APPENDIX C: DESIGN EVOLUTION SUMMARY REPORT

08 May 2023

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SITE LAYOUT PLAN DEVELOPMENT

The objective of the screening process is to ensure that an environmentally sustainable site layout plan (SLP) is taken forward for impact assessment. As such, the SLP presented in the DEIR is the product of a screening process that has been informed by a large multi-disciplinary team of environmental specialists, the EAP, the project sponsor and project developer.

This document provides a summary of the screening process that took place during the pre-application & scoping phase, and the role it played in defining the SLP. This process is described under the following steps:

1. National Web-Based Environmental Screening Tool;
2. Site sensitivity verification;
3. No-Go Mapping; and
4. SLP Development.

1. NATIONAL WEB-BASED ENVIRONMENTAL SCREENING TOOL

As a first step, the National Web-Based Environmental Screening Tool (hereafter referred to as "the screening tool") was consulted to gain a high-level understanding of the site's sensitivity towards WEF development and determine the level of assessment required based on the environmental theme's sensitivity rating within the development site (see **Table 1** below).

Table 1: Sensitivity ratings from the DFFE web-based online Screening Tool

Environmental Theme/Specialist Assessment	Sensitivity Rating ito the Screening Tool
Agricultural Impact Assessment	High Sensitivity
Landscape/Visual Impact Assessment	Very High Sensitivity
Archaeological and Cultural Heritage Impact Assessment	Low Sensitivity
Palaeontology Impact Assessment	Very High Sensitivity
Terrestrial Biodiversity Impact Assessment	Very high Sensitivity
Aquatic Biodiversity Impact Assessment	Low Sensitivity
Avian Impact Assessment	High Sensitivity
Civil Aviation Assessment	Low Sensitivity
Defence Assessment	Low Sensitivity
RFI Assessment	High Sensitivity
Flicker Theme	Very High Sensitivity
Noise Impact Assessment	Very High Sensitivity
Bats Impact Assessment	High Sensitivity
Plant Species Assessment	Medium Sensitivity
Animal Species	High Sensitivity

2. SITE SENSITIVITY VERIFICATION

Based on the professional experience of the EIA team, as well as inputs from the screening tool, the following environmental specialists were identified and appointed to inform the screening process:

Table 2:Loxton WEF specialist team

Specialist	Field of Study
3Foxes	Terrestrial Ecology
EnviroSci	Aquatics
Wild Skies Ecological Services	Avifauna
Camissa Ecological Services	Bats
Asha Consulting	Heritage (including archaeology and palaeontology)
BOLA	Visual Impact Assessment
Enviro Acoustic Research	Noise
Tony Barbour	Social Impact Assessment
John Lanz	Soils and Agricultural Potential Assessment
Athol Schwartz	Traffic

All specialists undertook a desktop-based screening exercise to identify provisional No-Go, high-sensitive, medium-sensitive and low-sensitive areas within the site boundaries. These sensitivities were then ground-truthed on site to inform their constraints and sensitivity mapping.

The following site visits were undertaken over and above the standard site sensitivity verification survey:

- **Bats:**
  - **12-month monitoring campaign:** During the 12-month monitoring period, the study area was visited by Camissa Ecological Services on six occasions to install the monitoring equipment, check equipment, download data, perform seasonal driven night-time transects, ground-truth potential bat important features and decommission the monitoring equipment
- **Birds:**
  - **7-day pre-feasibility or screening survey conducted in June 2020.** This included a survey for large eagle nests and other avifaunal constraints on site and within approximately six kilometres of the initial site footprint.. In this case three Verreaux Eagle Nests and one Martial Eagle Nest were located within the original development area.
  - **Vera Model.** The applicant ran the Vera Model for the identified VE nests which further reduced the development area.
  - **Four seasonally timed site visits** consisted of approximately 12 – 15 consecutive days across the study area to record all flights of Priority species. These seasonal Site Visits covered: summer (when summer migrants are present); winter (when raptors breed and Blue Cranes flock); spring (when summer migrants are arriving on site and many species start to breed; and autumn (when summer migrants are leaving and many raptors are preparing to breed).

