



**Appeals Convenor**  
**Environmental Protection Act 1986**

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**REPORT TO THE  
MINISTER FOR ENVIRONMENT**

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**APPEAL AGAINST AMENDMENT OF LICENCE L6217/1983/15**

**WAGERUP ALUMINA REFINERY  
WAGERUP**

**Proponent:**

**Alcoa of Australia Ltd**

Appeal number 143 of 2015

**February 2018**

## APPEAL SUMMARY

This report relates to an appeal objecting to the amendment of a licence issued by the Department of Environment Regulation (DER) to Alcoa of Australia Ltd (licence holder) in relation to the Wagerup Alumina Refinery.

The appellant raised a number of concerns in respect to health and environmental impacts primarily associated with increases in emissions resulting from the DER's decision to allow the licence holder to increase production to 2.85 mtpa. Other concerns raised by the appellant included noise impacts, discharges to groundwater and use of water.

The appellant also raised concerns about the location of the refinery and the appropriateness of a buffer zone. These concerns are considered to be beyond the scope of the appeal, which is limited to the amended conditions of the licence.

Having regard to information provided during the appeal investigation, including information from the appellant, licence holder and from DER (now the Department of Water and Environmental Regulation (DWER)), the Appeals Convenor considered that DER had considered the issues raised by the appellant in its assessment and that the majority of the concerns raised could be managed through the existing regulatory controls.

The Appeals Convenor considered that issues of uncertainty regarding levels of emissions and reliance on historical data would be most appropriately addressed in the full licence review currently being undertaken by DWER. This review will ascertain whether additional monitoring and management conditions are required. The Appeals Convenor also considered that an existing condition relating to contaminated water should be amended to ensure that no contaminated water is released to the environment from the premises.

### Recommendation

The Appeals Convenor recommends that the Minister allow the appeal in part to the extent that DWER be requested to:

- ensure that the licence review currently underway considers:
  - the identified uncertainties in respect to VOC emissions, particularly in relation to low-elevation sources
  - particulate emissions, in the context of current data
  - emissions of mercury, in the context of current data
- amend condition W2 of the licence to ensure that no contaminated water is released to the environment from the premises, consistent with commitments in licence holder's Long Term Residue Management Strategy.

It is recommended that the appeal be otherwise dismissed.

## INTRODUCTION

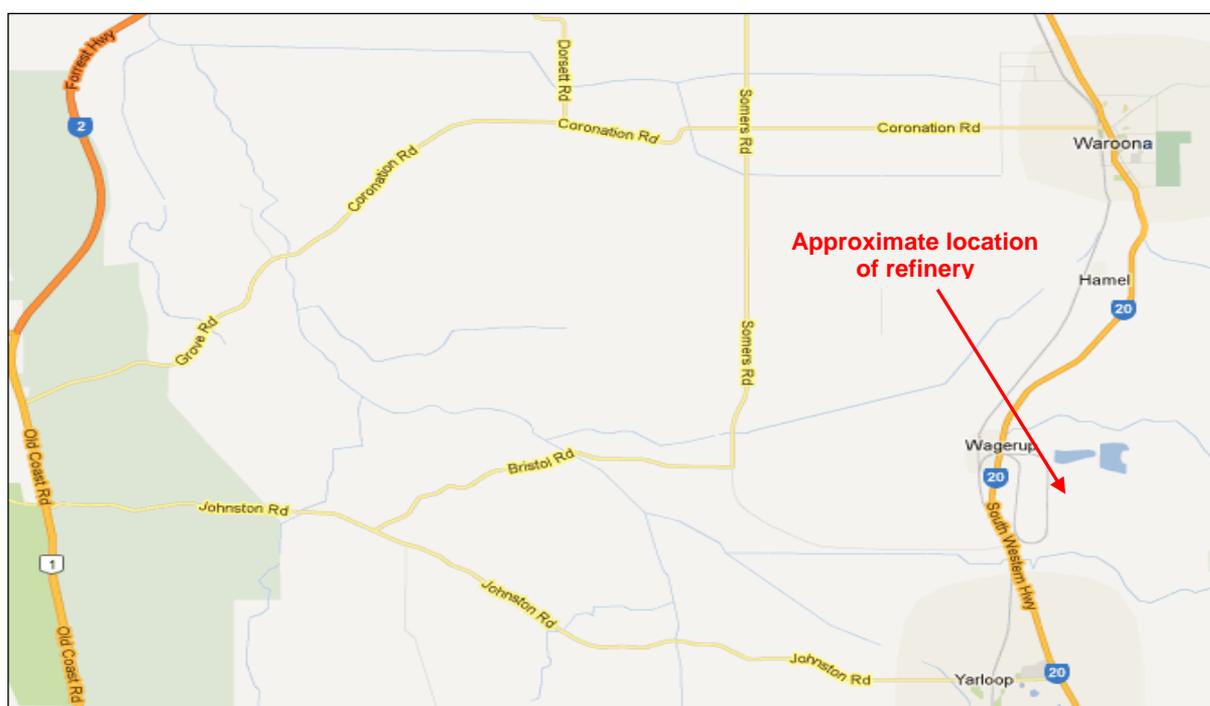
This report relates to an appeal lodged by Community Alliance for Positive Solutions Inc (the appellant) in objection to the amendment of licence L6217/1983/15 issued to Alcoa of Australia Ltd (Alcoa/licence holder) in relation to the Wagerup Alumina Refinery (Refinery).

This document is the Appeals Convenor's formal report to the Minister for Environment under section 109(3) of the *Environmental Protection Act 1986* EP Act.

## BACKGROUND

Alcoa operates an alumina refinery in Willowdale Road, Shire of Waroona, shown at Figure 1.

**Figure 1 – Location of proposal**



(source: whereis.com)

The Refinery was established under the *Alumina Refinery (Wagerup) Agreement and Acts Amendment Act 1978* (State Agreement) and is classified as prescribed premises under Category 46 (Bauxite refining); Category 52 (Electric power generation); Category 64 (Class II or III putrescible landfill site); and Category 67 (Fuel burning) of the *Environmental Protection Regulations 1987* (EP Regulations). It has been subject to a number of works approvals and licences under Part V of the EP Act.

The licence the subject of this appeal was issued by the Department of Environment Regulation (DER) on 7 November 2013 for a two year duration. The licence was subsequently amended in September 2015 to extend the duration of the licence to 12 November 2016, as well as making other changes, including increasing the production of the refinery from 2.65 million tonnes per annum (mtpa) to 2.85 mtpa. The amendments made to the licence are summarised in Table 1. It is these amendments that are the subject of this appeal report.

**Table 1 – Summary of amendments to the licence the subject of this appeal**

Condition	Description of amendment
G4(a)(ii)	Deletion of former requirement for complaints register to include information as to whether the complainant moved to the area pre or post 1 July 2002.
G7	Former condition requiring the licence holder to notify the Director as soon as practicable of any unplanned occasion when any pollution control equipment at the premises malfunctions or ceases to operate which has the potential to significantly impact on the environment deleted.
A1(a)	Increase in production from 2.65 mtpa to 2.85 mtpa
A2(a)	Reduction in aggregate priority calciner VOC emissions from 31,219 kg per annum to 29,501 kg/annum, with commensurate reductions in 90, 180 and 270 day periods
A4	Condition prohibiting visible dust crossing the boundary of the premises deleted
A13 (now A12)	The following text is deleted: <i>The Licensee shall target mercury control system process parameters specified in Table 4.</i> And replaced with (now condition A12): <i>The Licensee shall, upon becoming aware that a mercury control system parameter listed in Column 2 of Table 4 from a source in Column 1 of Table 4 has not met the response level for that parameter in Column 4 of Table 4, undertake the management actions required in Table 5 of condition A13</i>
A23(d) (now A24(a)-(c))	DER agreed to licence holder request that this condition be replaced with the same condition that applies to Pinjarra Refinery – DER agreed, stating that there are no alterations to the licence holder's obligations
S3(c)	The following text deleted: <i>The licensee shall ensure that oxalate discharged into the approved oxalate storage areas is stored underwater within 12 hours of being discharged.</i> Replaced with: <i>The licensee shall, within 12 hours of oxalate being discharged into the approved oxalate storage ponds, ensure the oxalate is kept moist or maintained under water or beneath a full surface cover that ensures dust is not generated from oxalate storage and does not impinge on the ability to fully recover the oxalate</i>

Several previous works approvals and licences have been subject to appeals which raised similar grounds to some of those contained in this report. Where relevant, the previous appeal reports are referenced for further information. The Appeals Convenor's reports are publicly available from the Office of the Appeals Convenor's website.<sup>1</sup>

The State Agreement allows the expansion of the Refinery, subject to the State's approval. The proposal to expand the Refinery by up to 4.7 million tonnes per annum (Mtpa), known as the Alcoa Refinery Wagerup Unit (Wagerup 3), was conditionally approved by Government in

<sup>1</sup> [www.appealsconvenor.wa.gov.au](http://www.appealsconvenor.wa.gov.au).

