



# Multi-Site Preliminary Technical Evaluation of Site Suitability for Geology, Soil Conditions and Deep Foundations

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## Multi-Site Preliminary Technical Evaluation of Site Suitability for Geology, Soil Conditions and Deep Foundations

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## Contents

<b>Acronyms and Abbreviations .....</b>	<b>4</b>
<b>Executive summary .....</b>	<b>5</b>
<b>1. Background.....</b>	<b>6</b>
<b>2. Purpose of Report .....</b>	<b>7</b>
2.1 Aims.....	7
2.2 Scope of Works.....	7
<b>3. Sources of Information .....</b>	<b>8</b>
<b>4. Assumptions and Limitations .....</b>	<b>9</b>
4.1 General.....	9
4.2 Bounding Case Development.....	9
4.3 3D Geological Models .....	10
4.4 Groundwater Control.....	10
4.5 Rigid Inclusion Quantification .....	10
4.6 Time Impact Classification.....	11
4.7 Financial Impact Classifications.....	11
<b>5. Methodology of Evaluation .....</b>	<b>12</b>
5.1 Multi-Criteria Scoring, Weighting & Technical Factsheets.....	12
5.2 Rigid Inclusion Quantification .....	13
5.3 Time Impact Classification.....	14
5.4 Financial Impact Classification.....	14
<b>6. Assessment Results .....</b>	<b>16</b>
6.1 Multi-Criteria Scoring .....	16
6.2 Time Impact Assessment .....	23
6.3 Financial Impact Assessment .....	23
6.4 Risks/Uncertainties.....	24
6.5 Alternative Solutions and Revised Financial and Time Impacts .....	25
<b>7. Conclusion and Recommendations .....</b>	<b>29</b>
7.1 Conclusion.....	29
7.2 Recommendations.....	29

## Appendices

<b>Appendix A. Multi Criteria Scoring Definitions .....</b>	<b>30</b>
<b>Appendix B. Technical Factsheets .....</b>	<b>31</b>

## Acronyms and Abbreviations

AP1000	Pressured Water Reactor developed by Westinghouse Electric Company
CI	Conventional Island
EPR	European Pressured Reactor (pressured Water Reactor developed by EDF)
GI	Ground Investigation
HPC	Hinkley Point C (NPP construction ongoing in the UK which adopted the EPR technology)
KGG	Ministry of Climate Policy and Green Growth
NI	Nuclear Island
NPP	Nuclear Power Plant
RAG	Red-Amber-Green
SME	Subject Matter Experts
SSI	Soil Structure Interaction
TPR	Third Party Review
AP1000	Pressured Water Reactor developed by Westinghouse Electric Company
BoQ	Bill of Quantities
CI	Conventional Island
EDF	Électricité de France S.A.

## Executive summary

This report provides a comprehensive technical evaluation of seven candidate sites with two alternatives in the Netherlands for the development of nuclear power infrastructure, specifically assessing their geological, soil, and deep foundation suitability. Commissioned by KGG, the study supports strategic decision-making by comparing the feasibility of each site to accommodate both AP1000 and EPR reactor technologies under a bounding case scenario. The bounding case assumes the most demanding spatial and geotechnical requirements, including deep excavations and extensive use of Rigid Inclusions as the foundation solution.

The evaluation methodology involved developing 3D geological models, applying a multi-criteria scoring system, and estimating both time and financial impacts. Criteria such as liquefaction potential, ground variability, excavation feasibility, and the suitability of Rigid Inclusions were assessed and weighted based on their influence on construction risk and complexity. Technical Factsheets were produced for each site to summarise the findings in a consistent format.

The results indicate that Terneuzen 1A, Terneuzen 1B, Eemshaven 1B, and Eemshaven 3 are the most technically favourable sites, showing consistent ground conditions and lower geotechnical risks. In contrast, Sloegebied 1 and Maasvlakte 2 present significant challenges due to poor ground uniformity, high groundwater levels, and subsidence risks, resulting in lower scores and higher risk classifications. All sites were initially classified as medium in terms of time impact, but revised estimates for complex sites, after proposing alternative solutions, suggest durations of up to 36 months. Financial impacts were initially low across all sites, but revised costs for high-risk locations such as Maasvlakte 2 exceed €100 million.

Several uncertainties were identified, including limited ground investigation data at Terneuzen sites and the presence of glauconitic sands, which may affect soil behaviour and foundation performance. The report recommends targeted ground investigations, soil-structure interaction modelling, and consideration of alternative foundation solutions for high-risk sites. These measures are essential to improve confidence in site selection and reduce construction risk. The study concludes that while multiple sites are technically feasible, further investigation and design refinement are necessary to support final site selection and ensure successful project delivery.

## 1. Background

This document has been prepared by Amentum to guide KGG with the technical suitability evaluations for the seven candidate sites, two of them with two possible alternatives, identified by the Client for the nuclear power programme in the Netherlands. This report specifically relates to 'Geology, Soil Conditions and Deep Foundations' within a series of other reports covering the wider Technical Evaluation. The outline requirements for this study were instructed by KGG at the commencement of the technical assessments to support decision-making related to site evaluations across seven candidate sites and the scope developed in collaboration with KGG at the onset. This follows previous Westinghouse and EDF Vendor assessments for the Borssele-2 site, that were undertaken in 2024 and reported in the TPR, with Westinghouse proposing the AP1000 technology and EDF proposing the EPR technology.

KGG wishes to evaluate the suitability of the sites against a 'bounding case', i.e. the requirements necessary to accommodate both vendor NPP technologies. In terms of the deep foundations, this includes considering the greatest spatial footprint and deep excavations required to accommodate both vendors NPP, to enable estimates the quantities and cost of Rigid Inclusions as the foundations solution.

KGG requested the outcome of technical evaluations for each site to be summarised in the form of Technical Factsheets. These evaluations comprise a list of criteria to classify the ground risks and to assess the suitability of the Rigid Inclusions for the Nuclear and Conventional Islands. In addition, both the time (referred to as Time Impact Classification) and cost (referred to as Financial Impact Classification) have been assessed against predefined ranges as outlined in KGG's letter (04/06/2025) and assigned each site with the specific category.

It is understood that the findings from this report will form part of the wider collated evaluation study by Antea which will include evaluations of other technical studies developed by others.

## 2. Purpose of Report

### 2.1 Aims

The main aims of this report are to:

- Identify and evaluate the key differentiators among the seven sites with two alternatives, in terms of overall geology, ground and groundwater conditions, and suitability of Rigid Inclusions covering the Bounding Case;
- Estimate the relative Time and Financial Impact Classifications for each site;
- Highlight any risks or uncertainties;
- Present possible alternative solutions along with their cost and time implications; and,
- Provide recommendations for additional work.

### 2.2 Scope of Works

The scope of works to achieve the aim are as follows:

- Review available information and generate geological 3D models based on the site evaluation reports undertaken by Deltares given in Section 3.
- Define the Bounding Case parameters using the available information and make relevant assumptions as necessary for the assessments purposes.
- Develop a frame-work with multi-criteria and scoring grade to allow unified and unbiased technical scoring for different sites.
- Generate models and estimate quantities of Rigid Inclusions.
- Use the Rigid Inclusion quantities and the typical unit rates to determine relative Financial Impact Classification.
- Use the productivity rates of assumed plants and equipment and determine relative Time Impact Classification.
- Populate the Technical Factsheets with key drivers.
- Present possible alternative solutions for those sites where the use of Rigid Inclusions may present significant challenges or limitations, and provide a semi-qualitative estimate of the associated cost and time implications.
- Provide recommendations for additional work to improve certainty of the site suitability assessments.

### 3. Sources of Information

The key sources of information used in the study are listed here:

#### Reports:

- Sloehaven sites: 11209639-013-GEO-0002\_v0.1-Sloehaven Site Evaluation - Geological and geotechnical characteristics and hazards (Deltares). Date: 17-07-2025
- Eemshaven sites: 11209639-011-GEO-0003\_v1.0-Eemshaven Site Evaluation – Geological and geotechnical characteristics and hazards (Deltares). Date: 28-07-2025
- Maasvlakte 2: 11209639-004-GEO-0003\_v1.0-Maasvlakte 2 Site Evaluation – Geological and geotechnical characteristics and hazards (Deltares). Date: 01-07-2025
- Terneuzen Sites: 11209639-013-GEO-0001\_v1.0-Terneuzen Site Evaluation - Geological and geotechnical characteristics and hazards (Deltares). Date: 04-08-2025

#### GIS data

- GKNederlandGeolVlak: A geological polygon layer representing surface geology across the Netherlands. Source: Nationaal Georegister. Geological unit boundaries and classifications used in national subsurface modelling.
- BRO-GMM-Geomorfologischekaart\_V2023-01\_1: Geomorphological Map of the Netherlands (GMM), version 2023-01\_1. Source: BROloket – Basisregistratie Ondergrond (1:50,000 scale).

#### Time Impact Classification

- Unit rates of productivity are based on Amentum experience of similar equipment, engagement with specialist contractors and various reference literature.
- Quantification of Rigid Inclusions is based on concept design performed as part of this study.

#### Financial Impact Classification

- Unit rates of cost for construction items are based on international catalogues and engagement with specialist contractors.

#### Additional sources used:

- Geological cross sections were extracted from the Netherlands Geological Survey website <https://www.dinoloket.nl/en>.
- Digital Terrain Mapping was extracted from Actueel Hoogtebestand Nederland (AHN) LiDAR programme, specifically the AHN4 dataset, which provides high-resolution (0.5m) DSM and DTM data for the Netherlands.
- Aerial imagery from ESRI's ArcGIS platform was utilised to provide a general understanding of the site and its surrounding environment.
- Base mapping, i.e. existing site infrastructures e.g. buildings, roads, uses Top10NL 2017 DWG files. Content sourced from Top10NL 2017 and the TU Delft Library's Topographical Maps collection at <https://www.tudelft.nl/en/library/collections/map-room/map-collection/topographical-maps/top10nl/>, accessed on 04 September 2025.

## 4. Assumptions and Limitations

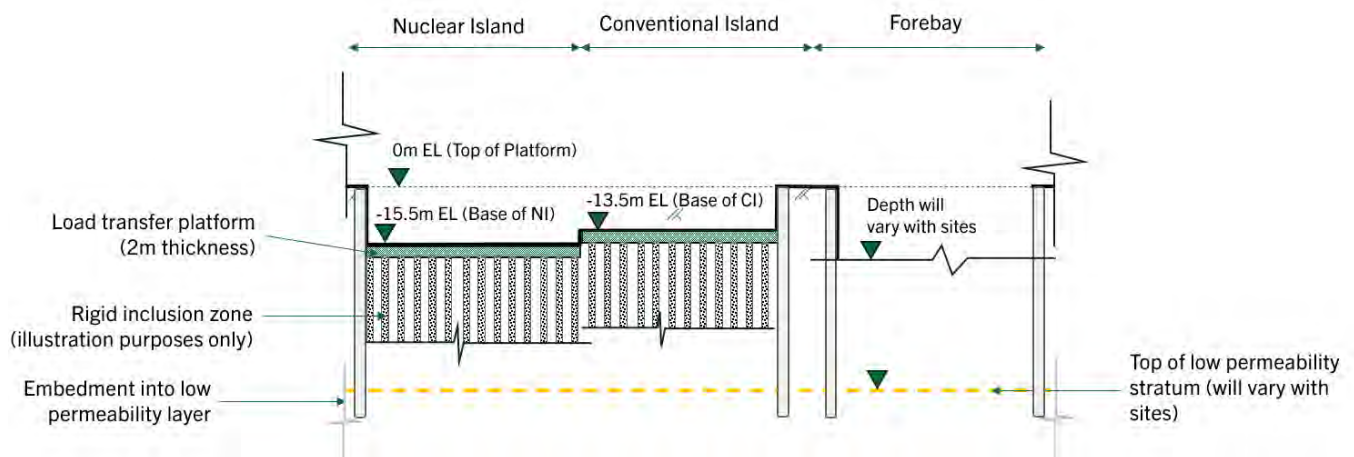
### 4.1 General

- The ground information provided by Deltares and national geological databases (refer to Section 3) formed the basis for the site evaluations.
- Site boundaries are based on the technical factsheets created by Antea and provided by Deltares to Amentum.
- The scoring of sites against each of the defined criteria is based on the best overall engineering judgement.

### 4.2 Bounding Case Development

- For the development of the Bounding Case, the EDF's EPR reactor presents the largest spatial footprint of the two Vendor technologies and has therefore been selected for the Bounding Case.
- In the absence of design information, the extents and foundation levels of the EPR Plant have been estimated based on the planning documentation for HPC, a two-unit NPP in the UK, that uses the EPR Reactor. Whilst it is understood that modifications were made to the HPC plant configuration for the proposed EPR at the Borssele-2 site, no change to the overall spatial requirements was assumed for the purpose of the works described in this report.
- Engagement with EDF was made by KGG during the initial study period and the Bounding Case assumptions were provided. Updates were made based on EDF response letter provided to Amentum on 04 August 2025. This includes excavation depths for the Nuclear Island (NI) and Conventional Island (CI) and assumptions on thickness of load transfer platforms. Figure 4-1 below shows a schematic of illustration of the NI, CI and Forebay.

Figure 4-1 Schematic Illustration of Nuclear Island, Conventional Island and Forebay (cross section)



- The possible spatial positioning of the Platform is based on the Report: Multi-Site Preliminary Technical Evaluation for the Construction of Earthworks Platforms (ref: PR00/006/FR-001).
- As per the bounding case, Rigid Inclusions have been assumed to provide the form of foundation under the NI and CI for all locations and their depths were based on the ground conditions.
- Forebay and Discharge Chamber foundations have been excluded for the assessment works carried out for this report as the depth and the form of these structures are not known at this stage.

### 4.3 3D Geological Models

- 3D geological models were developed for each site using Leapfrog Works, integrating multiple datasets to properly represent subsurface conditions.
- Digital elevation data was sourced from the Actueel Hoogtebestand Nederland (AHN) LiDAR programme, specifically the AHN4 dataset, which provides high-resolution (0.5m) DSM and DTM data for the Netherlands. Detailed bathymetric data was incorporated to enhance terrain modelling for the sea area.
- The geological stratigraphy was primarily derived from Deltares geological reports, which provided validated interpretations of lithological and geotechnical units. Stratigraphic consistency was maintained using the Dinoloket 3D geological model sections, which offer interactive cross-sectional views and lithological classifications. The detailed geological sections from Deltares were digitised in three dimensions and used as primary references for model construction. Where discrepancies in stratigraphic contacts were identified during 3D modelling, the Deltares sections were prioritised as the validated source for lithological boundaries and unit definitions.
- The models should be interpreted in conjunction with this report which outlines key constraints and assumptions. Further, limitations in input data and modelling assumptions may also affect the accuracy of geological boundaries and unit definitions.
- The model reflects complex depositional environments and geological relationships near the site. It is based on limited ground investigation data available at this stage and interpretative sections from Deltares. A degree of interpretation was inevitable to integrate disparate datasets. The model does not include a quantifiable uncertainty indicator, which is a known limitation of digital subsurface modelling.
- **General reliability considerations:** It should be noted that interpretations are based on unverified existing data and the level of uncertainty increases with distance from investigation points. Further, 2D outputs are simplified representations of complex 3D geometries.

### 4.4 Groundwater Control

- The suitability of the site related to effective control of groundwater by cut off walls will be considered in the multi criteria evaluations in the Multi-Site Preliminary Technical Evaluation for the Construction of Earthworks Platforms (ref: PR00/006/FR-001). This will be based on the feasibility to achieve a cut off into a low permeability stratum using either a cutter soil mix wall (for open excavations) or diaphragm wall techniques.

### 4.5 Rigid Inclusion Quantification

- Rigid Inclusions are vertical ground improvement elements, typically made of concrete or grout, installed in the ground to increase load-bearing capacity and reduce settlement under structural loads. They are not connected to the structure above but work by transferring loads from the overlying structure through the soft soil into deeper, more competent strata via a Load Transfer Platform.
- Rigid Inclusions are assumed to be 750mm in diameter and arranged in a square grid with a spacing of three times the RI diameter. This means the centre-to-centre distance between adjacent RIs is 2.25m in both principal directions in plan.
- A 2m thick Load Transfer Platform (LTP) assumed below the base of the building and the top of the Rigid Inclusions at both the Nuclear and Conventional Islands.
- Based on the loading conditions, the lengths of the Rigid Inclusions is assumed to be 30m beneath the Nuclear Island and 25m below the Conventional Island. In the areas where weak/soft layers were present, additional 5m in length of Rigid Inclusions has been included. These assumed Rigid Inclusion lengths are indicative only and considered appropriate for the purpose of programme and financial

impact assessments. Detailed SSI analysis would be required to improve the certainty of the actual configuration of the Rigid Inclusions required to meet the project performance criteria.

## 4.6 Time Impact Classification

- In this report, only the construction of the Rigid Inclusions is considered. For more details on Time Impact Classification of platform construction, landscape, cut off walls, diaphragm walls and excavation, reference should be made to the Multi-Site Preliminary Technical Evaluation for the Construction of Earthworks Platforms (ref: PR00/006/FR-001).
- The production rates for construction activities are typical values and are considered appropriate to guide the Technical Evaluation of the sites. The rates adopted are not necessarily relevant for detailed construction planning.
- In order to estimate the Time Impact Classification, the number of plants and equipment has been estimated and compared to the material quantities and typical productivity rates (e.g., Continuous Flight Auger rigs, etc.).
- The duration requirements for Enabling Works (i.e., piling platforms, concrete plants, etc.) has not been considered in this evaluation.
- The local availability of plant and equipment (e.g., continuous flight auger rigs) is not considered in the assessment.

## 4.7 Financial Impact Classifications

- The approach used to develop the cost estimate and inform the Financial Impact Classification is only appropriate for the Technical Evaluation process and not be used for project planning/cost management as part of any wider site assessment studies.
- Unit rates for construction activities selected are representative at the time of writing based on the available information.
- In this report, only the construction of the Rigid Inclusions is considered. For more details on Financial Impact Classification of platform construction, landscape, cut off walls, diaphragm walls and excavation refer to the Multi-Site Preliminary Technical Evaluation for the Construction of Earthworks Platforms (ref: PR00/006/FR-001)
- Preliminary costs and contractors profits are not included in the estimate. These will be subject to the final construction programme and requirements.

## 5. Methodology of Evaluation

### 5.1 Multi-Criteria Scoring, Weighting & Technical Factsheets

Amentum SMEs have developed a series of criteria and scoring system to allow unbiased and meaningful differentiation of the different sites. Table 5-1 below summarises and describes the main criteria and sub criteria used in the Technical Evaluation process. It is noted that the assessment of the Rigid Inclusion quantification and related evaluations is presented separately Section 5.2.

**Table 5-1 Summary of Multi-criteria scoring**

Main Criteria	Sub criteria	Description
Nuclear Island Foundation Suitability	Use of Rigid Inclusions	Suitability of using Rigid Inclusions
	Open battered excavation	Feasibility for open excavation or necessity for retained excavation
Ground Risks	Liquefaction	Potential for soil liquefaction during seismic events
	Ground variability	Ground uniformity across the site in terms of stratigraphy and the presence of weak/soft layers

For the above sub criteria, a scoring range of between 1 and 9 was developed to provide sufficient distinction between different sites and to provide an appropriate RAG rating to be presented on Technical Factsheets in Appendix B. Table 5-2 summarises the scoring in relation to risk rating. Full definitions of the scoring criteria are presented in Appendix A.

It is noted that the scoring criterion ranging from between 1 to 9 represents a gradational approach, meaning it provides a structured scale where each increment reflects a progressive change in risk severity and/or impact. This type of scale is gradational in level of risk, with lower scores indicating minimal or negligible risk and higher scores signifying increasing levels of risk. Such an approach allows for nuanced evaluation rather than binary judgments/statements, enabling more precise differentiation between varying degrees of risk and supporting informed decision-making for site evaluations.

