



Application for works approval

Division 3, Part V *Environmental Protection Act 1986*

Works approval number	W6329/2019/1
Applicant	Mid West Ports Authority
File number	DER2019/000467
Premises	Port of Geraldton 298 Marine Terrace GERALDTON WA 6530 Legal description – Part of Lot 503 on Plan 17801
Date of report	23 January 2020
Status of report	Final

Overview of premises

Classification of premises

The Mid West Ports Authority (MWPA) operates the Port of Geraldton (port) under licence L4275/1982/15. It is the major seaport of the Mid West region with seven bulk handling berths, storage facilities and bulk materials handling infrastructure. The port currently facilitates the export of grain, minerals and livestock, and imports of fuel, fertiliser and general cargo.

Activities on the premises relate to the following prescribed premises category outlined below. Other prescribed activities occurring at the premises, such as boat building and seafood processing, are regulated independently through separate licences granted to the occupiers of those activities.

Classification of Premises	Description	Premises design capacity
Category 58	Bulk material loading and unloading: premises on which clinker, coal, ore, ore concentrate, or any other bulk granular material (other than salt) is loaded onto or unloaded from vessels by an open materials loading system.	44,000 tonnes per day (cumulative); and 16,000,000 tonnes per annual period (cumulative)

This application relates to a proposal to handle a new bulk granular material through the port. An application for works approval was submitted by MWPA under Division 3 Part V of the *Environmental Protection Act 1986* (EP Act) on 11 November 2019.

Description of proposed activity

Iluka Resources Ltd (Iluka), being an existing client of MWPA, seeks to export approximately 50,000 tonnes per year of a 'mineral sands concentrate' (MSC) product. The proposal involves around 5 shipments per year of 10,000 tonnes each, to be loaded through Berth 6 via a loading system comprising specialised rotating containers.

Material characterisation

The MSC product comprises around 20.5% monazite, 23% zircon, 30% ilmenite and minor amounts of aluminosilicates, xenotime, quartz and rutile. An estimate of the typical mineral assemblage is outlined below.

Mineral	Typical range (% by weight)
Zircon	21.3 – 26.5
Rutile	1.0 – 1.3
Monazite	17.4 – 21.7
Xenotime	0.9 – 1.1
Ilmenite	25.5 – 31.7
Aluminosilicates	14.7 – 18.3
Quartz	11.1 – 13.8
Other	2.6 – 3.2

The Safety Data Sheet provided with the application indicates the MSC is not classified as hazardous product and has low toxicity, however like all mineral sands contains naturally occurring radioactive elements of the uranium and thorium series, which produce low levels of alpha particles and gamma rays (uranium), and which are classified as human carcinogens (thorium).

Radiological composition

Samples of the product have been found to contain radionuclide concentrations of 61 and 9.4 Becquerel's per gram (Bq/g) of thorium and uranium, respectively. Testing has also indicated both the thorium and uranium decay chains are in secular equilibrium within an analytical error

of $\pm 10\%$. Under the ARPANSA National Directory¹, a material is deemed to be radioactive if the concentration of any radionuclide in the Th-232, U-238 and U-235 decay chains exceeds 1.0 Bq/g. The product is therefore considered to be radioactive with respect to this definition.

Leachability testing at a controlled pH of 3.0 indicates the concentrations of chromium, manganese, nickel and lead exceed the respective Australian Drinking Water Guideline Values². In addition, the concentrations of radium isotopes and U-238 leached in a controlled pH of 3.0 are well above drinking water guidelines (ANSTO, 2015).

Asbestos content

Samples of the product were tested to determine the presence of asbestos containing material. None of the samples had an elemental composition or morphology indicative of asbestos mineral fibre, according to the definition in AS 4964³.

Moisture content

Following processing at the mine, the MSC will be pumped to a designated product storage bunker, where it will remain at around 4 to 10% moisture. Once a truck arrives the product will be loaded directly into enclosed shipping containers on the truck and transported via road to the Narngulu complex (see below).

Moisture sampling and testing will be carried out at the mine site, and the product will not be loaded if the moisture levels are above a transport moisture limit. Once the MSC is loaded into the shipping containers, a sealed lid will be placed over the container and there is not expected to be any significant change to the moisture levels inside the container during storage.

