ESR
Science for Communities

25 February 2022

Hon Dr Megan Woods
Minister of Research, Science and Innovation
Parliament Buildings
WELLINGTON

Tēnā koe e Minita

ESR Strategic Issues Letter

Thank you for your 'Annual Letter of Expectations for 2022/23'. How we intend to meet those expectations is set out below.

ESR's national role requires it to maintain specialist expertise with respect to emerging national and international threats to health and community wellbeing, to demonstrate science leadership, and to share its scientific expertise with key partners and government agencies. ESR therefore takes a broad system approach, and acts to benefit New Zealand. It offers **research-led science delivery and invests in science solutions for tomorrow's challenges**, rather than merely delivering the services or outputs specified in a contract.

Resilience, endurance, innovation, and flexibility will be key as we continue to operate in a time of uncertainty and change. ESR will continue to prepare for the challenges that will face New Zealand communities through our forward-looking applied science research and delivery approach. Being informed by a te Ao Māori view we look to the past to inform, learn, develop, and implement the solutions for the public health and community wellbeing challenges of today, tomorrow and for the future.

A Focus on Wellbeing

Research-led science delivery for improved community health and wellbeing is at the core of everything ESR does. ESR delivers impact for community wellbeing through our world class science research and delivery which:

- enables the effective response to Covid-19
- delivers essential public health intelligence on all infectious and other diseases
- delivers evidence based forensic analysis to support justice outcomes
- ensures radiation services remain safe, and
- drives research and effective response to water and food borne contaminants

ESR's investment in future-focussed research programs and in world leading research staff generates technologies and intelligence to address future challenges to New Zealand's wellbeing.

Wellbeing is also a core focus of our manaakitanga toward our staff. We ensure we have the appropriate culture, systems, processes, and support procedures to look after the health and safety of our people, particularly as we navigate the impacts of the Covid-19 pandemic, whilst we continue to deliver world class science research and delivery.

Partnership with Māori for Māori

We aspire to be acknowledged as a place where mātauranga thrives alongside science and Māori ways of being and doing are embraced. ESR is refreshing its He Pūtaiao He Tāngata strategy to identify the actions that will create greater impact with and for Māori.
The core elements of our wero are to:

build enduring partnerships with iwi and hapu to ensure that our scientific endeavour realise material and holistic benefits for those communities. ESR's He Wai Māpuna programme continues to progress strongly and promises to be an exemplar for ESR of a new way of working with Māori.

build and enable mātauranga Māori across all areas of our mahi so that it informs and guides our approach to science research and delivery. Our Māori Data Sovereignty work is one enabler of this approach.

build and apply a business approach that reflects a Māori world so that the development and implementation of our applied science research and delivery is shaped and informed by a te Ao Māori view. Our close collaboration with the Iwi Chairs Forum and our work in partnership with Ngāti Toa Rangatira to design a building at Kenepuru that reflects and allows for the flourishing of māturanga in our science are reflections of this intent.

a leading employer of Māori scientists by offering the built environment, cultural affinity and training pathways that enable Māori to flourish from within. The partnership between ESR and Pūhoro brings science to rangatahi, developing and inspiring them to be active participants in the fields of science, technology, engineering, mathematics and Mātauranga.

This is a journey that the Board and management are fully committed to embedding within ESR – so that it is in our DNA.

Applied Science Solutions that make a Difference

The ability of ESR to co-lead infectious disease research in New Zealand and our capability to lead responses to other challenges such as climate change in the future, stem from our rapidly expanding ability to distil policy-ready intelligence from complex data.

ESR's research and applied intelligence will help inform:

- adaptation to climate related risks including health systems and critical infrastructure such as wastewater and drinking water
- understanding risks from climate sensitive infectious diseases, and
- understanding social and cultural impacts of climate change.

<u>An Integrated Research and Delivery CRI</u>

ESR's approach to research-led science delivery recognises the **value of recombinant, cross sectoral and transdisciplinary skills,** and their importance in the development of comprehensive solutions. Prioritisation of singular science approaches without understanding the connections limits the development of comprehensive solutions.

ESR's applied expertise lies in the conjunction of detecting, connecting, and protecting – our strength to foresee future challenges and the potential solutions and to scale up capabilities across public health, forensic and environmental science areas. This approach contributes to high-level systems intelligence and evaluation as well as enabling critical data analysis. This recombinant strength is demonstrated, for example, through our:

- genome sequencing expertise and capability effectively utilised in New Zealand's response to the Covid-19 pandemic which is jointly developed by a collaboration between ESR's health and forensics groups and enables forensic and environmental scientists to step into Covid-19 genome sequencing activities as demand requires

- toxicology and chemistry teams combining to develop a framework for testing the compounds to be used in the End of Life Choice Act 2019

- wastewater surveillance tool which had its origins in ESR's environmental health area, was initially utilised for detection of illicit substances through the forensic team and came to its fore in health area in the Covid-19 response

ESR's transdisciplinary approach to solutions facilitates easy adoption of different sciences for national benefit where our OneESR purpose delivers improved health and wellbeing outcomes for communities.

Investment in eResearch and use of technologies

ESR has major strategic investments in Computation Science disciplines and looks to support the design of future systems that deliver benefit to communities. ESR utilises High Performance Compute to support our operational as well as research work. We see great potential in the way we share knowledge and capacity with others to plan for future system investments.

