

ADDENDUM:

STATE SIGNIFICANT DEVELOPMENT ASSESSMENT Dubbo Zirconia Project (SSD 5251)



Secretary's Environmental Assessment Report
Section 89E of the
Environmental Planning and Assessment Act 1979

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1. INTRODUCTION

1.1 Background

This report provides an addendum to the Secretary's Environmental Assessment Report (September 2014) for the Dubbo Zirconia Project (SSD-5251) (the project).

The report has been prepared to consider the recommendations made in the NSW Planning Assessment Commission's (PAC's) review of the project (see Appendix A), and additional information received from Australian Zirconia Limited (AZL) since the PAC's review (see Appendix B).

The report should be read in conjunction with the Secretary's Environmental Assessment Report for the project, which provides a detailed assessment of the key issues in accordance with the requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

1.2 Chronology of Events

A brief chronology of the key events relevant to this addendum report since the Department of Planning & Environment's (the Department's) referral of its assessment report to the PAC for review is presented in the table below.

Table 1: Chronology of Events

| Date | Event |
|------------------|---|
| 3 September 2014 | Secretary's Environmental Assessment Report referred to PAC |
| 4 November 2014 | PAC holds public hearings in Dubbo |
| 9 February 2015 | PAC finalises its review and refers the review report to the Department (Appendix A) |
| 16 February 2015 | AZL provides its response to the recommendations of the PAC Review (see Appendix B) |
| 24 March 2015 | AZL provides additional information in support of its proposal for 24 hour road transport operations (Appendix C) |
| 24 April 2015 | All agency comments on proposed draft conditions received |

2. CONSIDERATION OF PAC REVIEW

2.1 PAC Review

The PAC review report for the project concluded that:

...the Commission is generally satisfied that the project is approvable subject to further detail on a number of matters and stringent environmental requirements.

The Commission recognises that the project is unique in nature and accordingly some flexibility should be allowed to enable further design development prior to construction and commencement of operations on site, so long as it complies with the health, amenity and environmental standards. The Commission also recognises the significant economic benefits of the project for both the state of NSW and the region. It considered that the proposal is unlikely to result in significant environmental impacts and that on balance the benefits of the project outweigh its impacts.

The PAC made 26 recommendations for the Department to consider before submitting its final assessment report for determination. These recommendations can be summarised as follows:

1. *Air Quality* – recommended conditions requiring compliance with relevant emission criteria and the development of an air quality management and monitoring strategy which includes development of best practice air quality controls at the processing facility;
2. *Water* – further consideration of permeability of underlying geology, and measures to ensure appropriate storage and containment of potential pollutants, including provision of bonds as a contingency in the event AZL is unable to properly contain the residue wastes;
3. *Transport* – to assess the feasibility of rail transport during the early stages of the project and to implement measures to reduce the impacts of both road and rail transport options on the road and rail network and the amenity of receivers near the transport routes;
4. *Rehabilitation & Final Landform* – ensure the final landform is progressively rehabilitated to integrate with the surrounding landscape with detailed performance measures for the key waste

residue landforms, all to be outlined in a rehabilitation management strategy to be prepared in consultation with DRE;

5. *Traffic Noise Impacts on Taronga Western Plains Zoo* – to commission a study of the transport noise impacts on the Zoo and install a noise barrier if the study indicates adverse impacts;
6. *Fossil Records* – investigate options to relocate a liquid residue storage facility currently planned near a site which contains a deposit of fossilised plants and if unable to relocate, then retain an open excavation for future reference; and
7. *Hazards and Risks* – an updated calculation of the risks to workers and the public taking into account all exposure pathways and require the preparation of a NORM (Naturally Occurring Radioactive Material) Management Plan, including a Radiation Management Plan and Radioactive Waste Management Plan, with requirements to monitor waste streams to ensure proper blending of radioactive materials from the processing waste stream.

The Department's consideration of these recommendations is provided below. Based on this consideration, the Department has also prepared recommended conditions of development consent (see Appendix C).

2.2 Air Quality

Air Quality Management

PAC Recommendation

Appropriate consideration of the detailed design and benchmarking against best practice standards will be important to ensure the impacts of the project [are] minimised and include all reasonable and feasible control measures.

1. *The Commission recommends that any development consent for the project should include conditions requiring:*
 - *the applicant to comply with the relevant emissions criteria at all residential receivers. In this regard it will be important to clarify whether the NO₂ emissions listed in Table 28 of the EIS Part 2 Air Quality volume represent the incremental or cumulative impact levels, as it presently suggests it is both (p56 vol 1 part 2);*
 - *the applicant to benchmark the design and the emissions controls against best practice standards;*
 - *emissions validation reports to be provided prior to commissioning (to demonstrate the design will comply with the EPA's Impact Assessment Criteria) and during operations (to demonstrate the commissioned facility is complying with the relevant standards and predictions);*
 - *detailed and comprehensive management, monitoring and reporting, including an integrated reactive and predictive management and monitoring system.*

The Department supports all of the above recommendations and has prepared conditions of consent accordingly. Regarding the calculation of NO₂ emissions in the EIS, AZL has confirmed that the predictions in the air quality impact assessment are cumulative (see Appendix B).

The Department has recommended a number conditions requiring AZL to ensure the final design of the processing facility meets best practice standards, including requirements to:

- comply with strict air quality criteria for emissions from the processing facility and use all reasonable and feasible avoidance and mitigation measures to comply with applicable dust criteria at all receivers;
- comply with the minimum stack heights detailed in the EIS;
- ensure that the sampling methodologies in the NSW Environment Protection Authority (EPA) guidelines are followed;
- prepare a revised air quality impact assessment based upon the final design of the processing facility; and
- prepare a validation report which would confirm that the emissions from the processing facility meet the predicted emissions in the revised air impact quality assessment.

