


## DIRECTION TO PROVIDE ADDITIONAL INFORMATION

Direction given under section 124 of the Environment Protection Regulations 2020

<b>Name of proposed action</b>	Phase 2 Expansion Arnhem Space Centre
<b>Proponent</b>	Equatorial Launch Australia Pty Ltd
<b>NT EPA reference</b>	EP2023/031
<b>Nature of proposed action</b>	Industrial
<b>Description of proposed action</b>	<p>Expansion of launch pads and associated facilities at the multi-user commercial Arnhem Space Centre located on NT Portion 1646 in the East Arnhem local government area.</p> <p>The proposed expansion includes:</p> <ul style="list-style-type: none"> <li>• an increase to the lease area to encompass mineral lease 31025 to utilise areas disturbed by mining operations</li> <li>• an additional 14 launch pads including supporting infrastructure: <ul style="list-style-type: none"> <li>○ mission support buildings</li> <li>○ helipad</li> <li>○ accommodation facility</li> <li>○ fuel storage and pumping facilities</li> </ul> </li> <li>• 1500 megalitre capacity water dam</li> <li>• internal access roads</li> <li>• directly affected area of approximately 250 – 300 ha</li> <li>• where practicable, activities to recover any returning waste materials and space debris from launched rockets from within NT land and coastal waters.</li> </ul>
<b>Method of environmental impact assessment</b>	Assessment by supplementary environmental report (SER)
<b>Direction</b>	The proponent is directed to provide additional information in relation to the SER (refer to <b>Attachment A</b> )
<b>Submission period</b>	The additional information must be submitted to the NT EPA within 6 months of the date of this Direction
<b>Document to be published</b>	Additional information to the SER
<b>Person authorised to give direction</b>	<p>Dr Paul Vogel AM – Chairperson, Northern Territory Environment Protection Authority (NT EPA)</p> <p>Delegate of the NT EPA under section 36 of the <i>Northern Territory Environment Protection Authority Act 2012</i></p>
<b>Signature</b>	
<b>Date of direction</b>	13 September 2024

## Attachment A – Additional information

### Equatorial Launch Australia Pty Ltd – Phase 2 Expansion Arnhem Space Centre

Topic	Context	Additional information requested
<b>The proposed action</b>		
<b>General – launch facility and downrange areas</b>	<p>Submissions received on the SER indicate that many of matters raised in submissions on the referral were not addressed.</p> <p>Additional evidence is required to address submissions on the referral and SER in relation to:</p> <ul style="list-style-type: none"> <li>a) potential significant impacts to terrestrial ecosystems, culture and heritage, air quality and the community and economy values; and</li> <li>b) stakeholder engagement regarding the <u>down-range areas</u> and processes to ensure potentially affected stakeholders are adequately informed, understand the role that ELA wants them to perform, and have had input into identifying environmental values, potential impacts, mitigation and management.</li> </ul>	<p>See below for details.</p>
<b>General – launch facility and downrange areas (activities, extent and limitations)</b>	<p>There are some components of the proposal that are indicated in the referral, however information has not been provided – with the assumption being made that these would be subject to future design, assessment and approval under other statutory processes. However, where these have the potential for significant impacts, the NT EPA must be satisfied that it has sufficient information to conclude its assessment. Alternatively, the proponent may exclude future expansion from the proposed action, and/or clarify the limitations and extent of the proposed action and environment protection measures.</p>	<p>1) Confirm (or otherwise provide additional assessment information):</p> <ul style="list-style-type: none"> <li>a) that 60 launches per year (same as phase 1) is proposed</li> <li>b) that a liquid oxygen (LOX) manufacturing plant is not part of the proposed action</li> <li>c) that fuels containing mercury will not be used in the proposed action</li> <li>d) that a landfill is not required and not part of the proposed action</li> <li>e) that no wastewater will be discharged to the environment</li> <li>f) that groundwater extraction is not part of the referred proposed action</li> <li>g) proposal activities do not involve potential significant impacts from radiation.</li> </ul>

