EPBC Act referral

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Title of proposal	2021/9025 - Intermediate Level Solid Waste Storage Facility

Section 1

Summary of your proposed action

1.1 Project industry type Commonwealth

1.2 Provide a detailed description of the proposed action, including all proposed activities

Australian people, our industry and our economy benefit from both the radiopharmaceuticals (otherwise known as nuclear medicines) produced at Australia's Nuclear Science and Technology Organisation (ANSTO), as well as the industrial and environmental research undertaken by the organisation. The production of radiopharmaceuticals and research activities result in the generation of radioactive waste. Like all other nuclear-capable countries, ANSTO has a responsibility to safely manage the radioactive waste generated through the nuclear processes from which we benefit.

The definition of what is Intermediate Level and Low Level waste in Australia will be determined by Australian Radioactive Waste Agency (ARWA) in the future. The new store will be for holding Intermediate Level Solid Waste (ILSW) but will also hold some wastes prior to characterisation to identify their radioactivity levels. All wastes to be held in the facility are collectively referred to as Remote Handled Solid Wastes (RHSW). ANSTO currently uses a contact dose rate of greater than 2mSv per hour to distinguish Remote Handled from Contact Handled waste on our site.

Based on current projections for certain streams of RHSW production at ANSTO, existing storage facilities will be at capacity from 2027. As a result, an additional facility is required to ensure that ANSTO can safely store and manage this RHSW, until a time where it is able to be safely transported to the National Radioactive Waste Management Facility (NRWMF) for interim storage, subject to it meeting the NRWMF's waste acceptance criteria. The NRWMF is currently stated to be operational from 2030.

The proposed ILSW storage facility, also referred to as the Intermediate Level Waste Capacity Increase (ILWCI) facility, will be used to store RHSW from various ANSTO activities including filter cups generated in the ANSTO Nuclear Medicine (ANM) Mo-99 process which are welded into storage vessels and stored in tubes. Other RHSW, including Synroc cans placed in aluminium retrievable bins (ARB), will be stored in engineered below ground sections of the new facility.

The ILWCI facility is to be a purpose-built single-level store similar to an existing storage facility on the ANSTO site, which has been safely operated for over 60 years. The facility will be located in the Southeast corner of the Lucas Heights campus, which is approximately 35 km southwest of Sydney's Central Business District, and has operated at that location since the 1950s. The campus has been investigated extensively through the development of safety assessments and Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) licence applications for other Nuclear Installations including the OPAL reactor, and various radioactive waste stores. Supported by various studies and analyses, this site has proved to be a suitable location for Nuclear Installations. Locating the facility within the ANSTO campus will enable the facility to be managed and operated by ANSTO until it can be transported to the NRWMF, where it will be managed by other suitably-qualified experts.

The building will have a steel portal framed building superstructure, with a fully braced roof and end bays supported on concrete piled footings with a total area of 1186 m2. The building exterior will be clad in precast concrete panels and lightweight steel, while the roof is clad with steel sheeting. Within the building are subfloor in-situ concrete storage areas in over-excavated rock, supported directly on rock. A truck bay with roller door access at each end would be provided to accommodate the delivery of waste into and out of the facility.

The following general plant and equipment will be associated with the facility:
- Dangerous goods-rated electric overhead travelling crane (15 t) and other lifting equipment (e.g. slings)
- Shielded flasks
- Active ventilation system
- Local area radiation monitors

Operations and material handling processes at the proposed ILWCI facility will be similar to those successfully utilised in the existing RHSW storage facility. RHSW generated from research or manufacturing of nuclear medicine on the campus will be transported to the facility in a specially designed transport flask on an ANSTO truck. An overhead crane will be used to remove the lid from one of the below ground storage areas and then move the transport flask from the truck to that location. The flask containing the RHSW will be placed onto the desired position, its contents will be lowered directly from the flask into the storage location, then the flask will be returned to the truck and the storage lid will be positioned back in place. The empty flask will then be moved back to its storage area.

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To support the proposed facility, road works will be performed on Dalton avenue to provide for facility access. A substation and associated site power infrastructure will be upgraded; and site utilities including water, telecommunications, and effluent may be relocated or adjusted. The construction will be managed under an Environmental Management Plan to be developed to minimise any impacts to the environment. Details on the management of any impacts to the environment can be found throughout ATT I - EPP.

