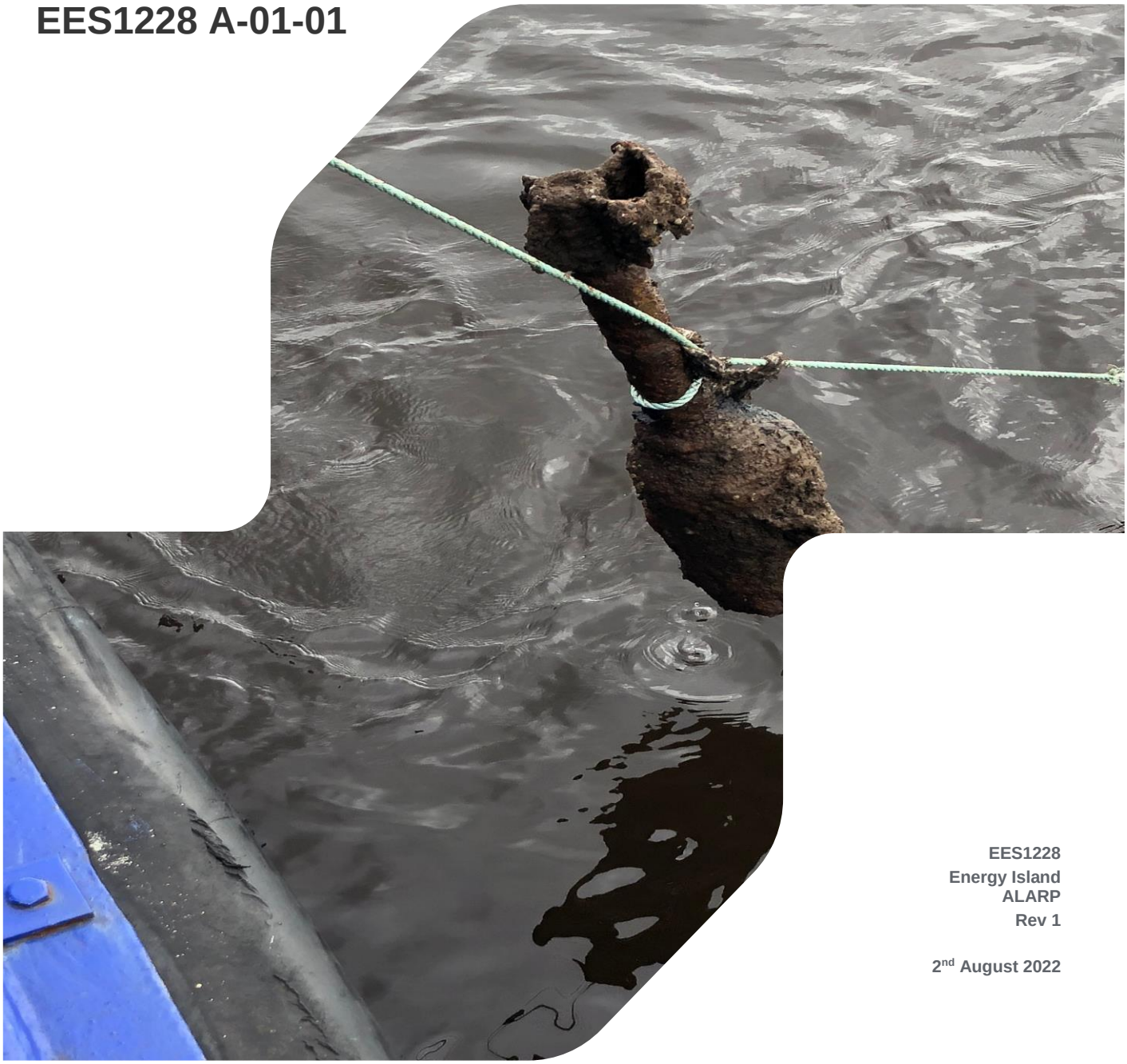
ENERGINET - ENERGY ISLAND – NORTH SEA

ALARP CERTIFICATE

EES1228 A-01-01



EES1228
Energy Island
ALARP
Rev 1

2nd August 2022

rpsgroup.com

Document status

Revision	Purpose of document	Authored by	Reviewed by	Approved by	Review date
0	ALARP Certificate	John Baker	Dan Brown	Victoria Phillips	29/06/2022
1	Client Comments	John Baker	Dan Brown	Victoria Phillips	02/08/2022

Approval for issue

Victoria Phillips  2 August 2022

Prepared by:

RPS

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Prepared for:

ENERGINET

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Appendices

ABBREVIATIONS

Abbreviation	Definition
ALARP	As Low As Reasonably Practicable
GW	Giga Watt
ID&C	Identification & Clearance
Kg	Kilogramme
m	Metre
MTL	Master Target List
pUXO	Potential UXO
ROV	Remotely Operated Vehicle
TIR	Target Investigation Report
UXO	Unexploded Ordnance

1 INTRODUCTION

1.1 Energy Islands in Denmark

Denmark is establishing the world's first energy islands, marking the beginning of a new era for large-scale offshore wind power.

In June 2020, the Danish Folketing decided to begin preparations for the construction of two energy islands in Denmark – in the North Sea and in the Baltic Sea. The energy island on Bornholm will have a capacity of 2 GW, while the one in the North Sea will have a capacity of 3 GW in 2030, and 10 GW in the longer term.

The two energy islands are to be completed in 2030 and will be able to supply 5 GW of power. This is enough to meet the average electricity consumption of 5 million households.

1.2 North Sea Energy Island

The site of this ALARP certificate is the North Sea Energy Island as detailed in the client-provided document "*Energy Island - UXO consultant -Scope of Services - North Sea"* and shown in ***Figure 1.1.***

The Energy Island area comprises of:

- 1 offshore wind farm area of 3 GW.
- 1 location for an artificial island (likely a caisson structure) to host substation functionality and potentially maintenance facilities.
- Subsea cables from energy island to offshore wind farms.

Although the construction site area is expected to be in the order of 500 m x 500 m the ALARP certified area required is 2.5 km x 2.5 km as shown in **Appendix 3.**

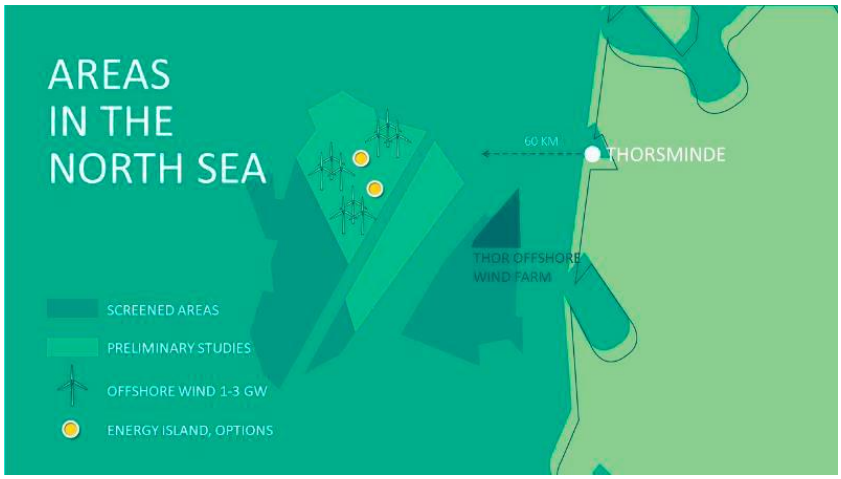


Figure 1.1 - Project Location

The purpose of this document is to sign-off the Unexploded Ordnance (UXO) risks prior to site activities in order to conform to the legal and Health & Safety Executive endorsed principle of As Low as Reasonably Practicable (ALARP). The ALARP principle has been achieved on site through the conducting of geophysical surveys designed to detect UXO on the seabed. From the geophysical surveys, anomaly lists were produced of items that modelled within the realms of UXO. It should be noted that whilst the UXO risks have been reduced in accordance with the identified threat, they have not been reduced to zero. Importantly it needs to be clarified that it is not reasonably practicable to reduce the risk to zero and may never be possible to do so within the limits of the technology available and used on this project. As such a residual risk, albeit small, may remain; nevertheless, these risks are considered "*de minimis*" and are therefore considered reasonable and practicable.

The delivery of this certificate serves as the final step in the process of reducing the site to ALARP. Geophysical Surveys were conducted in 2021 to detect UXO and a UXO clearance campaign was completed in 2022.

1.3 Terminology

The term 'site' refers to the surveyed area (**Appendix 3.*)** associated with the proposed works. Further select terminology used in this document is presented in **Appendix 1.**

1.4 Data Collection

Offshore geophysical surveys were conducted between October and December 2021 from the Dynamically Positioned (DP) vessel the *Relume*. The UXO survey was detailed under Work Pack D with the following summary, "*To mitigate the UXO risk in the area planned for the North Sea energy island, a high resolution UXO survey including magnetometry, side scan sonar and multibeam echosounder shall be performed".*

Figure 1.2 – DP Vessel Relume & Launch of ROV with Gradiometer Frame being extended.

The ROV was fitted with a Gradiometer Frame that, once the ROV was launched, extending out on both the port and starboard sides of the ROV (***Figure 1.2*** shows the starboard frame in the process of being extended).

The ROV UXO Survey was a high-quality SSS, MBES & Magnetometer survey that resulted in 100% data coverage of the Artificial Island Site with UXO depth of detection (50 kg ferrous mass) to 2 m burial.

The raw data was processed independently by RPS and any anomalies modelling as having the potential to be UXO (pUXO) were identified and detailed in RPS Master Target List (MTL): **EES1228-Energy Island-RPS-UXO-MTL_00**

1.5 Anomaly Investigation / Avoidance

The data-processing and potential UXO (pUXO) target picking resulted in 33 magnetometer targets being identified as requiring further investigation to confirm either that the target was UXO or that the target location was free from UXO. Any targets that were identified as being UXO would be disposed of in-situ by the Danish Navy who were mobilised on the Identification & Clearance (ID&C) vessel, the *Stril Explorer.*

The aim of the ID&C campaign was to allow "ALARP" certification to be provided for the entire energy island area (2.5 x 2.5 km^2). The UXO ID&C Campaign commenced beginning of June 2022 and was completed within two weeks.

pUXO Targets were investigated by Remotely Operated Vehicle (ROV) with individual Target Investigation Reports (TIRs) completed for each pUXO target location. Debris items were relocated outside the survey area to allow an as-left survey to be completed proving that the debris item was the original pUXO target and therefore the target location is now free from UXO.

Figure 1.3 – DP Vessel Stril Explorer

All 33 pUXO targets were inspected and there are no anomalies that still model as pUXO within the ALARP area and therefore there are no avoidance zones within the ALARP certified are.

30 of the 33 pUXO targets were identified as debris items, two targets were confirmed as being UXO with one location being defined as “target not located - nothing found”.

Results from the ID&C campaign are detailed in, **EES1228-Energy Island-RPS-UXO-IMTL_00**

The two targets confirmed as being UXO are:

- WPD_EI_GRAD_0065 – identified as a German Moored Mine (Buoyant Mine)
- WPD_EI_GRAD_0255 – identified as a German Moored Mine (Buoyant Mine)

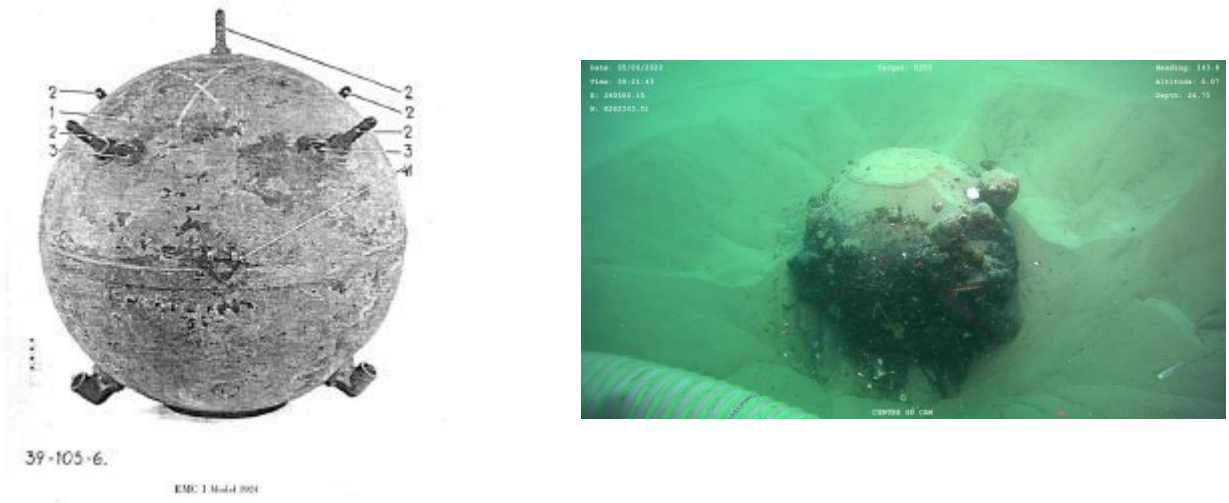


***Figure 1.4 – Example Buoyant Mine and Target* WPD_EI_GRAD_0255**

These two confirmed UXO were disposed of in-situ by Danish Navy Divers from the *Stril Explorer*. Following the detonation, the seabed was inspected by ROV, any debris cleared, and a TSS440 / visual as-left survey completed to confirm the location was free from UXO and to allow ALARP sign-off.

The TIRs for targets WPD_EI_GRAD_0065 & 0255 are provided in **Appendix 2.**

1.6 Sign Off Clarifications

If there are any concerns regarding the risk management process or the clarity of this document, RPS should be contacted immediately.

2 'ALARP' CERTIFICATION

2.1 Applications of this Certificate

This document is to be used as evidence that the risk from UXO has been reduced to ALARP in areas with:

- Geophysical data coverage and outside the avoidance distance of any potential UXO anomalies identified during the survey (presented in **Appendix 3.**).

This ALARP certificate is provided for the area where Energy Island Installation operations will take place. This ALARP certificate is solely applicable to the areas detailed above and designated as 'UXO Risk reduced to ALARP' as illustrated in **Appendix 3**. Operations taking place outside the areas depicted in **Appendix 3** are not covered by this ALARP certificate and may require further mitigation measures prior to any works taking palace.

2.2 Locations Covered by this Certificate

This ALARP certificate has been compiled based on the following:

Client-provided artificial island area:

- ***project_area_northsea_artificial_island.shp***

(This being the 2.5 x 2.5 km^2 area where ROV UXO Survey was completed and the site of this ALARP Certificate).

2.2.1 ALARP Area

The areas that are ALARP for operations related to the installation of the energy island are provided in the RPS files:

- EES1228-F-501-00-EI_UXOStatus_Construction_220623_Layers.lpk
- EES1228-F-501-00-EI_UXOStatus_Construction_220623_ALARP_SHP.zip

2.2.2 Geodetics

All positions are reported are: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989 EPSG Code: 25832

2.3 Risk Management

Energy Island Installation operations within the areas shown in **Appendix 3** can continue without further proactive UXO mitigation in accordance with the following provisos:

2.3.1 Provisos to Carrying Out Works on Site

The following section outlines conditions that must be observed when conducting seabed intervention works on site:

- The planned works must take place in areas that have been reduced to ALARP based on UXO Survey / UXO investigation and these operations must be located within the area shown in **Appendix 3.**
- **The Site Manager, or those charged with ensuring this ALARP certificate is adhered to, must add any additional buffer they deem appropriate/necessary to the ALARP avoidance area in order to take into consideration their navigational/positional errors to ensure the avoidance areas are always observed.**
- It is recommended that all personnel conducting intrusive works, in any part of the site, should attend an ***Explosives Safety & Awareness Briefing***. This should comprise part of the standard site induction briefing and would form a component of the Health and Safety Plan.

2.4 ALARP Certificate

This certificate remains valid till the **29th June 2027**.

After this date - RPS should be contacted to reassess the risk posed on the site from UXO where it is expected that some proactive UXO mitigation may be required to allow an extension of the ALARP certificate to include the Energy Island construction period.

This proactive mitigation could include:

- Sidescan Sonar Survey of the ALARP area.
- MultiBeam Echo Sounder Survey of the ALARP area.

ALARP Certificate

Name & Position:	Signature:	Date:
Victoria Phillips **Director ERW (Marine)**		**29th June 2027**

Certificate Valid Till: 29th June 2027

Appendix 1 Terminology

Terminology

ALARP - *As Low As Reasonably Practicable*; ALARP has particular connotations in UK Health and Safety law and the core concept of what is "*reasonably practicable*". This involves weighing a risk against the effort, time and costs needed to control it. For a risk to be reduced in line with ALARP it must be possible to demonstrate that the cost involved in reducing the risk further would be "*grossly disproportionate*" to the benefit gained. The ALARP principle arises from the fact that it would be possible to spend infinite time, effort and money attempting to reduce a risk to zero. Importantly, it is not simply a quantitative measure of benefit against detriment but a common practice of "*judgment*" of the balance of risk and social benefit.

Anomaly/Target– a geophysical contact with properties modelling within the realms of UXO likely to be found on site.

Exclusion Zone - an area surrounding an anomaly where operations cannot take place.

Geophysical Contact - an item that has been identified via a geophysical survey.

Unexploded Ordnance (UXO) - Explosive Ordnance that has been primed, fuzed, armed or otherwise prepared for action, and which has been fired, dropped, launched, projected or placed in such a manner as to constitute a threat to the safety and/or security of people, animals, property or material and remains unexploded either by malfunction or design or for any other reason.

UXO Contamination - UXO that is present, within any given physical context that is considered to be an impediment to the safe on-going or intended use of a facility, including geological features. Safety in this instance is measured against an acceptable level of exposure to the potential risks that UXO present.

MAKING COMPLEX EASY

Explosives Engineering Services

+44 (0) 845 638 4760

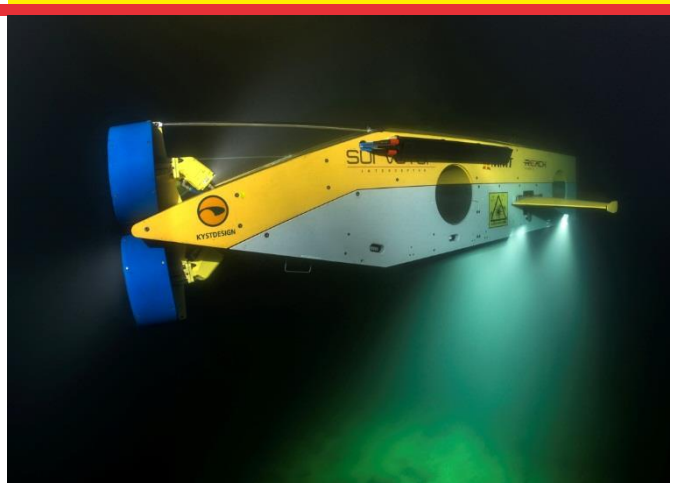
www.rpsuxo.com

Appendix 2 Confirmed UXO TIRs

TARGET INVESTIGATION REPORT (TIR) – ARTIFICIAL ISLAND PROJECT SITE

TARGET ID 0065

104087-ENN-MMT-SUR-REP-TIR-0065
REVISION A | ISSUE FOR USE
JUNE 2022



ENERGINET

NORTH SEA OWF AND ENERGY ISLAND

UXO INSPECTION AND DISPOSAL SURVEY (WPD) FOR OFFSHORE WIND FARMS AND ENERGY ISLAND

NORTH SEA
JUNE 2022

MMT SWEDEN AB | SVEN KÄLLFELTS GATA 11 | SE-426 71 VÄSTRA FRÖLUNDA, SWEDEN
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MMT

REVISION HISTORY

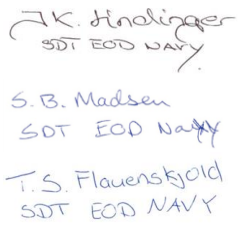
REVISION	DATE	STATUS	CHECK	APPROVAL	CLIENT APPROVAL
A	2022-06-10	Issue for Use	CVB	PB	RL
02	2022-06-09	Issue for Client Review	RL	RL	RL
01	2022-06-09	Issue for Internal Review	PB	PB	

REVISION LOG

DATE	SECTION	CHANGE
2022-06-04	Template	Updated template according Client requests

DOCUMENT CONTROL

RESPONSIBILITY	POSITION	NAME
Content	Offline Coordinator	Catarina Viegas Baptista
Check	Project Report Coordinator	Darryl Pickworth
Approval	Project Manager	Karin Gunnesson

TARGET INVESTIGATION APRROVAL			
NAME	**POSITION**	**RESPONSIBILITY**	**SIGNATURE**
Jörgen Knudsen Lindinger (02h-06h – 14h-18h) Simon Bagger Madsen (06h-10h – 18h-22h) Thomas Sönderup (10h-14h – 22h-02h)	EOD Supervisor	UXO assessment	 Date: 2022-06-07
Robert Lothian (18h-06h)	Client Representative	Confirmation of works being carried out in accordance with procedures	 Date: 2022-06-10
Patrick Bell	Offshore Manager (M/V Stril Explorer)	Confirmation of data fit for purposes	 Date: 2022-06-09

TARGET INFORMATION (PRIOR TO ROV INVESTIGATION)			
Target ID:	0065	**Target Amplitude (nT):**	556.80
Expected Grid Position:	E 348484.38	**Latitude (N DD,dddddd):**	N 56.497486
	N 6264165.04	**Longitude (W DD,dddddd):**	W 6.538608

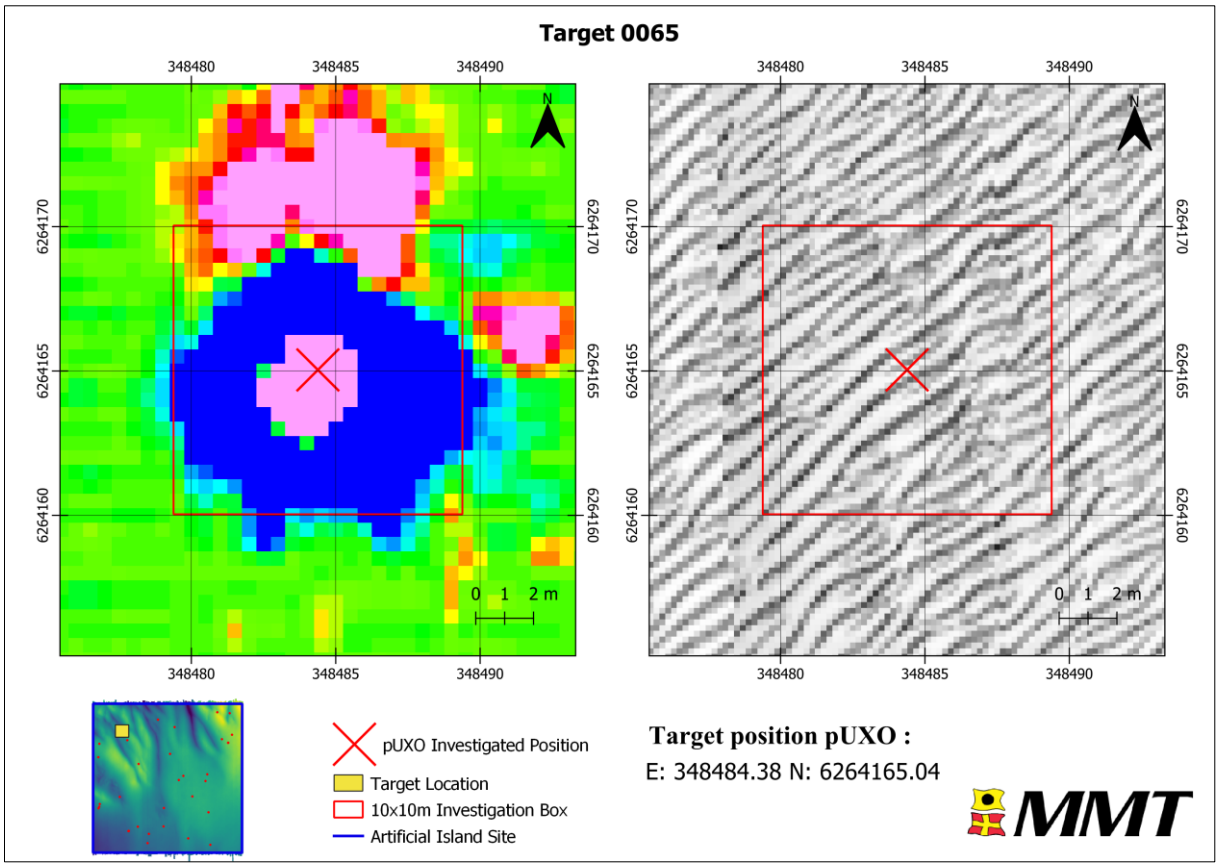


Figure 1 - Location map (Residual grid on left and SSS mosaic on right).

TARGET INVESTIGATION SUMMARY			
Target ID	0065	**Method**	WROV
Date of identification **Date of disposal**	2022-06-07 2022-06-08/09	**Water Depth (Actual) (m)**	28.5
Start Time (UTC) – identification **Start Time (UTC) – disposal**	01:35:09 20:47:24	**Visibility**	Good
End Time (UTC) – identification **End Time (UTC) – disposal**	05:17:06 12:42:47	**Seabed Geology**	Sand
Vessel	M/V Stril Explorer	**EOD Supervisor**	Jörgen Knudsen Lindinger Simon Bagger Madsen Thomas Sönderup
Equipment Used	Positioning and INS (Primary): Sonardyne SprintNAV 500. Secondary Attitude System: IXBLUE Octans 3000. Sound velocity sensor: Valeport miniSVS. CTD probe: Valeport miniCT. Pressure Gauge: Valeport IPS. Obstacle avoidance sonar: Gemini 720is. Altimeter: Tritech PA500 (500 kHz). USBL Transponder: HiPAP cNODE. DVL: Sonardyne Syrinx, co-mounted to INS (600 kHz). Multibeam echo sounder: R2Sonic 2024 (200-400 kHz, optional 700 kHz). Electromagnetic Survey System: Teledyne TSS440. SIT Camera: Imenco HD Camera. Colour camera: Imeco Mini Colour Subsea Camera. Colour and Zoom camera: Imenco 18x Zoom Subsea Camera. Underwater Lasers: Dual DSPL Sealaser 100. Hydraulic Dredge pump: Deep C 6''.		
Methodology	**Target 0065 (UXO):** Not detected by obstacle avoidance sonar or WROV video. TSS detected anomaly. Excavation of site performed. Debris found and classified as UXO. No relocation allowed, disposal required. Buoy placed to mark UXO position for later disposal. Disposal with explosives performed by Navy EODs. Post-explosion TSS survey showed anomaly removed.		
	Target 0065_a (debris): Not detected by obstacle avoidance sonar or WROV video. TSS detected anomaly. Excavation of site performed. Debris found and relocated. Post-excavation TSS survey showed anomaly removed.		

RESULT
Target 0065 identified as German Moored mine (UXO). Target 0065_a, located at 6.1 m NE of expected location, identified as metal debris (wire).

Target Found			Yes
Altitude (m)	0065: 0.60 0065_a: 0.50	**Amplitude (µV)**	0065: 6315.14 0065_a: 155.36
Excavation Required			Yes
As-Found Grid Position	0065: E 348485.31	0065_a: E 348489.40	
	0065: N 6264164.74	0065_a: N 6264168.47	
As-found Offset from Target Position (m)		0065: 1.0	0065_a: 6.1
Target Relocated	0065: No 0065_a: Yes	**Debris Created After Explosion Relocated**	0065: Yes 0065_a: N/A
Debris Relocated and Target Relocated Grid Position	E 348504.46	**Latitude (DMS)**	56 29' 50.995'' N
	N 6264165.83	**Longitude (DMS)**	006 32' 20.163'' E

TARGET 0065 DETAILS (UXO)			
Classification	UXO	**Potential Risk**	c-UXO
Diameter (m)	1.10	**Burial Pre-Excavation (~%)**	100
Radius (m)	0.55	**Excavation Depth (m)**	1.0
Height (m)	N/A	**Burial Post-Excavation (~%)**	0
TARGET 0065_A DETAILS (DEBRIS)			
Classification	Debris	**Potential Risk**	Non-UXO
Length (m)	2.0 – 2.5	**Burial Pre-Excavation (~%)**	100
Width (m)	0.03	**Excavation Depth (m)**	0.4
Height (m)	N/A	**Burial Post-Excavation (~%)**	0
EOD SUPERVISOR TARGET ASSEMENT			
EOD Supervisor Confirmed UXO			Yes
Classification	Moored mine	**Type of Explosives**	300kg novit and 10% aluminium
Material	Steel	**Arming Condition**	Armed
Nationality of Origin	German	**Approximate Weight (kg)**	580 kg
Period	20th Century	**Explosive Weight (kg)**	300 kg
Type of Fuses	Chemical horn	**Action Required**	Disposal

Comments

TARGET 0065 (UXO)

Comments from Danish EOD Supervisor:
1) During video investigation, it was visible that the top horn was missing and one of the side horns was damage.

2) For the identification of the target, there was a really good coordination between Online team, WROV pilots and Danish EOD.

Summary of operations after UXO identification:
1) Hole around the UXO with, approximately, 1.0 m deep and 2.0 m diameter was excavated.

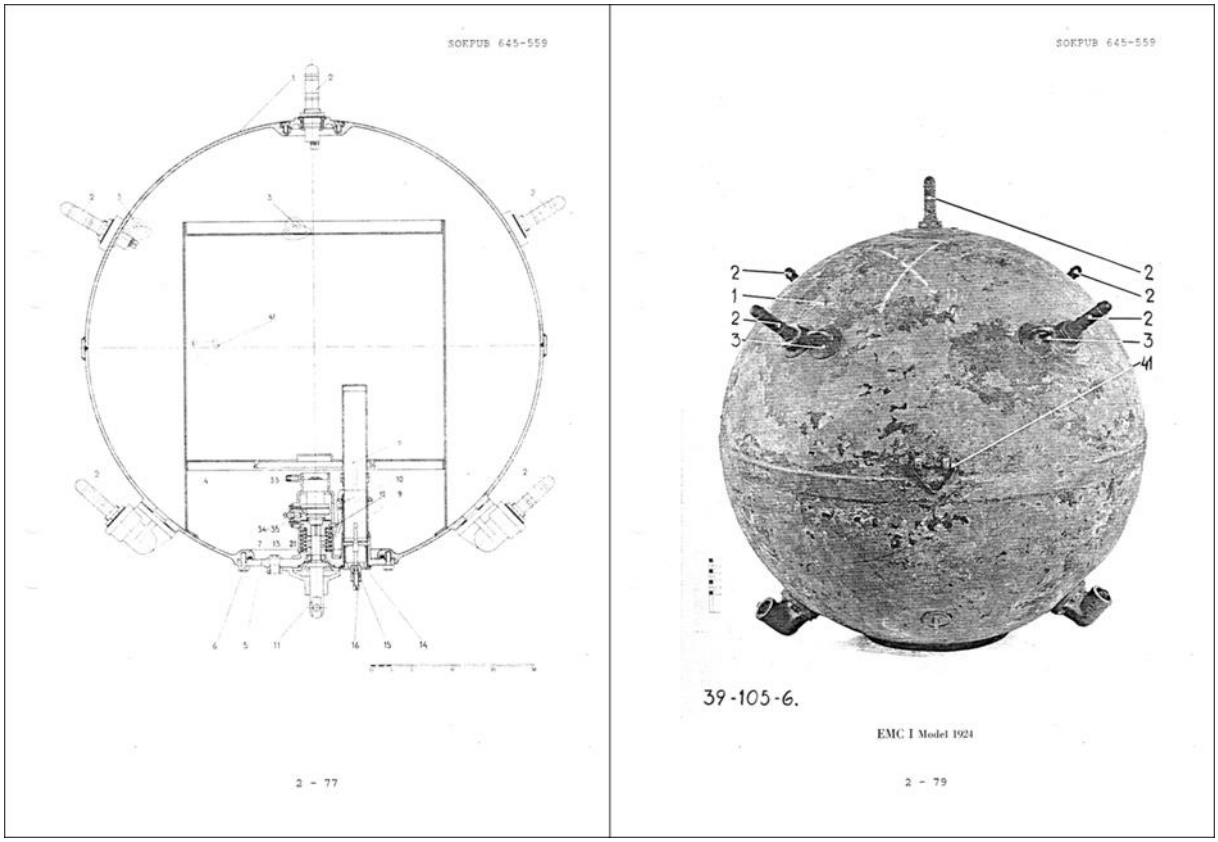
2) A buoy was placed at UXO position by the Navy EODs/WROV pilot.

3) Divers boarded the RIB. RIB launched and operations in the vessel handed over to military.

4) Navy divers placed the explosives at UXO location and the explosion was performed.

5) Post-explosion TSS survey (out-survey) was performed and the major debris were removed from the location (As-Left-1).

Technical drawing of the Moored mine on left and diagram on the right:



TARGET 0065_a (DEBRIS)

No action was required. Debris relocated outside the 10m x 10m box.

