

# Outer Dowsing Offshore Wind Preliminary Environmental Information Report

## Volume 2, Appendix 26.4: Noise Model Outputs

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**OUTER DOWSING OFFSHORE WIND  
PRELIMINARY ENVIRONMENTAL  
INFORMATION REPORT**

**VOLUME 2, APPENDIX 26.4: NOISE  
MODEL OUTPUTS**

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## 1.0 Noise Model Outputs

As part of the Outer Dowsing Offshore Wind project, it is proposed to construct an onshore substation (OnSS). At this stage, there are three options of substation location: one to the east of Alford (Lincolnshire Node, LN), one on the west bank of the River Glen north of Spalding (Weston Marsh North), and one on the east bank of the River Glen north of Spalding (Weston Marsh South).

As part of Chapter 26 of the Preliminary Environmental Impact Report (PEIR), noise modelling has been undertaken using the proprietary noise modelling software CadnaA®. At this stage, the finalised substation footprint and the layout of the equipment within the footprint have not yet been finalised; therefore, the sources that will be present within the substation have been evenly distributed across the worst-case (smallest) anticipated footprint of 210m x 190m.

**Table 1-1**  
**Operational plant associated with the OnSS**

OnSS Option	Item of Plant	Sound Power Level (SWL), dB	Quantity
All Options (High Voltage Alternating Current (HVAC))	Variable Shunt Reactor	90	4
	Fixed Shunt Reactor	90	4
	DRC	90	4
	DRC Transformer	90	4
	DRC Reactor	90	4
	Super Grid Transformer	90	4
	Harmonic Filter	90	8
	MV/LV Transformer	90	4

The modelling has been undertaken based on the following set of assumptions:

- All the plant is operating simultaneously 100% of the time;
- All sources modelled as point sources at a height of 2.5m above ground level for each source;
- As no 1/3 octave band data all predictions have been undertaken in the 500 Hz frequency band;
- G = 0 hard ground within the OnSS footprints;
- G = 0.9 soft ground between each OnSS footprint and each receptor;
- A daytime receiver height of 1.5m and a night-time receiver height of 4m, approximate height of a ground floor and first floor window respectively at all the NSRs considered; and
- A reflection factor of 3.

The following meteorological inputs have also been used:

- Downwind propagation between each OnSS option and the receiver (NSRs);
- Relative Humidity = 70%; and
- Air Temperature = 10°C.

Specific sound levels have been predicted from each operational substation option (LN, WMN, WMS). Predictions were undertaken with the footprint of the OnSS at the closest approach of each receptor in order to determine the worst-case operational sound level at each receptor.

The receptors considered in these predictions are described in Table 1-2 below.

**Table 1-2**  
**Noise Sensitive Receptor Locations – LN, WMN and WMS OnSS Options**

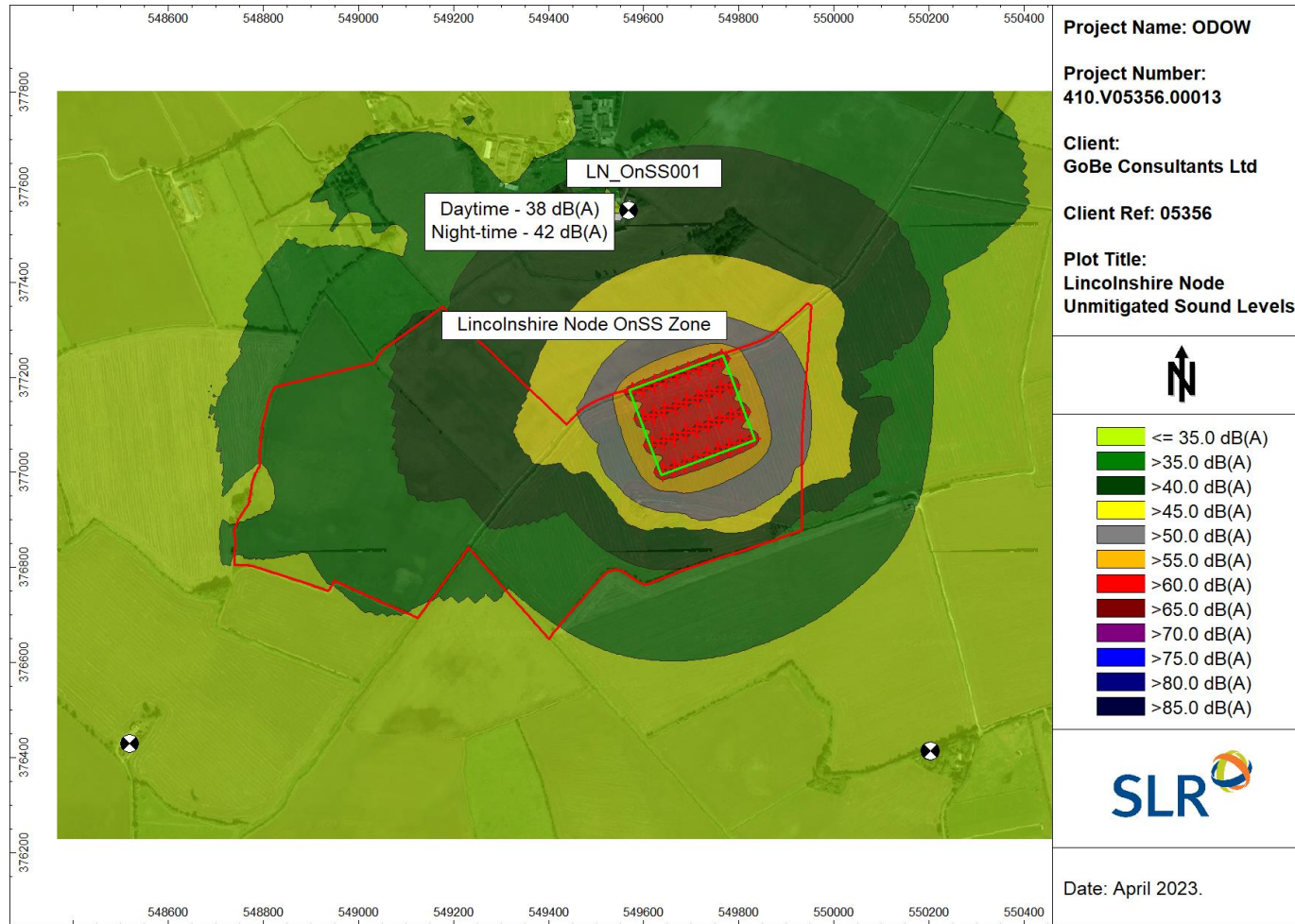
Location ID	Description	OS Grid Ref	
LN_OnSS001	To the north of the substation zone, representative of the farm and residential property to the north.	549568	377520
LN_OnSS002	At a location representative of the residential property to the southwest of the substation zone.	548519	376417
LN_OnSS003	At a location representative of the residential property to the southeast of the substation zone.	550155	376401
WMN_OnSS001	At a location representative of the residential property to the southwest of the substation zone.	527833	330478
WMN_OnSS002	At a location representative of the residential property to the southeast of the substation zone.	528613	330820
WMN_OnSS003	At a location representative of the residential property to the west of the substation zone.	527374	331328
WMN_OnSS004	At a location representative of the residential property to the north of the substation zone.	528486	332442
WMS_OnSS001	At a location representative of the residential property to the north of the substation zone.	529017	329164
WMS_OnSS002	At a location representative of the residential property to the northeast of the substation zone.	529882	329052
WMS_OnSS003	At a location representative of the residential property to the southeast of the substation zone.	529889	327621
WMS_OnSS004	At a location representative of the residential property to the south of the substation zone.	528830	327155
WMS_OnSS005	At a location representative of the residential property to the south-west of the substation zone.	528125	327719
WMS_OnSS006	At a location representative of the residential property to the west of the substation zone.	528349	328640

The noise model outputs of a substation footprint at the closest approach to each receptor considered are presented below. The grids are set at 4 m height, showing the specific sound levels for a first-floor receptor.

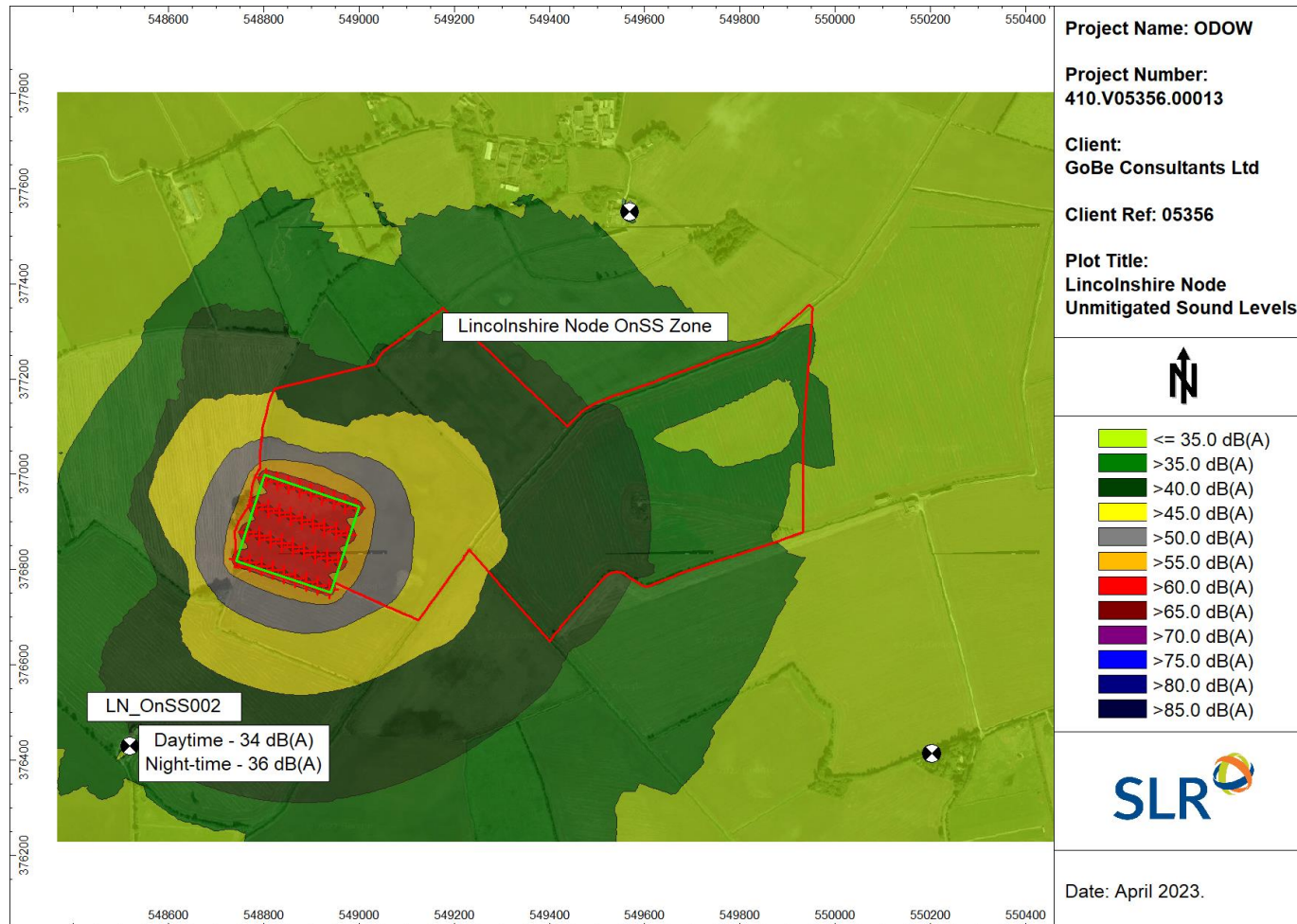
## 1.1 Lincolnshire Node Substation Option