Where applicable, and depending on the seasonal and/or monitoring requirements, verified constraints were received from the various specialists at different stages of the project lifecycle, e.g. avifaunal, and aquatic inputs were considered to be central to the facility layouts and these specialists were appointed at project inception in 2020.

A final constraints layer was consolidated in January 2023.

For the purpose of this document, we have summarised the constraints that informed the layouts in Table 3, i.e. the No-Go areas.

Table 3: Sensitive receptors to be avoided and associated buffers (where applicable)

Discipline	Sensitive Receptors (must be avoided)	Buffer (m)	Restricted Infrastructure		
			Turbines	Roads & MV Cabling	Other infrastructure
Bats	Major drainage lines and wetlands	200-300	✓	✓	
	Functional farm dams and reservoirs	Varies between 150-300	✓		✓
	Minor drainage lines.	100	✓		✓
	Man-made structures, buildings, houses, barns and sheds.	300	✓	✓	✓
	Potential bat roosts	500	✓	✓	✓
	Alluvial plains and washes and seasonal drainage lines and Rocky ridge slopes with limited exposed rocks	250	✓		✓
Cultural Landscapes	R356 road	500	✓		✓
Visual	R390 road	500	✓		✓
	Homesteads	1000			
Noise & Shadow Flicker	Identified sensitive noise receptors	500	✓		✓
Aquatic	Primary and Larger Ephemeral Washes	50	✓	✓*	✓
	Minor drainage lines	35	✓	✓	✓
	Wetlands (Seepage & Depression)	50	✓		✓
Avifauna	Martial Eagle	6000	✓		
	Vera Buffer	Varies	✓		✓
	Ludwig Bustard Lek	500	✓	✓*	
	Jakal Buzzard	1000	✓		
Ecology	Riverine Rabbit	500	✓	✓*	✓
	Dolerite Ridges	Varies	✓	✓*	✓

* Upgrades to existing roads acceptable within buffer area & new road crossings acceptable within watercourses

3. NO-GO MAPPING

Following receipt of verified sensitivity datasets, a consolidated No-Go map was generated for applicable infrastructure, i.e. turbines, roads and MV cabling and other associated infrastructure (e.g. BESS, substations, laydown areas, site camps, etc.).