TSS AS-FOUND SURVEY - µV	TSS AS-FOUND SURVEY - ALTITUDE

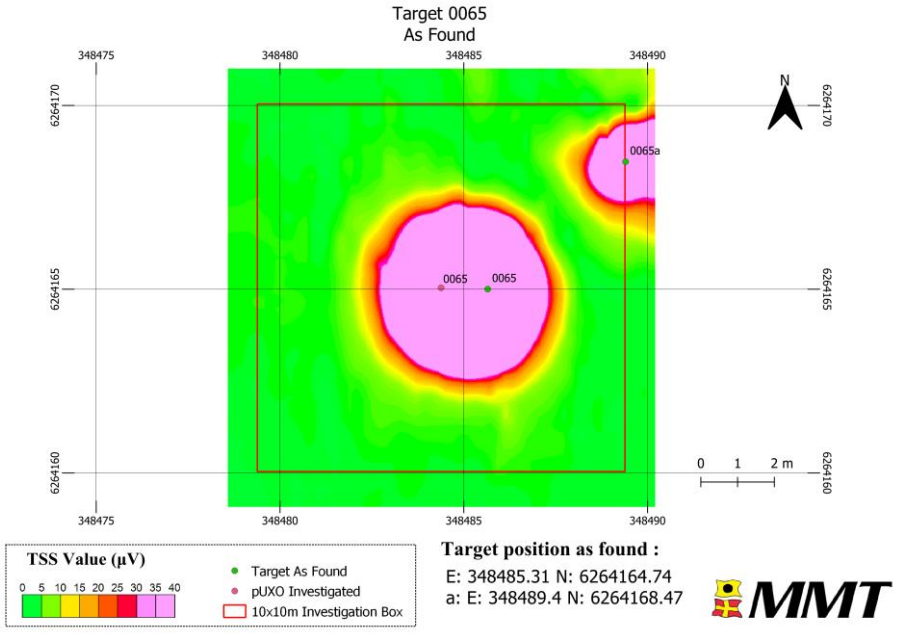
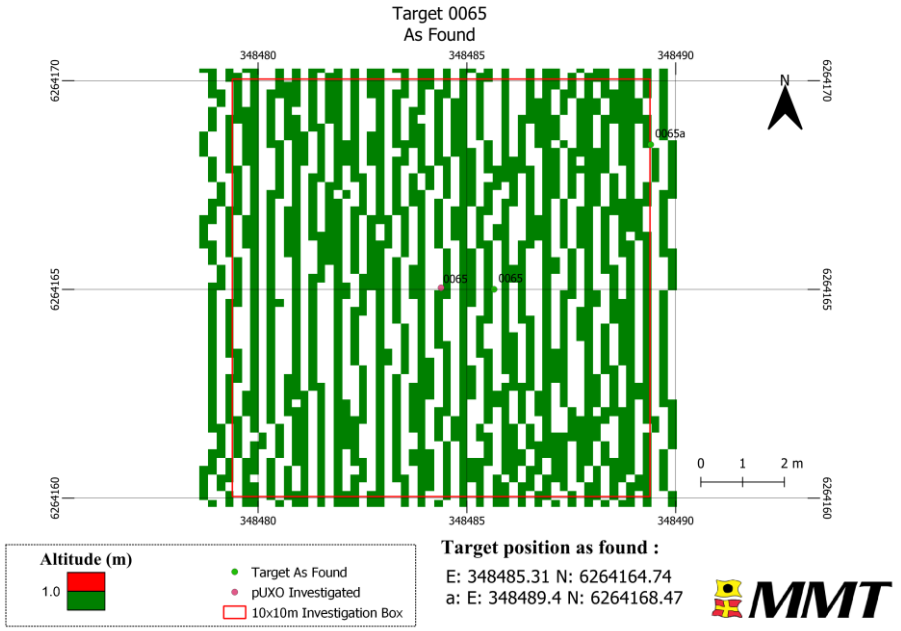

	

Figure 2 - TSS440 As-Found Grid Image.	*Figure 3 - TSS440 As-Found Altitude/Track Image.*

TSS OUT-SURVEY - µV	TSS OUT-SURVEY - ALTITUDE

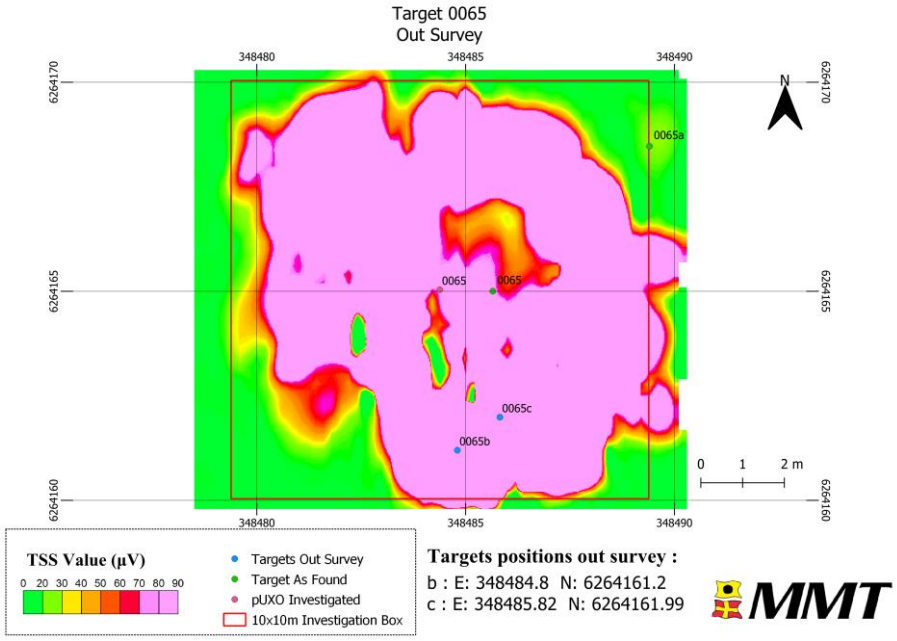
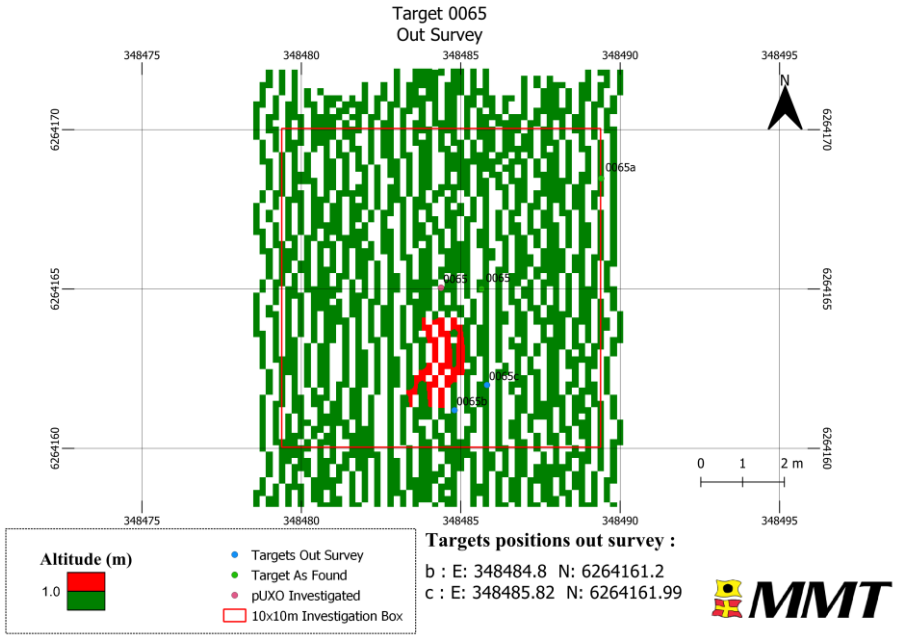

	

Figure 4 - TSS440 Out-Survey Grid Image.	*Figure 5 - TSS440 Out-Survey Altitude/Track Image.*

TSS AS-LEFT-1 SURVEY - µV	TSS AS-LEFT-1 SURVEY - ALTITUDE

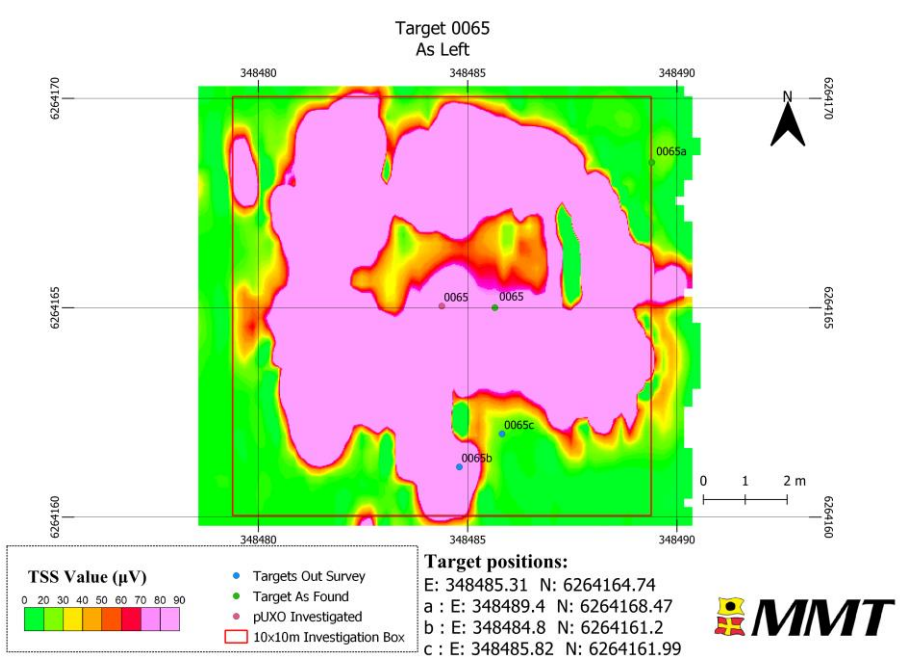
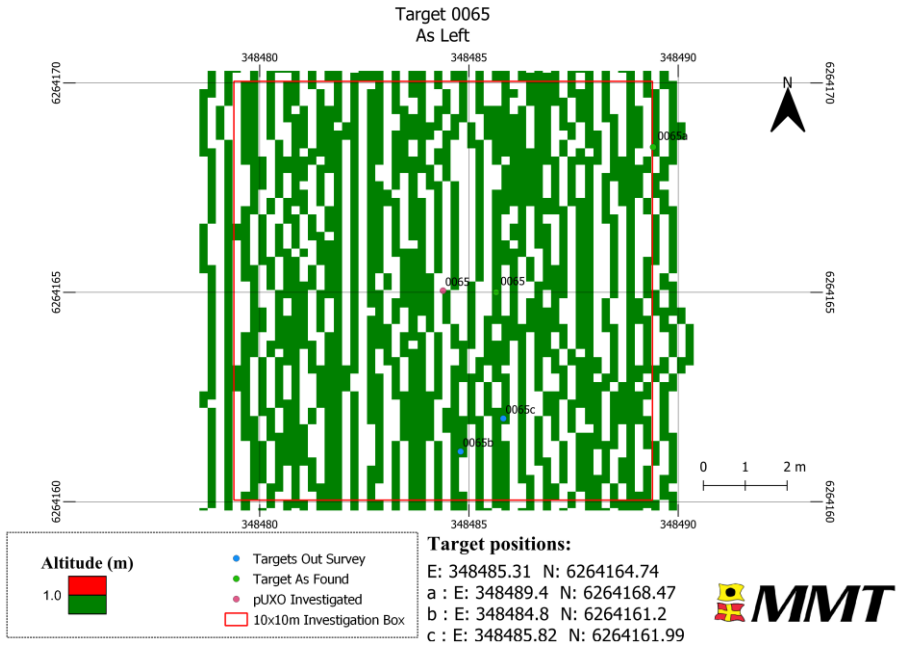

	

Figure 6 - TSS440 As-Left-1 Grid Image.	*Figure 7 - TSS440 As-Left-1 Altitude/Track Image.*

MBES IN SURVEY	MBES OUT SURVEY

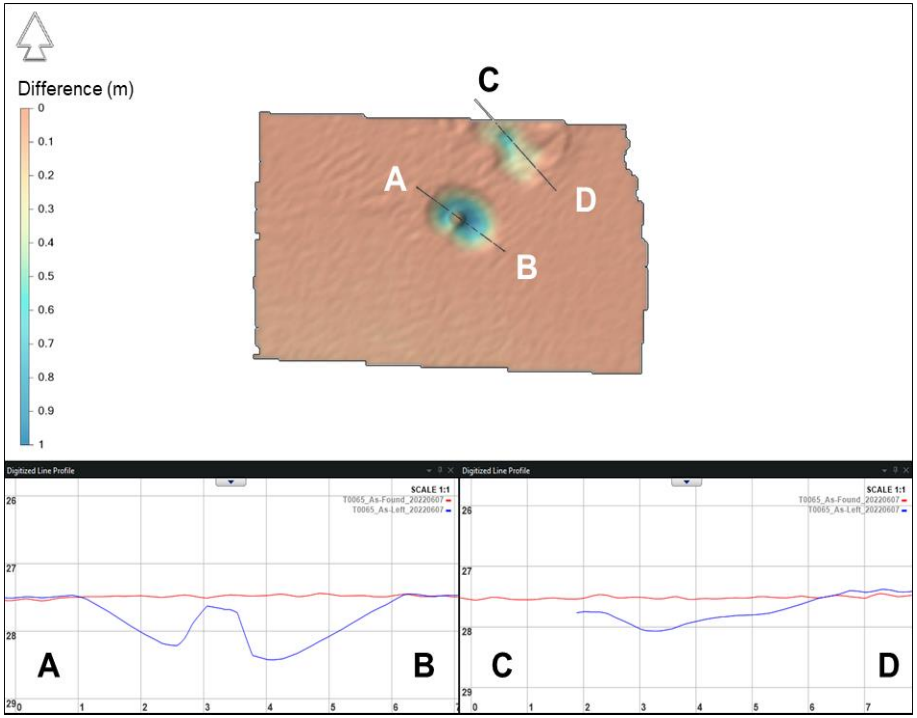
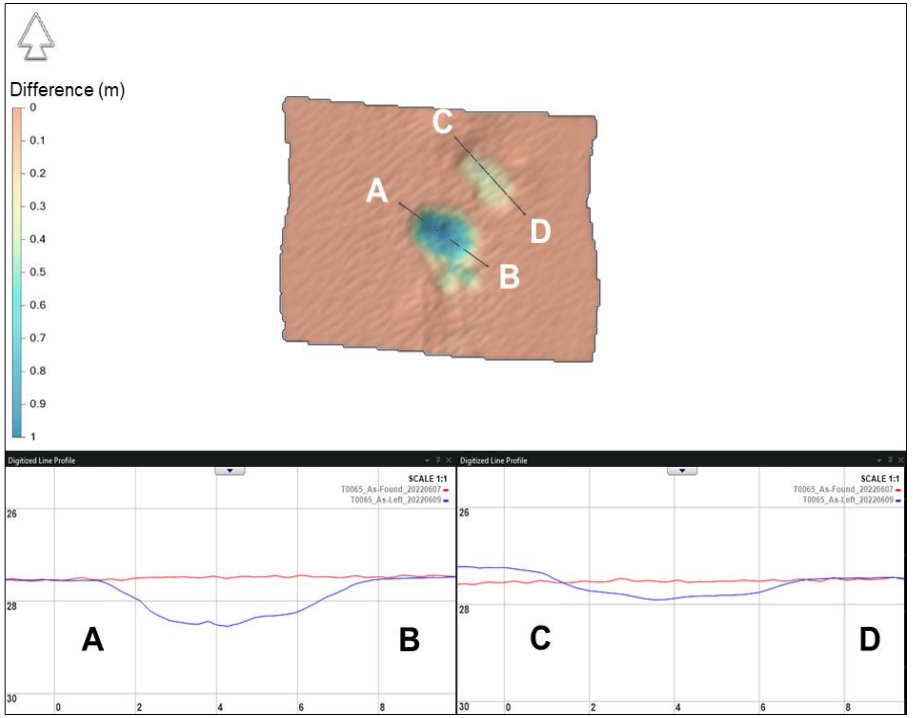

	

Figure 8 - MBES Grid Image after excavation and UXO identification on 2022-06-07 (UXO left in situ).	*Figure 9 - MBES Grid Image after UXO detonation on 2022-06-09.*

TARGET 0065 (UXO)

ROV VIDEO/SONAR AS-FOUND

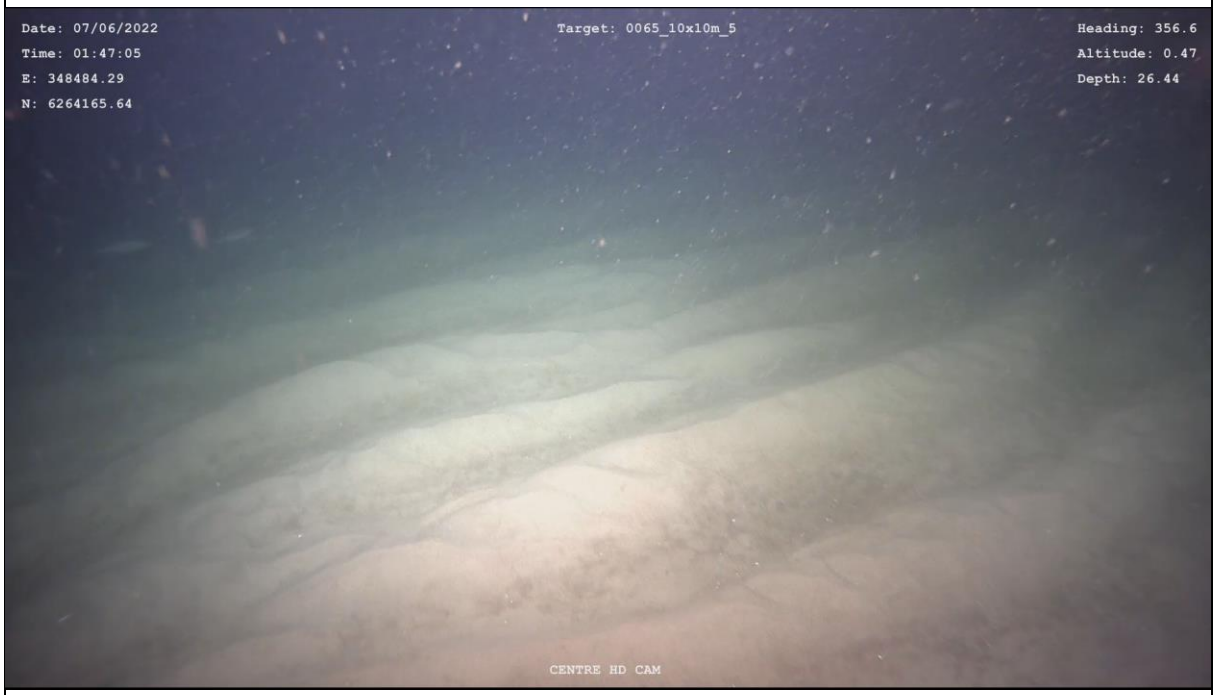


Figure 10 - Video Image – As-Found.

ROV VIDEO/SONAR EXCAVATION

Figure 11 - Video Image – Excavation.

ROV VIDEO/SONAR BUOY PLACEMENT

Figure 12 - Video Image – Buoy placement.

ROV VIDEO/SONAR OUT SURVEY (AFTER EXPLOSION)

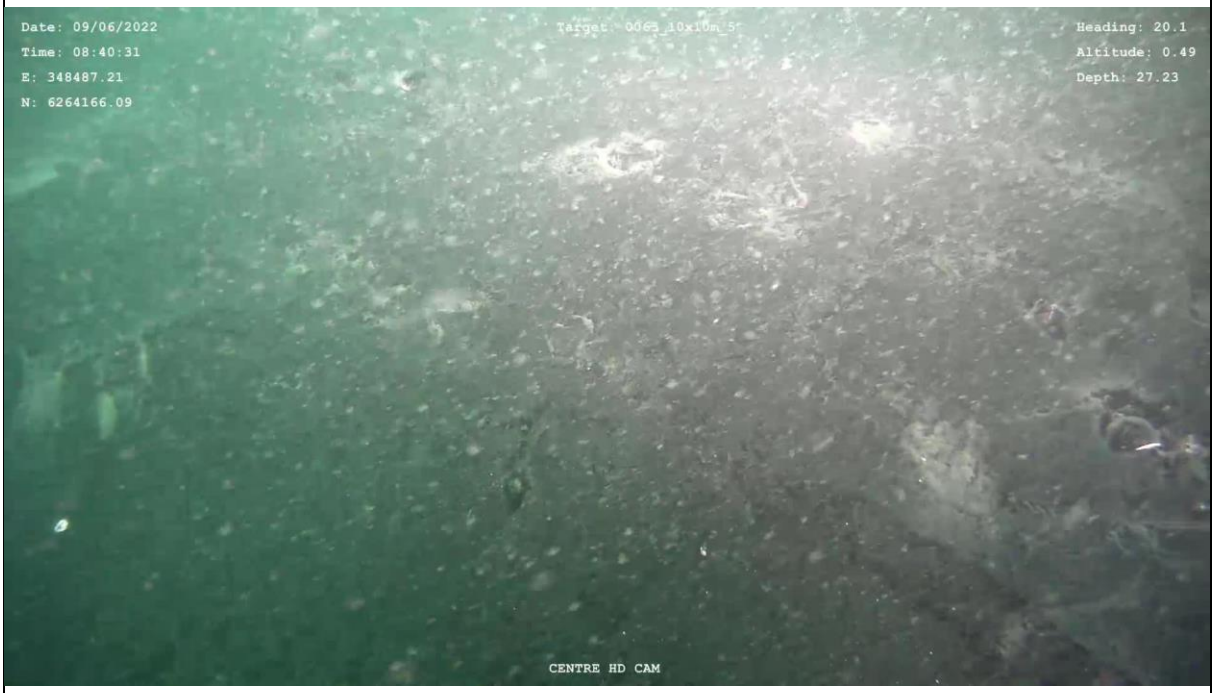
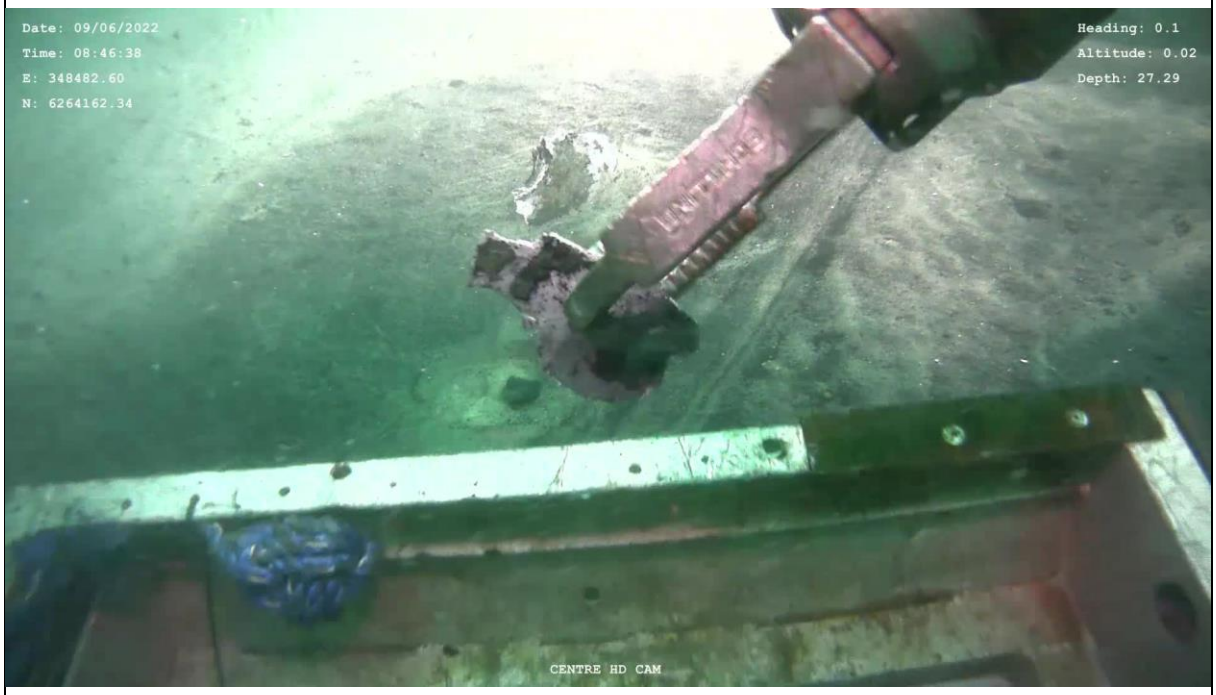
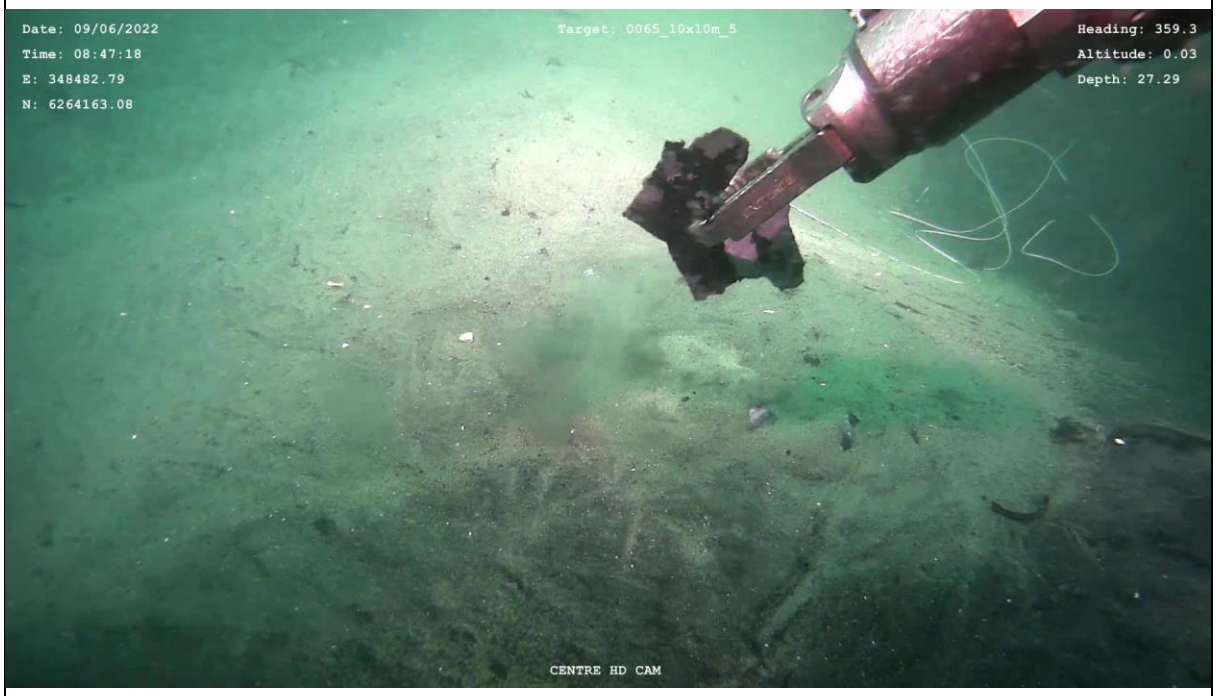


Figure 13 - Video Image – Out-Survey (after explosion) – no visibility.

ROV VIDEO/SONAR RELOCATED/AS-LEFT

Debris removal


Date: 09/06/2022
Time: 08:46:38
E: 348482.60
N: 6264162.34
Heading: 0.1
Altitude: 0.02
Depth: 27.29
CENTRE HD CAM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N: 6264163.08
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Heading: 359.3
Altitude: 0.03
Depth: 27.29
CENTRE HD CAM


Date: 09/06/2022
Time: 08:48:20
E: 348484.38
N: 6264164.70
Heading: 323.0
Altitude: 0.14
Depth: 27.19
CENTRE HD CAM


Date: 09/06/2022
Time: 09:01:16
E: 348488.98
N: 6264163.05
Target: 0065_10x10m_5
Heading: 342.9
Altitude: 0.03
Depth: 27.22
CENTRE HD CAM


Date: 09/06/2022
Time: 09:04:01
E: 348482.08
N: 6264161.05
Target: 0065_10x10m_5
Heading: 345.5
Altitude: 0.05
Depth: 27.23
CENTRE HD CAM


Date: 09/06/2022
Time: 09:05:27
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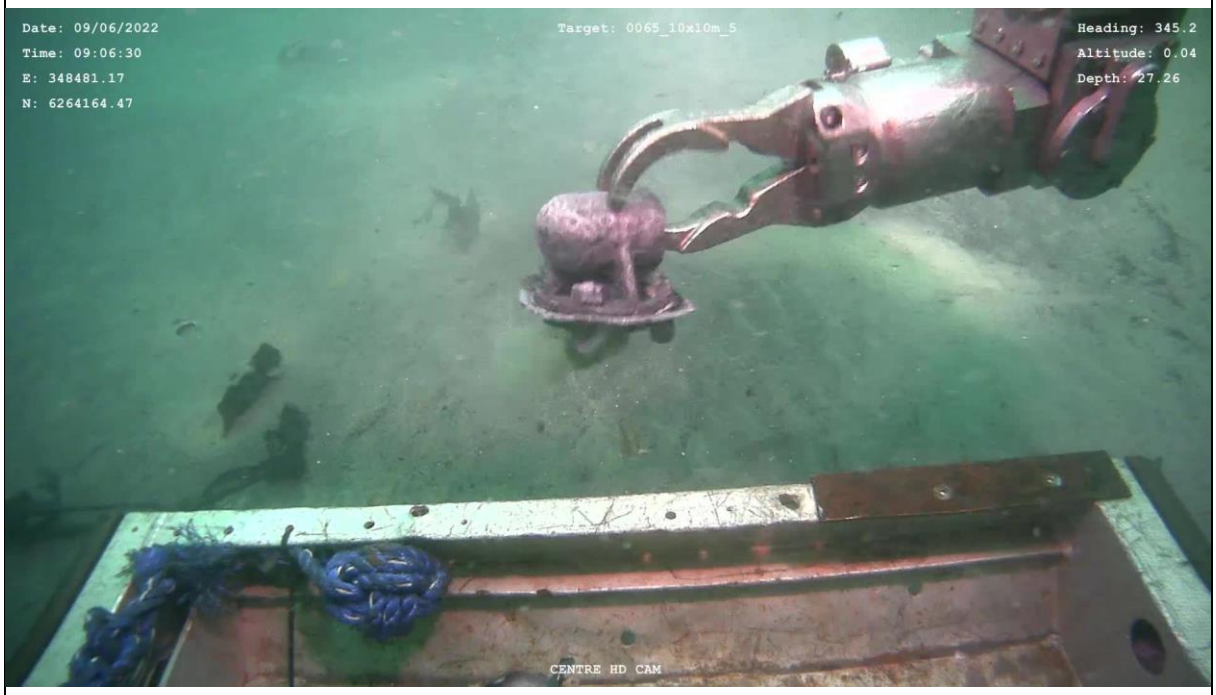
N: 6264164.01
Target: 0065_10x10m_5
Heading: 347.9
Altitude: 0.05
Depth: 27.27
CENTRE HD CAM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Depth: 27.26
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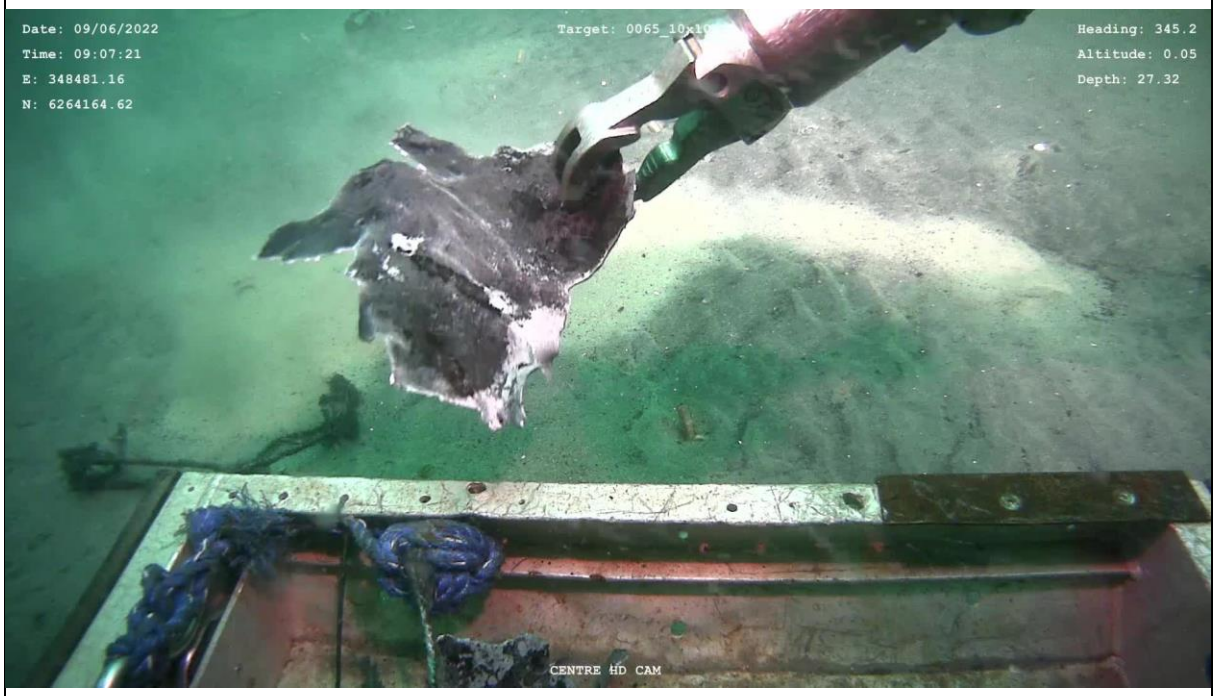
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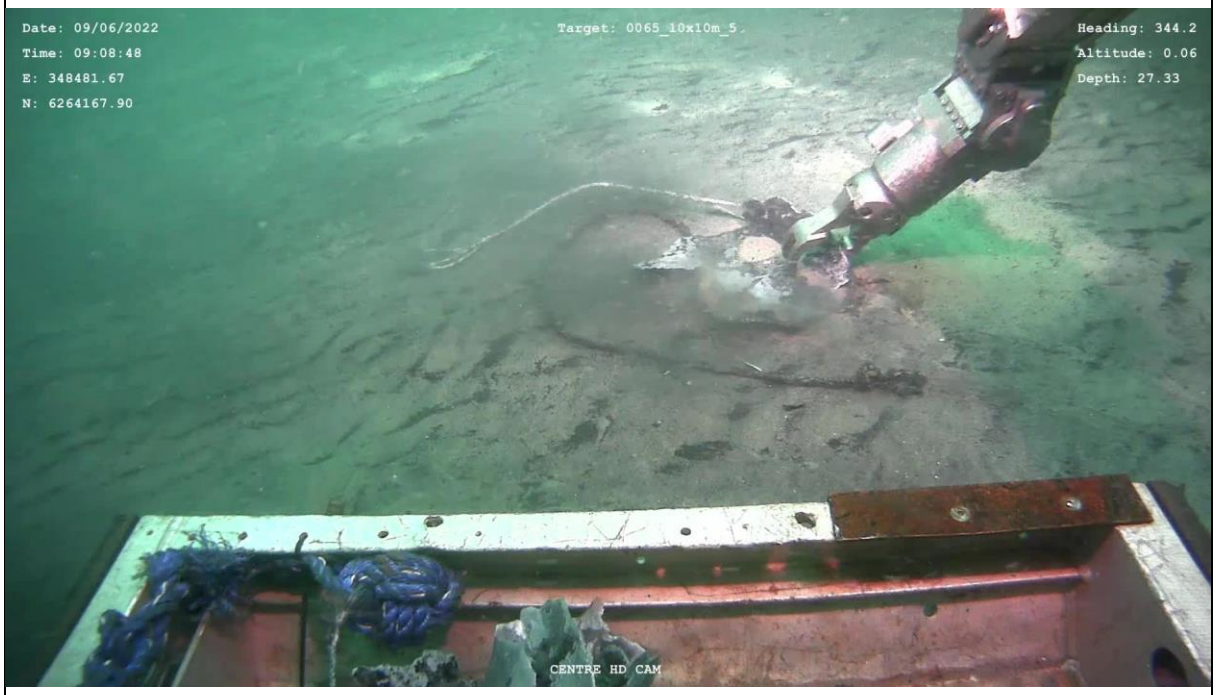
CENTRE HD CAM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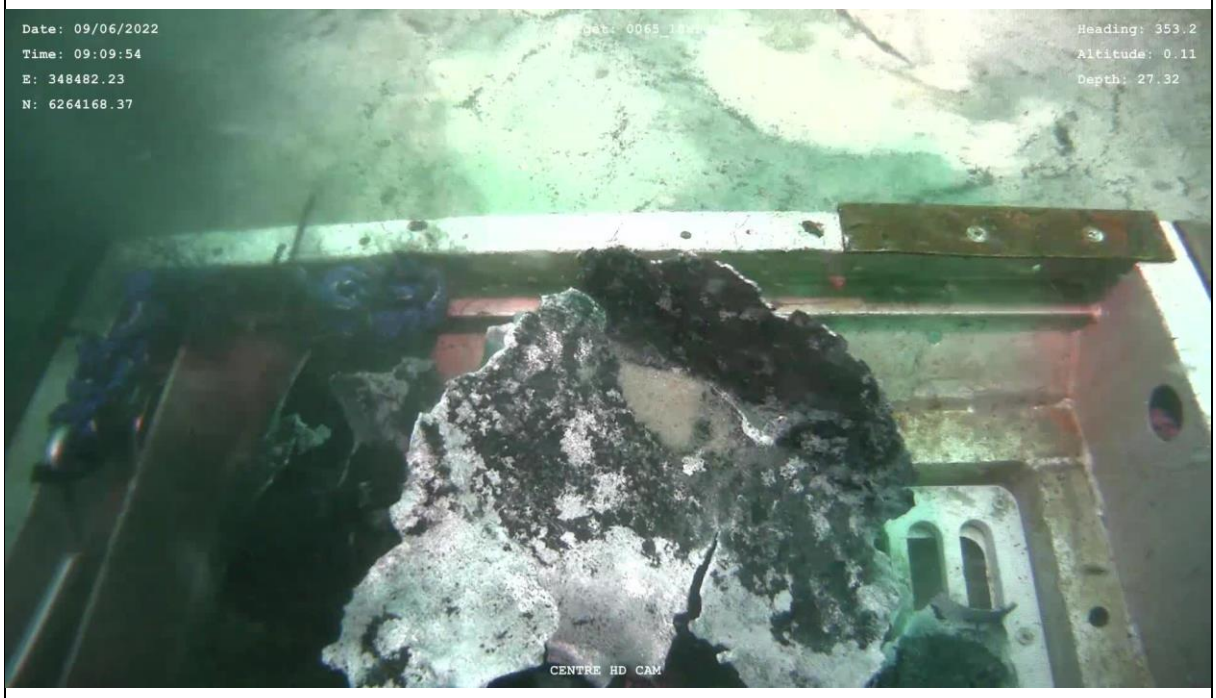
CENTRE HD CAM


Date: 09/06/2022
Time: 09:09:54
E: 348482.23
N: 6264168.37
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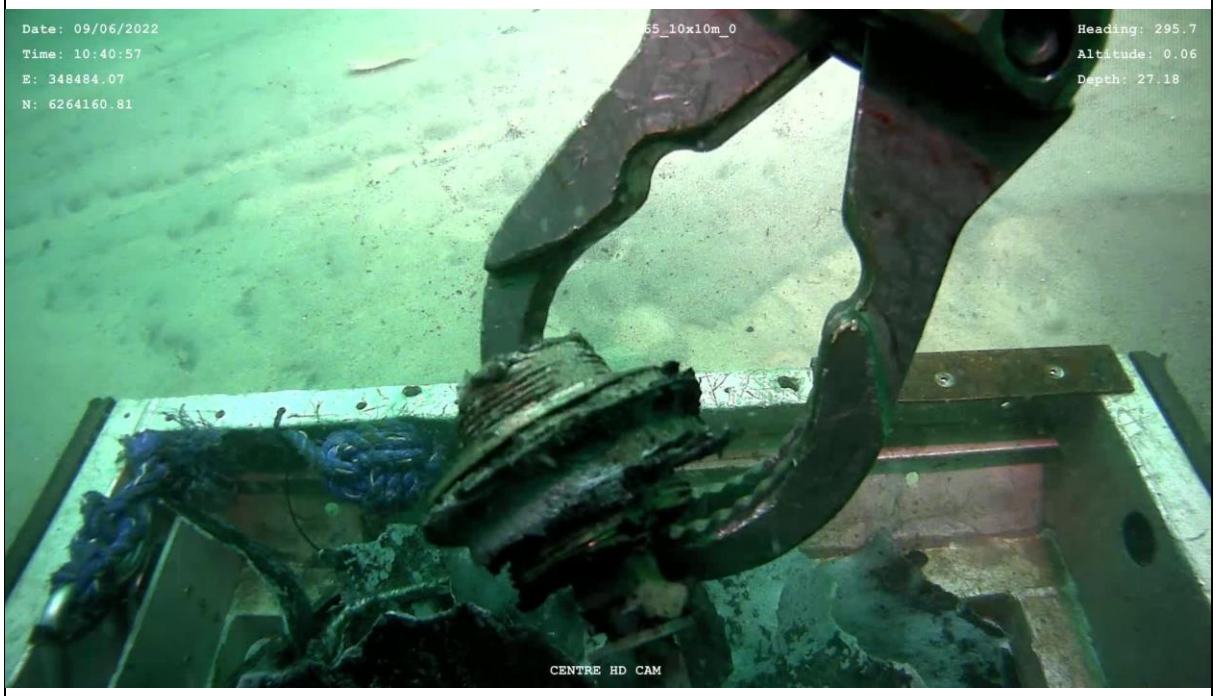
Depth: 27.32
CENTRE HD CAM


Date: 09/06/2022
Time: 09:13:56
E: 348487.43
N: 6264167.02
Heading: 253.4
Altitude: 0.02
Depth: 27.27
CENTRE HD CAM


Date: 09/06/2022
Time: 10:31:07
E: 348484.25
N: 6264161.19
Target: 0065_10x10m_0
Heading: 329.0
Altitude: 0.05
Depth: 27.20
CENTRE HD CAM


Date: 09/06/2022
Time: 10:40:13
E: 348484.06
N: 6264160.83
Heading: 295.8
Altitude: 0.07
Depth: 27.18
CENTRE HD CAM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N: 6264160.81
Heading: 295.7
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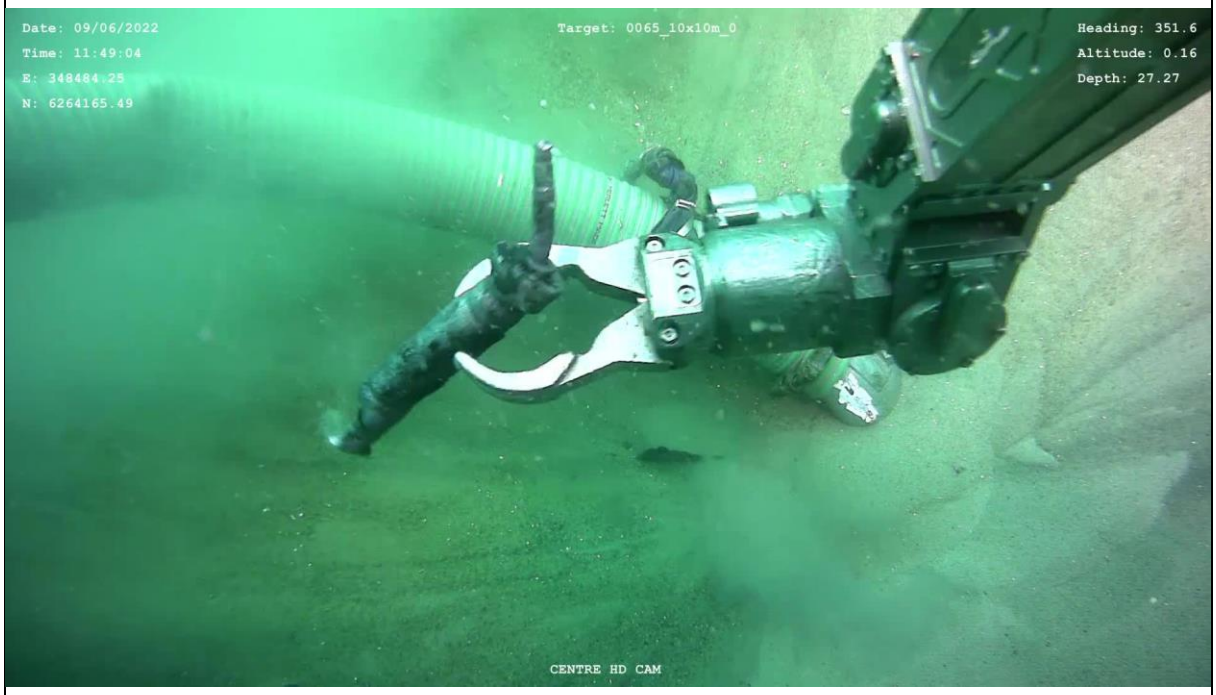
Depth: 27.18
CENTRE HD CAM



Debris relocated

As-Left

Figure 14 - Video Image – Relocated/As Left.