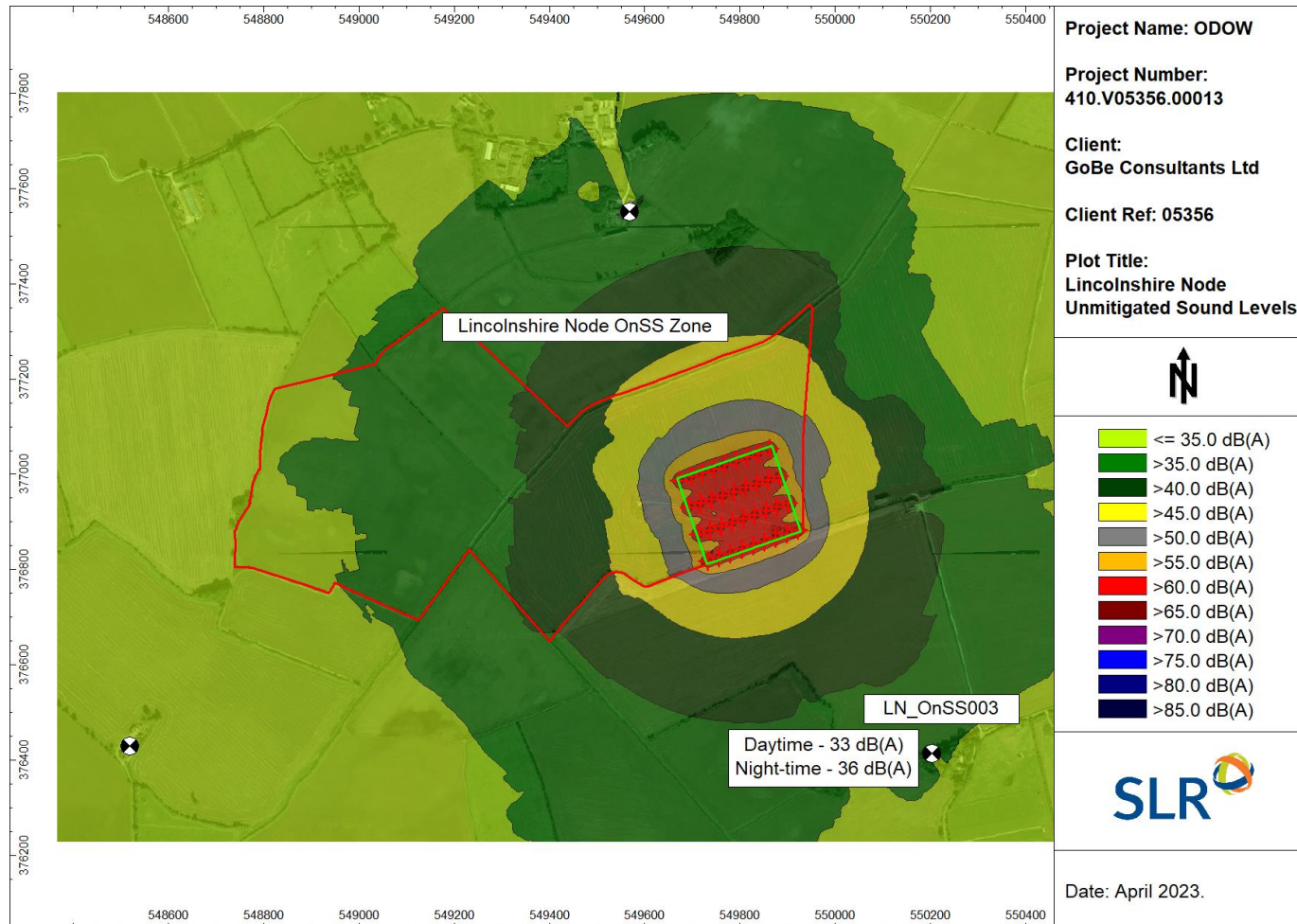
**Figure 1-1**  
**Unmitigated LN\_OnSS001**



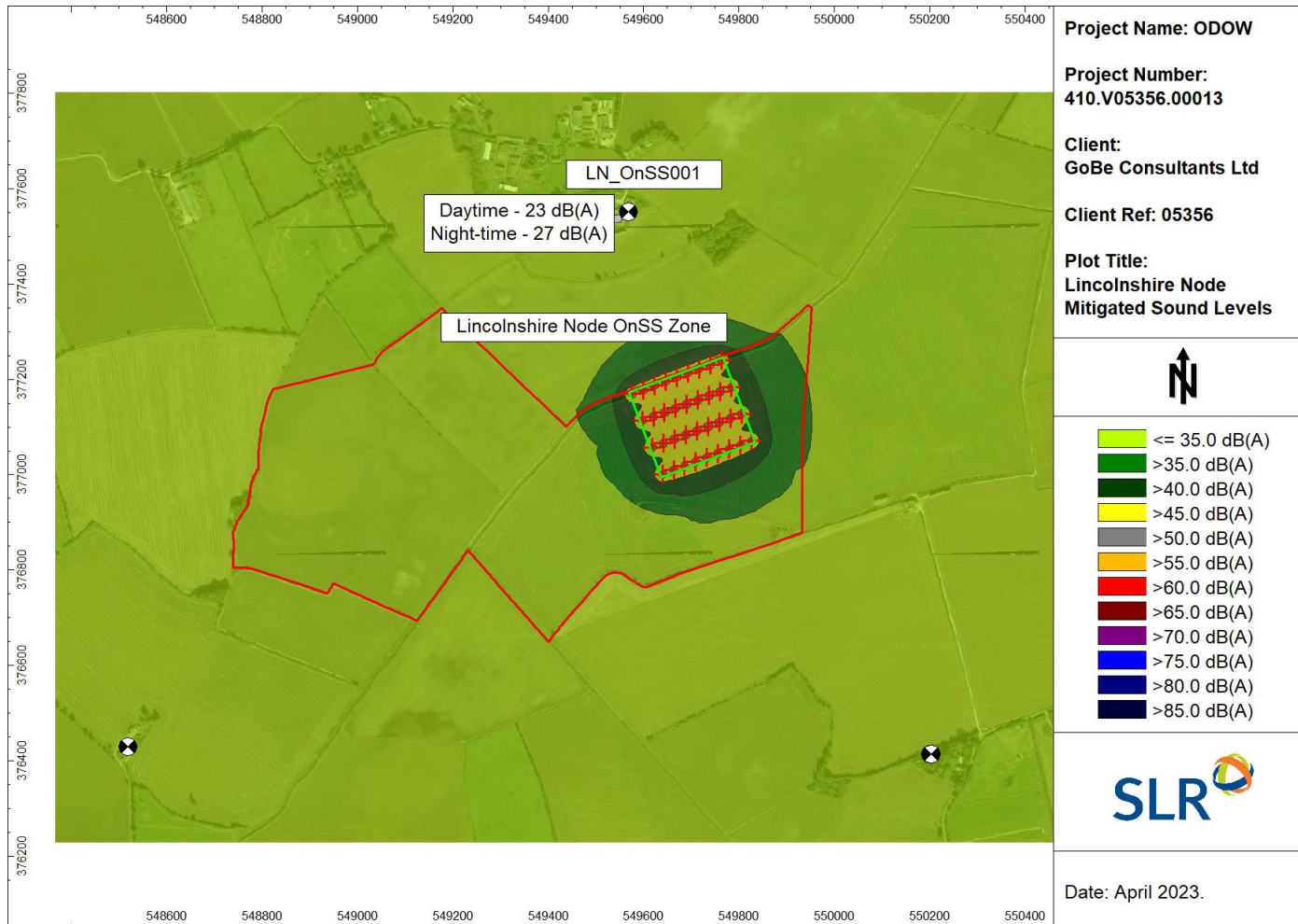
**Figure 1-2**  
**Unmitigated LN\_OnSS002**