**Table 5-2 Evaluation scoring and risk rating**

Scoring	Risk Rating	Description
9 to 7	Low Risk	Indicates minimal or negligible risk. Conditions are generally favourable, with little to no expected impact on design, construction, or performance.
6 to 4	Moderate Risk	Represents manageable risks that may require standard engineering solutions. While not critical, these risks could influence construction efficiency, cost, or programme and may require some mitigation measures.
1 to 3	High Risk	Denotes significant geotechnical or construction-related challenges. These risks could impact safety, design complexity, or cost, and typically require extensive mitigation or alternative solutions.

SMEs attended a series of workshops appraising each site against the scoring criteria. In addition to the scoring, a weighting factor was applied to selected sub criteria to help further differentiate the site suitability. Applying a weighting ensures that sub criteria that are significant to confirming technical feasibility are amplified appropriately in the overall evaluation process. The selection of the weighting factors was based on SME's judgement regarding which sub criteria were considered critical to the soil conditions and foundations design.

**Table 5-3 Summary of Weighting Factors**

Weighting Factor	Impact	Description
1	Low Impact	These are site constraints that affect construction logistics and planning, but are typically resolvable through construction planning or temporary measures. They are less likely to cause major delays or cost overruns.
2	Moderate Impact	These criteria influence construction efficiency, cost, and design flexibility, but are generally manageable with standard engineering solutions. They may not pose direct safety risks but can affect programme and budget
3	High Impact	These are critical geotechnical risks that could significantly affect the safety, design complexity, and cost of the project. They often require extensive mitigation and have direct implications for nuclear safety and regulatory compliance.

During the course of the study, it was observed that the volume of relevant site-specific GI varies considerably between the sites. The sufficiency of the available GI data for each site influences the degree of reliability in the ground model, which in turn impact the reliability of the evaluation. Sites with a higher level of confidence in the ground model have been identified and presented in Section 6.1 and in the Technical Factsheets in Appendix B. Table 5-4 summarises and defines the ground model confidence into three RAG categories.

**Table 5-4 Summary of ground model confidence**

Ground model confidence level	Description
Limited but adequate	At least two deep BHs/CPTs 30m apart and up to 25m depth within the footprint of the site boundary
Very Limited	At least one deep BHs/CPTs up to 25m depth within the footprint of the site boundary
Extremely Limited	No BHs/CPTs up to 25m depth within the footprint of the site boundary

A template for Technical Factsheets was presented to KGG on 04/07/2025 and received no objections. As the study has been progressing, minor modifications to the initial draft of the template have been made to further improve the effectiveness of the communication of the evaluations process.

## 5.2 Rigid Inclusion Quantification

As discussed in Section 4.2 and 4.5, the Bounding Case has been used to quantify the Rigid Inclusions beneath the Nuclear and Conventional Island footprints. The Rigid Inclusions have been assumed to be 750mm in diameter and arranged in a square grid with a spacing of three times the RI diameter. This means the centre-to-centre distance between adjacent RIs is 2.25m in both principal directions in plan. Based on this, the total number of Rigid Inclusions per unit is:

- 1,524 beneath the Nuclear Island;
- 1,481 beneath Conventional Island.

It should be noted that each site includes two units, and the estimated length of the Rigid Inclusions varies across sites depending on the presence of the weak or soft ground layers as outlined in Section 4.5. This data has been used to calculate the Time and Financial Impact classifications outlined in Section 5.3 and Section 5.4.

### 5.3 Time Impact Classification

Programming of construction depends on many factors such as project timing, market pressures, plant availability, contract mechanism, etc. The approach used to consider the construction durations described in this report is appropriate to support the Technical Evaluation process only and should not be used for any supplementary site assessments or project planning purposes.

The approach undertaken is as follows:

- Determine typical production rates for the proposed construction activities (i.e., continuous flight auger rigs for Rigid Inclusion installation). For the purposes of the Technical Evaluation process the following assumption and production rates have been assumed for the proposed Rigid Inclusions;
  - Rigid Inclusions can be installed by either CFA or displacement type rig.
  - Approximately 200m of RI columns can be installed per day per rig.
- Determine number of rigs operating simultaneously on each structure;
  - It is assumed that two (2 No.) rigs per structure can safely operate within the available working areas for Rigid Inclusion installation.
- Calculate the total linear meters of Rigid Inclusions required per structure;
- Estimate the number of months needed to construct the Rigid Inclusions for each structure;
- Use the structure with the longest construction period to define the overall time range and assign a classification;
- Selecting Time Impact Classifications (i.e., Class and Consequence ratings) using the generated productivity estimates and comparing them to the time ranges defined by KGG, as presented in Table 5-5 below.

**Table 5-5 Time Impact Classification (in months)**

Class	Consequence	Time Range
0	None	0
1	Low	0 – 6
2	Medium	6 – 12
3	High	12 – 24
4	Very High	24 – 36
5	Exceptional	36 and above

### 5.4 Financial Impact Classification

Cost estimation of construction activities is a complex exercise and depends on many factors such as inflation, project timing, market pressures, project financing, contract mechanism, exchange rates, risk management, etc. The approach used to develop the cost estimation described in this report is appropriate to support the foundation optioneering process only and should not be used for project planning or cost management as part of the wider project development.

The approach undertaken to develop the relative cost comparison comprised:

- Acquiring representative unit rates for construction related to foundation requirements. These rates were selected based on a review of specialist contractors, international catalogues and Amentum’s experience. The following rates have been used:
  - Establish CFA pilling rig (1No.): €12,650
  - Rig Standing time (per hour): €648
  - Move rig between piles (1No.): €62
  - Install 750mm diameter Rigid Inclusion (per m<sup>3</sup>): €134
- Apply the selected unit rates to the Rigid Inclusion to estimate costs;
- Selecting Financial Impact Classifications (i.e., Class and Consequence ratings) using the generated cost estimates and comparing them to the monetary ranges defined by KGG, as presented in Table 5-6 below.

Table 5-6 Financial Impact Classification

Class	Consequence	Money Range
0	None	€ 0 M
1	Low	€ 0 M - €100 M
2	Medium	€ 100 M – € 500 M
3	High	€ 500 M – € 1,000 M
4	Very High	€ 1,000 M – € 2,000 M
5	Exceptional	€ 2,000 M and above

## 6. Assessment Results

### 6.1 Multi-Criteria Scoring

As discussed in section 5.1, the suitability of bounding case for each site has been scored against the following criteria:

1. Use of Rigid Inclusions.
2. Feasibility for open excavation to reach RI installation level or necessity for retained excavation.
3. Potential for soil liquefaction during seismic events.
4. Ground uniformity across the site in terms of stratigraphy and the presence of weak/soft layers

Section 6.1.1 to Section 6.1.4 provide a detailed discussion of how each site has been scored and the associated risk. Table 6-1 presents the individual multi-criteria scoring performed for each site, while Table 6-2 shows the adjusted overall weighted scores based on geotechnical criteria related to soil conditions and deep foundation feasibility. Detailed assessments are provided in the Technical Factsheets in Appendix B.

#### 6.1.1 Rigid Inclusions

##### Sloegebied 1

The risk associated with the RIs solution at the Sloegebied 1 site is considered high due to the presence of poorly-graded fine to medium sands (NUNAWAga). These loose, non-cohesive soils can adversely affect the installation of RIs using continuous flight auger (CFA) methods, potentially resulting in partial collapse or borehole instability during construction.

Additionally, a vertical geological boundary, resulting from tidal channel deposits (NUNAWAga) running through the middle of the site, further increases the complexity. This boundary between the tidal channel deposits (NUNAWAga) and the Koewacht Formation (NUKW) may lead to abruptly varying ground stiffness across the footprint of the development, making it very challenging to control differential settlements. Further, accurately defining the position of this vertical geological boundary would require a substantial amount of GI to reduce the uncertainty and to inform the design.

The Breda Formation (NUBR) is also present at depths of approximately -30m NAP. This member consists of sands with high content of glauconite. Glauconite is a friable mineral that tends to crush under mechanical stresses, inducing particle degradation that may shift soil behaviour from granular to more cohesive. This could impact the side friction, drainage characteristics, and concrete-soil interface quality. However, this risk can be mitigated through appropriate testing and design measures.

##### Sloegebied 2

The risk associated with the RIs solution at this site is considered medium due to the presence of poorly-graded fine to medium sands (NUNAWAga) extending to depths of approximately -25m NAP. These loose, non-cohesive soil conditions can adversely affect the installation of RIs using continuous flight auger (CFA) methods, potentially leading to partial collapse or instability of the borehole during construction. This may compromise the integrity of the inclusions and increase the likelihood of construction defects if not properly mitigated, for example by partially casing the RI during its installation. Additionally, to the north-east of the site clay layers have been identified probably as part of the Waalre Formation (NUWA) which might also introduce some lateral variability in the stiffness of the ground.

The Breda Formation (NUBR) is also present at depths of approximately -35m NAP. This member consists of sands with high content of glauconite. This could impact the side friction, drainage characteristics, and concrete-soil interface quality.

However, both the differential settlement as well as glauconite sands risks can be mitigated through appropriate GI, testing and design measures.

### **Eemshaven 1a**

The risk associated with the RIs solution at this site is considered medium. The Naaldwijk Formation (NUNA and NONAWO), up to 10m thick, comprises fine to medium-coarse clayey sands and sandy clay layers located below the foundation level. As a result, partial casing of the continuous flight auger (CFA) may be required during RIs installation to prevent borehole instability and reduce the potential for permanent defects. No significant obstructions are however anticipated that would hinder the use of CFA techniques.

A basal peat layer (NUNIBA) has been identified; however, it is less than one metre thick and is not expected to significantly affect installation. Based on current data, limited lateral geological variability is anticipated, which is favourable for the design and performance of the Rigid Inclusions.

### **Eemshaven 1b**

The ground conditions at this site are similar to those at Eemshaven 1a, therefore, the risk associated with the RIs solution is also considered medium.

### **Eemshaven 2**

The risk associated with the RIs solution at this site is considered high. A tidal channel incision (NUNA) has been identified directly beneath the Eemshaven 2 site. This incision affects only part of the site, resulting in significant lateral geological variability, which could pose extreme challenges in controlling differential settlements due to variations in ground stiffness.

Furthermore, in areas where the tidal channel is absent, peat layers (NUNIBA) have been encountered. These layers may also influence the performance of the RIs and should need particular consideration in the design.

### **Eemshaven 3**

The ground conditions at this site are similar to those at Eemshaven 2, but without the tidal channel incision. This results in more consistent lateral geology, which is advantageous for controlling differential settlements. Peat layers (NUNIBA) have been encountered, however, they are only a few tens of centimetres thick. While these layers may influence the performance of the rigid inclusions (RIs), their limited thickness reduces the overall impact. For these reasons, the risk associated with the RI solution is considered medium.

### **Maasvlakte 2**

The risk associated with implementing the RI solution at this site is considered high due to several geotechnical challenges.

This location is part of a recently reclaimed area from 2018, with a reclamation layer approximately 20m thick. The reclamation was carried out in three phases: bottom dumping, rainboring, and pipeline discharge. Importantly, this process was completed without compaction. The loose and non-compacted fill material presents a serious challenge for installation of RIs using the CFA method. It may result in poor borehole stability, difficulty in maintaining verticality, and inconsistent grout confinement. These issues can significantly compromise the integrity and performance of the RIs system.

Beneath the foundation layer, extending to approximately -23.6m NAP, there is a peat layer up to 2m thick. This layer presents considerable variability in thickness across the site, which poses challenges for both the installation of CFA (continuous flight auger) rigs and the performance of the RIs system. The inconsistent peat thickness also complicates the control of differential settlements, increasing the risk of uneven ground movement.

Due to the combination of recent reclamation and the presence of compressible peat, the site is already experiencing notable subsidence. Additionally, part of the site remains un-reclaimed, further contributing to the uncertainty and complexity of ground behaviour.

#### **Terneuzen 1a**

The geotechnical risk associated with the RIs solution at this site is considered low. The RIs will be installed primarily through the stiff clay of the Rupel Formation (NMRU), which is well-suited to the continuous flight auger (CFA) technique. The site geology is generally consistent, with low lateral variability, which supports effective control of differential settlements. However, glauconitic soils are present within the Ruisbroek Member (NMTORU), and as observed in the Sloehaven area, these may locally affect side friction, behaviour, and the quality of the concrete-soil interface. These factors should be considered during design and construction. However, this risk can be mitigated through appropriate testing and design effort.

#### **Terneuzen 1b**

Conditions at this site are similar to those at Terneuzen 1a, but with greater horizontal geological variability due to the partial presence of the Eem Formation (NUEE) within the site boundary. This formation also reduces the thickness of the stiff clays of the Rupel Formation (NMRU), which are typically favourable for RIs installation. The increased variability makes the control of differential settlement more challenging. Consequently, the geotechnical risk associated with the RIs solution is considered medium. However, this risk can be mitigated through appropriate testing and design measures.

### **6.1.2 Open Battered Excavation**

#### **Sloegebied 1**

The geotechnical risk associated with the open battered excavation at this site is considered high, primarily due to the presence of a high groundwater table and poorly-graded fine to medium sands (NUNAWAgA). The high permeability of these sands, combined with the elevated groundwater level, will likely require deep perimeter cut-off measures or diaphragm walls. The site is also highly constrained in terms of available space, which will likely require a retained excavation for the deep foundations, potentially supported by deep well-point dewatering systems. Additionally, the deep excavation may induce settlements in nearby structures. Given the close proximity of the existing Nuclear Power Plant, this risk must be carefully considered during design and execution.

#### **Sloegebied 2**

Hydrogeological and geological conditions at this site are similar to those at Sloegebied 1, making a fully-open excavation challenging. Therefore, the geotechnical risk associated with the open battered excavation is considered high.

#### **Eemshaven 1a, 1b, 2 and 3**

Excavation across all sites is expected to take place within the Naaldwijk Formation (NUNA), which predominantly consists of fine to coarse sands with high permeability and a high groundwater table. Additionally, Eemshaven 1a, 2, and 3 are spatially constrained, with Eemshaven 1a being particularly limited due to its proximity to the main dyke of the Netherlands. These conditions make open excavation highly challenging. As a result, all sites will likely require fully-retained excavations, potentially supported by deep well-point systems to manage groundwater levels. Therefore, the geotechnical risk associated with the open battered excavation at this site is considered high.

#### **Maasvlakte 2**

The geotechnical risk associated with the open battered excavation at this site is considered high. The excavation is located in non-compacted, high-permeability fill material used for land reclamation, with strong hydraulic connectivity to the North Sea, making groundwater control extremely difficult. Additionally, the site

is highly constrained in terms of space, meaning a fully-retained excavation will be required, likely supported by deep well-point systems to manage groundwater levels.

#### **Terneuzen 1a**

The geotechnical risk associated with the open battered excavation at this site is considered low.

#### **Terneuzen 1b**

The geotechnical risk associated with the open battered excavation at this site is considered medium. Although the excavation will be formed in the tidal channel deposits (NUNAWAga) and the groundwater table is high, an impermeable clay layer of the Ruper Formation (NMRU) is present 5 to 10 metres below the target excavation level. This makes groundwater control measures simpler, helping to ensure a safe excavation. Sufficient land is available to accommodate the battered excavation, however, cut-off walls extending to the Ruper Formation will be required.

### 6.1.3 Potential for Liquefaction

#### **Sloegebied 1 and 2**

The geotechnical risk associated with liquefaction at these sites is considered medium. The NUNAWAga and NUKW layers comprise poorly graded fine to medium sand and fine to very coarse sand, respectively, and are located below the groundwater table. Both layers are considered to have a low risk of liquefaction for earthquakes with an annual probability of exceedance of  $10^{-4}$ , however, they may be prone to liquefaction under rare, high-magnitude seismic events.

#### **Eemshaven**

The area is characterised by induced seismicity resulting from gas extraction in the Groningen gas field. As gas extraction has now ceased, the hazard associated with induced earthquakes is diminishing. An analysis carried out by Deltares, based on CPT data, indicates a low risk of liquefaction for both induced seismicity and tectonic earthquakes, noting that tectonic activity in the area is very low.

#### **Maasvlakte**

The geotechnical risk associated with liquefaction at these sites is considered medium, due to the presence of approximately 20m of non-compacted granular fill material used for land reclamation, as well as aeolian river dunes. These soils may be susceptible to liquefaction under rare, high magnitude, seismic events.

#### **Terneuzen**

The geotechnical risk associated with liquefaction at these sites is considered medium. The NUNAWAga layer contains loose and medium dense sands, which are considered low risk of liquefaction for earthquakes with an annual probability of exceedance of  $10^{-4}$ , however, they may be prone to liquefaction under rare, high-magnitude seismic events. Similarly, the NUKW member, present beneath Terneuzen 1b, comprises poorly-graded fine to very coarse sands. This material may also be subject to liquefaction under rare, high magnitude, seismic events.

### 6.1.4 Ground uniformity and presence of weak/soft layers

#### **Sloegebied 1**

High lateral variability due to tidal channel deposits (NUNAWAga) running through the middle of the site, creating a distinct vertical boundary in the geological profile.

#### **Sloegebied 2**

Medium lateral variability is observed across the site. The entire site is underlain by channel deposits (NUNAWAga), but there is potential for the Waalre Formation (NUWA), which comprises coarse sands, to be present only partially within the site.

**Eemshaven 1a**

The geotechnical risk is considered high due to due to the presence of soft spots of organic clays/peat (NUNIBA).

**Eemshaven 1b**

Ground stratigraphy is laterally uniform, and no soft or weak layers have not been mapped. The geotechnical risk is considered low.

**Eemshaven 2 and 3**

The geotechnical risk is considered high. A tidal channel is present across the central part of site 2 and the northern part of site 3. Moreover, peat (NUNIBA) has also been mapped below the foundation level, which contributes to increase the geotechnical risk.

# Multi-Site Preliminary Technical Evaluation of Site Suitability for Geology, Soil Conditions and Deep Foundations

**Table 6-1: Summary of Multi-criteria site scoring (not weighted)<sup>1</sup>**

Criteria <sup>2</sup>	Sloegebied 1	Sloegebied 2	Eemshaven 1b	Eemshaven 1a	Eemshaven 2	Eemshaven 3	Maasvlakte 2	Terneuzen 1A	Terneuzen 1B
Liquefaction Potential	4	5	7	6	7	8	4	4	5
Ground Variability	1	5	6	3	1	2	4	6	5
Open battered excavation	1	3	3	2	1	2	2	2	6
Use of Rigid Inclusions	2	5	6	6	3	5	1	7	6
<b>Total number of risk criteria in scoring</b>									
Total no. of High Risk criteria	3	1	1	2	3	2	2	1	0
Total no. of Moderate Risk criteria	1	3	2	2	0	1	2	2	4
Total no. of Low Risk criteria	0	0	1	0	1	1	0	1	0
<b>Confidence level in Site Ground Model</b>									
Confidence Level	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Extremely Limited	Extremely Limited

**Notes:**

1. To be read in conjunction with main report.
2. Summary description of criteria is presented below:

Criteria	Criteria Description
Liquefaction Potential	Potential for liquefaction during seismic loading
Ground Variability	Ground uniformity across the site in terms of stratigraphy
Open battered excavation	Feasibility for open excavation or necessity for retained excavation
Use of Rigid Inclusions	Suitability of using Rigid Inclusions

Multi-Site Preliminary Technical Evaluation of Site Suitability for Geology, Soil Conditions and Deep Foundations

**Table 6-2 Summary of Multi-criteria site scoring (Weighted)<sup>1</sup>**

Criteria <sup>2</sup>	Weighting Factor	Slogebied 1	Slogebied 2	Eemshaven 1b	Eemshaven 1a	Eemshaven 2	Eemshaven 3	Maasvlakte 2	Terneuzen 1A	Terneuzen 1B
Liquefaction Potential	3	4	5	7	6	7	8	4	4	5
Ground Variability	2	1	5	6	3	1	2	4	6	5
Open battered excavation	1	1	3	3	2	1	2	2	2	6
Use of Rigid Inclusions	2	2	2	6	6	3	5	1	7	5
<b>Total score</b>		19	38	48	38	30	40	24	40	43

**Confidence level in Site Ground Model**

Confidence Level	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Limited but adequate	Extremely Limited	Extremely Limited
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Notes:

1. To be read in conjunction with main report.
2. Brief description of criteria is given below:

Criteria	Criteria Description
Liquefaction Potential	Potential for liquefaction during seismic event
Ground Variability	Ground uniformity across the site in terms of variation in stratigraphy
Open battered excavation	Feasibility for open excavation or necessity for retained excavation
Use of Rigid Inclusions	Suitability of adopting Rigid Inclusions as foundation solution

In summary:

- All sites classified as Amber (Medium Risk) or Green (Low Risk) under the “*Use of Rigid Inclusions*” criteria are considered technically feasible for the implementation of Rigid Inclusions as ground treatment. However, the nature of the subsurface conditions will significantly influence the complexity of the solution, the construction programme, and the associated capital cost. Section 6.5 provides insight into potential measures and alternatives during the construction phase. Sites classified as Amber (Medium Risk) are more likely to require additional measures during the GI, design and construction phases.
- Sites classified as Red (High Risk) under the “*Use of Rigid Inclusions*” criteria are likely to require alternative solutions to mitigate the associated risks. These potential alternative solutions are discussed in Section 6.5.
- Eemshaven 1b site ranks the highest in the weighted scoring (48 points), followed closely by Terneuzen 1B (43 points), Terneuzen 1A (40 points) and Eemshaven 3 (40 points) sites. These sites generally exhibit favourable conditions in terms of liquefaction potential, ground variability, and suitability for Rigid Inclusions.
- Sloegebied 1 and Maasvlakte 2 rank lowest, with weighted scores of 19 and 24, respectively. These sites show multiple high-risk criteria, particularly in ground variability and excavation feasibility, which may require complex and expensive foundations solutions.
- Risk classification indicates that Sloegebied 1 and Eemshaven 2 have the highest number of high-risk criteria (3 each), while Terneuzen 1B has none.
- Availability of the level of ground information is generally termed as “Limited but adequate” for the purpose of this report, except for Terneuzen 1A and 1B, it is termed as “Extremely Limited” based on the available subsurface information. These two sites will require supplementary investigation to improve the reliability of the suitability assessment reported here.
- The total scoring reflects the overall suitability considering the liquefaction potential, subsurface variability, excavation feasibility, and the adoptability of rigid inclusion as the foundation solution. Sites with higher scores typically offer more predictable ground conditions and greater flexibility in foundation design, reducing construction risk and complexity.

