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Dr Gillian Hirth
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Dear Dr Hirth

SUBMISSION IN RESPONSE TO THE AUSTRALIAN SUBMARINE AGENCY LICENCE APPLICATION TO SITE A PRESCRIBED RADIATION FACILITY KNOWN AS THE "CONTROLLED INDUSTRIAL FACILITY"

Tellus appreciates the opportunity to provide a submission in response to the Australian Submarine Agency's application (the Application) to establish a Controlled Industrial Facility (CIF) at HMAS Stirling in Western Australia, as provided on the ARPANSA website on 9 May 2024. This Application is for siting of the proposed facility, and we note that the proposed facility will include a temporary radioactive waste storage facility.

We understand that under its regulations ARPANSA's usual practice is to release a proponent's full application for public consultation. In this case, a six page "submission overview" document has been provided for public consultation, upon which our submission is based. We note the challenge of providing a comprehensive submission based on only partial information about ASA's application.

Executive Summary

The success of AUKUS is in Australia's national interest. Its realisation will depend on the Australian community accepting that the benefits of nuclear-powered submarines for our national security outweigh the risks arising from the generation of nuclear and radioactive waste.

Demonstrating a safe and secure radioactive waste disposal pathway as soon as practicable will be a key component of gaining community acceptance of AUKUS and support its long-term sustainability.

Tellus is a strong supporter of the AUKUS partnership. In accordance with international best practice, Australia requires a permanent waste disposal solution for low level radioactive waste generated by AUKUS submarines. This is something Tellus can provide today.

To explain, Australia has a licenced low-level radioactive waste disposal facility, located in Western Australia, owned and operated by Tellus. Since receiving its licence to operate, the facility has accepted for disposal nearly 6,000 cubic metres of low-level radioactive waste and more than 800 disused sealed radioactive sources from across Australia.

ASA's Application to store low-level radioactive waste in a temporary storage facility on base at HMAS Stirling without a defined disposal pathway or defined time for disposal does not appear to meet its own objectives to achieve international 'best practice' regulatory guidance, nor does it appear to align with guidance issued by ARPANSA for regulated entities.

In terms of exposing workers or the public to radiation doses, ASA has not justified why ongoing temporary storage of low-level radioactive waste at HMAS Stirling is a safer and better outcome than disposal of waste in a timely manner at the licenced Sandy Ridge disposal facility.

Further, ASA's Application increases the social licence risks of Australia's nuclear-powered submarine program, and AUKUS more generally, by failing to reassure the Australian public that radioactive waste will be immediately and safely permanently disposed and declining to give reasons why it is not disposing of waste immediately when this capability exists in Australia today.

About Tellus

Tellus owns and operates Australia's first and only nationwide radioactive waste facility, Sandy Ridge, which is 240km northwest of Kalgoorlie. Sandy Ridge is a near-surface geological repository, a type of facility well-known internationally as extremely safe for the permanent disposal of low-level radioactive waste.

Sandy Ridge is located on the Archean Yilgarn craton where extensive granitic rocks are overlain by surficial kaolin and saprolite formed by in-situ weathering. The environment is arid, with low annual rainfall and high rates of evapotranspiration.

Sandy Ridge operates with approval from the Western Australia Government and is licensed by WA Radiological Health Council to permanently dispose of low-level radioactive waste.

Tellus' radioactive waste licence has been carefully scrutinised by ARPANSA, who was engaged by WA Radiological Health Council for the evaluation of Tellus' licence application.

Tellus has established a record of safe operations for the disposal of hazardous waste, from commencement of hazardous chemical waste operations in 2020 through to full operations since its radioactive waste licence was received in 2023.

There are no legislative barriers to ASA disposing of low-level radioactive material from nuclear-powered submarines at Sandy Ridge. Since licence approval, Tellus has accepted for disposal more than 5,700 cubic metres of LLW from government and private sector entities operating in locations in every mainland state and territory in Australia.

In addition to its regulatory approvals, Tellus has obtained and maintains social licence to operate from its local communities. It operates under a native title agreement with the Marlinyu Ghoorlie community at Sandy Ridge, while two additional projects in development – a deep-geological repository in a bedded salt formation (Chandler) in the Northern Territory and a Deep Borehole Demonstration project near Sandy Ridge, have also been approved by traditional owners.