Moisture management will be covered under a moisture management plan to be approved by the Australian Maritime Safety Authority (AMSA). The MSC product will not be loaded if moisture levels are above the shipping transport moisture limit, to minimise the risk of the product liquefying in the hold of the ship and causing stability issues during shipping. The applicant is obliged to comply with all AMSA requirements to ensure the MSC product is tested and moisture levels are confirmed prior to shipping.

Materials handling

Specialised containers known as 'rotainer boxes' will be used to facilitate the shipments, which are considered to be a more effective handling method at controlling dust than conventional open loading systems. The product will be loaded into the containers at the mine site and hauled to Iluka's Narngulu complex on the outskirts of Geraldton, where they will be temporarily stored, pending shipment.

The containers will be conveyed to the port on the back of trucks on the day of shipping. It is estimated that each truck movement from Narngulu will deliver around 55 tonnes of product to the port for ship loading (i.e. around 182 truck movements per shipment).

Once at the port the containers will be unloaded from the trucks and transferred into a position to be lowered into the hold of the docked vessel. Once partially lowered into the hold of the vessel by either a ship or shore-based crane, the lid will be lifted by a specialised attachment and the container rotated through 180 degrees to release the product into the hold to form the bulk cargo. The lid will then be replaced and lifted back to the berth deck where any visible excess product will be cleaned off the extremities of the container. Excess product will be retained in a storage receptacle. The container will then be relocated by forklift onto the back of a waiting truck for removal off the port site and return to Narngulu.

Iluka has developed a Radiation Management Plan which addresses radiation risks associated with the processing, transport, storage and exporting of the 'mineral sands concentrate'. This plan has been approved by both the Department of Mines, Industry Regulation and Safety

¹ RPS No.6 – National Directory for Radiation Protection (NDRP), July 2011 (www.arpana.gov.au).

² Australian Drinking Water Guidelines 6, 2011, Version 3.5, Updated May 2019 (www.nhmrc.gov.au).

³ Australian Standard 4964 Method for the qualitative identification of asbestos in bulk samples.

(DMIRS) and the Radiological Council of WA (RCWA).

Proposed timeframes

Iluka anticipate the first shipment to be exported in March 2020, with around 5 shipments of 10,000 tonnes each planned to occur during 2020. The commissioning period for this project will be the first two shipments, of which the second shipment is expected to occur in May/June 2020. The additional volumes fall within the current throughput of 44,000 tonnes per day, as currently permitted through L4275/1982/15.

Commissioning will involve observation of the materials handling process, from initial unloading of rotainers arriving from Narngulu, through loading the docked vessel and reloading empty rotainers back onto the truck. It will also include inspection of spillage, dust and equipment contamination of the emptied and cleaned rotainers, in addition to appraisal of berth housekeeping processes and monitoring of ambient air quality (human health and environmental levels) within proximity to the berth.

Depending on commercial arrangements, up to 100,000 tonnes of MSC product may be exported through the port in future years. Any increases to planned shipments will be monitored to ensure compliance with the estimated throughputs.

Environmental siting

The port is located on the northern side of the Point Moore peninsula at the southern end of Champion Bay in the City of Greater Geraldton. It consists of a highly modified marine environment and an urbanised industrial land-based component.

The social environment of the port area is complex and reflects the historical development of the city of Geraldton as a seaport. It is surrounded by land zoned industrial, commercial and residential, with the nearest residence to the boundary of the Premises being around 100 metres to the south. A number of other industries such as boat building, boat maintenance and seafood processing occur within the port precinct.

The area has a Mediterranean to semi-arid climate, with a short mild wet winter and the remainder of the year being warm to hot, dry and windy. Moderate to strong south to south-westerly winds dominate the summer period and mild north-westerly winds occur in winter. The average annual rainfall is around 450 mm, with most rain falling during May to August.

Legislative context and other approvals

Relevant approvals

Legislation	Details
<i>Part IV of the EP Act</i>	MWPA has carried out several expansion projects over the past 20 years, which have been assessed by the EPA and approved by the Minister for Environment: <ul style="list-style-type: none">Dredging and land reclamation activities for port expansion, approved in accordance with Ministerial Statement (MS) 87 of 1989, as amended by MS 367 of 1994; andGeraldton Port enhancement project (breakwater construction, railway extension, dredging and land reclamation activities for port expansion), approved in accordance with MS 600 of 2002. No approvals are required under Part IV for this proposal.
<i>Part V of the EP Act</i>	Storage, and loading/unloading operations at berths 4 – 7, of bulk granular materials, are regulated under Licence L4275/1982/15. An amendment to this licence will be required following commissioning of the first two shipments subject to this application.
<i>Port Authorities Act 1999 (WA)</i> <i>Port Authorities Regulations 2001 (WA)</i>	The main legislation governing operation of the port. MWPA is governed by a board of directors as per the Port Authorities Act and is responsible to the Minister for Planning and Infrastructure.

