

Amendment Report

Application for Works Approval Amendment

Part V Division 3 of the Environmental Protection Act 1986

Works Approval

Number

W4661/2010/1

Works Approval

Holder

Alcoa of Australia Ltd

ACN 004 879 298

File Number 2010/004167-1

Premises

Pinjarra Refinery

South Western Highway, OAKLEY, WA 6208

Legal description -

Lot 19 on Diagram 44739, Part of Lot 109 on Diagram 60089, Part of Lot 151 on Plan 10914, Lot 221 and Lot 222 on Plan 302638, , Part of Lot 251 and Lot 252 on Plan 35963

As defined by the premises map in Schedule 1 of the

amended Works Approval

Date of Report 23/12/2020

Proposed Decision Revised works approval granted

Table of Contents

1.	Decision summary					
2.	Scope of assessment					
	2.1	Regulatory framework				
	2.2	Application summary				
	2.3	Update and consolidation of the works approval				
	2.4	Background				
3.						
4.	Decision					
5.	Con	clusion	6			
	5.1	Summary of amendments				
Ref	erenc	es				
App	endix	t 1: Summary of Works Approval Holder's comments on draft ent (if required) Error! Bookmark not o				
App	endix	2: Application validation summary	9			

1. Decision summary

The Delegated Officer has determined to make amendments to works approval W4661/2010/1. The amendments are administrative in nature therefore they do not alter the risk profile of the Premises, providing that activities, emissions and receptors as stated in existing approvals remain unchanged.

This Amendment Report documents the amendments made pursuant to section 59 and 59(B) of the *Environmental Protection Act 1986* (EP Act).

2. Scope of assessment

2.1 Regulatory framework

In amending the works approval, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

Works approval W4661/2010/1 was granted to Alcoa of Australia Ltd (Alcoa or works approval holder) on 25 June 2010 for the conversion of existing wet Residue Storage Area 1 (RSA1) at the Pinjarra refinery to a dry stacked RSA. The Premises relates to the Category 46 Bauxite refining under Schedule 1 of the *Environmental Protection Regulations* 1987 (EP Regulations).

On 9 October 2020, the works approval holder submitted an application to the department to amend W4661/2010/1 under section 59B of the *Environmental Protection Act 1986* (EP Act) to extend the expiry of the instrument by an additional four years to 27 December 2024. The extension is proposed to allow sufficient time for works to complete the conversion of the south eastern portion of RSA 1 South (RSA1SE) to a dry stacked RSA. Approximately 70% of RSA1 South (RSA1S) has already been converted with the remaining 30% not able to be completed to date as the area was not sufficiently consolidated to support the conversion works.

The works approval holder advised that RSA1E is now sufficiently consolidated and the scope of works to convert the area to a dry stacked RSA includes:

- 1. Construction of embankments from residue sand using the upstream construction method on the southern and eastern sides of RSA1SE. The embankments will reach a maximum height of 50mAHD and will be designed to include allowance for storm surge capacity for 72 hour, 1 in 100 annual recurrence interval (ARI) rainfall event. The embankments will be treated with dust suppressant or planted with grasses to aid in dust suppression.
- 2. Lining of approximately 17 ha of RSA1SE, the embankments and the perimeter drain with a minimum 1.5 mm thick synthetic high density polyethylene (HDPE) liner. The liner will be tied into existing RSA 1 North (RSA1N) and RSA1S liners already installed under the requirements of W4661/2010/1.
- 3. Establishment of a perimeter drain around the southern and eastern embankment areas of RSA1SE for collection and transfer of runoff and sediment to the refinery water circuit. The synthetic liner will extend to include lining of the drain.
- 4. Establishment of an underdrainage system above the synthetic liner comprising a perforated pipe covered with geofabric filtration protection, laid in a minimum 700 mm layer of residue sand.
- 5. Installation of drainage infrastructure to assist in recovery of alkaline water from the

existing wet residue deposit, reducing the associated risk of seepage to, and contamination of, groundwater in the superficial aquifer below the residue storage area. The drainage infrastructure will comprise wick drains (perforated vertical drains) in the existing wet residue deposit, a sub-liner drainage layer between the existing wet residue deposit surface and the HDPE synthetic liner, and a minimum of three deliquoring bores on the RSA1SE southern and eastern embankment walls.