These reports would be prepared in consultation with the EPA and to the satisfaction of the Secretary and would be submitted prior to the commissioning of the processing facility.

The Department has also recommended:

- a series of operating conditions that would require all reasonable and feasible measures to be undertaken to minimise gaseous emissions from the processing facility;

- that AZL operate a comprehensive air quality management system that uses meteorological forecasting and regular monitoring to ensure compliance with the criteria; and
- that AZL prepare and implement a comprehensive air quality management plan, which would include the details of how AZL would ensure both the operating conditions and air quality criteria are met, as well as measures for responding to exceedances and dealing with complaints.

The combination of these requirements would ensure that the amenity and health of nearby receivers is protected and that the processing facility would be designed in a manner that achieves best practice.

AZL has also committed to benchmark the detailed design of the ore processing facility against best practice standards.

Consistent with the recommendations of the PAC review, the Department has recommended a range of conditions in regard to air quality as set out below. These conditions have been prepared in consultation with the EPA.

With the implementation of these conditions, the Department is satisfied that the detailed design and development of the project would:

- adequately address the recommendations made by the PAC;
- ensure the design and operation of the processing facility meets best practice standards to achieve the relevant air quality criteria; and
- include reasonable and feasible air quality management, monitoring and reporting procedures to track the performance of the project.

Operating Conditions

20. The Applicant shall:

- (a) implement all reasonable and feasible measures to minimise the:
 - odour, fume, dust and radon emissions of the development;
 - gaseous emissions from the ore processing facility; and
 - greenhouse gas emissions from the site;
- (b) minimise the surface disturbance of the site;
- (c) operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting and real-time air quality monitoring data to guide the day-to-day planning of mining operations and implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this consent;
- (d) minimise the air quality impacts of the development during adverse meteorological conditions and extraordinary events (see note d to Tables 4 to 6 above), to the satisfaction of the Secretary.

Processing Plant Design and Validation

21. Prior to commissioning the ore processing facility on the site, the Applicant shall:

- (a) finalise the detailed design of the emission control measures at the ore processing facility to ensure:
 - it has TM-1 compliant sample ports so sampling of emissions will comply with the EPA's *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW 2006* (or its latest version); and
 - compliance with the minimum stack height detailed in the EIS, unless the Secretary agrees otherwise; and
- (b) prepare a revised air quality impact assessment to predict the emissions from the development at surrounding sensitive receivers based on the final design of the ore processing facility, in consultation with the EPA and to the satisfaction of the Secretary.

Note: The revised air quality impact assessment must be undertaken in accordance with the relevant methods and guidelines, including EPA's Approved Methods for the Modelling and Assessment of Air Pollutants in NSW 2005 (or latest version).

22. Within 1 month of commissioning the ore processing facility, unless the Secretary agrees otherwise, the Applicant shall prepare an emissions validation report, which includes monitoring to compare the actual emissions with:

- a. the predicted emissions in the revised air quality impact assessment in condition 21 (b) above; and
 - b. the criteria in Table 7,
- in consultation with the EPA and to the satisfaction of the Secretary.

2.3 Water

Chemical Storage and Stormwater Management

PAC Recommendation

2. *Prior to determination of the application, the applicant is to assess the probability and consequences of any contaminated discharges from the chemical storage areas and the feasibility (including costs) of covering the bunded tanks. The objective of these additional investigations is to avoid generating additional potentially contaminated water in the bunded area, which would need to be managed during rain events.*
3. *The water management plan for the site should include a pipe leak detection and maintenance program and should also be required to demonstrate that the design of the Liquid Residue Storage Facility will have sufficient capacity to contain the probable maximum flood event during all years of mining and decommissioning (as is proposed in the application). These calculations will need to demonstrate:*
 - *how runoff from the Salt Encapsulation Cell is managed and contained;*
 - *that any stormwater in the bunded tank farm would be contained; and*
 - *how ongoing liquid waste generated would be managed while the water levels are evaporating.*

In its response to the PAC review AZL has committed to covering storage tanks within the bunded areas where appropriate.

AZL states that many of the chemical storage tanks, such as the sulphuric acid and solvent storage tanks, are already designed to be covered as it is either unsafe or detrimental to the process to allow incidental water to fall into these areas.

AZL states that any open storage tanks normally operate with enough 'freeboard' to capture a 1 in 10,000 year rainfall event. Therefore, the potential for spillage as a result of rainfall is extremely low. Bunded areas surrounding the storage tanks have been designed to comply with the relevant Australian Standards to ensure that, as a minimum, each bunded area provides for at least 110% capacity of the largest storage vessel, further reducing the risk of an uncontrolled discharge.

As noted by the PAC, the project design also includes an automated pump-out system to maintain sufficient capacity in bunded areas. Any collected water would be pumped to a HDPE lined stormwater retention dam with enough capacity for 1 in 100 year rainfall event. Water can then be pumped to either the water processing dam or Liquid Residue Storage Facility (LRSF) as a contingency measure to ensure any captured water in the bunds is removed to prevent uncontrolled releases from the site.

The Department considers that the proposed design of the storage tank farm is conservative and the proposed controls would effectively prevent any uncontrolled discharge. Additionally the Department has recommended conditions requiring the final design of the processing facility to be subject to a Hazard and Operability Study and a Final Hazards Analysis prepared in accordance with the Department's *Hazardous Industry Advisory Guidelines*. These studies and their recommendation must be implemented before the commissioning of the processing plant. This 'HAZOP' process would ensure the design of the facility is appropriately reviewed by an independent expert, which would make recommendations for best practice controls where required to minimise any release of hazardous material.

The Department agrees with the PAC's recommendation for a pipe leak detection protocol within the Water Management Plan, and has included this requirement in the recommended conditions.

