Leveraging geospatial to assess the large-scale renewable generation potential of the Northern Territory .

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SUMMARY

In 2023, the Northern Territory Government engaged Jacobs to undertake a Wind Resource Assessment and Wind Measurement Strategy to better understand the Territory's wind resource potential. The study sought to provide an evidence based strategic approach to mapping the Territory's wind resources and identifying opportunities for wind generation. By leveraging geospatial information, an easily consumable evidence-based approach is achieved which can then be used as the foundation for investing in more targeted and detailed wind assessment and, subsequently, in wind generation infrastructure. □□Several factors need to be considered when identifying opportunities and investigating sites suitable for large-scale wind farms, these include: □□1. Is there sufficient wind present. □□2. Is there an absence of factors that might be impacted by the turbines. □□3. Can the turbines be feasibly transported to and constructed at a given site. □□Many of these factors are or can be captured by geospatial information, this information can then be assessed to evaluate and rank areas of the Territory, at the Territory scale. A major aspect of this study was the wind compatibility assessment, which communicated the results of a geospatial multi criteria analysis series undertaken by the Jacobs' geospatial team. □□Areas with the following attributes were excluded from assessment: □□a. Cyclonic winds. □□b. Communities and townships. □□c. Areas with insufficient average wind speeds. □□d. Steeply sloped areas. □□The geospatial multi criteria analysis sought to create constraint surfaces depicting three scenarios, all which collectively, assess the potential of a given area for wind power infrastructure. □□The first scenario was a constraint surface generated to evaluate the compatibility of the Territory to wind infrastructure. Primary criteria for this scenario included wind speeds and topography. □□The second scenario was a constraint surface generated to evaluate the economic drivers associated with wind infrastructure in the Territory. Primary criteria for this scenario included proximity to existing infrastructure such as roads or transmission lines, as well as noted areas of strategic importance where there is current investment in developing service corridors and

supporting infrastructure. The third scenario was a constraint surface generated to assess sensitivity constraints. Primary criteria for this scenario included proximity to existing communities, national parks, and areas of conservational significance. Regions in the Territory were generated depicting areas suitable for wind infrastructure, these were then assessed and ranked with respect to the economic development assessment and land sensitivity. Five regions were selected for a deeper analysis, which provided a breakdown of the criteria present to provide a more in depth understanding of what was present at a site, and how the wind and economic drivers interplayed with land sensitivity. This Wind Resource Assessment informed the Wind Measurement Strategy in identifying areas to invest in obtaining industry standard wind resource data to attract the interest of developers and investors to consider the Northern Territory for wind development.