TARGET 0065 (UXO)

ROV VIDEO/SONAR AS-FOUND

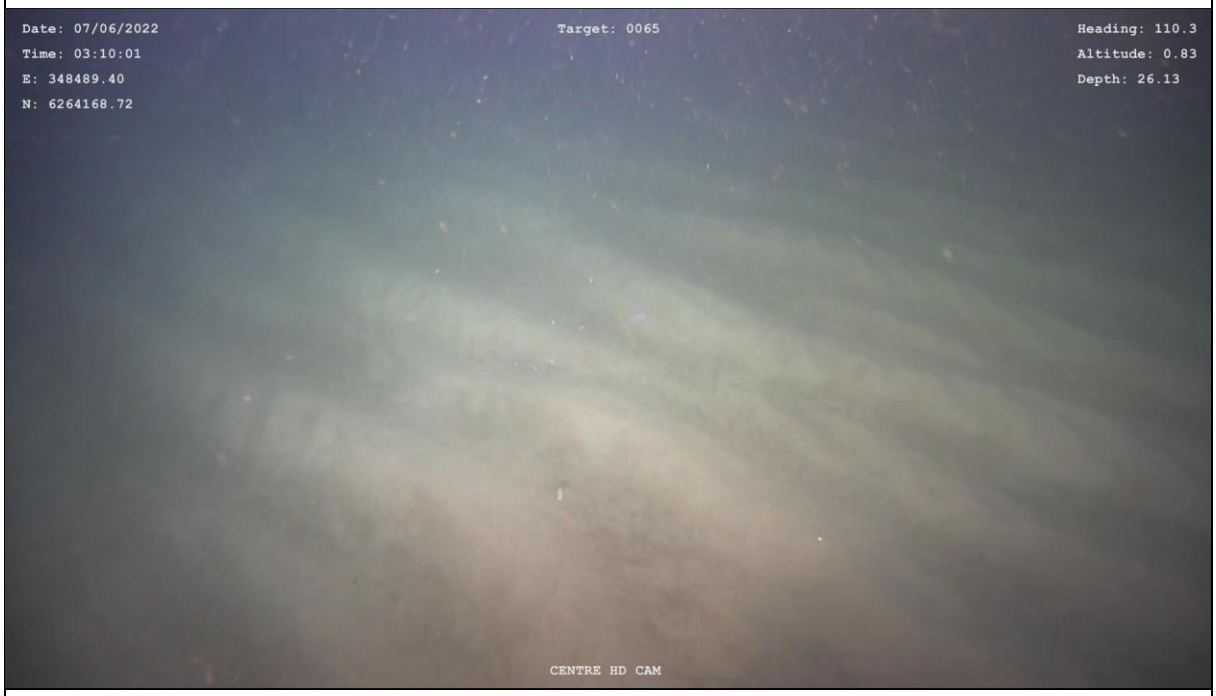


Figure 15 - Video Image – As-Found.

ROV VIDEO/SONAR EXCAVATION

Figure 16 - Video Image – Excavation.

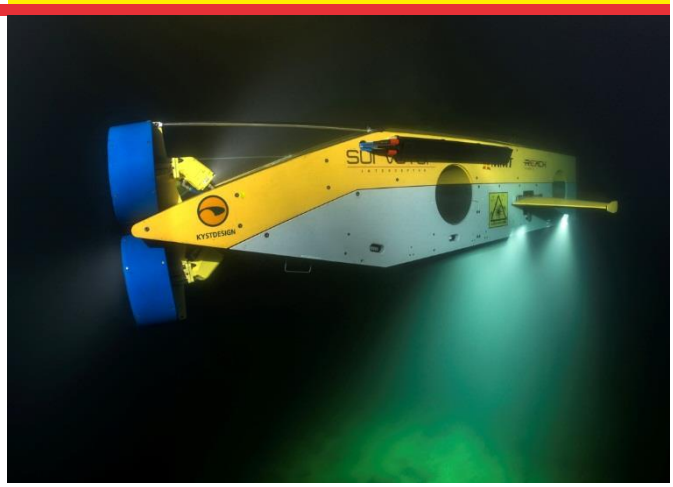
ROV VIDEO/SONAR RELOCATED/AS-LEFT

Figure 17 - Video Image – Relocated/As Left.

TARGET INVESTIGATION REPORT (TIR) – ARTIFICIAL ISLAND PROJECT SITE

TARGET ID 0255

104087-ENN-MMT-SUR-REP-TIR-0255
REVISION A | ISSUE FOR USE
JUNE 2022



ENERGINET

NORTH SEA OWF AND ENERGY ISLAND

UXO INSPECTION AND DISPOSAL SURVEY (WPD) FOR OFFSHORE WIND FARMS AND ENERGY ISLAND

NORTH SEA
JUNE 2022

MMT SWEDEN AB | SVEN KÄLLFELTS GATA 11 | SE-426 71 VÄSTRA FRÖLUNDA, SWEDEN
PHONE: +46 (0)31 762 03 00 | **EMAIL:** INFO@MMT.SE **WEBSITE:** MMT.SE

MMT

REVISION HISTORY

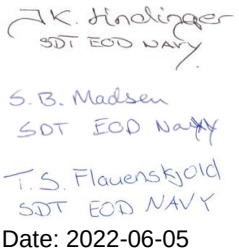
REVISION	DATE	STATUS	CHECK	APPROVAL	CLIENT APPROVAL
A	2022-06-07	Issue for Use	CVB	PB	TH
02	2022-06-06	Issue for Client Review	TH	TH	TH
01	2022-06-06	Issue for Internal Review	PB	PB	

REVISION LOG

DATE	SECTION	CHANGE
2022-06-04	Template	Updated template according Client requests

DOCUMENT CONTROL

RESPONSIBILITY	POSITION	NAME
Content	Offline Coordinator	Catarina Viegas Baptista
Check	Project Report Coordinator	Darryl Pickworth
Approval	Project Manager	Karin Gunnesson

TARGET INVESTIGATION APRROVAL			
NAME	**POSITION**	**RESPONSIBILITY**	**SIGNATURE**
Jörgen Knudsen Lindinger (02h-06h – 14h-18h) Simon Bagger Madsen (06h-10h – 18h-00h) Thomas Sönderup (10h-14h – 22h-02h)	EOD Supervisor	UXO assessment	 Date: 2022-06-05
Timothy Hall (06h-18h)	Client Representative	Confirmation of works being carried out in accordance with procedures	 Date: 2022-06-06
Patrick Bell	Offshore Manager (M/V Stril Explorer)	Confirmation of data fit for purposes	 Date: 2022-06-06

TARGET INFORMATION (PRIOR TO ROV INVESTIGATION)			
Target ID:	0255	**Target Amplitude (nT):**	269.70
Expected Grid Position:	E 349588.87	**Latitude (N DD,dddddd):**	N 56.481662
	N 6262362.95	**Longitude (W DD,dddddd):**	W 6.557573

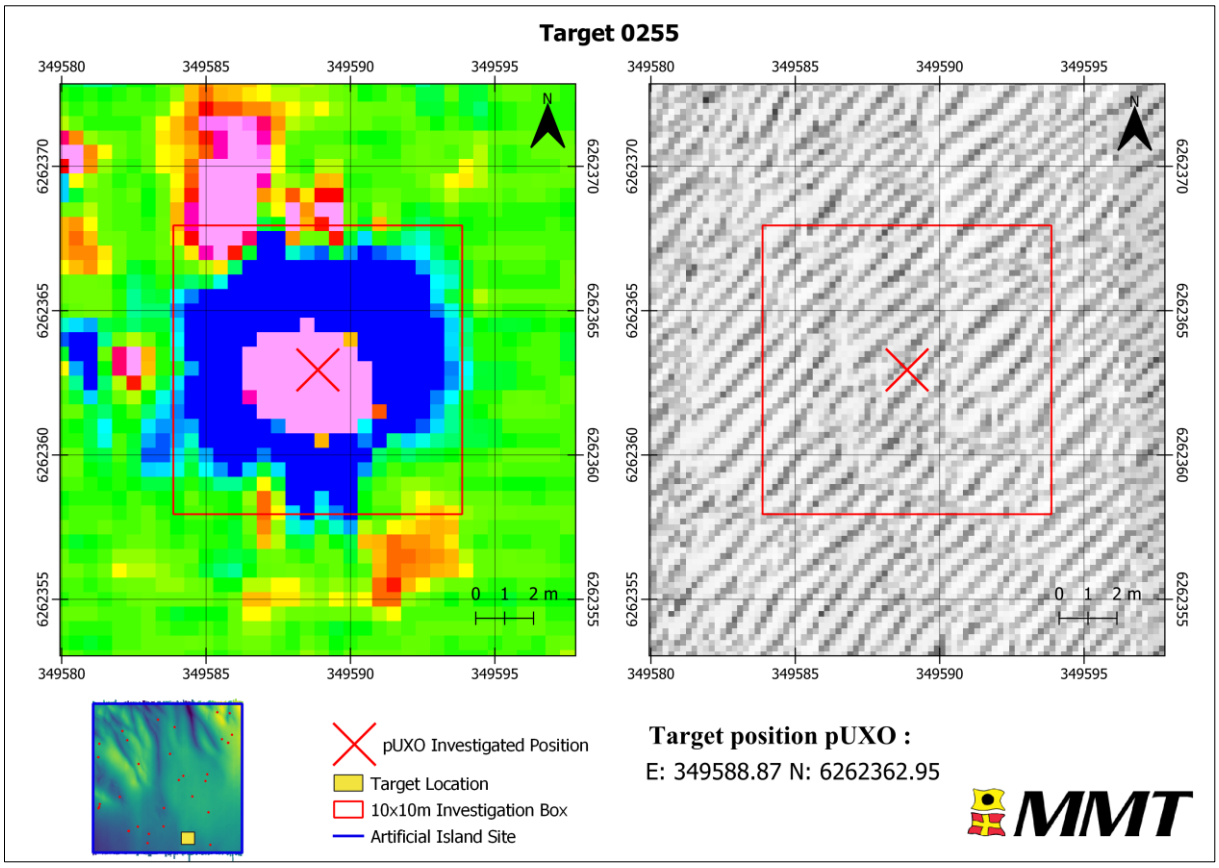
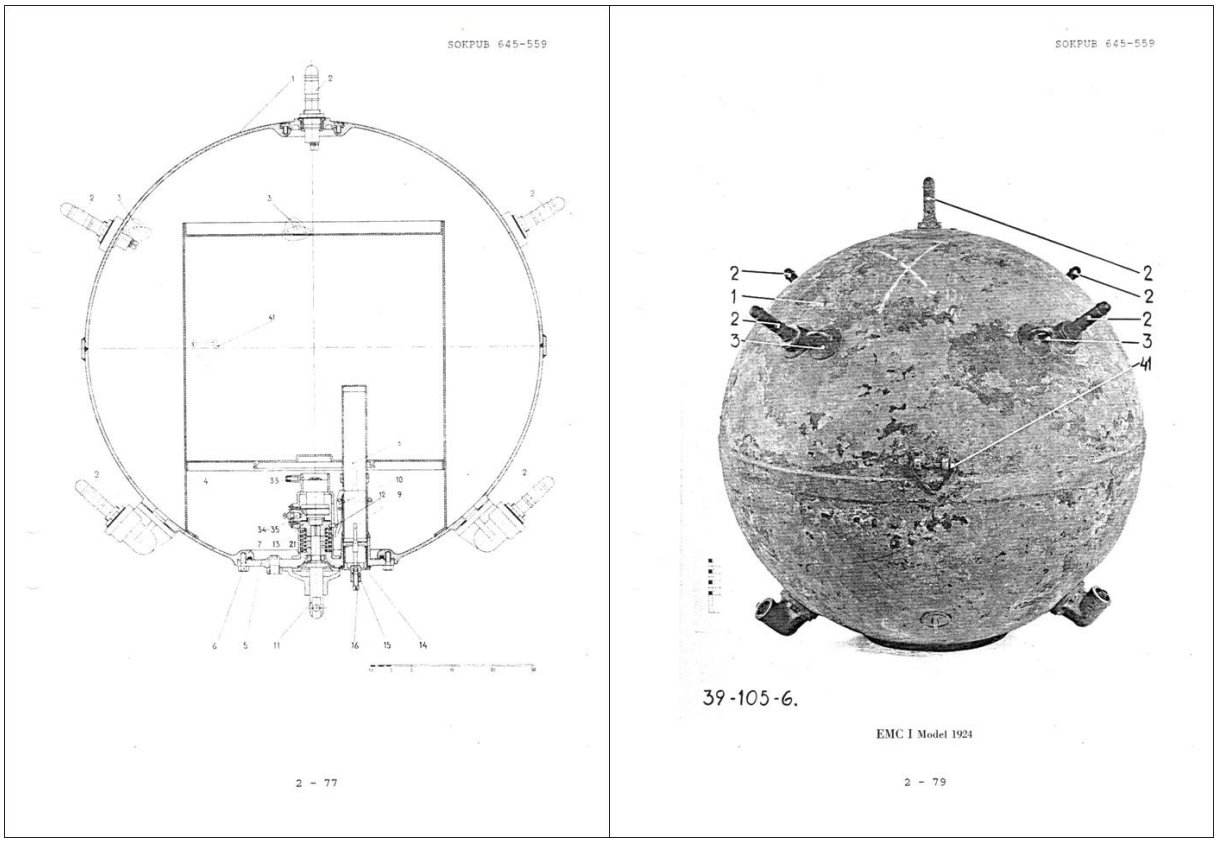


Figure 1 - Location map (Residual grid on left and SSS mosaic on right).

TARGET INVESTIGATION SUMMARY			
Target ID	0255	**Method**	WROV
Date	2022-06-05	**Water Depth (Actual) (m)**	28.2
Start Time (UTC)	07:11:42	**Visibility**	Good
End Time (UTC)	21:05:20	**Seabed Geology**	Sand
Vessel	MV Stril Explorer	**EOD Supervisor**	Simon Bagger Madsen Jörgen Knudsen Lindinger
Equipment Used	Positioning and INS (Primary): Sonardyne SprintNAV 500. Secondary Attitude System: IXBLUE Octans 3000. Sound velocity sensor: Valeport miniSVS. CTD probe: Valeport miniCT. Pressure Gauge: Valeport IPS. Obstacle avoidance sonar: Gemini 720is. Altimeter: Tritech PA500 (500 kHz). USBL Transponder: HiPAP cNODE. DVL: Sonardyne Syrinx, co-mounted to INS (600 kHz). Multibeam echo sounder: R2Sonic 2024 (200-400 kHz, optional 700 kHz). Electromagnetic Survey System: Teledyne TSS440. SIT Camera: Imenco HD Camera. Colour camera: Imeco Mini Colour Subsea Camera. Colour and Zoom camera: Imenco 18x Zoom Subsea Camera. Underwater Lasers: Dual DSPL Sealaser 100. Hydraulic Dredge pump: Deep C 6''.		
Methodology	Not detected by obstacle avoidance sonar or WROV video. TSS detected anomaly. Excavation of site performed. Debris found and classified as UXO. No relocation allowed, disposal required. Buoy placed to mark UXO position for later disposal. Disposal with explosives performed by Navy EODs. 3 post-explosion TSS survey showed anomaly removed.		
RESULT			
Object identified as German Moored mine (potential chemical risk UXO).			
Target Found			Yes
Altitude (m)	0.70	**Amplitude (µV)**	6824.55
Excavation Required			Yes
As-Found Grid Position	E 349588.64 N 6262363.13		
As-found Offset from Target Position (m)			0.3
Target Relocated	No	**Debris Created After Explosion Relocated**	Yes
Debris Relocated Grid Position	E 349576.40 N 6262367.72	**Latitude (DMS)** **Longitude (DMS)**	N 56° 28' 54.128'' N W 006° 33' 26.524'' E
Classification	UXO	**Potential Risk**	cUXO
Diameter (m)	1.10	**Burial Pre-Excavation (~%)**	100
Radius (m)	0.55	**Burial/Excavation Depth (m)**	0.8
Height (m)	N/A	**Burial Post-Excavation (~%)**	0
EOD SUPERVISOR TARGET ASSEMENT			
EOD Supervisor Confirmed UXO			Yes
Classification	Moored mine	**Type of Explosives**	300kg novit and 10% aluminium
Material	Steel	**Arming Condition**	Armed

Nationality of Origin	German	**Approximate Weight (kg)**	580 kg
Period	20th Century	**Explosive Weight (kg)**	300 kg
Type of Fuses	Chemical horn	**Action Required**	Disposal
Comments			



Technical drawing of the Moored mine on left and diagram on the right.

Summary of operations after UXO identification:
1) A buoy was placed at UXO position by the Navy EODs/WROV pilot for later disposal.
2) Navy divers placed the explosives at UXO location and the explosion was performed.
3) Post-explosion TSS survey (out-survey) was performed and the major debris were removed the location (As-Left-1).
4) A 2nd post-explosion TSS survey was performed and high anomalies were seen at the location so a 2nd phase of debris removal was performed to clean the location (As-Left-2).

TSS AS-FOUND SURVEY - µV	TSS AS-FOUND SURVEY - ALTITUDE

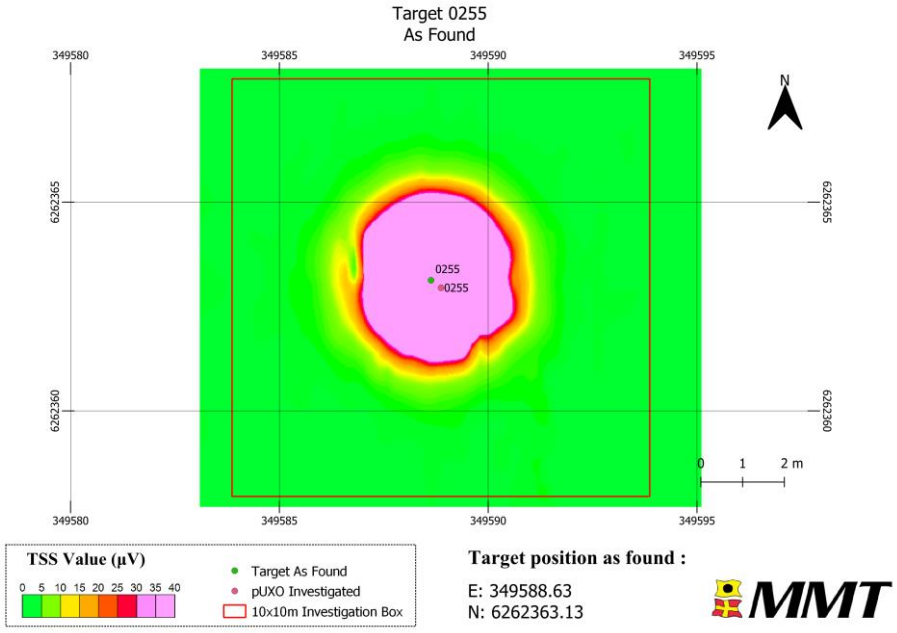
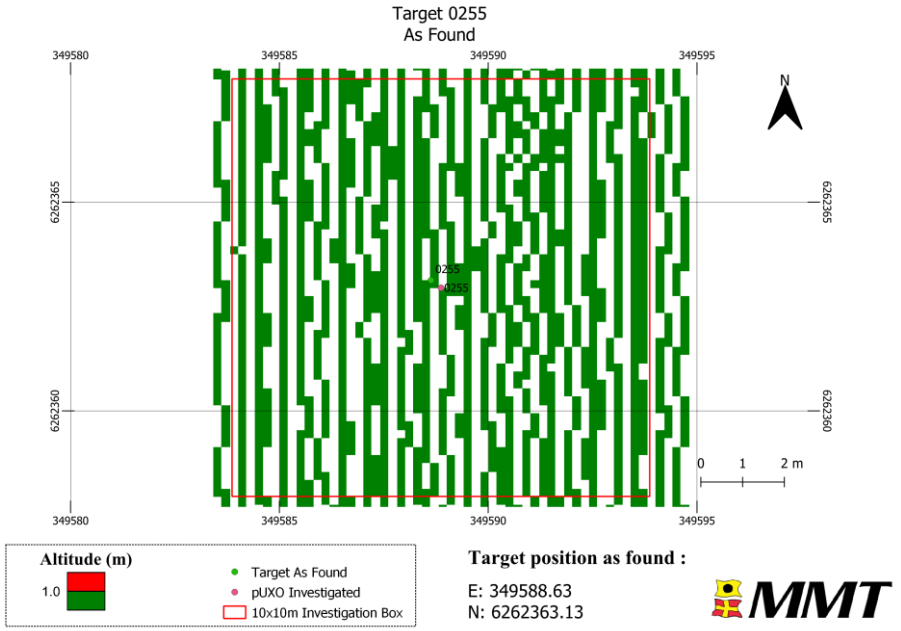

	

Figure 2 - TSS440 As-Found Grid Image.	*Figure 3 - TSS440 As-Found Altitude/Track Image.*

TSS OUT-SURVEY SURVEY - µV	TSS OUT-SURVEY SURVEY - ALTITUDE

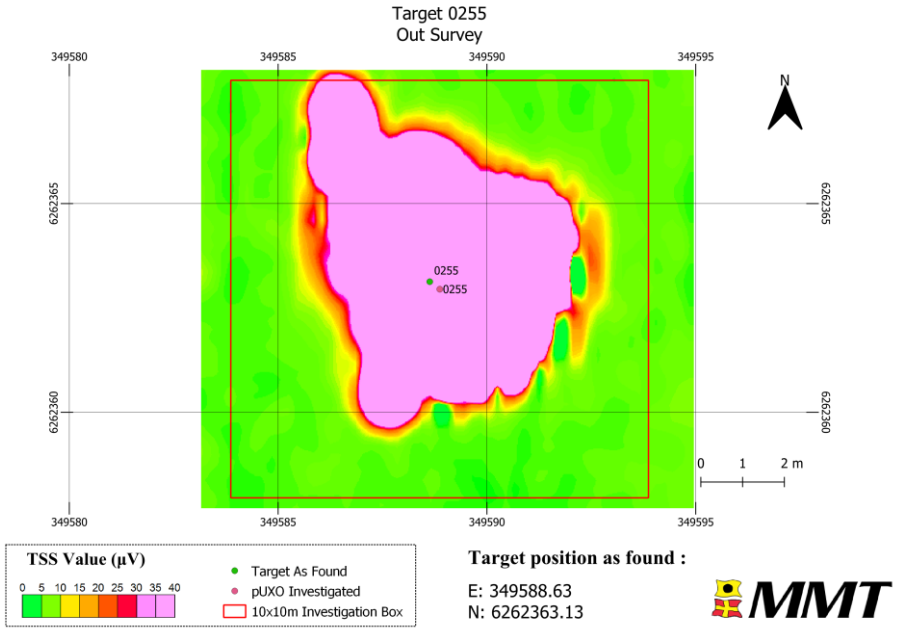
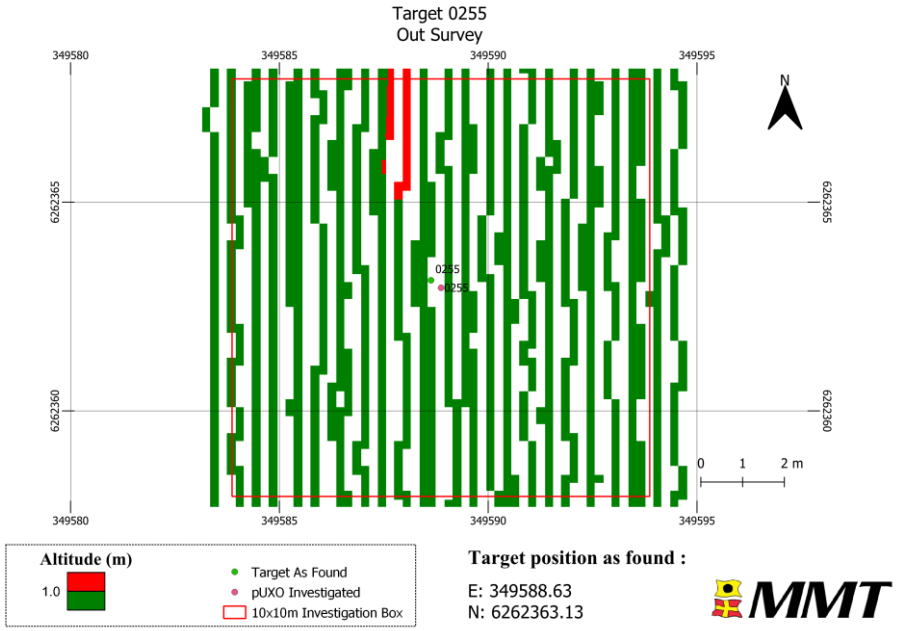

	

Figure 4 - TSS440 Out-Survey Grid Image.	*Figure 5 - TSS440 Out-Survey Altitude/Track Image.*

TSS AS-LEFT-1 SURVEY - µV	TSS AS-LEFT-1 SURVEY - ALTITUDE

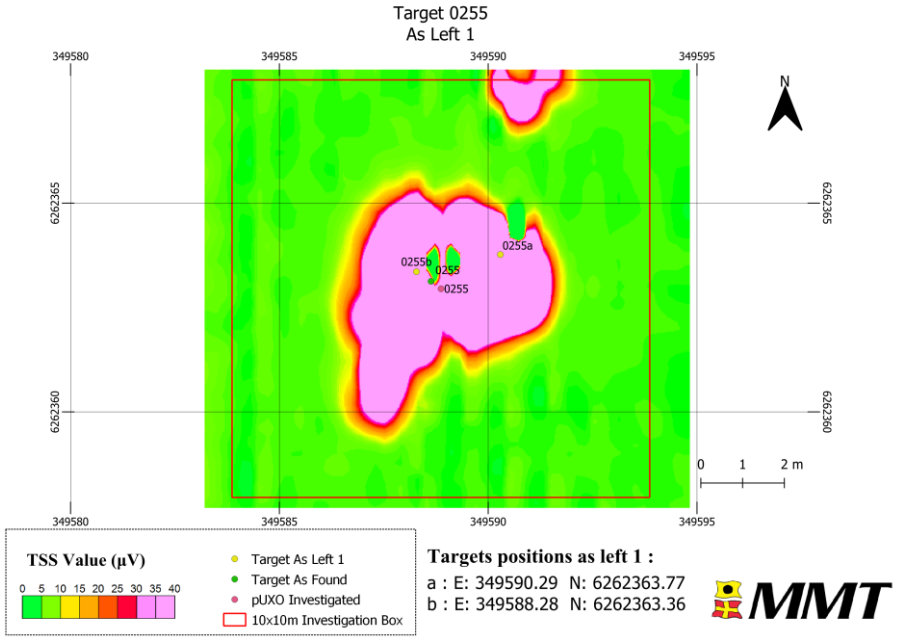
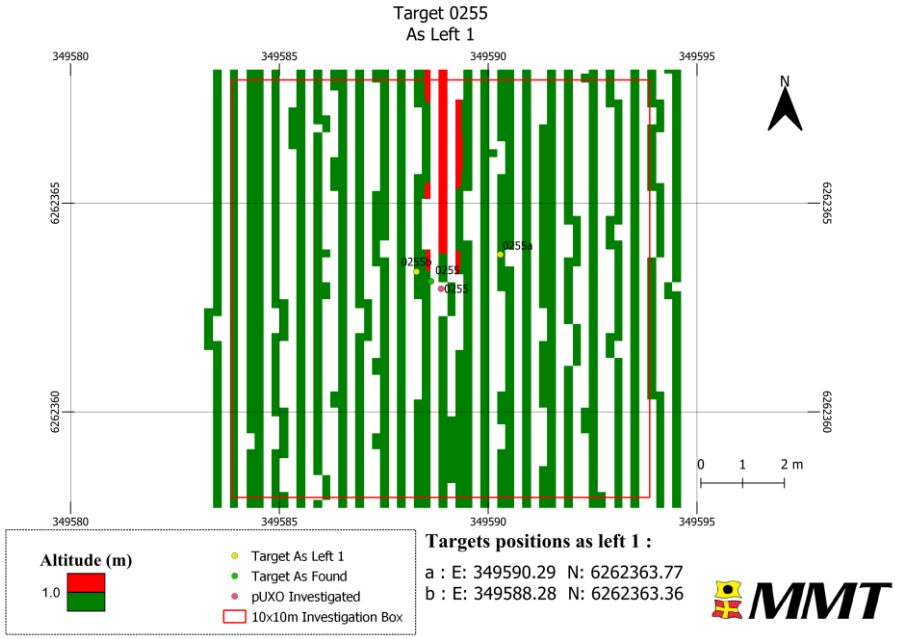

	

Figure 6 - TSS440 As-Left-1 Grid Image.	*Figure 7 - TSS440 As-Left-1 Altitude/Track Image.*

TSS AS-LEFT-2 SURVEY - µV	TSS AS-LEFT-2 SURVEY - ALTITUDE

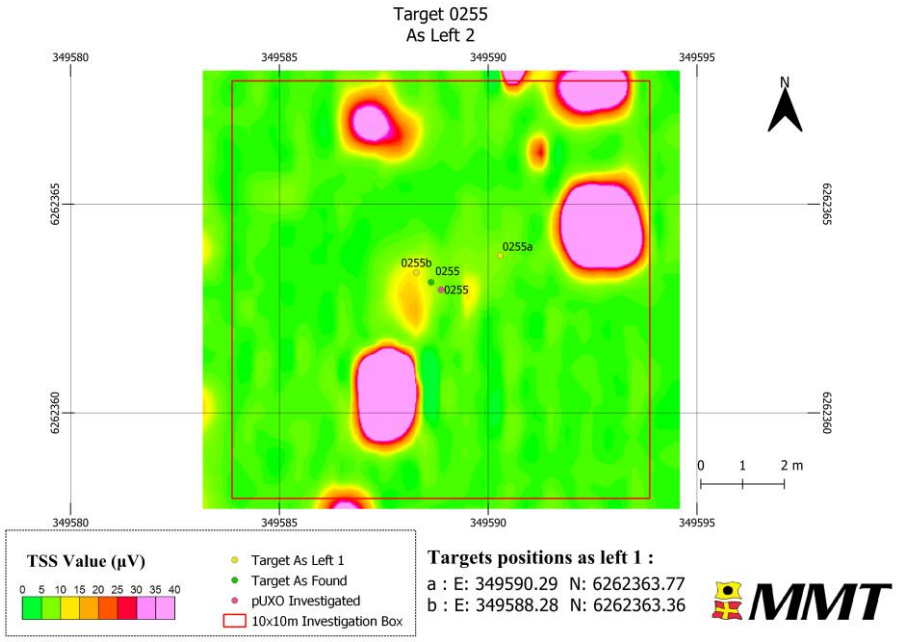
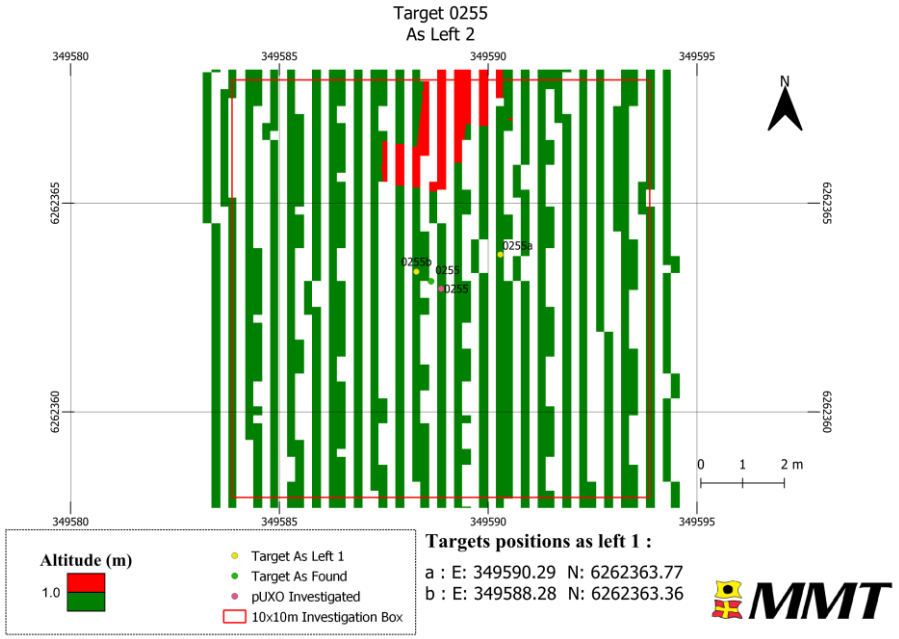

	

Figure 8 - TSS440 As-Left-2 Grid Image.	*Figure 9 - TSS440 As-Left-2 Altitude/Track Image.*

MBES IN AND OUT SURVEY

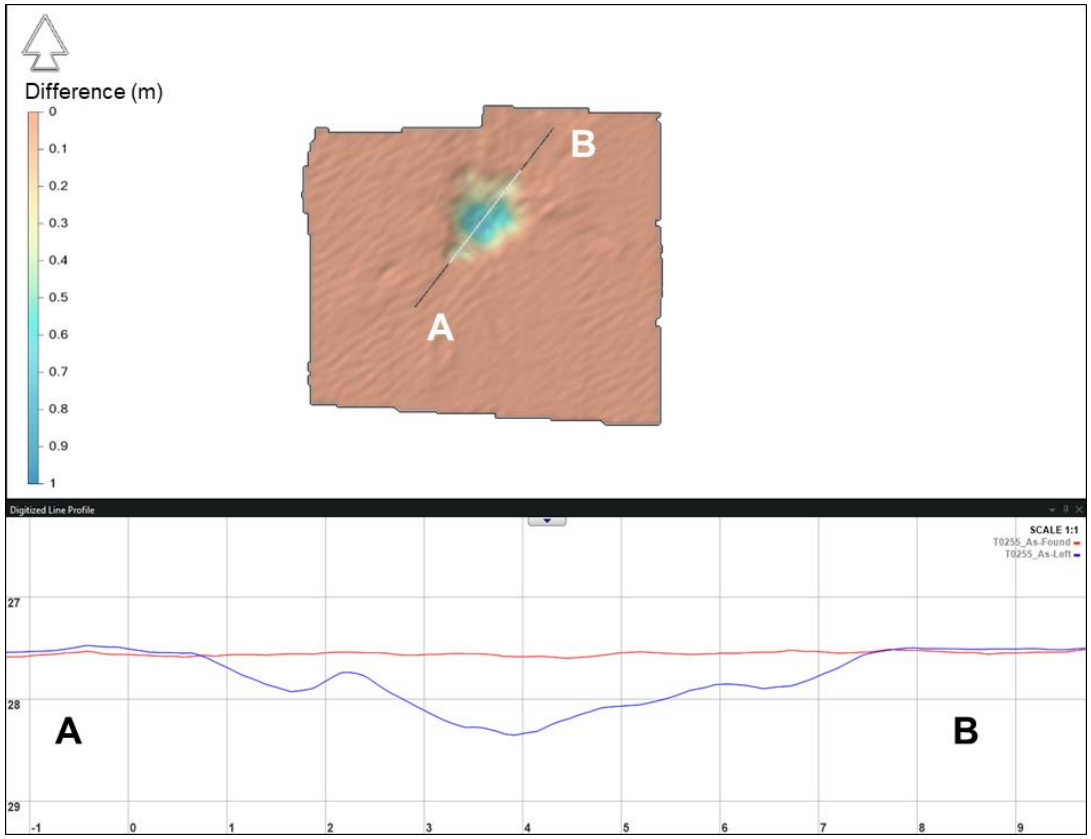


Figure 10 - MBES Grid Image.