**Figure 1-3**  
**Unmitigated LN\_OnSS003**



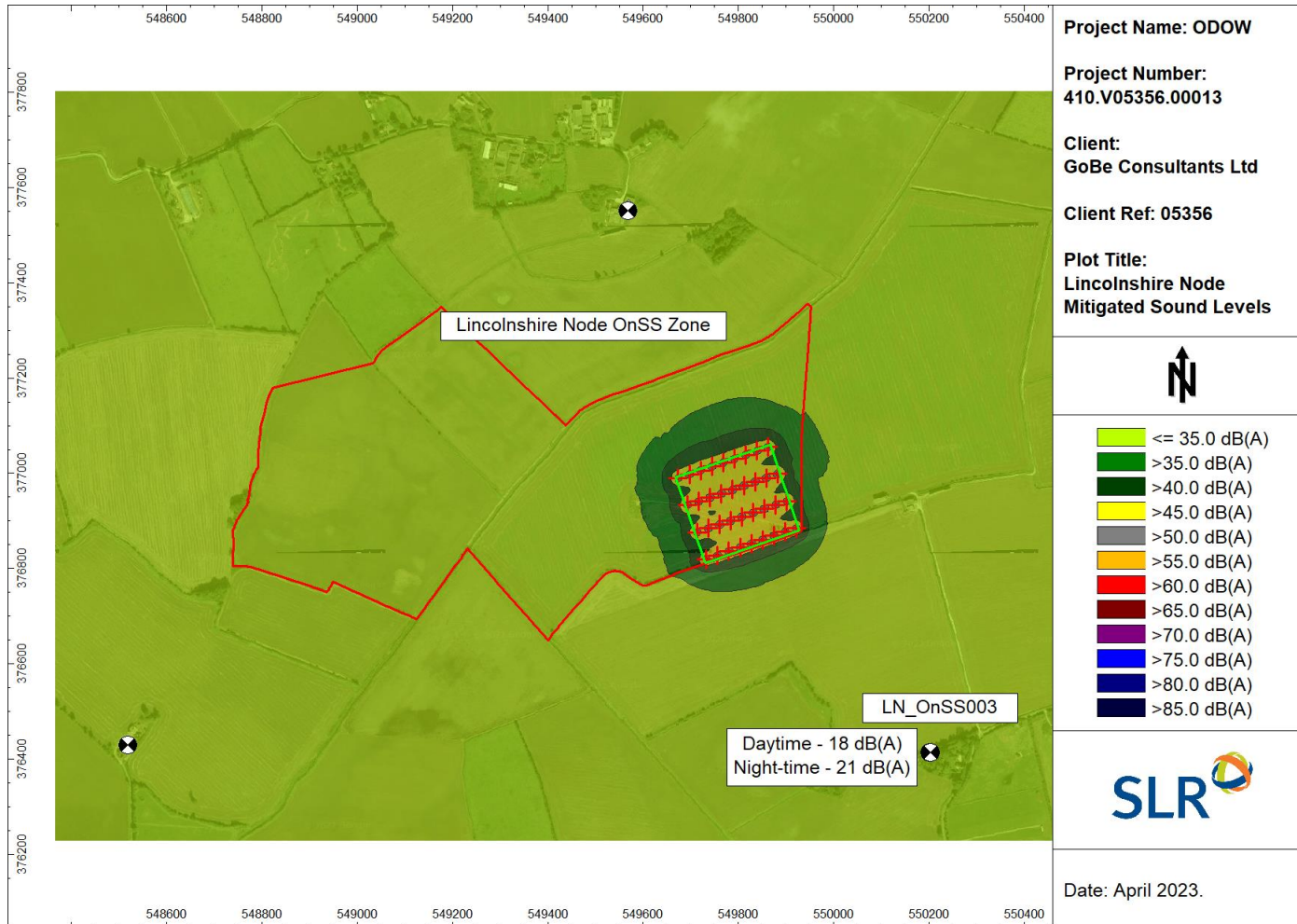
**Figure 1-4**  
**Mitigated LN\_OnSS001**



**Figure 1-5**  
**Mitigated LN\_OnSS002**

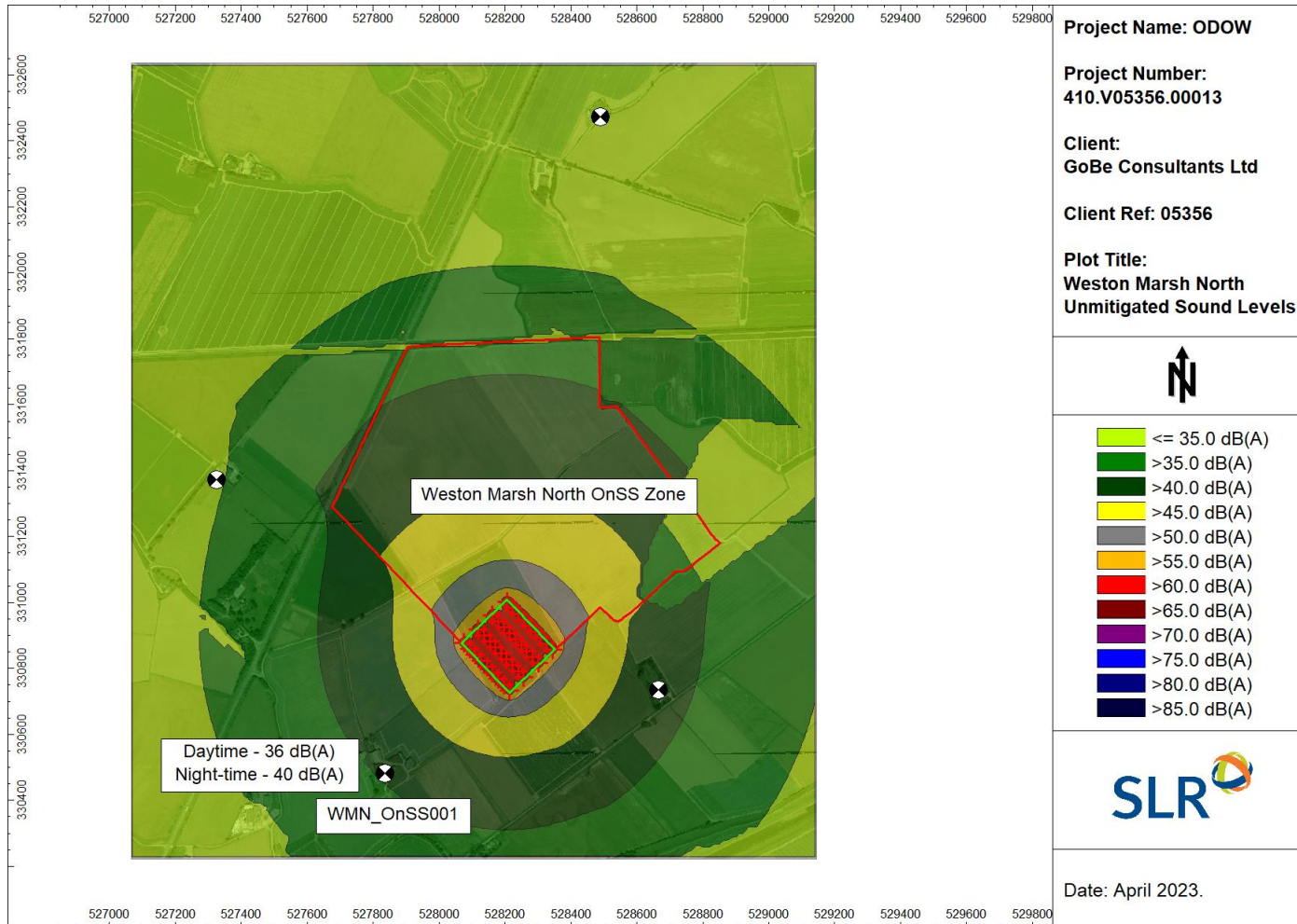


**Figure 1-6**  
**Mitigated LN\_OnSS003**



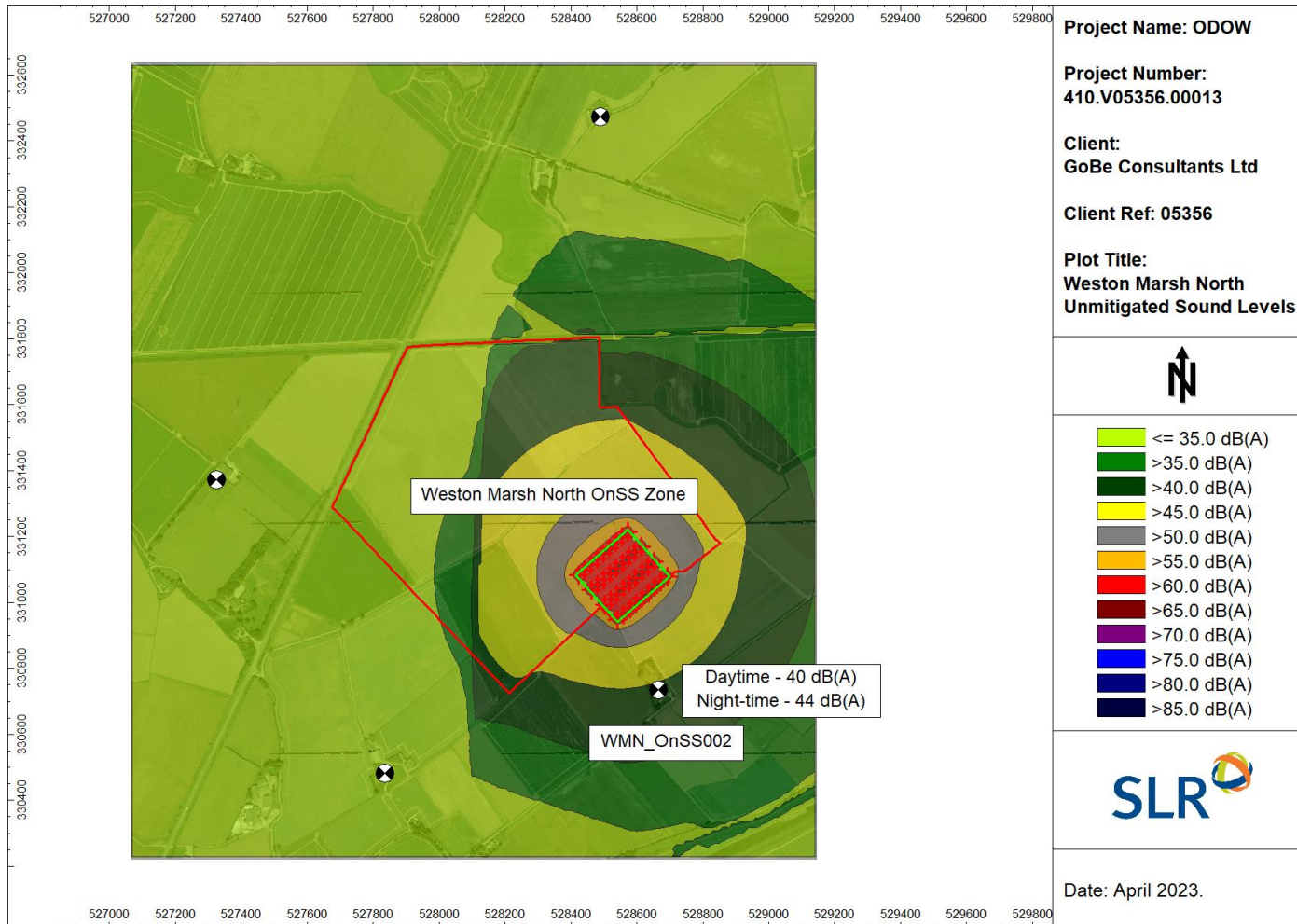
## 1.2 Weston Marsh North Substation Option