## 6.2 Time Impact Assessment

Time Impact Assessment for all sites is classified as Class 2 - Medium Consequence, based on the assumptions and methodology outlined in Section 4.6 and Section 5.3.

## 6.3 Financial Impact Assessment

Financial Impact Assessment for all sites is classified as Class 1 – Low Consequence, based on the assumptions and methodology outlined in Section 4.7 and Section 5.4.

## 6.4 Risks/Uncertainties

Table 6-3 presents a summary of the key risks identified across all sites:

**Table 6-3 Summary of key risks**

Site	Key Risks
Sloegebied 1	<ul style="list-style-type: none"> <li>• Significant lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements.</li> <li>• Presence of glauconitic sands (NUBR), with associated uncertainties in soil behaviour under in-situ stress variations.</li> <li>• Adjacent to the existing Nuclear Power Plant, where deep excavation activities could pose risks of ground movement induced damage to existing structures.</li> <li>• Open battered excavation presents challenges due to slope instability conditions and potential hydraulic connectivity with the sea.</li> </ul>
Sloegebied 2	<ul style="list-style-type: none"> <li>• Proximity of the existing Gas Power Plant could impose restraints on temporary excavation works in the proximity.</li> <li>• Presence of glauconitic sands (NUBR), with associated uncertainties in soil behaviour under stress variations due to the development.</li> <li>• Open battered excavation presents challenges due to granular slope instability conditions and potential hydraulic connectivity with the sea.</li> </ul>
Eemshaven 1b	<ul style="list-style-type: none"> <li>• Open battered excavation presents challenges due to granular slope instability conditions and potential hydraulic connectivity with the sea.</li> </ul>
Eemshaven 1a	<ul style="list-style-type: none"> <li>• Presence of Peat layer below the foundation level.</li> <li>• Open battered excavation is challenging due to proximity to the dyke and complex geohydrological conditions.</li> </ul>
Eemshaven 2	<ul style="list-style-type: none"> <li>• Significant lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements.</li> <li>• Presence of Peat layer below the foundation level.</li> <li>• Open battered excavation presents challenges due to space restrictions.</li> </ul>
Eemshaven 3	<ul style="list-style-type: none"> <li>• Significant lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements.</li> <li>• Presence of Peat layer below the foundation level.</li> <li>• Open battered excavation presents challenges due to granular slope instability conditions and hydraulic connectivity with the sea.</li> </ul>
Maasvlakte 2	<ul style="list-style-type: none"> <li>• Presence of Peat layer below the foundation level.</li> <li>• Significant lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements.</li> <li>• Ongoing subsidence risk due to the recent construction of the port over organic soils, which could impact foundation performance in the long term.</li> <li>• Open battered excavation presents challenges due to granular slope instability conditions, hydraulic connectivity with the sea and also due to space constraints.</li> </ul>
Terneuzen 1A	<ul style="list-style-type: none"> <li>• Extremely limited Ground Investigation data available.</li> <li>• Presence of Glauconitic sands (NMTORU and NMRUBO) with associated uncertainties in soil behaviour under stress variations due to the development.</li> <li>• Open battered excavation presents challenges due to space restrictions.</li> </ul>
Terneuzen 1B	<ul style="list-style-type: none"> <li>• Extremely limited Ground Investigation data available.</li> <li>• Presence of Glauconitic sands (NMTORU) with associated uncertainties in soil behaviour under stress variations due to the development.</li> <li>• Significant lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements.</li> </ul>

In summary, the key uncertainties are as follows:

- **Ground Model Confidence:** The level of uncertainty in the ground model varies across sites, with Terneuzen 1A and 1B presenting the highest risk due to extremely limited available data. No boreholes or CPTs which extend more than 20m depth are available within the boundaries of these sites. Consequently, the current assessment is primarily based on geological sections as interpreted by Deltares in the Site Evaluation Report; notably, weak or organic layers have not been mapped. If such layers are encountered, then it could significantly impact the scoring process, as well as cost and programme. Further, the available boreholes are not sufficiently deep to confirm the thickness of the Rupel Formation (NMRU) above the underlying Tongeren Formation (NMTO).
- **Structural Loading and Foundation Design:** The configuration of the Rigid Inclusions, including its diameter and depth profile, is dictated primarily by the load intensity variation across the footprint of the Nuclear Island, Conventional Island and any other critical structures. On the other hand, ground conditions play a significant role as the Rigid Inclusions should be extended to a suitable founding layer such that to reduce the total and differential settlements across the footprints of the proposed development. A degree of numerical analyses will be necessary to achieve improved certainty on the configuration of the Rigid Inclusions required at different sites. However, at this stage, no such quantitative analysis has been carried out, instead a ball-park estimate has been made for to assess required quantities of Rigid Inclusions for the costing purposes which is entirely based on engineering judgements and precedents.
- **Presence of Glauconitic Sands:** Glauconitic sands are present in the Sloehaven and Terneuzen areas at depths of approximately 20m and 30m respectively below the footprint of the proposed Nuclear Island. Their presence will need particular geotechnical considerations during the detailed design stage. Glauconite is a friable mineral that tends to crush under mechanical stresses, which can significantly affect driven piles and monopiles by altering load transfer mechanisms and interface conditions. While the impact on CFA piles is less well understood, there is potential for similar effects, including particle degradation that may shift soil behaviour from granular to more cohesive. This could impact the side friction, drainage characteristics, and concrete-soil interface quality. Targeted site investigation and mineral-specific testing will assist in reducing the uncertainty and are strongly recommended to inform the detailed design and construction strategies.

## 6.5 Alternative Solutions and Revised Financial and Time Impacts

As described in Section 6.1, some of the sites may present challenges in applying the current bounding case strategy for the NI and CI foundations (i.e., use of RIs). Table 6-4 below provides a summary of potential additional works required for alternative solutions.

The proposed alternatives are based solely on high-level engineering judgement and considering the ground conditions based on currently available information, which varies between sites. If adopted for continued design development, these alternative solutions will need to be confirmed and refined during the next stages of the site evaluations following down selection through:

1. Numerical analysis, and
2. Additional supporting Ground Investigation data.

In addition, Table 6-5 outlines indicative cost and time implications associated with these alternatives. These figures are preliminary and will require refinement during the next project stage.

For alternatives involving excavation and replacement, the risk of liquefaction is likely to be effectively mitigated. At other sites where excavation and replacement are not currently considered necessary, additional ground improvement may be necessary if the risk of liquefaction materialises. In such cases, targeted excavation and replacement could be required to enhance the shear modulus of the sub-base.

## Multi-Site Preliminary Technical Evaluation of Site Suitability for Geology, Soil Conditions and Deep Foundations

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However, at this stage of the project, it is not possible to estimate the extent of such measures. A more detailed seismic hazard assessment, along with site-specific geotechnical testing, will be necessary to inform future design decisions.

## Multi-Site Preliminary Technical Evaluation of Site Suitability for Geology, Soil Conditions and Deep Foundations

Table 6-4 Summary of potential additional works for alternative solutions

Site	Partial casing during CFA operation	Excavate and replace soft/organic clays below foundation level	Deep diaphragm wall	Anchors	Temporary propping during construction	Description
Sloegebied 1	✗	✓	✓	✓	✗	<ul style="list-style-type: none"> <li>To address stiffness variation from the vertical geological boundary, excavation to about -20m NAP (<math>\approx 10\text{m}</math> deeper) is required, followed by RIs installation from foundation level. This will require deep perimeter retaining walls supported by anchors.</li> <li>Backfill with engineered fill to foundation level</li> </ul>
Sloegebied 2	✓	✗	✗	✗	✗	<ul style="list-style-type: none"> <li>Install CFA partial casing from -10.5m to -25m NAP (approximately first 15m of the RIs) to prevent borehole collapse in loose granular material.</li> </ul>
Eemshaven 1a	✓	✗	✗	✗	✗	<ul style="list-style-type: none"> <li>Install CFA partial casing from -8.5m to -13m NAP (approximately the first 5m of the RIs) to prevent borehole collapse in loose granular material.</li> <li>Verify consolidation of the Peat layer (less than 1m thick), which is likely already undergoing consolidation due to land reclamation</li> </ul>
Eemshaven 1b	✓	✗	✗	✗	✗	<ul style="list-style-type: none"> <li>Install CFA partial casing from -8.5 m to -17 m NAP (approximately the first 5m to 10m of the RI) to prevent borehole collapse in loose granular material.</li> </ul>
Eemshaven 2	✗	✓	✓	✓	✗	<ul style="list-style-type: none"> <li>Additional excavation to -15m NAP to remove weak/organic spots (NUNIBA) and replace with engineered fill. Deep perimeter retaining walls required supported by anchors.</li> <li>Ground treatment on the tidal channel valley (jet grouting) might be required to control differential settlements.</li> </ul>
Eemshaven 3	✓	✗	✗	✗	✗	<ul style="list-style-type: none"> <li>Install CFA partial casing (less than 5m) to prevent borehole collapse in loose granular material.</li> </ul>
Maasvlakte 2	✗	✓	✓	✓	✓	<ul style="list-style-type: none"> <li>Excavate and replace to -25 m NAP (<math>&gt;30\text{m}</math> excavation) to remove organic soils and replace with suitable granular fill. Due to site constraints, this will require retaining walls and anchors.</li> <li>Anchors on the south-east side may pose challenges. Allow for one level of temporary propping.</li> </ul>
Terneuzen 1A	✗	✗	✗	✗	✗	<ul style="list-style-type: none"> <li>No Peat layer mapped within the RIs extension. If present, to be excavated and replaced</li> </ul>

## Multi-Site Preliminary Technical Evaluation of Site Suitability for Geology, Soil Conditions and Deep Foundations

Site	Partial casing during CFA operation	Excavate and replace soft/organic clays below foundation level	Deep diaphragm wall	Anchors	Temporary propping during construction	Description
Terneuzen 1B	✗	✗	✗	✗	✗	<ul style="list-style-type: none"> <li>No Peat layer mapped within the RIs extension. If present, to be excavated and replaced.</li> <li>Lateral variability of geology to be remediated by more GI and design effort.</li> </ul>

**Table 6-5 Revised Financial and Time impacts**

Site	Time Impact			Financial Impact		
	Original Duration (months)	Revised Duration (months)	Class/Consequence	Original Cost (Million €)	Revised Cost (€)	Class/Consequence
Sloegebied 1	6-12	18-24	Class 3/High	15 -20	60-70	Class 1/Low
Sloegebied 2	6-12	12-18	Class 3/High	15 -20	20-30	Class 1/Low
Eemshaven 1a	6-12	12-18	Class 3/High	15 -20	20-30	Class 1/Low
Eemshaven 1b	6-12	12-18	Class 3/High	15 -20	20-30	Class 1/Low
Eemshaven 2	6-12	18-24	Class 3/High	15 -20	60-70	Class 1/Low
Eemshaven 3	6-12	12-18	Class 3/High	15 -20	20-30	Class 1/Low
Maasvlakte 2	6-12	24-36	Class 4/Very High	15 -20	+100M	Class 2/Medium
Terneuzen 1A	6-12	6-12	Class 2/Medium	15 -20	15 -20	Class 1/Low
Terneuzen 1B	6-12	6-12	Class 2/Medium	15 -20	15 -20	Class 1/Low

## 7. Conclusion and Recommendations

### 7.1 Conclusion

All the sites have been assessed individually, with the best use and interpretation of the available information, adopting the proposed methodology in this report. This assessment concludes that the following four (4 No.) sites are the most suitable for the development:

- Terneuzen 1A
- Terneuzen 1B
- Eemshaven 1B
- Eemshaven 3

### 7.2 Recommendations

The available ground information for Terneuzen 1A and 1B is extremely limited compared to all other sites and therefore it is strongly recommended to carry out limited additional GI for these two sites in order to improve the reliability of the findings of this report. The additional GI could involve the following as a minimum with *in situ* and laboratory testing:

- 1 No. 60m deep borehole (centred near to the Platform)
- 4 No. cone penetration tests to 30m.

This additional information will allow the selection of the best site for the development. Once the preliminary site selection has been undertaken, it is recommended to carry out surface non-intrusive geophysical surveys and rule out any major ground risk at the site before proceeding with the definitive location selection.

Based on the assessments conducted by Deltares, the liquefaction potential has not been flagged as a primary risk in this report, however, this still needs to be confirmed by undertaking a detailed study for the preferred site before proceeding with the final selection.

Futhermore, it is essential to undertake a scheme design of the Rigid Inclusions beneath the Nuclear and Conventional Islands. Considering the significant variation in the loadings across the development and the tight total and differential settlement criteria associated with the development, it is strongly recommended to undertake a suitably detailed Soil-Structure Interaction modelling works early in the design process. This will also inform the logistics, constructability, cost and programme with increased certainty.

## Appendix A. Multi Criteria Scoring Definitions

### Rigid Inclusions suitability

Criterion	Assessment Considerations	Scoring	Risk Category
Rigid Inclusions suitability Weighting factor = 2	Ground conditions generally cohesive with stiffness increasing with depth and suitable founding layer within 20m below the excavation level. No risk of obstructions due to boulders.	7 to 9	Low Risk
	Mixed ground conditions with no soft layers below the deep excavation level and with suitable founding layer within 20m below the excavation level. No risk of obstructions due to boulders.	4 to 6	Moderate Risk
	Mixed ground conditions with possible soft layers below the deep excavation level or no suitable founding layer within 20m below the excavation level or with potential risk of obstructions due to boulders.	1 to 3	High Risk

### Suitability for open excavation

Criterion	Assessment Considerations	Scoring	Risk Category
Suitability for open excavation Weighting factor = 1	Sufficient land available for battering the open excavation with water table sufficiently low or water table in cohesive ground	7 to 9	Low Risk
	Sufficient land available for battering the open excavation but deep cut-off wall and deep well-points is required to control the water	4 to 6	Moderate Risk
	Insufficient land available to accommodate the fully battered solution but partially battered or stepped wall or fully retained solution required	1 to 3	High Risk