ROV VIDEO/SONAR AS-FOUND

Figure 11 - Video Image – As-Found.

ROV VIDEO/SONAR EXCAVATION

Figure 12 - Video Image – Excavation.

ROV VIDEO/SONAR BUOY PLACEMENT

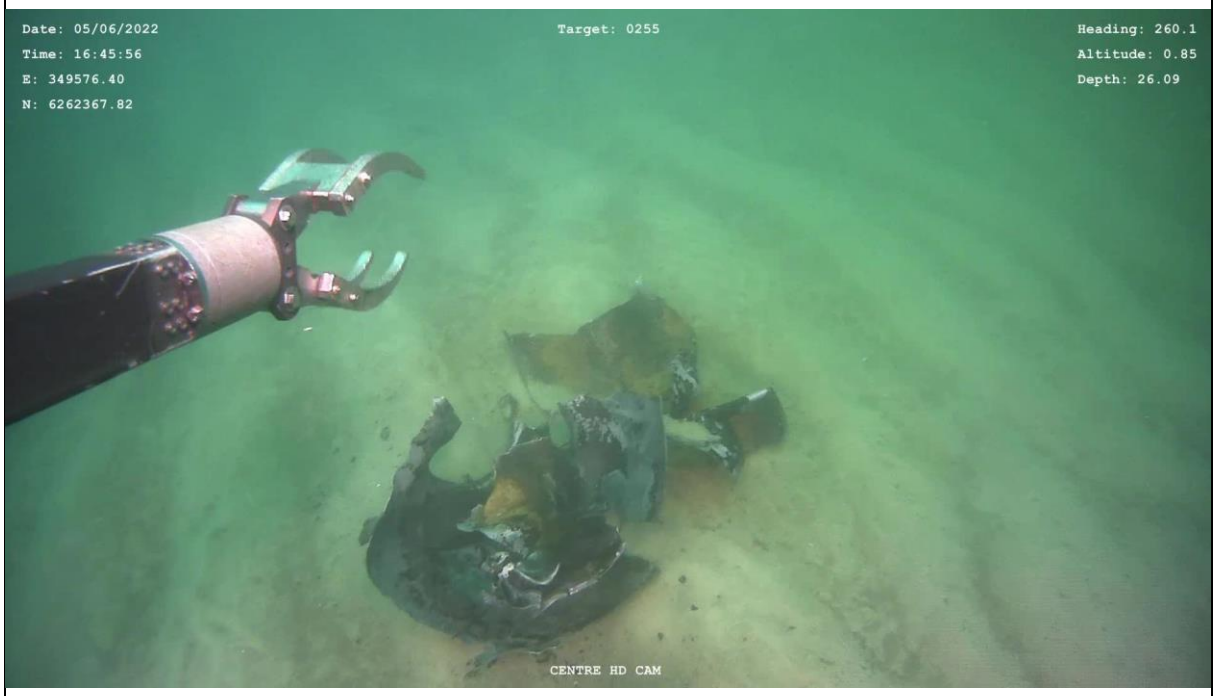
Figure 13 - Video Image – Buoy placement.

ROV VIDEO/SONAR OUT SURVEY (AFTER EXPLOSION)

Figure 14 - Video Image – Out-Survey (after explosion).

ROV VIDEO/SONAR RELOCATED/AS-LEFT

AS-LEFT-1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Time: 16:45:56
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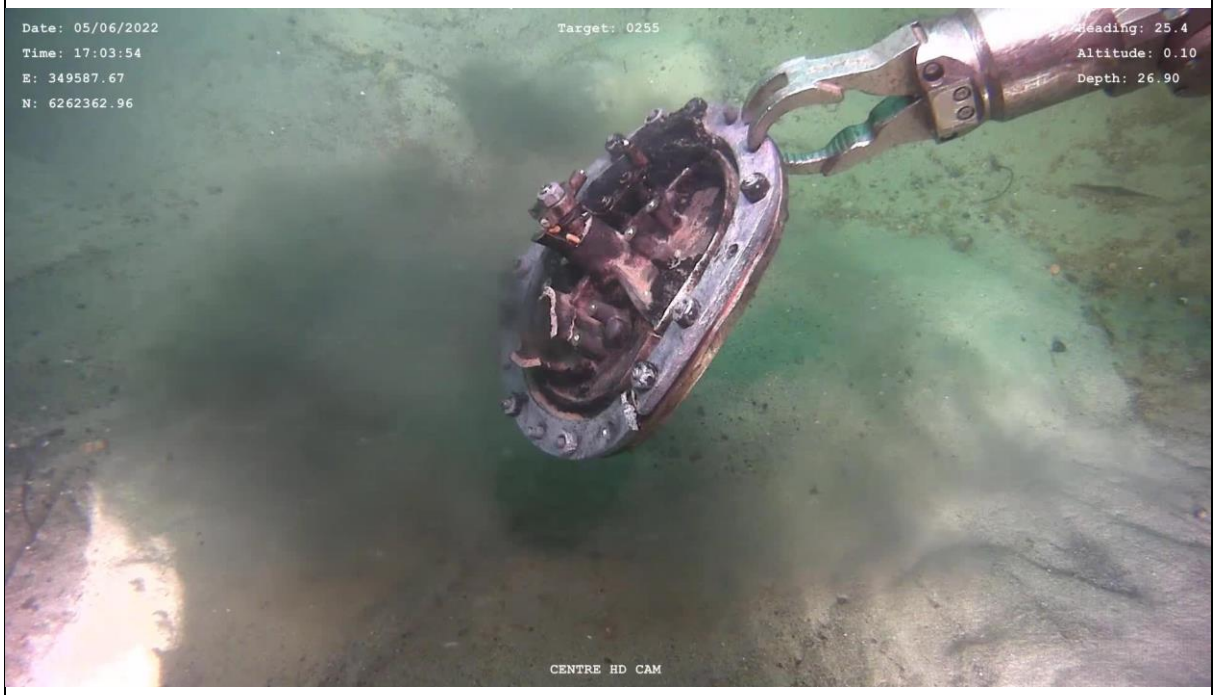
N: 6262367.82
Target: 0255
Heading: 260.1
Altitude: 0.85
Depth: 26.09
CENTRE HD CAM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Time: 17:03:54
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N: 6262362.96
Target: 0255
Heading: 25.4
Altitude: 0.10
Depth: 26.90
CENTRE HD CAM

AS-LEFT-2


Date: 05/06/2022
Time: 19:15:54
E: 349589.63
N: 6262363.83
Target: 0255
Heading: 120.8
Altitude: -0.08
Depth: 27.05
CENTRE HD CAM


Date: 05/06/2022
Time: 19:18:33
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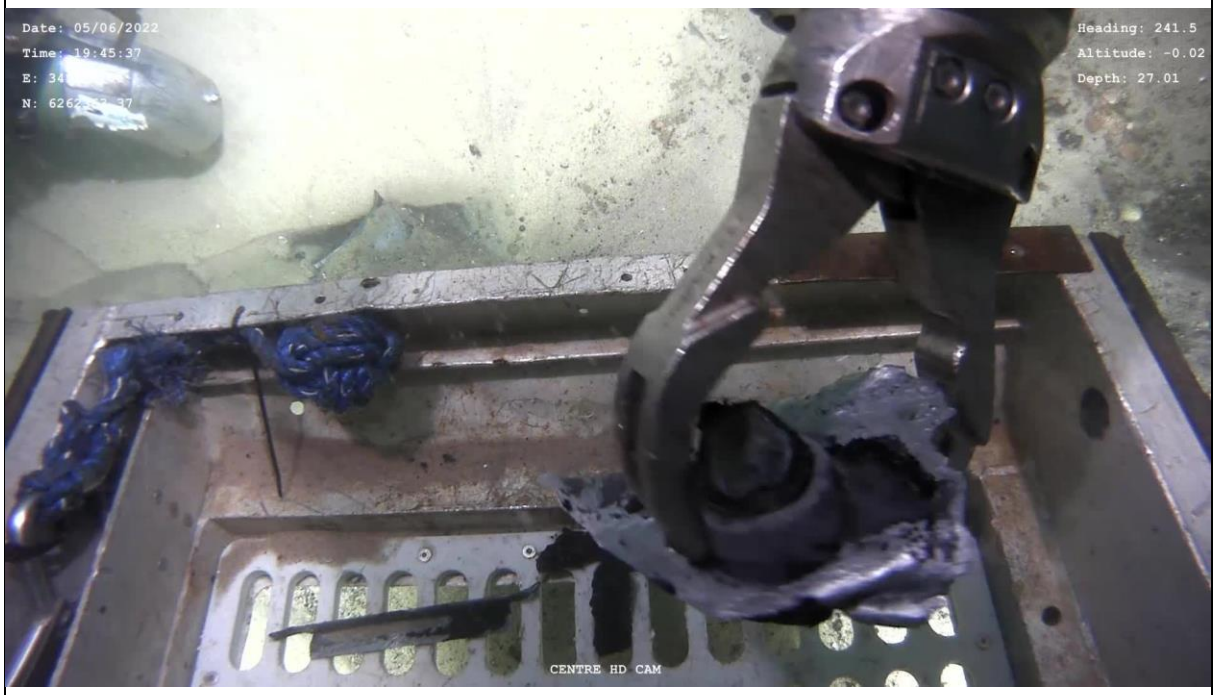
N: 6262364.21
Target: 0255
Heading: 119.2
Altitude: -0.10
Depth: 27.06
CENTRE HD CAM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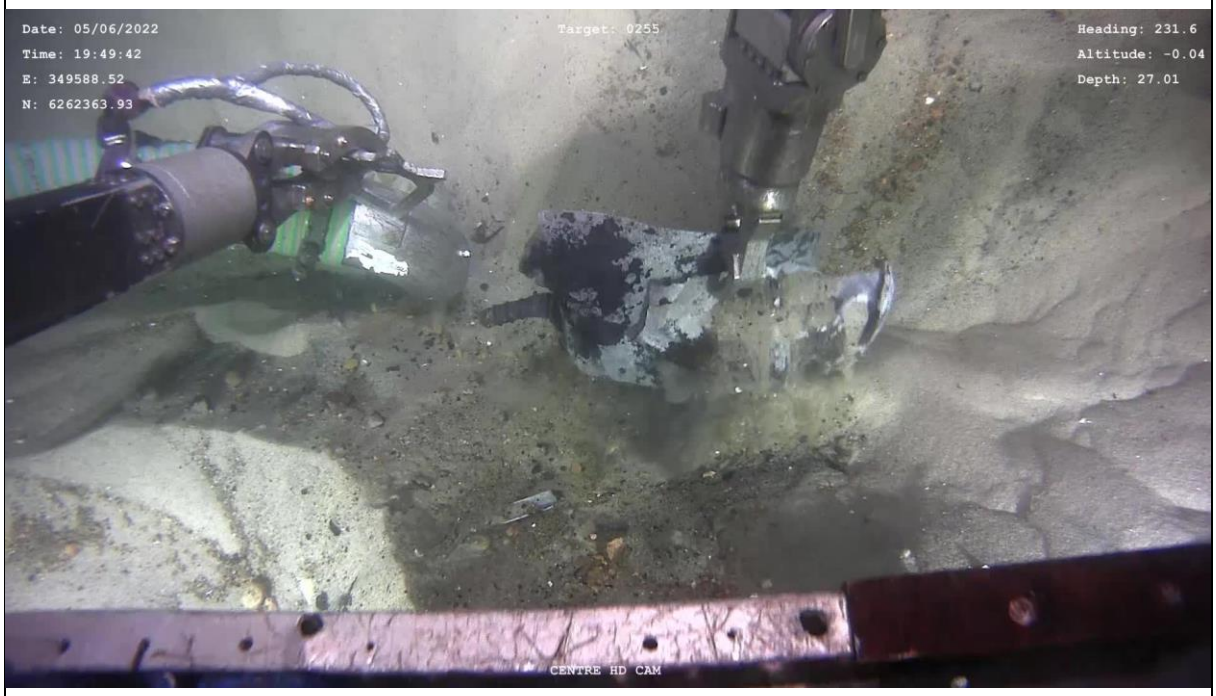
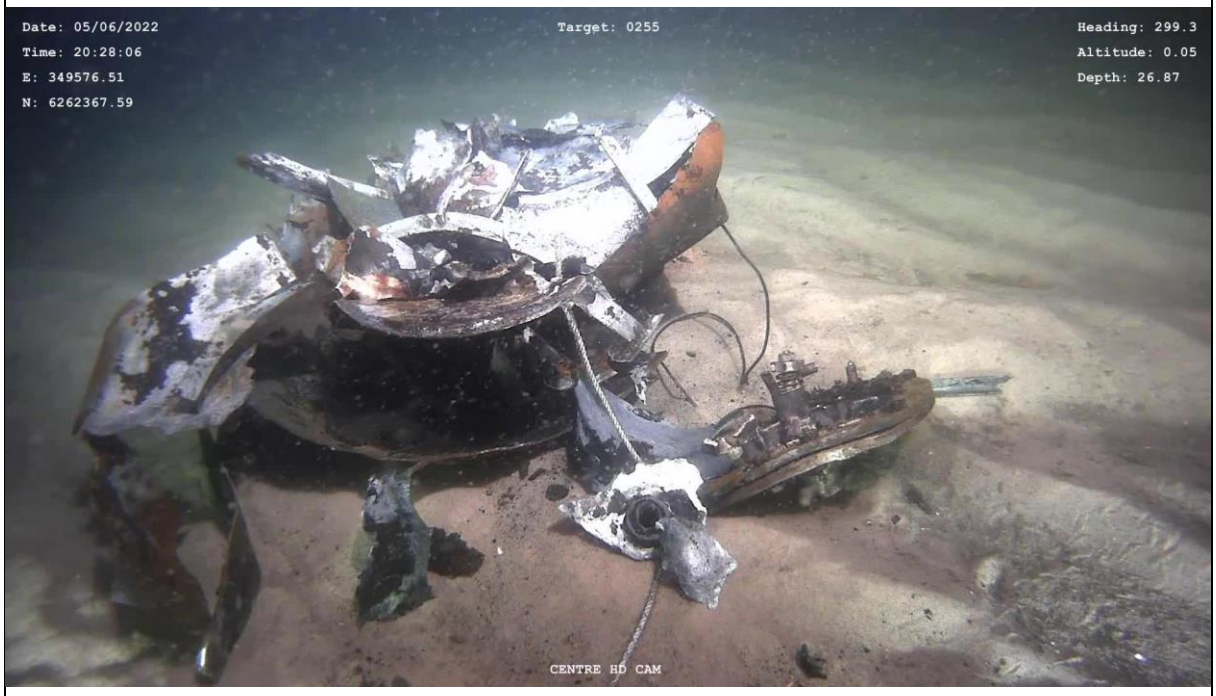
CENTRE HD CAM


Date: 05/06/2022
Time: 19:49:42
E: 349588.52
N: 6262363.93
Target: 0255
Heading: 231.6
Altitude: -0.04
Depth: 27.01
CENTRE HD CAM

RELOCATED AS-LEFT-1 AND AS-LEFT-2



AS-LEFT AFTER DEBRIS RELOCATION

Figure 15 - Video Image – As-Left/Relocated.

Appendix 3 ALARP Charts

Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Data Sources: Client
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
Page: 1 of 48

MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
Status: INITIAL ISSUE
Scale @ A3: 1:1,500
Date Created: 23/06/2022

Notes:
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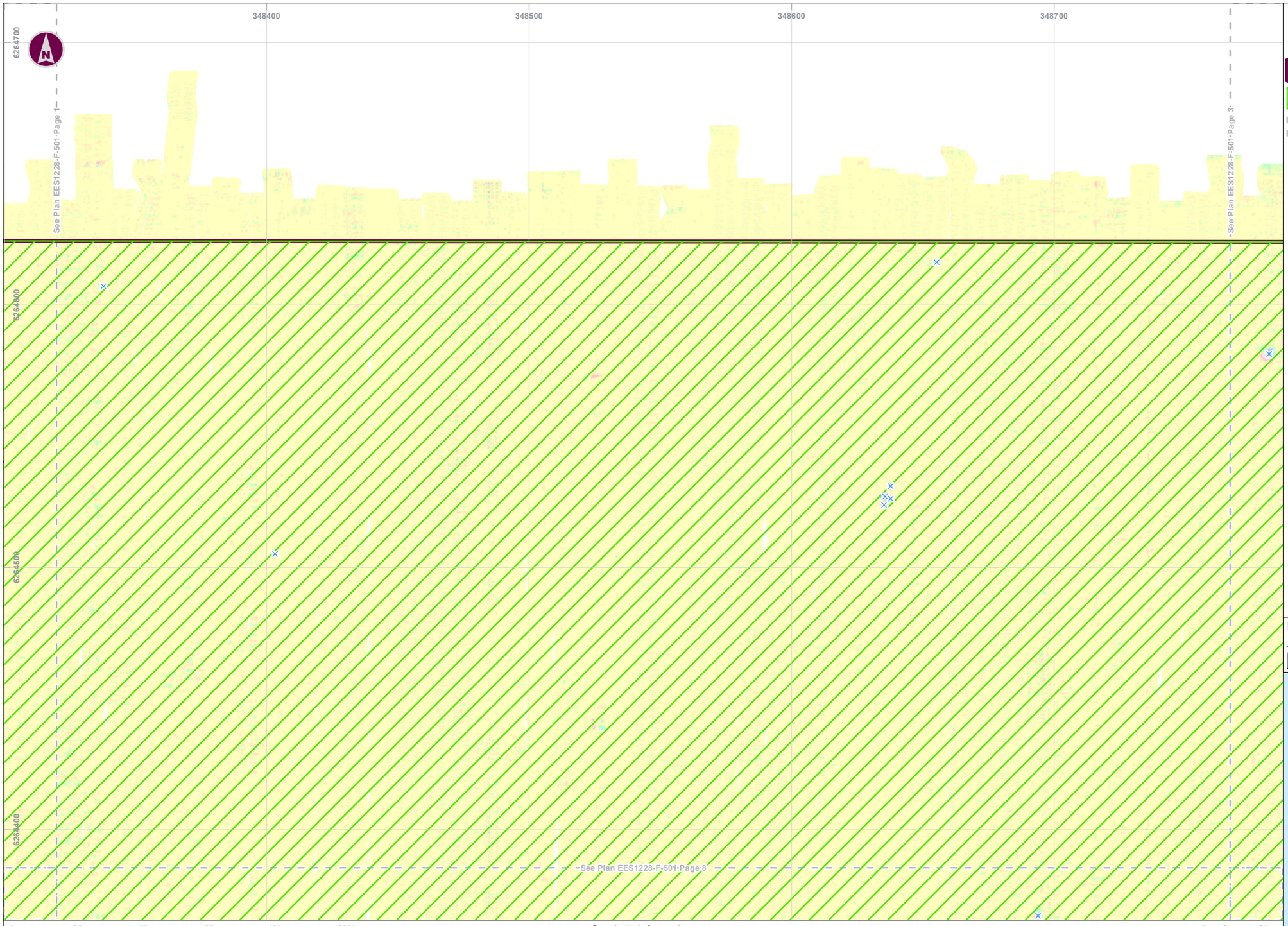
3. Only written dimensions should be used .
4. Not to be used for Navigation.
5. The locations shown are based on the information identfied /provided, and should be used for general guidance only.



Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Data Sources: Client
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
Page: 2 of 48

MAKING COMPLEX EASY
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Client: Energinet
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Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
Status: INITIAL ISSUE
Scale @ A3: 1:1,500
Date Created: 23/06/2022

Notes:
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348800 348900 349000 349100 349200

6264700 6264600 6264500 6264400

See Plan EES1228-F-501 Page 2

See Plan EES1228-F-501 Page 4

See Plan EES1228-F-501 Page 9

Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Data Sources: Client
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
Page: 3 of 48

MAKING COMPLEX EASY
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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
Status: INITIAL ISSUE
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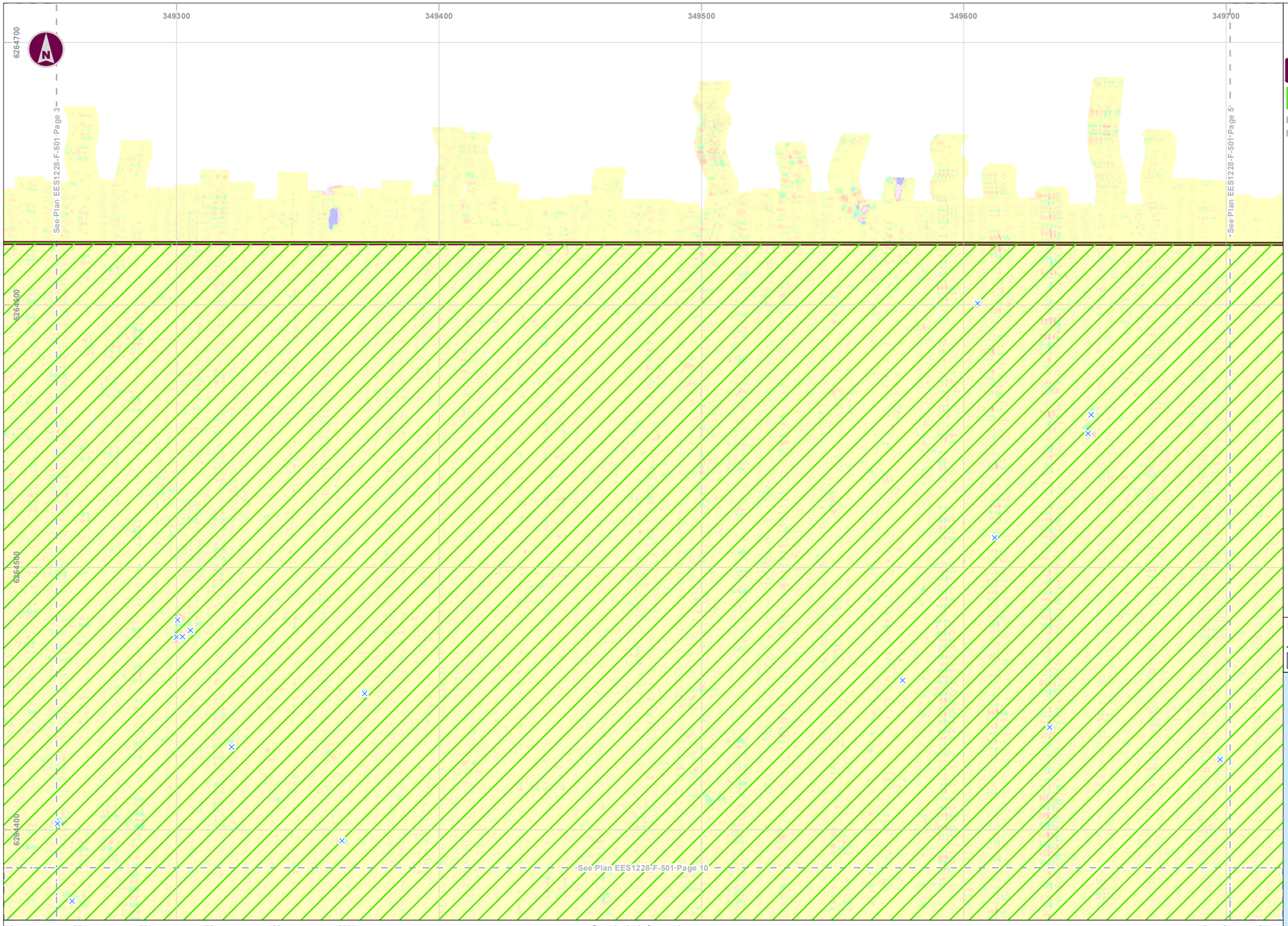

Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
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0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
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Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

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MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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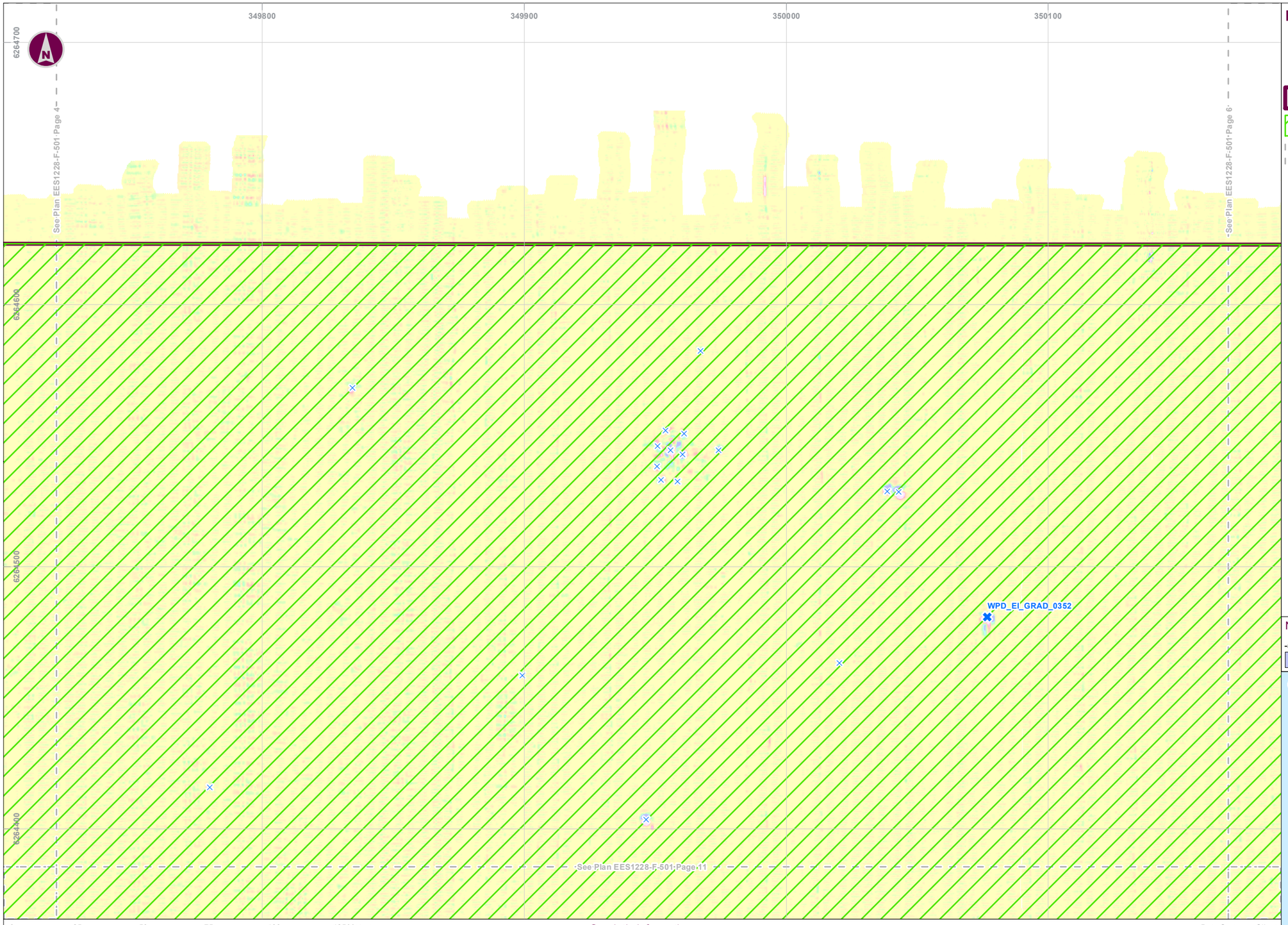

Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

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0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

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Data Sources: Client
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Ver	Description	By	Check	Date
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MAKING COMPLEX EASY
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Client: Energinet
Project: North Sea Energy Island
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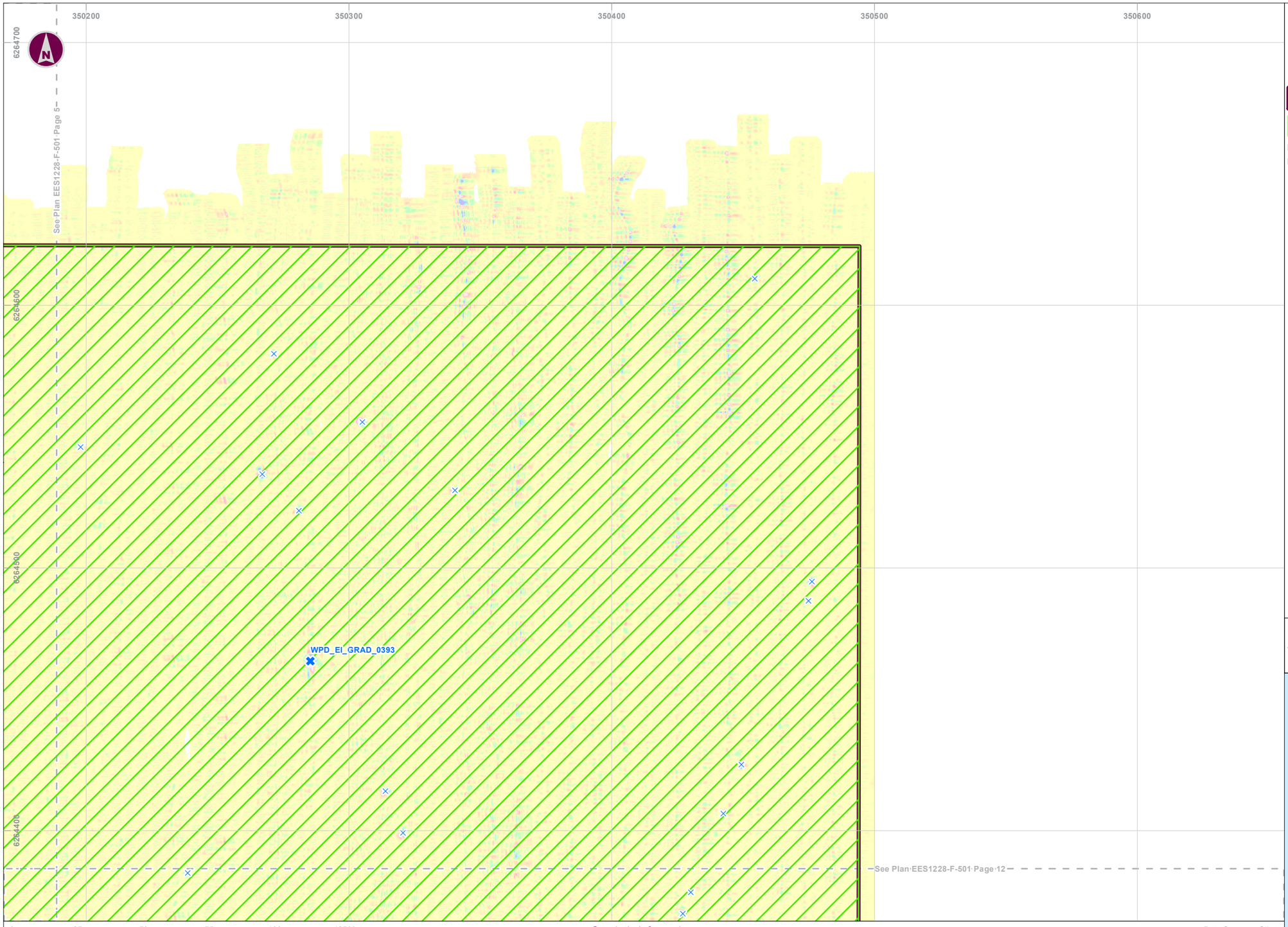

Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

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0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
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Ver	Description	By	Check	Date
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MAKING COMPLEX EASY
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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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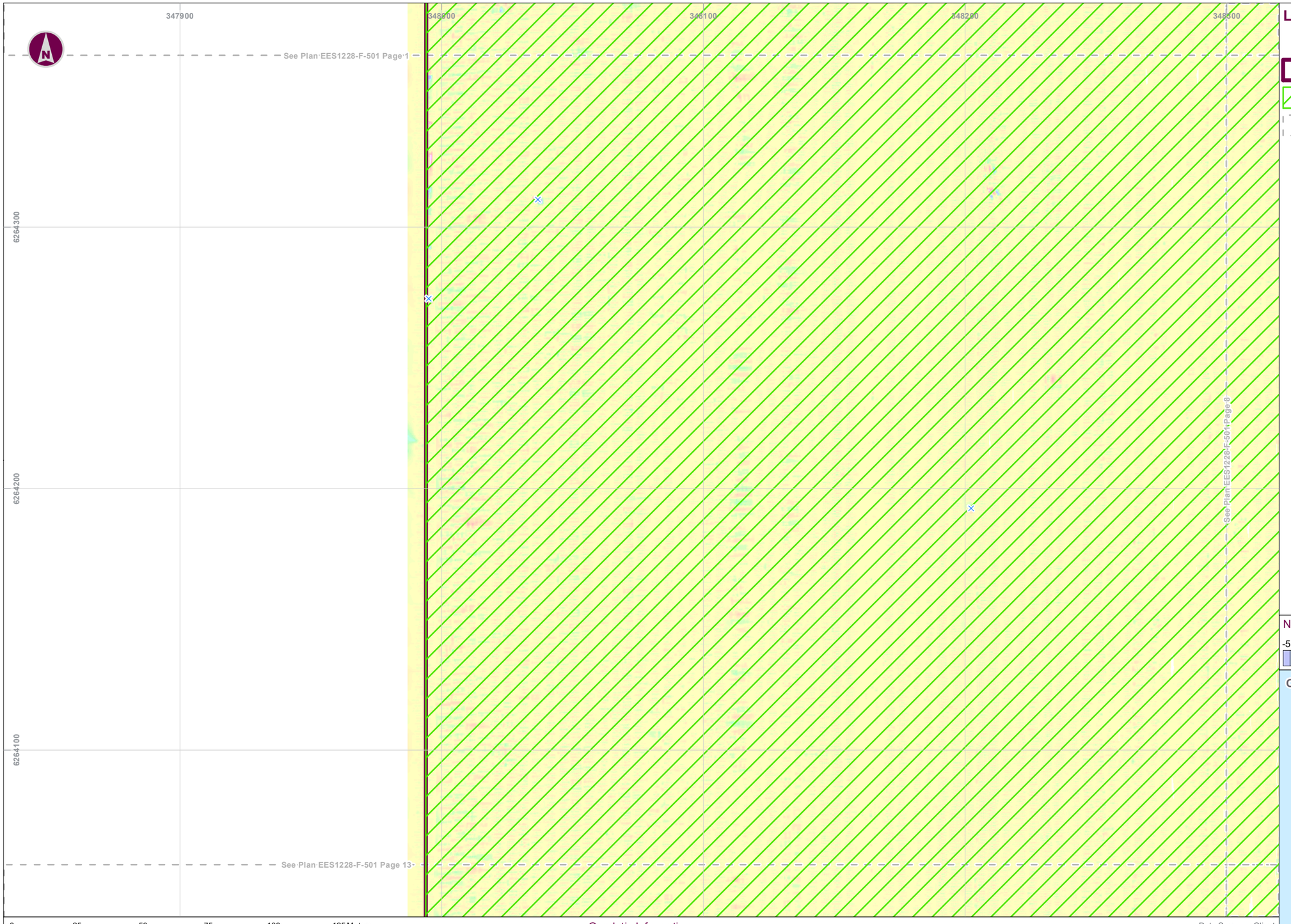


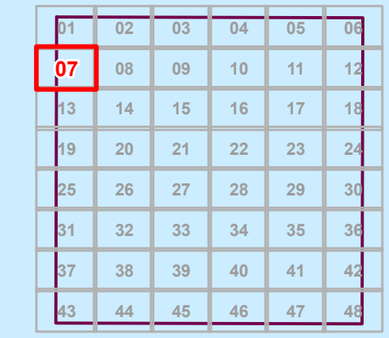
Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview



0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

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Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Client: Energinet
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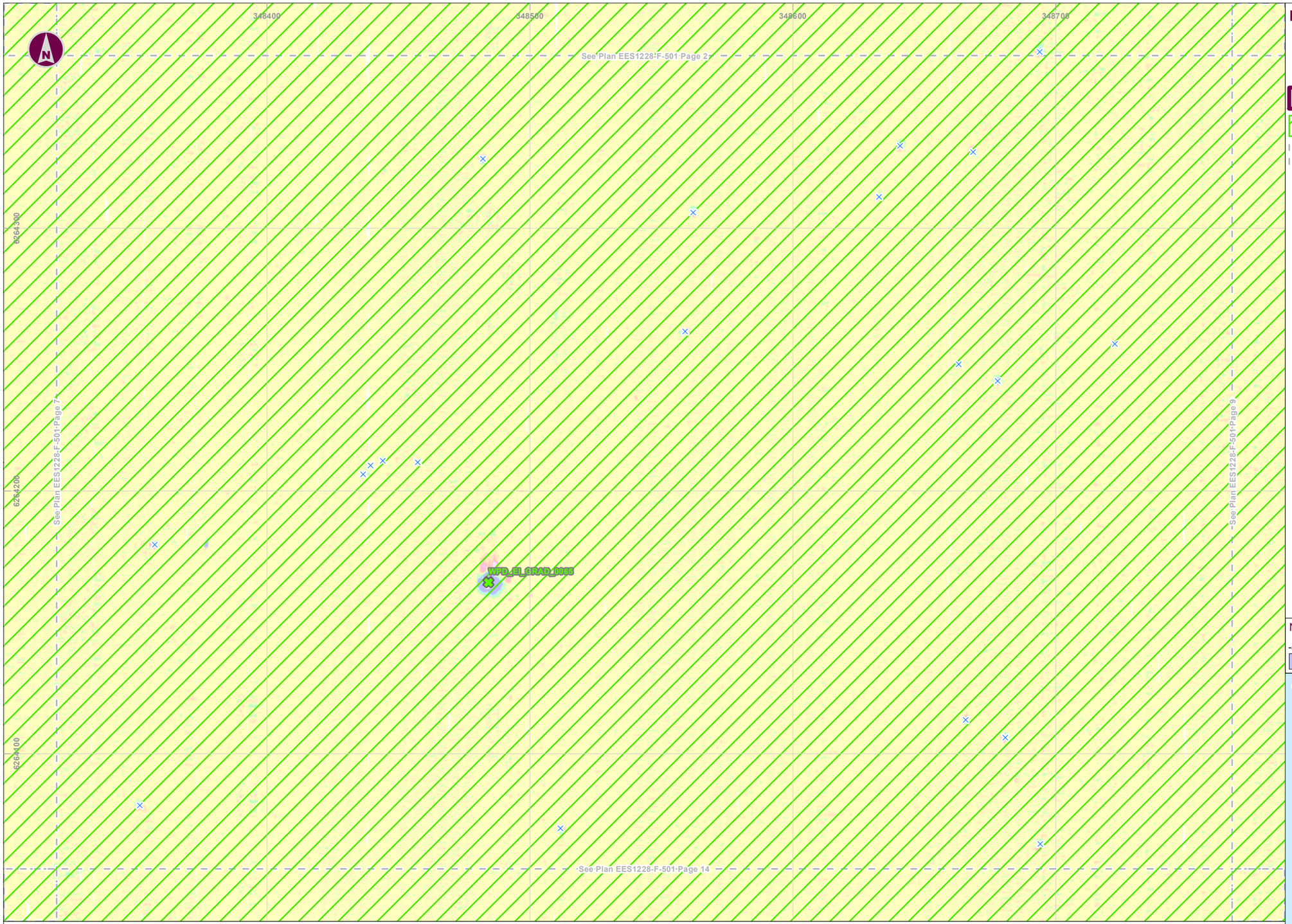

Legend

- Investigated Target: Disposed UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

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0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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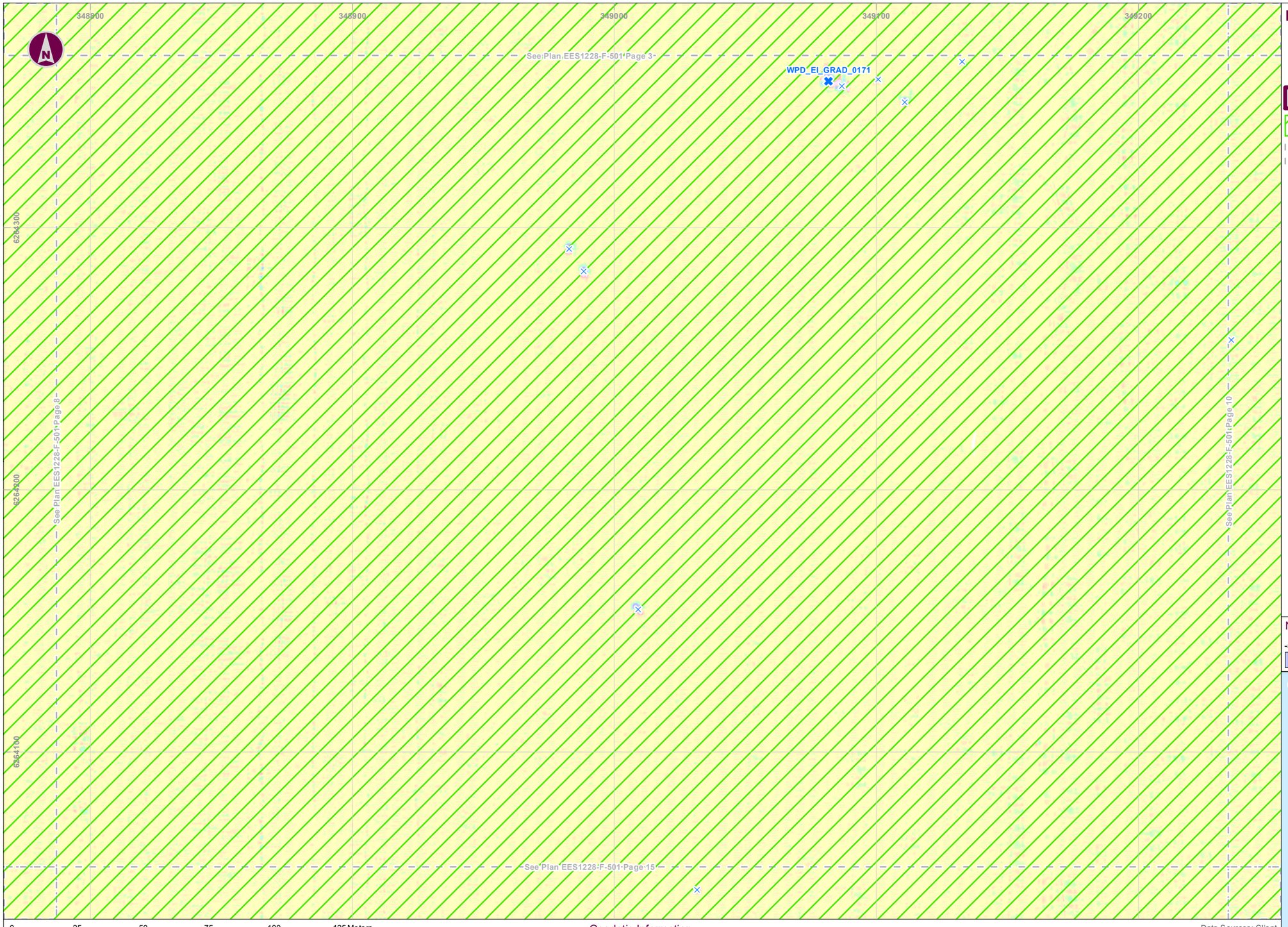

Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

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0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

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Ver	Description	By	Check	Date
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Figure Number: EES1228-F-101
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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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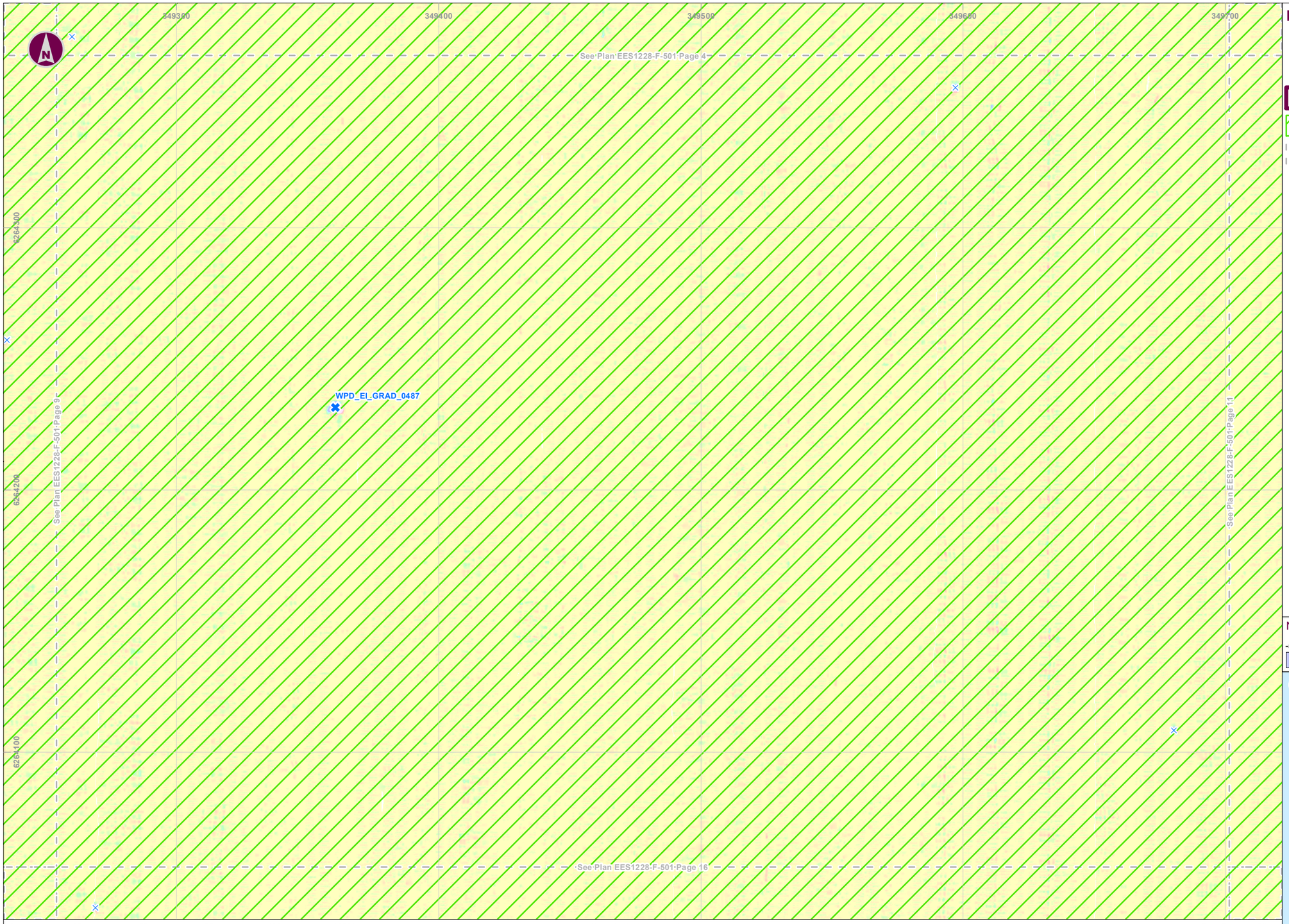


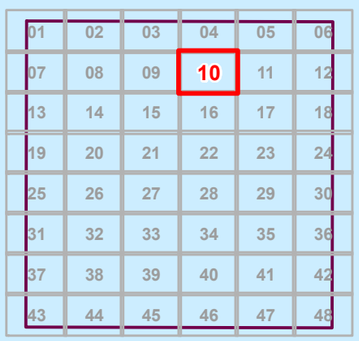
Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview



0 25 50 75 100 125 Meters

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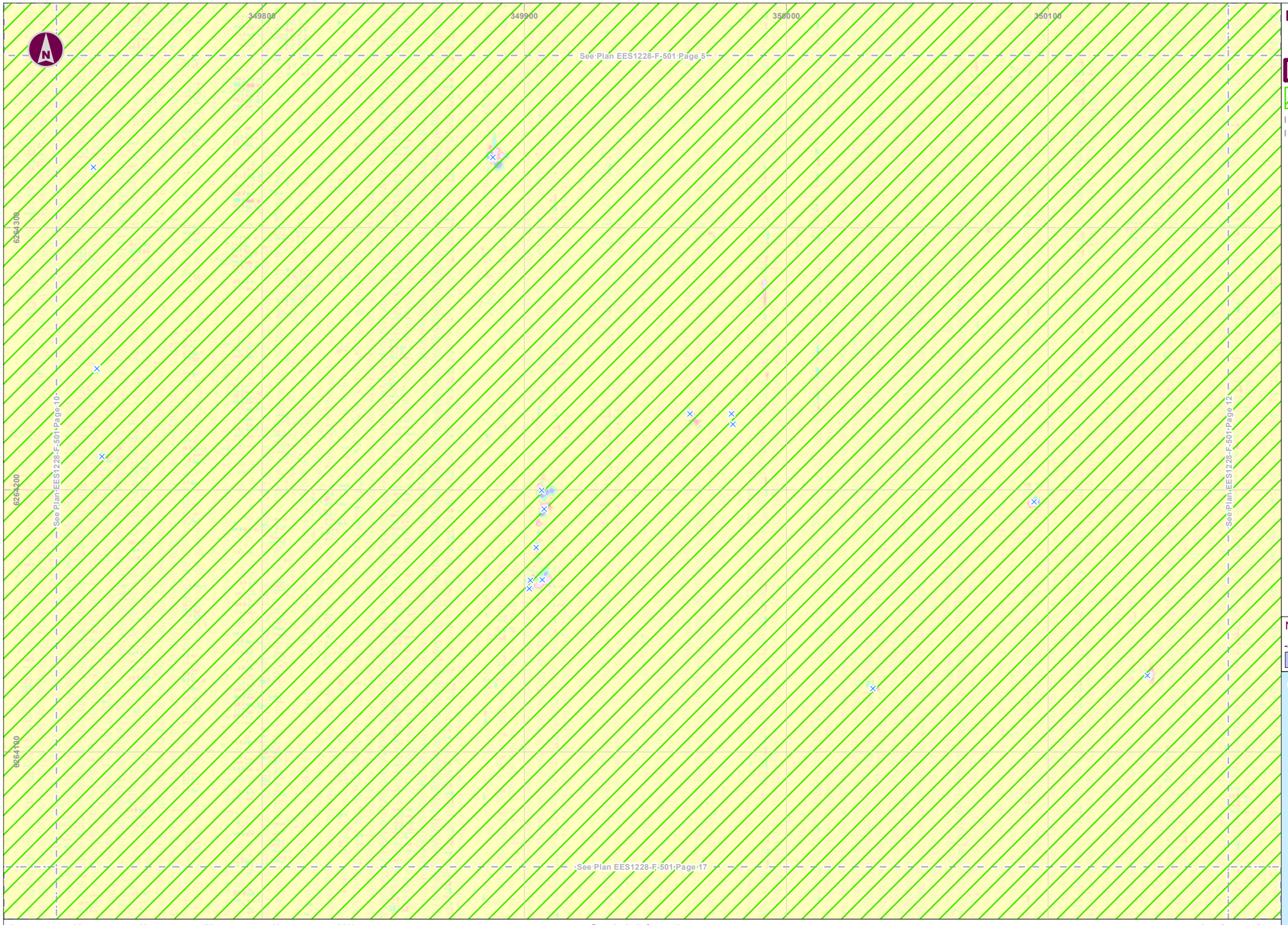

Legend

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Figure Number: EES1228-F-101
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MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
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Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

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- Target - Not-UXO
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Nanotesla (nT) Colour Scale:

-5 0 +5

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Ver	Description	By	Check	Date
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rpsgroup.com

Client: Energinet

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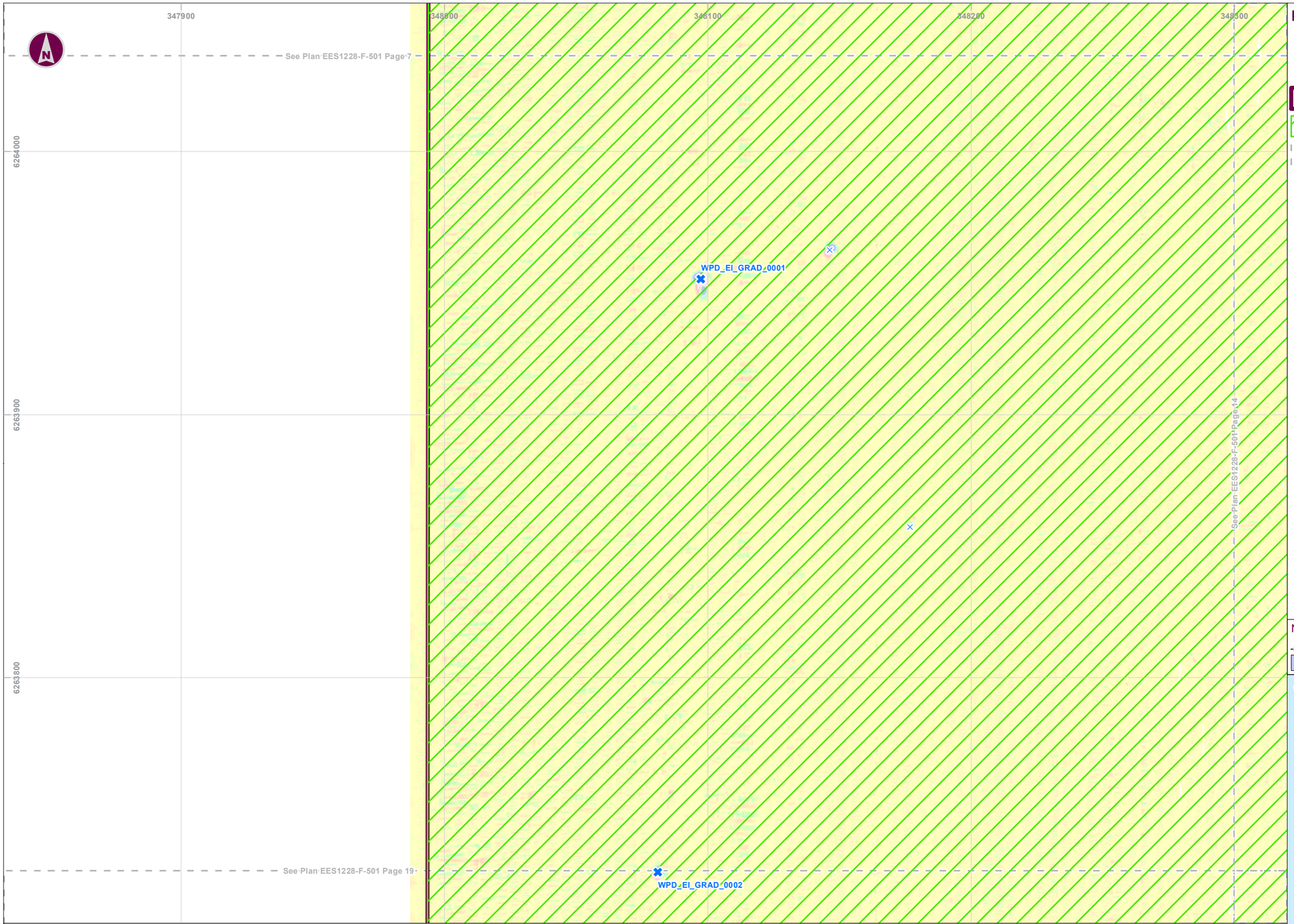

Legend

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Figure Number: EES1228-F-101
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Client: Energinet
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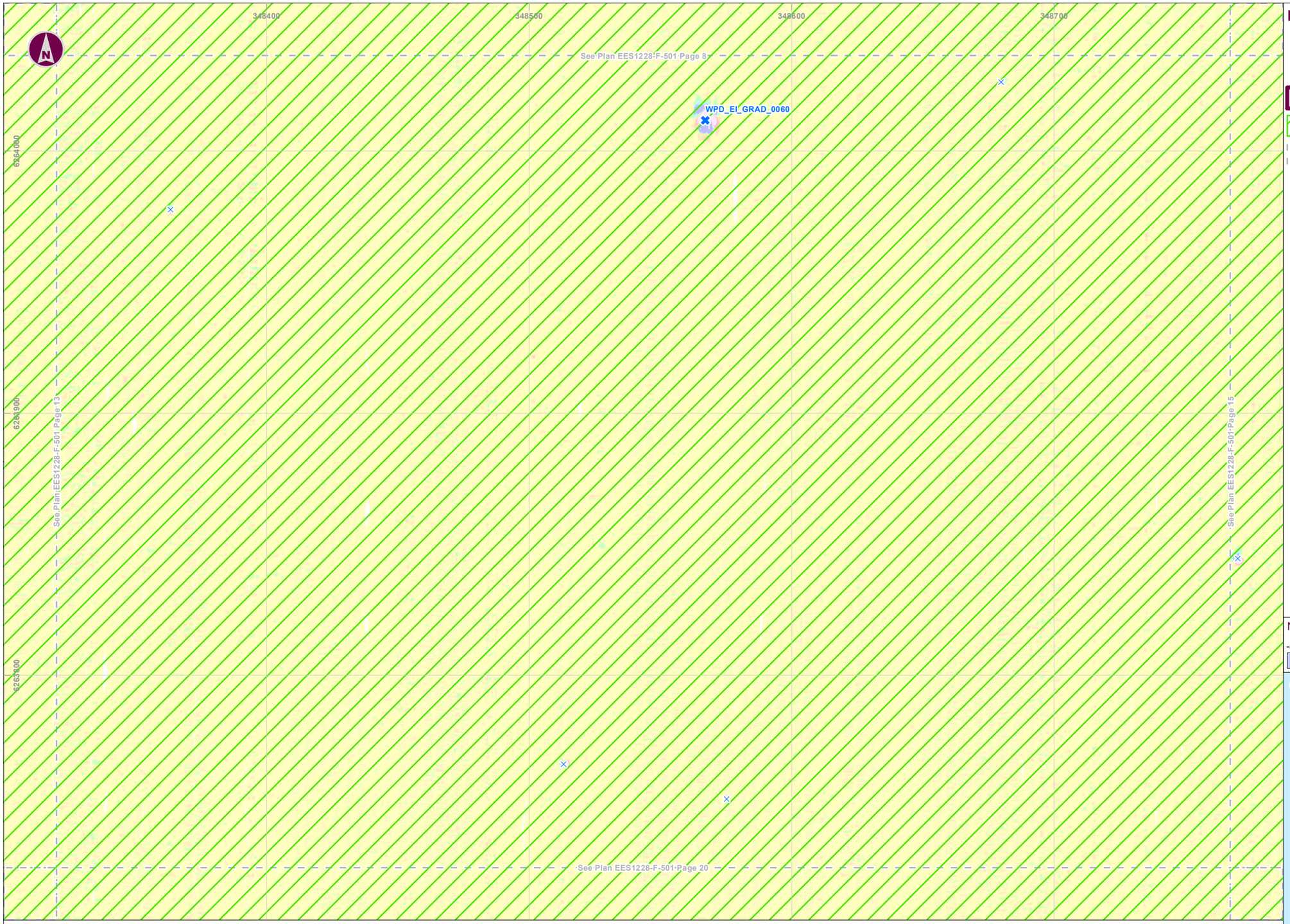

Legend

- Investigated Target: Not-UXO
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31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters
0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Data Sources: Client
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
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MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
Status: INITIAL ISSUE
Scale @ A3: 1:1,500
Date Created: 23/06/2022

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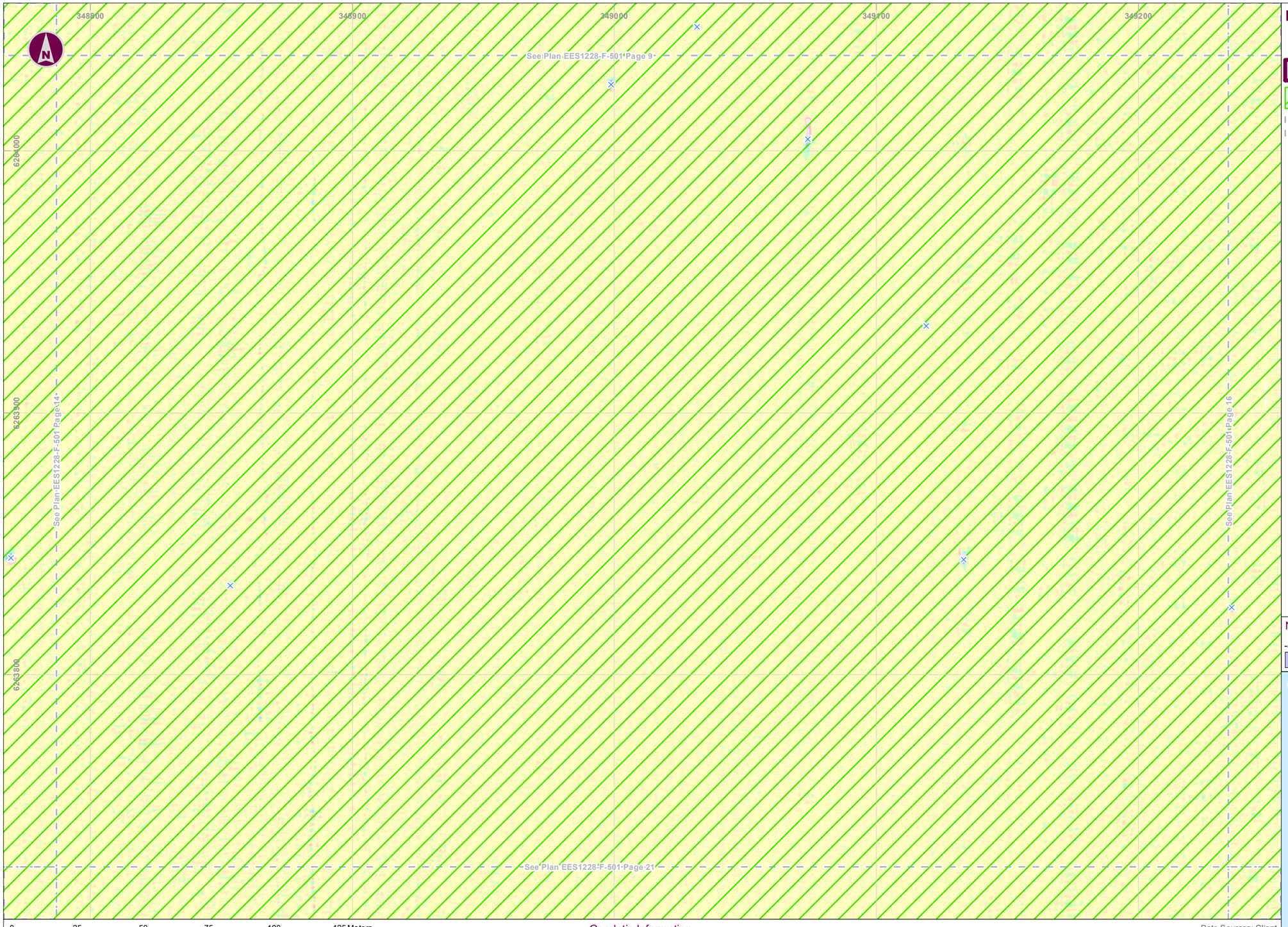

Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
13	14	**15**	16	17	18
19	20	21	22	23	24
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0 25 50 75 100 125 Meters

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Figure Number: EES1228-F-101
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MAKING COMPLEX EASY
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Project Number: EES1228
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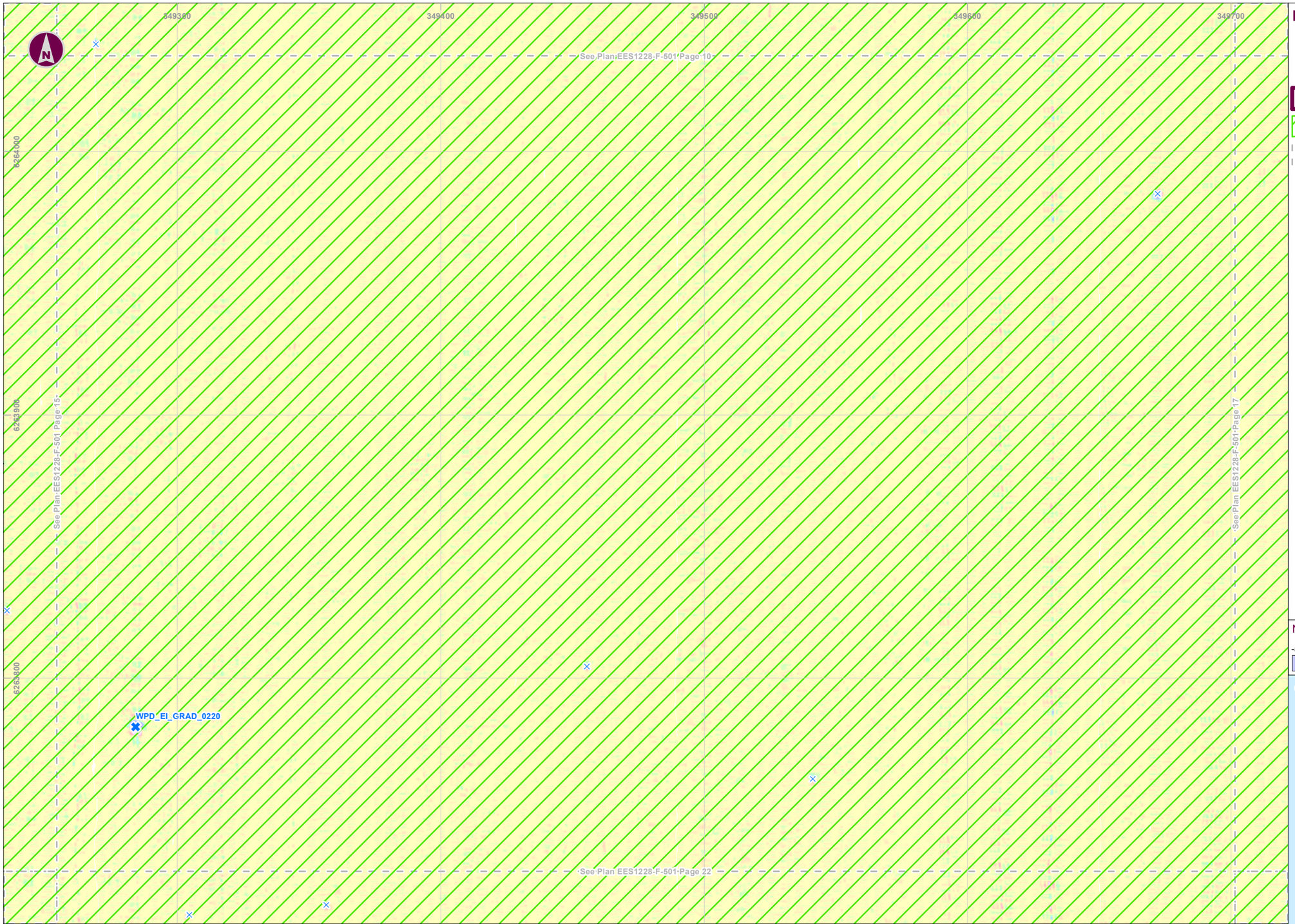

Legend

- Investigated Target: Not-UXO
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Nanotesla (nT) Colour Scale:

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MAKING COMPLEX EASY
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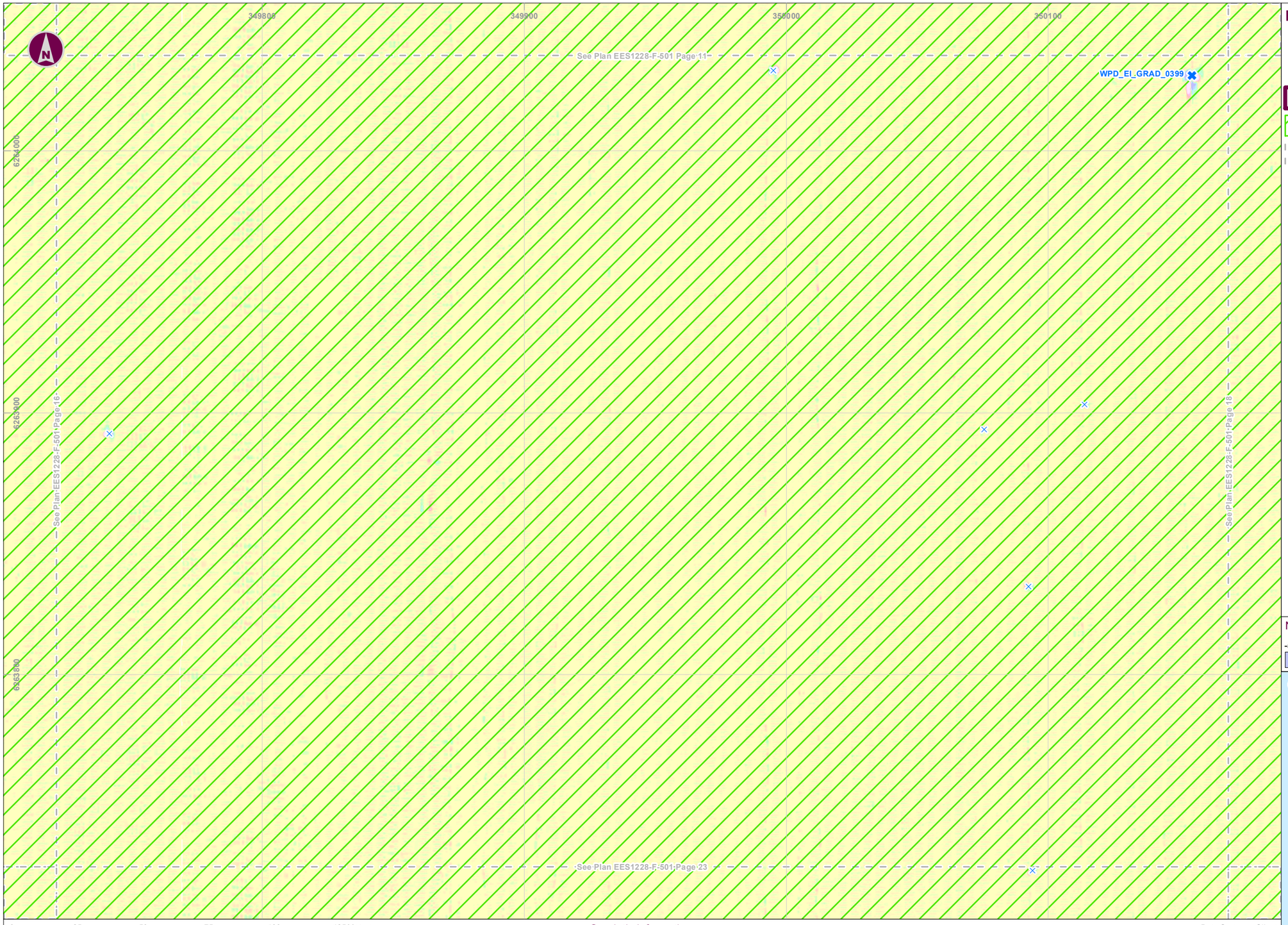