September 2006 by Ministerial Statement 728. The licence holder has advised that the proposed expansion is on hold at this time.<sup>2</sup>

It is also noted that on 29 April 2016, DER amended the duration of the licence, with the end date changed from 12 November 2016 to 12 October 2035. This amendment was not appealed.

## **APPEAL PROCESS**

By letter dated 26 November 2015, DER was requested to provide a response to the matters raised by the appeal pursuant to section 106 of the EP Act. The licence holder was also given an opportunity to respond to the appeals. DER's response was received on 9 May 2016.

Following receipt of DER's response to the appeal, representatives from the Office of the Appeals Convenor met with representatives of the appellants in Yarloop, and undertook a meeting and site visit of the refinery with representatives of the licence holder.

Discussions were held with DER officers, and further written advice was requested in July and December 2016, and again in March 2017. Responses to these requests were provided in November 2016, January and August 2017 (the latter from the Department of Water and Environmental Regulation (DWER), which assumed DER's functions on 1 July 2017), respectively. Additional discussions were held with DWER officers after 1 July 2017, and with representatives of the licence holder and appellant throughout the appeal investigation.

The environmental appeals process is a merits based process. Appeal rights in relation to an amendment to a licence relate only to the amendment, and not to elements of the licence that are not amended. The Appeals Convenor normally considers whether the amendments are appropriate, including whether any new conditions are suitable to minimise, manage or abate pollution and to ensure that premises are operated in an environmentally acceptable manner.

Consistency of the conditions with any conditions set under Part IV of the EP Act and previous Ministerial appeal determinations are also relevant, subject to new information or evidence being presented not previously considered.

## **OUTCOMES SOUGHT BY APPELLANT**

The appellant requested that the conditions of the licence be amended to address the concerns detailed below.

## **GROUND OF APPEAL**

The primary focus of the appeal is on health and environmental impacts associated with increases in emissions to air resulting from DER's decision to allow Alcoa to increase production to 2.85 mtpa. Emissions of key concern to the appellant are volatile organic compounds, particulates, poly aromatic hydrocarbons, metals and odour.

Other concerns raised by the appellant relate to noise impacts and discharges to groundwater. The appellant also raised broader concerns around buffer distances between the refinery and residences, including those in the towns of Yarloop and Hamel.

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<sup>2</sup> In 2017, the EPA gave a report on its recommendations for amending the conditions applying to the Wagerup 3 proposal, which were subsequently agreed by the Minister for Environment and relevant decision making authorities. These changes were directed at ....

In the above context, this report will consider the appeal grounds as follows:

1. Volatile organic compounds
2. Particulates
3. Other emissions to air (PAH, metals etc)
4. Noise
5. Impacts to water
6. Water usage
7. Process issues

The appeal also raised broader concerns about the location of the refinery, and the appropriateness of the buffer zone around the premises. As these issues are not directly related or consequential to the amendment they are considered to be beyond the scope of the appeal and are discussed under Other Matters at the end of this report.

### **GROUND 1 – VOLATILE ORGANIC COMPOUNDS (VOC)**

By this ground of appeal, the appellant submitted that there should be no increase in VOC emissions from the refinery, and requested further consideration be given to investigating and quantifying all VOC emission sources to ensure decisions on future expansion of the refinery can be effectively made.

The appellant submitted a number of concerns about increases in VOC emissions that are predicted to occur as a result of the approved increase in production from 2.65 mtpa to 2.85 mtpa. Key submissions include:

- all sources and emission points should be assessed as part of the consideration of the increase in production, and if a licence is granted, it should include all sources, not the limited number that are currently included
- historical data should not continue to be relied upon as part of the assessment of emissions justifying an increase in production
- current emissions are significantly different to those considered in the 2005 Health Risk Assessment and as such, there needs to be a new health study completed prior to any production increase
- the 42 conditions in the Ministerial Statement should be addressed before a production increase is approved
- from information provided by Alcoa, there is significant uncertainty about sources, rates and types of emissions from the refinery, such that the entire licence ought be reviewed
- interaction of chemicals not sufficiently addressed (see CSIRO recommendation 5)
- modelling of impacts should be required ahead of a decision to grant the increased production level

### **Amendments relevant to this ground**

This ground of appeal is considered to relate primarily to the amendment to condition A1(a) of the licence to authorise an increase in production from 2.65 mtpa to 2.85 mtpa (see Table 1). In essence, it is the appellant's view that the information in support of the application indicates

that there will be an increase in VOC emissions from the facility, and the implications of the increase has not been properly assessed.

## Consideration

The current licence includes the following conditions that expressly reference VOC emissions from the refinery:

- A2(a) – limit on aggregate priority<sup>3</sup> calciner emissions, with an annual limit of 29,501 kg (down from 31,219 kg in the pre-amended licence)
- A23(a) – quarterly monitoring of priority VOC emissions from calciners 1 to 4
- A23(b) – quarterly monitoring of priority VOC emissions from calciner low volume stack
- A25(a) – quarterly monitoring of priority VOC emissions from liquor burner stack and oxalate kiln stack

In addition, DER advised that other existing controls and measures address VOC emissions, including:

- the liquor burner and oxalate kiln each have a regenerative thermal oxidiser (RTO) for VOC destruction
- automated shutdown of liquor burner and oxalate kiln RTO's in the event of bypass
- calciner 1-3 LVV gases (excluding the 50B condensate tank emissions) are redirected through Calciners 1,2 or 3 for VOC destruction
- 25A vents, 35J tank vents, digestion, heat interchange and evaporation condensables are extracted by condensers and directed to the lower dam, lakewater circuit or reused as process water, with non-condensables directed to the air feed of the powerhouse boilers for destruction.<sup>4</sup>

In the assessment of the current application to increase production to 2.85 mtpa, DER noted that Alcoa:

... predicted an 8% increase (i.e. 3.6 g/s to 3.89 g/s) of total VOCs from 2.65 Mtpa to 2.85 Mtpa from point sources based on 2014 emissions inventory information. The predicted increase is unlikely to be solely attributed to the production increase, given that the 2014 updated emissions inventory will include additional sources of emissions. The increase in point source total VOCs associated with the production increase appears to be primarily related to the milling vents and cooling towers.

In further advice received from DER during the appeal investigation it noted:

The predicted change in total VOC emissions associated with an alumina production of 2.65 Mtpa to 2.85 Mtpa is 0.29 grams per second (g/s) (annual average). Of this 0.29 g/s, approximately 0.016 g/s can be attributed to additional southern refinery sources; approximately 0.116 g/s to increasing low elevation sources (e.g. Building 45K cooling tower and milling vents); and 0.158 g/s to updated data.

In its application for the increase in production, Alcoa submitted:

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<sup>3</sup> Priority VOC emissions are defined in the licence to be the combined emissions of acetaldehyde, acetone, 2-butanone, formaldehyde and benzene (page 2 of L6217/1983/15).

<sup>4</sup> DER, Decision Document for Licence L6217/1983/15, 30 October 2015, page 23.