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<p><b>Launch facility</b></p> <p><b>Water balance and quality</b></p>	<p>Section 3.2.2 of the referral indicates the capacity of the proposed dam is 1,500 ML and section 6.4.2 indicates the intent to harvest and store approximately 1,700 ML of surface water to supply the deluge system.</p> <p>Groundwater extraction has been mentioned as a future alternative water supply.</p> <p>At present there is insufficient information about potential significant environmental impacts from groundwater extraction in the referral and SER documents. Alternatives for water supply have not been assessed with respect to the environment decision-making hierarchy under the EP Act. It's also not clear what criteria ELA will use to trigger the establishment of the alternative water supply.</p>	<p>2) Confirm (or advise otherwise) the proposed annual water demand and annual supply for the proposed action, accounting for:</p> <ul style="list-style-type: none"> <li>a) variability with different phases of the proposed action e.g. construction phase, operation phase, decommissioning and rehabilitation phase</li> <li>b) potable (including drinking water) for the accommodation facility and personnel onsite</li> <li>c) dust suppression and landscaping (if applicable)</li> <li>d) functionality of the deluge system during launches and static tests</li> <li>e) other water uses for example, an emergency conflagration event</li> <li>f) water treatment options for recovered deluge water and domestic water.</li> </ul>
<p><b>General – down range areas</b></p> <p><b>mission optimisation process</b></p>	<p>The referral states that <i>Known areas of importance will be avoided through launch planning</i>. Launch planning and launch optimisation processes in the SER do not include details of how ELA will identify areas of environmental importance for down range areas.</p> <p>Appendix 1 of the SER states that <i>Launch parameters will ensure that recovery areas will avoid inhabited areas, the coastal areas of the Gulf of Carpentaria, the Great Barrier Reef, and spatially definable areas of high ecological value including those in the Coral Sea. Other areas may also be spatially defined and excluded as ELA becomes aware of them during each launch planning process.</i></p>	<p>3) Describe the process to define and identify the inhabited areas that would be avoided (in NT jurisdiction)</p> <p>4) Define the methods to identify whether areas of high ecological value are present</p> <p>5) Describe the action ELA will take where consultation and analysis of spatial information indicates physical surveys need to be undertaken in order to identify environmentally important areas</p>
<p><b>General – consultation</b></p>	<p>The <a href="#">NT EPA's Stakeholder Engagement and Consultation guidance</a> discusses the importance of consultation, objects of the EP Act, general duty of proponents, effective engagement and proponent obligations.</p> <p>The NT EPA and submissions on the referral and SER express concern about the adequacy of consultation with potentially affected individuals and communities about the</p>	<p>6) Describe how relevant stakeholders (e.g. Aboriginal landholders, pastoral lessees) (particularly down range) will be identified, contacted and informed that they may be potentially impacted land managers</p> <p>7) Provide supporting evidence that potentially affected stakeholders (particularly down range) have already been consulted and/or involved rather than informed only.</p>

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	<p>proposed action, and therefore uncertainty about consideration of matters in the environmental impact assessment, that relate to several environmental factors.</p> <p>The SER states that <i>the optimisation of this trajectory to balance mission objectives and safety or environmental constraints is conducted with ELA Mission Optimisation Process at reference Q. This occurs approximately 9 months out from a prospective launch. ELA can then consult communicate to and engage with the appropriate stakeholders including Traditional Owners regarding specific operational parameters and obtain consent for the dropping and recovery of LV.</i></p> <p>Information about consultation has been provided in the SER with a focus on the ASC facility and engagement with the Gumatj Corporation (the lease holder under section 19 of the <i>Aboriginal Land Rights Act (Northern Territory) 1976</i>).</p> <p>The stakeholder engagement plan in Appendix 3 lists stakeholders. Roles of the stakeholders are broadly implied or discussed in appendices 3 and 4.</p> <p>The SER did not provide adequate information to address item 19 of the NT EPA's Direction. This item included the requirement to demonstrate that the payload landing and hardware recovery plan was developed in consultation with relevant stakeholders.</p> <p>The Northern Land Council's submission on the SER identified that: consultations are expected to "take place over the coming months as part of the NLC's function..." and the lease area must be expanded, requiring the Arnhem Land Aboriginal Land Trust to vary the existing lease</p> <p>The SER states that ELA has written to CLC to begin the process of engagement and consultation.</p> <p>The submissions indicate traditional owners have not been consulted as requested in the direction for the SER and NT EPA stakeholder engagement guidance.</p>	<p>8) Describe the process, regulatory framework (e.g. access or permits required under other NT or Commonwealth legislation) and timeframe that may be required to permit access to potentially impact land managers</p> <p>9) Clarify why the <i>Safety and Retrieval Committee</i> membership does not include down range area stakeholders</p> <p>10) Demonstrate that the proposed timing for execution of the consultation processes accounts for the identification of environmentally sensitive areas, feedback from potentially affected stakeholders and changing launch trajectories to avoid potential significant impacts.</p> <p>11) Provide documents G - R mentioned in section 3.2 of Appendix 1 – ASC Flight Hardware Recovery Plan of the SER.</p>