<i>Mines Safety and Inspection Act 1994 (WA)</i> <i>Radiation Safety Act 1975 (WA)</i>	<p>The project falls within the remit of Part 16, Divisions 1 & 2 of the <i>Mines Safety and Inspection Regulations 1997</i>, and as such requires a Radiation Management Plan to be in place, prior to operations commencing.</p> <p>The project also falls within the remit of the <i>Radiation Safety Act 1975</i>, and as such will require approvals from the Radiological Council for aspects such as transport on public roads, etc.</p>
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Part V of the EP Act

The overarching legislative framework of this assessment is the EP Act and EP Regulations.

The guidance statements which inform this assessment are listed in Appendix 1.

Works approval and licence history

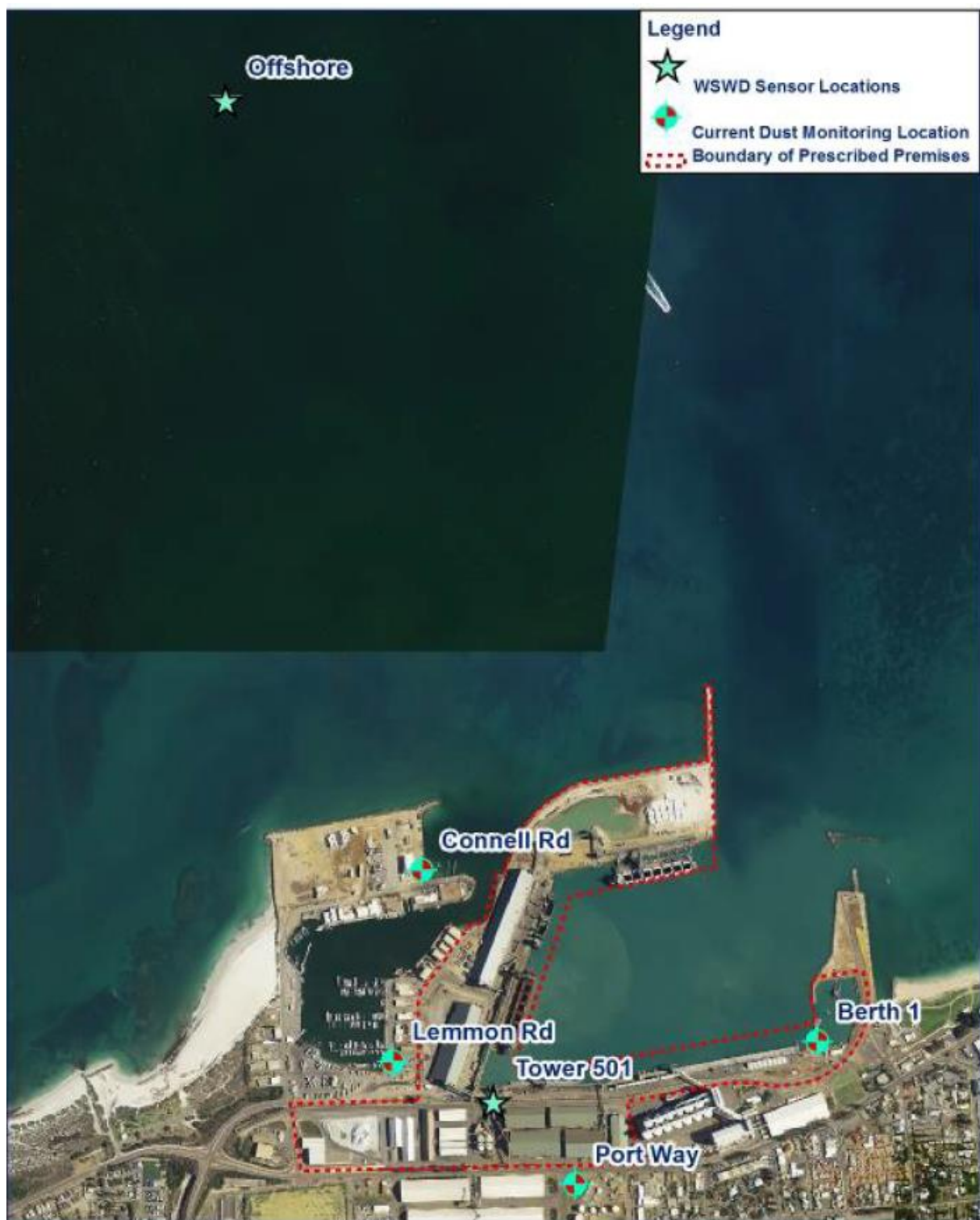
Instrument	Issued	Nature and extent of works approval, licence or amendment
L4275/1982/13	18/03/2008	Licence renewed.
W4398/2007/1	26/06/2008	Works approval for construction of metal concentrate storage shed.
W4443/2008/1	15/09/2008	Works approval for construction of iron ore storage shed at Berth 5.
W4461/2008/1	01/12/2008	Works approval for construction of iron ore storage shed at Berth 6.
W4462/2008/1	28/09/2009	Works approval for construction of iron ore storage shed at Berth 6.
W4805/2010/1	13/12/2010	Works approval for construction of loading/unloading infrastructure.
L4275/1982/13	09/02/2011	Licence amendment to change copper air quality target.
L4275/1982/13	08/09/2011	Licence amendment to change lead air quality target.
L4275/1982/14	18/03/2012	Licence renewed.
L4275/1982/14	03/01/2013	Licence amendment for trial nickel exports.
W5345/2013/1	04/03/2013	Works approval for new cargo (nickel).
L4275/1982/14	14/02/2014	Licence amendment for new cargo (nickel).
L4275/1982/15	12/03/2015	Licence renewed and conversion to new licence format.
L4275/1982/15	29/04/2016	Amendment by notice to extend expiry date to March 2025.
L4275/1982/15	15/08/2018	Amendment notice 1 – approval to increase handling of manganese ore up to 300,000 tpa at Berth 6.
L4275/1982/15	21/01/2019	Amendment notice 2 – addition of trial conditions
W6239/2019/1	23/01/2020	Works approval to export 50,000 tpa of mineral sands concentrate at Berth 6 (this works approval).