- 6. Installation of a sprinkler system for dust control. The system will have a 60 m by 60 m triangular pitch and will be connected to the existing RSA sprinkler system.
- 7. Extension of the feed pipeline and pump system into RSA1SE.

Some of the proposed infrastructure will become operational immediately following installation as it is connected to existing operational systems of the RSA. This includes the underdrainage system, wick drains and drainage layer, deliquoring bores, sprinkler system and water management system.

2.3 Update and consolidation of the works approval

The department's regulatory framework has changed since the grant of W4661/2010/1. Given the age of the works approval, and the works approval holder requesting a four year extension to the expiry, the delegated officer updated the format of the works approval. This included converting the conditions to align with the department's current regulatory framework, in particular the *Guidance Statement: Condition setting* (DER 2015). As part of the amendment the department has also consolidated the works approval with changes made under previous amendment notices.

The obligations of the works approval holder have not changed in making the changes described above, and the department has not undertaken any additional risk assessment related to these changes. In making these changes to CEO has:

- updated the front-page appearance of the works approval:
- consistent with previous assessments, specified the construction requirements and commitments (relevant to the remaining conversion works) set out in the document Works Approval Application Supporting Information, Pinjarra Alumina Refinery, Residue Storage Area 1 Conversion (to a Residue Drying Area) Project dated 12 September 2017, and Appendix A to this document, as construction requirements in the amended licence (including updates to these requirements detailed in the amendment application supporting information);
- included an additional requirement to submit a Critical Containment Infrastructure Compliance Report and defined when deposition of residue mud into the RSA1SE can occur based on the submission of this report (previously referred to as phase 2 commissioning);
- removed redundant conditions and definitions relating to Phase 1 works which have been completed and compliance documents submitted;
- added, updated and removed definitions where required; and
- updated the premises map to clearly define the premises boundary relevant to the works approval and included infrastructure maps setting out the location of the remaining works and design requirements.

The amendments to the works approval are detailed in section 5.1. Previously issued Amendment Notices will remain on the department's website for future reference and will act as a record of the department's decision making.

2.4 Background

The Pinjarra refinery and residue storage area are located approximately 5 km east of the town of Pinjarra, between the South Western Highway and the Marrinup State Forest in Oakley, Western Australia. The refinery commenced operation in 1972 and is subject to operating conditions in accordance with licence L5271/1983/14 granted under Part V of the EP Act as well as other relevant approvals including Ministerial Statement 646 granted under Part IV of the EP Act, the *Alumina Refinery (Pinjarra) Agreement Act 1969*, and the *Alumina Refinery Agreements (Alcoa) Amendment Act 1987*.

The refinery uses the Bayer process to extract and refine alumina from bauxite ore. Residual sand and mud remaining from the extraction process (bauxite residue) is pumped as an alkaline slurry to the residue storage area adjacent to the refinery. Early storage processes for the bauxite residue involved deposition of a slurry comprising residue sand and mud into storage areas, a process termed 'wet disposal'. In 1987 a process termed 'dry stacking' was adopted as it was considered to reduce the risk of groundwater impact, result in a more stable landform and reduce the footprint required for residue storage. Dry stacking involves separation of the coarse sand fraction of the residue (residue sand) in a sand filtration plant (for use in construction of RSA) and increasing the density of the remaining mud fraction in a mud thickener before being pumped to the RSA. The mud is applied in layers approximately 800 mm thick layers which are solar dried before covering with a new layer.