Leading COVID Science for Informed Decisions

ESR will provide the applied science research-led delivery to inform responses to the Covid-19 pandemic. ESR's investment and expertise will also improve the functionality of infrastructure and the high-performance computing needed to run the data pipelines to build additional tools and dashboards for faster sharing and decision-making. Work is under way to improve EpiSurv to become a central hub of health intelligence, improving public health surveillance to increase disease response readiness and influence policy decisions.

ESR has expanded wastewater testing and genome sequencing of wastewater samples at the Kenepuru and Christchurch Science Centres. We are exploring new and faster methods for testing as well as investigating and validating new wastewater assessment and monitoring tools. This will strengthen public surveillance and provide robust evidence for response efforts.

ESR is also taking the lead on the Covid-19 biological sample initiative and will work collaboratively with other interested parties to establish the collection system and make samples available to research projects through an equitable governance process aligned with data sovereignty standards.

We remain committed to be ahead of curve in understanding and implementing solutions to Covid-19.

Developing and Implementing Leading Edge Applied Science

LUMI developed by ESR scientists will be a gamechanger for community policing and prevention of harm from drugs within our communities. LUMI enables on the spot drug analysis, supporting better frontline decisions. This type of frontline **innovative point of care** applied research is also being developed and trialled in the areas of health and animal welfare. Work is underway with the Capital Coast DHB to develop/optimise sequencing assay to analyse blood stream infections to enable quicker treatment decisions. Work is also underway with OSPRI seeking to significantly reduce the diagnostic time for TB.

It is the interplay of ESR's collective scientific expertise and science data specialists that enables these types of innovative solutions to co-generate and co-create for the benefit of New Zealand and internationally particularly in the Pacific.

Thought Leaders in a changing research, science, and innovation system

ESR plays a critical national role in **public health, forensics, and biosecurity**. It is accountable for providing a robust health surveillance system for New Zealand. Its role as a national reference laboratory demands time-critical responses. ESR's public health mandate has become more prominent over the past two years because of the lead it has taken in the national pandemic response.

As a thought leader and expertise in research-led delivery for community wellbeing outcomes, ESR looks forward to the decisions arising from Te Ara Paerangi. We will ensure that ESR's science and science system expertise and experience is constructive to this conversation to enable the foundations for an innovative inclusive science system for the benefit of New Zealanders and the world.

ESR's successful joint bid with the University of Otago as co-hosts of the new Infectious Diseases Research Platform is an opportunity to develop and deliver greater pathways for impact. The platform will be co-designed and established with Māori, including Māori health providers, communities, researchers, educators, and Māori organisations such as Wānanga Hauora Māori providers. This Platform will equip the health and the research, science, and innovation sectors to develop capability and technology that will lift New Zealand's capability and capacity to face infectious disease outbreaks and challenges.

Effective Collaboration and Partnerships

ESR is recognised as an effective co-leader, co-innovator and finder of synergies with partners. Our effective collaborations and partnerships with iwi, key government agencies, universities, research centres and industry partners are key to future-proofing public health, supporting the economy, and improving community wellbeing outcomes.

ESR's Drug CoLab brings together multi-disciplinary forensic scientists to explore innovative and holistic approaches to reduce drug harm in New Zealand. ESR and the New Zealand Police have established a joint Innovation Group to find new ways of developing and delivering smarter frontline policing solutions and technologies that support better justice and community outcomes.

Amongst a number of initiatives with universities, including developing joint appointment roles, ESR is actively pursuing with the University of Auckland the development of a joint graduate school. This focuses on collaborative post graduate student research, teaching and secondment opportunities initially in forensics with the intention to expand into health, water and food borne disease sciences.

Location for Community led Outcomes

ESR believes that as a science research-led delivery institute focused on improving community Wellbeing, uplift in research system performance benefits from being located within the communities where its science has impact. ESR already realises the uplift in research system performance from co-location with universities and other research institutes at its sites.

Community connection is important. ESR's facilities located in communities such as its Kenepuru campus in Porirua, for example, make the facility and its science accessible to co-creation and co-learning with those communities especially local hapu. ESR continues to work very closely with Ngāti Toa Rangatira at Kenepuru in offering community youth outreach

activities, co-designed research initiatives, employment opportunities for local iwi scientists, and close collaboration on development of ESR's local facilities.

Ngāti Toa and ESR are united in their determination to ensure that ESR's property proposals achieve the positive outcomes laid out by the government for the science industry for the benefit of all New Zealanders.

Delivering for New Zealand

The opportunities and approaches outlined above, amongst many others will continue to contribute to the implementation of government and industry strategies such as *MBIE's Circular Economy Strategy and Business Productivity Goals, the Fit for a Better World Roadmap and the Conservation and Emissions Reduction Plan.*

ESR continues to look for opportunities to add value, protect people and support regulatory outcomes. We look forward to continuing and growing our collaboration with iwi, the Government, and partners. In this way together ESR will ensure that the applied science research and delivery for community health and wellbeing is innovative, connected and delivered in the most effective way.

Nāku iti noa, nā

Denise Church
Chair ESR