Due to the emission point of the aggregate calciner priority VOCs sources being high level stacks, the increase in VOCs ... will be dispersed more readily than the low level sources and hence is expected to have a minimal impact off site.<sup>5</sup>

By its appeals the appellant questioned the adequacy and sufficiency of the data relied upon by DER in its assessment and submitted that it failed to take into account all emission sources at the premises and that only licenced point sources have been monitored and assessed. The appellant submitted that the licence holder should 'take an all-encompassing and all-inclusive approach to include all refinery alumina operations emissions, from all source points, in particular as outlined in the Winter Study 2006.'<sup>6</sup>

In response to this issue, DER disagreed that only licenced emission sources were considered in its assessment:

[T]he Delegated Officer considered all point sources of emissions and all significant sources of fugitive emissions across the refinery. If the Appellant considers that the Delegated Officer considered only those point sources that are the subject of specific licence conditions, then it is incorrect. Only those emission sources that are considered to present a significant environmental risk are subject to licence conditions.<sup>7</sup>

DER further advised that;

In considering the risk associated with point source emissions to air as part of the assessment of the licence application, the Delegated Officer took into account a number of factors that are relevant to predicted changes in air emissions but not directly related to the production increase to 2.85 million tonnes per annum (Mtpa) of alumina. This included:

- additional southern refinery sources not previously identified in the emissions inventory (i.e. the B50 cooling towers, 44-1 and 44-2 vents, Calciner 4 low volume vent and extraction hood stack and 48A tank vent);
- reduction in aggregate Calciner Priority VOC emissions achieved from the Calciner 1-3 low volume vent (authorised by works approval W5391);
- updated monitoring data from 2012-2014 sources monitored under licence; and
- updated flow data of licensed sources to reflect current flow rates.

To consider this element of the appeal, the licence holder was requested to provide details of the contribution each identified point source makes to total and peak VOC emissions from the refinery. This information is shown in Table 2.

Noting DER's response to the appeal that only those emission sources that are a significant environmental risk are subject to licence conditions, further advice was sought as to why low-elevation sources such as the cooling towers, building 25 milling and building 25A slurry storage were not subject to controls under the licence.

In response, DER advised that it was not considered appropriate to use percentage contributions of particular emissions sources as the basis for assessing risk, however:

[I]t is accepted that following the implementation of the VOC reduction program and focus on high-level Aggregate Calciner priority VOC emissions, the increased significance of low-level VOC emission sources requires further assessment to ensure that an accurate inventory is maintained to better inform risk-based assessment of emissions from low-level sources.

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<sup>5</sup> Alcoa, Licence amendment application, 19 August 2015, page 8.

<sup>6</sup> CAPS, appeal letter, 23 November 2015, page 4.

<sup>7</sup> DER, Response to appeal 143/15, 5 May 2016, page 8.

**Table 2 – Average and peak VOC emissions by point source**

(Source: Alcoa 2016)

Building Description	Average total VOCs contribution (%)	Peak VOCs contribution (%)
Building 25 (Milling)	8.05	3.95
Building 25A (Slurry storage)	15.14	15.14
Building 26 (Sand Separation)	1.26	1.04
Building 30 (Blow-Off tanks)	1.48	0.42
Building 35A (Filtration)	0.76	2.02
Building 35J (Causticisation)	2.56	0.90
Building 44 (Seed Filtration)	2.89	0.83
Building 45 (Precipitation)	0.50	0.14
Building 45K (Cooling Tower)	29.05	41.32
Building 47 (Oxalate Kiln)	0.08	0.88
Building 48 (ILiquor Burner and 48A Tank)	0.48	0.07
Building 50 (Cooling Tower)	1.94	2.76
Building 50 (Calciner 1-3)	17.47	19.29
Building 50 (Calciner 1-3 low flow)	0.56	1.16
Building 50 (Calciner 4)	8.94	6.85
Building 50 (Calciner 4 low flow)	1.86	0.53
Building 110 (Boilers)	4.75	1.95
Building 110 (GT/HRSG)	2.23	0.74
Total	100.0	100.0

DER noted that the largest single source of VOC emissions, as per the inventory, related to the cooling tower at Building 45K which accounts for 29.05 per cent of total average and 41.32 per cent of total peak VOC emissions from the premises.<sup>8</sup>

In this regard, DER noted that the characteristics of cooling towers pose considerable problems for accurate sampling of emissions, stating that low levels of VOCs in cooling water are difficult to analyse and report, as sample analysis can be reported at the method limit of detection which can be higher than the actual emissions. DER advised that these issues mean data can be unreliable and can overestimate the actual emissions of VOCs.

Notwithstanding these uncertainties, DER advised that given the large contribution to total and peak VOC emissions associated with the cooling towers, it was appropriate to introduce additional controls to ensure that VOC emissions from these sources are minimised and to ensure that VOC emissions from low elevation sources can be more fully accounted. To achieve this, DER set out the following approach:

<sup>8</sup> DER, Additional advice, 9 November 2016, pages 2-3.

[I]n the first instance, DER will develop licence conditions to introduce a water quality specification and water quality monitoring requirements for cooling tower input water. Alternatively, consideration could be given to imposing similar conditions through the appeal process.

DER will continue to develop appropriate criteria for measuring, calculating or estimating VOC emissions from low-level emission sources with the licensee. Production limit controls are often only a proxy for more direct regulation of emissions. Once appropriate criteria for valid and enforceable emission measurements are developed, it may be preferable to move to direct regulation of VOC emissions from all sources.<sup>9</sup>

DER was subsequently requested to provide details as to the nature and content of the proposed conditions, such that they could be considered as part of the appeal investigation.

DER responded in March 2017 that draft licence conditions had been prepared, which included an obligation to monitor water quality in the Lower Yalup Dam, and to ensure that water quality specifications are met for cooling tower water taken from the dam. However, DER advised further information was required from Alcoa in order to finalise the content of the conditions. In this regard, DER noted:

Recommendation 2 of the CSIRO 2004 Air Quality Review stated that, given the apparent contribution of the cooling towers to some of the volatile organic compounds (VOC) emissions from the Wagerup refinery, either further measurement of emissions from the cooling towers should be made, or further documentation of emission measurements should be made available.

In 2013, the Licensee prepared a report (Recommendation 2 Report) in response to this recommendation ... That report includes discussion of several trials in 2003 and 2004 using clean input water for the cooling towers. The Recommendation 2 Report indicates that sampling and VOC analysis of Lower Dam water may have been undertaken by the Licensee on a number of occasions from 2002 to 2006. The [DER] is not currently in possession of water quality data for clean water input trials.

The Licensee's Recommendation 2 Report provided emissions information for 16 VOC parameters. Of these, eight have guideline values in the Australian Drinking Water Guidelines (ADW Guidelines). In the absence of other appropriate data, the values in the ADW Guidelines have been used as the basis for the water quality specification in the preliminary draft condition.

However, as the ADW Guidelines do not provide standards for all the VOC parameters identified in the Recommendation 2 Report, it is considered that it would be appropriate to seek clarification on the nature of any VOC water quality analysis for the clean water sources used in the Licensee's 2003 and 2004 trials and obtain any available data for review. This will aid in developing specifications for all 16 VOC parameters, and to provide comparison with the values in the ADW Guidelines.<sup>10</sup>

In August 2017, DWER provided the following update on the status of its further discussions with Alcoa:

In its response to the Department's request, Alcoa provided clarification on cooling tower VOC emissions data collected over the period 2002 to 2006 as part of its trials. Alcoa advised that during this period air emission measurements were taken when cooling towers were running with makeup water sourced from the Lower Yalup Dam (normal water supply) and the Upper Yalup Dam (clean water supply). Alcoa confirmed that corresponding water quality samples

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<sup>9</sup> DER, Additional advice, 9 November 2016, page 3.