The Pinjarra refinery residue storage area comprises a number of RSA separated by embankments. Having multiple storage areas available allows for deposition to by cycled between the RSA allowing time for solar drying of the residue layers. Historically, RSA1 was used for storage of residue sand and mud when the sand filtration or thickener were offline, and was also used as a cooling pond. Alcoa's Long Term Residue Management Strategy for the Pinjarra refinery proposed to convert RSA1 from a wet RSA to a dry stacked RSA. The purpose of the conversion was to optimise residue storage and reduce the risk to groundwater associated with the facility, as evidence of alkaline process waters and mounding in the superficial aquifer beneath RSA1 had been identified through monitoring bore data.

Works approval W4661/2010/1 was subsequently granted by the department in 2010 to authorise the conversion of RSA1. The conversion works were authorised to occur in two defined phases with the northern portion of RSA1 (referred to as RSA1N) being converted in phase 1, and the southern portion (referred to as RSA1S) in phase 2. A splitter dyke separated the two areas allowing RSA1S to continue to be used as a cooling pond while phase 1 was completed. The timeframe for the conversion of RSA1S was dependent on the timing of the establishment and commissioning of a new cooling pond, to allow the RSA1S cooling pond to be taken offline, drained and allowed time for drying and sufficient consolidation.

Phase 1 was completed in May 2013 and in accordance with the conditions of W4661/2010/1 a compliance document, inclusive of as constructed drawings, was submitted to the department on 29 May 2013 which confirmed the works had been completed in accordance with the works approval conditions. RSA1N now operates as a dry stack RSA subject to the conditions of the refinery licence L5271/1983/14.

Conversion of RSA1S (phase 2) was delayed from the original schedule therefore the works approval holder sought an amendment to extend the works approval to 2020 to allow time to undertake the phase 2 works. Only 70% of the area was available for conversion as finer grained residue in the south eastern section (RSA1SE) meant the remaining 30% was not sufficiently consolidated for the conversion works to occur. In amending the works approval to extend its duration by four years, the delegated officer considered that delaying the phase 2 works (which included drainage infrastructure and deliquoring bores to reduce alkaline water within the existing residue deposit) could potentially change the assessed risk to groundwater.

The delegated officer reviewed the Groundwater Report (Alcoa 2016) which justified that delay to the installation and commissioning of deliquoring bores will not cause any significant change to the risk posed by seepage. The delegated officer therefore determined there would be no material change to groundwater risk associated with extending the duration of the works approval by four years, and that the long term risk associated with seepage from the facility can be managed under the provisions of the *Contaminated Sites Act 2003*. The full benefit of the installed drainage and deliquoring systems installed on RSA1N and RSA1S will not be realised until the remaining works are complete on RSA1SE as the water bodies in the residue deposits are hydraulically connected.

Phase 2 conversion works for RSA1S were completed in May 2018. Alcoa submitted a compliance report for the works in June 2018 confirming that they had been completed in accordance with the works approval conditions. The report confirmed all proposed additional groundwater monitoring bores had been installed.

For reference the areas discussed RSA1N (phase 1), RSA1S (phase 2) and RSA1SE are illustrated in Figure 1.



Figure 1 Conversion areas/phases of Pinjarra refinery RSA1 (subject of W4661/2010/1)

3. Works approval holder's comments

The works approval holder was provided with the draft amendment report on 14 December 2020. The works approval holder responded on 21 December 2020 and provided additional details relating to the infrastructure design and construction requirements which had been requested. The works approval holder also requested the permeability of the synthetic liner be removed from Table 1 and Table 2 of the works approval on the basis that polyethylene is an essentially impermeable substance. The works approval holder provided sufficient details of the proposed liner that the delegated officer considered removal of the permeability would not increase the risk to groundwater and the permeability requirement was therefore removed.