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	<p>There is concern about whether there is sufficient time and adequate opportunity for stakeholder consultation, integral to inform the EIA, and to avoid potential significant impacts in down-range areas, (particularly in relation to identifying environmental values, potential impacts and management measures in the recovery areas) and associated recovery processes and response.</p>	
Air – Air quality		
<b>Air model</b>	<p>The SER justifies the use of the AERMOD dispersion model by stating that “there are no complex terrain, or other features, in the surrounding area that would result in the AERMOD dispersion model underestimating ground-level concentrations of air pollutants.” However, the site sits on the Dhupuma plateau situated ~100 m “above the valley floor below” (Appendix 2 Veg and Habitat Assessment).</p>	<p>12) Clarify how the consideration of the model accounted for the proximity and effect of Dhupuma plateau, and the resultant level of confidence, supported by sensitivity analysis of the air quality modelling results and assessment.</p>
<p><b>Pollutants of concern</b>  <b>Magnitude of impact including cumulative</b>  <b>Whole of environment</b></p>	<p>The referral identifies the following four potential pollutants of concern:</p> <ul style="list-style-type: none"> <li>• carbon monoxide;</li> <li>• hydrogen chloride;</li> <li>• nitrogen dioxide; and,</li> <li>• aluminium oxide (as PM10).</li> </ul> <p>Information provided with the SER defined the areas likely to receive 25% and above air quality criteria. It is not clear what potential effects or impacts are associated with the exceedances.</p> <p>Levels of sulfur compounds (e.g. SO<sub>2</sub> and H<sub>2</sub>S) have not been provided.</p> <p>Dispersion modelling maps have been provided for three normal launch scenarios only.</p> <p>SER Appendix 6, Figure 22, indicates the air quality criteria for hydrogen chloride may not be met and may be exceeded at the Garma festival site when launching from the “maroon” launch pad. Launch pads 2-9 and 2-11 (pink launch pads</p>	<p>13) Describe and map the area of potential air quality impacts resulting from the four potential pollutants of concern at each of the 14 proposed launch pads (particularly the launch pads 2-9 and 2-11 (pink launch pads shown on Figure 5 of the referral) (or provide the sensitivity of modelled concentrations for all launch pad locations)</p> <p>14) Discuss/justify the necessity of the launch pad proposed closest to the Garma Festival site</p> <p>15) Provide the predicted level of sulfur compounds from the proposed action</p> <p>16) Demonstrate there is no potential significant impact from sulfur compound emissions.</p>