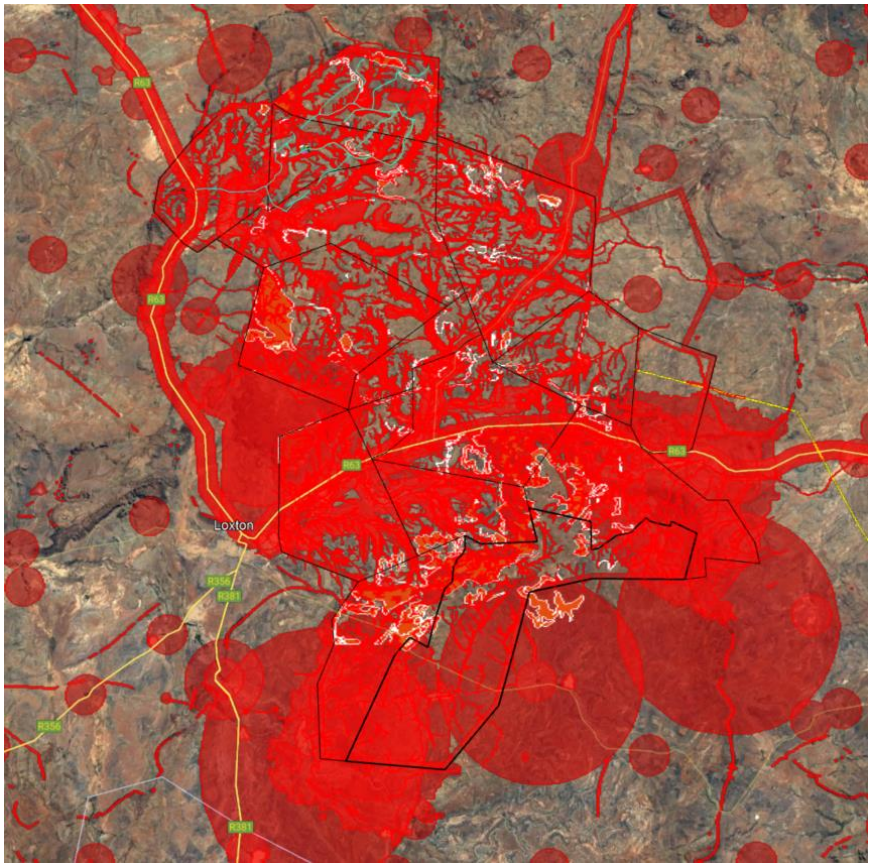


Figure 1:Turbine No-Go's

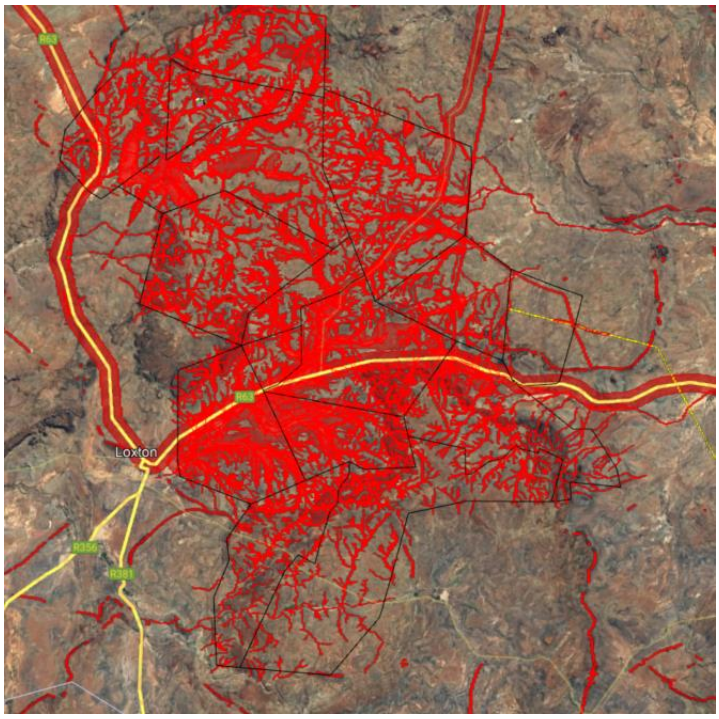