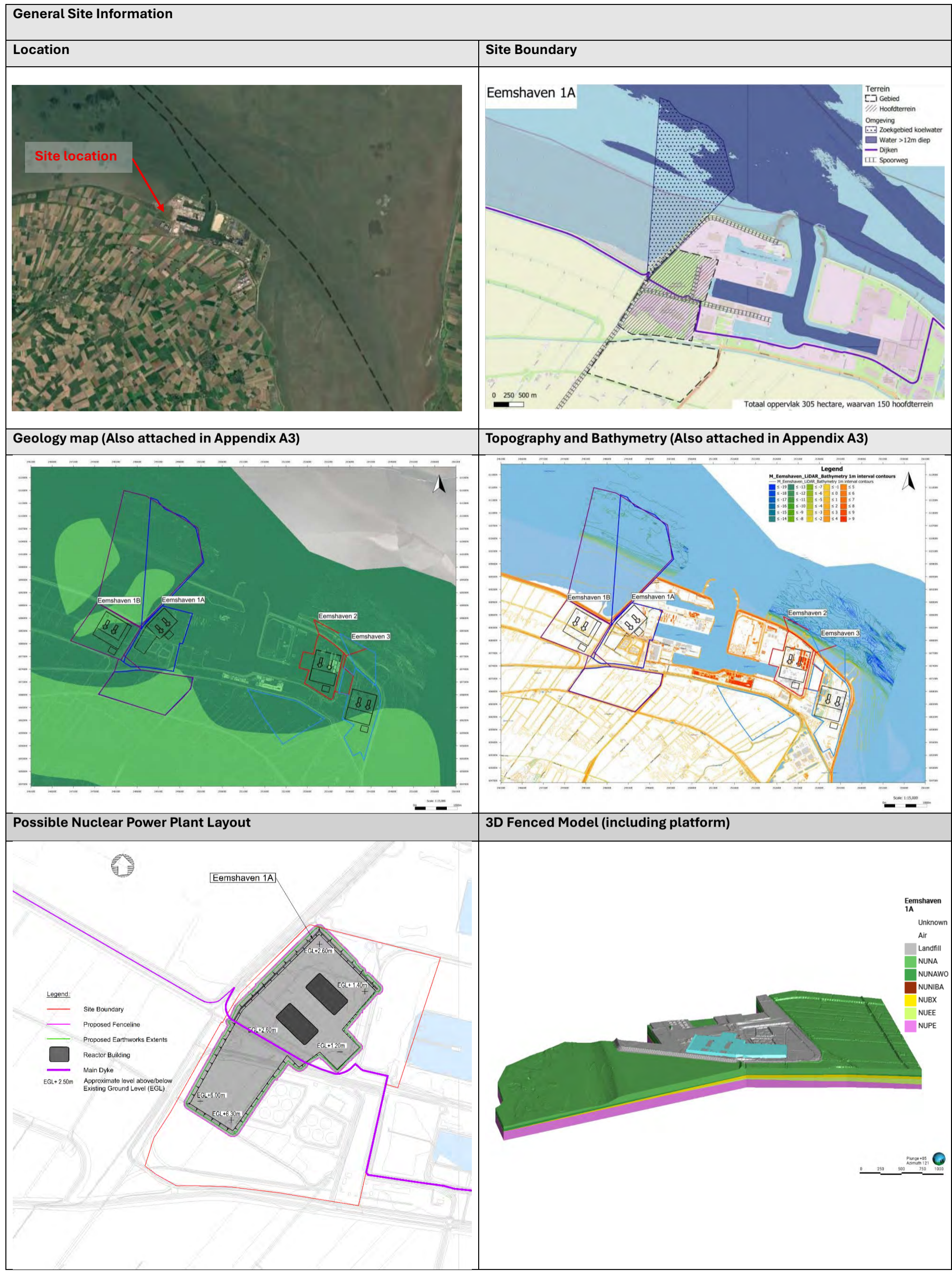
### Liquefaction potential

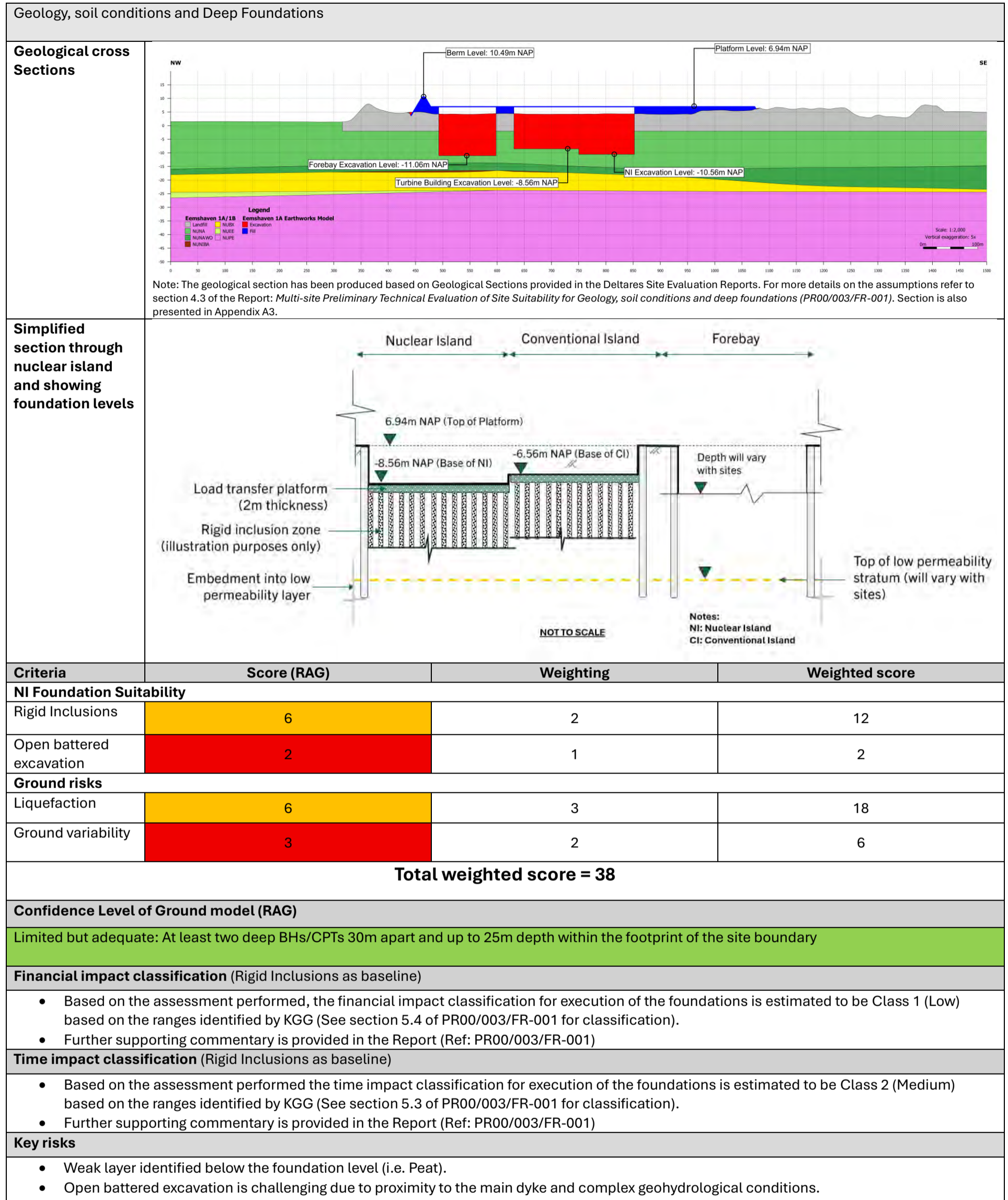
Criterion	Assessment Considerations	Scoring	Risk Category
Liquefaction potential Weighting factor = 3	Stiff cohesive ground or dense granular ground or water table at depth	7 to 9	Low Risk
	Loose sand or silty layers present below water table but of limited extent or in low seismicity zone	4 to 6	Moderate Risk
	Loose sand or silty layers present below water table and to wider extent and in high seismicity zone	1 to 3	High Risk

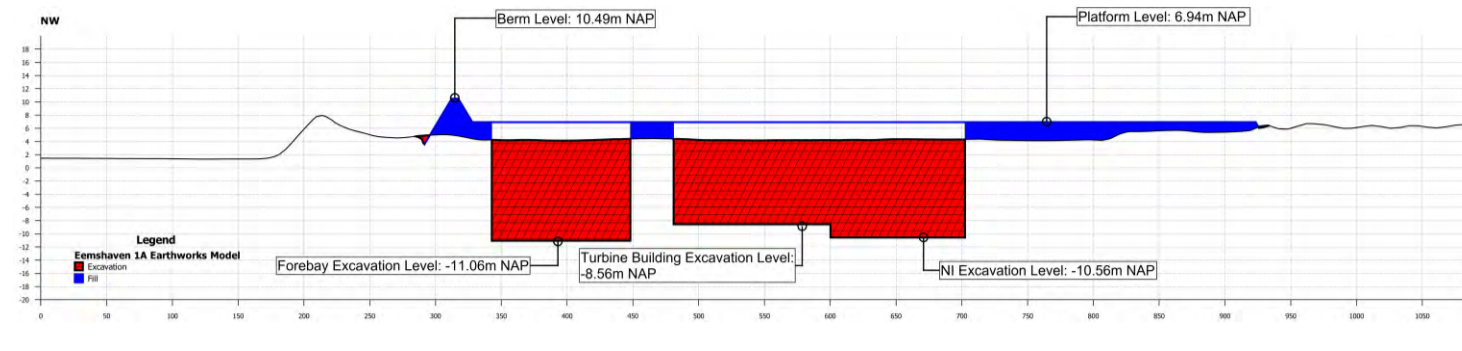
### Ground variability

Criterion	Assessment Considerations	Scoring	Risk Category
Ground variability Weighting factor = 2	Competent ground with relatively uniform ground stratification across the site with no weak/soft layers below excavation depth	7 to 9	Low Risk
	Competent ground with ground stratification varies gradually across the site (not abruptly) with no weak/soft layers below excavation depth	4 to 6	Moderate Risk
	Ground stratification varies irregularly with potential weak/soft layers at depth or with irregular rock head level	1 to 3	High Risk

## **Appendix B. Technical Factsheets**





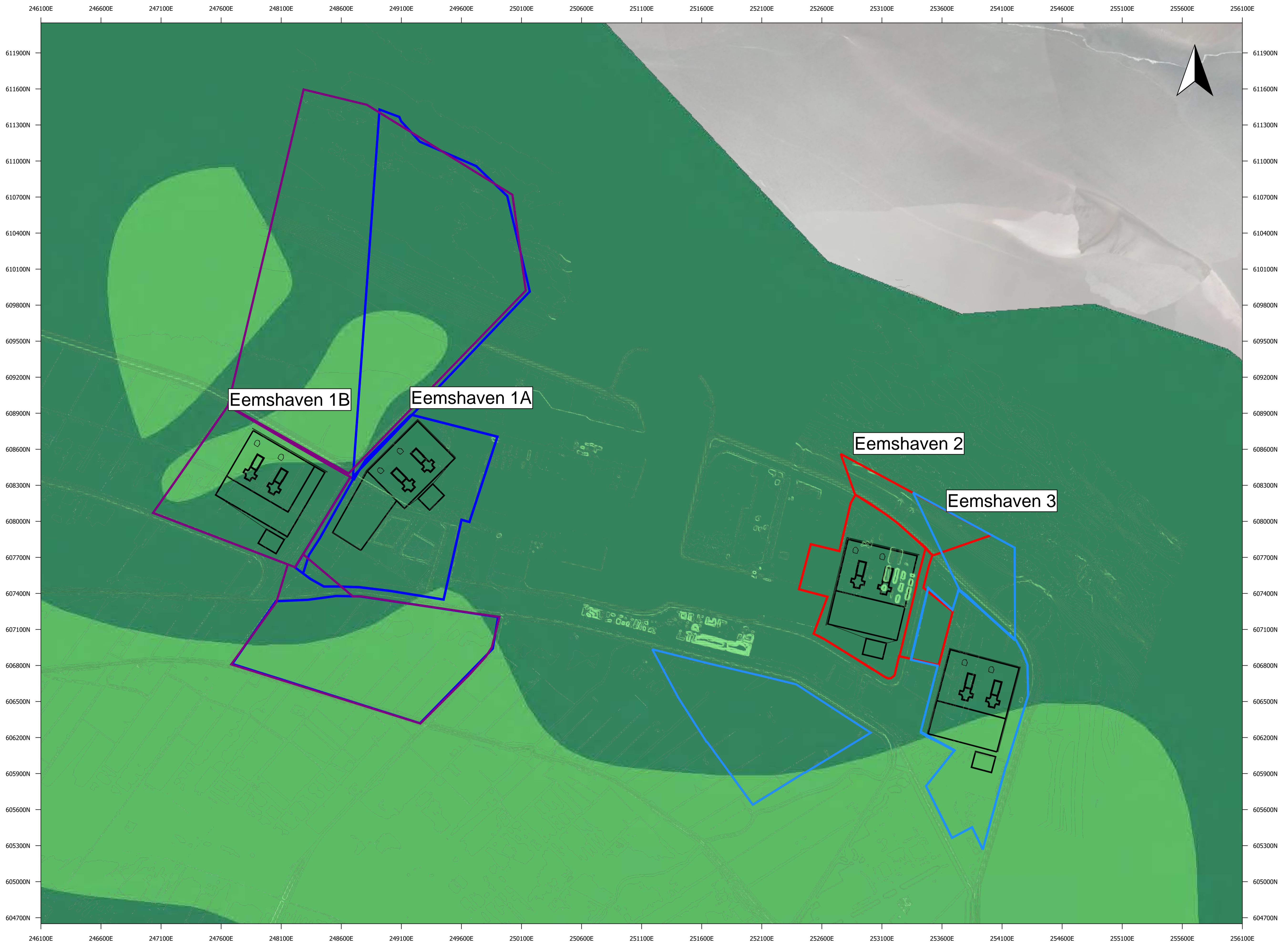
Design Basis Flood Level and Platform							
<b>Schematic Typical Section</b>							
<b>Static earthworks quantities</b>	<b>Topsoil stripping (BCM) – m<sup>3</sup></b>	<b>earthworks Excavation (BCM) - m<sup>3</sup></b>	<b>Import (BCM) - m<sup>3</sup></b>	<b>Available Fill (CCM) - m<sup>3</sup></b>	<b>Required filling (CCM) - m<sup>3</sup></b>	<b>Balance - m<sup>3</sup></b>	<b>Required landscaping (CCM) - m<sup>3</sup></b>
	-	1,064,00	2,148,000	3,085,000	3,085,000	-	1,045,000
Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters							
<b>Criteria</b>	<b>RAG</b>		<b>Weighting</b>		<b>Overall Risk rating</b>		
<b>Groundwater</b>							
Groundwater control requirements	3		3		9		
<b>Earthworks logistics</b>							
Logistics (Accessibility and plant movement)	7		1		7		
Area for stockpiling	7		1		7		
Temporary works area	8		2		16		
<b>Earthworks design</b>							
Earthworks re-use potential	5		2		10		
Contaminated soils risk	6		2		12		
<b>Onsite constraints</b>							
Existing utilities	6		1		6		
Existing structures	4		1		4		
<b>Total Weighted score = 71</b>							
<b>Financial impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 (Medium) based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001)</li> </ul>							
<b>Time impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 4 (Very High) based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001)</li> </ul>							
<b>Key risk</b>							
<ul style="list-style-type: none"> <li>Existing Structures – Solar Farm, Gas Tanks, &amp; Main Dyke.</li> </ul>							

Overall Scoring summary (PR00/003/FR-001 & PR00/006/FR-001)	
Total score	109
Total number of Red (High risk) criteria	3
Total number of Amber (Medium risk) criteria	6
Total number of Green (Low risk) criteria	3

# APPENDIX A3

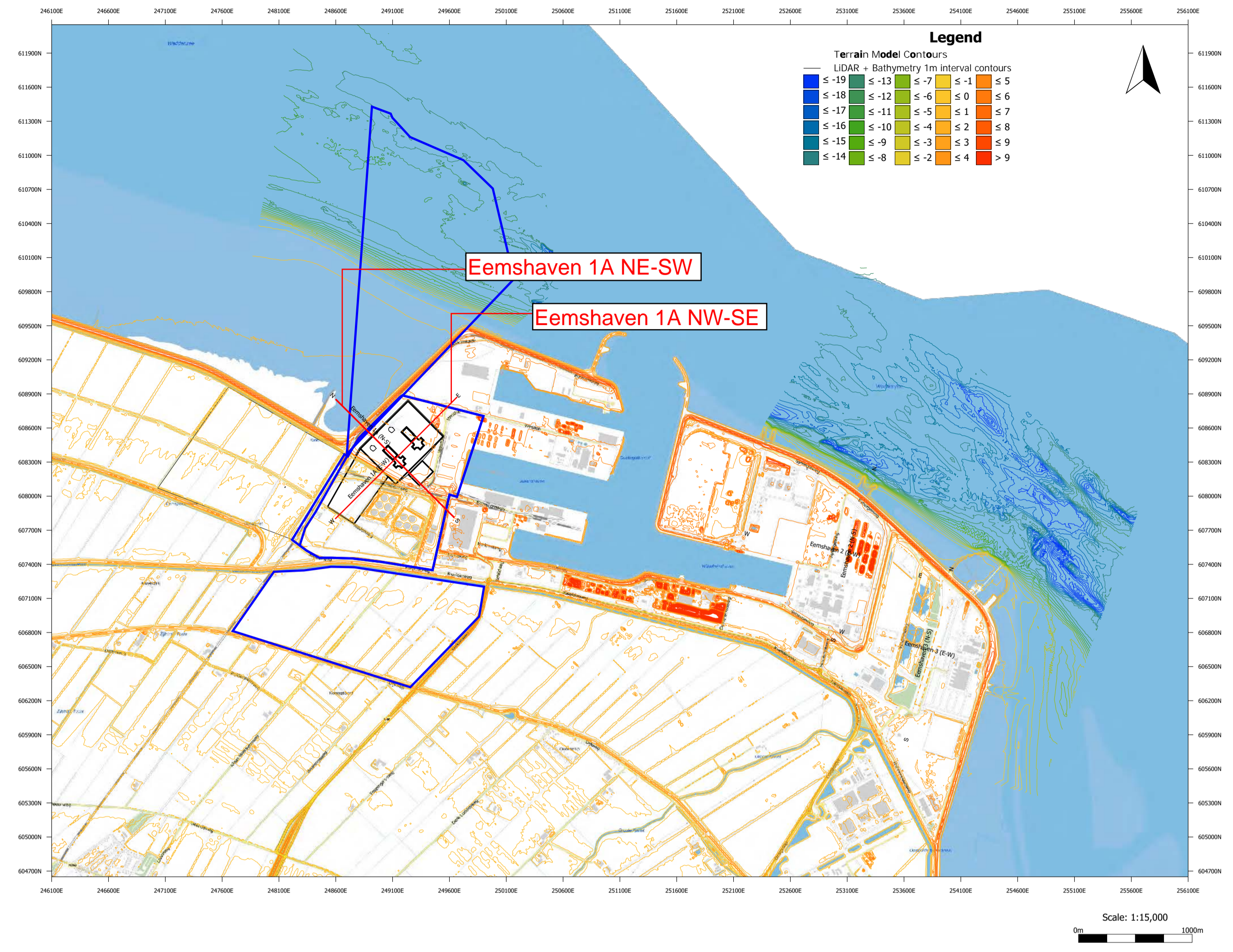
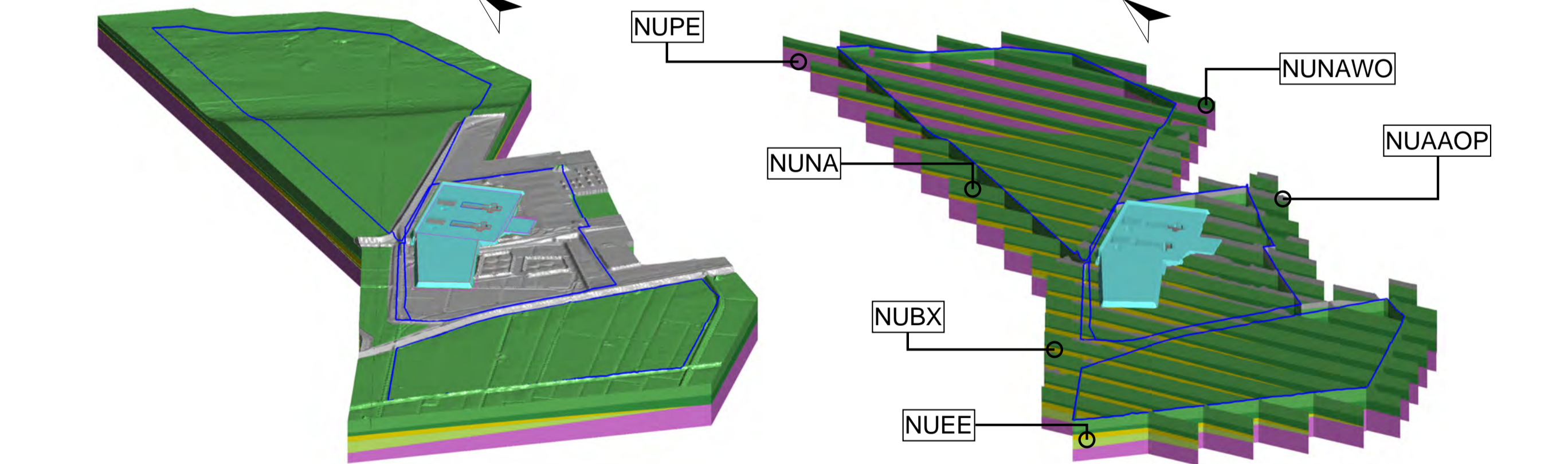
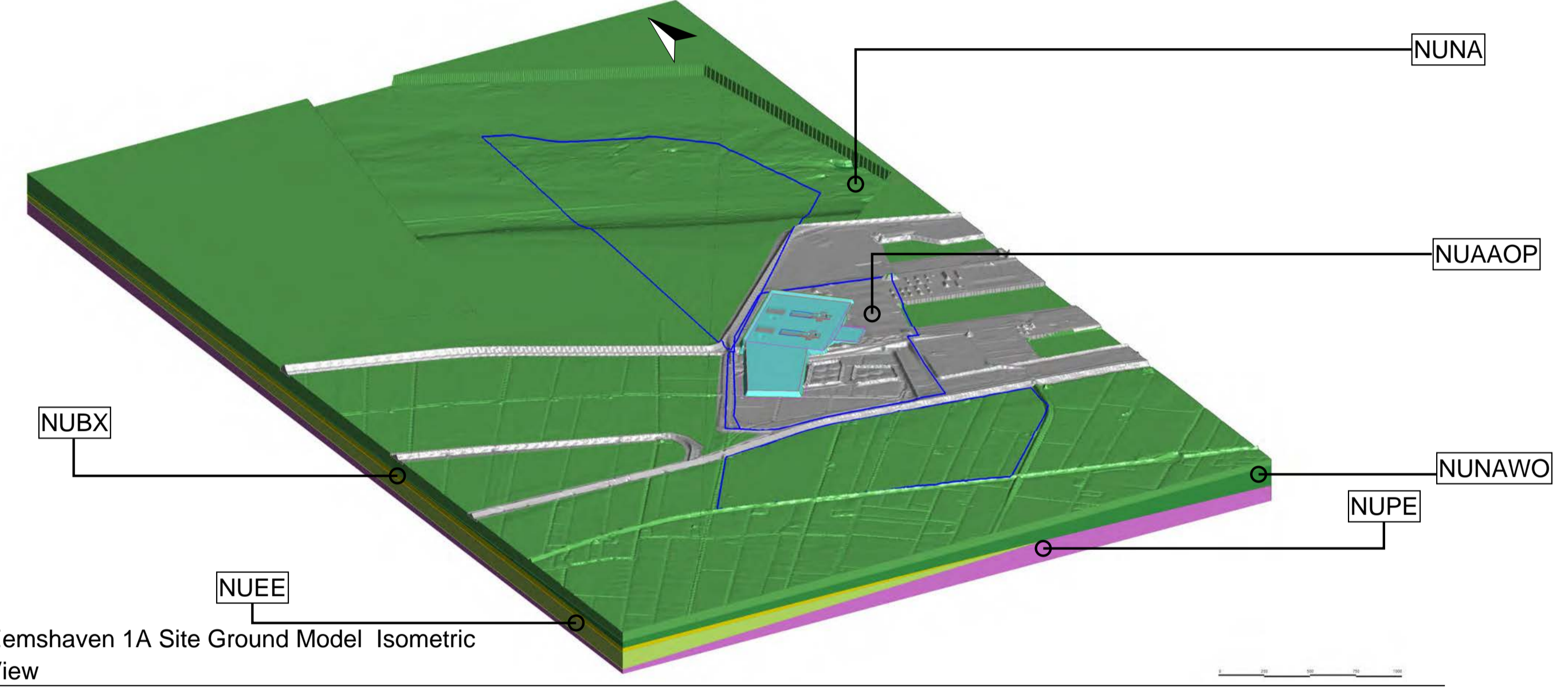
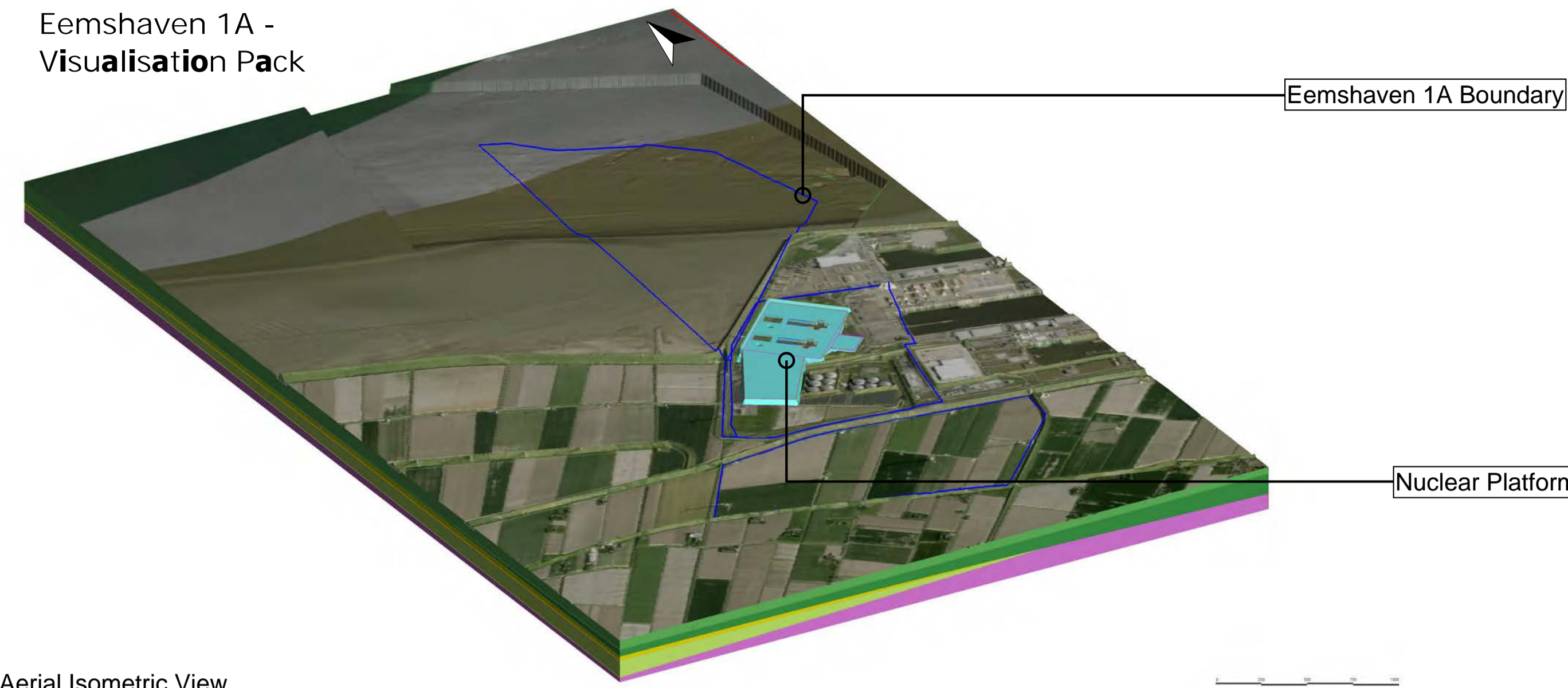
Units geological map			
<b>Holocene units</b>			
d	Coastal dune sand	ds	dg
s	Beach and foreshore deposits	s	
g	Tidal channel deposits	g	
o	Tidal deposits	o	ovg* ovo* oo*
<p><i>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</i></p>			
<b>Pleistocene and older units (onshore and at base of tidal channels)</b>			
BX1-4	Various glacial (aeolian) sand units (Boxtel Fm)	BX1	BX2 BX3 BX4
SY	Middle Pleistocene sandy fluvial sediments (Stramproy Fm)	SY	
WA	Early and Middle Pleistocene fluvial sediments (Waalre Fm)	WA	
MO	Plio-Pleistocene coastal and shallow-marine sands (Maassluis and Oosterhout formations)	MO	
BR	Miocene fine shallow-marine glauconite sands (Breda Fm)	BR	
RTD	Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD	
<b>Pleistocene and older units (offshore underneath Holocene marine deposits)</b>			
KR2	Coarse-grained Late Pleistocene fluvial deposits	KR2	
EE2	Open marine sandy and shell-rich Last Interglacial sediments.	EE2	
RTD	Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD	