<sup>10</sup> DER, Additional advice, 15 March 2017, pages 1 to 2.

were not collected as part of the trials and that no further cooling tower studies have been conducted since.<sup>11</sup>

DWER reiterated its earlier advice that estimation of the contribution of cooling tower emissions to total VOC emissions is complicated by the uncertainty introduced by the very low concentrations of VOCs in the gas stream, the laboratory limits of detection used when analysing the gas, and the very large flow rates through the cooling towers. Given these issues, DWER stated that the emission figures for the cooling towers 'can be unreliable' and 'can overestimate the actual emissions of VOCs':

For example, where the concentration of a compound is below the limit of detection, the concentration is assumed to be at the limit of detection for the purpose of estimating mass emissions; in some cases, the limit of detection may be an order of magnitude higher than the actual concentration.<sup>12</sup>

As a result, DWER advised that the 'monitoring of cooling tower air emissions as part of monitoring requirements on a licence would have limited value'.<sup>13</sup>

DWER advised that improved direct measurement is the most accurate and appropriate way to quantify VOC emissions when considering the ongoing assessment of risk:

Noting the number and complexity of sources across the refinery, a full review will be undertaken in regard to the most appropriate monitoring techniques and requirements for each source. By improving the accuracy of monitoring, the Department considers that a more appropriate approach can be taken towards regulating the site, as opposed to production limits.<sup>14</sup>

Noting that low-elevation sources are identified as producing the majority of point source VOC emissions in the 2014 Emissions Inventory, DWER advised that it has commenced a review of the licence, and noted that:

... VOC emissions from low-level sources require further investigation to ensure the accuracy, integrity and currency of the emissions inventory which will be used in this and future risk assessments.<sup>15</sup>

DWER advised that prior to initiating a broader stakeholder consultation regarding the licence review, both Alcoa and the appellant were notified of the review, with the latter making a submission on 7 June 2017 that DWER advised will be considered through the review process.

## Conclusion

From the foregoing, the following is noted:

- VOC emissions from calciners has reduced, and a reduced emission limit has been applied through the amendment of condition A2(a) of the licence
- uncertainty exists over the accuracy of mass emission calculations for the cooling towers
- the quality of water in the cooling towers may contribute to VOC emissions

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<sup>11</sup> DWER, Additional advice, 8 August 2017, page 1.

<sup>12</sup> DWER, Additional advice, 8 August 2017, page 1.

<sup>13</sup> DWER, Additional advice, 8 August 2017, page 1.

<sup>14</sup> DWER, Additional advice, 8 August 2017, page 2.

<sup>15</sup> DWER, Additional advice, 8 August 2017, page 2.

- DWER has advised that low elevation emission sources require further investigation.

DWER has advised that the review currently underway provides an opportunity to consider the most appropriate monitoring techniques and requirements for each emission source at the refinery, with a particular emphasis on low-elevation sources. It is considered that this review is the most appropriate mechanism through which the identified uncertainties can be addressed.

It is therefore recommended that the Minister allow this ground of appeal to the extent that DWER be requested to review the nature and extent of point source and fugitive VOC emissions from the refinery, with a focus on low-elevation point sources, at current and proposed future production levels.

## **GROUND 2 – DUST AND PARTICULATES**

The appellant raised similar concerns about particulate emissions as it raised in respect to VOC emissions considered above. Specific concerns included:

- failure of Alcoa to mention PM<sub>2.5</sub> in its application for amendment of the licence
- overuse of assumptions and historical data in respect to dust
- inter-relationship between dust and other chemical compounds should be the subject of further investigation before approval to expand is given
- the smaller the particles, the larger the surface area, the greater the dose delivered, which has not been adequately studied.

### **Amendments relevant to this ground**

This ground of appeal is considered to relate primarily to the amendment to condition A1(a) of the licence to authorise an increase in production from 2.65 mtpa to 2.85 mtpa (see Table 1). In essence, it is the appellant's view that the information in support of the application indicates that there will be an increase in particulate emissions from the facility, and the implications of the increase have not been properly assessed.

### **Consideration**

The current licence includes the following conditions for the control of dust from the premises:

- A8(c) – requirement to cease feed to liquor burner where particulate levels in exhaust gas exceeds 30 mg/m<sup>3</sup> for more than 60 consecutive minutes
- A11 and A15 – requirement to cease feed to oxalate kiln if particulate levels in stack exceed 30 mg/m<sup>3</sup> for more than 60 consecutive minutes
- A21 – requirement to have analysed four dust samples for certain chemicals between October and March where dust concentration exceeds 100 ug/m<sup>3</sup> (background adjusted), or as directed by the department
- A23(a) – quarterly monitoring of particulate emissions from calciners 1 to 4
- A25(a) – quarterly monitoring of particulate emissions from liquor burner stack and oxalate kiln stack
- A27 – limits for:
  - total suspended particulates from the residue storage areas

- particulates from each of calciners 1 to 4, and from the liquor burner
- A29(a) – requirement to shut down feed to any calciner where the dust concentration meter records a dust concentration that exceeds the equivalent in condition A27 for more than 60 minutes and not recommence feed until the cause of the high dust concentration is rectified
- A29(b) – in the event of a partial failure of a calciner electrostatic precipitator (ESP) continuing for more than 60 minutes, immediately shut off the feed to the relevant calciner and not recommence feed to the calciner until the ESP is fully restored
- A29(c) – in the event of a complete failure of a calciner ESP continuing for more than 10 minutes, the licensee shall:
  - immediately shut off the feed to the calciner, if the failure has not been at least partially remedied within that time, and not recommence feed to the calciner until the ESP is fully restored; or
  - manage the failure in accordance with condition A29(b), if the failure has been at least partially remedied within that time.

This ground of appeal relates primarily to the adequacy of the assessment of risks posed to the environment and human health by dust and particulate emissions from the refinery. In the view of the appellant, the assessment was defective, in that it did not adequately consider emissions of PM<sub>2.5</sub> from the premises, which it asserted pose the greatest risks to human health.

In response to this ground of appeal, DER described the assessment of risks posed by dust and particulate emissions as follows:

The Delegated Officer undertook risk assessment of the emissions, discharges and impacts for the whole refinery, including the residue area, associated with the prospective increase in production to 2.85 Mtpa...

The risk assessment addressed point source emissions to air, surface water, groundwater, land, fugitive emissions (in particular, fugitive dust emissions from the residue area), odour and noise.<sup>16</sup>

In relation to fugitive emissions, DER stated that the Delegated Officer considered the risk associated with dust and particulates of PM<sub>10</sub> and below, principally from the residue area:

The Delegated Officer identified the risk associated with fugitive particulate emissions as moderate in both normal and abnormal operating conditions. The Delegated Officer also noted the array of management measures undertaken by the Licensee set out in the Licensee's *2012 Long Term Residue Management Strategy* ... Existing regulatory controls included continuous ambient dust monitoring requirements, and a total suspended particulate limit.

DER went on to say that as the Delegated Officer considered PM<sub>2.5</sub> in the assessment, the extent to which Alcoa 'did or did not mention PM<sub>2.5</sub> particulates [in its application] is not relevant to the appeal'.<sup>17</sup>

In its application for the production increase, Alcoa provided the following information to DER in respect to fugitive dust emissions (i.e. those from residue areas and bauxite stockpiles):

Alcoa has utilised the National Pollutant Inventory (NPI) annual data to assess the impact of fugitive dust emission with a production throughput increase. The NPI data present fugitive

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<sup>16</sup> DER, Response to appeal, 5 May 2016, page 3.

<sup>17</sup> DER, Response to appeal, 5 May 2016, page 7.

dust as both PM<sub>10</sub> and PM<sub>2.5</sub>. The NPI calculations utilises the fugitive dust sources of residue dust and bauxite dust with some minor addition of diesel usage.<sup>18</sup>

The NPI data referred to by Alcoa is replicated in Table 3.

**Table 3 – NPI reporting data for fugitive dust**

NPI reporting period	Fugitive particulates (in kg/year)	
	PM <sub>10</sub>	PM <sub>2.5</sub>
2007/08	420,000	1,326
2008/09	450,000	1,291
2009/10	340,000	1,969
2010/11	310,000	1,462
2011/12	240,000	1,200
2012/13	260,000	820
2013/14	260,000	710

Alcoa advised that the decrease in fugitive dust emissions shown in Table 3 is attributable to:

... improved dust management practices at both residue and bauxite stockpile areas. Even with increased production throughput, and the potential for additional residue storage areas in the future, it is anticipated that fugitive dust emissions will continue to be minimised due to continued dust management practices and potential plans for residue filtration technology.<sup>19</sup>

Alcoa also pointed to requirements to monitor dust around the residue area under condition A21 of the licence, as well condition A27 which sets limits for total suspended particulates from the residue area, being 200 ug/m<sup>3</sup> daily average not to be exceeded for more than 18 days per annum; and 250 ug/m<sup>3</sup>, which is never to be exceeded. The information provided by Alcoa indicated that neither of these limits had been exceeded between 2011 and 2014.<sup>20</sup>

It is noted that additional NPI data for the years following the lodgement of the appeal is now available. The additional data shows:

- 2014/15 fugitive particulates:
  - PM<sub>10</sub> 300,000 kg/a
  - PM<sub>2.5</sub> 1,400 kg/a
- 2015/16 fugitive particulates:
  - PM<sub>10</sub> 280,000 kg/a
  - PM<sub>2.5</sub> 1,100 kg/a

<sup>18</sup> Alcoa, Licence amendment application, 19 August 2015, page 19.