ANSTO has made a submission to ARPANSA to seek authorisation for the Siting Licence. This will be followed later by applications for Construction and Operating Licenses. The design of the facility building will be compliant with relevant Australian Standards and ARPANSA requirements for a controlled facility. Procedures will be written to operate and maintain the facility, and will reflect decades of experience in operating similar facilities. These will demonstrate that:

- All engineering systems work in a safe and effective manner in accordance with specifications;
- Shielding against radiation in the plant is effective;
- Material handling systems operate as designed;
- Off-gas systems demonstrate effectiveness in minimising radioactive emissions for optimisation of protection; and
- Staff are adequately trained and capable of operating the plant.

After commissioning, an Operating Licence will be sought from ARPANSA. Subject to this approval, the facility will begin to accept RHSW. The facility will be operated in accordance with the established procedures and ARPANSA regulations. Critical elements of these procedures are:

- Radiation safety: The requirements will be set to comply with ANSTO's procedures for handling and storage of radioactive materials. In particular, all staff working in the area will continue wearing personal dosimeters and carrying personal digital radiation monitors. Appropriate wall-mounted radiation monitors will be installed in selected locations within the building to provide operational staff with additional warning of abnormal radiation readings.
- Personnel and materials access: This will be controlled by ANSTO's security and material access procedures. Routine personnel access will be restricted by ANSTO's site wide security system and building electronic card reader access. Materials moved into and out of the building will be subject to clearance through existing ANSTO procedures.
- Gaseous Emissions: The facility has been designed so that emissions of chemicals and radioactivity will be either zero or below prescribed limits. Monitoring devices will ensure compliance with regulatory requirements.

1.3 What is the extent and location of your proposed action?

See Appendix B

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland)

ANSTO's main campus is located in Lucas Heights, about 35 km south-west of the Sydney CBD on the dissected Woronora Plateau at an elevation of about 150 m Australian Height Datum (AHD). The site is approximately 2 km west of the Woronora River and 8 km south of the Georges River and is surrounded by bushland for several kilometres with no significant human habitation in the north-west, west and south-west quadrants.

The campus comprises approximately 500 ha of which 70 ha is developed whilst the remainder is a combination of landfill, brownfields and bushland. The 70 ha fenced area is in a 1.6 km radius bushland zone, around the existing HIFAR reactor. No residential development is permitted within the ANSTO bushland perimeter. The residential suburbs of Barden Ridge and Engadine are located in the north-east to south-east sectors adjacent to the ANSTO bushland perimeter zone boundary while the growing suburban area of Menai is located about 3 km further to the north-east.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

The proposed site footprint is approximately 0.3 ha. The disturbance foot print is expected to be minimal.
Maximum north-south, and east-west dimensions of approximately 50 m and 15 m respectively in an area bounded by Dalton avenue, B61, B64, B93 and substation 7. Facility will be approximately 10m tall with 10m deep excavations

1.7 Proposed action location

Address - Dalton Avenue, Lucas Heights, NSW, 2234, Australia

1.8 Primary jurisdiction	New South Wales

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1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

☑ Yes ☐ No

1.9.1 Provide detail

Funding for the full project was announced in the 2021 Budget Paper Number 2 (Australian Government, 2021, Budget Paper Number 2, Canberra, https://budget.gov.au/2021-22/content/bp2/index.htm).

1.10 Is the proposed action subject to local government planning approval?

☐ Yes ☑ No

1.11 Provide an estimated start and estimated end date for the proposed action	Start Date	01/01/2024
	End Date	29/08/2025

1.12 Provide details of the context, planning framework and state and/or local Government requirements

Project Milestone	Forecast Date/s
Facility Design	March 2022 - February 2023
Construction Licence Approval	February 2023
Facility Construction	January 2024 - August 2025
Operating Licence Approval	December 2025
Operational Commencement	December 2025
Current Waste Storage Depletion	2027

In accordance with the Australian Radiation Protection and Nuclear Safety Act 1998 (ARPANS Act), the action will be the subject of an application for authorisation to the ARPANSA. ARPANSA's objective, as expressed in the ARPANS Act, is "to protect the health and safety of people, and to protect the environment, from the harmful effects of radiation". To meet that principal objective, a framework for regulation of the Commonwealth's radiation and nuclear activities has been developed which reflects best international best practice in radiation and nuclear regulation, and is consistent with the requirements for radiation protection and nuclear safety of the Australian State and Territory regulatory authorities.

Within that regulatory framework, ARPANSA's Operations Services Branch:

- assesses applications for licences against accepted standards for radiation protection and nuclear safety;
- makes recommendations to the CEO on the issuing of licences;
- undertakes inspections of licensed activities to confirm compliance with legislative requirements; and
- takes any enforcement actions necessary to ensure compliance, safety of people and protection of the environment.