# Eemshaven Plan View



Scale: 1:15,000  
0m 1000m

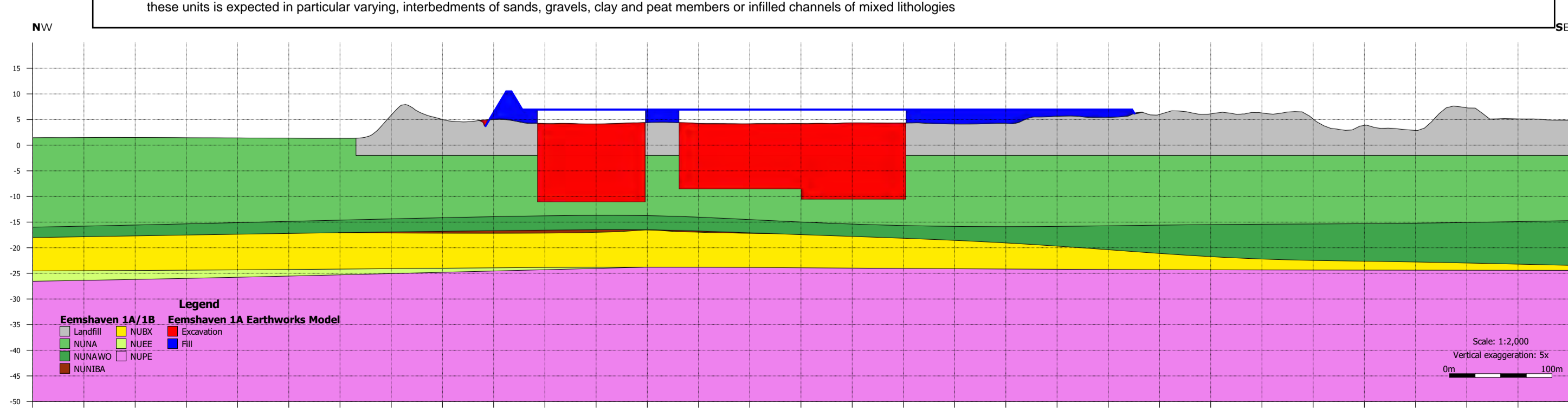
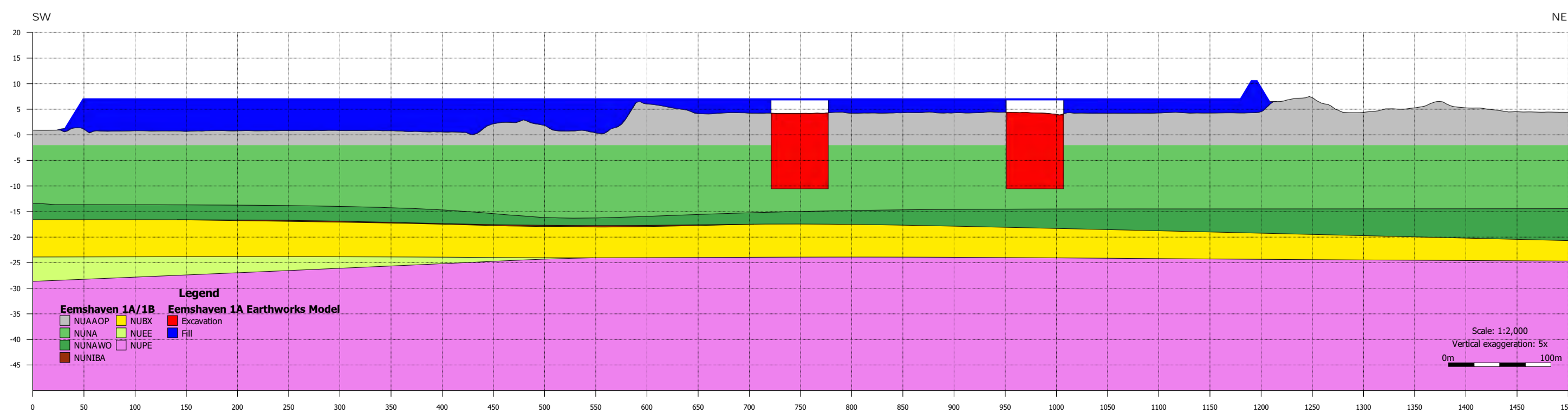
# Eemshaven 1A - Visualisation Pack



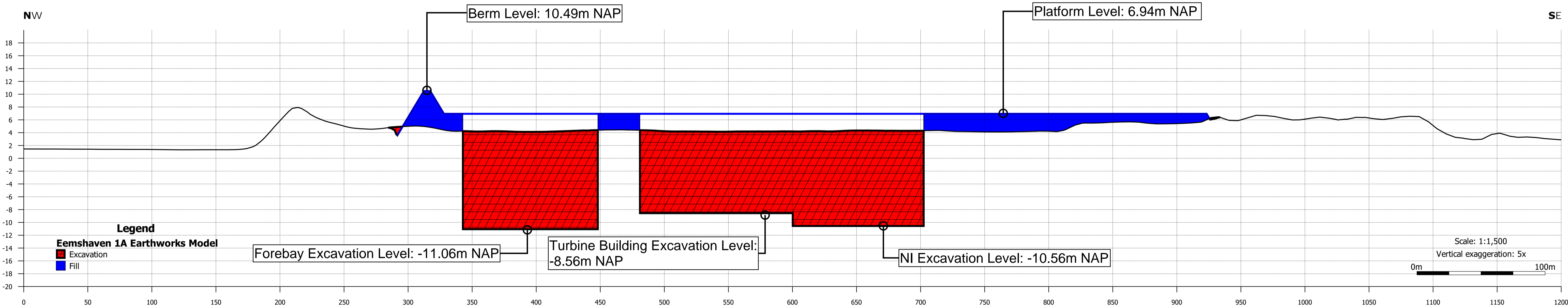
Geological Code	Formation Name	Description	Depth Top (m bg)	Depth Base (m bg)	Elevation Top (m NAP)	Elevation Base (m NAP)	Thickness (m)
NUNAWO (Landfill)	Anthropogenic Ground	Reworked sand used as engineering fill for land reclamation. Has thin clay layers too	15.7	22.0	1.3	-20.7	6.3
NUNA	Naaldwijk Formation	Highly variable, grey fine to medium sand, with grey to blue silt and clay layers, discontinuous peat layers	22.0	35.5	-20.7	-34.3	13.5
NUNAWO	Wormer Member of the Naaldwijk Formation	Fine sand, silty, clayey, intercalated silt and clay layers	35.5	37.8	-34.3	-36.5	2.3
NUNIBA	Niuekoop Formation basal peat	Basal peat found on-shore from -14 to -15m NAP	n/a	n/a	n/a	n/a	n/a
NUBX	Boxtel Formation	Light yellow to dark brown very fine to medium sand, silty, some peat and gyttja layers	37.8	44.0	-36.5	-42.7	6.2
NUUE	Eem Formation	Grey fine to medium sand, some clay and silt	n/a	n/a	n/a	n/a	n/a
NUPE	Peelo Formation	Yellowish/brownish grey very fine to very coarse sand, with subordinate gravel layers	44.0	Not proven	-42.7	Not proven	Not proven

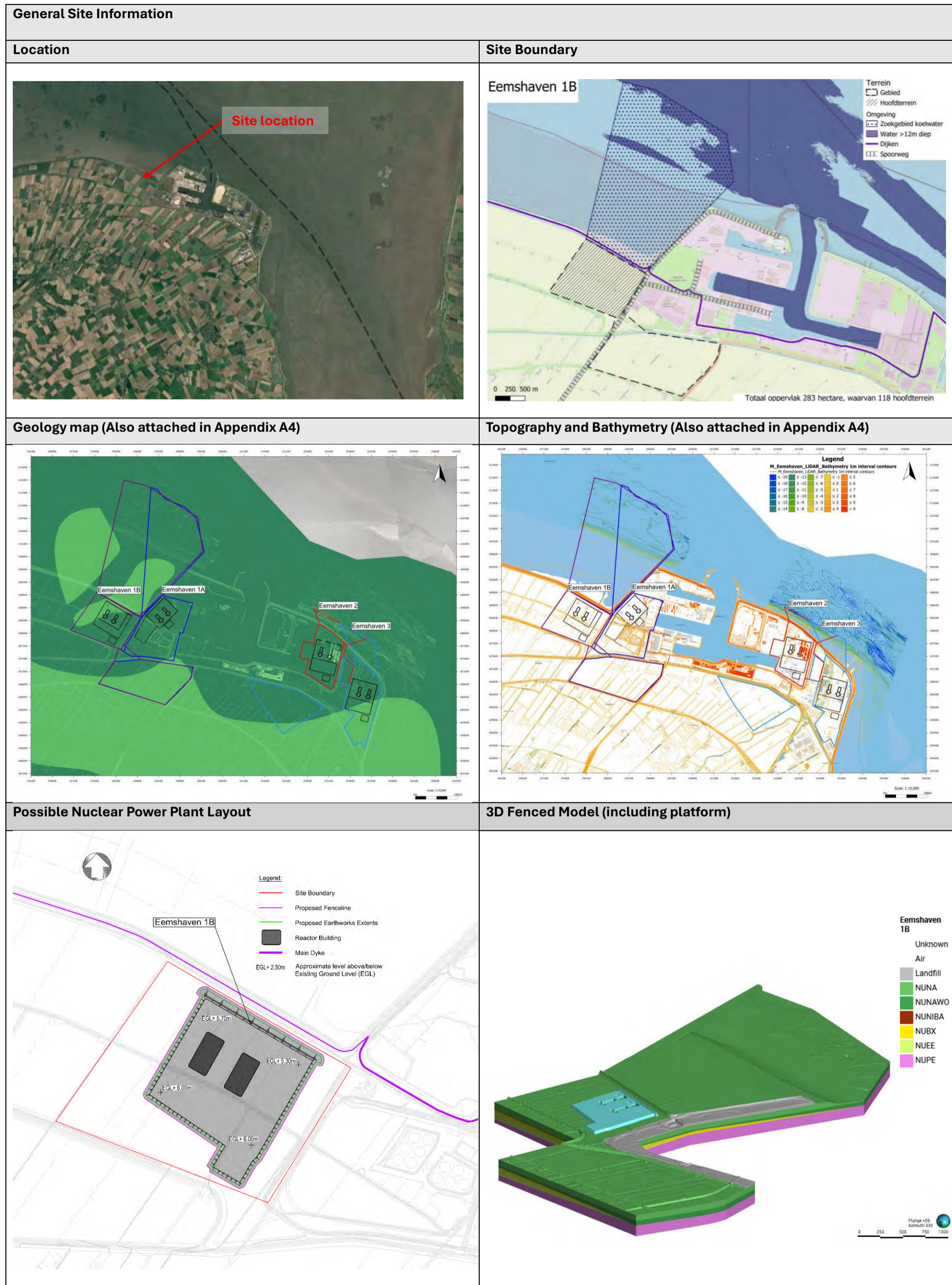
n/a Geological Unit not initially expected immediately beneath the proposed Nuclear Island location

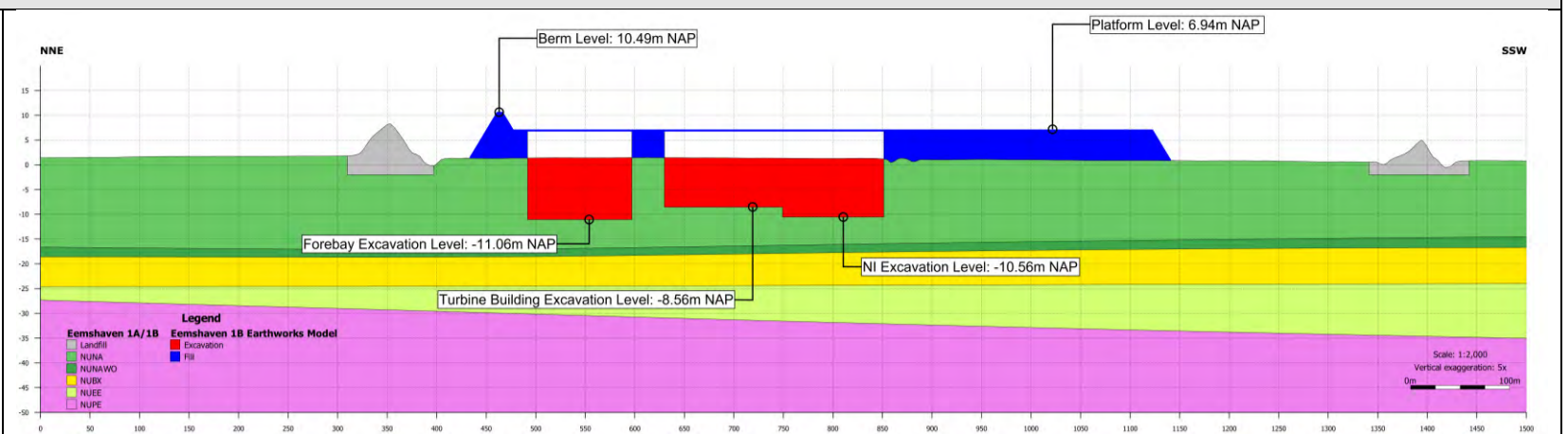
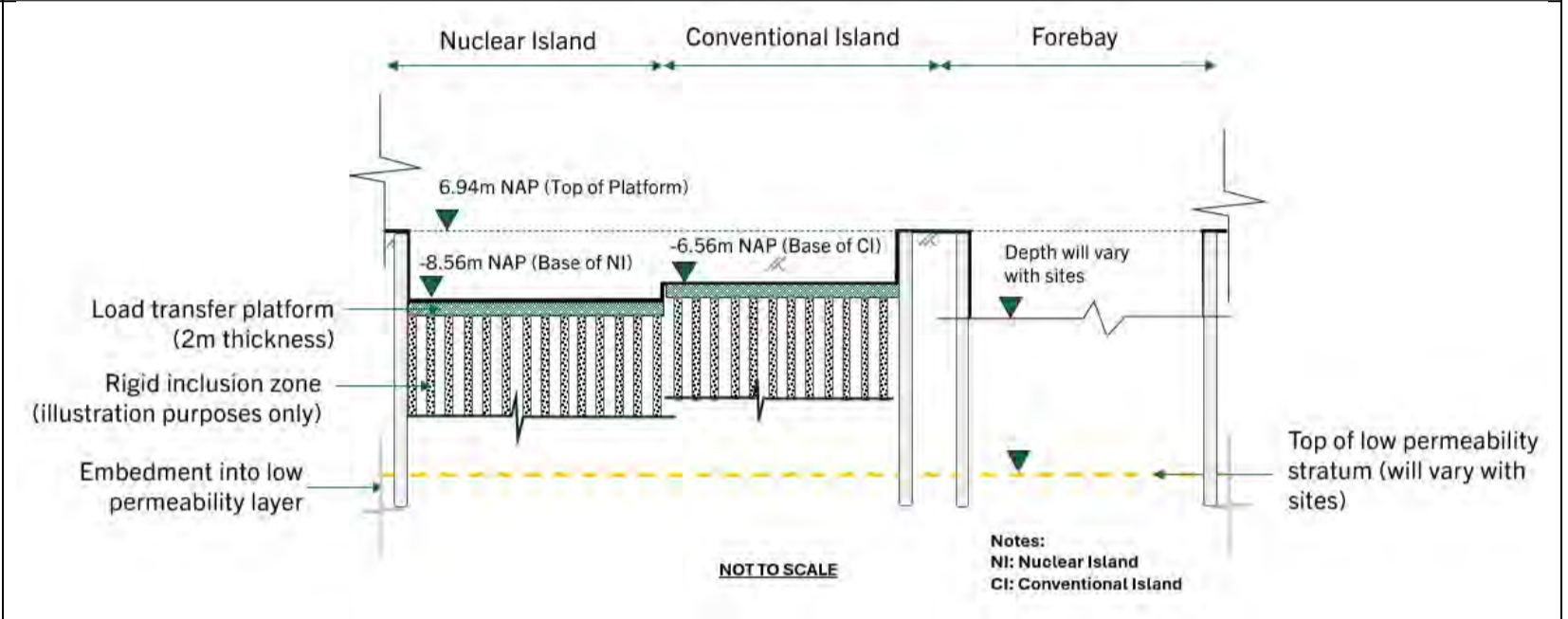
- Notes:
- To be read in conjunction with Work Package 6: Multi-site Preliminary Technical Evaluation for the Construction of Earthworks Platforms.
  - Topography generated from the Actueel Hoogtebestand Nederland (AHN) dataset. Resolution has been reduced to 5m for modelling efficiency. Bathymetry generated from Deltares based on Netherlands Hydrographic Office (NLHO). Site boundaries are based on GIS information provided by Deltares.
  - Initial geological interpretation based on TNO – GDN (2025) BRO GeoTOP v1.6.1. TNO geological model.
  - The geological detailed interpretation is based on Deltares detailed geological sections.
  - Conceptual ground model depths, elevations and thickness expected at the nuclear island location, based on the interpretation of the geological model, high variability is expected outside the area.
  - There is limited verification that can be undertaken on the historical ground investigation data and the varying levels of detail that has been used by the Geological Survey of the Netherlands and Deltares
  - The continuity and variability of ground model units between exploratory holes is unknown. Although there is a relatively high confidence in the lateral extent of the broad Geological Units defined in Deltares interpretation reports, variation within these units is expected in particular varying, interbedments of sands, gravels, clay and peat members or infilled channels of mixed lithologies