<sup>19</sup> Alcoa, Licence amendment application, 19 August 2015, page 19.

<sup>20</sup> Alcoa, Licence amendment application, 19 August 2015, page 21.

These figures are consistent with levels of fugitive emissions prior to 2012/2013. This additional data was not available to the DER at the time of their assessment.

In relation to point sources, DER advised that the assessment of the application focused on particulates of PM<sub>10</sub> and below, which were expected to increase as a result of the production increase. In this regard, the Delegated Officer identified:

... that particulate emissions from refinery calciner stacks were expected to increase by approximately 9.4% as a result of the production increase, but emissions from the liquor burner stack and oxalate kiln were not expected to increase. The risk associated with the prospective particulate emissions levels was assessed as moderate. The existing regulatory controls in the Licence included limits on particulate emission levels from the liquor burner and calciner stacks, mandated management actions to deal with increases in emissions levels, and mandatory monitoring and reporting requirements. The Delegated Officer considered that the risk could be managed acceptably with the existing regulatory controls.<sup>21</sup>

The Decision Document noted that refinery particulate emissions were predicted to increase by 9.4% (2.8 g/s to 3.06 g/s). However, DER noted that this includes additional sources not previously included in the emissions inventory.

To manage risks from particulates, the Decision Document referred to the following controls in the licence:

- Condition A27 sets a particulate limit of 80 mg/m<sup>3</sup> for the liquor burner stack and Calciners 1, 2, 3 and 4 as individual emission points.
- Conditions A7 and A12 set particulate response level of 30 mg/m<sup>3</sup> for the liquor burner and oxalate kiln respectively...
- Conditions [sic] A28 and A29 specify management actions for exemption events and cease feed scenarios for calciners ...
- Conditions A24(d), A25(c), A25(d) and A25(e) require operation and maintenance [sic] of continuous dust concentration meters on calciner stacks, liquor burner stack and oxalate kiln stack.<sup>22</sup>

The Decision Document concluded that:

Despite a relatively small predicted increase in overall particulate [sic] mass emission from point sources to air attributable to the increase in production through calcination, Alcoa will still be required to comply with the specified limits and response levels. There are no identified changes required to the existing management actions, stack or continuous monitoring and reporting requirements. The risk of particulate point source emissions to air attributed to a production increase to 2.85 Mtpa can be managed through the existing regulatory controls.<sup>23</sup>

On the overall contention raised by this ground of appeal that emissions of PM<sub>2.5</sub> particulates were not adequately assessed, DER denied this was the case, responding that:

... the Delegated Officer considered the risk of particulate emissions of PM<sub>10</sub> and below, which includes particulates of PM<sub>2.5</sub>. The Licence also includes regulatory limits on allowable levels of total suspended particulates, which includes particulates of PM<sub>2.5</sub>.<sup>24</sup>

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<sup>21</sup> DER, Response to appeal, 5 May 2016, page 4.

<sup>22</sup> DER, Decision Document for Licence L6217/1983/15, 30 October 2015, page 22.

<sup>23</sup> DER, Decision Document for Licence L6217/1983/15, 30 October 2015, page 22

<sup>24</sup> DER, Response to appeal, 5 May 2016, page 4.

With respect to the currency of the data available, it is noted that ambient monitoring was conducted by the then DEC between May and October 2009 in Yarloop and Cookernup. In relation to PM<sub>2.5</sub>, the study showed:

The 24 hour averaged PM<sub>2.5</sub> concentrations measured at both Yarloop and Cookernup were below the advisory reporting standard of 25µg/m<sup>3</sup> for the majority of the study period. There was one day (16 May 2009) during the study period when 24 hour averaged PM<sub>2.5</sub> concentration measured in both Yarloop and Cookernup exceeded 25µg/m<sup>3</sup>.<sup>25</sup>

Analysis conducted by DEC in respect to PM<sub>2.5</sub> indicates that the source of the elevated particle levels on 16 May 2009 was likely to be from wood smoke possibly caused by bushfires or controlled burns in the area.<sup>26</sup>

## Conclusion

Based on the foregoing, it is noted that in assessing the risk of particulate emissions, the DER considered emissions of PM<sub>10</sub> and below. This included PM<sub>2.5</sub>. The DER was satisfied that, whilst a small increase in particulate emissions (including PM<sub>2.5</sub>) was expected as a result of the increase of production to 2.85 Mtpa, this risk can be managed through the existing regulatory controls.

It is also noted that particulate emissions may have changed since ambient monitoring was conducted by DEC as part of the Wagerup 2009 Air Quality Study.

It is therefore recommended that this appeal be allowed in part, to the extent that, as part of the licence review currently underway, DWER considers particulate emissions in the context of current data, to ascertain whether additional monitoring and management conditions are required.

## GROUND 3 – OTHER EMISSIONS TO AIR (PAH, METALS ETC)

By this ground of appeal, the appellant submitted that there is limited evidence that the following parameters were considered in the assessment of the amendment application:

- poly-aromatic hydrocarbons (PAH)
- heavy metals (with specific reference to arsenic, uranium, thorium, cadmium, beryllium and mercury)
- greenhouse gas emissions.

In the absence of these emissions being adequately considered, the appellant submitted that there should be no approval of the production increase to 2.85 mtpa.

## Consideration

In response to this appeal ground, DER advised that the assessment of the amendment application focused on emissions identified as posing significant risks of potential environmental impacts, namely point source VOCs; combustion gases, particularly oxides of nitrogen (NOx) and carbon monoxide (CO); and particulates of PM<sub>10</sub> and below. It further stated that the:

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<sup>25</sup> DEC, Wagerup 2009 Air Quality Study, May 2011, page iv.

<sup>26</sup> DEC, Wagerup 2009 Air Quality Study, May 2011, page iv.

... identification of emission categories posing significant potential environmental risks is based on monitoring data from the 2014 Emission Inventory, in addition to findings of historical studies and assessments of the emissions and impacts of the Wagerup refinery, which identified the principal sources of potential health and environmental impacts.<sup>27</sup>

On the basis of these historical studies, DER advised that the current available evidence does not indicate that PAH emissions from the refinery pose a significant environmental or health risk that would warrant specific assessment or regulatory control through the licence.<sup>28</sup>

DER provided a similar response in respect to heavy metals:

Like PAH emissions, emissions of heavy metals from the refinery have been considered in a number of historical studies. The 2009 Wagerup Air Quality Study undertaken by the then DEC included monitoring of heavy metal concentrations, including the metals listed by the Appellant.

The study compared ambient heavy metal concentrations at Wagerup with those in the Perth Central Business District (CBD) and found that, while caution needs to be taken in the comparison due to the use of different averaging periods, average concentrations of all heavy metals measured at the Wagerup monitoring site were lower (often by an order of magnitude) than those measured in the Perth CBD. The results of the 2009 Wagerup Air Quality Study were reviewed by the Department of Health, and that Department did not raise any issues with the levels reported. The Licence currently includes regulatory controls to provide indicators of possible risks associated with heavy metals and other substances, notably condition A21, which requires chemical analysis of residue area dust samples.

However, the current available evidence does not indicate that heavy metal emissions from the refinery pose a significant risk that would warrant focused assessment or regulatory control in the Licence.<sup>29</sup>

Table 7 shows PAH and metals emissions from the Wagerup refinery between 2011/12 and 2015/16, as recorded in the NPI.