The planning framework for this facility involves staged submissions to ARPANSA for approval to:

- Site a nuclear installation based on the concept plan for the facility and outlining the capacity of the storage facility. This siting licence application has been submitted to ARPANSA.
- Construct a nuclear installation based on the detail plans of the facility. This construction licence application will be submitted to ARPANSA.
- Operate a nuclear installation once construction and commissioning is complete.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders

Prior to granting licences to Site and Construct the ILWCI facility, the CEO of ARPANSA will conduct a public consultation process as the Section 40 of the ARPANS Regulation 2018.

In accordance with legislative requirements, given the budget for the project is more than $15 million, the project has been referred to the Federal Parliamentary Standing Committee on Public Works (PWC) for approval. The PWC will publish a public submission and call for public comment. The PWC may conduct public hearings on the referral.

ANSTO has also liaised with local community leaders, including the Mayor.

Finally, this EPBC referral will be subject to public comment.

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There has been no public consultation regarding the proposed ILWCI facility to date.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project

There are no World Heritage properties, Ramsar wetlands, listed threatened species or communities and/or known habitat for these species or communities, listed migratory species and/or known habitat for these species or Commonwealth marine areas located within the project area. There will be no significant impact on any of these items located outside of the project area as a result of the depth-in-design features to minimise any emissions to the environment.

As part of the Siting Licence submission to ARPANSA, ANSTO has developed an environmental protection plan to demonstrate that the systems, structures and components, and the management of the controlled facility will provide protection of the environment. It also highlights that the facility does not adversely impact an area that has special environmental attraction or appeal, will not impact endangered ecological communities, or impact habitat for EPBC listed fauna or flora.

1.15 Is this action part of a staged development (or a component of a larger project)?

☐ Yes ☑ No

1.16 Is the proposed action related to other actions or proposals in the region?

☐ Yes ☑ No

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Section 2

Matters of national environmental significance

2.1 Is the proposed action likely to have any direct or indirect impact on the values of any World Heritage properties?

☐ Yes ☑ No

2.2 Is the proposed action likely to have any direct or indirect impact on the values of any National Heritage places?

☐ Yes ☑ No

2.3 Is the proposed action likely to have any direct or indirect impact on the ecological character of a Ramsar wetland?

☐ Yes ☑ No

2.4 Is the proposed action likely to have any direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

☑ Yes ☐ No

Species or threatened ecological community

Coastal Upland Swamp in the Sydney Basin Bioregion

Impact

Small areas of 'Coastal Upland Swamp in the Sydney Basin Bioregion' (EPBC threatened ecological community) exist within the ANSTO Buffer Zone along Barden's Creek. The closest identified area is about 500m from the project area (see ATT A-Veg Communities 2016), however the project area is not in the catchment for Barden's Creek and no significant impacts to these areas are expected from the facility.

Species or threatened ecological community

Shale Sandstone Transition Forest in the Sydney Basin Bioregion

Impact

Large areas of 'Shale Sandstone Transition Forest in the Sydney Basin Bioregion' (EPBC critically endangered ecological community) exist in the northern-most extent of the ANSTO Buffer Zone, approximately 1.6 km from the project area (see ATT A-Veg Communities 2016). No significant impacts to these areas are considered expected from the facility due to the distance from the project area and the negligible radioactive emissions expected from the facility

2.4.2 Do you consider this impact to be significant?

☐ Yes ☑ No

2.5 Is the proposed action likely to have any direct or indirect impact on the members of any listed migratory species or their habitat?

☐ Yes ☑ No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

☐ Yes ☑ No

2.7 Is the proposed action likely to be taken on or near Commonwealth land?

☑ Yes ☐ No

2.7.1 Is the proposed action likely to have any direct or indirect impact on the Commonwealth land?

☑ Yes ☐ No

2.7.2 Describe the nature and extent of the likely impact on the whole of the environment

The action is on Commonwealth land.
The extent of the likely impact on the whole of the environment will be limited to the ANSTO Lucas Heights Site, which has

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been developed land already used for numerous licensed nuclear installations, and prescribed radiation and waste facilities. Further details provided in Section 2.10.1

2.7.3 Do you consider this impact to be significant?

☐ Yes ☑ No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

☐ Yes ☑ No

2.9 Is the proposed action likely to have any direct or indirect impact on a water resource from coal seam gas or large coal mining development?

☐ Yes ☑ No

2.10 Is the proposed action a nuclear action?

☑ Yes ☐ No

2.10.1 Describe the nature and extent of the likely impact on the whole of the environment

The action will not have any significant impact on the environment for the following reasons:

- The construction of the facility will result in short-term, localised, small scale impact to soils, air quality, noise, visual amenity and landscape, within the boundaries of a campus already used for technical, scientific and industrial purposes. Management protocols will restrict any impact on surface runoff and erosion and mitigate any other environmental effects. These protocols will be documented through a Construction Environmental Management Plan.