Monitoring

Ambient air quality

Ambient air quality monitoring is conducted in and around the port using a network of tapered element oscillating microbalance (TEOM) real time dust monitors that measure particulate matter finer than 10 microns in diameter (PM₁₀) at 10 minute intervals. Metals speciation monitoring is also conducted at three boundary locations and at Berth 1, within the premises (see figure below), using high volume air samplers (HiVol) than can measure metals as total suspended particulates (TSP) and PM₁₀. A beta attenuation monitor (BAM) real time PM₁₀ dust monitor is also used as a background monitor and is located around 4 km north of the port.

A target of 50 µg/m³ for PM₁₀ has been imposed in L4275 since 2009. During the most recent monitoring period (July 2018 to June 2019), this target was exceeded on 103 occasions



▲ MWPA reference air quality monitoring locations.

across all 5 monitoring sites⁴. A maximum 24-hour concentration of 121.2 $\mu\text{g}/\text{m}^3$ was recorded during September 2018 at the Berth 1 monitoring site, which is more than double the Air NEPM guideline⁵ measure for PM_{10} . DWER notes the dust monitors record dust during all wind conditions, therefore port operations may not be attributable to dust levels measured at MWPA boundary monitoring stations at all times.

⁴ Some exceedances may have occurred on the same day, but at different monitoring sites.

⁵ National Environment Protection (Ambient Air Quality) Measure (Air NEPM), February 2016 (www.nepc.gov.au)

An analysis of wind directions that were predominant during each of the exceedance periods identifies 49 days in which boundary monitoring indicates exceedances were downwind of the port, thus providing a potential for port operations to contribute to recorded exceedances (around 74% of the total recorded exceedances).