**Figure 1-7**  
**Unmitigated WMN\_OnSS001**

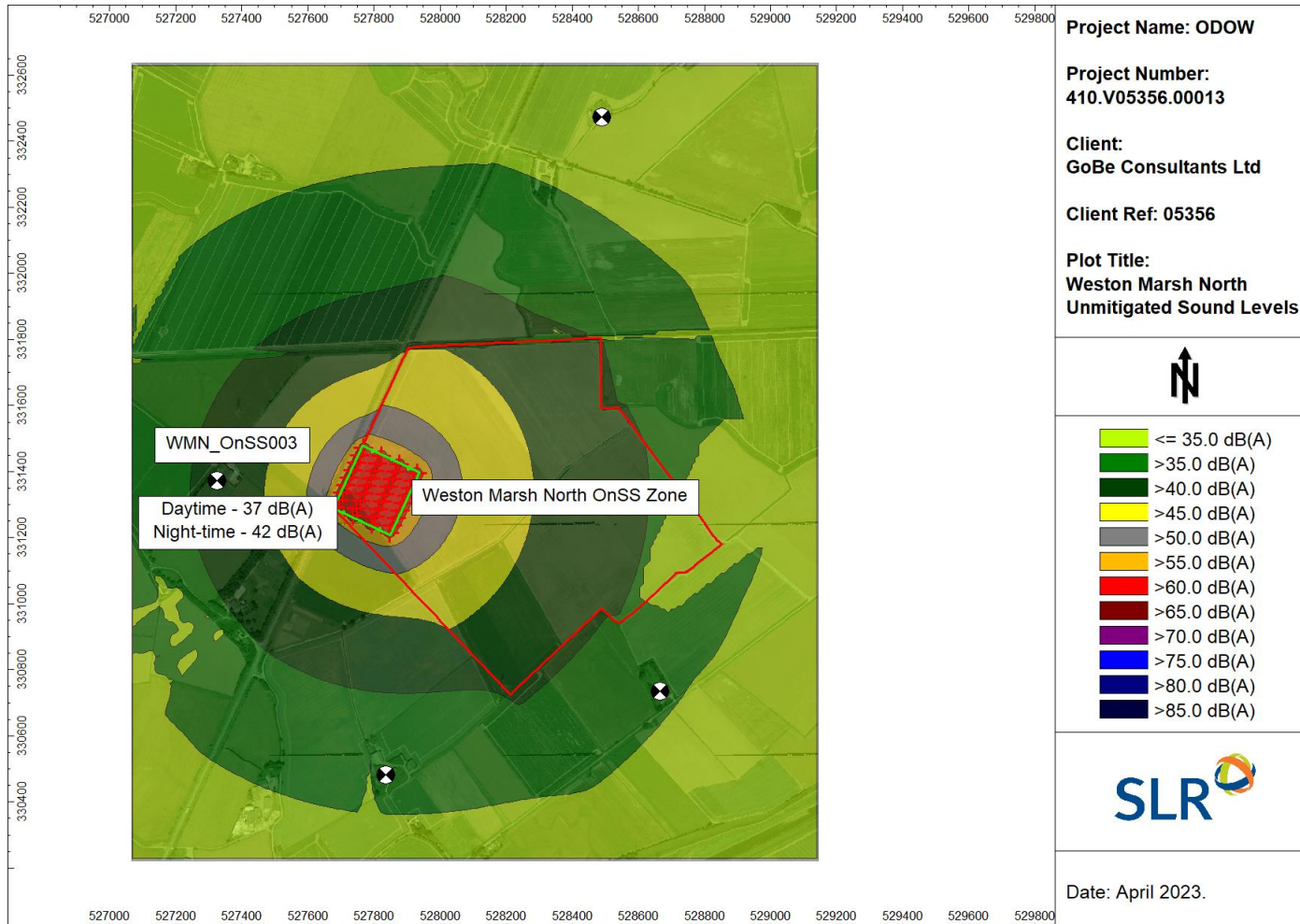




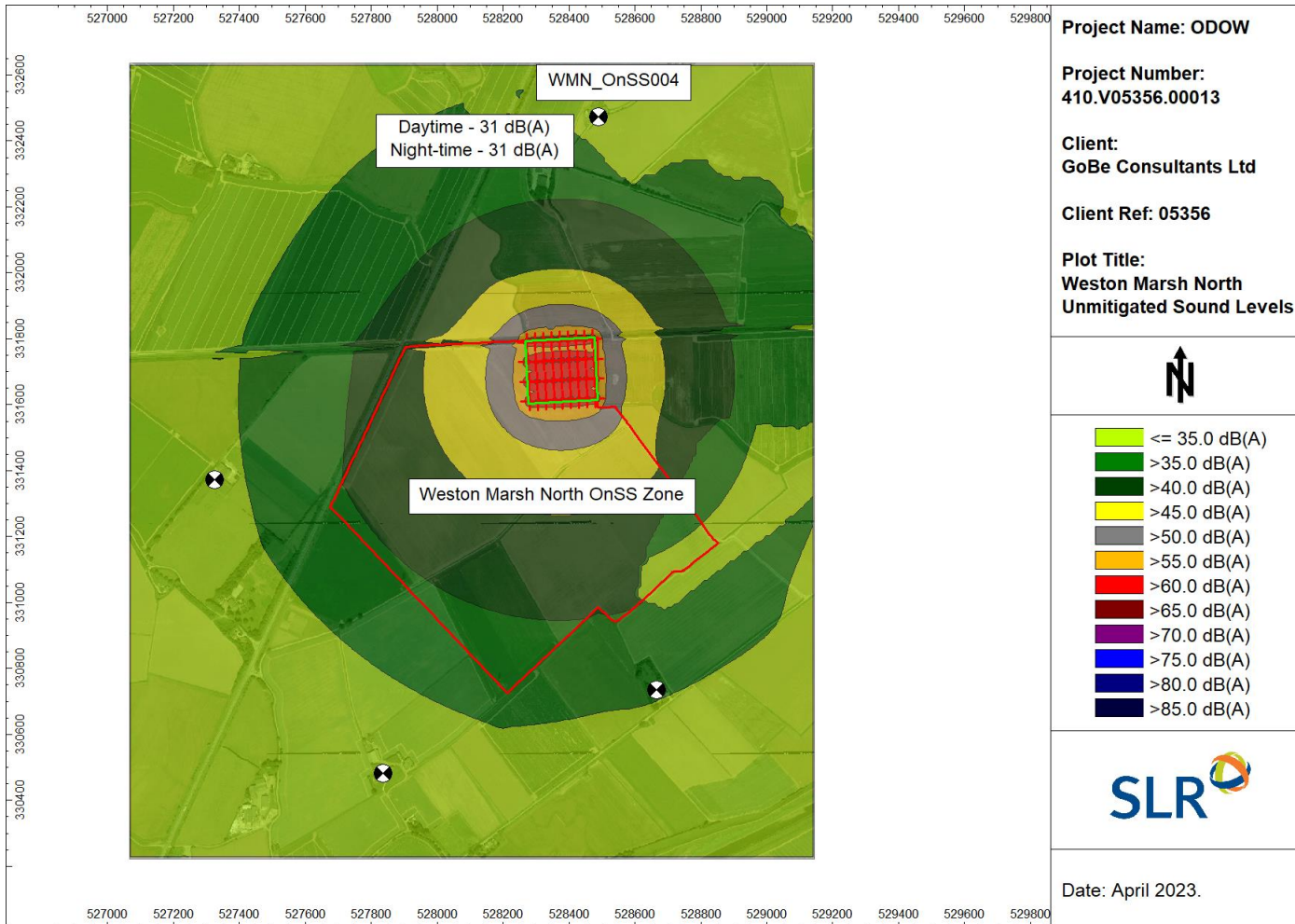
**Figure 1-8**  
**Unmitigated WMN\_OnSS002**



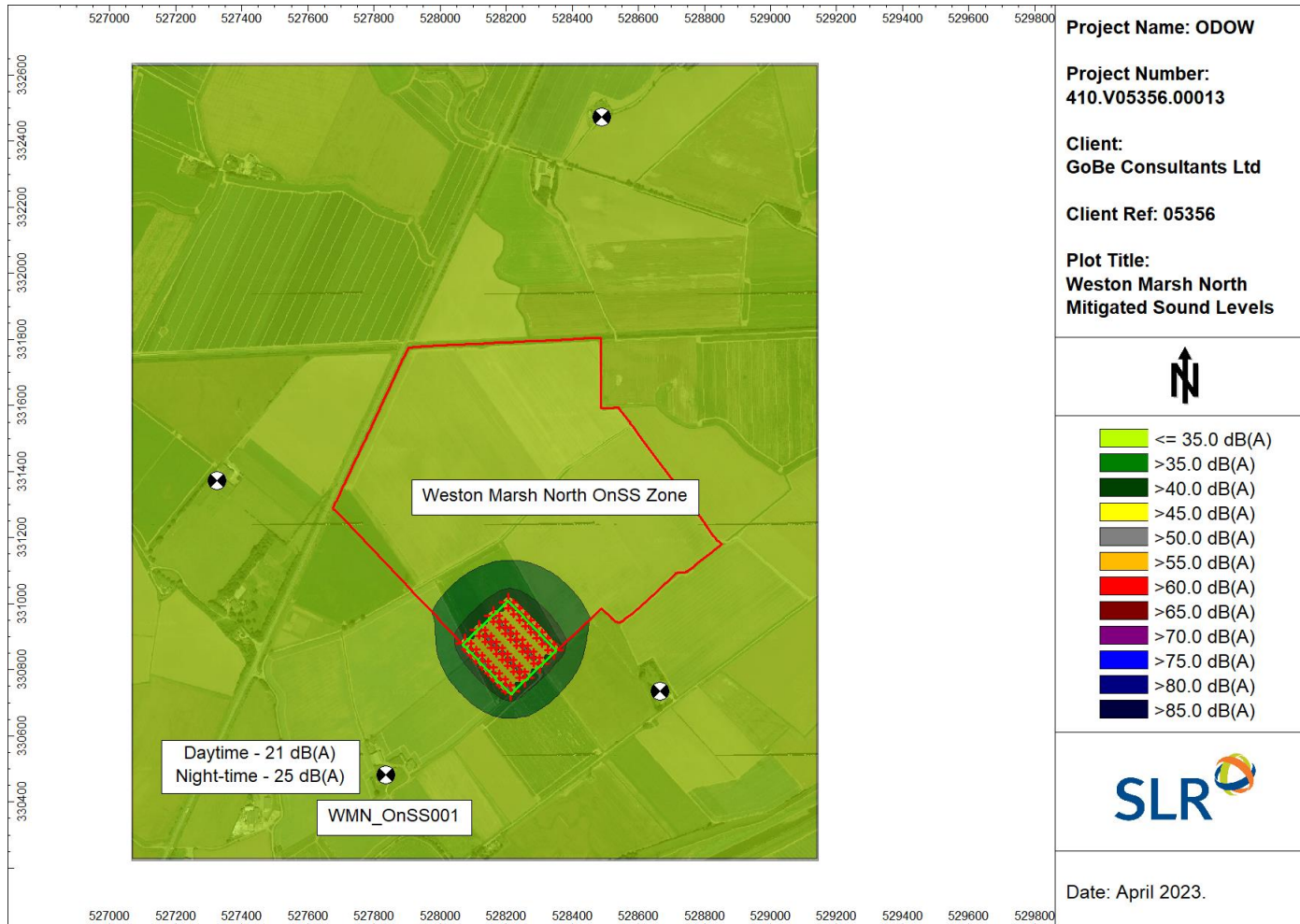
**Figure 1-9**  
**Unmitigated WMN\_OnSS003**