4. Decision

The delegated officer has determined that the proposal to extend the duration of the works approval to complete remaining works is unlikely to result in a material change to the overall risk profile of the premises. In making this determination the delegated officer noted that:

The risk to groundwater associated with continued alkaline seepage from the existing

residue deposit in RSA1 was previously considered by the delegated officer in the context of extending the expiry of the works approval from 27 December 2016 to 27 of December 2020.

- At this time the delegated officer determined that there would be no material change to groundwater risk associated with extending the duration of the works approval and that the long term risk associated with seepage from the facility can be managed under the provisions of the Contaminated Sites Act 2003.
- Completion of the works will reduce the risk to groundwater associated with operation
 of RSA1S due to the installation of deliquoring bores and drainage infrastructure which
 will reduce alkaline process waters in the existing residue deposit therefore allowing
 time to complete the works will achieve a net benefit.
- It is necessary to allow sufficient time for adequate consolidation of the existing residue deposit in RSA1SE to ensure the conversion of the area to dry stacking will not impact on the stability of the landform.
- The works approval holder has completed phase 1 works (conversion of RSA1N) and 70% of the conversion of RSA1S (phase 2) and has complied with the requirements of the works approval in undertaking these works. Dry stacking of residue is occurring within the converted RSA1N.
- All new monitoring bores which were proposed to be installed for the converted residue storage area have been installed during the works previously undertaken and are being monitored by the works approval holder.

The delegated officer determined that due to the works approval having been assessed and granted under the department's previous regulatory framework, it was appropriate to ensure the conditions of the works approval were consistent with the department's current regulatory format, particularly the *Guidance Statement: Condition Setting* (DER 2015). The delegated officer has therefore specified construction commitments/controls from the document *Works Approval Application Supporting Information, Pinjarra Alumina Refinery, Residue Storage Area 1 Conversion (to a Residue Drying Area) Project dated 12 September 2017 and Appendix A of this document, together with updated information provided by the works approval holder, as design and construction requirements in the amended works approval.*

The department's *Industry Regulation Guide to Licensing* (DWER 2019), specifies that containment infrastructure may require submission of a Critical Containment Infrastructure Report (CCIR) so the department can confirm the environmental controls on the containment infrastructure are properly constructed before material is deposited into it. As the RSA1SE will be used for the purpose of storage and containment of residue (waste), it is considered containment infrastructure. In line with the decision to align with the department's current regulatory framework, and in line with this guide, the delegated officer determined to include a requirements to submit a CCIR in the amended works approval andhas specified a timeframe the works approval holder must wait before commencing deposition of residue into RSA1SE to allow the department time to assess the CCIR. In specifying construction requirements for the critical containment infrastructure it was identified that embankment construction criteria had not previously been detailed for RSA1SE in the application documents for W4661/2010/1. This information was therefore sought from the works approval holder to be included in the amended works approval.

The delegated officer reviewed the Environmental Assessment undertaken for W4661/2010/1 to determine if consideration had been given to whether conditions of the refinery licence L5271/1983/14 apply to ongoing operation of RSA1. The Environmental Assessment Report identified that the licence includes conditions which regulate potential emissions associated with the operation of RSA1 including dust, discharges to land, surface water and groundwater. The Environmental Assessment also identified that the works approval holder would install eight new monitoring bores and monitor them for a period of 12 months. The monitoring bores

were installed during the phase 1 and 2 works but have not yet been included in the water monitoring program specified in L5271/1983/14. As these monitoring bores are already established and undergoing monitoring the works approval holder should seek amendment of the licence for inclusion of relevant monitoring bores within the licence specified groundwater monitoring program. Given the refinery licence includes conditions which regulate the operation of the residue storage area the delegated officer considers that licence amendment is only required to include relevant monitoring bores. The licence holder has advised that a review of the RSA groundwater monitoring bores will be undertaken for inclusion in the next licence amendment application Residue deposition in the converted RSA1SE can therefore commence in accordance with the works approval conditions and continue in accordance with the licence conditions.