Waste packages are approved for storage within the facility, and have been stored in a similar facility nearby, for many years. The safety assessment report for the proposed action did not identify any credible pathway by which radioactivity could be released to the environment. The storage design will be highly contained and highly shielded in a robust facility.

The construction and the subsequent storage of radioactive waste will be managed and regulated in accordance with the requirements of the Australian Radiation Protection and Nuclear Safety Act 1998 and the Australian Radiation Protection and Nuclear Safety Regulations 2018 and ANSTO's WHS Management System.

- The proposed action will have a negligible effect on the health of members of the public and to the surrounding environment. The average yearly dose from natural radiation sources to a member of the public in the greater Sydney area is approximately 1.5 - 2 mSv. The presence of this facility will not change that. The perimeter dose rates of the facility when fully occupied with RHSW will be less than 0.5 Sv/hr, which is a small increase from the background and which is within the normal and safe operation ranges for this type of facility. There will be no health or safety risks to staff caused by radiation.

2.10.2 Do you consider this impact to be significant?

☐ Yes ☑ No

2.11 Is the proposed action to be taken by a Commonwealth agency?

☑ Yes ☐ No

2.11.1 Describe the nature and extent of the likely impact on the whole of the environment

See section 2.10

2.11.2 Do you consider this impact to be significant?

☐ Yes ☑ No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage place overseas?

☐ Yes ☑ No

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2.13 Is the proposed action likely to have any direct or indirect impact on any part of the environment in the Commonwealth marine area?

☐ Yes ☑ No

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Section 3

Description of the project area

3.1 Describe the flora and fauna relevant to the project area

The proposed ILWCI facility will take place on developed lands and will have no effect on the existing surrounding bushland, flora or fauna (ATT G - Site Design Basis, Section 2.7, p21).

The site is primarily clear of flora and is within a security fenced zone that limits local fauna entering the site. Note, the entire LHSTC site was cleared of all vegetation c1955 and therefore there is no remnant vegetation within the project area that existed prior to c1955.

3.2 Describe the hydrology relevant to the project area (including water flows)

Parsons Brinckerhoff Australia Pty Ltd (PB) completed Consolidated Volume of Reports on Groundwater Investigations at the Lucas Heights Campus to May 2007 (ATT B -Groundwater invest 2007, section 2.4, pp4-7) report to support the Replacement Research Reactor (now OPAL) to baseline the groundwater monitoring for the Lucas Heights site. The report provides detail of the site and surrounding areas of the physical setting, geology, and hydrogeology using a variety of imaging techniques, borehole studies and calculations.

The report describes the groundwater flow within the site as highly variable with shallow flows within perched water table horizons (1-7 m) and deeper flows (15-25 m) through main sedimentary structures. The report did not make conclusions about the very deep flows in relation to the regional Hawkesbury Sandstone groundwater aquifers.

The shallow flows are dominated by intergranular flow within the weathered sandstone with extremely low flow velocities (0.02-7.36 m/year). In contrast, the deeper flows are dominated by flows within primary structures such as joints, shears, faults and partings. The thickness of the sandstone and sandy soil is highly variable across the site resulting in perched shallow water tables and the pattern of deeper fractures being equally variable. In general, however, the flow is a subdued reflection of the surface topology.

ANSTO continues to regularly monitor the groundwater composition and flow across the site. The attached contour map (ATT D- Contour Shallow Aquifer, Figure 17e) details the shallow flows across the Waste Precinct as well as the location of the nearest well to the proposed ILWCI site, MW6S, whilst ATT C - Contour Deep Aquifer, Figure 16e shows the deeper flows across the precinct.

Recent surveys of the site include: Soil Classification Assessment Report (ATT E - Soil Assess, Section 2, p2) and Report on Geotechnical Investigation Proposed Warehouses (ATT F - Geotech report, section 3.2, p5, section 5, p6). The results of the GETEX report is consistent with the information presented here, finding soils and loose sandstone over a sandstone bedrock starting at depths between 0.2-1.1 m.

The Douglas Partners geotechnical assessment did not find free ground water at depths to 1.1 m and did not observe for free groundwater below this depth. The assessment noted that it would be expected that the groundwater table would be well below the proposed bulk excavation of the site.

Additional information is included in the attached Site Characteristics and Site Related Design Basis (ATT G - Site Design Basis, Section 2.4, p16), as well as the Environment Protection Plan (ATT H - EPP, Section 5.2-5.3, p5). Although the surface and ground water hydrology is discussed therein, the likelihood of any release of radioactivity from the proposed ILWCI Facility is considered to be not credible.