# Eemshaven 1A Earthworks Long Section (N-S)





Geology, soil conditions and Deep Foundations			
<p><b>Geological cross Sections</b></p>	 <p>The geological section has been produced based on Geological Sections provided in the Deltares Site Evaluation Reports. For more details on the assumptions refer to section 4.3 of the Report: Multi-site Preliminary Technical Evaluation of Site Suitability for Geology, soil conditions and deep foundations (PR00/003/FR-001). Section is also presented in Appendix A4.</p>		
<p><b>Simplified section through nuclear island and showing foundation levels</b></p>	 <p><b>NOT TO SCALE</b></p> <p>Notes:  NI: Nuclear Island  CI: Conventional Island</p>		
Criteria	Score (RAG)	Weighting	Weighted score
<b>NI Foundation Suitability</b>			
Rigid Inclusions	6	2	12
Open battered excavation	3	1	3
<b>Ground risks</b>			
Liquefaction	7	3	21
Ground variability	6	2	12
<b>Total weighted score = 48</b>			
<b>Confidence Level of Ground model (RAG)</b>			
Limited but adequate: At least two deep BHs/CPTs 30m apart and up to 25m depth within the footprint of the site boundary			
<b>Financial impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for execution of the foundations is estimated to be Class 1 (Low) based on the ranges identified by KGG (See section 5.4 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/003/FR-001)</li> </ul>			
<b>Time impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for execution of the foundations is estimated to be Class 2 (Medium) based on the ranges identified by KGG (See section 5.3 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Technical Feasibility Report (Ref: PR00/003/FR-001)</li> </ul>			
<b>Key risks</b>			
<ul style="list-style-type: none"> <li>Open battered excavation presents challenges due to granular slope conditions and hydraulic connectivity with the sea.</li> </ul>			

Design Basis Flood Level and Platform								
<b>Schematic Typical Section</b>								
<b>Static earthworks quantities</b>		<b>Topsoil stripping (BCM) – m<sup>3</sup></b>	<b>Bulk earthworks Excavation (BCM) - m<sup>3</sup></b>	<b>Import (BCM) - m<sup>3</sup></b>	<b>Available Fill (CCM) - m<sup>3</sup></b>	<b>Required filling (CCM) - m<sup>3</sup></b>	<b>Balance - m<sup>3</sup></b>	<b>Required landscaping (CCM) - m<sup>3</sup></b>
		147,000	839,000	3,374,000	4,002,000	4,002,000	-	797,000
		Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters						
<b>Criteria</b>	<b>RAG</b>			<b>Weighting</b>		<b>Overall Risk rating</b>		
<b>Groundwater</b>								
Groundwater control requirements	3			3		9		
<b>Earthworks logistics</b>								
Logistics (Accessibility and plant movement)	6			1		6		
Area for stockpiling	9			1		9		
Temporary works area	9			2		18		
<b>Earthworks design</b>								
Earthworks re-use potential	7			2		14		
Contaminated soils risk	7			2		14		
<b>Onsite constraints</b>								
Existing utilities	8			1		8		
Existing structures	6			1		6		
<b>Total Weighted score = 84</b>								
<b>Financial impact classification</b>								
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 (Medium) based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>								
<b>Time impact classification</b>								
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 4 (Very High) based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>								
<b>Key risks</b>								
<ul style="list-style-type: none"> <li>Logistics – likely requires new access roads for construction traffic to access site.</li> </ul>								

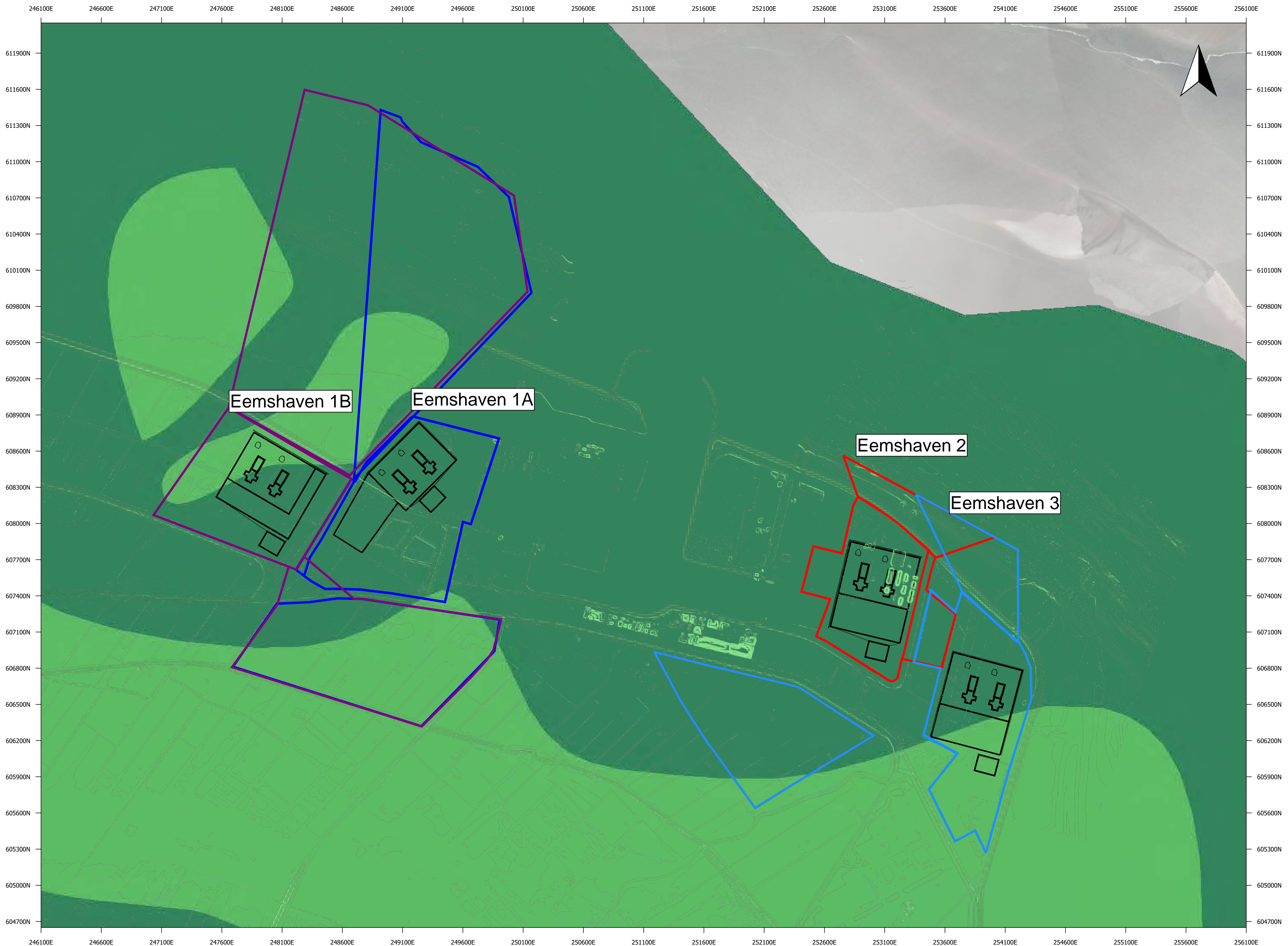
**Title: Eemshaven 1B Technical Factsheet**

<b>Overall Scoring summary (WP03 &amp; WP06)</b>	
<b>Total score</b>	<b>132</b>
<b>Total number of Red (High risk) criteria</b>	<b>2</b>
<b>Total number of Amber (Medium risk) criteria</b>	<b>4</b>
<b>Total number of Green (Low risk) criteria</b>	<b>6</b>

# APPENDIX A4

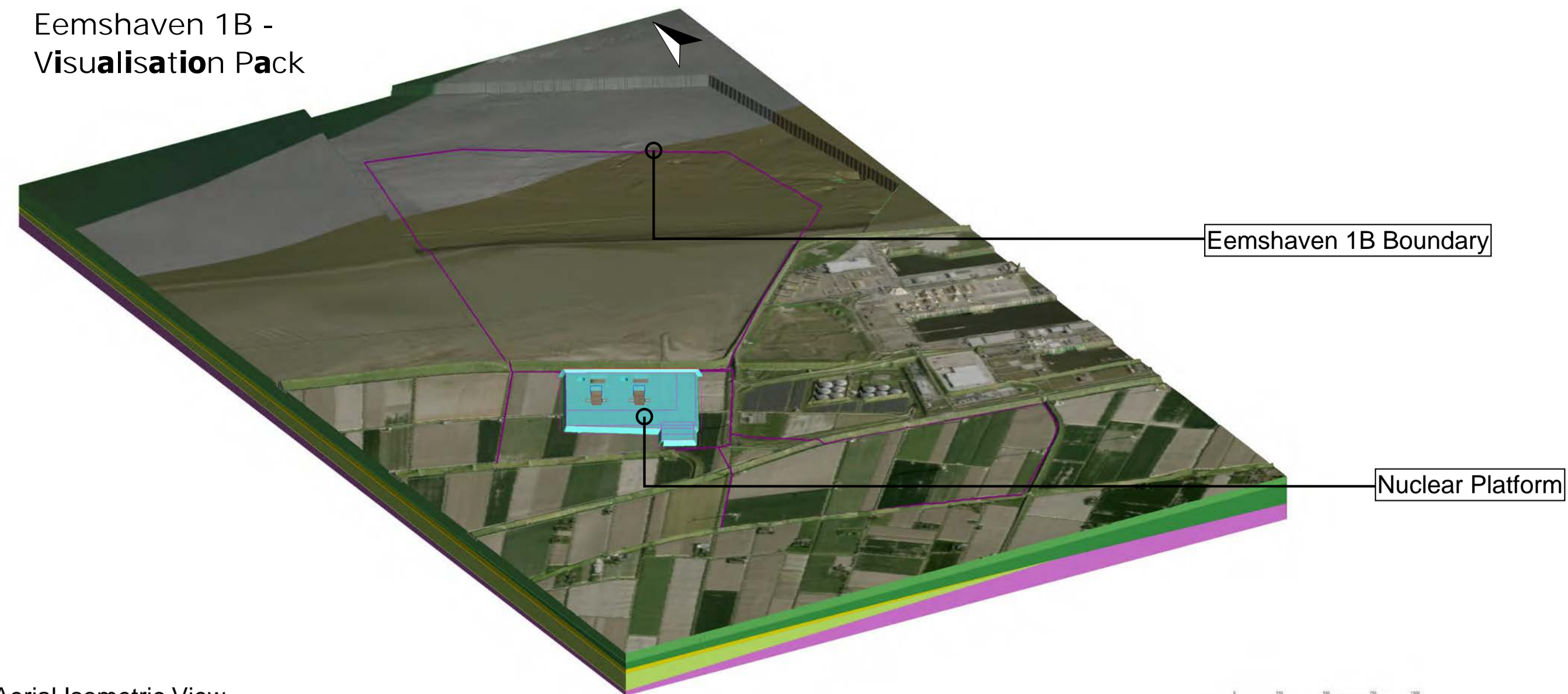
Units geological map	
<b>Holocene units</b>	
d Coastal dune sand	ds dg
s Beach and foreshore deposits	s
g Tidal channel deposits	g
o Tidal deposits	o ovg* ovo* oo*
<p><i>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</i></p>	
<b>Pleistocene and older units (onshore and at base of tidal channels)</b>	
BX1-4 Various glacial (aeolian) sand units (Boxtel Fm)	BX1 BX2 BX3 BX4
SY Middle Pleistocene sandy fluvial sediments (Stramproy Fm)	SY
WA Early and Middle Pleistocene fluvial sediments (Waalre Fm)	WA
MO Plio-Pleistocene coastal and shallow-marine sands (Maassluis and Oosterhout formations)	MO
BR Miocene fine shallow-marine glauconite sands (Breda Fm)	BR
RTD Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD
<b>Pleistocene and older units (offshore underneath Holocene marine deposits)</b>	
KR2 Coarse-grained Late Pleistocene fluvial deposits	KR2
EE2 Open marine sandy and shell-rich Last Interglacial sediments.	EE2
RTD Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD

# Eemshaven Plan View

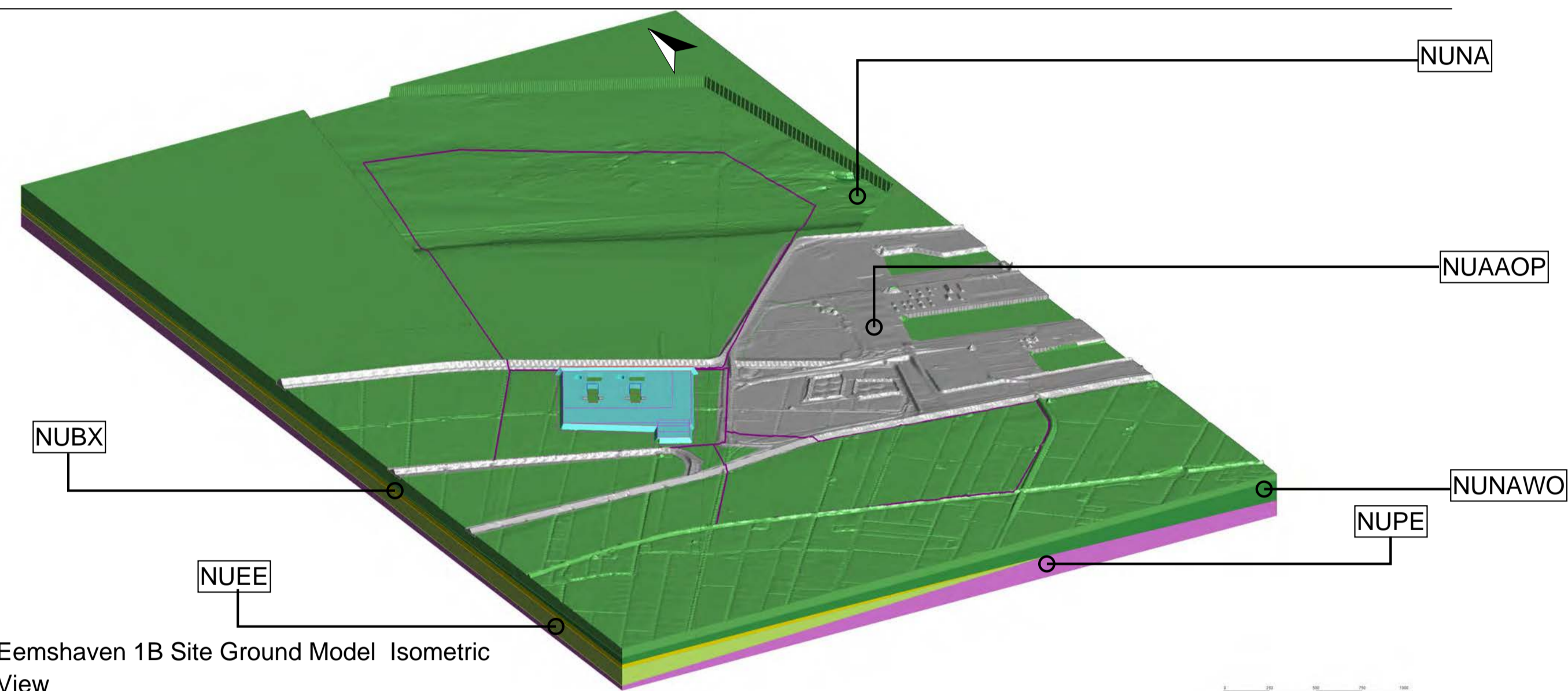


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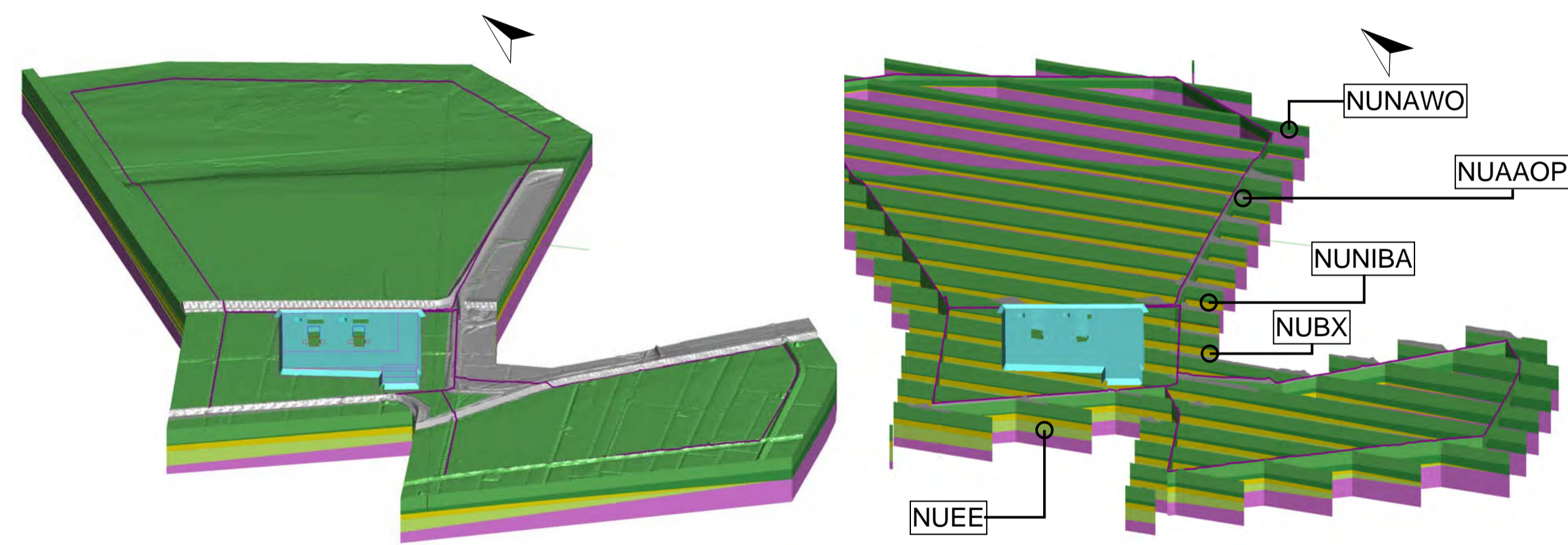
Eemshaven 1B - Visualisation Pack