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<p><b>Pollutants of concern</b> <b>Magnitude of impact</b> <b>Whole of environment</b></p>	<p>shown on Figure 5 of the referral) are in close proximity to the festival site too.</p> <p>There is uncertainty about the presence/absence of environmental values within the indicated area of reduced air quality, (and therefore environmental impacts to those values from the proposed action) because:</p> <ul style="list-style-type: none"> <li>• an Authority Certificate (issued by the Aboriginal Areas Protection Authority) has not been included</li> <li>• a heritage survey has not been undertaken</li> <li>• there are information gaps in the flora and fauna assessment</li> <li>• there are gaps in consultation to inform absence/presence of receptors and values</li> </ul>	<p>17) Using the new maps requested in item 13 above, to be able to visually compare ground level concentrations in proximity to values, show:</p> <ol style="list-style-type: none"> <li>a) ground level concentration contours in <math>\mu\text{g}/\text{m}^3</math> and include a contour for the criteria limit,</li> <li>b) the boundary of the ASC</li> <li>c) location of human sensitive receptors</li> <li>d) location of environmental values such as sacred site, culturally significant sites, sensitive vegetation/ high biodiversity and water bodies.</li> </ol> <p>18) Discuss any potential impact to water quality from aluminium oxide particulate matter and demonstrate that Australian drinking water and freshwater and marine water quality guidelines will be met.</p> <p>19) Confirm dioxins and furans will <u>not</u> be produced by the proposed action</p> <p>20) Update the assessment of impacts from air quality with any relevant new information identified in addressing this Direction from the NT EPA such as proximity to sacred sites or monsoon vine thicket.</p>
<b>Land - Terrestrial ecosystems</b>		
<p><b>The proposed action</b> <b>Sensitive vegetation</b></p>	<p>The proposed action has the potential to significantly impact sensitive native vegetation. There are discrepancies in information and there is uncertainty about which terrestrial ecosystem values will be impacted, and the extent and any limitation of native vegetation clearing.</p> <p>As indicated in item 4 of the NT EPA's Direction for the SER, the referral states that "250-300 ha of primarily regrowth will be cleared". The proposed clearing footprint in the SER (section 7.1 incl. Figure 4) was 91 ha and an affected area of 305 ha. Appendix 2 of the SER (section 1) indicates 91 ha will be cleared. Submissions on the SER indicate that an application (under the <i>Planning Act 1999</i>) to clear 115 ha of native vegetation has been made.</p>	<p>21) Confirm the area (in hectares, on a map and shp files), and vegetation types proposed to be:</p> <ol style="list-style-type: none"> <li>a) cleared for the proposed action</li> <li>b) affected / impacted (but not by clearing).</li> </ol>

Topic	Context	Additional information requested
<p><b>The proposed action</b></p> <p><b>Sensitive vegetation</b></p> <p><b>Threatened species</b></p>	<p>The proposed action boundary in the SER was larger than the boundary in the referral and identifies that there is an area of monsoon vine forest (depicted in Figure 4-7 of Appendix 2) that sits within the area proposed for clearing (as depicted in Figure 4 of the SER). This is contrary to the proposed control measures identified in the Executive Summary and section 7.1.2 of the SER (Site Management – Biodiversity) which commits to “applying a non-clearing buffer of 50 m to the majority of the outer edge of the monsoon vine forest community, however there may be a small area which goes no closer than 20 m”.</p> <p>Refer to the submission from DEPWS and ECNT for additional context.</p>	<p>22) Provide a map and shp files of areas of monsoon vine forest within 250 m of the proposed extent of clearing (as identified by an appropriately qualified person, using appropriate methodology), and the extent of proposed buffers.</p> <p>23) Where the monsoon vine thicket cannot be avoided, provide survey results of the extent to be cleared and determine the potential impacts (including on threatened fauna species as per the DEPWS submissions).</p> <p>24) Undertake an assessment of the value of all monsoon forest identified within, and adjacent to, the project area and implement an appropriate buffer, as required by the NTPS Land Clearing Guidelines</p> <p>25) Should implementing the recommended buffer as per the NTPS Land Clearing Guidelines not be achievable, the alternative must be justified.</p> <p>26) Describe ongoing monitoring, inspection and reporting of impacts on monsoon vine thicket to ensure its protection.</p>
<p><b>Threatened fauna species</b></p>	<p>Refer to the submission from DEPWS</p>	<p>27) Review and revise the conservation status of threatened species listed in Table 3-2 and Table 5-1 of the ‘Vegetation and habitat assessment’ (Appendix 2 of SER)</p> <p>28) Provide revised assessments for threatened species considering the correct threatened species conservation status, monsoon vine thicket surveys and any new or updated information in addressing this Direction.</p>
<p><b>People - Community and economy</b></p>		
<p><b>Community and economy values</b></p> <p><b>Objects of the Act</b></p>	<p>The additional information provided did not demonstrate that affected communities and individuals have been consulted about the proposed action’s potential social and economic impacts, nor on the broader potential positive and negative impacts of the proposed action, as required by item 16 of the NT EPA’s Direction.</p> <p>Table 7 of the SER provides a summary of engagement occurred and planned, however there is no evidence of information that was provided to the stakeholders to inform them of the phase 2 proposed action, whether the details of</p>	<p>29) Provide further information that identifies and demonstrates that affected communities and individuals have been consulted on:</p> <p>a) potential social and economic impacts, including impacts on:</p> <ul style="list-style-type: none"> <li>• services to medical, and logistical services to the region from increased demand / use</li> <li>• users of the Gulkula ceremonial site (which includes the Garma Institute and Garma Cultural Knowledge Centre)</li> <li>• individuals</li> <li>• other businesses particularly during peak visitor periods</li> </ul>