**Table 7 – Wagerup refinery NPI emission data for PAH and metals (kg/annum)**

Year	PAH	Arsenic	Beryllium	Cadmium	Mercury
2011/12	520	95	0.53	32	120
2012/13	510	92	0.58	32	160
2013/14	520	92	0.49	32	180
2014/15	510	96	0.56	32	320
2015/16	510	95	0.56	32	250

With the exception of mercury, the quoted emissions for the listed compounds is largely unchanged between 2011/12 and 2015/16. Over the same period, it appears there has been

<sup>27</sup> DER, Response to appeal, 5 May 2016, page 3.

<sup>28</sup> DER, Response to appeal, 5 May 2016, page 3.

<sup>29</sup> DER, Response to appeal, 5 May 2016, pages 5-6.

an increase in emissions of mercury. The emissions data in 2014/15 and 2015/16 was not available to the DER at the time of the assessment.

The licence includes controls on mercury emissions from the oxalate kiln, specifically, a requirement to implement various management actions should the published response levels be exceeded (condition A12). For example, if the level of mercury in oxalate belt filter cake exceeds 1,000 parts per billion (ppb) in quarterly testing, condition A13 requires the licence holder to take certain defined steps, including increasing sulphide dosing rate above 6 litres per hour, resample the cake within 7 days, and repeat these steps until mercury in the cake is below 1,000 ppb.

There is also a requirement to collect water samples twice yearly from a surface water point west of the RDAs (see condition W3(a)).

There is no requirement for any other monitoring of mercury emissions from the premises.

In relation to greenhouse gas emissions, DER advised that it does not consider that the environmental impact of greenhouse gas emissions falls within the type of impact that is able to be regulated by a licence for prescribed premises under Part V of the EP Act.<sup>30</sup>

## Conclusion

Taking the above information into account, it is considered that DER adequately considered emissions of the kind raised by this ground of appeal.

It is recommended that the current licence review includes consideration of the increase in emissions of mercury, in the context of current data, to ascertain whether additional monitoring and management conditions are required.

## GROUND 4 – NOISE

By this ground of appeal, the appellant contended that Alcoa cannot maintain noise levels in the Yarloop and surrounding communities to applicable standards set under the *Environmental Protection (Noise) Regulations 1997* (the Noise Regulations), specifically 35 dB for night time operations.

The appellant stated that the licence should be amended to include controls on noise emissions, and no production increase should be granted until Alcoa reduces its noise to the appropriate level of 35 dB.

## Consideration

In response to this ground of appeal, DER stated:

In general, industrial noise emissions are not regulated under Part V licences, but under the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) or approvals made under regulation 17 of those regulations.

Noise emissions from the refinery are regulated under the *Environmental Protection (Wagerup Alumina Refinery Noise Emissions) Approval 2012*, which is an approval made under regulation 17 of the Noise Regulations. Accordingly, noise emissions from the refinery are not regulated under the Licence.

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<sup>30</sup> DER, Response to appeal, 5 May 2016, page 6.

In relation to the regulation 17 approval, DER advised:

The Licensee was granted the *Environmental Protection (Wagerup Alumina Refinery Noise Emissions) Approval 2012* to allow the emission of noise to exceed or vary from the prescribed standard by the then Minister for Environment under Regulation 17 of the Noise Regulations in June 2012. Appeals against this approval were determined in December 2013 and the noise amendment approval was gazetted in December 2013. The approval is valid for two years from its issue, at which time the Licensee will be required to apply for a new approval.

In its response to this issue, Alcoa advised:

The appeal has documented some concern over the current noise approval for the Alcoa Wagerup Refinery. As documented in the supporting information to the DER (Alcoa, 2015), Alcoa Wagerup Refinery is compliant with the conditions of the *Environmental Protection (Wagerup Alumina Refinery Noise Emissions) Approval 2012*, as amended, initially gazetted on 10 December 2013 by the Minister for Environment. Reports detailing the noise monitoring and the land management plan have been submitted to the DER as per the approval conditions, with an application for a further extended approval submitted to the Minister in May 2015. Alcoa has yet to receive any feedback on these reports from the DER.

The regulation 17 approval permits Alcoa to emit noise above the assigned levels in the Noise Regulations as measured at eight locations identified in the approval.<sup>31</sup> For other locations, the assigned levels apply. In that regard, it is understood from discussions with Alcoa that exceedances of the assigned levels have been recorded at locations within the Hamel townsite. Monitoring conducted for Alcoa over 153 days in 2015 indicated that noise above the night time assigned level were exceeded for 7.1 hours in total.<sup>32</sup>

As noted by both DER and Alcoa, the regulation 17 approval was valid for a period of two years from December 2013. Alcoa stated that it has submitted reports required under the conditions of the approval to DER. In December 2017, the following advice was available from DWER on the status of the approval application:

DWER has commenced a risk-based assessment of the application that will occur with reference to its Regulatory Framework. The approach to the existing noise approval was extensively considered by the EPA, and was subject to community consultation and an appeals process.

DWER's assessment will focus on the practicality, appropriateness and effectiveness of the existing noise approval requirements. DWER does not intend to reconsider the existing strategy of exposure reduction, rather than emissions reduction established by the EPA.

...

DWER will provide a report to the Minister for Environment to determine whether to grant or refuse to grant a further noise approval after considering public submissions received.<sup>33</sup>

## Conclusion

Based on the information provided in respect to this ground of appeal, it is noted that noise emissions from the refinery at certain locations are subject to the requirements of the Regulation 17 approval. For all other areas, noise emissions from the premises are required to comply with the assigned levels in the Noise Regulations.

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<sup>31</sup> Government Gazette, 29 June 2012, page 2939 (the approval was subsequently amended on appeal in December 2013 – see Government Gazette 10 December 2013, page 5823).

<sup>32</sup> Alcoa, *Assessment of the Reasonableness and Practicality of Hamel Noise Mitigation Scenarios*, October 2016, page 5.

<sup>33</sup> <https://www.der.wa.gov.au/our-work/community-updates/463-alcoa-wagerup-alumina-refinery> (accessed December 2017). The closing date for submissions was listed as 31 January 2018.

The appellant's key concern in respect to this issue appears to arise from noise emissions outside the approval area. In this regard, Alcoa conceded that noise emissions may exceed the assigned levels, and it was liaising with affected owners accordingly.

For the purposes of this appeal, the question is whether noise emissions connected with the amendment to the licence warrant conditions in the licence. Noting other standards apply (either through the Regulation 17 approval or the Noise Regulations), it is considered unnecessary for additional measures to be applied through the licence. It is also noted that a new request for an approval under regulation 17 is currently being considered by DWER, with submissions closing 31 January 2018. There is a right of appeal against the terms of any approval given under regulation 17.

## **GROUND 5 – IMPACTS TO WATER FROM RESIDUE DRYING AREAS**

By this ground of appeal, the appellant submitted that:

All of Alcoa's Mud Lakes are leaking and contaminating ground water at all three sites, (Kwinana, Pinjarra & Wagerup). It is unknown how far the groundwater contamination has travelled.

Remediation of contaminated groundwater needs to be addressed prior to any increase in production being granted.<sup>34</sup>

The appellant also questioned the capacity of runoff collection pond 1 (ROCP1) and runoff water storage (ROWS) associated with residue drying areas (RDAs) to accommodate a 1:100 year 72 hour rainfall event, expressing concern that overtopping will lead to an uncontrolled release of contaminated material to neighbouring land and river systems.

### **Consideration**

This ground of appeal raises two separate concerns associated with water contamination from the RDAs – (1) leakage to groundwater and (2) overtopping to surface water during storm events.

#### Leakage to groundwater

By this element of the appeal, the appellant asserts that material in the RDAs is leaking into groundwater and causing contamination.

In response to this issue, DER advised:

The Delegated Officer ... considered the risks associated with fugitive emissions to surface or groundwater from the residue area. The risk was assessed as moderate, and the Delegated Officer noted that existing regulatory controls in the Licence included installation and maintenance of drainage systems, containment and monitoring requirements. The Delegated Officer considered that the existing regulatory controls, combined with the measures in the Licensee's *2012 Long Term Residue Management Strategy*, were appropriate to manage the risk associated with the production increase.<sup>35</sup>

DER further advised that it considered the risk of seepage and leakage from the RDAs, and determined that the licence conditions to control that risk (conditions W1-W4) were appropriate and that no additional conditions were required.