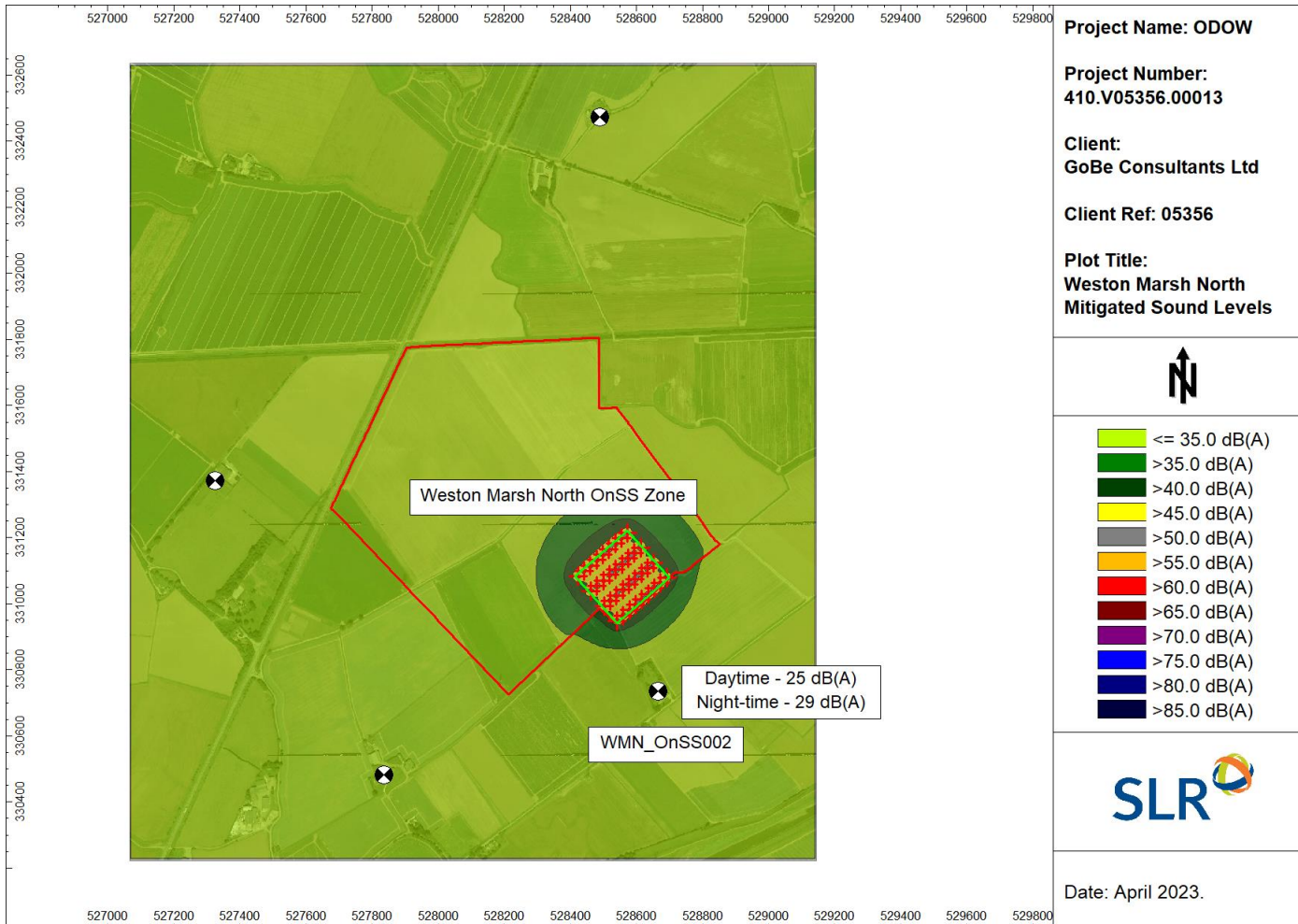
**Figure 1-10**  
**Unmitigated WMN\_OnSS004**



**Figure 1-11**  
**Mitigated WMN\_OnSS001**



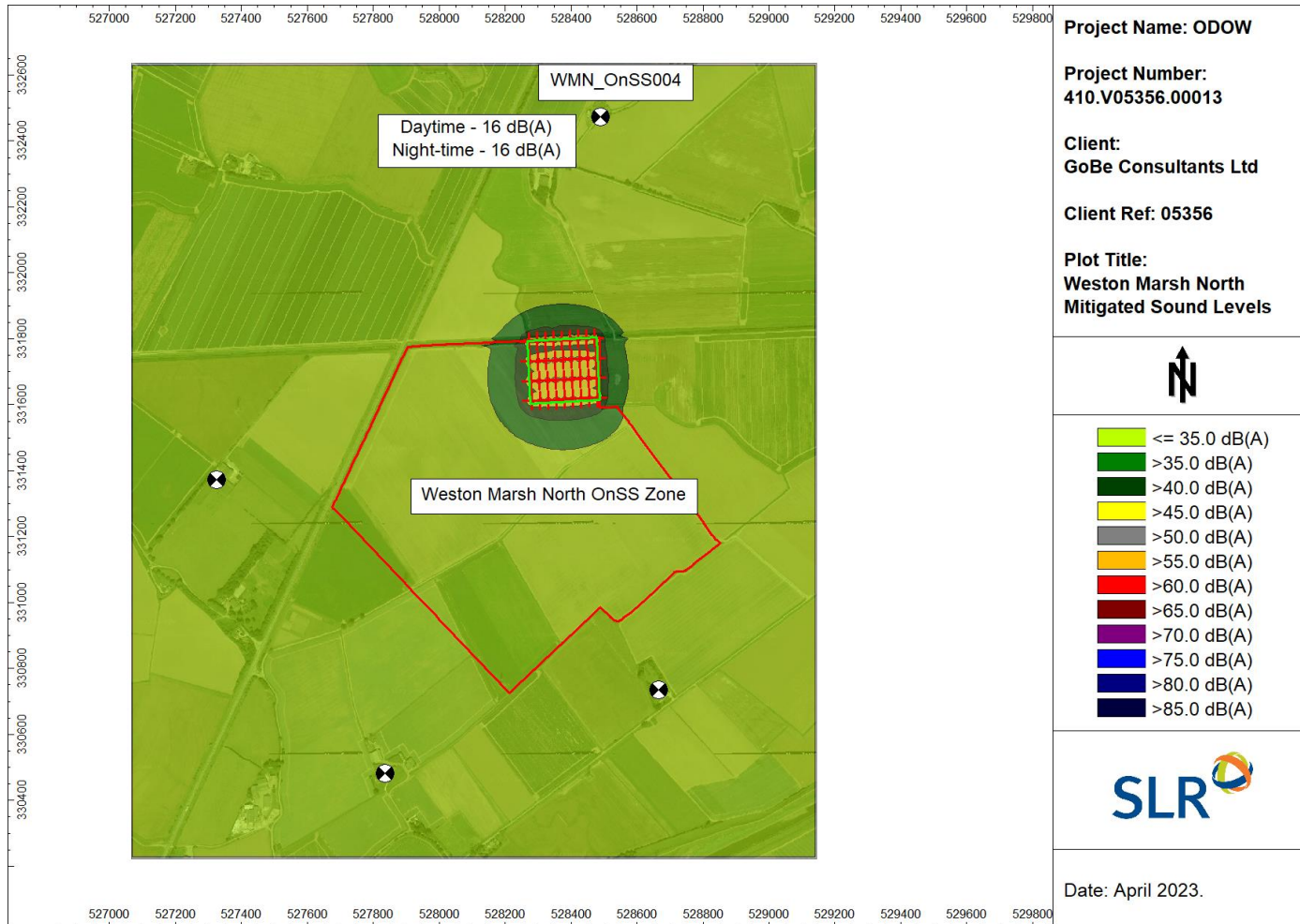
**Figure 1-12**  
**Mitigated WMN\_OnSS002**