There will be no radioactive or chemical discharge to the environment during the siting or construction of the proposed ILWCI facility.

Once operational, the ILWCI facility will have a safety shower and eye-wash station that drains to either a storage tank or the B-line network, which is connected to the site effluent treatment plant. This liquid will then be tested and discharged to the sewer in accordance with the Trade Waste Consent with Sydney Water Corporation.

3.3 Describe the soil and vegetation characteristics relevant to the project area

Initial geotechnical investigations were conducted in July 2019 to determine the suitability of the proposed site for the ILWCI facility. This investigation included drilling two core boreholes firstly to a depth of 1.1 m using solid flight augering methods and then advancing the boreholes to a depth of 10 m to obtain 50 mm diameter continuous core samples of the rock for identification and strength testing purposes (ATT F-Geotech report, Section 3, p2).

At the time of the investigation, the area was generally covered by grass and trees. The remaining available space was in

use for storage of shipping containers. Site levels range from approximately reduced level (RL) 137 m to RL 141 m, relative to the Australian Height Datum (AHD). Filling/topsoil, which was typically silty sand with grass roots, was encountered to the depths of 0.1 - 0.35 m followed by very low to low and medium strength fractured sandstone to depths of 1.89 - 3.7 m overlying medium to high strength, slightly fractured unbroken sandstone (ATT F - Geotech report, section 3.2 p5). Free groundwater was not observed during auger drilling to depths of up to 1.1 m. It is expected that the groundwater table would be well below the proposed bulk excavation of the site.

Reference to the Sydney 1:100,000 Geological Series Sheet indicates that the site is underlain by Hawkesbury Sandstone which typically comprises medium to coarse grained quartz sandstone with some shale bands or lenses. Both the current and previous investigations around the site confirmed the geological mapping.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area

There are no outstanding natural features on this site. See the Site Characteristics and Site related Design Basis report (ATT G-Site Basis Report, section 2.1, p8).

3.5 Describe the status of native vegetation relevant to the project area

The Lucas Heights site was developed from the 1950s and was cleared of all vegetation c1955 and therefore there is no remnant vegetation within the project area that existed prior to c1955.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area

The elevation of the site typically ranges between 138 and 141 m Australian Height Datum (AHD). This slopes to the south and west of the proposed site location

3.7 Describe the current condition of the environment relevant to the project area

This is a developed site since the 1950s. The area is a brownfield site within the ANSTO Lucas Heights campus, which has been historically degraded. The area was cleared to bedrock level in approximately the 1960's and has subsequently been filled with fill material. There are no existing structures to be demolished on the proposed site; however, some site services may be relocated or diverted as part of the construction.

3.8 Describe any Commonwealth Heritage places or other places recognised as having heritage values relevant to the project

No Commonwealth Heritage places have been identified that are relevant to the location of the proposed action.

3.9 Describe any Indigenous heritage values relevant to the project area

No Indigenous heritage vales have been identified that are relevant to the location of the porposed action.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area

The ANSTO Lucas Heights campus is Commonwealth land.

3.11 Describe any existing or any proposed uses relevant to the project area

The ANSTO site is currently used for nuclear science and technology research and operations, including the production of radiopharmaceuticals or nuclear medicines that every Australian will, on average, need in their lifetime, and the application of nuclear techniques with scientific and industrial applications in areas of key national and economic importance, such as the commercial production of irradiated silicon needed in windfarms, solar panels and electric cars, and in improving the profitability of our mining industry. The proposed ILWCI facility is entirely consistent with ANSTO's operations.

There are no existing structures to be demolished on the proposed site; however, some ancillary site services may be relocated or diverted as part of the construction. There will also be roadworks to enable safe truck access to and from the facility.

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Section 4

Measures to avoid or reduce impacts

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action

The proposed project will be implemented within the framework of ARPANSA Siting and Construction Licensing requirements as per the ARPANS Act and Regulation. The Licence Application includes plans and arrangements including an Environment Protection Plan, Safety Management Plan, Waste Management Plan and a Safety Assessment report.

The construction of the ILWCI facility will be undertaken by a suitably-qualified and experienced Principal Contractor who will be managed by ANSTO's Maintenance and Engineering department.