AZL proposes to design, construct and maintain the LRSF with a 1 m freeboard, which it notes is double the capacity of a 1 in 10,000 year rainfall event. Given the LRSF does not have a catchment area and has a design life of 20 years, calculating the probable maximum flood for the facility is not necessary or appropriate. Further, given the mean annual rainfall received in Dubbo is 570 mm, the Department considers that 1000 mm of freeboard likely exceeds the probable maximum precipitation event. However, to ensure that the level of freeboard is maintained throughout the life of the project the Department has recommended a performance measure to enforce this.

Both the EPA and NOW raised no significant issues in their comments on the response to submissions report regarding management of waste residues or the processing reagents storage tanks, subject to the thorough implementation of AZL commitments to manage these risks.

However, NOW recommended that AZL be required to calculate the risk of an embankment failure at the LRSF, and the potential consequences on the Macquarie River. Based on its assessment, the Department considers the risk to the Macquarie River to be extremely low, but has included a recommendation that requires AZL to design and construct the LRSF in accordance with the recommendations of the NSW Dam Safety Committee.

Below are the relevant extracts from the Water Performance Measures and Water Management Plan that were discussed above and are considered consistent with the recommendations of the PAC.

Water Management Plan

29. The Applicant shall comply with the performance measures in Table 8 to the satisfaction of the Secretary.

Table 8: Water management performance measures

| Feature | Performance Measure |
|---|---|
| Waste Residue Storage Facilities and Salt Encapsulation Cells | <ul style="list-style-type: none"> • Nil discharge from site. • Design, construct and maintain: <ul style="list-style-type: none"> – in accordance with the recommendations of the NSW Dam Safety Committee; – to be stable over the long term and under all expected loading conditions; – in accordance with the standards set out in the <i>Environmental Guidelines – Management of Tailings Storage Facilities</i> (VIC DPI, 2006); and – to be lined with HDPE liners or equivalent that complies with a minimum permeability standard of $< 1 \times 10^{-9}$ m/s in accordance with the <i>NSW Environmental Guidelines for Solid Waste Landfills</i> (EPA, 1996), unless otherwise agreed with the EPA; and – to ensure the Solid Residue Storage Facility and Salt Encapsulation Cells are double-lined and include an adequate leak detection system. • Ensure that at all times a freeboard of at least 600 mm (or 1000 mm for liquid residue storage facility) or a freeboard capable of accommodating a 1 in 100 year ARI, 72 hour rainfall event (or 1 in 10,000 year for the liquid residue storage facility) without overtopping, whichever is greater. |

30. The Applicant shall prepare and implement a Water Management Plan for the development to the satisfaction of the Secretary. This plan must:
- be prepared in consultation with the EPA, NOW and DPI, and be submitted to the Secretary for approval prior to carrying out any development under this consent, unless the Secretary agrees otherwise;
 - in addition to the standard requirements for management plans (see condition 3 of schedule), include a:
 -
 - Surface Water Management Plan, that includes:
 -
 - a program to monitor and report on:
 - o the effectiveness of the mine water management system, including the Waste Residue Storage Facilities, Salt Encapsulation Cells and associated pipelines between water management structures;
 - o surface water supplies for adjacent landowners;
 - o the operation of the Macquarie River water pumping station; and
 - o surface water flows and quality, including channel stability, stream and riparian vegetation health; and
 - a plan to respond to any exceedances of the performance criteria, and mitigate and/or offset any adverse surface water impacts of the development; and

Permeability of Underlying Sediments

PAC Recommendation

4. *The permeability of the sediments and geology underlying the proposed liquid storage facilities should be confirmed to justify the detailed design of liquid residue storage facilities, prior to determination of the application.*

The PAC Review noted that uncertainties were raised in the specialist Groundwater Assessment within the Environmental Impact Statement (EIS), relating to the presence and extent of the basalt geology beneath Area 4 of the LRSF. The Groundwater Assessment identified a potential risk to the underlying aquifer if a combination of some unlikely circumstances occurred (e.g. rupture of the HDPE liner and the geology being highly permeable).

In its response to the PAC recommendations, AZL argues that further detail on the extent and location of the basalt in Area 4 is not required prior to determination as:

- Area 4 would not be constructed until several years into operations, allowing AZL to conduct ongoing surveys to better define the underlying geology; and
- AZL has committed to undertake further geological testing prior to the construction of Area 4 to determine the presence of highly permeable aquifers. If necessary, AZL would either avoid the area or install a double liner in the relevant cells of Area 4 (refer section 7.7 in statement of commitments, which form part of the recommended conditions of consent).

Further the detailed water performance measures discussed above would ensure the LRSF are designed to prevent leaks. While the Water Management Plan would include a detailed monitoring program to detect any impacts upon the aquifer and would include contingency measures to mitigate and/or offset any adverse groundwater impacts from the development.

Combined these measures would ensure that the LRSF in Area 4 is constructed and maintained in a manner that either avoids or minimises the risk to the aquifer to an acceptable level.

Long Term Security of Waste Storages

PAC Recommendation

5. *Conditions of consent should specify appropriate long term maintenance funding and legal records are put in place prior to the commencement of operations on the site and are regularly reviewed and updated over the life of the project, and upon closure of the mine, to ensure the waste materials are appropriately contained in perpetuity.*

The Mining Lease granted for the project would require the lodgement of rehabilitation bond to ensure funds are available to successfully rehabilitate the site. DRE adjusts the amount of the rehabilitation bond as part of its approval process for each Mining Operations Plan (MOP), which occurs about every three to five years. The bond is adjusted to reflect the area of land that has been disturbed and the level of rehabilitation outstanding, as described in each MOP.

To ensure processing wastes are appropriately contained beyond the life of the project the Department has recommended a strict set of performance and rehabilitation objectives including the requirement that the Solid Waste Residue Storage Facilities and Salt Encapsulation Cells meet:

- the EPA's design standards;
- install two separate HDPE liners, with a leak detection system;
- are long term stable; and
- continue to meet their original design standards on closure.

