



MAPW - Health Professionals Promoting Peace

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Parliamentary Standing Committee on Public Works
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30 July, 2021

**Submission regarding Australian Nuclear Science and Technology Organisation
Intermediate Level Solid Waste Storage Facility Lucas Heights, NSW.**

SUMMARY

MAPW supports the construction of a new Intermediate Level Solid Waste Storage Facility at Lucas Heights. As noted in the ANSTO submission, there will be minimal expected impact on the community and ANSTO has excellent existing security.

This contrasts with the massive distress and community division in regional and remote communities that has been created by a succession of nuclear waste storage proposals.

This facility will be useful over a much greater timeframe if ANSTO's rapidly expanding production of isotopes for nuclear medicine is reined in. This very heavily subsidized export business has only a small minority of the radiopharmaceuticals produced being utilised in the care of Australians. There is no evidence whatsoever of more than minimal cost recovery. The burgeoning amounts of ILW produced will be a liability for Australians for many generations.

More reliable, safer, cheaper and much cleaner cyclotron production of technetium^{99m} (Tc^{99m}) has been shown to work and is being implemented in Canada. Japan, the USA, the UK and several European countries are all looking to implement cyclotron production.

The proposed new ILW facility provides an opportunity to identify and implement world's best practice ILW disposal options and update and reset nuclear medicine production to cleaner, cheaper and more reliable methods.

MAPW strongly recommends:

- an open and independent review of nuclear waste production and disposal in Australia, and
- progressing a shift to cyclotron rather than reactor-based production of isotopes for nuclear medicine as rapidly as feasible.

Individual criteria will now be addressed.

The stated purpose of the proposed work and its suitability for that purpose

This facility is needed and the proposal suitable. There is no urgency for the establishment of a National Radioactive Waste Management Facility (NRWMF), and progressing a new Intermediate Level Solid Waste Storage Facility at Lucas Heights recognises this. Carl-Magnus Larsson, the CEO of the federal nuclear regulator, the Australian Radiation and Nuclear Safety Agency (ARPANSA), told a Senate Inquiry in June 2020 that intermediate “waste can be safely stored at Lucas Heights for decades to come.”¹

At the same Inquiry he confirmed ARPANSA “is aware that some stakeholders have interpreted ARPANSA’s decisions regarding the IWS as a requirement for relocation of the waste stored in the IWS, even suggesting that there is an urgent need for relocation. This is not correct. ARPANSA has not raised safety concerns regarding storage of waste at the IWS.”¹

The need for the work

This facility is needed. For public health reasons ILW must be stored in a purpose built safe and secure facility until it is properly disposed of. Lucas Heights is the best placed for extended interim storage, with established expertise and security.

ILW remains radioactive for over 10,000 years and needs to be kept safe from the environment for that time. To put that in perspective, the Egyptian Pharaohs were around 5,000 years ago.

The cost-effectiveness of the proposal and the current and prospective value of the work

This plan may prove very cost effective if as a result of the extra capacity, there is time for an open and independent inquiry looking into world’s best practice management of nuclear waste. Given current world’s best practice standards, the likely result would be that the plan to shift ILW for temporary storage at a new NRWMF does not proceed.

Temporarily storing ILW in regional South Australia increases risk, complexity and cost with double handling of waste, building and maintaining a secure additional storage site, and increased long-distance transport of radioactive waste. It sends the waste to an area that

¹https://www.aph.gov.au/Parliamentary_Business/Hansard/Hansard_Display?bid=committees/commsen/3ae991cf-74a3-4f9e-9f5c-fbc6fccebfd2/&sid=0000

does not have the skill, experience and security present at Lucas Heights. Permanent disposal is considered internationally to be the safest long-term management option for radioactive waste.²

Arguments that radioactive waste should all be at one site overlook the ongoing need for hospitals to store clinical waste. After nuclear medicine is used in a patient, the vast majority of the residual material and radioactively-contaminated equipment is stored on site while the radioactivity decays away. Within a few days, it has lost so much radioactivity that the material can go to a normal rubbish tip. There will always need to be multiple waste storage locations at sites which utilise radiopharmaceuticals.