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<sup>34</sup> CAPS, Appeal letter, 23 November 2015, page 18.

<sup>35</sup> DER, Response to appeal, 5 May 2016, page 4.

Conditions W1 to W4 of the licence (cited by DER) are summarised as follows:

- W1 – requirement to maintain low permeability base and embankments of RDAs and maintain gravity base drainage system
- W2 – containment of contaminated waters to prevent process liquors contacting the ground
- W3 – specifies certain requirements for surface and groundwater monitoring of various parameters, as well as setting guidelines and limits (examined further below)
- W4 – requires water samples to be taken in accordance with relevant standards.

In its response to this issue, Alcoa acknowledged that the refinery and RDAs have been classified as *Contaminated – Remediation Required* under the *Contaminated Sites Act 2003*. Alcoa confirmed that:

Two recovery bore systems are currently in place at the refinery to extract alkaline fluid from the groundwater. A technical memorandum compiled by consultants Golder Associates (Golder, 2015) was recently submitted to the DER that summarises an extensive groundwater monitoring event at the refinery and residue storage areas (RSAs). The groundwater monitoring event was undertaken with the aim to further delineate the nature and extent of groundwater contamination at the site.

The memorandum has identified elevated concentrations of chemicals of interest present in locations associated with historical releases to groundwater at the refinery. These are confined to within the site boundary indicating that there is no risk posed to off-site receptors at this point in time. There is an area of elevated alkalinity reported to the west of the RSAs that will require further assessment, although it is noted that this area was not associated with the chemicals of interest. Conceptual Site Models for the refinery and RSAs have also been provided to the DER.<sup>36</sup>

Noting DER's advice that the monitoring and management measures in place are adequate, and noting Alcoa's advice that the site is identified as requiring remediation under the *Contaminated Sites Act*, it is considered that sufficient controls are presently in place in respect to this aspect of the licence.

#### Overtopping during storm events

By this element of the appeal, the appellant stated that due to the increase in water flowing into ROCP 1, the pond is now unable to manage a 1:100 year, 72 hour storm event, which poses risks to the environment. Similarly, the appellant cited risks of the ROWS overtopping during a similar rainfall event.

The appellant specifically submitted that:

... any production increase will exacerbate the problem, creating a greater risk of the walls collapsing, by increasing waste, which increases pressure and may result in another catastrophic scenario as seen recently in Hungary and Brazil. No doubt in a comparable situation, both Alcoa and the regulators will be held accountable for the resulting devastation and any losses incurred.<sup>37</sup>

In respect to water management, Alcoa's *Long Term Residue Management Strategy* provides that:

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<sup>36</sup> Alcoa, Response to appeal, 21 December 2015, page 3.

<sup>37</sup> CAPS, Appeal letter, 23 November 2015, page 19.

The Wagerup Refinery operates a closed water circuit, meaning that the refinery does not discharge any process water from the site. Fresh water only leaves the refinery property if the fresh water storage dams overflow.

Stormwater that runs off the residue or refinery process areas is characteristically alkaline. This renders the water unsuitable for direct discharge to the environment. Therefore all rainfall runoff from the refinery and residue process areas is collected and stored in lined ponds within the residue area for recycling via the refinery process as make-up water.<sup>38</sup>

Alcoa states that it manages risks to surface water by ensuring 'no contaminated stormwater is released from the residue area'.<sup>39</sup>

In response to this issue, DER advised that it considered risks of overtopping in its assessment of the amendments, with specific reference to drainage, containment and monitoring requirements. DER considered that existing controls were adequate, and no changes to the conditions were required in respect to this matter. In coming to this view, DER specifically endorsed Alcoa's Long Term Residue Management Strategy.<sup>40</sup>

Condition W2 of the licence is titled 'containment of contaminated or potentially contaminated waters', and requires Alcoa to:

... minimise the release of contaminated water to the environment by providing containment systems to capture any spillages and minimise contact of process liquors to the ground.

'Contaminated water' is not defined, but on the content of the Long Term Residue Management Strategy, it is taken to include process water and stormwater from the RDAs.

It is noted that Alcoa's commitment in the Long Term Residue Management Strategy is to ensure no contaminated water is released to the environment, however, condition W2 appears only to require that such releases are 'minimised'.

It is therefore recommended that the condition be amended to more clearly reflect the commitment that no contaminated water is released to the environment from the premises, as provided in Alcoa's Long Term Residue Management Strategy.

## Conclusion

It is recommended that this ground of appeal be allowed to the extent that as part of the current review of the licence, DWER revises condition W2 to ensure that no contaminated water is released to the environment from the premises, consistent with Alcoa's commitments in the Long Term Residue Management Strategy.

## GROUND 6 – WATER USAGE

By this ground of appeal, the appellant submitted that:

... the greater the production, the greater the water usage (4 tonne of water for every tonne of alumina). There seems to have not been sufficient attention given to this precious resource as part of the licence.

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<sup>38</sup> Alcoa, Long Term Residue Management Strategy, 2012, para 7.8.1.

<sup>39</sup> Alcoa, Long Term Residue Management Strategy, 2012, para 7.8.2.

<sup>40</sup> DER, Response to the appeal, 5 May 2016, page 4.

Alcoa should not be granted a production increase unless it's prepared to use recycled water and or have its own desalination plant. An environmental impact study would need to be undertaken as part of any such developments. This should a condition of the licence.<sup>41</sup>

## Consideration

In response to this ground of appeal, DER stated:

The Licensee obtains process water for its operations under a licence ... under the *Rights in Water and Irrigation Act 1914*. As the abstraction of water is regulated under a separate legislative regime, it is unnecessary to address it in the Licence and to do so would create regulatory duplication.<sup>42</sup>

Alcoa's response to this ground of appeal was in similar terms to that of DER:

The last annual report provided to the [former Department of Water] (2014) demonstrated extraction of both surface and groundwater below the licensed levels. In addition, Alcoa recycles its water through the refinery water circuit and residue areas avoiding any need to discharge water off site.

Alcoa does have contractual commitments with the farmer owned irrigation cooperative Harvey Water for the purchase of additional 'fit for purpose' water from Wellington Dam. This is not deemed fresh water and is part of the licensed industrial allocation held by Harvey Water with delivery to the refinery planned for the early spring and autumn periods to minimise disruption to delivery of irrigation water during the summer period.<sup>43</sup>

Noting requirements in the *Rights in Water and Irrigation Act 1914* for the taking of water, the position of both DER and Alcoa in response to this ground of appeal is supported. That is, the taking of water associated with the refinery is considered under specific legislation, and this process provides for consideration of the environmental concerns raised by the appellant.

## Conclusion

For the reasons stated above, it is recommended that this ground of appeal be dismissed.

## GROUND 7 – PROCESS ISSUES

By this ground of appeal, the appellant raised a number of process issues which it contended are relevant to the amendment of the licence, and to the meaningful contribution members of the public can make to the decision making process.

Specific concerns raised by the appellant are considered in turn.

### Community consultation

The appellant submitted that the Community Consultation Network (CCN) operated by Alcoa is an unelected, unrepresentative group that is without substantial support within the local community and therefore not a source of genuine community consultation.

The appellant also submitted that members of the CCN are not adequately qualified to independently assess technical information, and therefore recommended that the existing arrangements are scrapped and replaced with a group consisting of two government

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<sup>41</sup> CAPS, Appeal letter, 23 November 2015, page 20.

<sup>42</sup> DER, Response to the appeal, 5 May 2016, page 12.

<sup>43</sup> Alcoa, Response to appeal, 21 December 2015, page 4.

representatives, two representatives of Alcoa, four community members and an independent facilitator or chair.

### Consideration

In response to this issue, DER stated:

In assessing the Licence application, the Delegated Officer was concerned with assessing environmental risks posed by emissions arising from the operation of the refinery. As such, questions of the precise arrangements for the Licensee's community consultations were outside the scope of the Delegated Officer's deliberations.

During the assessment of the application, the Delegated Officer released the details of the application for public comment in order to allow public participation in the decision-making process, although this is not a statutory requirement for licence amendments ...