The design of the Solid Waste and Salt Encapsulation Facilities is discussed in Appendix 6 of the EIS. This includes a detailed Liner Integrity Protocol to ensure the liners are installed correctly. The protocol involves the installation of a double HDPE liner which is then covered with inert material prior to the addition of either solid waste residue or salt residue. The HDPE liners would be isolated from sunlight, air and water which would effectively remove the main mechanisms by which the liners are known to degrade. It is also important to note that the waste materials comprise a dry solid low permeability material, and because the containment structures would be capped at closure to eliminate infiltration of water, there would be a very low risk of any contamination leaking into the surrounding environment.

The Department considers that with the combination of the proposed design, recommended conditions and the requirements of the mining lease, the waste residues would be appropriately contained 'in perpetuity', in accordance with the PAC's recommendation.

2.4 Transport

Transport Options Review

PAC Recommendation

6. *AZL be required to undertake a feasibility study of Option A within 3 years of the commencement of operations on site and to implement Option A should the study determine that it is feasible.*
7. *The feasibility study be required to consider the feasibility of Option A over both the proposed 20 year mine life and long term mine life (approximately 70 years) and in addition to the usual matters, include consultation with the local community and Taronga Western Plain Zoo and monitoring of truck impacts (including noise impacts, traffic impacts, accident statistics etc.) on nearby residents, the zoo and other impacted parties.*
8. *If Option A is pursued, AZL is to be required to develop a detailed schedule, in accordance with the relevant rail authorities, to:*
 - *Reduce the potential amenity impacts of the train trips, by minimising the use of the railway at night; and*
 - *Reduce the potential traffic impacts of the train trips on key level crossings, such as the Cobra Street (Mitchell Highway) intersection, by minimising the use of the railway during peak traffic periods.*
9. *If Option B [road transport only] is pursued AZL be required to pay section 94 contributions in relation to the pavement life of Bootherba Road. Further AZL should be required to undertake a review of access controls for all accesses and roads intersecting with Bootherba Road and implement any recommendations prior to the commencement of operations.*

AZL has committed to undertake a transport options review (feasibility study) as recommended by the PAC, based on an extended mine life. If rail is to be utilised, it has committed to prepare a detailed schedule for rail transport (see Appendix B).

The Department supports the use of rail transport over road for moving bulk materials where it is reasonable and feasible to do so, which is consistent with objectives of the *State Environmental Planning Policy (Mining, Petroleum and Extractive Industries) 2007*.

The Department agrees with the PAC's recommendation to review the feasibility of using rail transport for the project and has recommended a condition requiring a comprehensive Transport Options Review be undertaken within 3 years of commencing the development (see recommended conditions below).

The Department has also recommended rail transport operating conditions which require the minimisation of impacts on level crossings and to restrict rail transport at night (see recommended conditions below).

A Voluntary Planning Agreement between AZL and Council has been executed (refer Appendix E). It includes contributions towards the maintenance of key roads and Council's other infrastructure. Given the agreed terms of the VPA have been executed the Department considers that additional contributions are not required.

With regard to the safety review of Bootherba road and its intersections, the Department has recommended that the Transport Options Review includes consideration of the capacity of Bootherba Road and associated intersections to cater for heavy vehicles associated with the project.

Additionally the Department has recommended an Independent Safety Audit Review (refer condition 40) be undertaken, which would investigate any safety deficiencies associated with the intersection of Bootherba Road and the Newell Highway and make recommendations for improvements, if required.

LIMITS ON CONSENT – SCHEDULE 2**Road and Rail Transport**

8. The Applicant shall use all reasonable endeavours to:
- (a) restrict train movements to and from the site to between the hours of 9:30 am and 2:30 pm and 4:30 pm and 9:00 pm;
 - (b) minimise the unloading and loading of train wagons on the site during the night; and
 - (c) minimise the transport of material by road between the Newell Highway and the site during the night.

TRANSPORT – SCHEDULE 3**Transport Options Review**

42. Three years after commencing development (as notified in accordance with condition **Error! Reference source not found.** of schedule 2), the Applicant shall review the feasibility of transport options for the development. The feasibility review shall:
- (a) be prepared in consultation with Transport for NSW, RMS and Council by a suitably qualified expert/s whose appointment has been approved by the Secretary;
 - (b) investigate the reasonable and feasible options to maximise the use of rail and minimise the use of public roads to transport chemical reagents and mineral concentrate to and from the site over the approved and projected life of the development;
 - (c) analyse the capital, construction and operating costs of the alternative transport options;
 - (d) review the capacity of Boothenba Road and associated intersections to cater for heavy vehicles associated with the project;
 - (e) consider the results of the Road Safety Audit undertaken in accordance with condition 0;
 - (f) compare the potential social and environmental impacts of each option; and
 - (g) assess the viability of the use of rail transport for the development.

Within 3 months of receiving the review, unless the Secretary agrees otherwise, the Applicant shall submit a copy of the report to the Secretary, with a detailed response to the recommendations contained in the review, including a timetable for the implementation of any reasonable and feasible measures proposed to address the recommendations in the review.

Any works recommended in the review must be undertaken in accordance with this timetable to the satisfaction of the relevant rail authority and RMS and Council (where relevant) for level crossings, unless otherwise agreed with the Secretary.

In the event that there is a dispute between the Applicant and the relevant rail or road authority about the implementation of this condition, then any of the relevant parties may refer the matter to the Secretary for resolution.