Tellus' expert radiation safety staff include: Mr Robert Blackley, with more than 20 years of experience in radioactive waste management at ANSTO, including significant international experience and leadership roles with the Australia Defence Force for the safe management of visiting nuclear navies to Australia; Dr Bill Miller, a world-renowned radioactive waste expert previously of ARWA, with operational experience at Fukushima Daichi remediation program; and Ms Annelize van Rooyen, who has been involved in all aspects of radiation safety and the nuclear fuel cycle, including waste recovery projects and IAEA non-proliferation and safeguards activity, in South Africa and Australia.

Tellus' views on the Application

a) The Application appears inconsistent with International Atomic Energy Agency guidance and international best practice.

Australia is a member of the International Atomic Energy Agency, which sets out international best practice for radioactive waste management. Tellus notes in deciding whether to issue a licence under the Australian Radiation Protection and Nuclear Safety Act 1998 (the Act), section 32(3) requires that "the CEO must take into account the matters (if any) specified in the regulations, and must also take into account international best practice in relation to radiation protection and nuclear safety."

The Application states: *"In accordance with the ARPANS Regulations 2018, the ASA has also provided information on safety management, radiation protection, low-level radioactive waste management, security management, emergency management and environment protection management, amongst other requirements. Included in this body of information is how the ASA is adopting international best practice published by the IAEA and ARPANSA, and building into its policies and procedures to ensure the ASA upholds the highest standards of nuclear safety, security and safeguards."*

Tellus also notes that an application for a facility licence must include, among other things, the radioactive waste management plan for the facility (Australian Radiation Protection and Nuclear Safety Regulations 2018 (the Regulations) – Regulation 46 (1)(d)(iv).

It is not possible to fully assess whether ASA's Application is in accordance with international best practice published by the IAEA and ARPANSA, given only a "submission overview" has been publicly released for consultation. Therefore, our comments relate to the limited information the ASA has provided.

So, what is international best practice in relation to radioactive waste management? The IAEA makes clear that "[t]he ultimate objective of radioactive waste management is to protect individuals, society and the environment from the harmful effects of ionizing radiation due to spent fuel and radioactive waste, both now and in the future" (*IAEA, Policies and Strategies for Radioactive Waste Management, 2009, p31.)*

ASA's proposed disposal strategy is indefinite "temporary" storage at HMAS Stirling and / or temporary relocation to other Defence radioactive storage locations, and provides no details as to when, or assurances that, disposal at a future facility will be implemented. According to the IAEA's 2009 guidance *Policies and Strategies for Radioactive Waste Management,* immediate disposal (*2009, p31*) in an appropriate facility designed to provide isolation from the biosphere *(2009, p22)* is usually the preferred option in considering timing and disposal strategy. Near-surface disposal facilities are considered an appropriate facility *(2009, p27.)*

An immediate disposal strategy requires a disposal facility to be available to achieve that aim. While the Australian Government has been unable for decades to establish a national radioactive waste management facility, since January 2023 a near-surface facility licenced for low-level radioactive waste disposal has been operational in Australia at Sandy Ridge and available for use. Indeed, Sandy Ridge has been utilised to dispose of low-level radioactive waste by a wide range of Australian clients, including State governments, Tier 1 mining companies, ASX-listed entities, radiation specialists, global oil and gas giants and elite Universities.

This means that ASA's deferred disposal strategy (often adopted when no disposal facility exists) is not required and indeed can be superseded by a more optimal strategy of immediate or timely disposal.

Of course, it is open to ASA to propose a deferred disposal strategy if it believes that it is the optimal strategy for the circumstances of readying for AUKUS submarines in 2027. According to the IAEA, the process of determining the optimal strategy should include a multi-attribute analysis *(2009, page 41*), comparing the relative advantages and disadvantages of each strategy option. Further, a proponent should ensure that its chosen strategy can be implemented in its country, including consideration of social or political reasons that may prevent its implementation *(2009, p41.)*

It may be the case that ASA has prepared and shared such a multi-attribute analysis with ARPANSA, which demonstrates that deferred disposal with a nominated endpoint that has never before been achieved by an Australian Government agency is more optimal than an immediate disposal strategy that incorporates a known, licenced and operating disposal facility located nearby. However, this information has not been included in the "submission overview" so it is difficult for stakeholders, including the local community where the CIF is to be located, to assess this work, if indeed it has been completed.