Aerial Isometric View

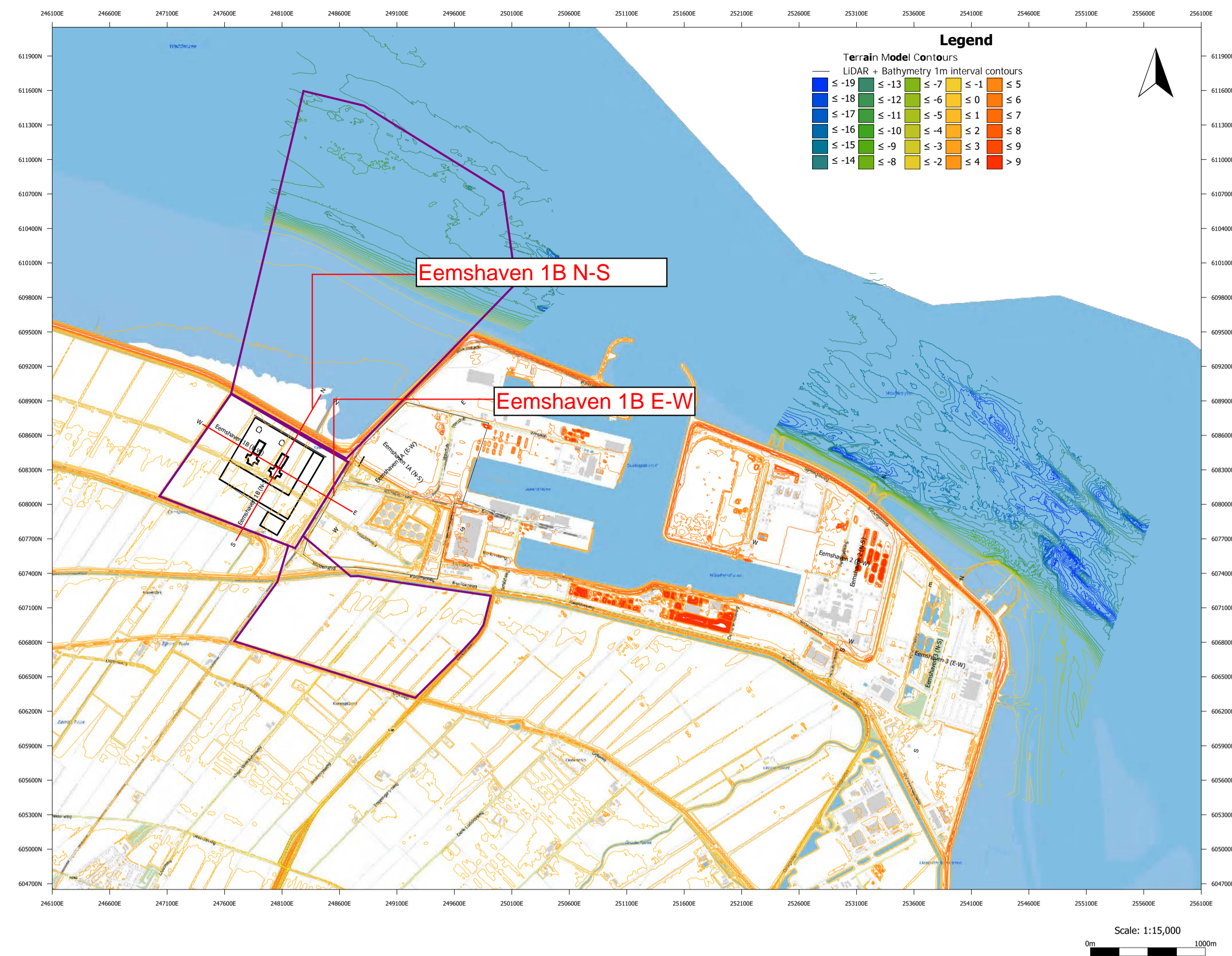
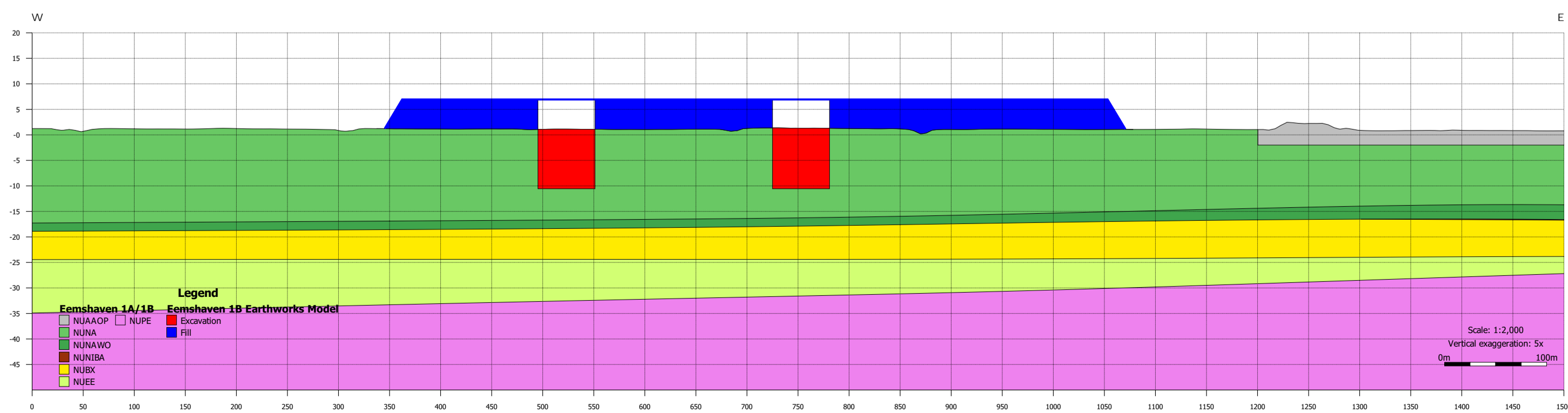


Eemshaven 1B Site Ground Model Isometric View



Eemshaven 1B Site Boundary Ground Model Isometric View

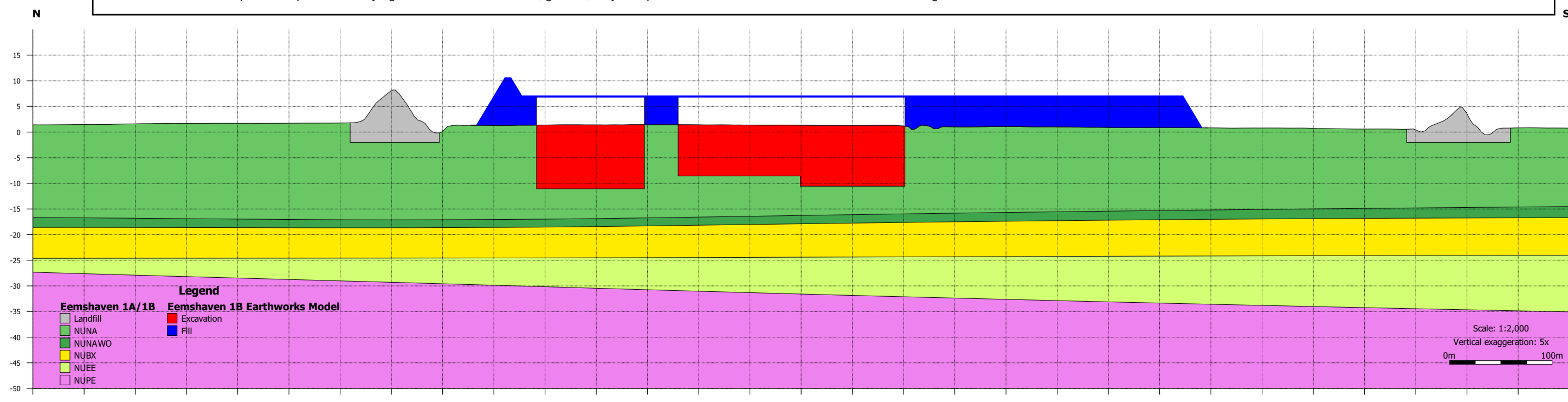
Eemshaven 1B Site Boundary Fence Ground Model Isometric View



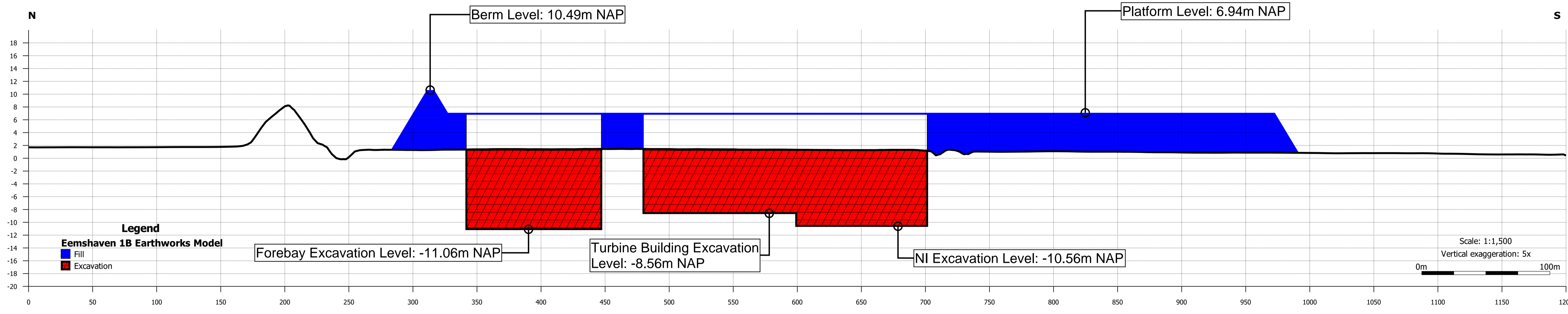
Geological Code	Formation Name	Description	Depth Top (m bg)	Depth Base (m bg)	Elevation Top (m NAP)	Elevation Base (m NAP)	Thickness (m)
NUA A (Landfill)	Anthropogenic Ground	Reworked anthropogenic material	n/a	n/a	n/a	n/a	n/a
NUNA	Naaldwijk Formation	Highly variable, grey fine to medium sand, with grey to blue silt and clay layers, discontinuous peat layers	0.0	17.3	1.3	-16.1	17.3
NUNAWO	Wormer Member of the Naaldwijk Formation	Fine sand, silty, clayey, intercalated silt and clay layers	17.3	19.0	-16.1	-17.7	1.7
NUNIBA	Niuewkoop Formation basal peat	Basal peat found on-shore from -14 to -15m NAP	n/a	n/a	n/a	n/a	n/a
NUBX	Boxtel Formation	Light yellow to dark brown very fine to medium sand, silty, some peat and gyttja layers	19.0	25.6	-17.7	-24.4	6.6
NUUE	Eem Formation	Grey fine to medium sand, some clay and silt	25.6	33.1	-24.4	-31.9	7.5
NUPE	Peelo Formation	Yellowish/brownish grey very fine to very coarse sand, with subordinate gravel layers	33.1	Not proven	-31.9	Not proven	Not proven

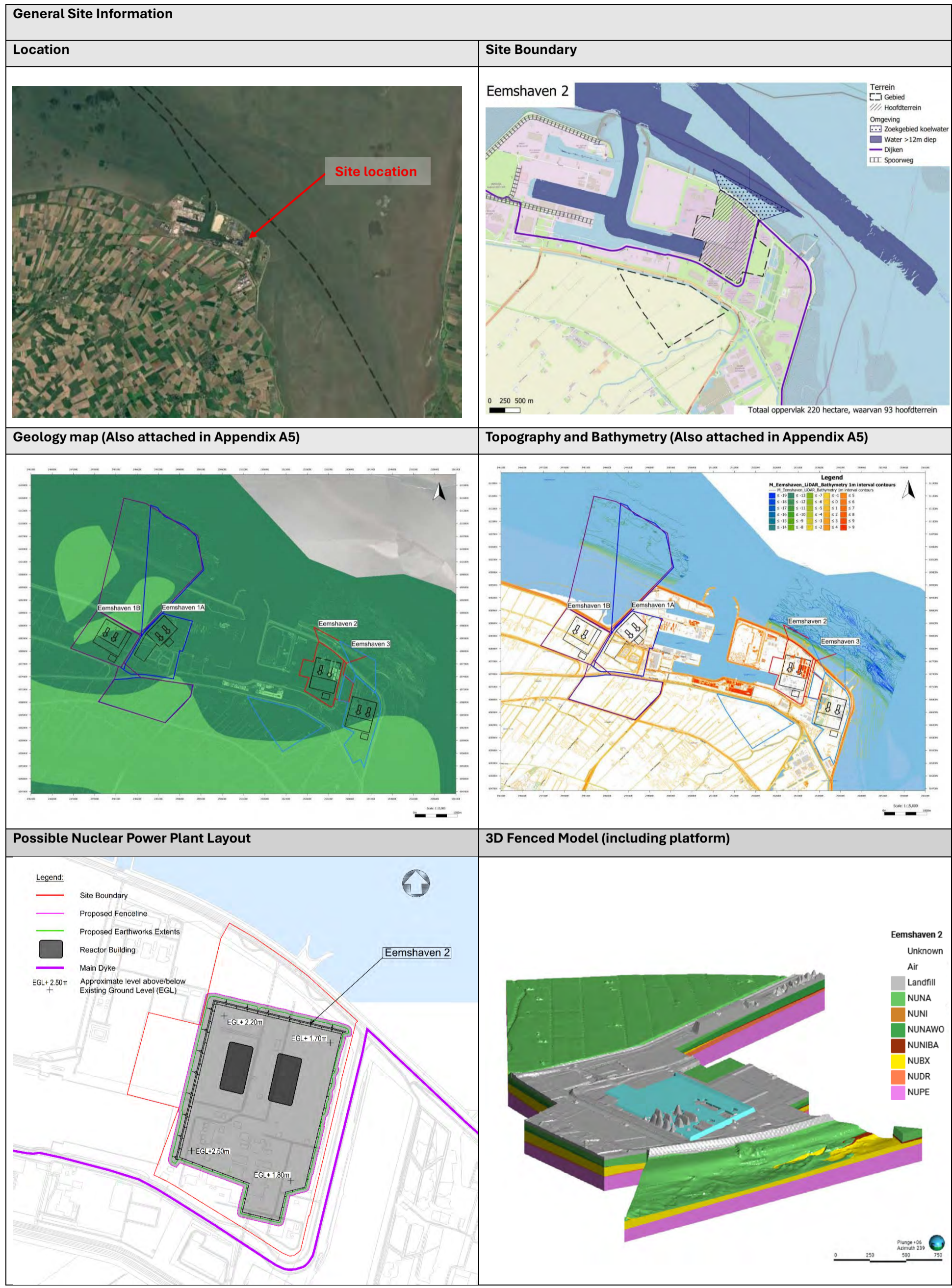
n/a Geological Unit not initially expected immediately beneath the proposed Nuclear Island location

- Notes:
- To be read in conjunction with Work Package 6: Multi-site Preliminary Technical Evaluation for the Construction of Earthworks Platforms.
  - Topography generated from the Actueel Hoogtebestand Nederland (AHN) dataset. Resolution has been reduced to 5m for modelling efficiency. Bathymetry generated from Deltares based on Netherlands Hydrographic Office (NLHO). Site boundaries are based on GIS information provided by Deltares.
  - Initial geological interpretation based on TNO - GDN (2025) BRO GeoTOP v1.6.1. TNO geological model.
  - The geological detailed interpretation is based on Deltares detailed geological sections.
  - Conceptual ground model depths, elevations and thickness expected at the nuclear island location, based on the interpretation of the geological model, high variability is expected outside the area.
  - There is limited verification that can be undertaken on the historical ground investigation data and the varying levels of detail that has been used by the Geological Survey of the Netherlands and Deltares.
  - The continuity and variability of ground model units between exploratory holes is unknown. Although there is a relatively high confidence in the lateral extent of the broad Geological Units defined in Deltares interpretation reports, variation within these units is expected in particular varying, interbedments of sands, gravels, clay and peat members or infilled channels of mixed lithologies.