Rail Transport

43. Prior to commencing the movement of trains to or from the site the Applicant shall:
- (a) upgrade the Molong-Dubbo rail line from Dubbo to Toongi and signalling within the Dubbo Rail Junction to the satisfaction of the relevant rail authority, and RMS and Council (where relevant) for level crossings and:
 - in accordance with Australian Level Crossing Assessment Model (ALCAM) and AS 1742.7-2007 *Manual of Uniform Traffic Devices – Railway Crossings*; and
 - in consultation with residents within 50 m of the rail line, and
 - (b) develop and implement a Train Network Pathway Plan in consultation with the relevant rail authority, to the satisfaction of the Secretary.

Traffic Safety Audit

PAC Recommendation

10. *AZL be required to undertake a traffic safety audit of the intersection of the Newell Highway and Obley Road prior to the commencement of operations (and then every 3 years) and to implement the findings of the audit. The audit should review the designated speed limit on Obley Road outside the Western Plains Zoo.*

The Department agrees with the PAC's recommendation and has proposed a condition of consent that requires an Independent Road Safety Audit of the haulage route between the Newell Highway and the mine, as well as the intersections of the Newell Highway and Obley and Bootherba Roads, which is incorporated into the conditions of consent, as follows:

Independent Road Safety Audit

41. Prior to commencing operations, and every three years thereafter, the Applicant shall commission an independent suitably qualified and experienced person endorsed by the Secretary to undertake a road safety audit of the haulage route between the Newell Highway and the mine (including the intersection of the haulage route with the Newell Highway, the intersection of the Newell Highway with Bootherba Road and Purvis Lane). This audit must:
 - (a) be undertaken by a suitably qualified person approved by the RMS, and undertaken in consultation with Council and RMS;
 - (b) identify any non-compliances with applicable design and safety standards, including consideration of:
 - the recommendations of the preceding Road Safety Audits;
 - the appropriateness of the speed limit along Obley Road past the Zoo;
 - haulage records;
 - accident records on the haulage route;
 - infringements of the code of conduct and any incidents involving mine-related vehicles;
 - community complaints register; and
 - minutes of CCC meetings.

Within 1 month of receiving the audit report, unless the Secretary agrees otherwise, the Applicant shall submit a copy of the report to the Secretary, with a detailed response to any non-compliances identified in the audit report, including a timetable for the implementation of any reasonable and feasible measures proposed to address the non-compliances.

Any road works recommended in the Independent Road Safety Audit must be undertaken in accordance with this timetable and to the satisfaction of the relevant road authority, unless otherwise agreed with the Secretary.

In the event that there is a dispute between the Applicant and the relevant road authority about the implementation of this condition, then either party may refer the matter to the Secretary for resolution.

Note: This preparation work for this report can be undertaken in conjunction with the Independent Environmental Audit detailed in condition 9 of schedule 5.

Traffic Management Plan

PAC Recommendation

11. *AZL be required to prepare a construction and operational traffic management plan for the project which details measures to reduce the traffic impacts of the project, including but not limited to:*
 - *Minimising the construction traffic impacts of the project*
 - *Staging shift changes outside of the peak traffic hours 8.00am – 9.00am and 3.00pm – 4.00pm and so as not to coincide for school bus drop off / pick up times*
 - *Restricting heavy vehicle movements to/from the site to the day period, unless there is an emergency*
 - *Preparing and implementing a Drivers Code of Conduct for the project; and*
 - *Monitoring the effectiveness of these measures.*

The Department broadly agrees with the PAC's recommendation and has proposed a condition requiring the preparation and implementation of a Transport Management Plan, which includes as a subset a construction and operational management plan.

The Transport Management Plan would be prepared in consultation with the relevant agencies and to the Secretary's satisfaction. It would need to be submitted prior to any development under the consent.

The plan would contain detailed measures to manage all transport related impacts, and would include a Drivers Code of Conduct, measures to minimise disruption to road users during construction and operation, promote low frequency trucking, include procedures to respond to complaints, schedule transport to minimise disruption to school bus timetables and to include measures to monitor the effectiveness of the plan (see Appendix C).

The Department has also recommended operating conditions which requires the shift changeover to be scheduled to avoid peak hour periods.

Regarding transport hours, AZL has strongly objected to the proposed restriction to day time only for heavy vehicle transport and further justified its proposal to undertake 24-hour road transport on the following grounds:

- a) the project is reliant on the importation of significant quantities of processing reagents sourced from NSW ports (e.g. Newcastle and/or Botany) which are operated on a 24-hour basis, which AZL has little or no influence on holding or departure of materials;
- b) based on calculations commissioned in response to the PAC review (see Appendix D), AZL estimated inefficiencies as a result of the restriction would cost approximately \$10.5 million annually in additional logistics, including the need for new night-time layover facilities in or near Dubbo as well as increased operating costs;
- c) the EIS predicted that road transport noise would comply with the relevant night-time road noise criteria at receivers;
- d) the majority of the transport route in the Dubbo LGA is on the State road network; and
- e) restricting transport to day hours would increase traffic and amenity impacts in this period due to a higher frequency of heavy vehicles. This is further complicated by the PAC's recommended restriction on project related traffic during peak hours and school times.

The PAC review report identified the potential impact upon the Zoo and receivers along Obley Road as key reasons to limit transport hours.

AZL has proposed two noise mitigation measures to protect the Zoo from traffic noise, firstly a 3 m high and 1 km long sound barrier wall near the Rhinoceros breeding pens, and secondly, a noise reducing asphaltic concrete seal on Obley Road from the Newell Highway to Camp Road.

AZL has also proposed an asphaltic concrete seal to Obley Road near Toongi Road to reduce road noise for receivers near that intersection.

Given that traffic noise impacts are predicted to be below the relevant criteria for receivers along Obley Road and these mitigation measures would further reduce noise levels, AZL argue that all reasonable and feasible mitigation has been undertaken. It therefore considers that there should be no restriction on evening and night road transport.

The Department has considered the arguments made by AZL in response to the PAC review and agrees there is justification for allowing expanded transport hours, subject to appropriate conditions being in place.