Before commencing the construction work, the Contractor will prepare and submit a Construction Environmental Management Plan (CEMP) to ANSTO for review and approval. The CEMP will include a series of measures to mitigate and eliminate any impact of the construction activities on the environment. The plan will be reviewed and updated periodically during the construction phase. The main items of the CEMP are as follows:

- Dust management which includes water-mist to supress dust, if necessary;
- Covering of truck loaded with soil, sand, gravel, etc.;
- Protection of trees;
- De-watering in controlled manner;
- Sediment controls, i.e., silt fences, gravel bags, etc.;
- Stormwater control, i.e., side entry pit and kerb drains are kept free of pollutants and not blocked by sediments;
- Installation of dust fences/shades;
- Noise suppression;
- Disposal of construction wastes in accordance with ANSTO waste procedures (recycled where applicable);
- Availability of spill kits – on site; and
- Fuel & chemical stored in bunded areas.

During construction, there will be only very minor environmental effects. The effect of localised noise during construction will be minimised due to the corridor of bush land surrounding ANSTO. Waste materials generated by the process will be managed within the context of ANSTO's existing management arrangements for radioactive and non-radioactive wastes.

During the operation of the facility, the ILWCI will be managed by ANSTO's Waste Management Services (WMS) who conduct operations under existing ARPANSA licences and are experienced in these operations. WMS currently operate a similar facility nearby.

Detailed operating procedures will be prepared and approved by ANSTO's internal safety committee (Safety and Reliability Assurance) and ARPANSA before the formal commencement of operations. The Safety Assessment Report found there is no credible pathway by which the radioactivity of the wastes could be released to the environment. The likelihood of any effect of radiation on the environment is envisaged to be negligible.

Radiation safety and contamination control will be achieved through various features and controls to be implemented at the site as part of the ongoing management of the ILWCI facility and as specified in the detailed Plans and Arrangements supporting the ARPANSA Licence applications. These include:

- Personnel and materials access: Routine personnel access and vehicular access to the building will be under the existing security arrangements. Materials moved into and out of the building will be subject to clearance through a dose and surface contamination monitoring system where appropriate.
- Management of airborne contaminants. An active ventilation system with carbon and HEPA filtering will be in place. In order to meet regulatory requirements, gaseous emissions will be negligible.
- Management of liquid aqueous borne contaminants. The facility will be designed to prevent the ingress of water into the storage pit, and to detect any water that may enter the storage pit. Any liquid detected will drain to dedicated sump pits to be pumped out for treatment as required.
- Radiation safety: There will be controlled ANSTO procedures for handling and storage of radioactive materials. In particular, all staff working in the area will wear thermoluminescent dosimeter (TLD) radiation badges and carry personal digital radiation monitors. Appropriate radiation monitors will be installed in selected locations or be portable within the building to provide operational staff with additional warning in the unlikely event of high radiation readings.
- Fire protection: A fire detection system will be building compliant with the Building Code of Australia (BCA). That system will provide an alarm output to ANSTO site alarm system.

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4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved

The proposed environmental outcomes to be achieved are nil environmental impact from radiation.
The proposed ILWCI facility will provide ANSTO with additional capacity to temporarily store RHSW until it can be conditioned in a form suitable for management at the future National Radioactive Waste Management Facility (NRWMF).

The proposed action will help ANSTO achieve effective isolation of the RHSW from the environment in a modern and secure facility that is designed to provide appropriate shielding and containment.

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Section 5

Conclusion on the likelihood of significant impacts

5.1 You indicated the below ticked items to be of significant impact and therefore you consider the action to be a controlled action

- ☐ World Heritage properties
- ☐ National Heritage places
- ☐ Wetlands of international importance (declared Ramsar wetlands)
- ☐ Listed threatened species or any threatened ecological community
- ☐ Listed migratory species
- ☐ Marine environment outside Commonwealth marine areas
- ☐ Protection of the environment from actions involving Commonwealth land
- ☐ Great Barrier Reef Marine Park
- ☐ A water resource, in relation to coal seam gas development and large coal mining development
- ☐ Protection of the environment from nuclear actions
- ☐ Protection of the environment from Commonwealth actions
- ☐ Commonwealth Heritage places overseas
- ☐ Commonwealth marine areas

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action

RHSW is currently safely managed within an existing facility at the Lucas Heights Campus. The proposed ILWCI facility will provide additional storage for these waste forms using the same design philosophy. Many of the waste items will be immobilised in the Synroc waste form. A second waste form will be securely contained within multiple layers of aluminium and stainless steel containers. Finally, miscellaneous RHSW arising from the production of radiopharmaceuticals will be stored within aluminium retrievable bins. These RHSW will remain underground inside heavily constructed concrete ,storage areas which provide isolation from the environment. The facility will be fitted with monitoring and alarms such as fire detection, moisture sensors and ventilation stack monitoring.