Legend

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MAKING COMPLEX EASY
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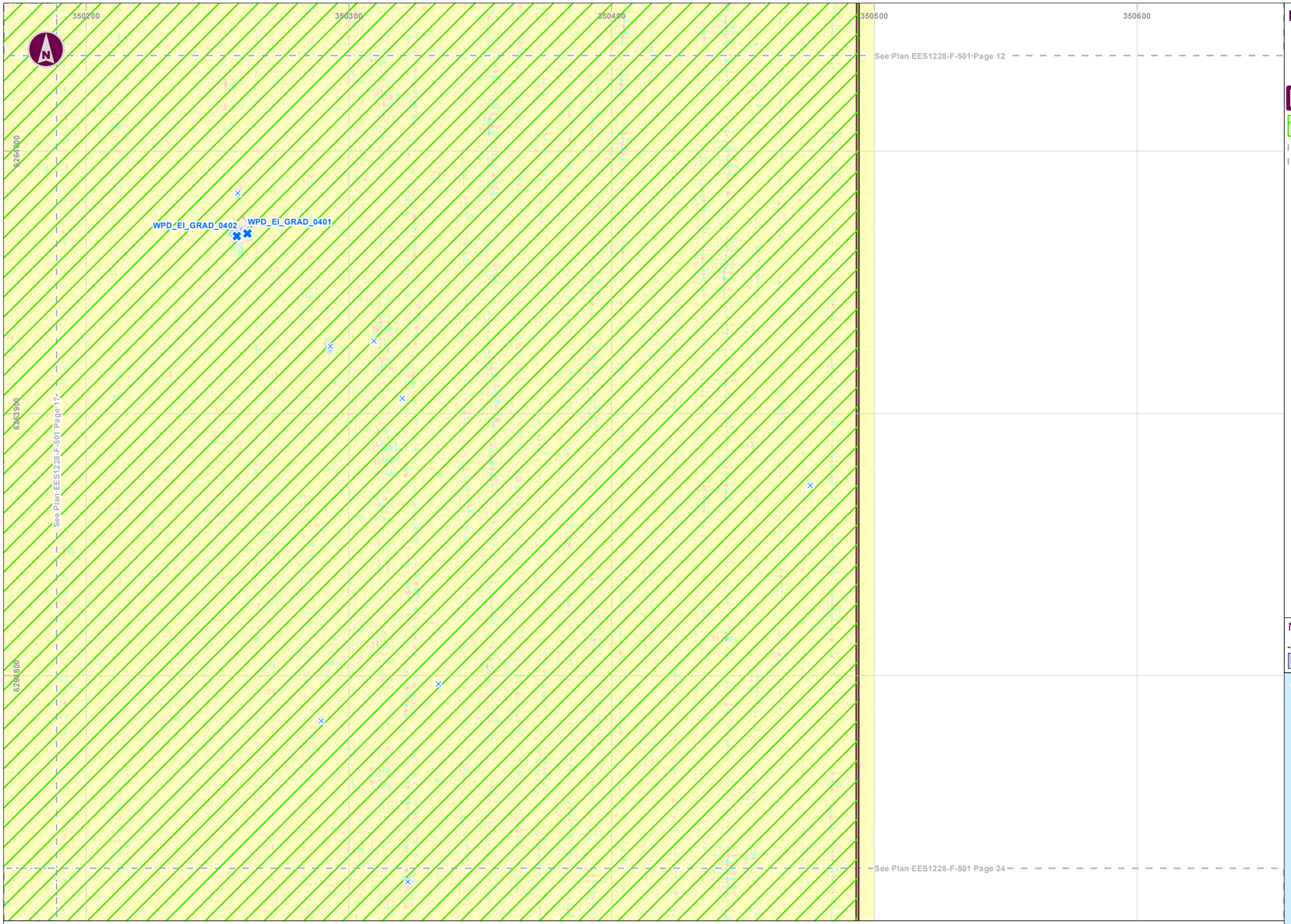

Legend

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MAKING COMPLEX EASY
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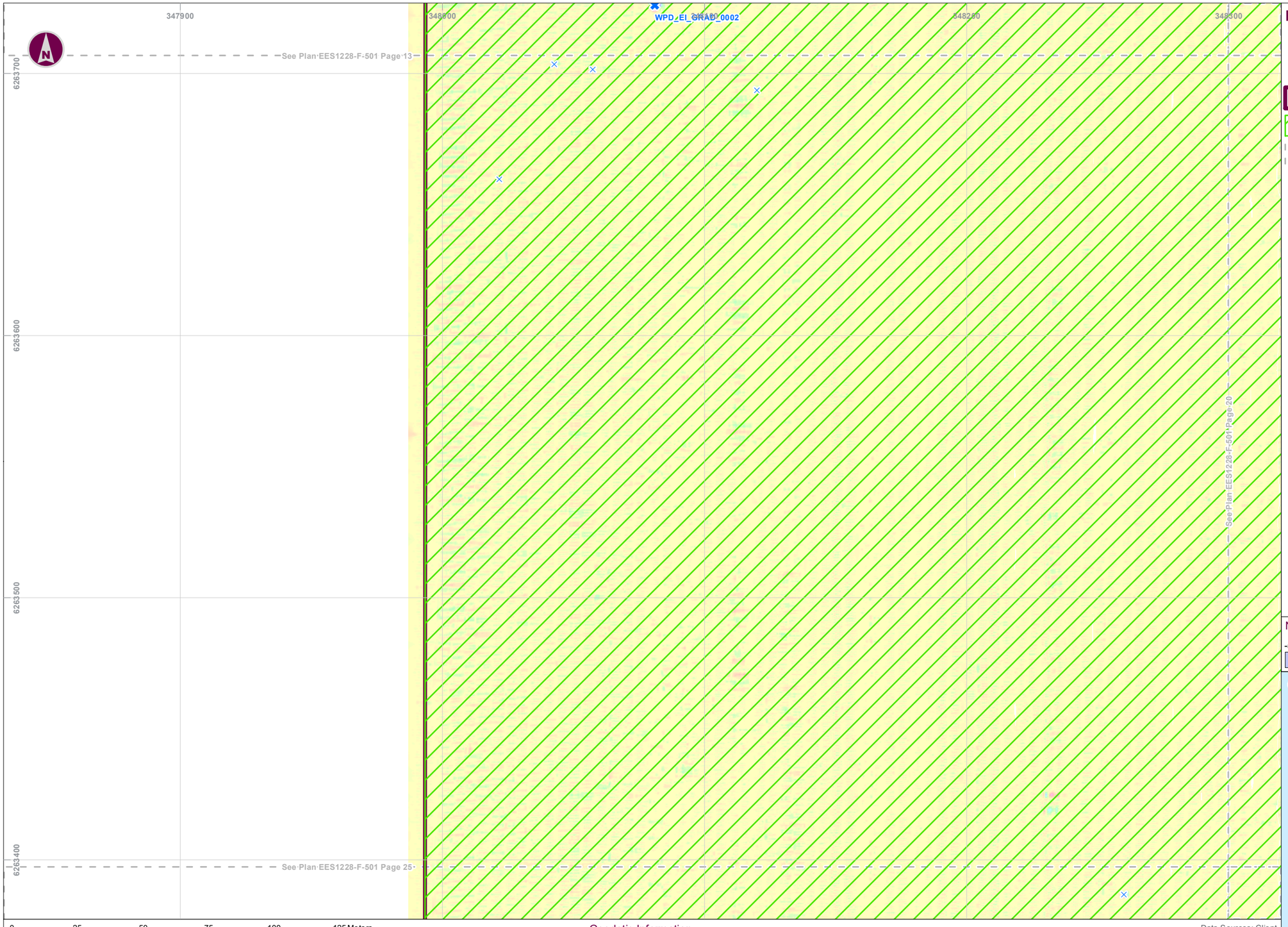

Legend

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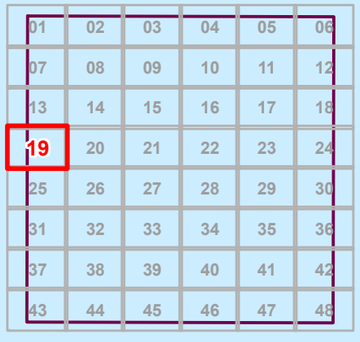

0 25 50 75 100 125 Meters
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Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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MAKING COMPLEX EASY
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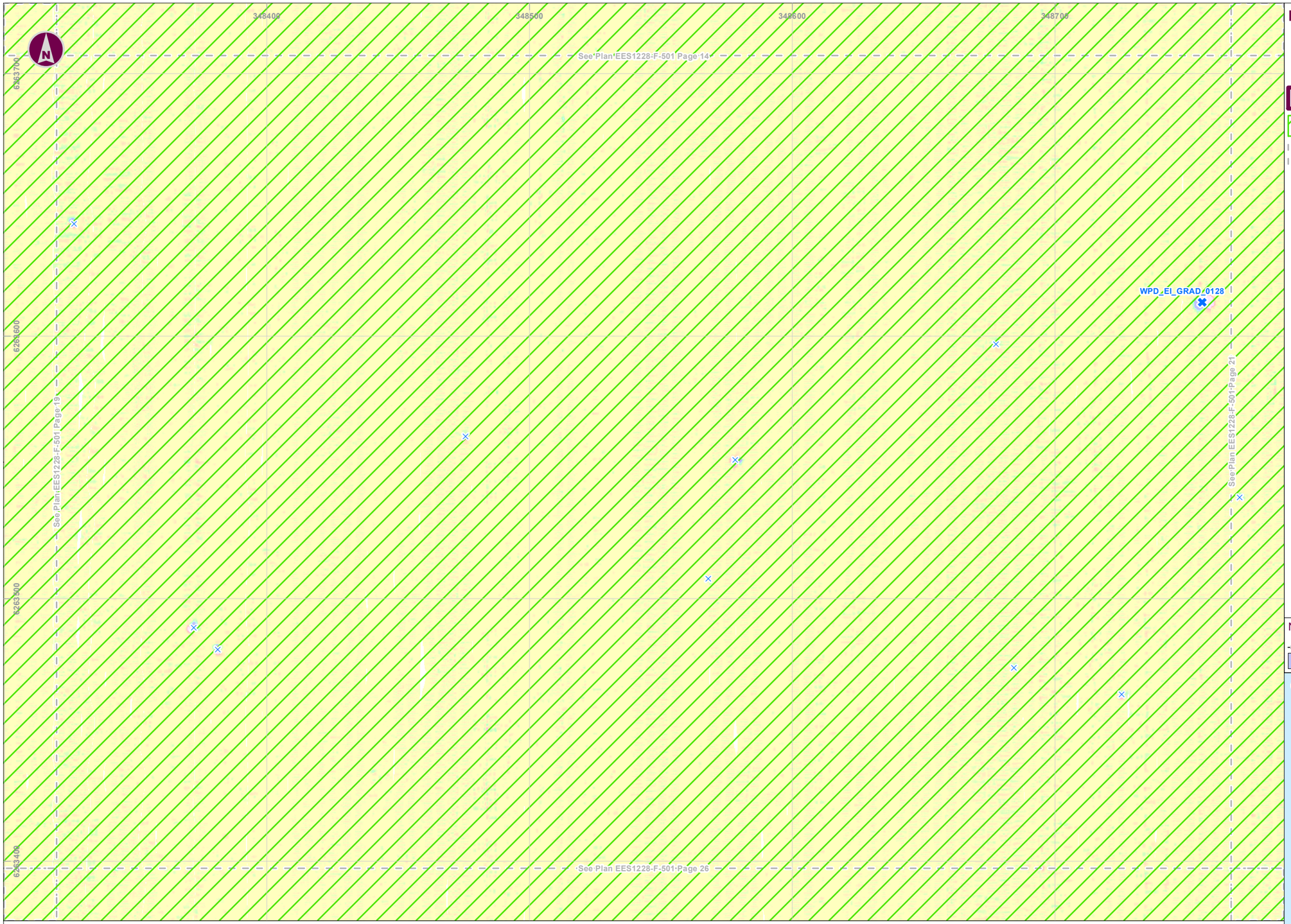

Legend

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Ver	Description	By	Check	Date
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rpsgroup.com

Client: Energinet
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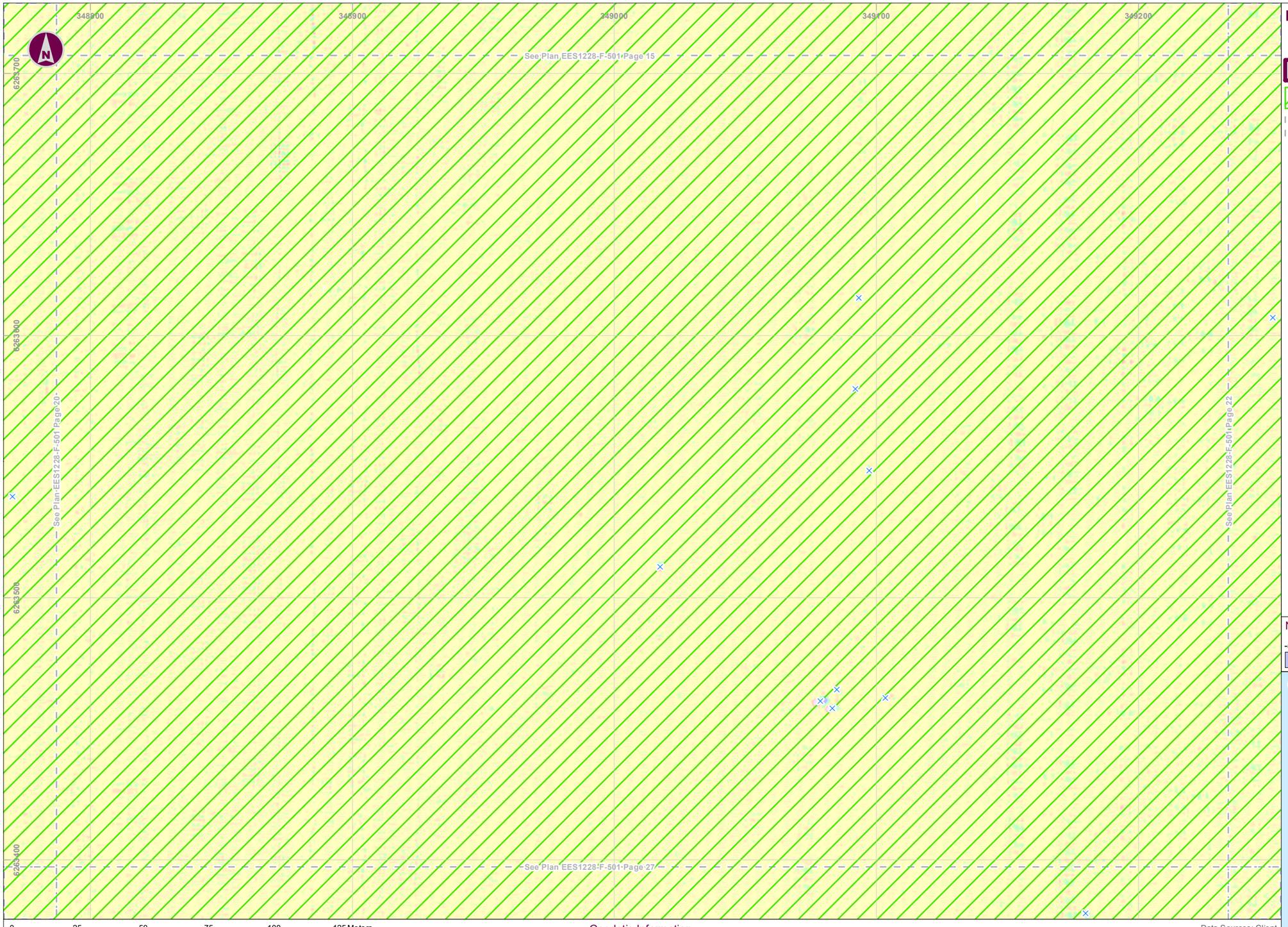

Legend

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Nanotesla (nT) Colour Scale:

-5 0 +5

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MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
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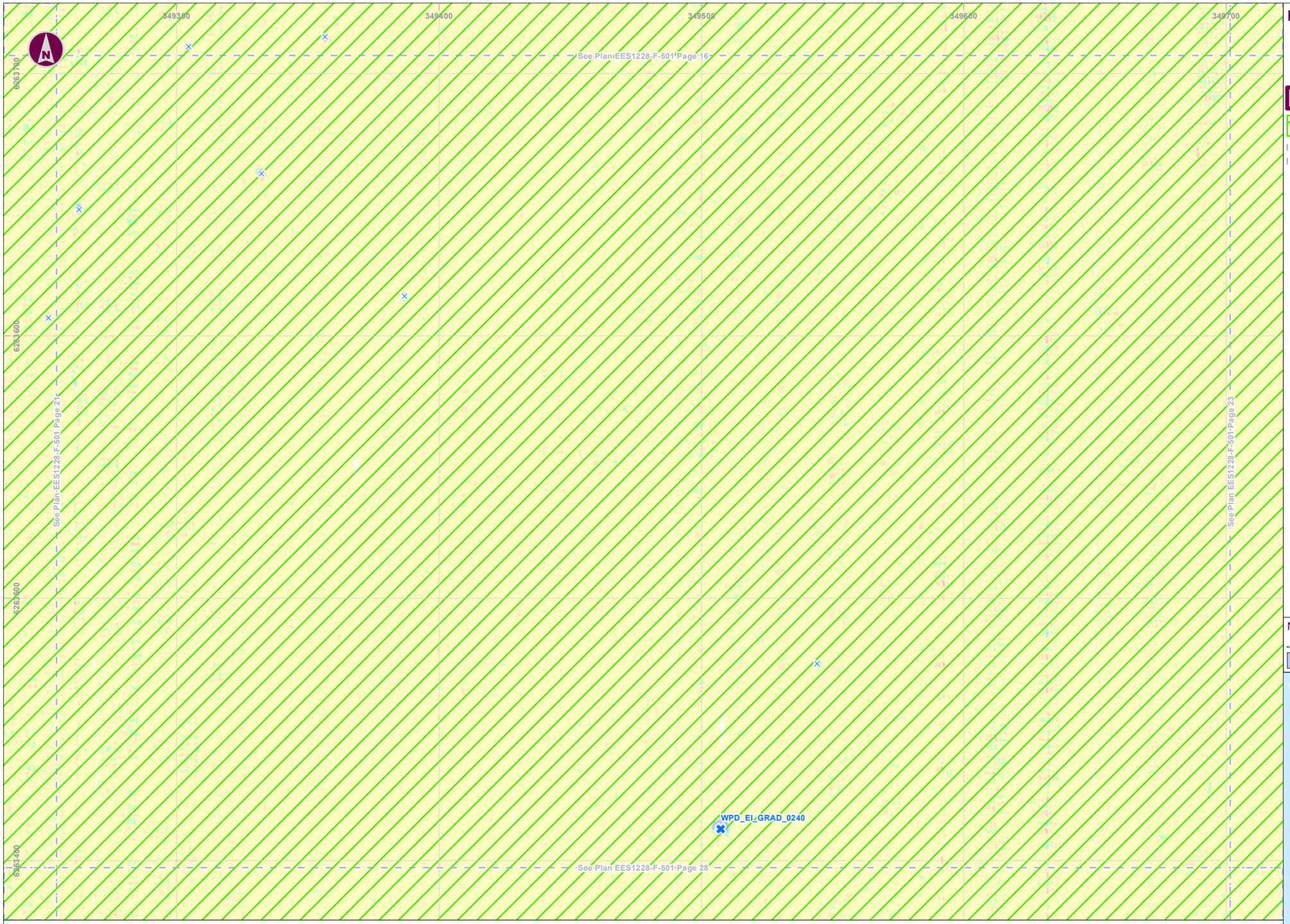

Legend

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01	02	03	04	05	06
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0 25 50 75 100 125 Meters
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MAKING COMPLEX EASY
rpsgroup.com

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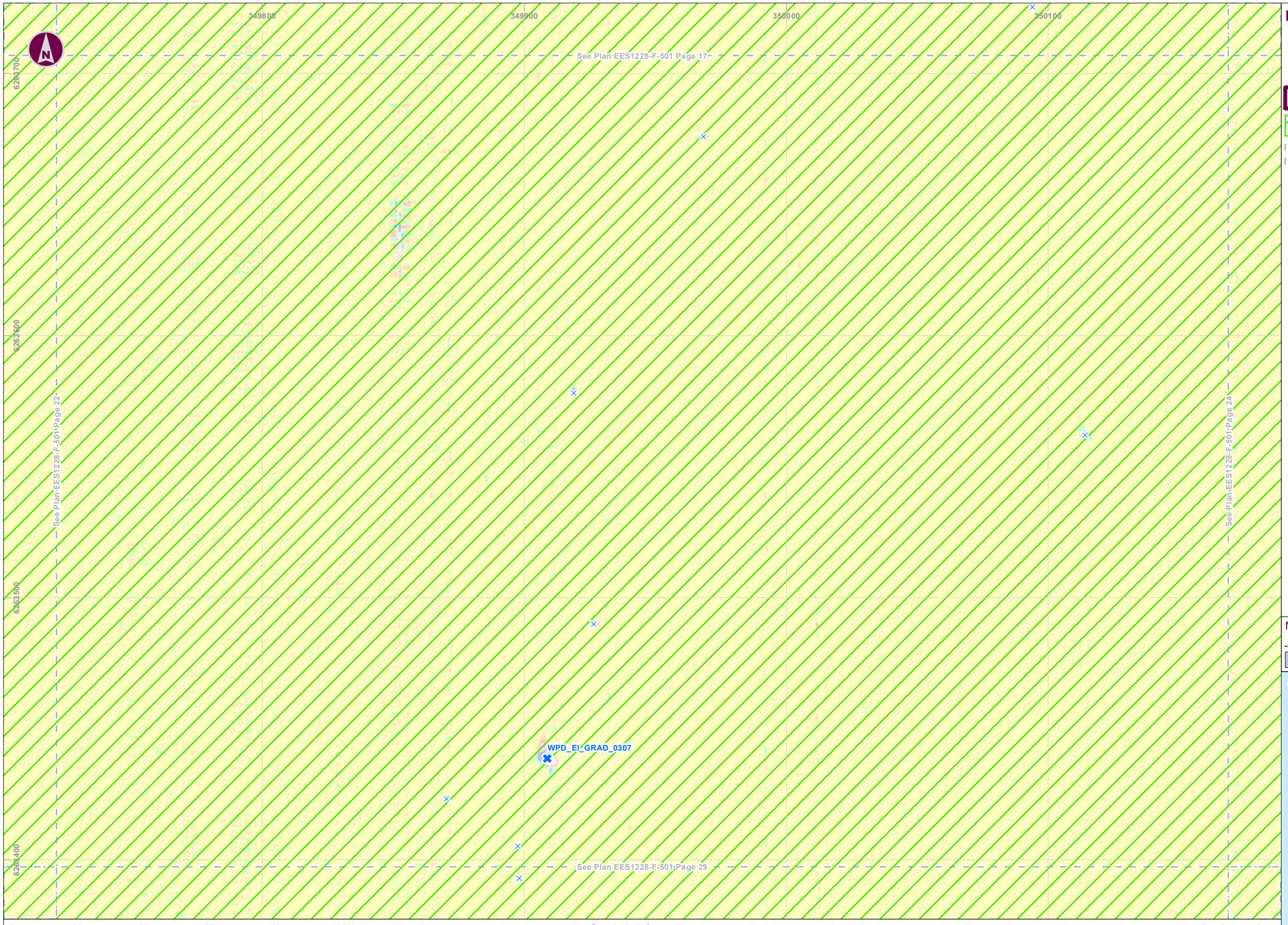

Legend

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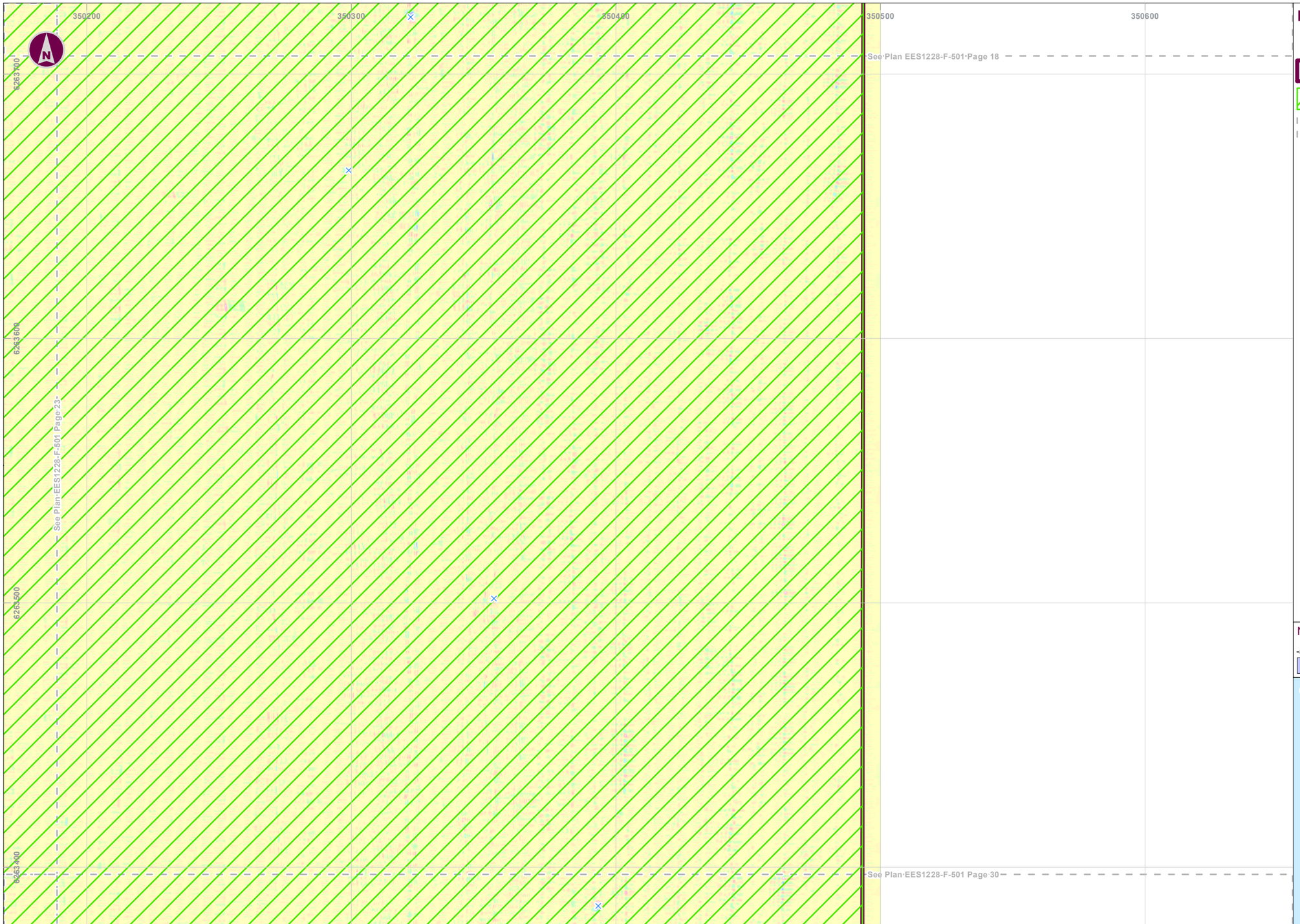

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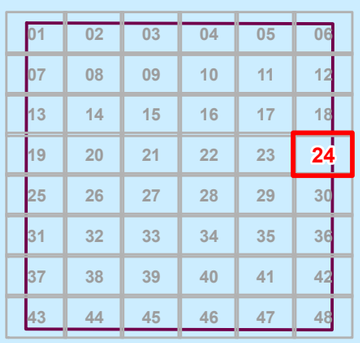

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MAKING COMPLEX EASY
rpsgroup.com

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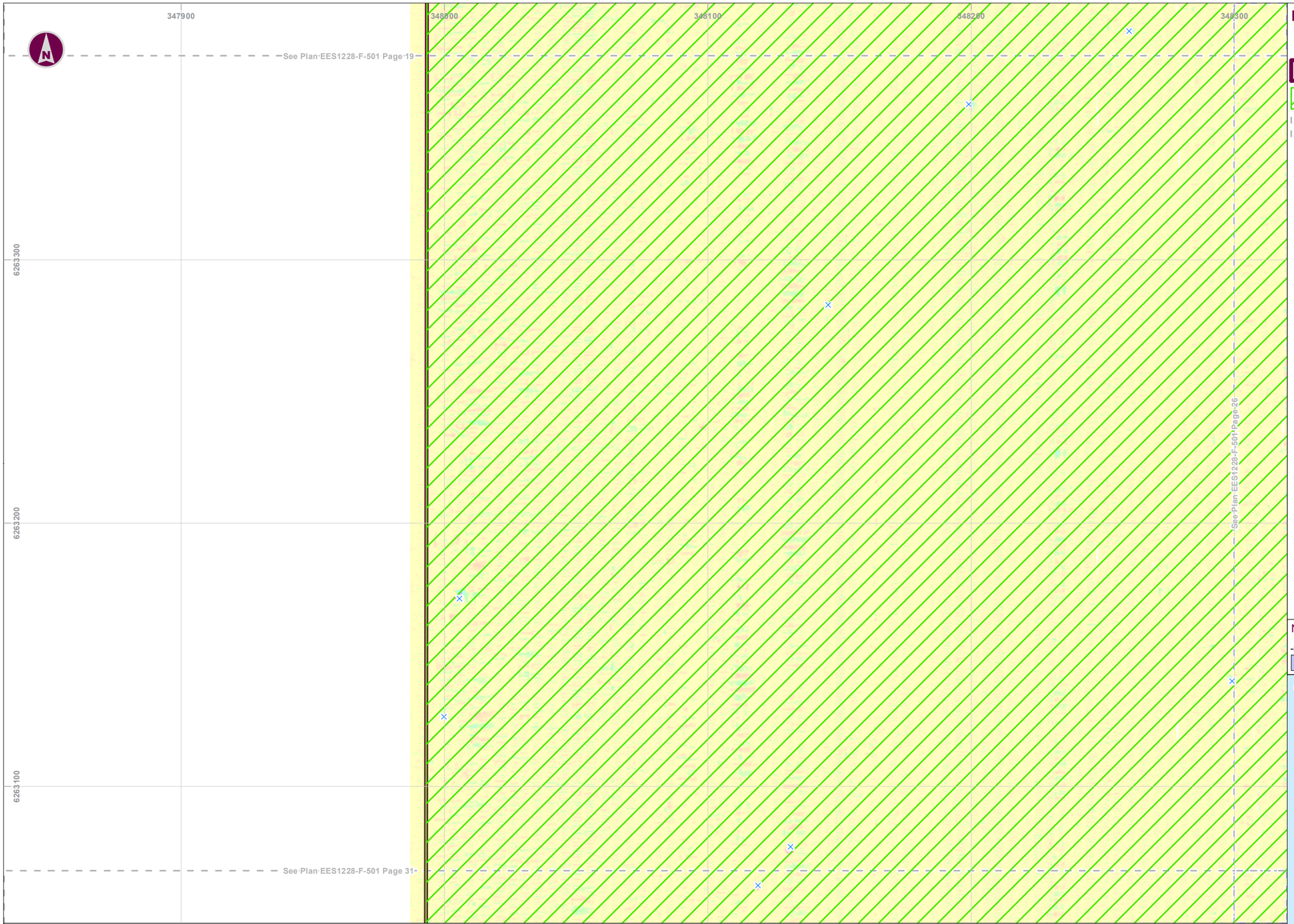

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MAKING COMPLEX EASY
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Checked By: JB
Status: INITIAL ISSUE
Scale @ A3: 1:1,500
Date Created: 23/06/2022

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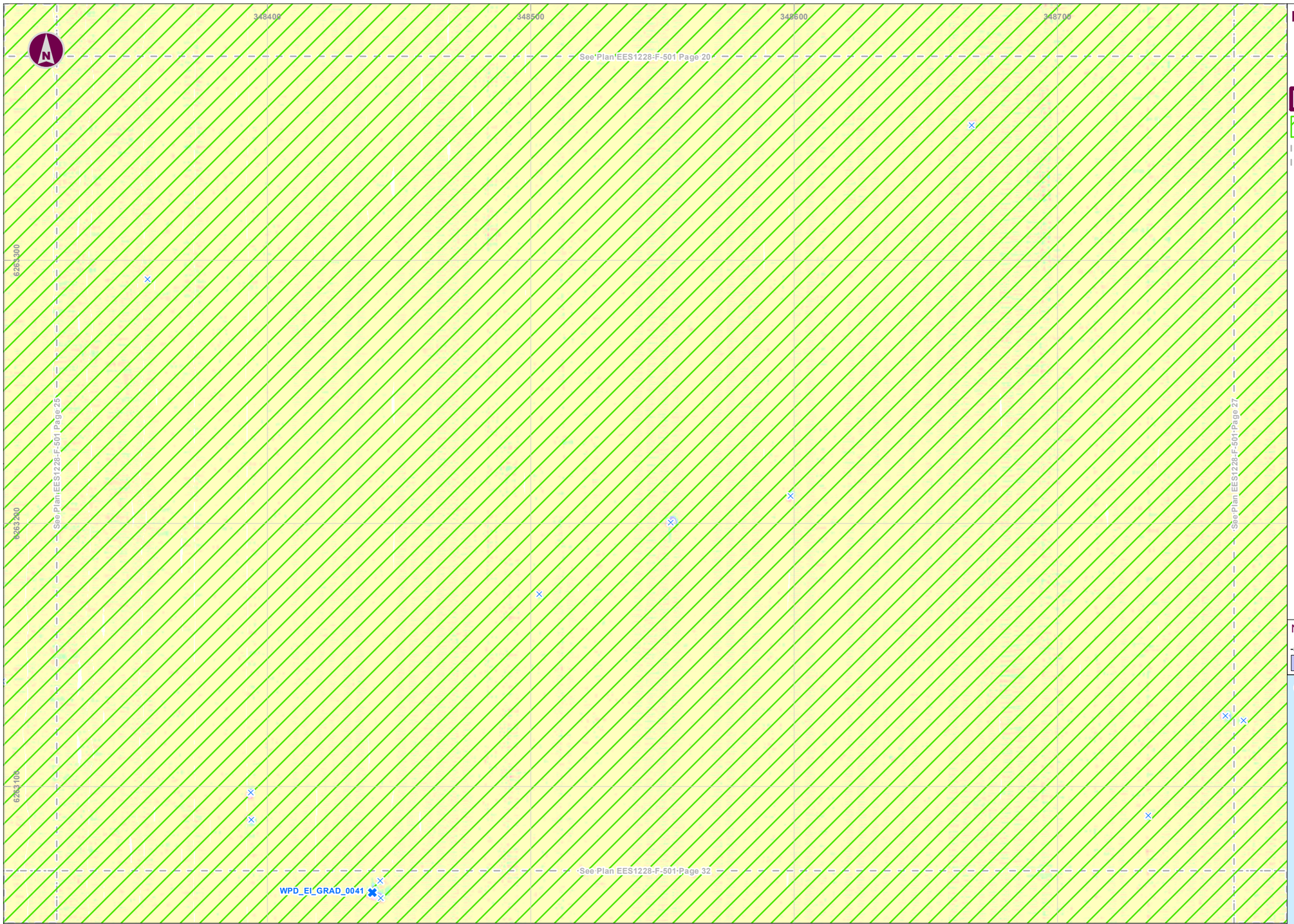

Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
13	14	15	16	17	18
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25	**26**	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
Status: INITIAL ISSUE
Scale @ A3: 1:1,500
Date Created: 23/06/2022

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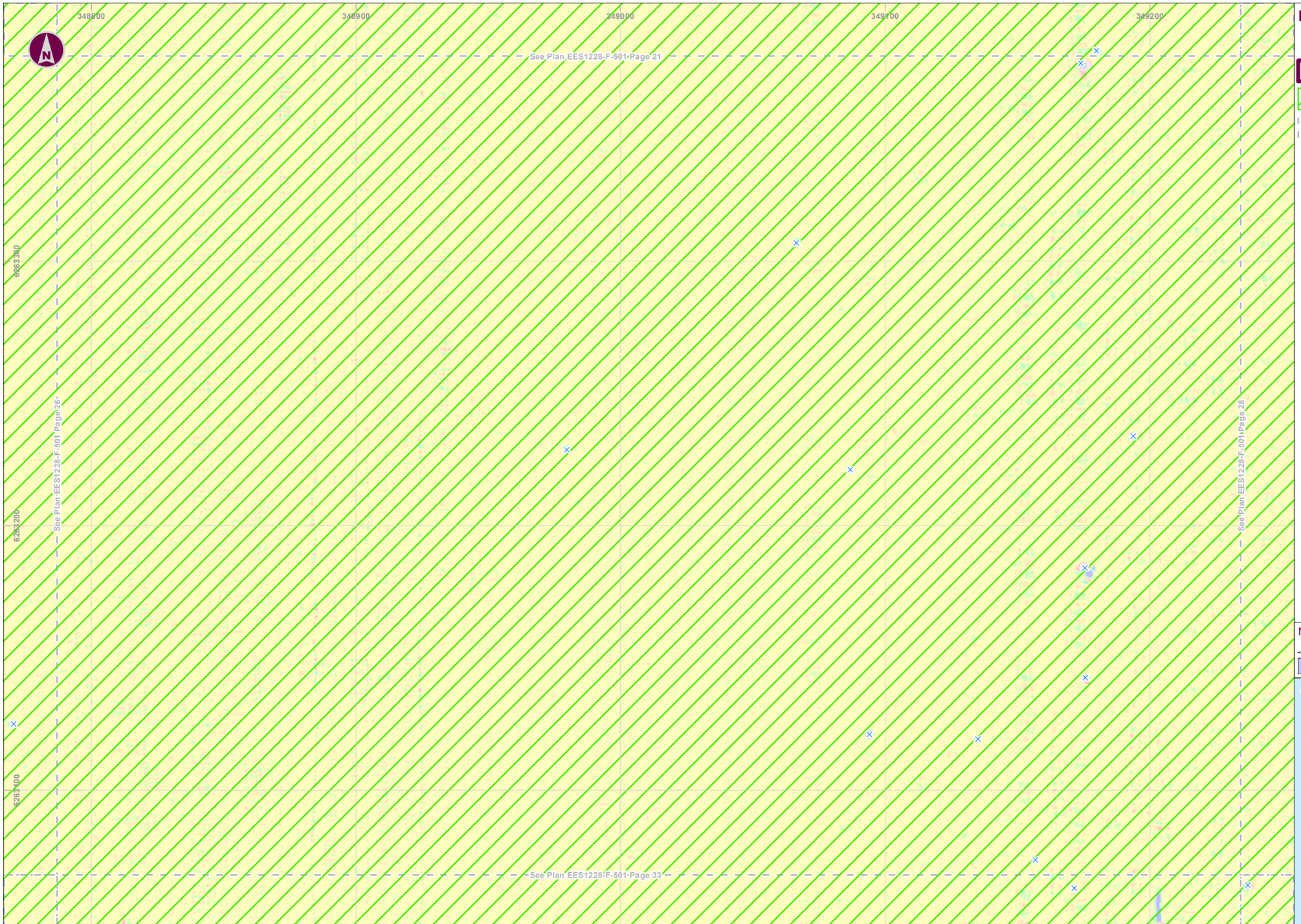

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Client: Energinet
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Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

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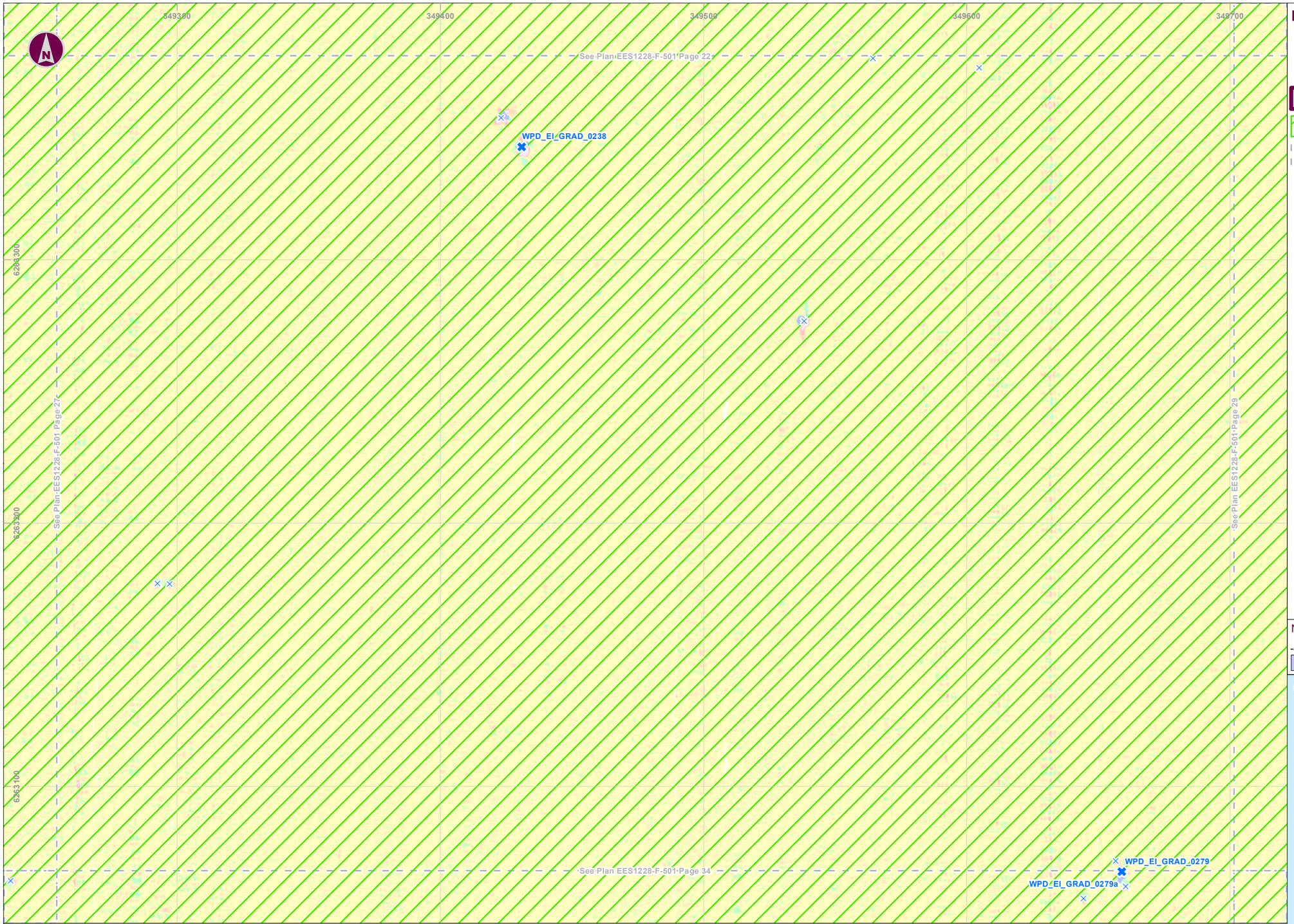

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Client: Energinet
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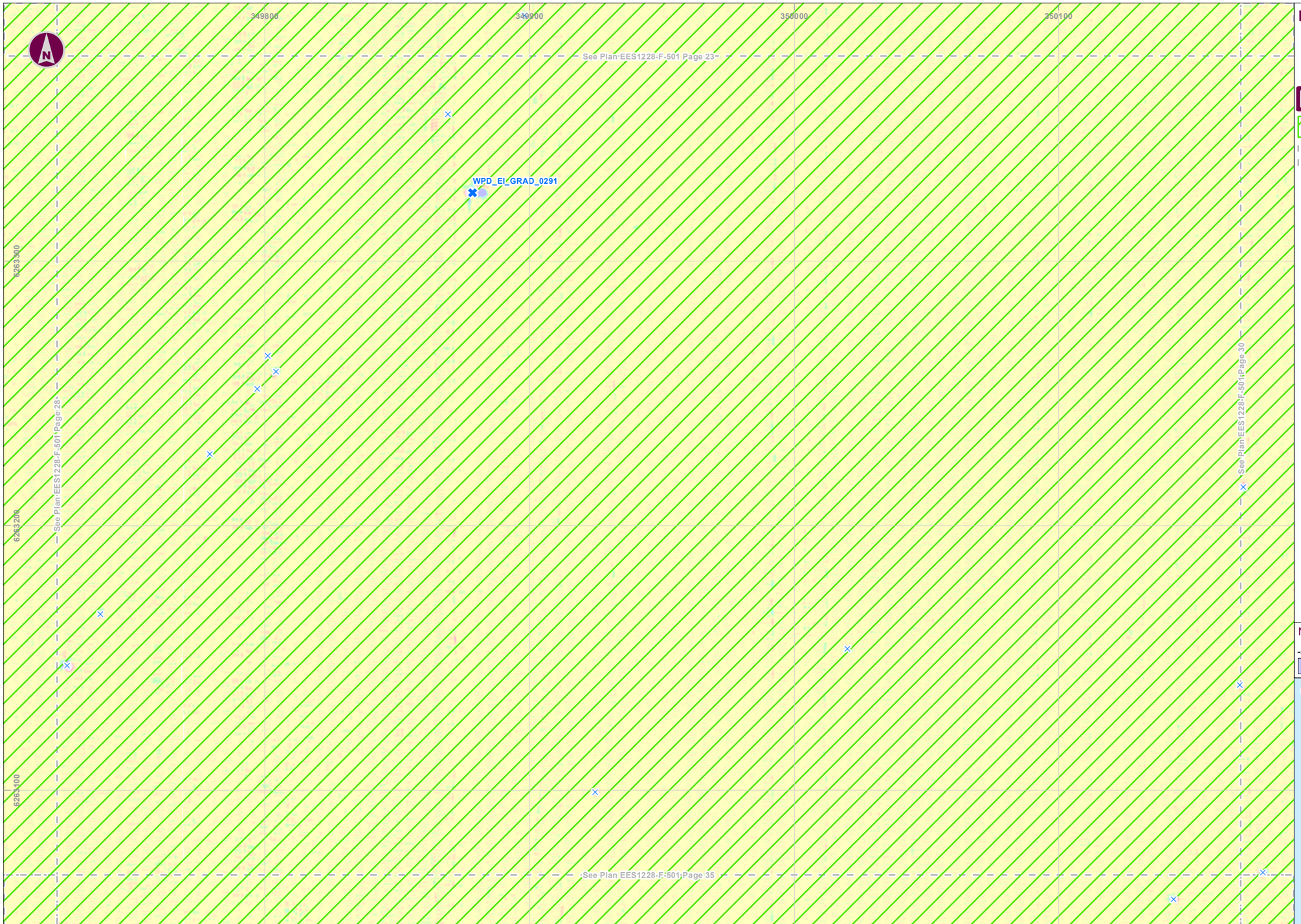

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MAKING COMPLEX EASY
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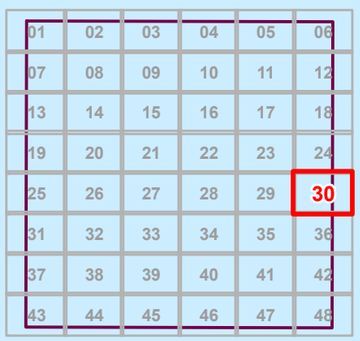

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Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

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Figure Number: EES1228-F-101
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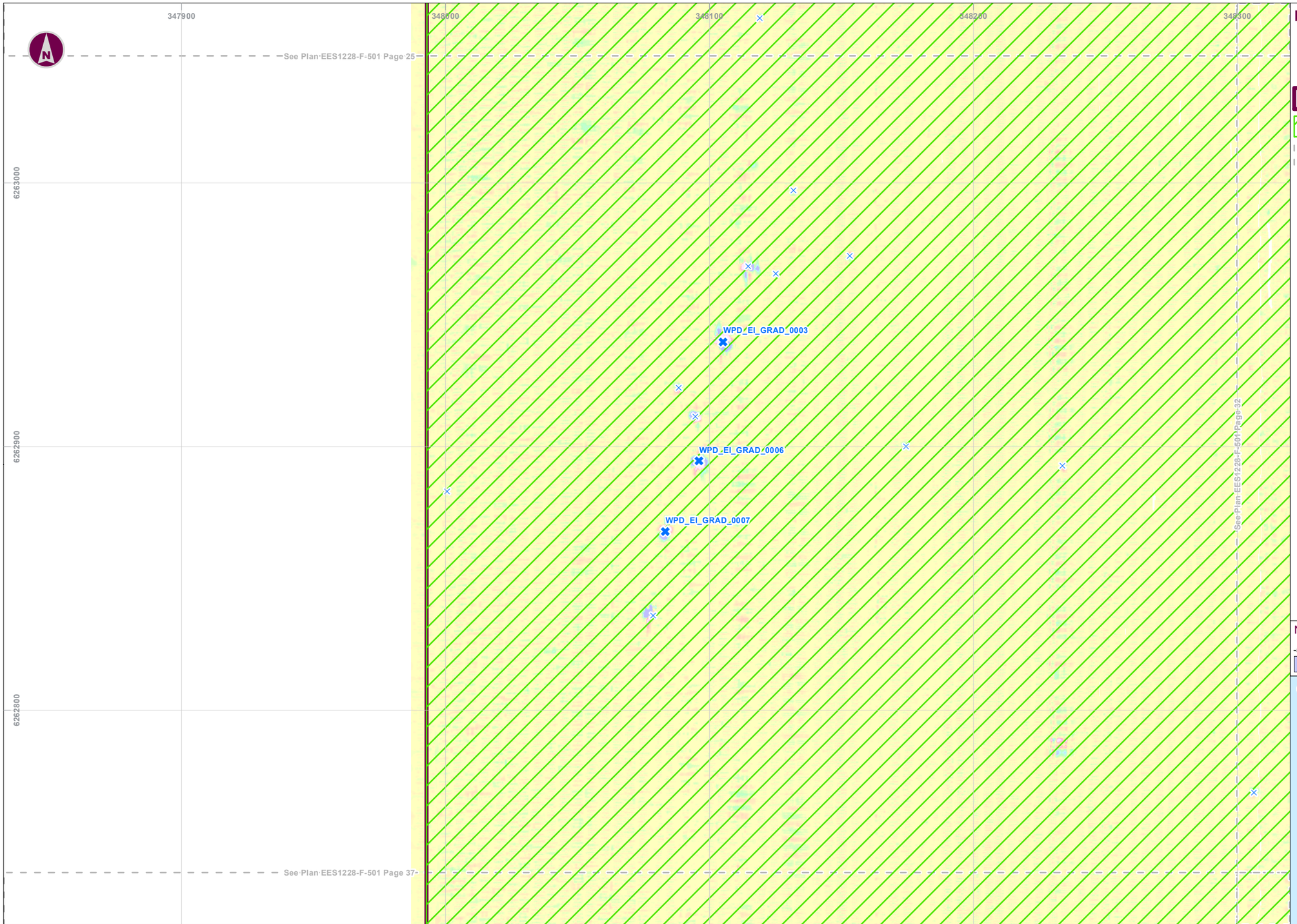

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0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

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Figure Number: EES1228-F-101
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348400 348500 348600 348700

6263000

6262900

6262800

WPD_EI_GRAD_0041

See Plan EES1228-F-501 Page 26

See Plan EES1228-F-501 Page 31

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Figure Number: **EES1228-F-101**
Rev: **00**
Page: **32 of 48**

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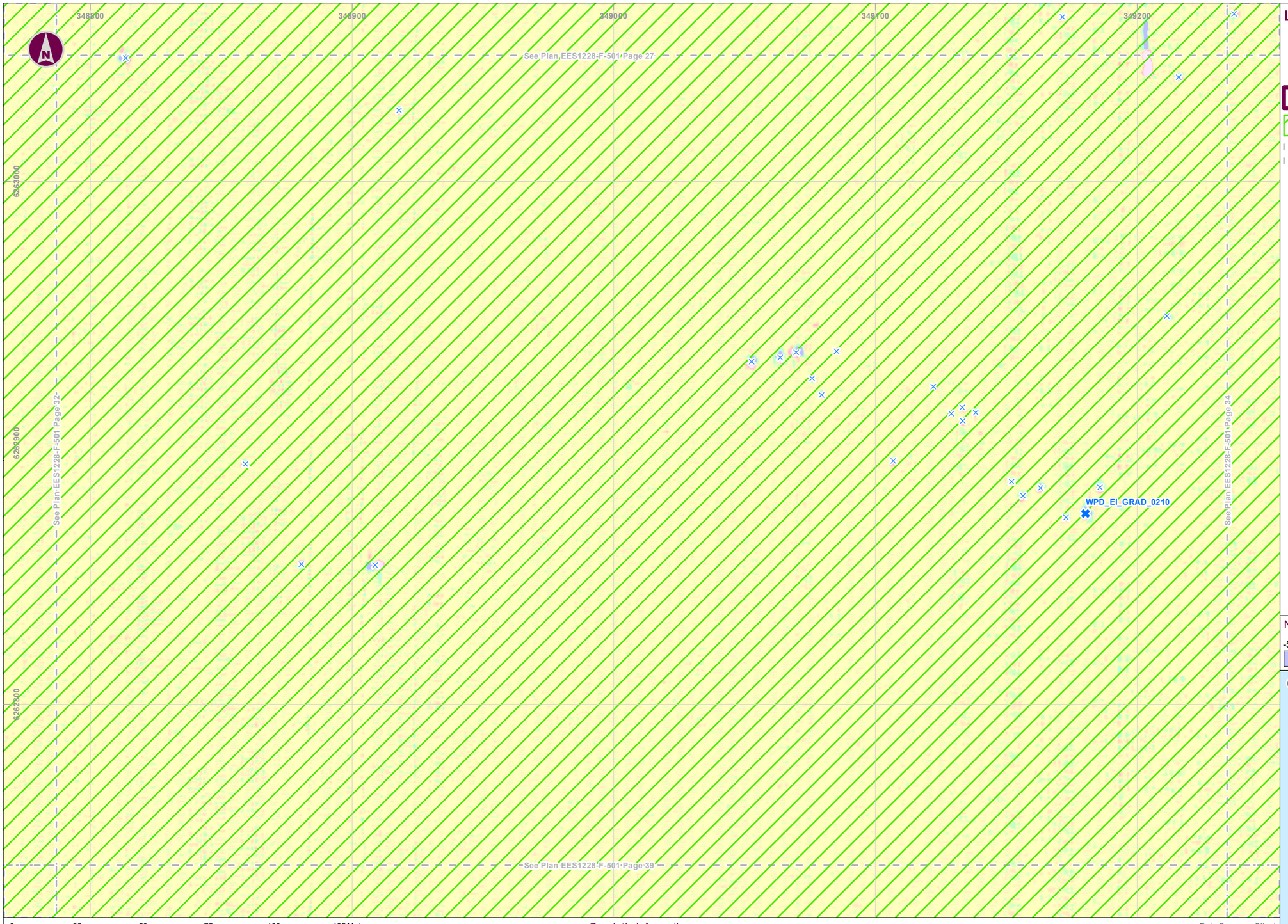

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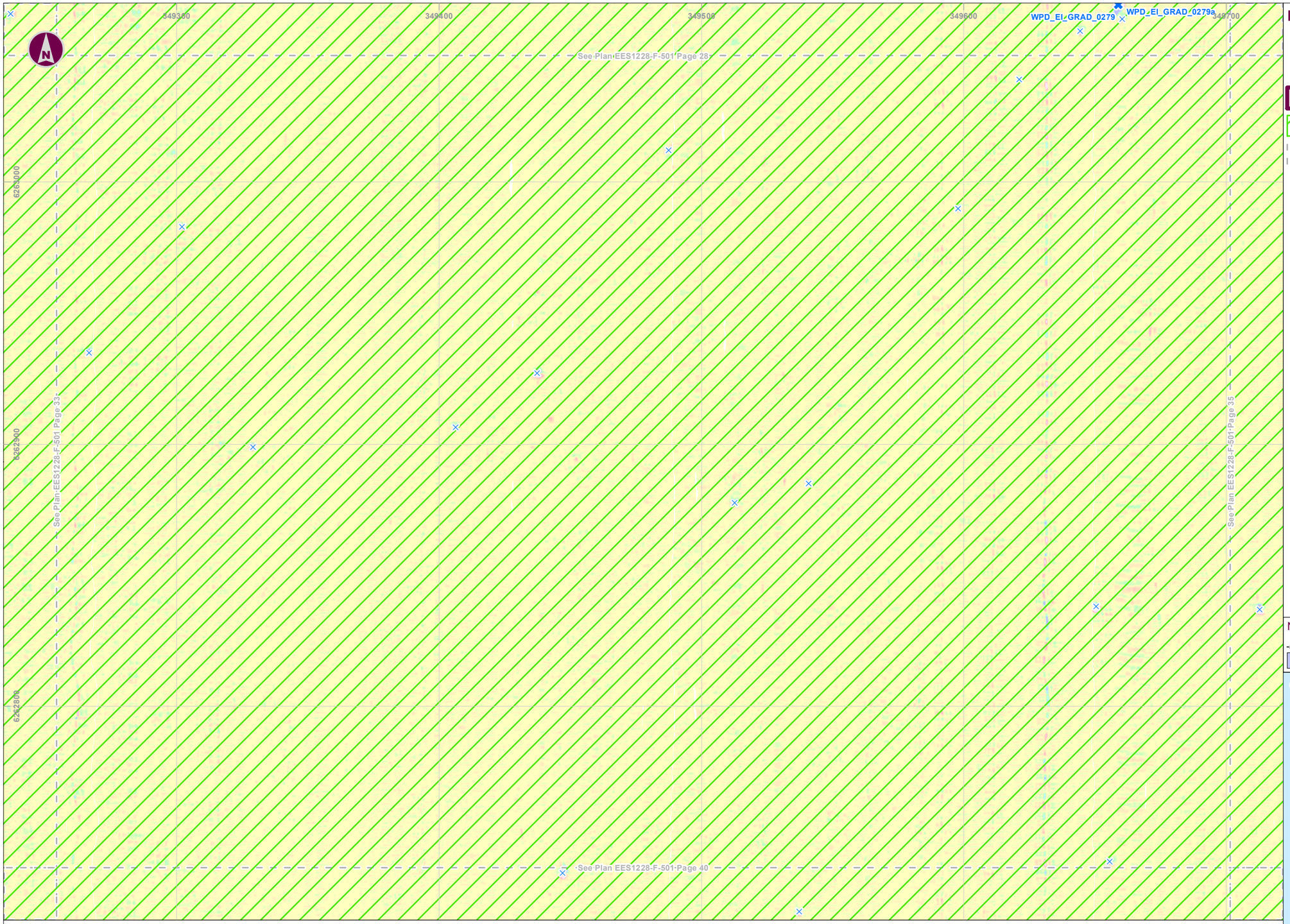

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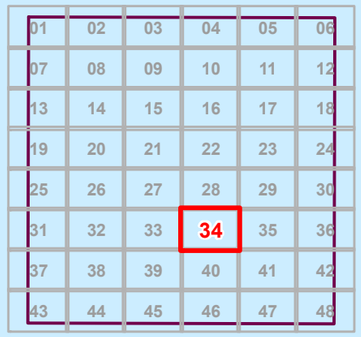

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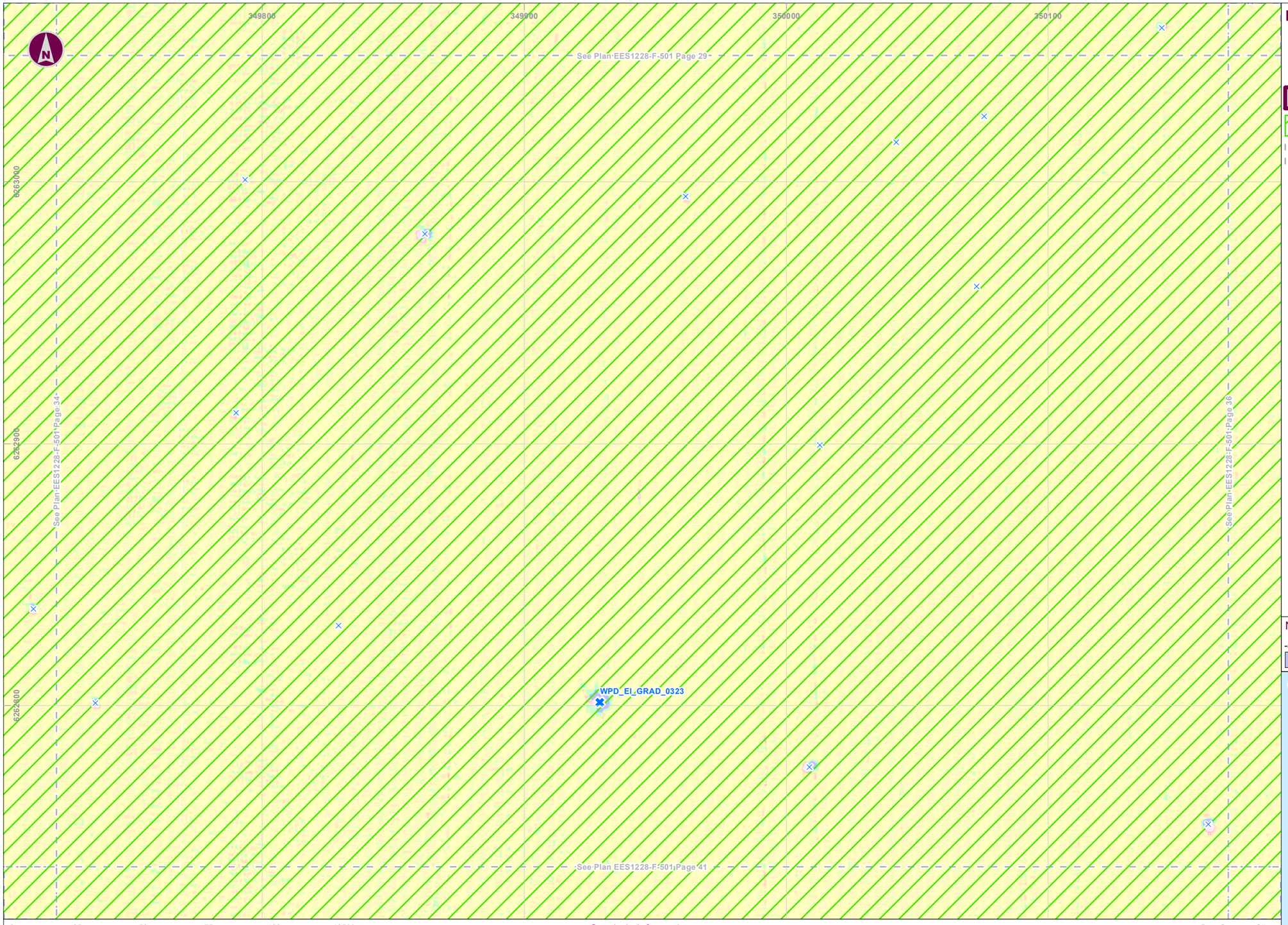

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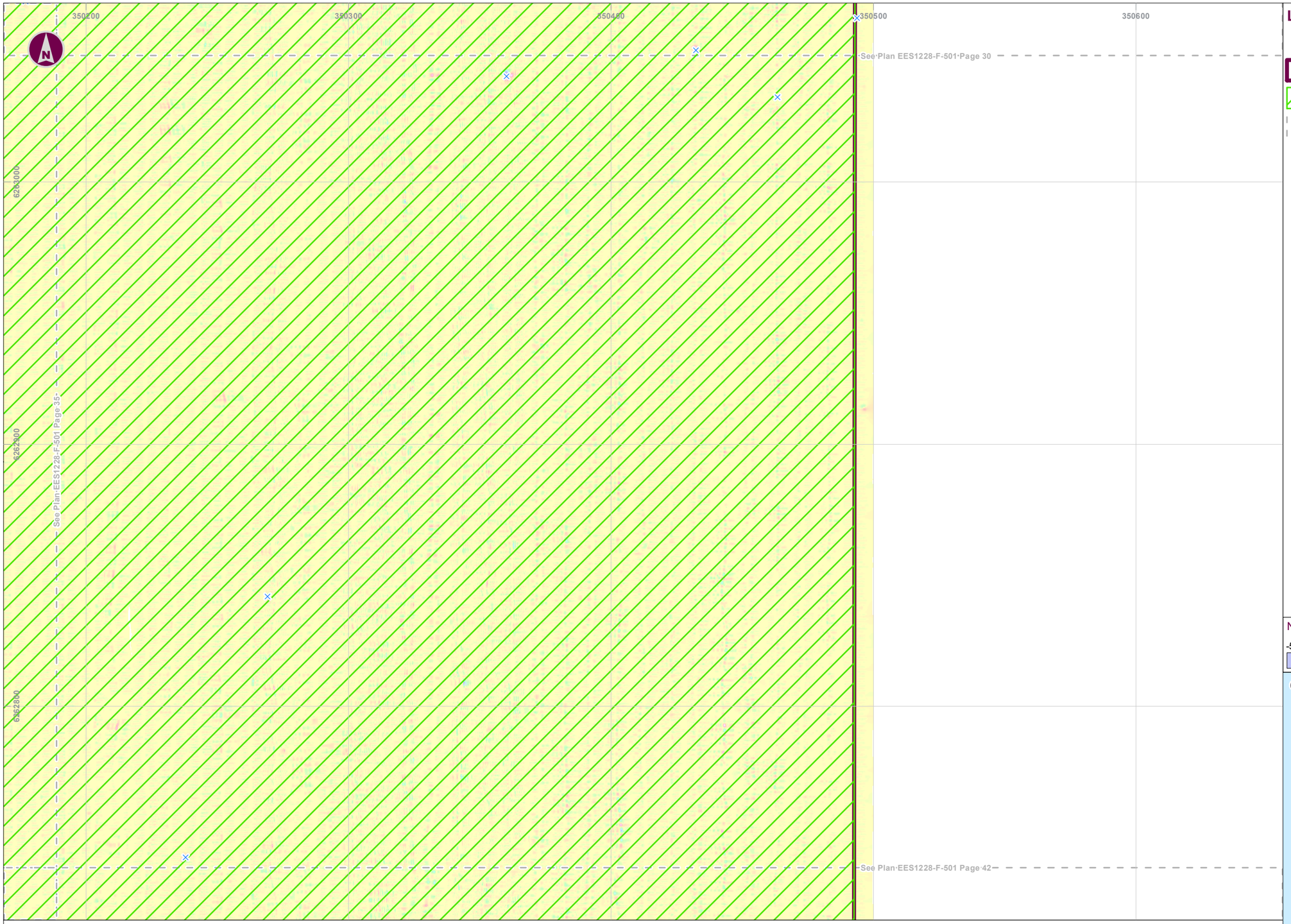

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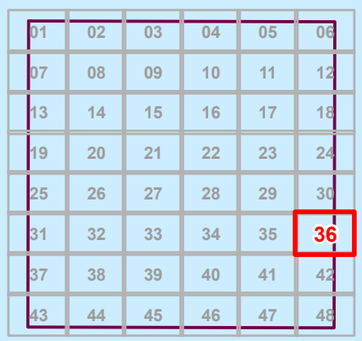

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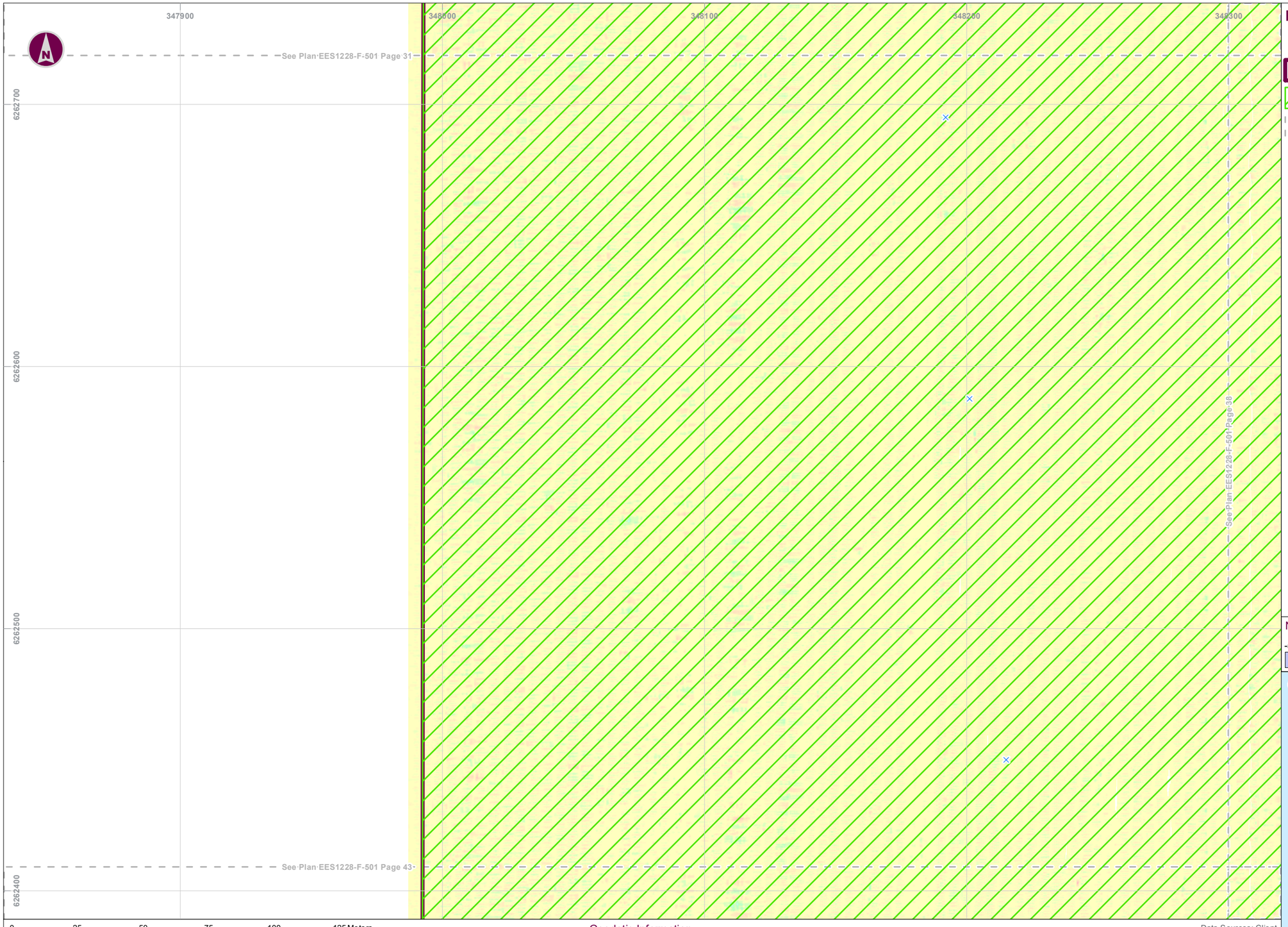

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- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
13	14	15	16	17	18
19	20	21	22	23	24
25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
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rps MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
Status: INITIAL ISSUE
Scale @ A3: 1:1,500
Date Created: 23/06/2022