The Department notes that annually up to 360,000 tonnes of processing reagents would be supplied from the port of Newcastle and/or Botany, and 240,000 tonnes of limestone from Geurie, compared with 75,000 tonnes of refined ore products dispatched from the site to port.

Consequently, the aspect of road transport operations that would most likely be affected by the night-time restriction would be the delivery of reagents from the port, as it is unlikely the limestone mining operations would be approved to operate on a 24 hour basis. The Department also notes the majority of the estimated \$10.5 million in additional costs is due to inefficiencies with the reagents from the Port.

On this basis, the Department considers it would be reasonable for the processing reagents to be transported to the site 24 hours a day seven days a week, while limestone and refined ore products be restricted to between 6 am to 10 pm Monday to Friday and 8 am to 5 pm on Saturdays, with no transport on Sundays or public holidays.

To ensure that the potential amenity impacts from heavy vehicles transporting material at night are minimised, the Department has recommended conditions requiring AZL to:

- limit the number of heavy vehicle received and dispatched from the site to 75 per day and no more than 16 per hour;
- prepare and implement an operational Transport Management Plan which includes measures to minimise road transport during the night;
- construct a sound barrier near the Rhinoceros breeding pens in consultation with the Zoo and to the satisfaction of the Secretary;
- upgrade relevant sections of Obley Road with asphaltic seals to reduce road noise; and
- review the impacts of road transport every 3 years during the operational life of the project.

Subject to these conditions night-time road transport can be undertaken with minimal impact to the amenity of residential receivers or the operation of the Zoo.

2.5 Rehabilitation and Final Land Form

PAC Recommendations

13. *Conditions of consent should limit the final land uses of the site to agriculture and biodiversity conservation and an amended land use plan reflecting this requirement should be required prior to commencement of construction on the site.*
14. *The applicant be required to prepare a Rehabilitation Plan in accordance with DRE guidelines for the approval of the Secretary of NSW Trade and Investment, Regional Infrastructure & Services prior to the commencement of surface disturbing activities within the Mining Lease. The plan is to address all aspects of rehabilitation and mine closure, including post mining land use, rehabilitation objectives, completion criteria and rehabilitation monitoring, and Include a final landform design that is consistent with the surrounding topography of the area and considers natural drainage design and relief patterns and principles*
15. *Conditions of consent should ensure that:*
 - *progressive rehabilitation be undertaken on site as far as practicable within the constraints of the project; and*
 - *the rehabilitation and final landform are reviewed and updated at year 15 of the mine life (or at any other stage, at the request of the Secretary) to ensure the proposal is consistent with current standards and best practice.*
16. *AZL be required to comply with detailed performance measures for the Solid Residue Storage Facility, Waste Rock Emplacement and Salt Encapsulation Cells to achieve an undulating landform consistent with the surrounding environment and revegetated suitable for pre mining grazing agricultural land, while ensuring the integrity of the cells is maintained.*
17. *AZL is to undertake ongoing monitoring and maintenance of the site post mining in accordance with the approved monitoring and maintenance program until such time as the Department of Planning and Environment and the Department of Resources and Energy direct.*
18. *AZL be required to maintain the agricultural productivity of lands within its control surrounding the project throughout the life of the project and control invasive species (weeds and pest animals) within the total site.*

In response to the recommendations of the PAC review (see Appendix B), AZL has prepared a revised final land use plan which proposes to rehabilitate the site to provide a combination of agricultural and biodiversity conservation land uses. The conditions of the consent also require up to 539 hectares of land disturbed by the development to be returned to its former agricultural productivity, and rehabilitate and revegetate significant areas of the site for biodiversity conservation (see condition 56 of schedule 3 and the final land use plan in Appendix 7 of the conditions of consent).

The Department has drafted a condition requiring the preparation and implementation of a Rehabilitation Management Plan, to the satisfaction of DRE. The plan must be submitted prior to the commencement of mining under this consent, and must be prepared in accordance with any relevant DRE guidelines.

The plan must contain measures to address the relevant aspects of rehabilitation and mine closure, including final land use. The plan would include detailed rehabilitation performance and completion criteria for the site to evaluate rehabilitation efforts, and would include triggers for remedial action (if necessary). The plan would include a program to monitor, independently audit and report on the effectiveness of the measures to rehabilitate the site, and report on the progress against the detailed performance and completion criteria.

The Department has also recommended an operating condition requiring the site to be rehabilitated progressively as soon as reasonably practicable following disturbance.

To ensure the rehabilitation of the site is completed in a manner that contains suitable landforms and does not pose a risk to the environment, the Department has recommended a series of rehabilitation objectives requiring AZL to:

- rehabilitate the mine site on the whole to be safe, stable and non-polluting;
- design a final landform that is consistent with the surrounding topography of the area and incorporates micro relief;
- design, construct and maintain the Solid Residue Storage Facility, Waste Rock Emplacement and Salt Encapsulation Cells to:
 - be long-term stable and to meet original design standards; and
 - include self-sustaining vegetation cover, free draining and consistent with surrounding rehabilitated areas;
- use all reasonable and feasible measures to return at least 539 ha of land disturbed by the project to former agricultural productivity; and
- restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of local native species.

While the Liquid Residue Storage Facilities are proposed to be returned to agricultural lands the remaining Solid Residue Storage Facilities, Waste Rock Emplacement and Salt Encapsulation Cells would not. These structures are not compatible with grazing as they must remain stable over the long-term and must be appropriately vegetated to prevent erosion.

Concerning ongoing monitoring of rehabilitation following the cessation of mining, the following standard note has been included under the Mining Operations condition in the consent:

LIMITS ON CONSENT – SCHEDULE 2

Mining Operations

5. The Applicant may carry out mining operations on the site until 31 December 2037.

Note: Under this consent, the Applicant is required to rehabilitate the site and perform additional undertakings to the satisfaction of either the Secretary or DRE. Consequently this consent will continue to apply in all other respects other than the right to conduct mining operations until the rehabilitation of the site and these additional undertakings have been carried out satisfactorily.