The IAEA states that important aspects to consider when developing and implementing a waste management strategy include transparency, openness and a regard for public attitudes of the local community *(2009, p38.)* According to the IAEA: "Transparency and openness by the developer in relation to plans that may affect local communities offer the best chance of success," and "[a]n important aim should be to gain the confidence and good opinion of the local community," *(2009, p38.)*

Although ASA applied to ARPANSA to establish a CIF at HMAS Stirling on 27 March, it has not published this information on its website. It has also declined to release for public consultation its full safety case for the CIF. These actions do not appear to follow the spirit of international best practice, as set out by the IAEA, with regard to transparency about ASA's radioactive waste management strategy. Further, the "submission overview" lacks any detail as to ASA's understanding of "public attitudes and expectations in relation to the potential construction of [a] radioactive waste management facilit[y]", nor does it include information that possible community concerns have been addressed in its Application.

This approach is also at odds with the declared position of the current Government and its Federal Minister responsible for the development of a National Radioactive Waste Management Facility who, in relation to that project, stated: "We have said all along that a National Radioactive Waste Facility requires broad community support. Broad community support which includes the whole community, including the traditional owners of the land. This is not the case at Kimba." *(Ministerial Statement 10 August 2023.)* It is not clear whether this is also the case at HMAS Stirling.

IAEA guidance *(2009, p41)* specifies that possible management end points should be identified and selected for each waste category it holds, including where a strategy includes long term storage. ASA has publicly stated, at Senate Estimates on 6 June 2024, that the CIF is not meant to be a long-term storage facility. However, with no disposal or removal date nominated, with the "submission

overview" only identifying a future disposal site yet to be determined, and decades of unfulfilled commitments to government radioactive waste disposal facilities, it is not clear for how long ASA proposes to store LLW at HMAS Stirling. Based on the safety case not being publicly available, it is difficult to ascertain whether one of the possible management end points identified by ASA include the existing Tellus radioactive waste disposal facility at Sandy Ridge. Based on IAEA guidance, it is reasonable to expect that it should have been.

Policies and Strategies for Radioactive Waste Management is reinforced by the IAEA's 2003 publication, *The Long-Term Storage of Radioactive Waste. A Position Paper of International Experts.* The paper responds to the proposition agreed at the International Conference on the Safety of Radioactive Waste Management, held in Córdoba, Spain, in March 2000, that "perpetual storage of radioactive waste is not a sustainable practice and offers no solution for the future"*(2003, Foreword)*. The paper's key point is that safety in the long-term is better ensured by disposing of radioactive waste material as soon as practicable.

A key principle of radioactive waste management, found in the IAEA's Principles of Radioactive Waste Management (1995) is to avoid imposing undue burdens on future generations: "the generation that receives the benefit from an activity should also commit to taking care of any liabilities from that activity" *(2003, p1)*. By not choosing immediate or timely disposal of radioactive waste being generated by AUKUS submarines, instead promising to identify a future disposal solution without having identified a site or timeframe for disposal, the ASA's Application risks violating this principle.

Another argument for immediate/timely disposal, as opposed to indefinite, temporary storage, is the risk of degradation of waste contents and packaging over time. Australia, through agencies like ANSTO, has demonstrated that this risk can be successfully managed, but there are other examples where this has not been the case, such as the thousands of drums of LLW material exposed to corrosion stored on the Woomera Defence site. Importantly, the IAEA notes: "The longer the waste is stored before transfer to another facility, the greater are the probabilities that such degradation will occur, with a resultant potential of radiation exposure for the workers who will eventually have to carry out the transfer and handling operations. In this regard, long term safety is not well served by very long periods of storage."*(2003, p5.)*

Immediate/timely disposal eradicates the risk of degradation and will significantly reduce, if not eliminate, risks to workers (including Defence personnel) managing the CIF who would otherwise be responsible for the ongoing maintenance and management of temporarily stored radioactive waste at HMAS Stirling. Over time, managing these safety risks will be more likely to be a higher-cost approach than the one-off costs of disposal.