HiVol sampling is conducted every 6 days and during the loading of metal concentrates. A target of 90 µg/m³ for TSP has also been imposed in L4275 since 2009. During the most recent monitoring period, this target was exceeded on 291 occasions across the 4 compliance monitoring sites, with the highest number of exceedances (126) recorded at the Connell Road monitoring site. The maximum dust as TSP (620 µg/m³) was also recorded at Connell Road in March 2019. These high values have been directly linked to 'sand bypassing' activities at Lives Beach, which was occurring at the time.

Metals speciation monitoring conducted during the previous monitoring period indicates there were no exceedances of relevant targets for copper and lead in dust (as PM₁₀) during monitoring conducted of loadings for concentrates of copper and lead sulfides (no shipments of nickel or manganese occurred during 2018/2019 reporting period).

Key Findings:

1. It is recognised that whilst dust levels measured at the MWPA monitoring sites are not necessarily exclusively related to port activities, an analysis of wind directions that were predominant during each of the exceedance periods indicates that port operations, which include construction and earthmoving activities that occurred throughout the port precinct during the reporting period, may have contributed to around 75% of the identified exceedances, in addition to dust generation from off-site activities on land surrounding the port.
2. The position of the BAM (background monitor) is located adjacent to an unsealed beach access track that may lead to higher particle concentrations being recorded at this site. However, a comparison of particle concentrations between this monitoring location and premises boundary monitors indicates that dust concentrations are consistently higher near to port activities.
3. Open materials stockpiling and operation of the overhead conveyor system were both identified as key contributors to dust generation recorded at the premises, which is not related to the MSC proposal due to the proposed loading system.
4. MWPA updated its dust monitoring software and associated infrastructure in June 2018 to real time monitoring, including the provision for automated alerts to be sent to key personnel upon real time exceedances of trigger dust levels (set internally by MWPA), to enable proactive management actions.

Sediment

Sediment samples are collected on an annual basis at 18 sites in and around the port, as shown in the below figure. Monitoring conducted to date indicates that bulk loading activities are contributing to the concentration of metals within the inner harbour.

Interim Sediment Quality Guidelines (ISQG) provided in the ANZECC & ARMCANZ (2000) water quality guidelines⁶ are exceeded most commonly within the inner harbour for both ISQG-Low (trigger) and ISQG-High values⁷.

In 2019, the primary area of concern in the commercial harbour was around berth 4, where the monitoring sites CH3 & CH4 recorded ISQG-Low exceedances for cadmium and lead (CH3 only), and ISQG-High exceedances for copper and zinc. Exceedance above the ISQG-Low value was recorded at remaining commercial harbour monitoring sites for copper (all except CH10) and zinc (CH2, CH5, CH6 and CH7). Copper exceeded the ISQG-High value and zinc

⁶ Australian and New Zealand Guidelines for Fresh and Marine Water Quality, Volume 1, October 2000 (www.waterquality.gov.au).

⁷ ISQG-High concentrations are intended to represent concentrations above which adverse biological effects are expected to occur more frequently.

For aluminium, iron and vanadium, no ISQG values are provided, however comparisons of the results with natural background concentrations determined that elevated concentrations recorded within the commercial and fishing boat harbours are predominantly representative of differences in sediment characteristics (i.e. PSD, TOC) between control and impact sites. The fishing boat harbour is located around 500 m west of berth 4, where zinc and copper concentrates are loaded onto vessels.



Key Findings:

1. Nickel concentrations in sediment do not exceed ISQG-Low or High values; this is likely due to the improved handling method (rotainers) and low tonnages in recent years.
2. Concentrations of aluminium and iron were also measured at high levels, although neither have ISQG values associated. Aluminium is considered to be naturally occurring within the 2017 annual sediment compliance survey and there are very few known anthropogenic sources in proximity to the port.
3. The applicant has stated that a significant area of the stormwater catchment is located beyond the bulk handling areas and therefore beyond its direct control. However, sediment quality monitoring indicates that existing handling methods for metal concentrates (conveyor to ship loader) may be resulting in elevated metals concentrations in the marine environment.