Regarding other agricultural lands under the control of AZL, the Department has recommended a condition, which requires AZL to undertake its best endeavours to ensure that the agricultural productivity and production of non-operational project-related land is maintained or enhanced.

2.6 Impacts on Taronga Plains Zoo

PAC Recommendation

19. AZL be required to commission a study of the impacts of the increased traffic on Obley Road on TWPZ animals and visitors during the first 6 months of operations. The Study is to be undertaken in conjunction with TWPZ and be submitted to the Secretary within 8 months of the commencement of operations. If the Study identifies adverse impacts AZL shall be required to implement a vertical sound barrier as agreed with the TWPZ to reduce noise impacts to acceptable levels.
20. AZL be required to provide a copy of its approved Transport Management Plan and emergency response detail to TWPZ for information following approval.

In consultation with the Zoo, AZL has committed to building a 3 m high 1 km long sound barrier wall to protect the Rhinoceros breeding pens from road traffic noise. As discussed earlier, the Department has recommended conditions accordingly and the Department has recommended that the Zoo be consulted during the preparation of the Transport Management Plan.

2.7 Fossil Hill

PAC Recommendation

21. *Prior to determination of the subject application AZL should be required to provide additional information which addresses options to relocate the proposed terraced tailing dam to ensure it does not impact on the fossil site. Where no such options are considered viable, a requirement should be imposed on any consent requiring that any excavation work carried out at the site should be inspected by a qualified person for any further geological and paleontological information and, if possible at least one exposure of the local stratigraphy retained for future reference.*

The Department agrees with the PAC's recommendation and has drafted a condition requiring AZL to avoid the area known as 'Fossil Hill', refer below. However, if the Secretary agrees it is not reasonable and feasible to do so, then the Department has recommended a condition requiring AZL to prepare a Fossil Management Plan, which would include procedures to inspect, document and report on the paleontological evidence of fossilised plants at the site.

Also, AZL has committed to retaining at least one exposed face for future reference (see statement of commitments 2.6). The Department has recommended that the management plan include the details and design of this area for future reference and/or research, refer below.

Finally, the proposed final landform would remove all of the LRSF and AZL would be required to return these areas to a pre-existing landform.

Fossil Hill

37. The Applicant shall avoid the recorded fossil locations at 'Fossil Hill', unless the Secretary agrees otherwise.

If the Secretary agrees it is not reasonable and feasible to avoid this area, then prior to construction of Area 4 of the Liquid Residue Storage Facility (refer Appendix 2) the Applicant shall submit a Fossil Management Plan, which must:

- (a) be prepared by a suitably qualified person, in consultation with DRE and Council;
- (b) include:
 - a program to undertake periodic inspections during construction of this facility by a suitably qualified person for paleontological evidence of fossilised plants; and
 - procedures to record and document new paleontological information; and
 - procedures to provide this information to the relevant government agencies; and
- (c) include the details and design of the exposed excavation area at 'Fossil Hill' for future reference and/or research.

2.8 Hazards and Risks

PAC Recommendation

22. *Condition of consent should include requirements for a NORM Management Plan, including a Radiation Management Plan and Radioactive Waste Management Plan*
23. *Calculations for worker and public exposure to be updated to take account of all potential pathways nominated in ARPANSA Safety Guide prior to determination of the application.*
24. *The Commission recommends that a comprehensive waste stream monitoring regime be developed prior to final determination of the proposal, to monitor the level of radiation in the materials both before and after mixing to ensure the final waste is well mixed and does not contain hot spots. This information should also be publicly available.*
25. *Conditions of consent should require decommissioning to be undertaken upon completion of mining, with provision of appropriate bonds or securities to ensure this can be completed in the event of financing issues.*

AZL provided a revised radiation assessment technical note which considered the potential additional exposure pathways detailed in the relevant guidelines (see Appendix B). The assessment states that

the doses from these additional pathways would be very low to negligible and confirms that the main exposure pathways assessed in the EIS (inhalation) provide an accurate estimate of potential doses to workers and the public.

The Department has recommended that the Applicant prepare and implement a comprehensive Radiation Management Plan. The plan must be prepared in consultation with EPA and DRE by a suitably qualified expert/s whose appointment has been approved by the Secretary. The plan must be:

- be submitted for approval prior to the extraction of ore;
- be consistent with the *Code of Practice and Safety Guide for Radiation Protection and Radioactive Waste Management in Mining and Mineral Processing* (ARPANSA, 2005); and
- describe the measures that would be implemented to ensure compliance with the ARPANSA Public Dose Limit.

The plan would also contain a Radioactive Waste Management Plan which would describe the procedures to ensure that the processing waste residues are blended and disposed in a manner to achieve an average radioactive concentration that does not exceed the average concentration of radioactive material in the original ore body.

It would also include a Radiation Monitoring Program that measures radiation in processing waste residues prior to and following blending for disposal.

As discussed earlier the Mining Lease would require a sufficient bond to be paid to DRE to cover the liabilities associated with rehabilitating the site. Also in NSW, the Division of Resources and Energy - Mine Safety Regulator is responsible for regulating the exploration, mining, and processing of 'radioactive ores', in accordance with the *NSW Radiation Control Act 1990*. Under this act 'regulated material' must be licenced, and a licence holder must abide by the licence conditions. Failure to do so can result in a maximum penalty of \$165,000 for a corporation or imprisonment for 2 years, or both, in any other case.

The Department considers that the recommended conditions of consent have addressed the PAC's recommendations and would ensure that the environment and the health of nearby residents are protected from the naturally occurring radiation within the ore body and process waste streams.