**Figure 1-13**  
**Mitigated WMN\_OnSS003**



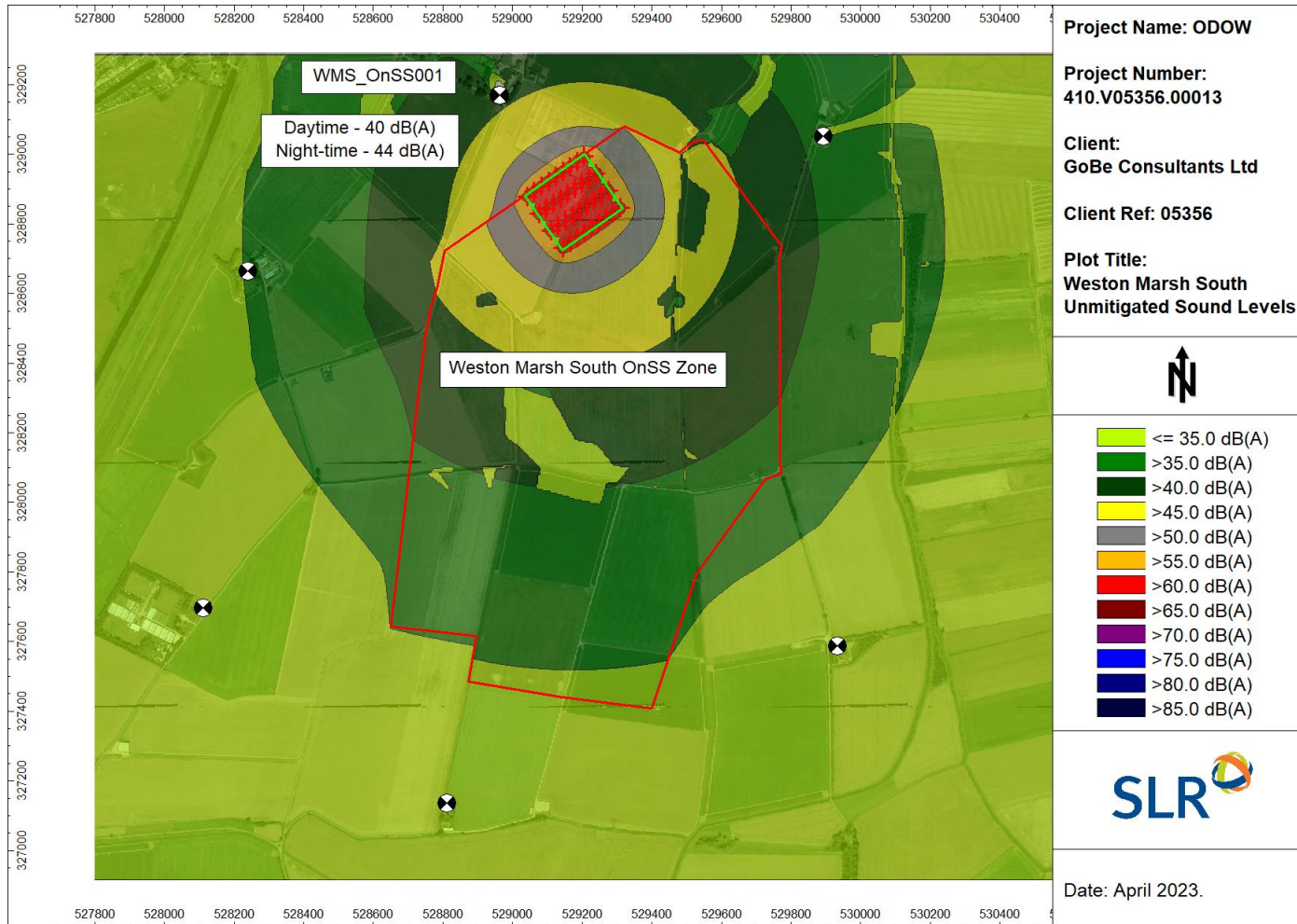
**Figure 1-14**  
**Mitigated WMN\_OnSS004**



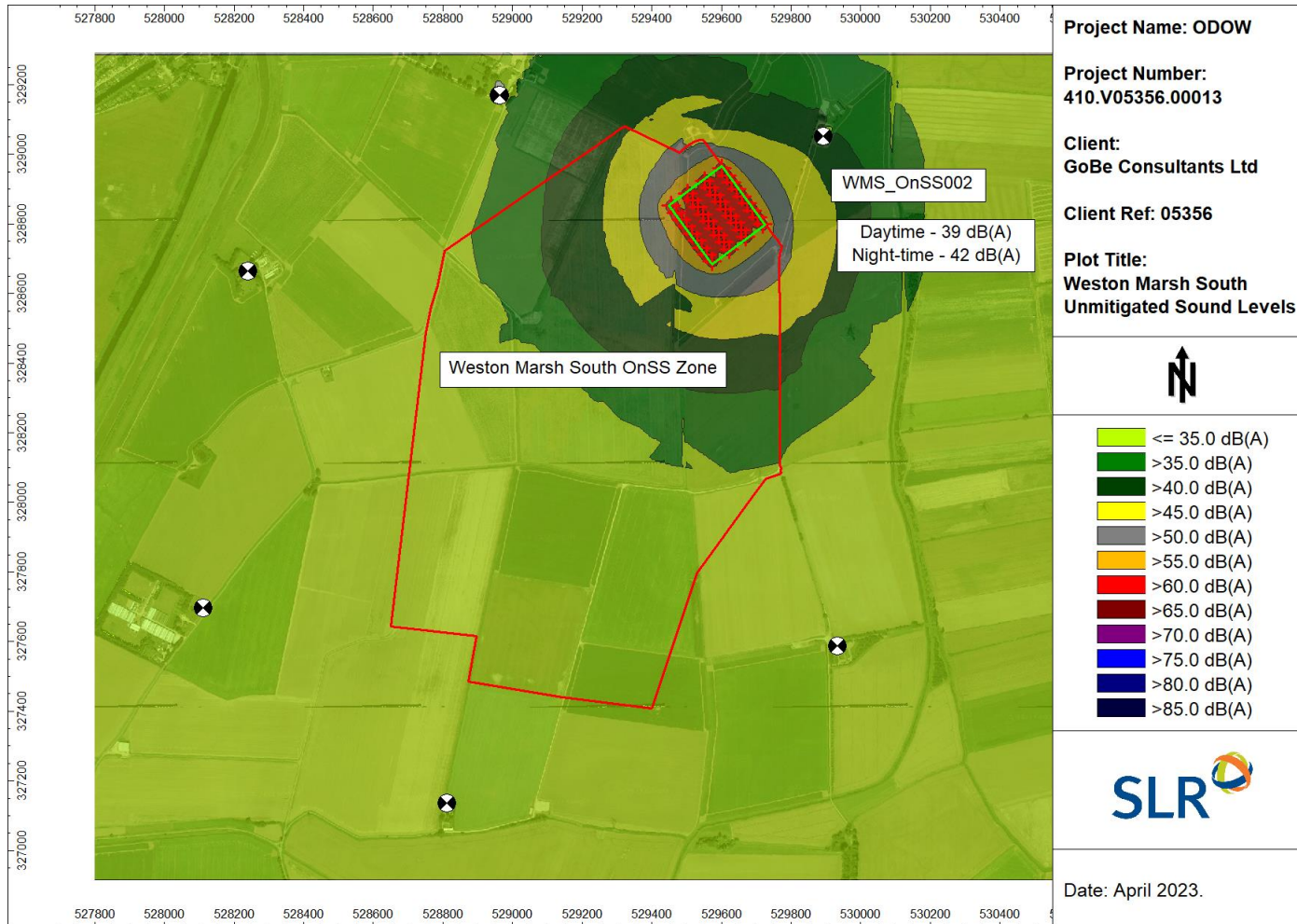
## 1.3 Weston Marsh South Substation Option



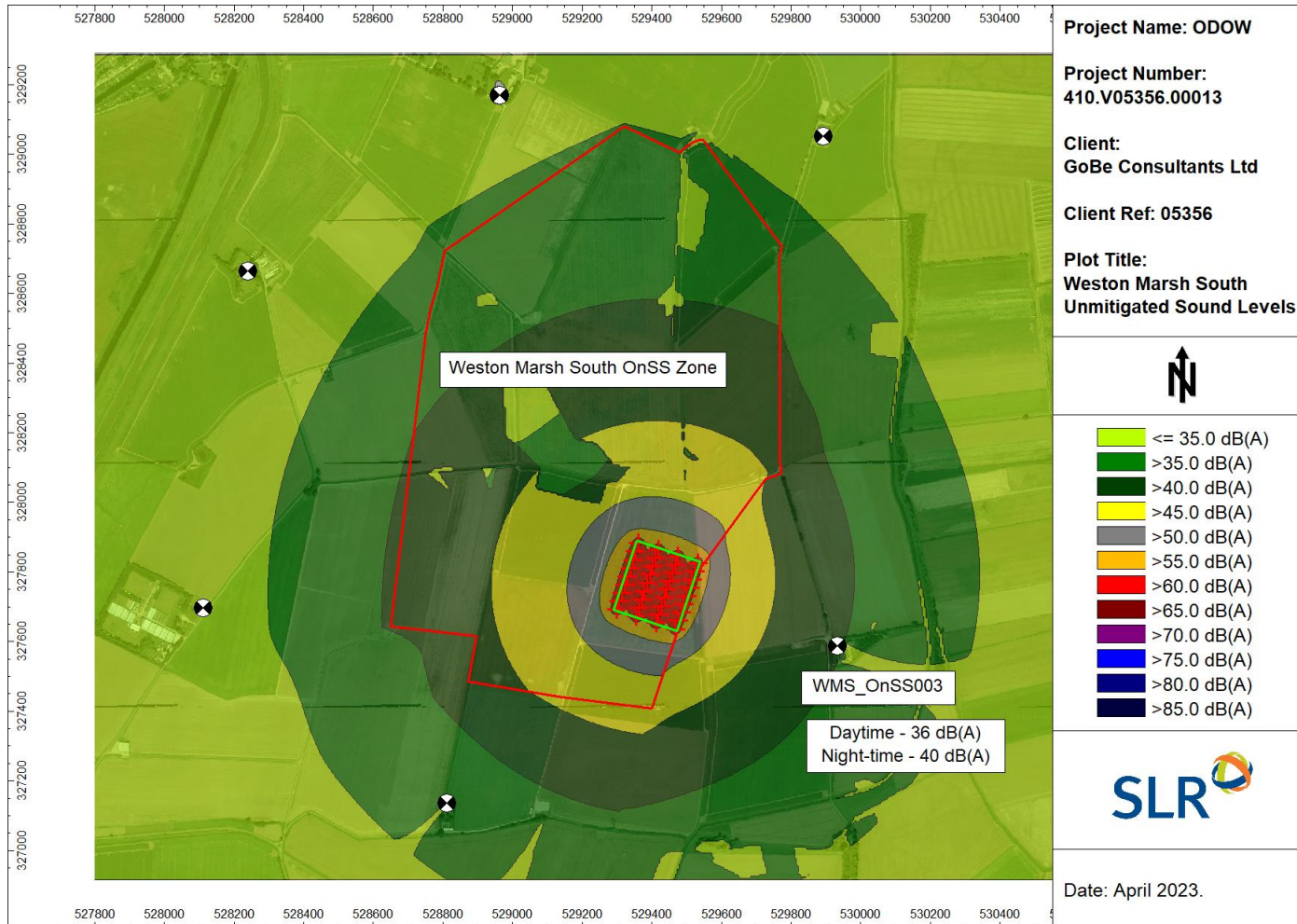
**Figure 1-15**  
**Unmitigated WMS\_OnSS001**