Finally, immediate disposal is a more secure approach than what has been proposed by ASA; the IAEA makes clear that disposal underground of low-level radioactive waste increases security, and disposal as early as is reasonable is "strongly and unequivocally" more secure *(2003, p12.)*

b) The Application appears inconsistent with ARPANSA Guidance.

ARPANSA issues regulatory guidance to Commonwealth radioactive waste holders it regulates, including in relation to waste storage and disposal facilities. In this case, ASA has applied for a facility licence for a prescribed radiation facility (**PRF**). ARPANSA Guidance about PRFs can be found in Regulatory Guide – Applying for a facility licence for a prescribed radiation facility (ARPANSA-GDE-1798).

Given the "submission overview" sets out that the facility will also be a temporary radioactive waste storage facility, we have also provided comment on ASA's Application with respect to regulatory guidance for a radioactive waste storage facility (ARPANSA-GDE-1736). It provides that:

- A safety case is to be prepared by an applicant demonstrating a full understanding of all relevant safety aspects of the controlled facility and suitable to be used as the basis for consultation with all stakeholders. This information has not been provided for consultation purposes by ASA.
- A licence application is to set out how the application meets international best practice. This information has not been provided in the "submission overview."
- An applicant must demonstrate optimization, that radiation exposure is as low as reasonably achievable. As stated above, immediate/timely disposal is a safer and more secure strategy than indefinite temporary storage, which will increase the likelihood of accidents and risks to workers of unnecessary radiation exposure. The lowest reasonably achievable rates, magnitude and likelihood of exposure are more likely to be achieved through an immediate disposal strategy.

ASA's Application to store LLW for an indeterminate period will increase radiation exposure for workers at the controlled industrial facility. Given ASA is currently unable to provide ARPANSA, Defence servicemen and women, members of the community in the City

of Rockingham or the public with a timeframe for when the temporarily stored waste will be disposed, there is no way to determine the levels of radiation exposure that will be faced by workers in the long term.

In contrast, the safest possible option available for Defence personnel and the local community is immediate or timely disposal of LLW at Sandy Ridge. Sandy Ridge is a purpose-built licenced disposal facility located in a remote location more than 100km from the nearest residential dwelling. This strategy will guarantee workers are not unnecessarily exposed to radioactive materials in the course of their service.

According to ARPANSA's guidance, permanent disposal of radioactive wastes in appropriately designed and licensed facilities is internationally recognised as best practice for materials that have no further utility.

Given a permanent waste disposal pathway exists but has not been nominated, at least not in the "submission overview" it is arguable that ASA's Application does not meet best practice standards as outlined by ARPANSA. While it is understood that a disposal program may need to be underpinned by a period of interim storage, until such time as a disposal facility becomes available, interim (or indefinite) storage is not an alternative to disposal, and disposal is the recognised end point for long-term safety. This is outlined in ARPANSA's 2019 publication *Radioactive Waste Storage & Disposal Facilities. Information for Stakeholders*.

Waste should always be managed by the waste holder in accordance with a valid and up-to-date radiation and waste management plan. ARPANSA's *2020 Code for Radiation Protection in Planned Exposure Situations* stipulates that the radiation management plan should explicitly provide justification for the continuation of any practice that gives rise to a dose to workers or the public and should be regularly reviewed.

The publicly released "submission overview" does not include information about a radiation management plan, so Tellus is unable to determine whether ASA's plan adequately justifies a decision not to use the available waste disposal facilities at Sandy Ridge. If such a radiation management plan has been prepared, Tellus has provided no information in its preparation.

As part of the application / assessment process, ASA should go through an options identification, selection, and optimisation process to justify their plan to implement indefinite storage rather than to implement prompt disposal, given Sandy Ridge is an option available for radioactive waste disposal. Tellus has had no correspondence with ASA that would demonstrate disposal at Sandy Ridge was considered and rejected on the basis that the establishment of new temporary radioactive waste storage facilities was a more optimal outcome.