The purpose for which a licence may be granted, and the types of conditions that can be attached to a licence, are circumscribed by the provisions of the EP Act. Arrangements for community consultation are not matters that can be regulated under the Licence.<sup>44</sup>

For its part, Alcoa advised that the licence amendment was the subject of consultation through long-standing practices, based on the Wagerup Community Consultative Network (CCN) and individual stakeholder discussions, along with contact by DER directly to interested stakeholders. Alcoa noted that DER received no comments during the consultation process from external interested parties and no issues were raised during the Alcoa consultation process.<sup>45</sup>

This ground of appeal is similar in form to previous appeals. The following text is extracted from the then Appeals Convenor's report (dated December 2014) to the Minister for Environment on the conditions of licence 6217/1983/15:

The Minister's appeal determination for Appeal Numbers 315-323 of 2012, dated 5 August 2013, noted that the DER would review and provide feedback to the proponent regarding several requirements in relation to completion timeframe, odour and air monitoring plan and successful implementation of a VOC reduction project.

The Minister understood that a new TAP [technical advisory panel] would be created and composed of community members, representatives from the DER and the proponent, and will address questions around emissions from the Refinery, and note the requirement for an independent expert to be consulted with on a case-by-case basis.

In its response to this matter, the DER has advised that a panel was initially established to provide advice to the Wagerup Tripartite Group (WTG) on the proponent's progress and completion of the recommendations in the report *Wagerup Air Quality Review*, CSIRO 2004. The DER noted that the WTG was dissolved by the then Minister for Environment in 2010, causing the disbandment of the TAP.

The DER advised that as an outcome of the amendment to Licence L6217/1983/14 issued on 17 May 2012, the then DEC requested that the proponent revise its commitment to the progression of the remaining eight CSIRO Review Recommendations and submit a timeframe by 30 November 2012.

In this regard, the DER noted that the proponent consulted with the Wagerup Community Consultative Network (CCN) and submitted a proposal to the DEC on 30 November 2012 to establish a Resolution Committee to fulfil its commitment to complete the outstanding CSIRO recommendations.

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<sup>44</sup> DER, Response to appeal, 5 May 2016, page 13.

<sup>45</sup> Alcoa, Response to appeal, 21 December 2015, page 2.

The DER advised that the CCN is an open public forum with upcoming meetings advertised in the local newspaper, the *Harvey Waroona Reporter*. The DER also noted that any community member can attend CSIRO Air Quality Recommendation presentations and volunteer to participate in the Resolution Committee review process. The DER was satisfied that the Resolution Committee review process fulfils the Minister for Environment's understanding, as documented in the determination for Appeal Numbers 315-323 of 2012, that a new TAP would be established, composed of community members, representatives from the DER, the proponent, and with independent consultants engaged where necessary.<sup>46</sup>

This ground of appeal does not relate to the conditions or amendment of the licence. As such, it is considered that DER's response to the appeal is appropriate.

To the extent that the appeal is that government should convene such a group, as is understood to have occurred in the past with the tripartite arrangements, this approach was ended in approximately 2010, as noted above.

### **Costs associated with lodging submissions**

The appellant submitted that the preparation of appeal materials is onerous, and members of the public lack financial resources to obtain copies of relevant Australian Standards that may be pertinent to the appeal. The appellant sought for the inclusion of a licence condition that requires Alcoa to provide community members with copies of relevant Australian Standards.

In response to this matter, DER advised:

It is recognised that Australian Standards are not readily accessible, as they are controlled by a private organisation that is protective of its copyright, and that this may pose difficulties for community stakeholders. However, mandating the provision by the Licensee to third parties of material in which the Licensee does not own the copyright cannot properly be the subject matter of a licence condition. It is recommended that the Appellant raise the issue of access to copies of relevant Australian Standards through existing community consultation arrangements.<sup>47</sup>

It is accepted that the licence holder does not own the copyright in Australian Standards and as such, it is accepted that it is not appropriate for a licence condition to require the licence holder to provide copies of relevant Australian Standards to a third party.

### **OTHER MATTERS**

The following matters were raised by the appeal, but are considered to be unrelated to the appeal right (being the amendment of the licence). As such, they are considered to be outside the scope of the appeal. They are nonetheless included in this report for information.

#### **Licence is not fully inclusive of the operations at the refinery**

The appellant asserted that several activities associated with the refinery are regulated under separate licences, notably the cogeneration plant and the water usage and wastewater disposal associated with the residue area. The appellant stated that the activities regulated under separate licences should be amalgamated into one licence.

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<sup>46</sup> Appeals Convenor, Report to the Minister for Environment on appeals 372-426/13, December 2014, pages 12-13.

<sup>47</sup> DER, Response to appeal, 5 May 2016, page 13.

The appellant also states that noise emissions from the refinery, residue area and mine impact on the community, and that the residue area is a source of dust, noise and chemical emissions, and mentions the establishment and maintenance of an industrial buffer zone to protect the local population.

In response to this issue, DER advised:

The Wagerup cogeneration plant is the subject of a separate Ministerial approval under Part IV of the EP Act, in addition to being regulated under a separate Part V licence. It is not considered that this arrangement is deficient or that the amalgamation of licences is warranted.

As noted above, the abstraction of water from the environment is regulated under the *Rights in Water and Irrigation Act 1914*, which is administered by the Department of Water. It is not possible to amalgamate this into the Licence as the Licensee does not itself abstract water from the environment, and the relevant licence is held by a third party.

The Licensee was granted the *Environmental Protection (Wagerup Alumina Refinery Noise Emissions) Approval 2012* to allow the emission of noise to exceed or vary from the prescribed standard by the then Minister for Environment under Regulation 17 of the Noise Regulations in June 2012. Appeals against this approval were determined in December 2013 and the noise amendment approval was gazetted in December 2013. The approval is valid for two years from its issue, at which time the Licensee will be required to apply for a new approval.

The Licensee's Willowdale mine is regulated under a separate Part V licence, and that operation is sufficiently distinct from the Wagerup refinery operation that amalgamation of the two licences would not serve a useful regulatory purpose.

The residue area is regulated under the Licence and environmental risks associated with the residue area were assessed by the Delegated Officer in considering whether to grant the Licence application.<sup>48</sup>

## Buffer area

The appellant stated that there is no buffer zone around the refinery, despite statements to the contrary in documentation. The appellant requested that residents within a five kilometre radius of the refinery receive compensation according to the same formula used to compensate residents within an area designated as 'Area A' in Alcoa's land management strategy.

In response to this issue, DER stated:

Establishing buffer zones outside the licensed premises are beyond the scope of the licensing provisions of Part V of the EP Act.

The matters of zoning and land use around the Wagerup refinery (including the establishment of buffer zones) are dealt with primarily by land use planning agencies including the Shires of Waroona and Harvey, the Department of Planning and Western Australian Planning Commission. The Department of State Development is responsible for ensuring all Alcoa's Western Australian operations, including the Wagerup refinery, operate in accordance with the *Alumina Refinery (Wagerup) Agreement and Acts Amendment Act 1978*.

DER provides formal advice to the above agencies for the Wagerup Refinery, to inform land use planning matters. DER's role is advisory only and it does not make determinations on these matters.<sup>49</sup>

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<sup>48</sup> DER, Response to appeal, 5 May 2016, page 14.

<sup>49</sup> DER, Response to appeal, 5 May 2016, page 15.

## CONCLUSION AND RECOMMENDATION

Taking into account the above, it is recommended the appeal be allowed in part to the extent that DWER be requested to:

- ensure that the current licence review considers:
  - the identified uncertainties in respect to VOC emissions, particularly in relation to low-elevation sources
  - particulate emissions, in the context of current data
  - emissions of mercury, in the context of current data
- amend condition W2 of the licence to ensure that no contaminated water is released to the environment from the premises, consistent with commitments in Alcoa's Long Term Residue Management Strategy.

It is otherwise considered that the licence conditions applied by the DER in respect to the amendment are appropriate and that the other grounds of appeal should therefore be dismissed.

Emma Gaunt  
APPEALS CONVENOR

**Investigating officer:**  
Jean-Pierre Clement, Deputy Appeals Convenor