5. Conclusion

Based on the assessment in this amendment report, the Delegated Officer has determined that an amended works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

5.1 Summary of amendments

Table 1 below provides a summary of the proposed amendments and will act as a record of implemented changes. All proposed changes have been incorporated into the Revised works approval as part of the amendment process. Amendment notices will remain on the department's website for future reference and will act as a record of the department's decision making.

Table 1: Summary of works approval amendments

Condition no.	Proposed amendments			
Cover page	Format updated to current version			
Duration	Extended to 27/12/2024			
Interpretation	Included based on the most recent instrument template			
History	Added to the works approval			
Condition 1 and Condition 2	The format of previous condition 1 has changed in specifying conditions 1 and 2, to align with the current regulatory framework. Where previously the condition referred to complying with commitments made in the works approval application documents the condition now specifies out the design and construction commitments from those documents and as advised by the works approval holder. Infrastructure which is considered critical containment infrastructure is specified in a separate condition.			
Conditions 3 to 6	Compliance reporting requirements previously specified in condition 2a to chave been revised. An environmental compliance report is requirement for all infrastructure not considered critical containment infrastructure and a CCIR is required for all infrastructure which is. The CCIR must be certified by a suitably qualified person as per the definitions.			
Condition 7	Timing for commencement of residue deposition into the RSA has been specified based on the submission of a critical containment			

Works Approval: W4661/2010/1

Condition no.	Proposed amendments				
	infrastructure report to align with the department's current regulatory framework.				
Conditions 8 to 10	Standard conditions relating to complaints and record keeping have been included in line with the department's current regulatory framework.				
Definitions	Definitions updated: 'CEO'				
	Definitions removed: 'Phase 1', 'Phase 2', 'Phase 1 commissioning' and 'Phase 2 commissioning' as conditions containing these references have been removed as part of this amendment				
	Definitions added: 'ASTM D5641', 'ASTM D6392' and 'GRI-GM6', 'environmental compliance report', 'critical containment infrastructure', 'critical containment infrastructure report', 'time limited operations', 'suitably qualified and experienced tailings design or geotechnical engineer', 'RSA', and other standard definitions.				
Premises map	New map included which depicts the premises boundary relevant to the works approval and additional infrastructure maps included illustrating the location of the works and design of embankments				

Caron Goodbourn Manager, Process Industries

an officer delegated under section 20 of the Environmental Protection Act 1986 (WA)

References

- 1. Alcoa 2017, Works Approval Application Supporting Information, Pinjarra Alumina Refinery, Residue Storage Area 1 Conversion (to a Residue Drying Area) Project, Pinjarra, Western Australia
- 2. Alcoa 2020, Pinjarra Alumina Refinery W4661 Amendment Supporting Information, Pinjarra, Western Australia
- 3. Alcoa 2020, Response to notice under section 59B of the *Environmental Protection Act* 1986 regarding proposed amendment to works approval W4661/2010/1 (DWERDT394910)
- 4. Department of Environment Regulation (DER) 2017, Guidance Statement: Risk Assessments, Perth, Western Australia
- 5. DER 2015, Guidance Statement: Setting Conditions, Perth, Western Australia
- 6. Department of Water and Environmental Regulation (DWER) 2019, Industry Regulation Guide to Licensing, Perth, Western Australia