Statement of Commitments

PAC Recommendation

26. *The Department should ensure that the commitments made by the applicant in its application are legally binding.*

The Department agrees with the PAC's recommendation and has included the company's statement of commitments in the recommended development consent (see Appendix C).

2.9 Aboriginal Heritage

During the PAC Review the Department received correspondence from a descendant of the Traditional Owners of the Dubbo area regarding a statement made in the Secretary's Environmental Assessment Report about the Dubbo Local Aboriginal Land Council's (DLALC) support of the economic benefits of the project. This correspondence also noted that the Secretary's Environmental Assessment Report did not acknowledge the concerns raised in public submissions about the impacts of the project on Aboriginal cultural heritage.

The Department notes that the submission in support of the project was made by the CEO of the DLALC, however it made reference to a personal position of support rather than that of the DLALC. The Department clarified this matter with the PAC following its receipt of the above correspondence.

Additionally, the Department notes that the potential impacts of the project on Aboriginal cultural heritage were raised as concerns in submissions on the project, including by a Traditional Owner of the land. While the Secretary's Environmental Assessment Report did not specifically identify these concerns in the discussion on consultation, the issues raised were considered by the Department during its assessment of the project.

3. PROPOSED CONDITIONS

The Department has prepared recommended conditions of consent for the proposed development (see Appendix C). These conditions are required to:

- prevent, minimise, and/or offset adverse impacts of the development;
- ensure standards and performance measures for acceptable environmental performance,
- ensure regular monitoring and reporting; and
- provide for the ongoing environmental management of the development.

The conditions recommended by Council, the Western Plains Zoo, and government authorities have been incorporated where appropriate. AZL has reviewed and accepted the recommended conditions.

4. CONCLUSION

In February 2015, the PAC completed a merit review of the Dubbo Zirconia Project and concluded that, as a whole, the project has merit and is approvable, subject to further detail on a number of matters and stringent environmental requirements.

This Addendum Report focuses on addressing these matters, and should be read in conjunction with the Secretary's Environmental Assessment Report for the project, which provides a detailed assessment of the key issues in accordance with the requirements of the EP&A Act.

The Department's has largely adopted all of the PAC's recommendations and has drafted conditions of consent which incorporate the requirements of these recommendations. A key area of difference is night-time road transport.

AZL has provided additional information which predicts that restricting the movement of heavy vehicles during the night would likely create inefficiencies in the transport operations, particularly those associated with the transport of processing reagent from the Port of Newcastle and/or Botany. These inefficiencies are estimated to impose additional costs on the operation of the project of up to \$10.5 million per year. Additionally restricting transport to day hours only would increase traffic and amenity impacts in this period due to a higher frequency of heavy vehicles. The impact during the day would be further complicated by recommendations by the PAC to minimise project related traffic during peak hours and school times.

With regard to amenity impacts from road transport, the EIS predicted compliance with the relevant road traffic noise criteria. Nevertheless, AZL has committed to the installation of sound barrier to protect the rhinoceros breeding pens at the Zoo and noise reducing pavement at key locations. The Department supports these commitments and has recommended conditions accordingly.

The recommended conditions require the implementation of other measures to minimise night-time transport noise, including limiting the trucking rates and to encourage scheduling of trucking outside the night period where practical. With the implementation of these measures, the Department considers that the amenity impacts of night-time road transport can be managed to acceptable levels. Accordingly the Department has recommended conditions permitting the 24 hour transport of processing reagents to the site. However, the Department considers that the transport of limestone and refined ore products to and from the site be restricted to the day and evening as there is little justification for 24 hour transport of these materials.

The Department's assessment has also found that the potential noise, air quality, radiation and water quality impacts of the project can be suitably managed through the design of the processing facility and residue waste storage facilities in accordance with best practice.

The Department has recommended a strict set of criteria for noise and air emissions to protect the health and amenity of residents. The Department has also recommended conditions to set comprehensive water performance objectives to protect the water quality as well as the requirement to prepare and implement a detailed Water Management Plan to ensure these objectives are met.

The recommended conditions also include requirements to undertake regular monitoring of noise levels, air emissions, water quality, radiation, transportation levels and rehabilitation performance. The proposed monitoring regime is thorough and would ensure any exceedances of the criteria or performance measures are readily detected and corrective action is taken.

The Department has drafted a comprehensive set of conditions of consent in consultation with relevant stakeholders to address the recommendations of the PAC, and considers these conditions would ensure the project is undertaken in manner that would achieve an acceptable level of environmental performance.

The Department also recognises that the project would provide economic benefits for the region and NSW, including:

- a direct capital investment of \$1.06 billion;
- direct employment for up to 250 workers;
- annual spending of around \$50 million in local economy;
- an annual payment of around \$600,000 to Dubbo Council for community enhancement; and
- up to \$240 million to the state in royalties over the life of the project.

Based on its assessment, and having considered the PAC's review, the Department considers that the PAC's residual concerns have been adequately addressed and that the project as a whole is in the public interest, and should be approved, subject to stringent conditions.

5. RECOMMENDATION

It is RECOMMENDED that the Planning Assessment Commission, as delegate of the Minister for Planning:

- **consider** the findings and recommendations of this report;
- **approve** the development application, subject to conditions; and
- **sign** the attached instrument of consent (**Appendix C**).


Mike Young
Director
Resource Assessments
5.5.15.


Marcus Ray
Deputy Secretary
Planning Services
05/05/2015

APPENDIX A: PAC REVIEW REPORT

APPENDIX B: AZL RESPONSE TO PAC REVIEW REPORT

APPENDIX C: RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX D: AZL'S ESTIMATION OF COSTS FROM RESTRICTED ROAD TRANSPORT HOURS

APPENDIX E: VOLUNTARY PLANNING AGREEMENT