Risk assessment

Risk Event				Consequence rating*	Likelihood rating*	Risk*	Reasoning	Regulatory controls (Refer to conditions of the granted works approval)	
Source/Activities		Potential emissions	Potential receptors						Potential pathway & receptor (impact)
Category 58: Bulk material loading or unloading Commissioning (first two shipments) Full loading operations (mineral sands concentrate)	Unloading of rotainer boxes onto Berth 6, ship loading using ship or land-based crane, re-loading empty rotainer box onto trucks	Dust escaping from the ship hold during ship loading	Residential dwellings ~840 m from Berth 6 Light industry neighbours ~700 m south of Berth 6 Fishing boat harbour ~220 m west of Berth 6 Marine environment – Geraldton foreshore adjacent to premises boundary	Air / wind dispersion, causing amenity impacts/ health impacts	Specific consequence criteria for public health are likely to be met Low level impact to amenity at local scale Minor	Not likely to occur in most circumstances Unlikely	Medium Acceptable, subject to applicant controls conditioned	There is an inherent risk of fugitive dust being generated during ship loading activities at the port, given the proximity to receptors and prevailing strong westerly winds. The MSC product is not classified as hazardous, does not contain asbestos fibres, and contains only a small amount of respirable crystalline silica. To minimise the risk of off-site impacts, loading of product will occur using a rotainer box system that remains sealed until the container is below the hold of the vessel. Product will be loaded at a drop height of less than 2 metres, with product moisture maintained at 4-10% w/w (DEM level determined as 7.3% (Microanalysis Australia, 2019). A sweeper will be available to remove any spills generated during loading. In accordance with DWER's Guidance Statement: Risk Assessments (DER, 2017a), as these controls lower the risk of impacts, they will be conditioned in the works approval and licence.	Works approval controls: <ul style="list-style-type: none">- Requirement to load using rotainer box system;- Requirement for average product moisture content of 4-8.5% w/w during the time limited operational period;- Requirement for loading at a drop height no less than 2 m;- Requirement to conduct full sweep of Berth 6 after each load out;- Requirement to conduct dust monitoring and speciation during the first two shipments
		Noise from machinery and truck movements	Residential dwellings ~840 m from Berth 6 Light industry neighbours ~700 m south of Berth 6	Air / wind dispersion, causing amenity impacts	Minimal impact to amenity on local scale Slight	Not likely to occur in most circumstances Unlikely	Low Acceptable, not subject to controls	Noise is expected from the additional truck movements for combined total of 15 days per year during loading campaigns of mineral sands concentrate. Each shipment is expected to take around 40 hours to load and therefore night time loading will be required. Cumulative impacts may arise when loading occurs concurrently with other port activities. As 24-hour loading is already undertaken at Berth 6, maximum noise levels are not likely to increase from existing levels.	None specified.
		Naturally Occurring Radioactive Material (NORM)	Residential dwellings ~840 m from Berth 6 Light industry neighbours ~700 m south of Berth 6 Fishing boat harbour ~220 m west of Berth 6	Air / wind dispersion, causing health impacts	Low-level impact to environmental values on a local scale Minor	Not likely to occur in most circumstances Unlikely	Medium Acceptable, subject to applicant controls conditioned	Containerised product will have elevated radiation levels, which present a risk to human health if exposed for prolonged periods of time, and a risk to marine sediments within the commercial harbour from windblown dust. Radon gas has been identified as a potential health risk, specifically associated with the ship's crew. Radon gas will accumulate within the rotainer boxes and be released when the containers are emptied into the ship's hold. Iluka's Radiation Management Plan (Iluka, 2019) outlines guideline exposure levels, internal investigation levels, annual anticipated radiation dose assessments for specific work groups, and methods for minimising exposure. Radon gas will readily disperse in light to moderate wind conditions and therefore is not considered to be a high risk in ship loading activities for port workers or other port users. Iluka will deploy gas detectors in	Radiological risks are regulated under the <i>Radiation Safety Act 1975</i> .