The proposed action will have a negligible effect on the health of members of the public and to the surrounding environment. The Safety Assessment Report for the proposed action did not find any credible pathway by which radioactivity could be released to the environment.

The Environmental Protection and Biodiversity Conservation Act 1999 requires approval for nuclear actions that have, will have, or are likely to have a significant impact on the environment. It is considered that the action will not have any significant impact on the environment and the action is therefore not a controlled action. The basis for this consideration is that:

- The nuclear installation has been specifically designed, based on existing technology, to store previously approved waste forms.
- It will be subject to emission restrictions monitored by ARPANSA (and is not expected to have airborne or liquid, radioactive or chemical, emissions).
- The construction and operation of the facility will be managed and regulated in accordance with the requirements of the ARPANS legislation.

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Section 6

Environmental record of the person proposing to take the action

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Explain in further detail

Yes, ANSTO does have a satisfactory record of responsible environment management. ANSTO is subject to strict ongoing environmental regulation by ARPANSA. In compliance with the ARPANS Act, ANSTO is required to obtain approval from ARPANSA of Plans and Arrangements, including the Environmental Protection Plan, for controlled facilities. Such plans are periodically reviewed and updated by ANSTO.

ANSTO's commitment to the environment is demonstrated through its certification to the international environmental management standard, ISO 14001.

In approving the construction of the OPAL reactor, the then Minister for the Environment and Heritage imposed 29 conditions. All conditions were fully complied with.
Details of ANSTO's accordance to the principles of ecological sustainable development (ESD) as required by the EPBC Act and general environmental performance are reported annually and are available publicly.

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application

In 1992, ANSTO was subject to action under the NSW Environmental Planning and Assessment Act in the NSW Land and Environment Court. The action related to a breach of NSW planning law. No adverse environmental impacts were alleged or found.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

☑ Yes ☐ No

6.3.1 If the person taking the action is a corporation, provide details of the corporation's environmental policy and planning framework

Environmental management at ANSTO is managed under a structured environmental management system (EMS) being the mechanism to ensure that ANSTO's environmental footprint is minimised. The ANSTO Environmental Policy is detailed in document AB-7100 (ATT I - Enviro Policy). ANSTO's commitment to protecting the environment is demonstrated through its certification to the international environmental management standard, ISO 14001.

Environmental management at ANSTO is structured in its approach. The specific elements of environmental management, as well as those requirements that are common to Environmental, Quality and Safety Management systems, and the implementation of controls that limit our environmental impacts, are all part of the Business Management System.

The process of identifying and review of environmental aspects and environmental compliance obligations is embedded within all business units throughout ANSTO. ANSTO's Environmental Management Strategy outlines our high-level environmental objectives and targets, which have been developed to control and minimise our identified significant environmental aspects.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

☑ Yes ☐ No

6.4.1 EPBC Act No and/or Name of Proposal

Construction of Building 20B (Radioactive Waste Processing Facility) (EPBC Ref 2001/342)
Placement of fill excavated from the site for the Replacement Research Reactor (EPBC Ref 2001/405)
Extension to Building 23 (Radiopharmaceuticals production facility) (EPBC Ref 2003/1114)
Shipment of Spent Nuclear Fuel to USA (EPBC Ref 2007/3672)
Construction of Nuclear Materials Store (EPBC Ref 2008/4459)
Decommissioning of the MOATA Reactor in (EPBC Ref 2008/4615)
Decommissioning of NMC and Camperdown Facility (EPBC Ref 2010/5645)
Interim Waste Store at Lucas Heights in Oct 2012 (EPBC Ref 2012/6564)
Synroc Waste Treatment Facility (EPBC Ref 2012/6697)
ANM Mo-99 Facility at Lucas Heights (EPBC ref 2012/6598)
Transport of Intermediate Level Wastes to Lucas Heights (EPBC ref 2015/7437)

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Extensions to Building 27 and Building 20B (EPBC ref 2016/7733)
Transport of OPAL Spent Fuel to France in 2018 and 2025 (EPBC Ref 2016/7841)
Return of Australian Intermediate Level Radioactive Waste from the UK (EPBC 2021/8998)

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 7

Information sources

Reference source

ARPANSA and International Codes
Australian Radiation Protection and Nuclear Safety Agency, “Australian Radiation Protection and Nuclear Safety Act,” C2016C00977, Act No 133
Australian Radiation Protection and Nuclear Safety Agency , “Australian Radiation Protection and Nuclear Safety Regulations,” F2019C00829
ARPANSA, “Regulatory Guide: Plans and arrangements for managing safety,” REG-LA-240B
IAEA, "Site Evaluation for Nuclear Installations", (SSR-1)
IAEA, "Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations"

Reliability

The references are Australian or International codes and regulations and are therefore of high reliability

Uncertainties

International and national requirements are well established. There is high certainty as to the requirements.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 8

Proposed alternatives

Do you have any feasible alternatives to taking the proposed action?