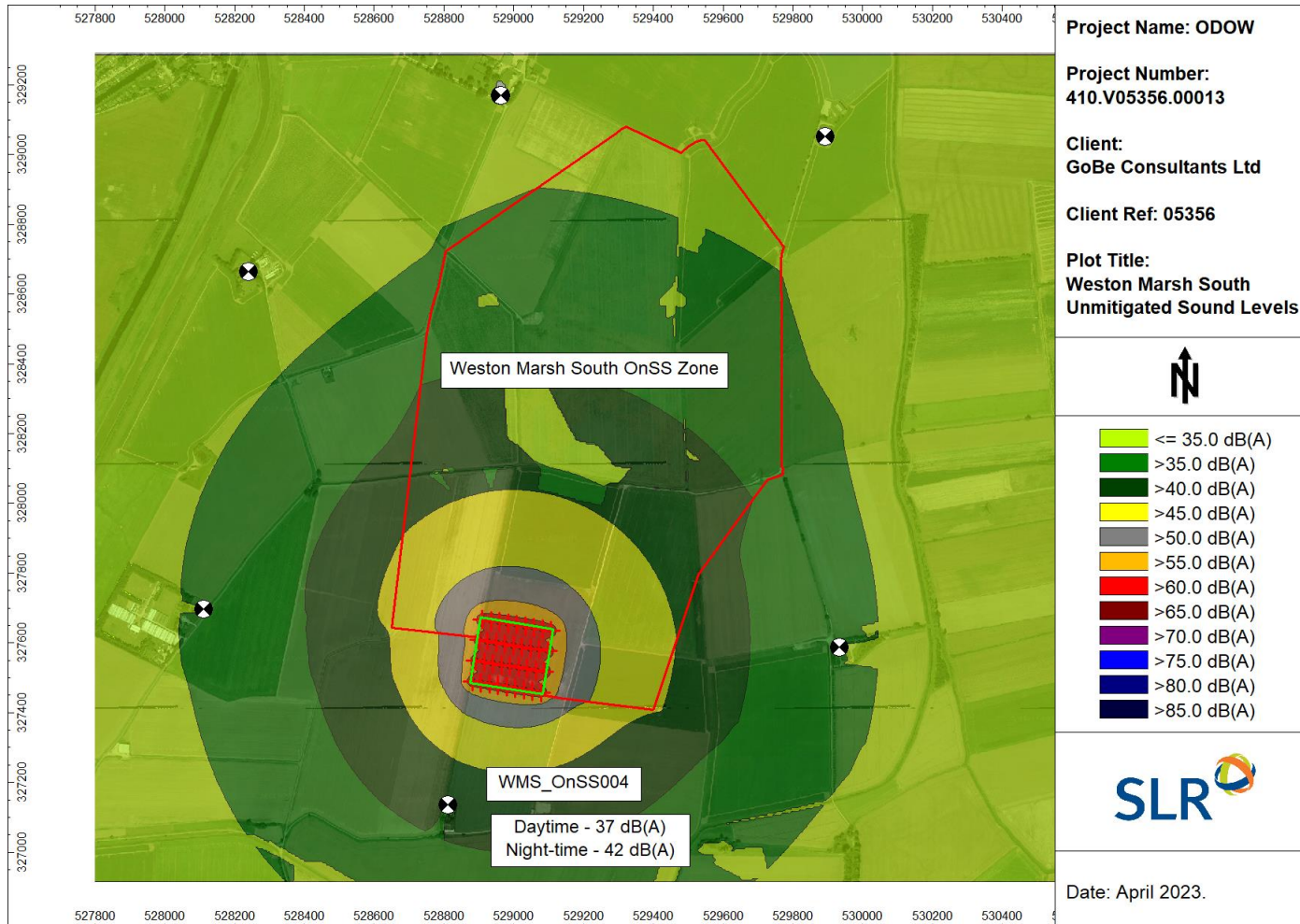
**Figure 1-16**  
**Unmitigated WMS\_OnSS002**



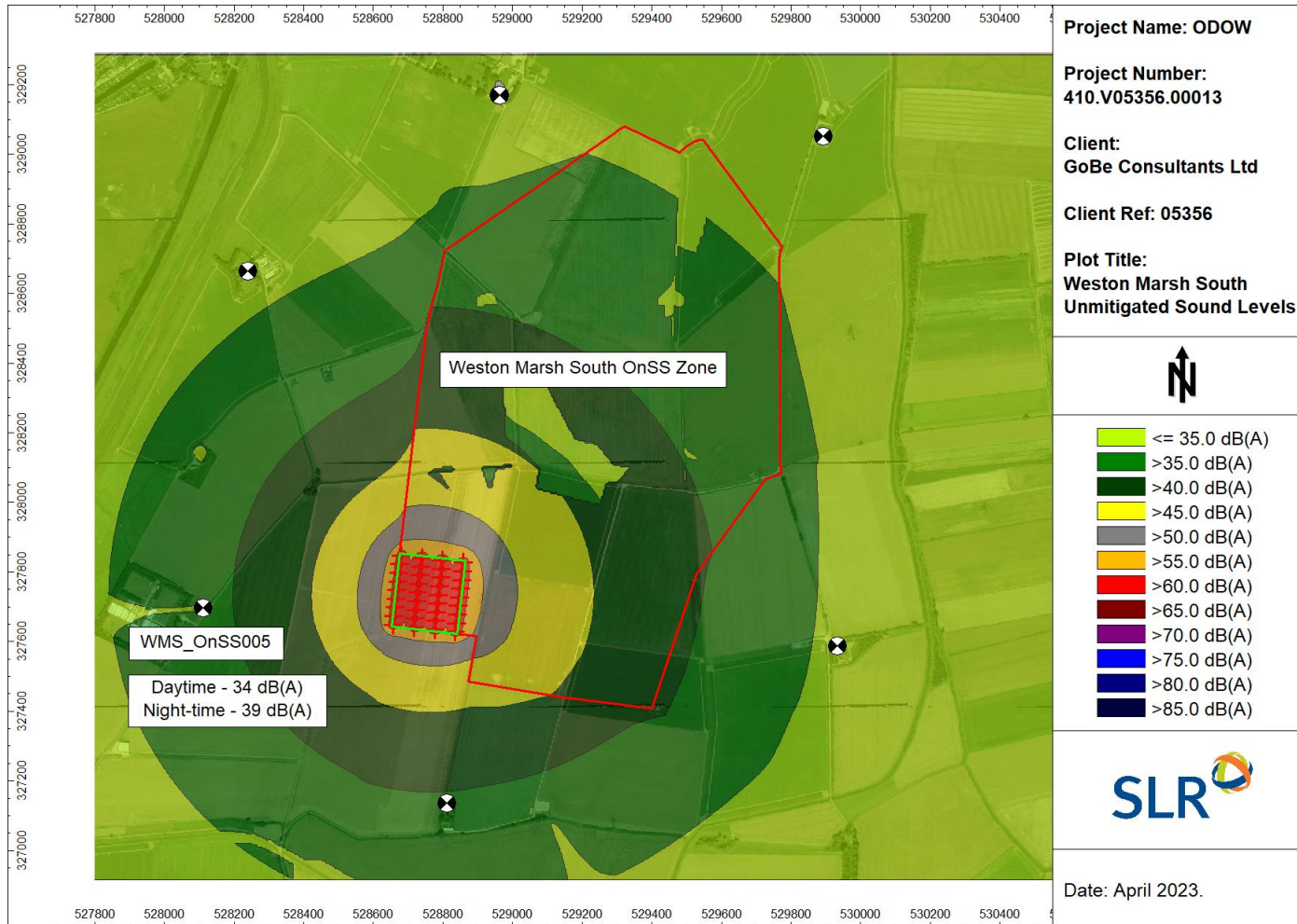
**Figure 1-17**  
**Unmitigated WMS\_OnSS003**