At some point ANSTO needs to address proper disposal of ILW. Countries such as Finland have spent decades researching how best to do this, and Australia could learn a lot from their research and expertise.³

The current and prospective value of the work

As noted above, this work may add value by providing breathing space - a time frame enabling open and independent review of the claimed need for a NRWMF for “temporary storage.”

The work will have even greater value to the Australian public if ILW production is also reviewed and curtailed. If this is done, the proposed new Intermediate Level Solid Waste Storage Facility at Lucas Heights will take much longer to fill, and will be available for a much longer time frame.

The first principle of managing toxic waste is to reduce production.

Currently ANSTO is rapidly expanding its production of nuclear medicine to supply isotope precursors for Tc^{99m}, which is the most commonly used isotope in nuclear medicine. This export business continues because it is heavily subsidised. It has no cost benefit analysis and no full cost recovery.⁴

Historically the OPAL reactor at Lucas Heights has produced 1% of the world’s supply, which is enough for Australian nuclear medicine practice. ANSTO is currently increasing to 25-30% of global supply, with very little acknowledgement of the massively increased quantity of ILW this will generate.

ANSTO has proved an unreliable supplier, with multiple outages and supply shortages in the last few years.⁵ When sourcing from a single nuclear reactor, one break in the chain of production shuts down the whole process. If Tc^{99m} were instead sourced from multiple cyclotrons based in hospitals around Australia, if one broke down there would be supplies available from other cyclotrons.

² <https://www.arpansa.gov.au/understanding-radiation/radiation-sources/more-radiation-sources/radioactive-waste-safety>

³ <https://www.nytimes.com/2017/06/09/science/nuclear-reactor-waste-finland.html>

⁴ Expert Review Panel on Medical Isotope Production <http://cins.ca/docs/panrep-rapexp-eng.pdf>

⁵ <https://www.theleader.com.au/story/5716557/lucas-heights-nuclear-medical-facility-needs-210m-revamp-report/>

Clean cyclotron production of Tc^{99m} has recently been approved and is being implemented in Canada. This should rapidly become the future of isotope production. It avoids the high cost, serious accident and terrorist risks of nuclear reactors, has no weapons proliferation potential, and creates very little nuclear waste⁶, and can utilise pre-existing cyclotrons.

Japan, the USA, the UK and several European countries are all looking into implementing the more reliable, safer, cheaper and much cleaner cyclotron production of Tc^{99m}.^{7,8,9}

Indeed, in the 2015 South Australian Nuclear Fuel Cycle Royal Commission Report, one of its recommendations was:

“ 7. Promote and actively support commercialisation strategies for the increased and more efficient use of the cyclotron at the South Australian Health and Medical Research Institute.”¹⁰

Australia needs to develop and implement cyclotron manufacture, rather than continue to heavily subsidise the current hazardous and costly production method that produces so much ILW.

The long-term liabilities of ILW are seldom acknowledged, and this proposed new Intermediate Level Solid Waste Storage Facility provides an opportunity for timely reassessment.

CONCLUSION

MAPW supports the construction of a new Intermediate Level Solid Waste Storage Facility at Lucas Heights.

MAPW strongly recommends:

- an open and independent review of nuclear waste production and disposal in Australia, and
- progressing a shift to cyclotron rather than reactor-based production of isotopes for nuclear medicine as rapidly as feasible.

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I would be happy to appear as a witness if that would be useful. Margaret Beavis

⁶ <https://news.ubc.ca/2020/12/18/made-in-canada-method-of-producing-life-saving-radioisotopes-receives-health-canada-approval/>

⁷ https://www.nmp.co.jp/sites/default/files/public/en/press_release/Press%20Release_191011Molybdenum-99.pdf

⁸ <https://www.annualreviews.org/doi/full/10.1146/annurev-nucl-032020-021829>

⁹ <https://researchbriefings.files.parliament.uk/documents/POST-PN-0558/POST-PN-0558.pdf>

¹⁰ https://s3-ap-southeast-2.amazonaws.com/assets.yoursay.sa.gov.au/production/2017/11/09/03/09/17/3923630b-087f-424b-a039-ac6c12d33211/NFCRC_Final_Report_Web.pdf