Yes ☑ No

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 9

Person proposing the action

9.1.1 Is the person proposing the action an organisation or business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION
Business name	
ABN	47956969590
ACN	
Business address	New Illawarra Road, Lucas Heights, 2234, NSW, Australia
Postal address	
Main Phone number	+61 2 9717 3111
Fax	
Primary email address	ciarac@ansto.gov.au
Secondary email address	

9.1.2 I qualify for exemption from fees under Regulation 5.23(1)(ii) of the EPBC Regulations because I am:

☐ Small business
☑ Not applicable

9.1.2.2 I would like to apply for a waiver of full or partial fees under Regulation 5.21A of the EPBC Regulations

☐ Yes ☑ No

9.1.3 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Pamela
Last name	Naidoo-Ameglio
Job title	Group Executive, Nuclear Precinct
Phone	02 9717 9104
Mobile	0498554870
Fax	
Email	pamelaa@ansto.gov.au
Primary address	New Illawarra Road, Lucas Heights, 2234, NSW, Australia
Address	

Declaration: Person proposing the action (To be signed by the person at 9.1.3)

I, Pamela Ameglio **, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity.**

Signature: ..... Date: 10/09/2021

I, Pamela Ameglio **, the person proposing the action, consent to the designation of** Paula Berghofer **as the proponent for the purposes of the action described in this EPBC Act Referral.**

Signature:.....Date: 10/09/2021

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Proposed designated proponent

9.2.1 Is the proposed designated proponent an organisation or business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION
Business name	
ABN	47956969590
ACN	
Business address	New Illawarra Road, Lucas Heights, 2234, NSW, Australia
Postal address	
Main Phone number	+61 2 9717 3111
Fax	
Primary email address	ciarac@ansto.gov.au
Secondary email address	

9.2.2 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Paula
Last name	Berghoger
Job title	General Manager, Waste Management Services ANSTO
Phone	02 9717 3754
Mobile	0457505497
Fax	
Email	paula.berghofer@ansto.gov.au
Primary address	New Illawarra Road, Lucas Heights, 2234, NSW, Australia
Address	

Declaration: Proposed Designated Proponent

I, Paula Berghofer **,the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.**

Signature: ..... **Date:** 13 September 2021

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Referring party (person preparing the information)

9.3.1 Is the referring party an organisation or a business?

☑ Yes ☐ No

Organisation

Organisation name (as registered for ABN/ACN)	AUSTRALIAN NUCLEAR SCIENCE AND TECHNOLOGY ORGANISATION
Business name	
ABN	47956969590
ACN	
Business address	New Illawarra Road, Lucas Heights, 2234, NSW, Australia
Postal address	
Main Phone number	+61 2 9717 3111
Fax	
Primary email address	ciarac@ansto.gov.au
Secondary email address	

9.3.2 Contact (for an organisation - the contact details of the person authorised to sign on behalf of the organisation)

First name	Ciara
Last name	Collins
Job title	Project Engineer, ANSTO Maintenance and Engineering
Phone	02 9717 3435
Mobile	
Fax	
Email	ciarac@ansto.gov.au
Primary address	New Illawarra Road, Lucas Heights, 2234, NSW, Australia
Address	

Declaration: Referring party (person preparing the information)

I, Ciara Collins **, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.**

Signature: ..... **Date:** 13/09/2021

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Appendix A

Attachment

Document Type	File Name
supporting_tech_reports	ATT A-Veg_Communities 2016.pdf
hydro_investigation_files	ATT B-Groundwater invest 2007.pdf
hydro_investigation_files	ATT C - Contour Deep Aquifer.pdf
hydro_investigation_files	ATT D-Contour Shallow Aquifer.pdf
hydro_investigation_files	ATT F-Geotech report.pdf
hydro_investigation_files	ATT E-Soil assess.pdf
hydro_investigation_files	ATT G - Site Design Basis.pdf
hydro_investigation_files	ATT H - EPP.pdf
corp_env_policy_docs	ATT I - Enviro Policy.pdf

Appendix B

Coordinates

Area 1
-34.051496901622,150.98764197915
-34.051468011677,150.98811136573
-34.052114699628,150.98818378538
-34.052145811639,150.98769025892
-34.051496901622,150.98764197915
-34.051496901622,150.98764197915