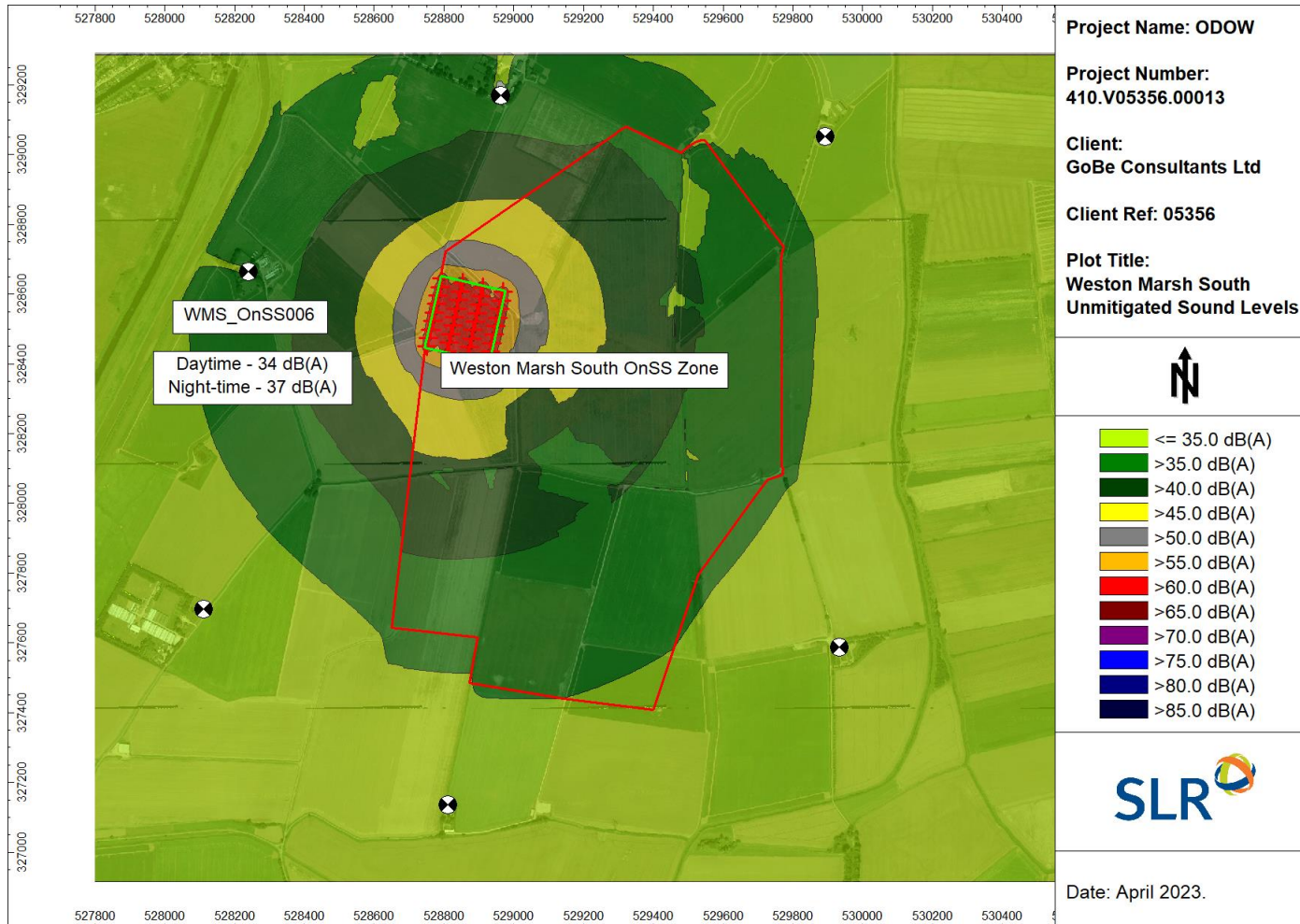
**Figure 1-18**  
**Unmitigated WMS\_OnSS004**



**Figure 1-19**  
**Unmitigated WMS\_OnSS005**



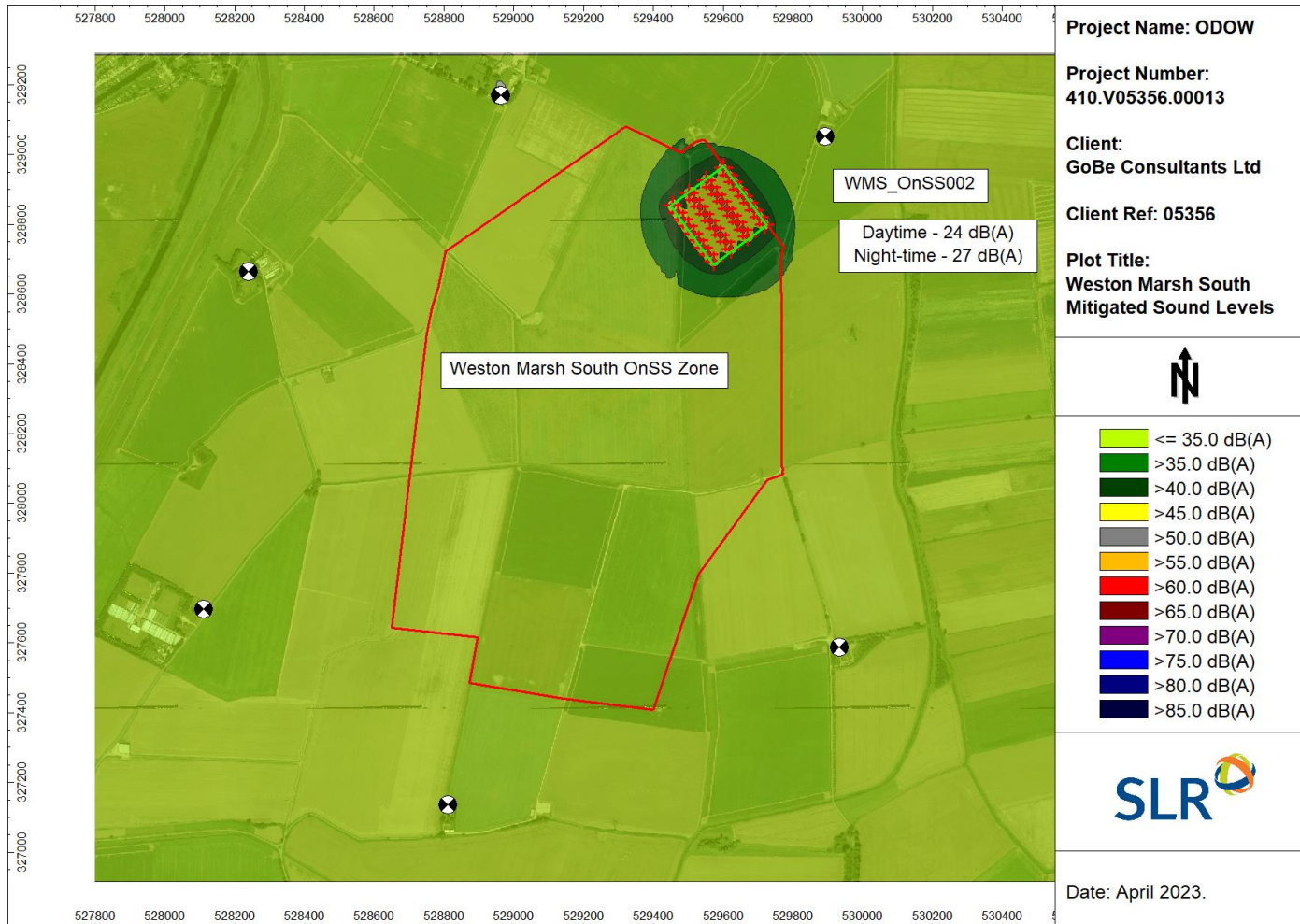
**Figure 1-20**  
**Unmitigated WMS\_OnSS006**



**Figure 1-21**  
**Mitigated WMS\_OnSS001**



**Figure 1-22**  
**Mitigated WMS\_OnSS002**

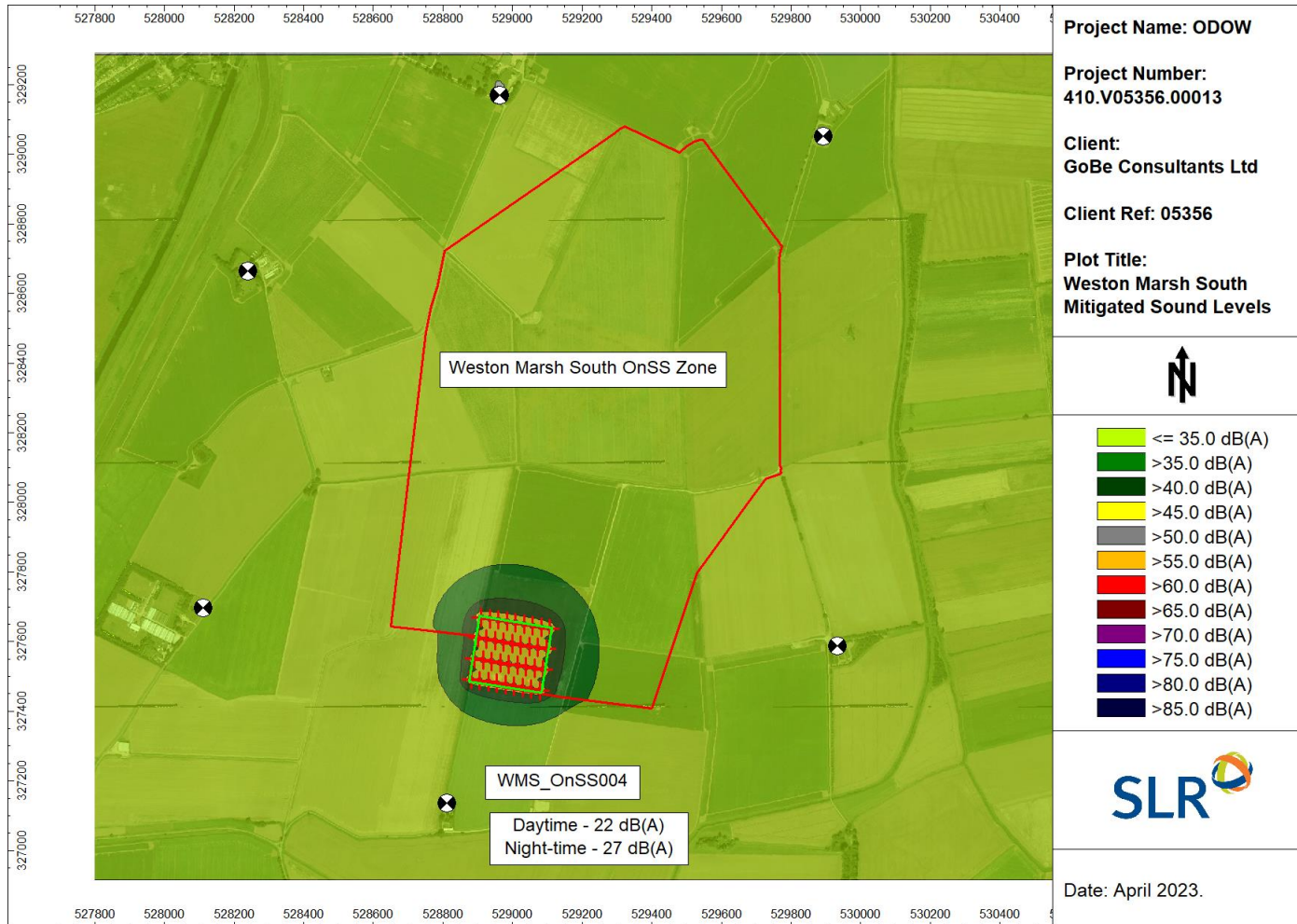




**Figure 1-23**  
**Mitigated WMS\_OnSS003**



**Figure 1-24**  
**Mitigated WMS\_OnSS004**



**Figure 1-25**  
**Mitigated WMS\_OnSS005**



**Figure 1-26**  
**Mitigated WMS\_OnSS006**



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