What is optimal depends on several factors, including radiation safety but also social and economic factors. To decide on what is optimal, a structured options assessment process is required for the identification, selection and implementation of the preferred optimisation option. This is outlined in ARPANSA's 2020 *Advisory Note: Dose and risk criteria for protection of people following the closure of a disposal facility for radioactive waste*.

Tellus also notes that the Application does not include information about the community's views of establishing a radioactive waste storage facility in the City of Rockingham, nor does it address the social and economic costs of siting and constructing a future radioactive waste disposal facility compared with using the services of a low-level radioactive waste disposal facility that has already been constructed and is operating under a native title agreement and with support from its local community.

c) The Application appears inconsistent with the Australian Radioactive Waste Management Framework.

The IAEA notes that any strategy for managing radioactive waste must be developed taking relevant national policies into account. (2009, p32). The Department of Industry, Innovation and Science (DISR) published in 2018 the Australian Radioactive Waste Management Framework (the **Framework**). The Australian Radioactive Waste Agency (**ARWA**), a division of DISR which now oversees the Framework, was established in 2020 for the purpose of advising Australian Government agencies on the management of radioactive waste and consolidating the Australian Government's LLW in a single national disposal facility. It is a matter of public record that ARWA has been advising ASA about, and has been receiving funds from ASA for, the development of its radioactive waste management strategy.

Echoing international best practice, one of the objectives of the Framework is to maintain intergenerational equity to avoid creating obligations and unfair burdens on succeeding generations. ARWA sought to deliver on this commitment by attempting to establish a single site for the disposal of waste held in storage around Australia – a National Radioactive Waste Management Facility (**National Facility**). ARWA's Framework notes: "the move away from multiple storage sites is aligned with international best practice for the

long-term management of radioactive waste as recognised by the Commonwealth radiation protection and nuclear safety regulator ARPANSA."

The Framework is predicated on the existence of a National Facility. While a National Facility has not been established (and there is currently no proposed site nor timeline for its completion), it should be recognised that there is a licensed radioactive waste facility available, Sandy Ridge, that could be used today to achieve ARWA's goals of delivering intergenerational equity and avoid the ongoing proliferation of "temporary" radioactive waste storage facilities.

There now exists a radioactive waste facility at Sandy Ridge able to dispose of low-level radioactive waste from all over Australia and its Exclusive Economic Zone. Creating a new temporary radioactive waste storage facility at HMAS Stirling, in addition to the other temporary radioactive waste facilities that ARWA was seeking to consolidate, would be directly counter to the goals of the Australian Radioactive Waste Framework to move away from multiple radioactive waste storage sites.

d) There are no policy or legal barriers to ASA disposing of low-level radioactive waste at Sandy Ridge.

ARWA has suggested, at Senate Estimates Hearings, that policy, legal and waste acceptance criteria issues may prohibit Tellus disposing of low-level radioactive waste produced and/or stored by Australian Government agencies.

In terms of legal issues, the ASA publicly stated at Senate Estimates on 6 June 2024 that the material generated by maintenance on nuclear-powered submarines will not be nuclear material (which we understand as meaning material directly from a nuclear reactor) but rather low-level radioactive waste. On that basis, the restrictions set out in the Nuclear Waste Storage and Transportation (Prohibition) Act 1999 (WA) would not apply to this material. For the avoidance of doubt, Tellus obtained advice to inform its view of the regulatory landscape, which is summarised below:

- There are no apparent legal prohibitions (including within the Prohibition Act) to prevent Tellus from accepting Commonwealth LLW material. Under its Western Australian radiation licence, Tellus possesses the capability to permanently isolate LLW material, including Commonwealth LLW material.
- Commonwealth LLW material that ***directly*** originates from a nuclear reactor cannot be permanently isolated by Tellus in adherence to the stipulations of the *Nuclear Waste Storage and Transportation (Prohibition) Act 1999 (WA)*. This prohibition does not apply to wastes arising from other types of facilities such as those used to produce radiopharmaceutical medicines.
- Commonwealth laws do not confer upon the Commonwealth any exclusive authority over the management of waste generated or managed by the Commonwealth, nor do such laws solely authorise the Commonwealth to establish waste facilities to the exclusion of private entities, such as Tellus.
- Certain types of radioactive waste are not covered by Tellus' licence or would not be able to be accepted by Tellus, specifically High-Level Waste (HLW), Spent Nuclear Fuel, and waste originating directly from nuclear reactors (the "Excluded Waste Types")
- The disposal of naturally occurring uranium, thorium, or depleted uranium, to the extent covered under the Safeguards Act, would necessitate specific batch approvals under Tellus's existing permit under the Safeguards Act, noting Tellus has already accepted for disposal Safeguards material.

With respect to policy issues, ARWA publicly confirmed in 2020 that use of a proposed National Radioactive Waste Facility would not be mandatory for Australian Government agencies, which would allow for such agencies to utilise Tellus services.

Regarding waste acceptance criteria for the Sandy Ridge facility, Tellus would welcome engagement with ARPANSA or any other relevant agency to assess the appropriateness of the current waste acceptance criteria and seek amendments if necessary to support the safe and secure disposal of low-level radioactive waste from nuclear-powered submarines in support of the AUKUS partnership.

e) The Application's approach has material social licence risks and risks the community's acceptance of AUKUS program and radioactive waste storage

The acquisition of nuclear-powered submarines is a paradigm shift for our nation. For the first time, Australia – a country with a legislated ban on nuclear power – is acquiring nuclear technology for national security purposes. The response by Australians shows

this policy does not enjoy full community support: a 2024 Lowy Institute Poll revealed that 32 per cent of Australians are somewhat against (20 per cent) or strongly against (12 per cent) Australia acquiring nuclear-powered submarines, a four-point increase since 2022. *([https://poll.lowyinstitute.org/charts/acquiring-nuclear-powered-submarines/)*

Many concerns have been raised about the management of AUKUS-generated radioactive waste. These concerns may stem from, among other things, Australia's historical experience of widespread radioactive waste contamination from Defence activities on indigenous lands in South Australia and the inability of Australian Governments to obtain social licence for an appropriate radioactive waste management facility since attempts began in the 1970s.

ASA is proposing a radioactive waste storage facility with no defined date for permanent disposal, and no designated site for the construction of a suitable facility. With the best of intentions, ASA is asking Australians to take on trust assurances that these things will happen in a timely way. Based on history (in Australia, the United Kingdom and the United States), this is a sizeable ask. Any further breach of trust in this respect may have consequences for ongoing electoral support of AUKUS, which is still at the early stages of its implementation.

Obtaining social licence for radioactive waste management activities is not easy but it is possible. Tellus has demonstrated through its development and operation of Sandy Ridge that community acceptance can be achieved through consultation and the development of trusting relationships. Tellus recent' agreement with the Titjikala traditional owners near Alice Springs, in October 2023, of its proposed deep geological repository for international hazardous chemical and low-level radioactive waste demonstrates a unique ability to achieve social licence for complex and potentially controversial projects. This social licence experience and expertise is available to be utilised by ASA in the national interest.

Possible future options

Tellus supports the Australian Government's AUKUS program and would welcome the opportunity to work with ARPANSA and ASA to address any issues we have identified in ASA's Application, especially regarding an appropriate options assessment to compare indefinite temporary storage against permanent disposal to existing facilities such as Sandy Ridge.

As the exclusive Australian distributor of PacTec radioactive waste packaging, and with nearly four years of operational experience in packaging and transporting hazardous waste from locations across Australia to Sandy Ridge for permanent disposal, Tellus can provide an immediate disposal pathway for the operational wastes expected to arise from nuclear-powered submarines under ASA's stewardship. The Sandy Ridge disposal facility is proximate to HMAS Stirling where wastes are expected to arise and from where established transport supply chain infrastructure and processes have been established.

We would be pleased to discuss any aspect of our submission in more detail. For more information, please contact Ryan Bloxsom, Head of External Affairs on 0429 219996 or at ryan.bloxsom@tellusholdings.com

Yours sincerely,

Nate Smith
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Tellus Holdings Ltd