Figure 2: Roads and MV cabling No-Go's

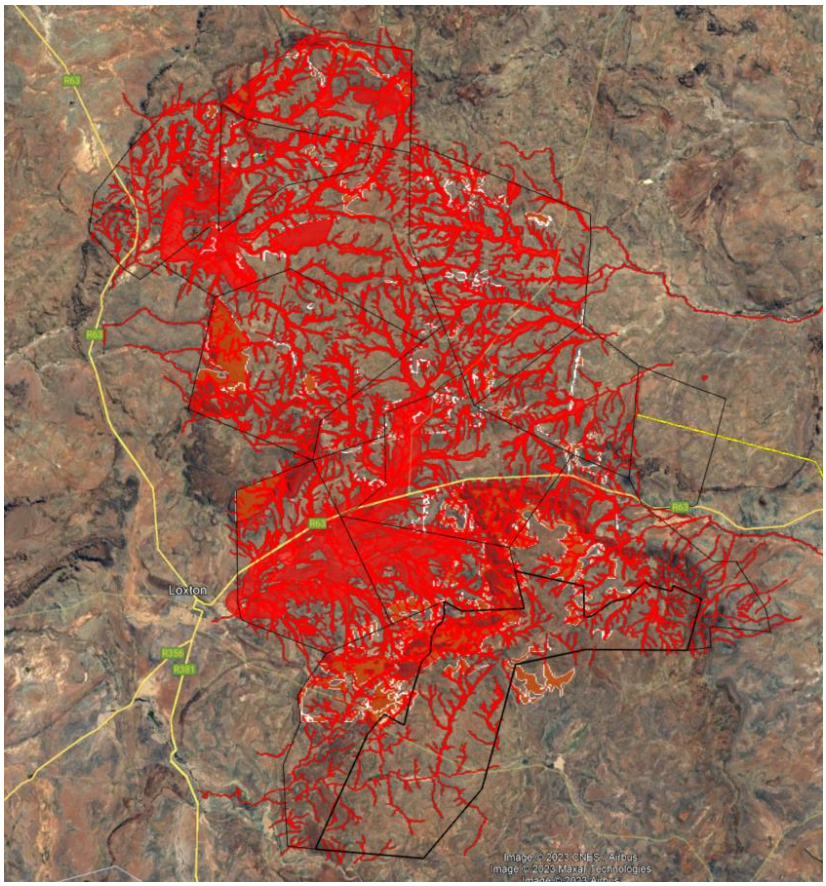
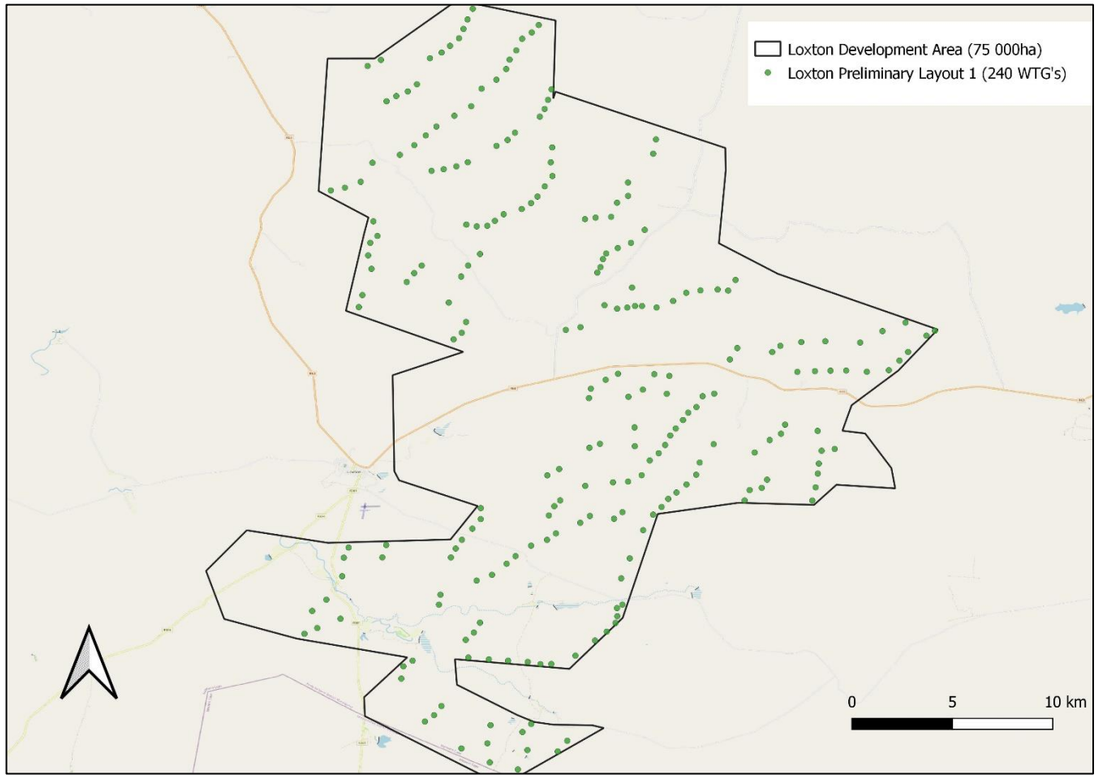