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY							
Application type							
Works approval							
		Relevant works approval number:		None			
		Has the works approval been complied with?		Yes □ No □			
Licence		Has time limited operations under the works approval demonstrated acceptable operations?		Yes □ No □ N/A □			
		Environmental Com Critical Containmen Report submitted?	Yes □ No □				
		Date Report received:					
Renewal		Current licence number:					
Amendment to works approval	\boxtimes	Current works approval number:	W466	61/2010/	1/2010/1		
Amendment to licence		Current licence number:					
Amendment to licence		Relevant works approval number:		N/A			
Registration		Current works approval number:		None			
Date application received		9 October 2020					
Applicant and Premises details							
Applicant name/s (full legal name/s)		Alcoa of Australia Limited					
Premises name		Pinjarra Refinery					
Premises location	Lot 19 on Diagram 44739, Part of Lot 109 on Diagram 60089, Part of Lot 151 on Plan 10914, Lot 221 and 222 on Plan 302638, Part of Lot 251 and Lot 252 on Plan 35963, Southwestern Hwy						
Local Government Authority		Shire of Murray					
Application documents							
HPCM file reference number:		DWERDT349442					
Key application documents (addition application form):	 Application form Supporting information which includes a description of remaining works making reference to previous works approval commitments which apply to the remaining works. It also includes a conceptual design for the remaining works, a noise risk assessment and a plan showing changes to groundwater monitoring bores. Supporting information which was previously submitted for the most recent amendment of the works approval in 2016 to extend the timeframe. This includes details of the proposed operational controls and further information relating to 						

	sensitive receptors. The supporting information also identifies sensitive receptors,					
		emissions and discharges.				
Scope of application/assessment						
		Works approval amendment				
Summary of proposed activities or changes to existing operations.	Alcoa is seeking a four year extension to the works approval to allow time for the conversion of the final 30% (south-eastern area) of RSA1 South from a wet residue disposal area to a dry residue disposal area. Conversation of 70% of RSA1 South was previously completed in May 2018 however additional time was need for consolidation of the remainder of the facility so works could be completed. Compliance reports have been submitted for two previous phases on consolidation works in May 2013 and May 2018. Remaining construction works are proposed to occur over 2021-2022 with commissioning in 2023.					
		The works approval is due t	to e	expire on 27 December 2020.		
Category number/s (activities that category Table 1: Prescribed premises category		the premises to become p	res	scribed premises)		
Prescribed premises category Ass		sessed production or sign capacity		Proposed changes to the production or design capacity (amendments only)		
		t specified within the licence WA currently, unknown		NA		
Legislative context and other approva	Legislative context and other approvals					
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?		Yes □ No ⊠	Ν	Referral decision No: Managed under Part V □ Ssessed under Part IV □		
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?		Yes ⊠ No □	Ministerial statement No: MS646 EPA Report No: 1122			
Has the proposal been referred and/or assessed under the EPBC Act?	Yes □ No ⊠	R	deference No:			
Has the applicant demonstrated occupancy (proof of occupier status)?		Yes ⊠ No □ Within existing premises boundary for Alcoa	Certificate of title □ General lease □ Expiry: Mining lease / tenement □ Expiry: Other evidence □ Expiry:			
Has the applicant obtained all relevant planning approvals?		Yes □ No □ N/A ⊠	Approval: Expiry date: If N/A explain why? Time extens only, no change in activit proposed.			

	T	T
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes □ No ⊠	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes □ No ⊠	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes □ No ⊠	Application reference No: Licence/permit No: Licence / permit not required.
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes ⊠ No □	Name: Murray River Surface Water Area and Murray Groundwater Area Type: Surface and Groudnwater Water Areas Has Regulatory Services (Water) been consulted? Yes □ No □ N/A ☒ Regional office: Kwinana Peel Consultation not required as there will be no changed to activities already assessed and authorised.
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes □ No ⊠	Name: N/A Priority: P1 / P2 / P3 / N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes □ No □ N/A ☒
Is the Premises subject to any other Acts or subsidiary regulations (e.g. Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx)	Yes ⊠ No □	Alumina Refinery (Pinjarra) Agreement Act 1969 Alumina Refinery Agreements (Alcoa) Amendment Act 1987
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes ⊠ No □	Environmental Protection (Peel Inlet-Harvey Estuary) Policy 1992.
Is the Premises subject to any EPP requirements?	Yes □ No ⊠	NA

Is the Premises a known or suspected contaminated site under the Contaminated Sites Act 2003?		Reported site Classification: possibly contaminated – investigation required		
	Yes ⊠ No □	Date of classification: 17 August 2012		