Notes:
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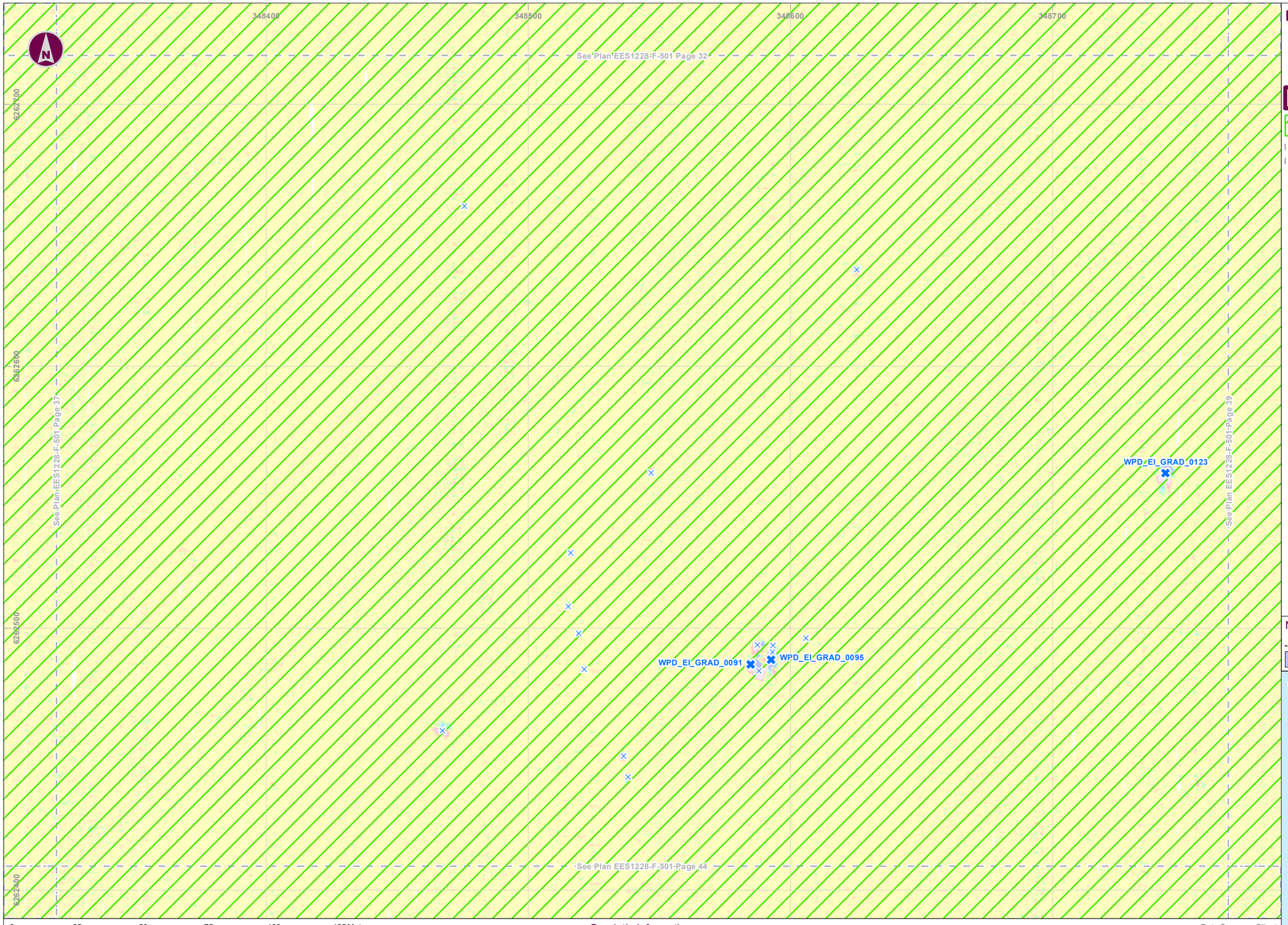

Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
13	14	15	16	17	18
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25	26	27	28	29	30
31	32	33	34	35	36
37	**38**	39	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Data Sources: Client
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
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rps MAKING COMPLEX EASY
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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
Status: INITIAL ISSUE
Scale @ A3: 1:1,500
Date Created: 23/06/2022

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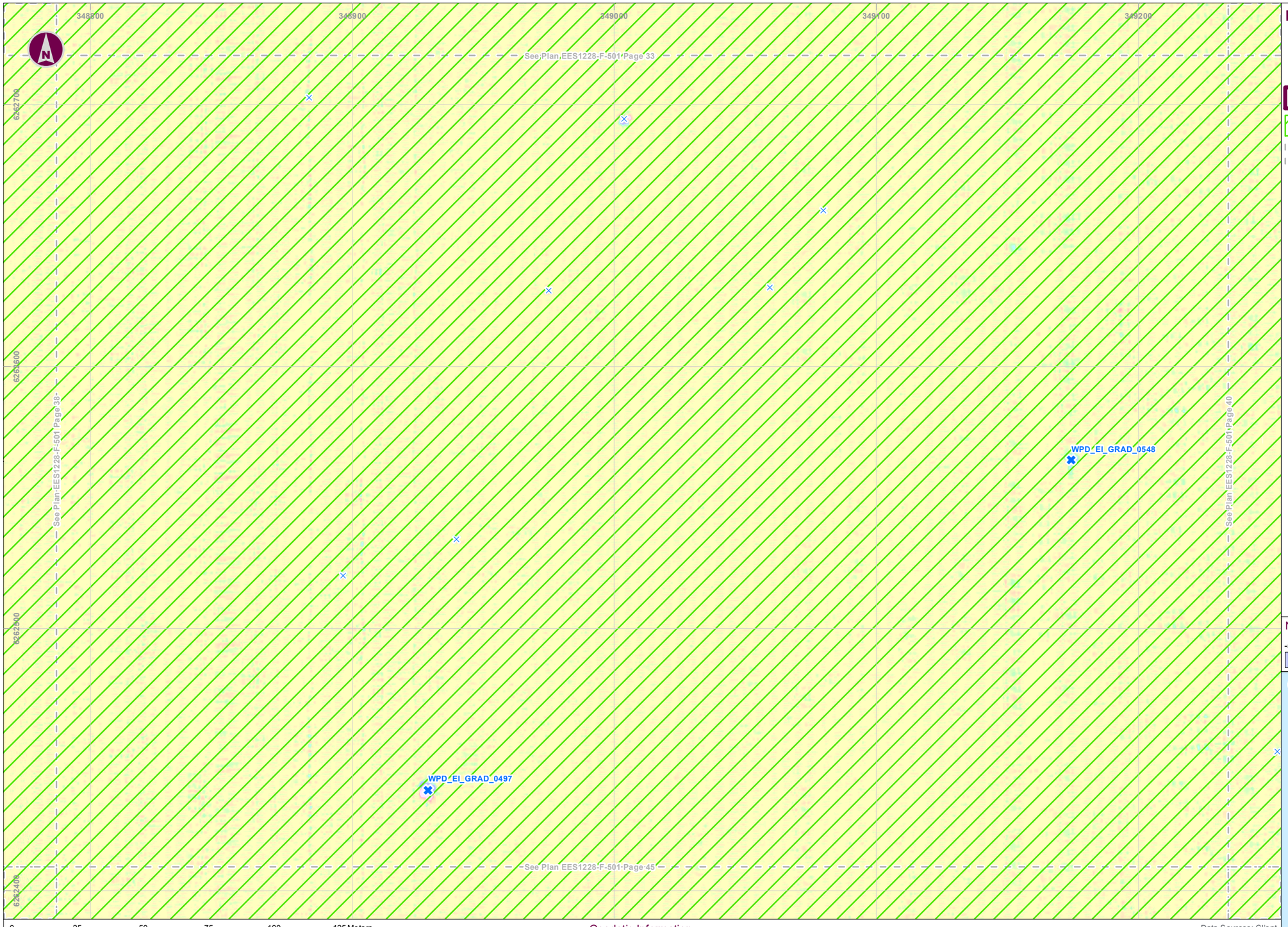

Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

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37	38	**39**	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
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EPSG Code: 25832

Ver	Description	By	Check	Date
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Figure Number: EES1228-F-101
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MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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Checked By: JB
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Scale @ A3: 1:1,500
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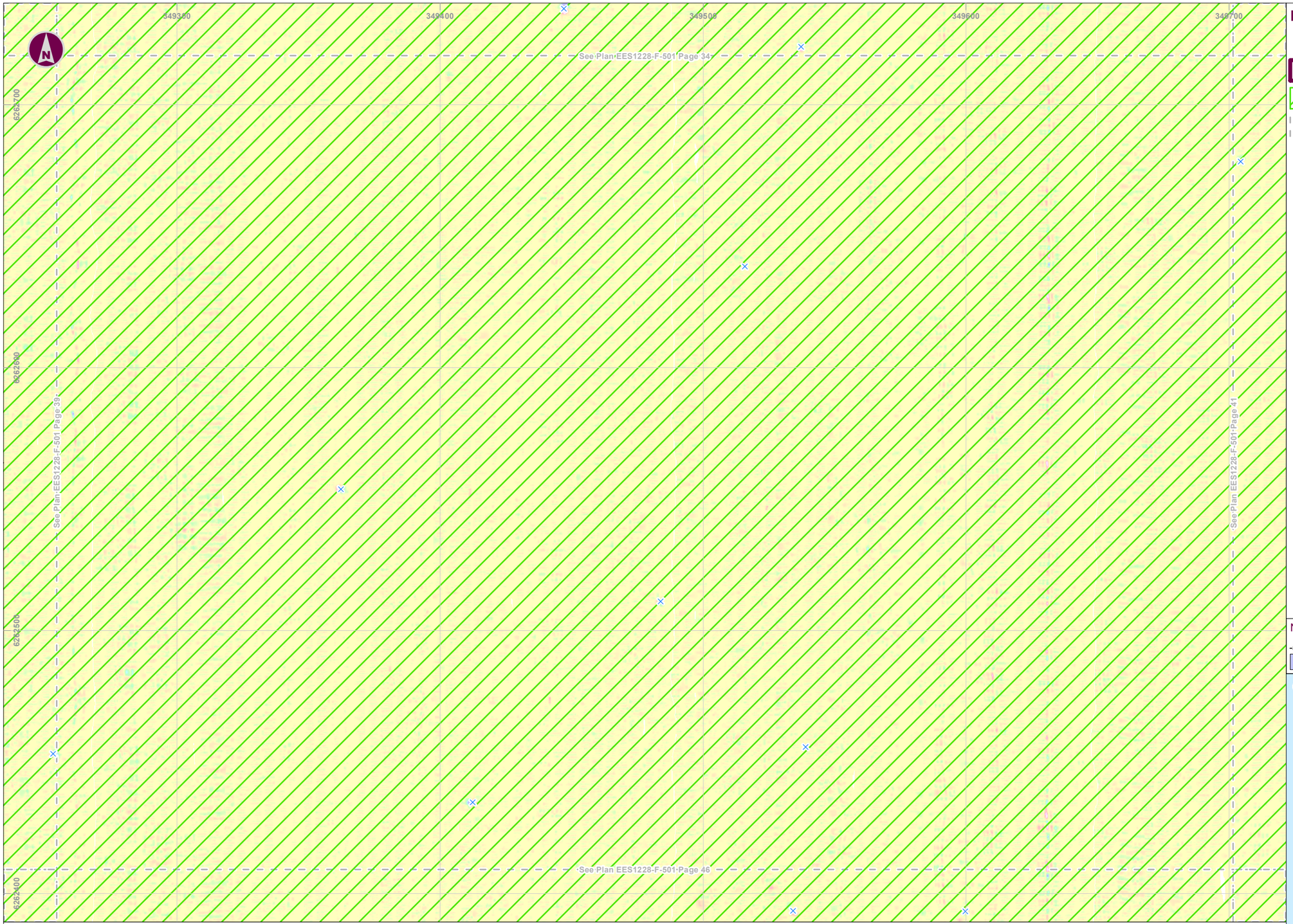

Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
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31	32	33	34	35	36
37	38	39	**40**	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Ver	Description	By	Check	Date
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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
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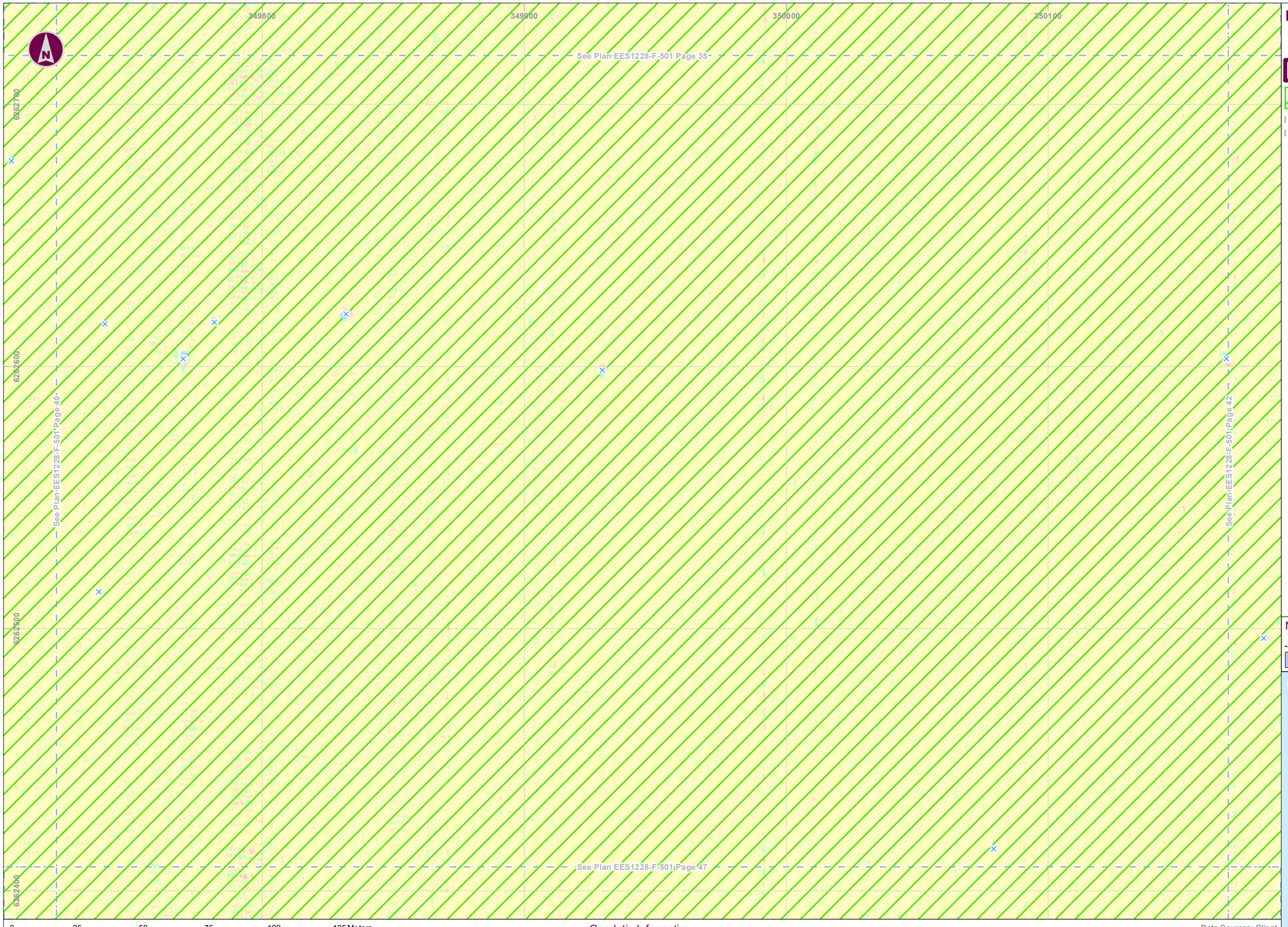

Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
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31	32	33	34	35	36
37	38	39	40	**41**	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
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MAKING COMPLEX EASY
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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
Checked By: JB
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Scale @ A3: 1:1,500
Date Created: 23/06/2022

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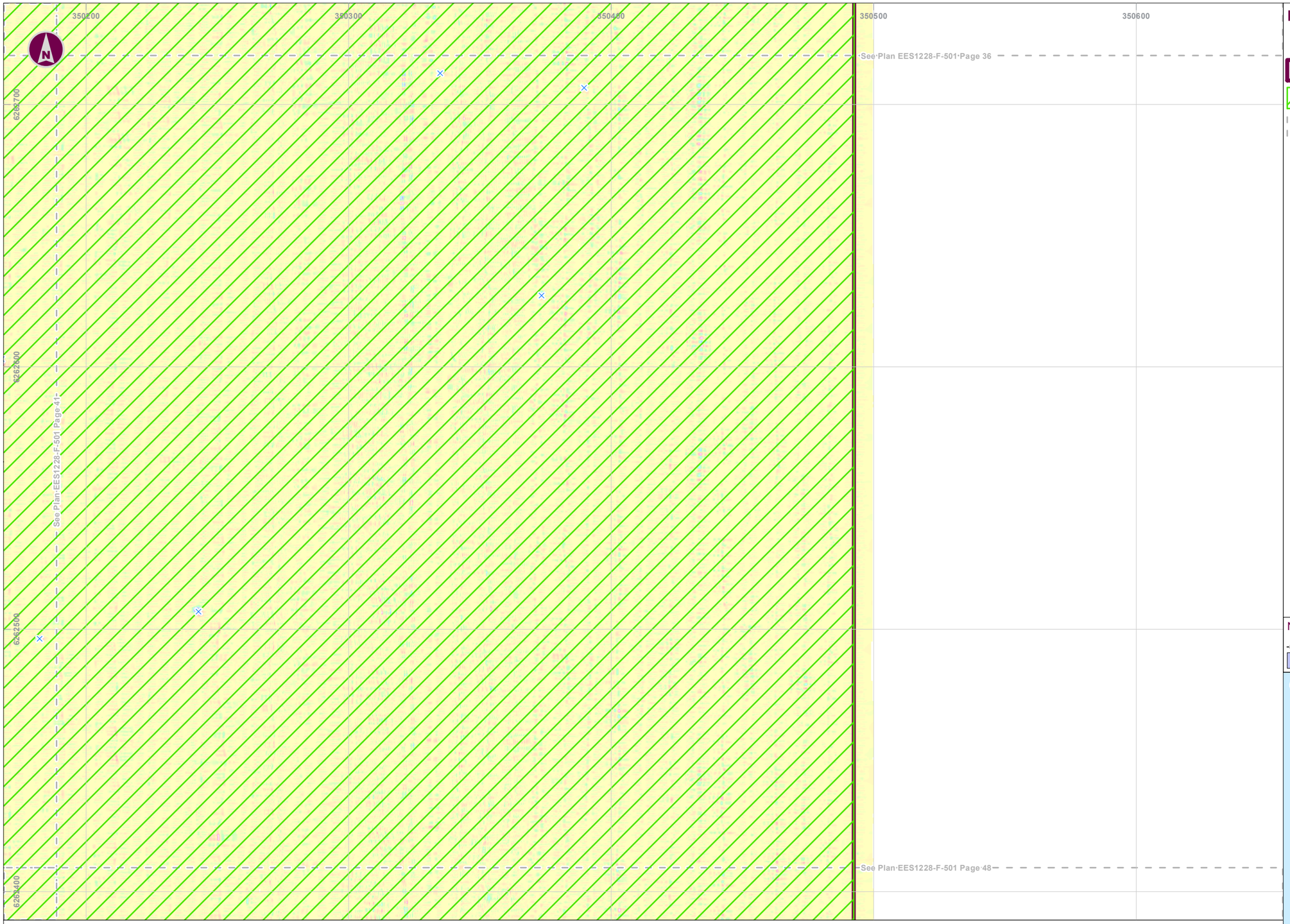


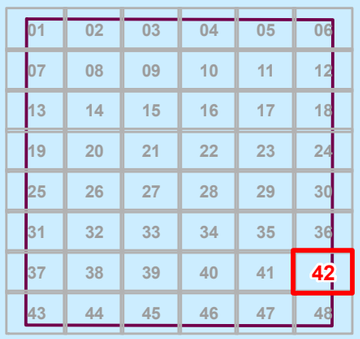
Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview



0 25 50 75 100 125 Meters
0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Data Sources: Client
Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
Page: 42 of 48

MAKING COMPLEX EASY
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Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
13	14	15	16	17	18
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25	26	27	28	29	30
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37	38	39	40	41	42
43	44	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
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Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
Page: 43 of 48

MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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Status: INITIAL ISSUE
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348400 348500 348600 348700

6262400 6262300 6262200 6262100

See Plan:EES1228-F-501 Page 38

See Plan:EES1228-F-501 Page 43

See Plan:EES1228-F-501 Page 45

Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
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25	26	27	28	29	30
31	32	33	34	35	36
37	38	39	40	41	42
43	**44**	45	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
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Figure Number: EES1228-F-101
Rev: 00
Page: 44 of 48

rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
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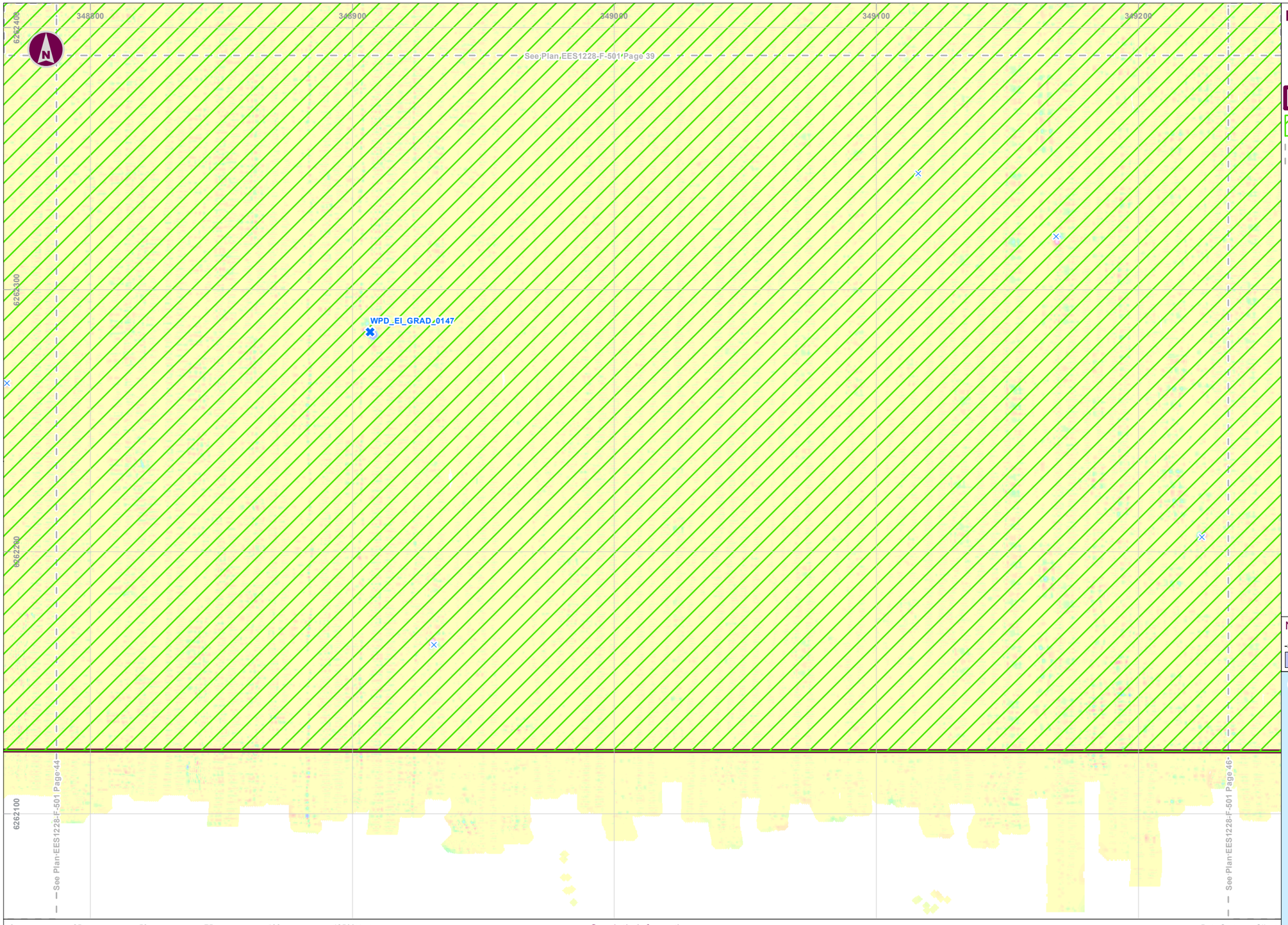

Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
07	08	09	10	11	12
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43	44	**45**	46	47	48

0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
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Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
Page: 45 of 48

MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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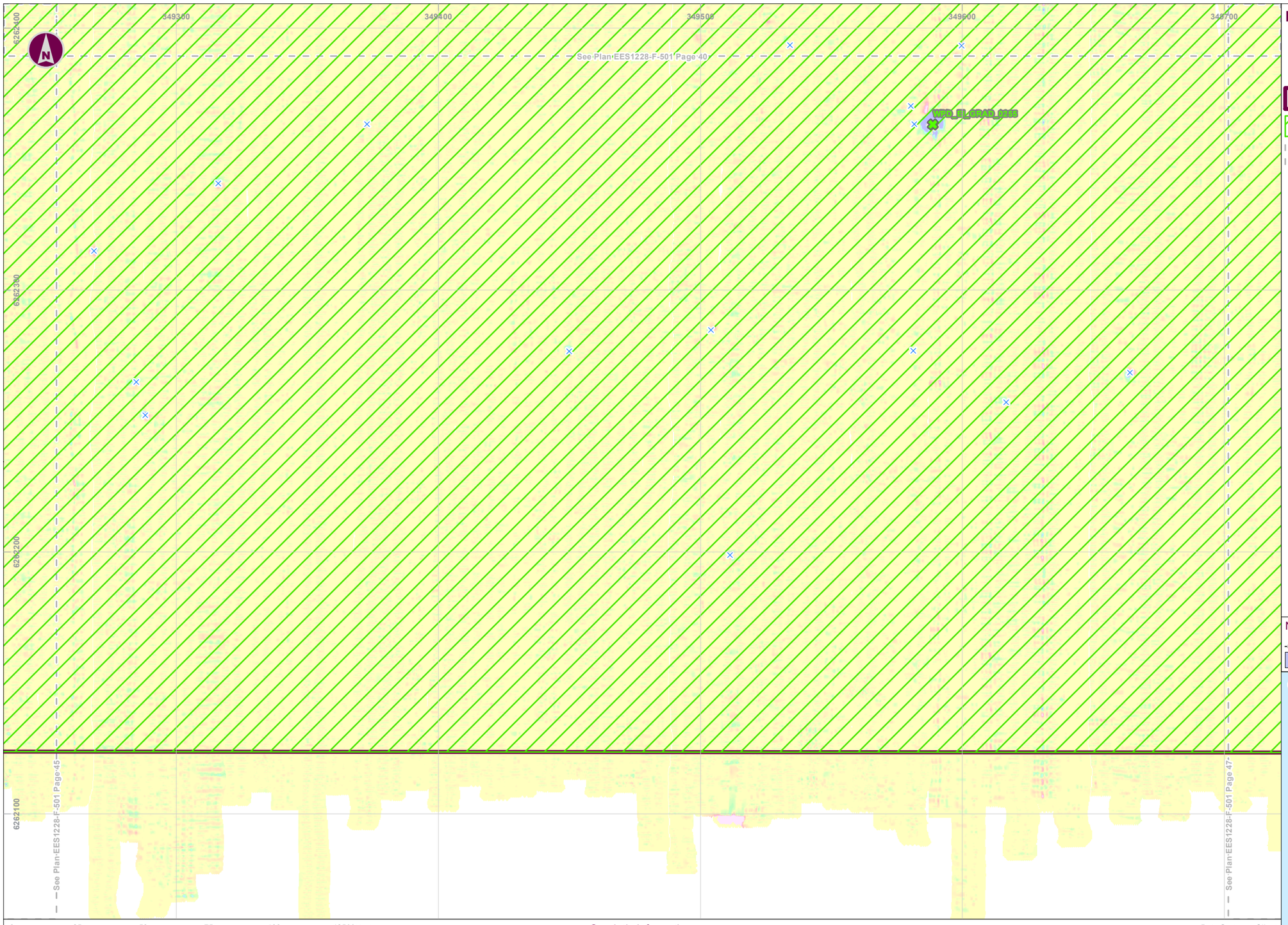

Legend

- Investigated Target: Disposed UXO
- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

01	02	03	04	05	06
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0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
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Figure Number: EES1228-F-101
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MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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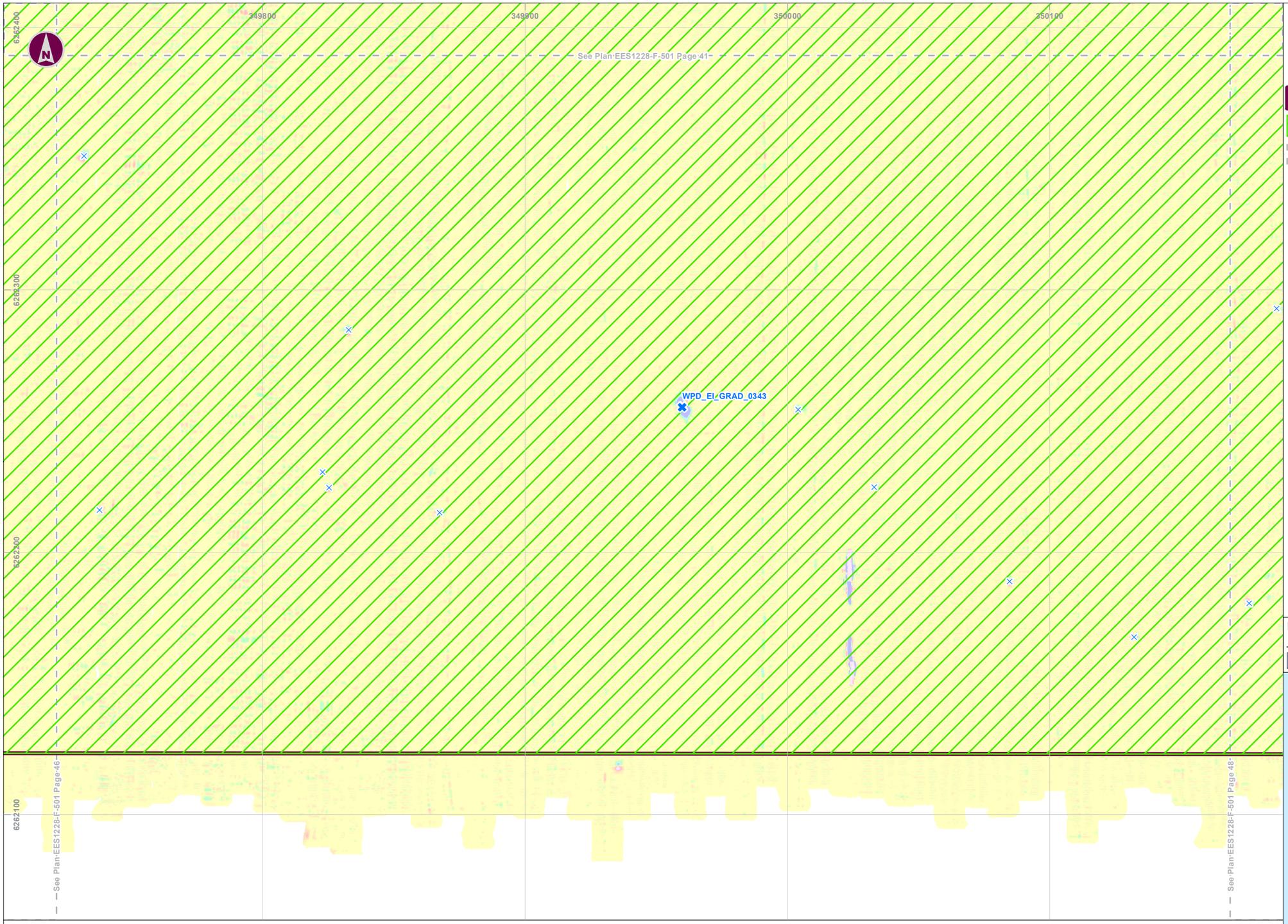

Legend

- Investigated Target: Not-UXO
- Target - Not-UXO
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- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

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Geodetic Information:
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Ver	Description	By	Check	Date
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Figure Number: EES1228-F-101
Rev: 00
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rpsgroup.com

Client: Energinet
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Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
Drawn By: LM
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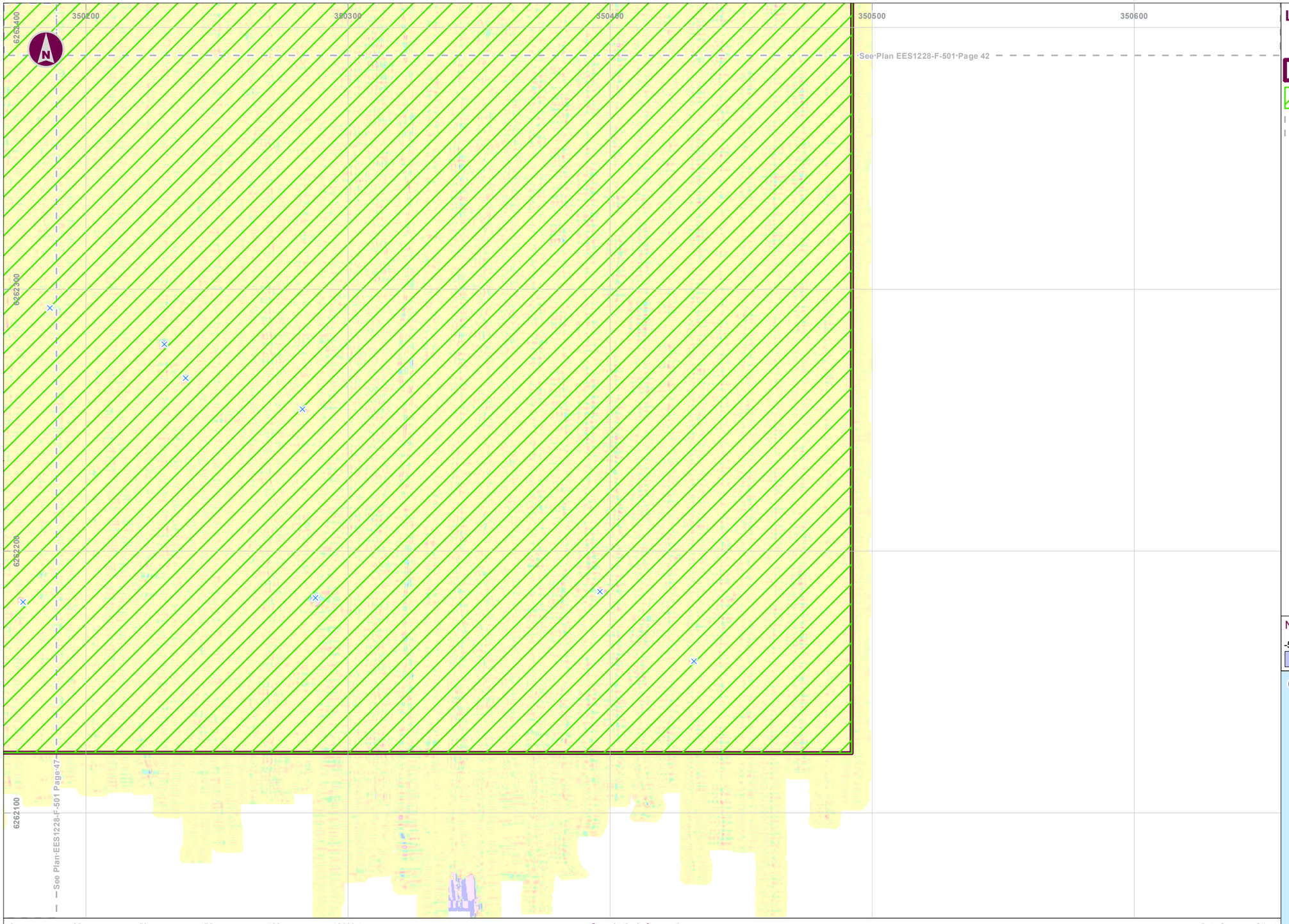

Legend

- Target - Not-UXO
- Artificial Island Site (Rev 1)
- UXO Risk Reduced to ALARP
- Frame Boundary Indicator

Nanotesla (nT) Colour Scale:

-5 0 +5

Overview

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0 25 50 75 100 125 Meters

0 100 200 300 400 500 Feet

Geodetic Information:
CRS: ETRS 1989 UTM Zone 32N, Datum: ETRS 1989
EPSG Code: 25832

Ver	Description	By	Check	Date
00	INITIAL ISSUE	LM	JB	23/06/22

Figure Number: EES1228-F-101
Rev: 00
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MAKING COMPLEX EASY
rpsgroup.com

Client: Energinet
Project: North Sea Energy Island
Title: UXO Risk As Low As Reasonably Practicable (ALARP) Plan for Energy Island Construction Operations

Project Number: EES1228
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3. Only written dimensions should be used .
4. Not to be used for Navigation.
5. The locations shown are based on the information identfied /provided, and should be used for general guidance only.