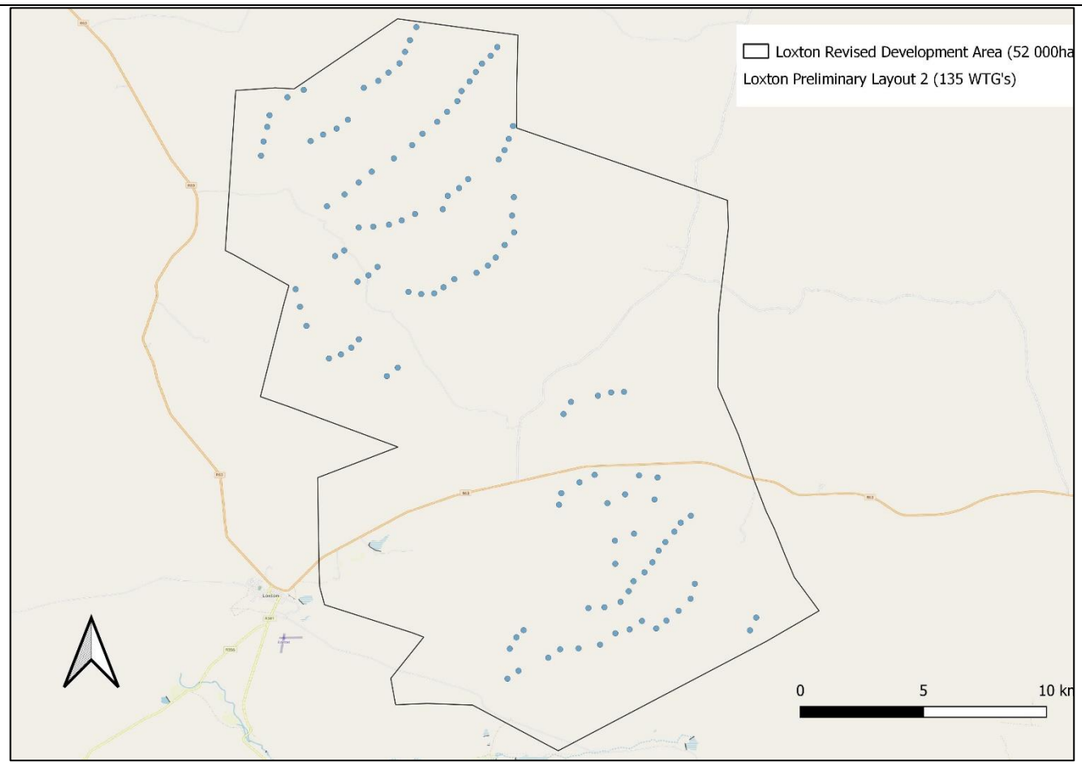
Figure 3: Other associated infrastructure No-Go's

4. SITE LAYOUT PLAN DEVELOPMENT

Since project inception, a number of layout iterations have been refined. While the purpose of this document is to demonstrate how the environmental and social constraints have defined the SLP presented in the Draft EIR, it is equally important to present the various technical feasibility aspects that informed the initial (preliminary) layout.

The table below demonstrates the level of avoidance and minimisation of impacts which informed the preferred site layout.

Version #	Date	Number of Turbines	Informant Constraints	Comments
		Preliminary Layout		
1	April-May 2020	240	Lease areas & wind resource modelling	The Initial boundaries of the lease areas as defined and agreed to with affected landowners was approx.75 000ha. Refer to Figure 4 Preliminary Layout 1 which consisted of 240 turbines which was proposed to be split into four Wind Energy Facilities (WEF).  **Figure 4: Loxton Preliminary Layout 1**
2	July 2020	142	Avifaunal screening	An avifaunal specialist was appointed to conduct an initial site survey and report on any key priority species nesting within the project or neighbouring properties the layout was reduced to 142 Turbines and three WEF's after considering the VERA Model buffers and two 6km Martial Eagle Nest Buffer's. Refer Figure 5 Preliminary Layout 2 within a development area of 52 000ha.