								the Berth 6 work area to detect levels of gas released from the containers once open.	
			Marine environment Aquaculture	Direct discharge, causing surface water contamination	Low-level impact to environmental values on a local scale Minor	May occur in exceptional circumstances Rare	Low Acceptable, not subject to controls	Should the MSC product find its way into the marine environment, leachability testing (ANSTO, 2015) indicates the MSC components are comparable to drinking water standards, except for low pH conditions (pH <3) where concentrations of U and Th are above drinking water guidelines. The MSC product is non-toxic and is not considered a marine pollutant. The port waters are subject to strong surge and regular mixing through ship movements, therefore it is unlikely that elevated natural radionuclides would be able to concentrate or be detected in the water column.	Radiological risks are regulated under the <i>Radiation Safety Act 1975</i> .
		Contaminated surface water runoff	Marine environment Aquaculture	Direct discharge into port waters, causing impacts to marine environment	Mid-level on-site impacts, low level off-site impacts Minor	Could occur at some time Possible	Medium Acceptable, subject to regulatory controls conditioned	The product is insoluble in water and is not expected to result in toxic effects to the marine environment. The main risk is therefore impacts from increased turbidity as a result of the product entering the marine environment from surface water discharges. The port has been dredged and is a highly disturbed ecosystem, and therefore has a low ecological value. To minimise the risk of impacts, Iluka propose to operate a sweeper and vacuum trucks to clean up spilt material. As product will be loaded into the rotainer boxes at the mine site, they will remain sealed until within the hold of the vessel, there is not expected to be significant spillages. In accordance with DWER's Guidance Statement: Risk Assessments (DER, 2017a), as these controls lower the risk of impacts, they will be conditioned in the works approval and licence.	<u>Works approval controls:</u> - Requirement to conduct full sweep of Berth 6 after each load out. - Compliance reporting, including summary of the environmental performance of each ship loading event and results of all inspections and assurance activities to validate the effectiveness of operational control measures.
		Odour	Residential dwellings ~840 m from Berth 6 Light industry neighbours ~700 m south of Berth 6	Air / wind dispersion, causing amenity impacts	N/A.	N/A.	Low Acceptable, not subject to controls	The mineral sands concentrate does not have a distinct odour.	N/A.

*Consequence ratings, likelihood ratings and risk descriptions are detailed in the Department's Guidance Statement: Risk Assessments (February 2017).

Consultation

Submitter	Comment	DWER response
Department of Mines, Industry Regulation and Safety (Mines Safety Directorate)	<p>There are sections of the port, specifically those areas that are used for the transport and shipment of mineral products that are deemed as mining operations under the Mines Safety and Inspection Act. Those areas not used for this purpose are not deemed as mining operations, where the MSIA do not apply, however the Occupational Safety and Health Act will and in this particular case, the Radiation Safety Act may apply. DMIRS consider the current definition being applied to the handling of 'mineral sands concentrate' unless other areas within the port that are not currently designated as a mining operation are also used, which will lead to an expansion of the footprint that is designated a mining operation.</p> <p>Radiation Management Plan – Iluka has submitted several iterations of the RMP for review by DMIRS and the Radiological Council, whereby approval status is pending.</p> <p>The 'mineral sands concentrate' contains a significant portion of the naturally radioactive rare-earth mineral monazite, which may contain up to 7% thorium and 300 ppm uranium. Monazite requires specific precautions in handling, transport and shipment to ensure radiation doses to workers and members of the public are kept as low as reasonable achievable. The primary radiation risk from monazite arises from inhalation of radioactive dust, therefore it is important to ensure effective dust controls are in</p>	<p>Noted. As the MSC product is largely insoluble the primary radiological risk relates to occupational exposure rather than from an environmental perspective. The works approval will contain operational controls to limit the generation of fugitive dust, in the form of maintaining a moisture content above the DEM, limiting drop height to less than 2 m during loading, in addition to clean up and sweeping of the containers and berth following each shipment, and ambient dust and sediment monitoring.</p>