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	<p>the proposed impacts were conveyed, what the stakeholder comments were and how they have been or will be taken into consideration in the proposed action.</p> <p>While the additional information did identify the broader potential positive and negative impacts of the proposed action, it did not provide details of the process used to identify these perspectives.</p>	<ul style="list-style-type: none"> <li>• community cohesion</li> <li>• recreational and cultural activities.</li> </ul> <p>b) the broader potential positive and negative impacts of the proposed action, including details of the process used to identify these perspectives.</p>
<p><b>Culture and heritage</b></p>	<p>As per the submission from the Heritage Branch:</p> <ul style="list-style-type: none"> <li>• the referral has not demonstrated that there is a baseline understanding of archaeological materials within the development area, nor within the wider archaeological landscape, as a result of reliance on survey used for previous mine development and no recent surveys for the proposed action.</li> <li>• ELA <u>has not</u> undertaken a Heritage register check.</li> <li>• the SER identifies a number of potential pollutants from launch emissions that have the potential to negatively impact on cultural heritage and archaeological sites.</li> </ul> <p>The Heritage Branch holds records of known heritage places and objects. Due to cultural sensitivity, information from the database is only provided to people with a legitimate interest. The Heritage Branch can provide information to proponents including advice on the need for, and scope of, an archaeological survey.</p>	<p>30) In consultation with the Heritage Branch, (formerly Department of Territory Families, Housing and Communities, now Department of Lands, Planning and Environment), provide evidence that ELA has:</p> <ol style="list-style-type: none"> <li>a) conducted a search for known archaeological places located within the subject site on the Heritage Branch archaeological database</li> <li>b) conducted a search for known archaeological places located within the proximity of the subject site on the Heritage Branch archaeological database</li> <li>c) determined the extent of pre-existing ground disturbance</li> <li>d) determined the scale and nature of the work proposed (major, moderate or minor)</li> <li>e) identified areas excluded from the work footprint (e.g. riparian buffers)</li> <li>f) conducted an assessment of the likelihood of unrecorded archaeological places existing within the subject site, based on landscape features, known archaeological places in the vicinity, and other predictive tools.</li> </ol> <p>31) Provide further information that identifies potential impacts, including cumulative impacts, from rocket emissions on potential archaeological sites (and if these impacts differ in the wet season and the dry season). Identify measures that will be implemented to avoid, or mitigate these impacts.</p>
<p><b>Culture and heritage – launch failures</b></p>	<p>As per the Heritage Branch submission, at least 139 registered shipwrecks and two aircraft wrecks on the National Shipwreck Database are within the Gulf of Carpentaria and potentially the projects footprint.</p>	<p>32) Provide the process to ensure potential impacts on underwater heritage will be avoided.</p> <p>33) In the event of a failed launch, demonstrate how impacts to cultural heritage are addressed.</p>



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<b>Noise and vibration</b>	Potential noise and vibration impacts from the proposed action was a matter raised in submissions on the referral and to be addressed in the SER. Section 5 of the SER includes cross-references to sections of the SER and Appendix 3. No discussion or information about potential significant impacts from noise and vibration was provided.	<p>34) Provide the predicted noise level (dBA) at the project boundary and nearest sensitive receptors during rocket launches</p> <p>35) Discuss potential noise impacts from the operation of the helipad (and assumptions such as the frequency of use of the helipad and flight path near the community)</p> <p>36) Discuss (and provide supporting evidence) about potential impacts from noise and vibration to the community and terrestrial fauna.</p> <p>37) Identify mitigation measures proposed to reduce noise and vibration impacts.</p>