				 **Figure 5: Preliminary Layout 2 (Avifauna Constraints)**	
3	March 2022	142	Ecological Sensitivity	The Terrestrial Ecologist & Herpetologist conducted detailed site surveys over a three-week period to map the site sensitivities, a specific focus was placed on the CBA & NPAES areas located in the south of the Loxton Cluster development area. The fine-scale mapping has been used based on the detailed survey was used to inform the layout and ensure avoidance of the Very High and High sensitivity features of the site. The high & very sensitive areas associated with Riverine rabbit habitat and their associated drainage features. Steep slopes and dolerite outcrops which represent potential Karoo Dwarf Tortoise habitat, but which are considered important for fauna more generally as well. The preliminary layout to was redesigned to avoid the high & very sensitivities.		

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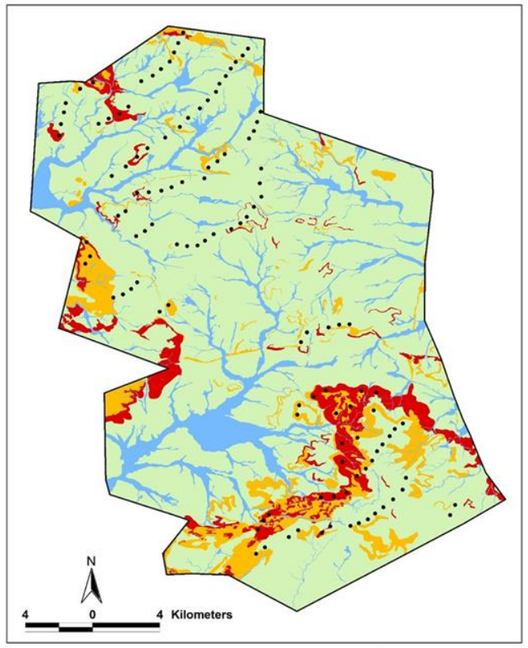

Figure 5: Original Site Layout prior to ecological screening
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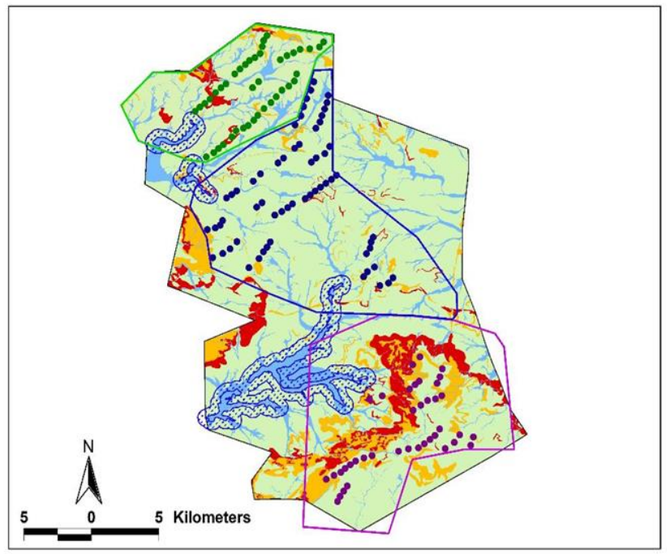