	<p>place, and any accidental spills of material are attended to expeditiously. The secondary route of exposure occurs via gamma rays, where the best control of doses being to ensure the mineral is kept as far away from receptors as possible, and the amount of time that exposure occurs is kept to a minimum. The proposal to store the materials off-site until ready for shipment will reduce potential exposure time.</p> <p>DMIRS has requested further details on how the 'mineral sands concentrate' is to be placed into the containers (i.e. double bagging) to reduce the likelihood of a spill, should an accident occur. The product has the capacity to generate high levels of radon and thoron, which can reach excessive levels in tightly concealed containers. There is anecdotal evidence that large exposures can occur to workers who open container doors and may be subjected to a plume of radon/thoron that subsequently vents to the atmosphere. Iluka has been requested to model the potential exposures, and to conduct trials on the radon/thoron exhalation rate of the product.</p> <p>The 'mineral sands concentrate' is largely insoluble, and therefore impact upon water bodies (especially the sea water that surrounds the port) and aquifers should be minimal. DMIRS has requested Iluka provide copies of any research conducted to date on the solubility of the product in order to DMIRS to independently review the findings.</p> <p>As a matter of course, DMIRS has requested Iluka to conduct an environmental assessment of background radiation levels in and around the port precinct, which is expected to be established before shipments commence, and these will be used as a benchmark to assess the impact of the activity on the surrounding terrain.</p>	
Department of Health (Environmental Health Directorate)	DoH has been made aware of the proposal through Iluka and the Department of Jobs, Tourism, Science and Innovation. The operations with respect to radiation with this project on Iluka sites at Eneabba and Narngulu, during transport and at the port of Geraldton, are addressed by the relevant Radiation Management Plan (RMP) and are regulated by DMIRS and the Radiological Council of WA. The Council approved the relevant RMP on 10 December 2019 and is aware the RMP was approved by DMIRS. DoH has no further comments to provide on the project at this stage.	Noted.
Department of Biodiversity, Conservation and Attractions	DBCA does not consider there to be any potential additional or cumulative impacts associated with this proposal on the Australian sea lion population which inhabits this environment, or other matters relevant to the Department's responsibilities under the Western Australian <i>Biodiversity Conservation Act 2016</i> .	Noted.
City of Greater Geraldton	Some information on how the 4-10% moisture content will be maintained throughout the transport and loading process would be beneficial.	Further details on management of moisture levels is provided in DWER's assessment above.
	There is conflicting information on the specific activity contained in table 2 and that specific activity during transport.	Radiological risks pertaining to transport are regulated by DMIRS under the RS Act.
	The Geraldton foreshore/public space is specifically identified as a receptor in appendix 2 but is missing from the SRPA.	Noted.
	The sea lion population should be a specific receptor.	Noted (see DBCA comments).
	There is available information on the ecotoxicological effects of rare earth/mineral sands, therefore it is unacceptable to state the toxicity if ingested by marine life is unknown.	Noted. DWER has considered the risk of the proposal to marine life to be low (see risk assessment).
	There is no information on the monitoring and detection for the wider area, e.g. residential/foreshore, if the benchmark or thresholds are exceeded within the port area.	The existing monitoring program in place for the port operations covers the wider area.
	The likelihood of public complaints as being 'possible' should be contemplated further.	The existing licence requires an adequate complaints management system to be in place.
	The potential for interruption to services and stakeholders as 'moderate consequence' >1 day should be contemplated further. Any risk that has an interruption or delay in time impact should also have an operational performance risk mitigation.	This does not fall within the scope of Part V.

Applicant comments

The applicant was provided with the drafts of the works approval and decision report on 16 January 2020, and raised only minor matters that have been addressed in the final.

Conclusion

This assessment of the risks of activities on the Premises has been undertaken with due consideration of a number of factors, including the documents and policies specified in this decision report (listed in Appendix 1).

Based on this assessment, it has been determined that a works approval will be granted subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

DWER notes that it may review the appropriateness and adequacy of controls at any time and that, following a review, DWER may initiate amendments to the approval under the EP Act.

Alana Kidd
MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES

Delegated Officer
Under section 20 of the *Environmental Protection Act 1986*

Appendix 1: Key documents

Document title	In text ref	Availability
Mid West Ports Authority – Proposal for Iluka Mineral Sands Concentrate Export Through the Port of Geraldton - Works Approval application (8 November 2019)	Application	DWER records (DWERDT222701)
Licence L4275/1982/15 – Mid West Ports Authority – Port of Geraldton	L4275/1982/15	accessed at www.der.wa.gov.au
DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	DER, 2015a	
DER, October 2015. <i>Guidance Statement: Setting Conditions</i> . Department of Environment Regulation, Perth.	DER, 2015b	
DER, February 2017. <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	DER, 2017a	
DER, February 2017. <i>Guidance Statement: Decision Making</i> . Department of Environment Regulation, Perth.	DER, 2017b	
ANSTO Minerals, November 2015. Technical memorandum to Iluka Resources – Eneabba Monazite Pit sample.	ANSTO, 2015	DWER records (A1848143)
Iluka Resources, November 2019. Eneabba Mineral Sands Recovery Project - Radiation Management Plan: Processing and Transport, v1.2	Iluka, 2019	DWER records (A1858319)

Attachment 1: Works Approval W6329/2019/1
