental and community benefits for Australia

CRCCARE
A safer, cleaner environmental future

Australia's remediation industry

10 fold growth in 20 years

$300 million per year → **$3 billion** per year

CRC CARE's work has unlocked the productive potential of contaminated land while safeguarding human and environmental health.

Without the **research, technologies & best-practice strategies** of

CRCCARE

for *assessing, cleaning up* and *preventing* contamination of

SOIL | WATER | AIR

Australia's remediation sector	would be smaller, less professional and less organised
Industry and government	would have substantially higher costs in dealing with contamination issues
The Australian people and environment	would be exposed to greater and more persistent contaminants

CRC CARE has created a skilled industry workforce

150+ PhDs

Training for **thousands** of industry practitioners

Professional certification scheme for a more skilled remediation industry; forecast economic benefit of **$63 million**

CRCCARE | A safer, cleaner environmental future

Case studies: success through collaboration

CRC CARE's impact would not be possible without its partners, not least the close relationship with state Environment Protection Authorities (EPAs). This has ensured that our work not only sits within, but also enhances, the national regulatory framework. Indeed, the CRC has collaborated closely with EPAs to harmonise the national approach to remediation, which had previously suffered significantly as a result of differences in policies and approaches across state borders. This unified approach has benefitted communities and business through greater certainty and clearer planning.

As well as EPAs, our industry partners include major players in the petroleum, minerals and resources sector (Australian Institute of Petroleum, BHP, Chevron and Rio Tinto), the Department of Defence, and leading environmental practitioners.

The collaborative and collegiate approach delivers on-the-ground results to solve complex soil, groundwater and air contamination problems in a transparent and consultative manner:

- CRC CARE's **industry guidance and policy insights** coupled with improved **risk-based management of both conventional and emergent contaminants** (including PFAS) allows limited resources to be directed to where they are needed most. CRC CARE's work has saved its industry partners millions of dollars annually; spread across the entire sector this amounts to hundreds of millions, if not billions, of dollars.
- Working with the Department of Defence (as well as Airservices Australia), we developed **matCARE™ technology to remediate PFAS contamination** from firefighting foams. To date, we have remediated on-site more than 3 million litres of wastewater, reducing annual clean-up costs by 90%.
- Much of CRC CARE's guidance, developed in collaboration with EPAs, has been incorporated into national legislation. For example, the CRC's **health screening levels (HSLs) for petroleum hydrocarbons** were included in the National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM). The NEPC confirms their adoption by regulators across Australia saves industry and governments over $20m per year.
- To **remediate hydrocarbon-contaminated soil** at multiple sites in the Pilbara, WA, BHP was required to meet regulatory criteria that were essentially unachievable in the local environmental conditions. Accordingly, the size and cost of BHP's landfarms (areas of contaminated soil where contaminants undergo microbial degradation) were presented to and subsequently endorsed by the WA regulator. As a result, **CRC CARE and BHP trialled 'biopiling'** as a means to attain contaminant concentrations that met risk criteria; this was achieved in 3 months (half the originally predicted time). Over the life of the affected mines, port and railways, the CRC's approach has reduced treatment costs to less than 30% compared with previous methods. This has both saved BHP millions of dollars and achieved a better result for the environment.
- Our work on **innovative acid sulfate soil remediation** at East Trinity, Queensland, turned badly acidified land into a place where mangroves, native birds and other wildlife again flourish. The 774-hectare site became an environmental disaster in the 1970s after being drained to create a sugarcane farm. The CRC optimised a remediation approach known as lime-assisted tidal exchange (LATE). Compared with conventional methods, which would have used nearly $80 million in lime alone, LATE reduced lime use to less than 5% of the original requirements. Accordingly, the CRC has provided a blueprint for the affordable rejuvenation of similarly affected wetlands globally.
- The innovative **probeCARE™** system allows farmers and agriculturalists to take **real- time measurements of common ions** (e.g. sodium, potassium and calcium) in irrigation water, providing vital information on water quality that informs decisions on crop management.
- Our improved technology for **cleaning up shooting range soils contaminated with lead and other toxic metals** has helped the Department of Defence clean up more than 100 tons of contaminated soil at major weapons ranges in WA and Queensland. The remediated soil is clean enough for reuse, while economic value of the recycled lead has offset the cost of remediation.
- CRC CARE-led research on **natural source zone depletion (NSZD) of light non-aqueous phase liquids (LNAPLs)** is transforming the management of petroleum-hydrocarbon-contaminated sites are managed across Australia, potentially saving industry $320 million over the next 10 years through more effective remediation techniques. The study found that the rate of hydrocarbon removal by NSZD will typically exceed that being achieved by active recovery within 3 to 5 years of the initial spill. It demonstrated that mass losses from NSZD were found to be very significant – 1.5 to 50 times greater than is being achieved by physically pumping hydrocarbons from recovery wells.

Working with the Department of Defence, CRC CARE was the first organisation to use modified clay to develop a remediation technology – matCARE™ – that irreversibly locks up PFAS (matCARE plant pictured *below*).

CRC CARE is the ideas factory that drives the remediation industry and, ultimately, contaminated site clean-up in Australia. It is uniquely placed to tackle the intractable challenge of site contamination by:

- **identifying new and existing contaminants and developing the remediation solutions**
- **significantly reducing the cost and time required to clean up contaminated sites**
- **providing certainty for Government and industry through robust scientific approaches**
- **acting as a trusted broker of knowledge and technology for government, industry and communities.**