Figure 6: Revised Site Layout to avoid high & very sensitivities
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<td>March-December 2022</td>
<td>145</td>
<td>Additional Specialist</td>
<td colspan="3">Further constraints and no go buffers for turbines were identified during the specialist assessment surveys required for the scoping phase of the EIA.</td>
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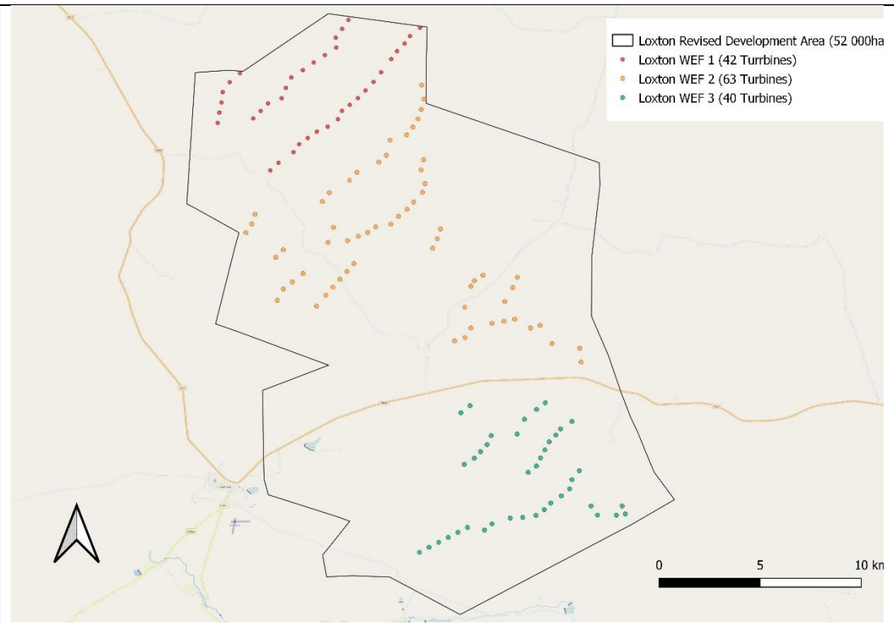
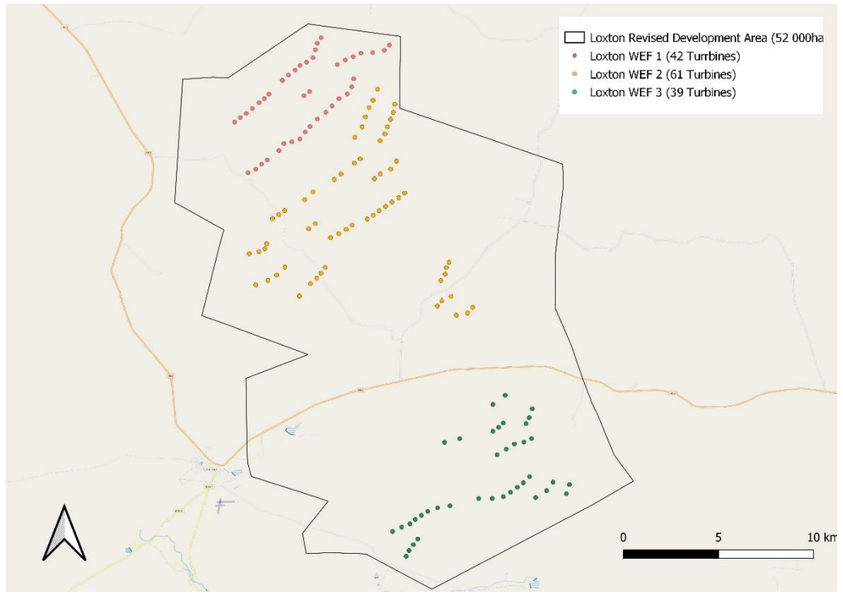
				 Figure 6: Scoping Phase Layout
4	November 22-February 23	142	Avoidance of Avifauna Noise & Bat Buffers	Refined aquatic, noise and bat buffers as well the final avifauna sensitivities were available at this point and were considered in this iteration. The layout was reduced to 142 turbines as result of Ludwig Bustard Lek which was identified in the northern half of the development area. The wind resource yield assessment undertaken from the 12 months of wind data from the measurement masts was also used to inform the EIA layout.  Figure 7: DEIR Layout
		DEIR Layout		

8	February 2023		Micro-siting of turbines 20,39, 36, 42 33, 29, 63, 72, 98, 100, 106, 108, 110, 100, & 127 outside of no-go areas. See Figures 8 & 9 as an example.	**Turbine #**	42	108
						
				Design Recommendation	Shift all infrastructure 100m northwest to avoid the bat buffer	Rotate blade laydown 50m north to avoid the aquatic and Bat buffers