# Eemshaven 1B Earthworks Long Section (N-S)





Geology, soil conditions and Deep Foundations			
<p><b>Geological cross Sections</b></p>	<p>The geological section has been produced based on Geological Sections provided in the Deltares Site Evaluation Reports. For more details on the assumptions refer to section 4.3 of the Report: Multi-site Preliminary Technical Evaluation of Site Suitability for Geology, soil conditions and deep foundations (PR00/003/FR-001). Section is also presented in Appendix A5.</p>		
<p><b>Simplified section through nuclear island and showing foundation levels</b></p>	<p>NOT TO SCALE</p> <p>Notes: NI: Nuclear Island CI: Conventional Island</p>		
Criteria	Score (RAG)	Weighting	Weighted score
<b>NI Foundation Suitability</b>			
Rigid Inclusions	3	2	6
Open battered excavation	1	1	1
<b>Ground risks</b>			
Liquefaction	7	3	21
Ground variability	1	2	2
<b>Total weighted score = 30</b>			
<b>Confidence Level of Ground model (RAG)</b>			
Limited but adequate: At least two deep BHs/CPTs 30m apart and upto 25m depth within the footprint of the site boundary			
<b>Financial impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for execution of the foundations is estimated to be Class 1 Low based on the ranges identified by KGG (See section 5.4 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/003/FR-001)</li> </ul>			
<b>Time impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for execution of the foundations is estimated to be Class 2 Medium based on the ranges identified by KGG (See section 5.3 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Technical Feasibility Report (Ref: PR00/003/FR-001)</li> </ul>			
<b>Key risks</b>			
<ul style="list-style-type: none"> <li>High lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements.</li> <li>Weak layer identified below the foundation level (i.e., Peat).</li> <li>Open battered excavation presents challenges.</li> </ul>			

**Title: Eemshaven 2 Technical Factsheet**

Design Basis Flood Level and Platform							
<b>Schematic Typical Section</b>							
<b>Static earthworks quantities</b>	<b>Topsoil stripping (BCM) – m<sup>3</sup></b>	<b>Bulk earthworks Excavation (BCM) - m<sup>3</sup></b>	<b>Import (BCM) - m<sup>3</sup></b>	<b>Available Fill (CCM) - m<sup>3</sup></b>	<b>Required filling (CCM) - m<sup>3</sup></b>	<b>Balance - m<sup>3</sup></b>	<b>Required landscaping (CCM) - m<sup>3</sup></b>
	-	979,000	1,257,000	2,145,000	2,145,000	-	951,000
	Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters						
<b>Criteria</b>	<b>RAG</b>		<b>Weighting</b>		<b>Overall Risk rating</b>		
<b>Groundwater</b>							
Groundwater control requirements	3		3		9		
<b>Earthworks logistics</b>							
Logistics (Accessibility and plant movement)	4		1		4		
Area for stockpiling	4		1		4		
Temporary works area	2		2		4		
<b>Earthworks design</b>							
Earthworks re-use potential	5		2		10		
Contaminated soils risk	6		2		12		
<b>Onsite constraints</b>							
Existing utilities	1		1		1		
Existing structures	1		1		1		
<b>Total Weighted score = 45</b>							
<b>Financial impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 Medium based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001)</li> </ul>							
<b>Time impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 3 High based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Key risks</b>							
<ul style="list-style-type: none"> <li>Temp. works area – very limited space.</li> <li>Existing utilities &amp; structures – existing Power Plants</li> </ul>							

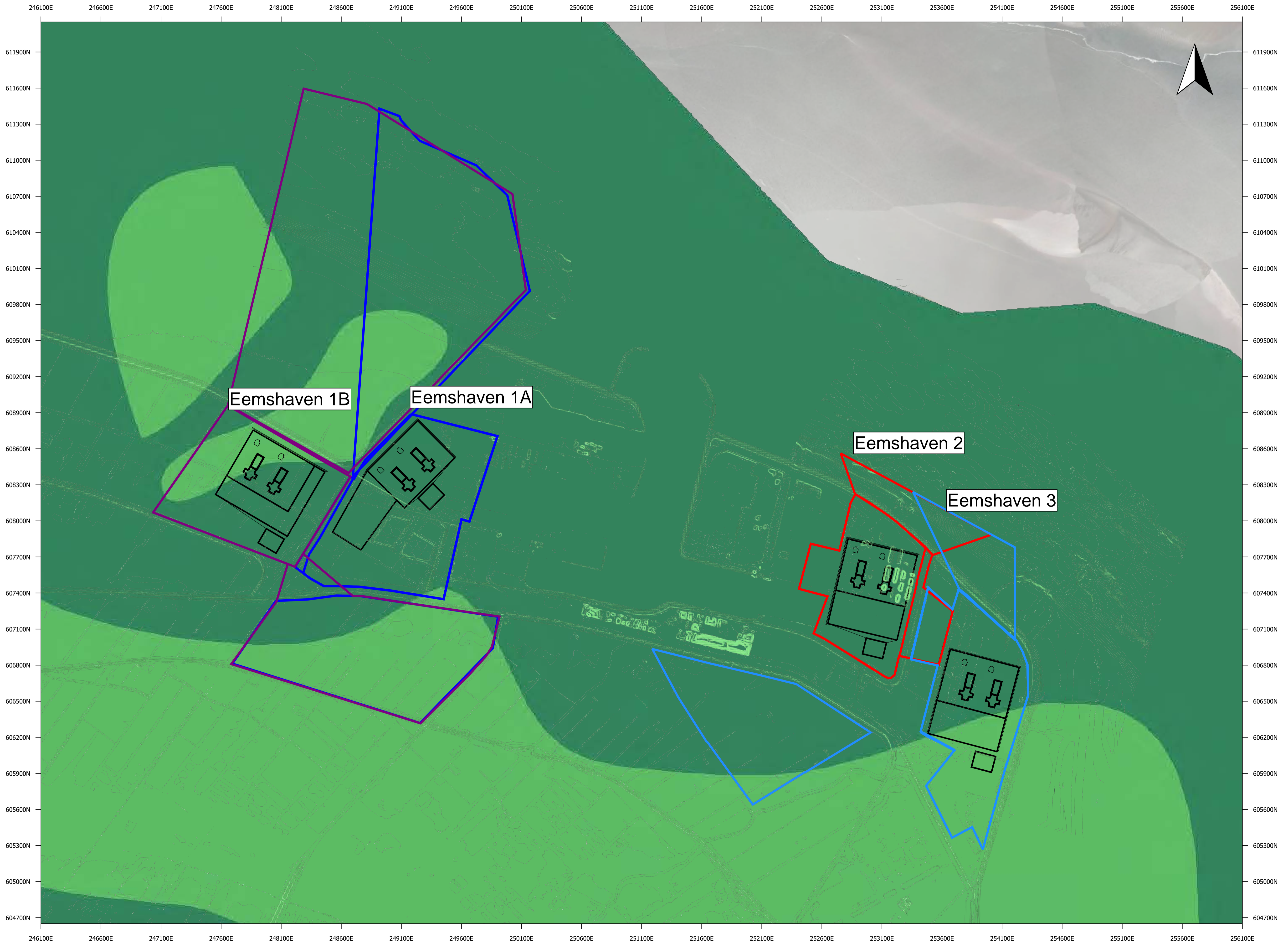
**Title: Eemshaven 2 Technical Factsheet**

<b>Overall Scoring summary (PR00/003/FR-001 &amp; PR00/006/FR-001)</b>	
<b>Total score</b>	<b>75</b>
<b>Total number of Red (High risk) criteria</b>	<b>7</b>
<b>Total number of Amber (Medium risk) criteria</b>	<b>4</b>
<b>Total number of Green (Low risk) criteria</b>	<b>1</b>

# APPENDIX A5

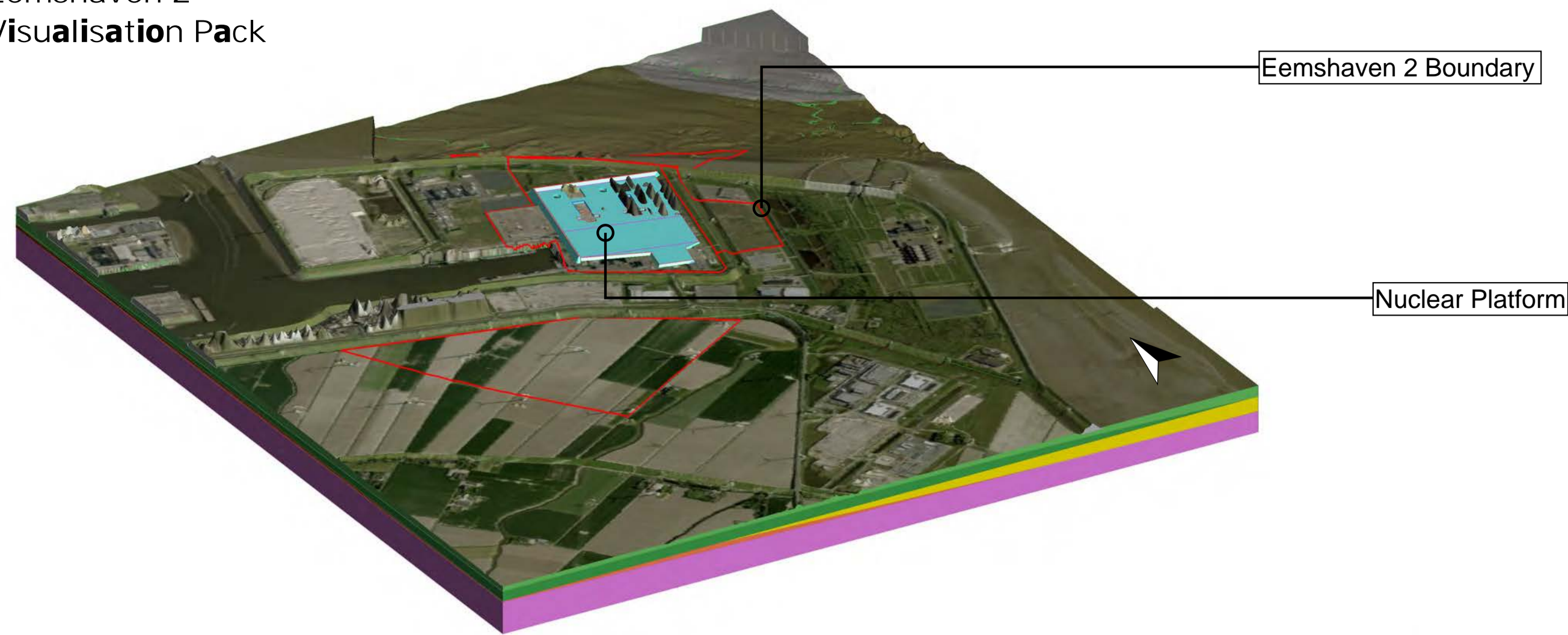
Units geological map	
<b>Holocene units</b>	
d Coastal dune sand	ds dg
s Beach and foreshore deposits	s
g Tidal channel deposits	g
o Tidal deposits	o ovg* ovo* oo*
<p><i>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</i></p>	
<b>Pleistocene and older units (onshore and at base of tidal channels)</b>	
BX1-4 Various glacial (aeolian) sand units (Boxtel Fm)	BX1 BX2 BX3 BX4
SY Middle Pleistocene sandy fluvial sediments (Stramproy Fm)	SY
WA Early and Middle Pleistocene fluvial sediments (Waalre Fm)	WA
MO Plio-Pleistocene coastal and shallow-marine sands (Maassluis and Oosterhout formations)	MO
BR Miocene fine shallow-marine glauconite sands (Breda Fm)	BR
RTD Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD
<b>Pleistocene and older units (offshore underneath Holocene marine deposits)</b>	
KR2 Coarse-grained Late Pleistocene fluvial deposits	KR2
EE2 Open marine sandy and shell-rich Last Interglacial sediments.	EE2
RTD Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD

# Eemshaven Plan View

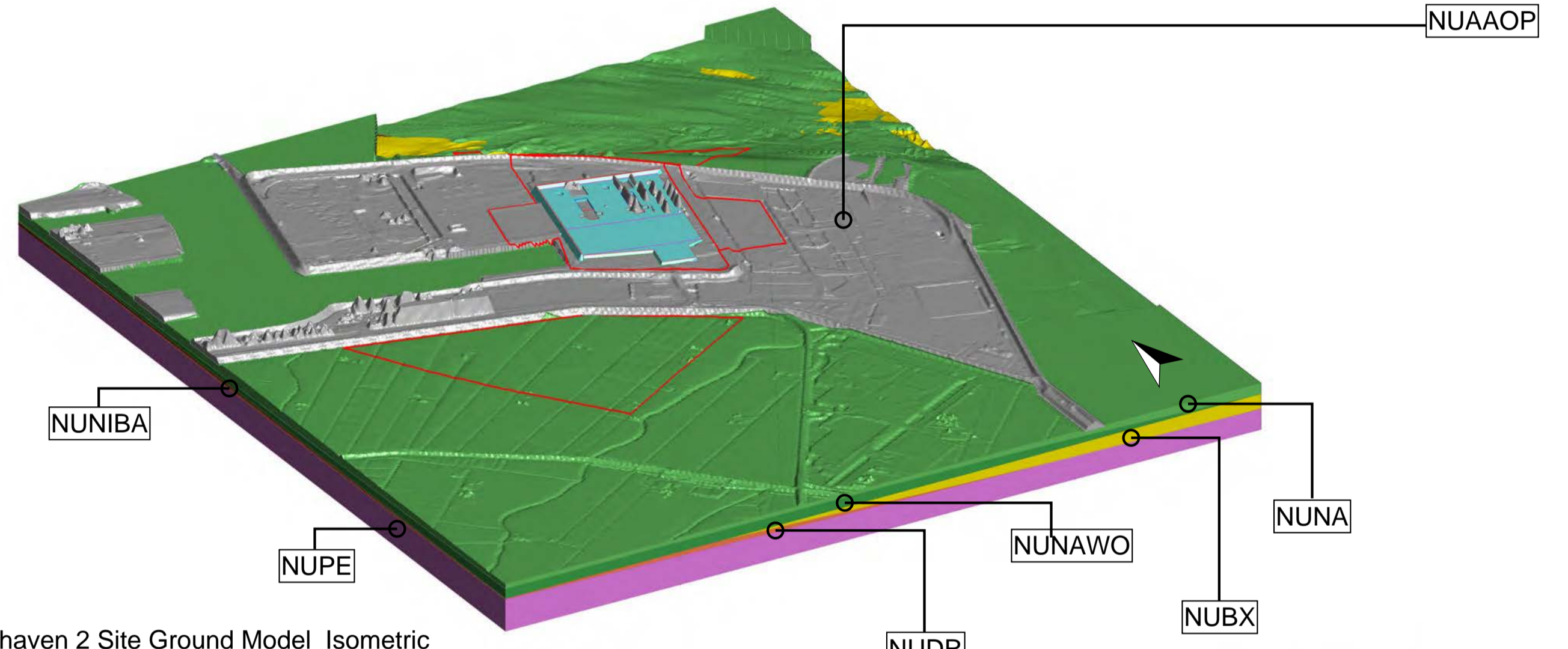
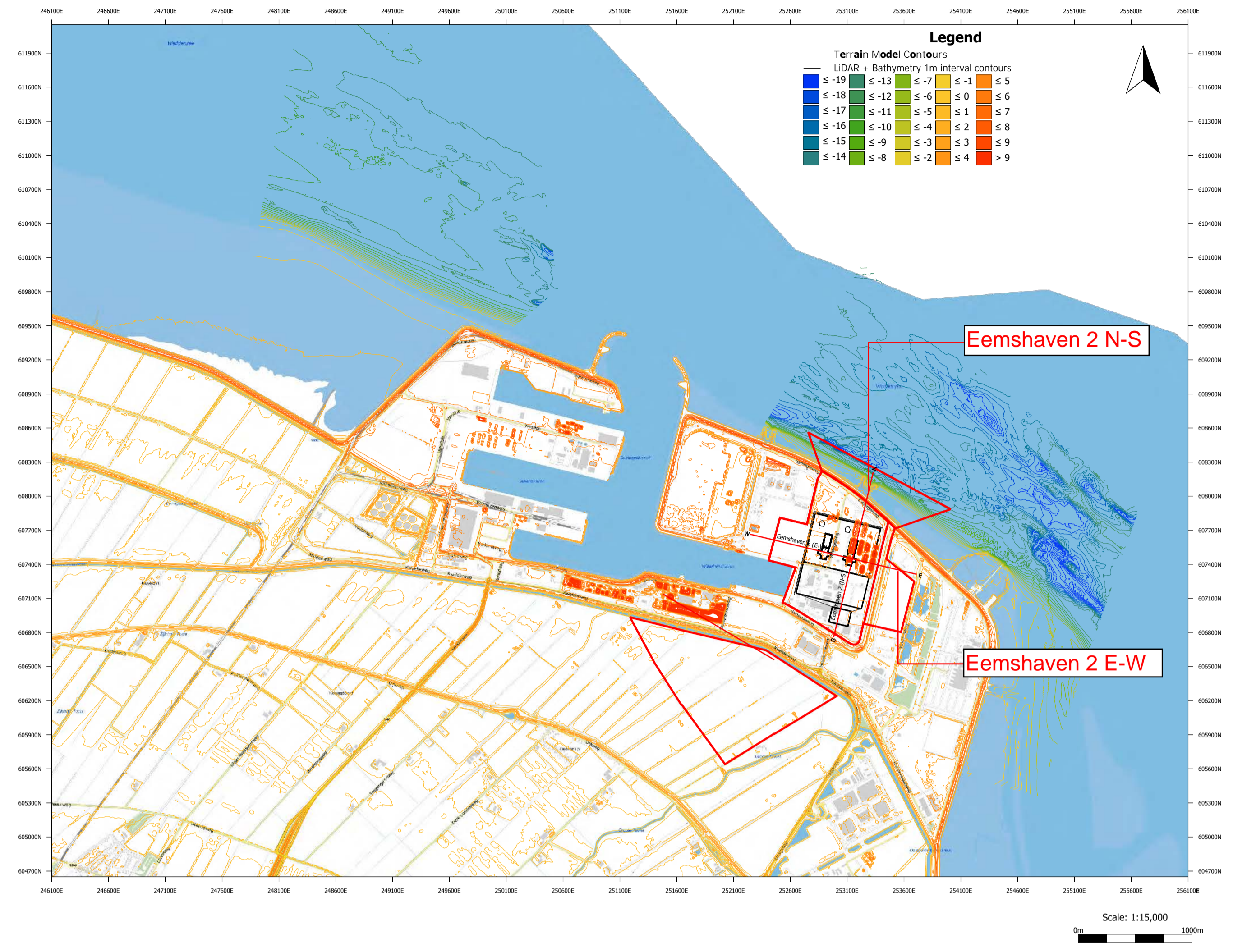


Scale: 1:15,000  
0m 1000m

# Eemshaven 2 - Visualisation Pack



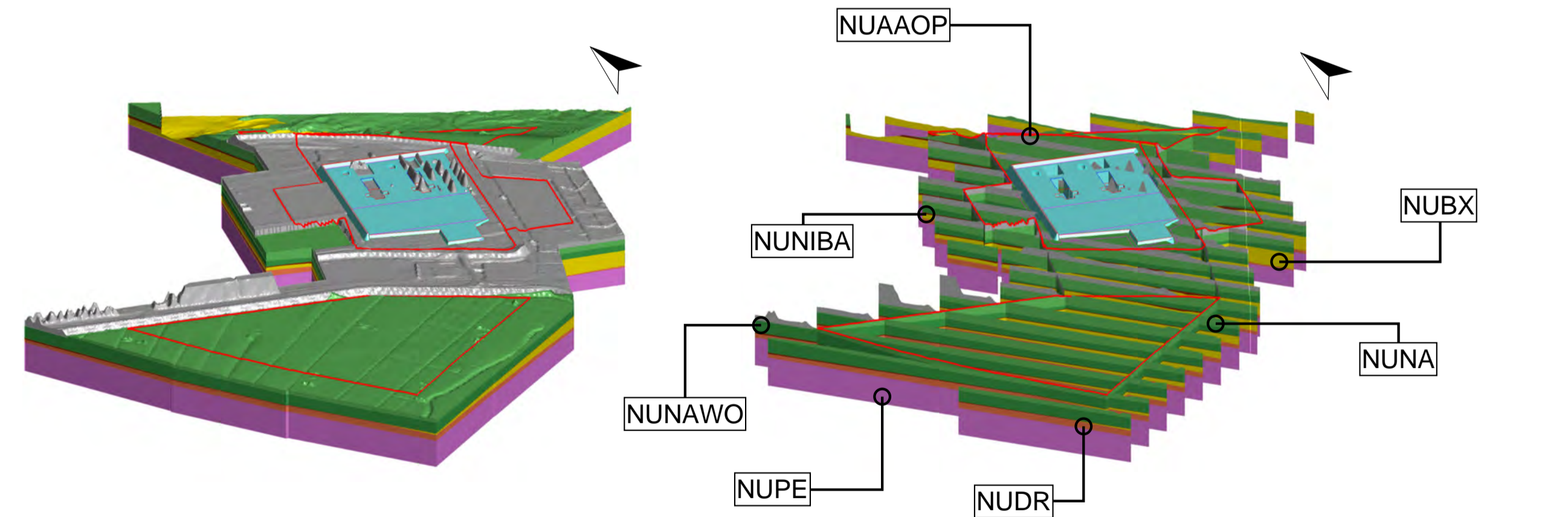
Aerial Isometric View



Eemshaven 2 Site Ground Model Isometric View

Geological Code	Formation Name	Description	Depth Top (m bg)	Depth Base (m bg)	Elevation Top (m NAP)	Elevation Base (m NAP)	Thickness (m)
NUAA (Landfill)	Anthropogenic Ground	Reworked anthropogenic material	0.0	6.4	4.5	-2.0	6.4
NUNA	Naaldwijk Formation	Highly variable, grey fine to medium sand, with grey to blue silt and clay layers, discontinuous peat layers	6.4	23.9	-2.0	-19.4	17.4
NUNAWO	Wormer Member of the Naaldwijk Formation	Fine sand, silty, clayey, intercalated silt and clay layers	n/a	n/a	n/a	n/a	n/a
NUNI	Niuekoop Formation	Brown to black peat and other organics	23.9	24.8	-19.4	-20.4	1.0
NUNIBA	Niuekoop Formation basal peat	Basal peat found on-shore from -14 to -15m NAP	n/a	n/a	n/a	n/a	n/a
NUBX	Boxtel Formation	Light yellow to dark brown very fine to medium sand, silty, some peat and gyttja layers	24.8	28.1	-20.4	-23.7	3.3
NUDR	Drente Formation	Clay and fine-grained to coarse sand, locally gravel or peat and brown-coal seams. There is a general trend from coarse- to fine-grained sediments towards the north and west.	28.1	31.6	-23.7	-27.1	3.4
NUPE	Peelo Formation	Yellowish/brownish grey very fine to very coarse sand, with subordinate gravel layers	31.6	Not proven	-27.1	Not proven	Not proven

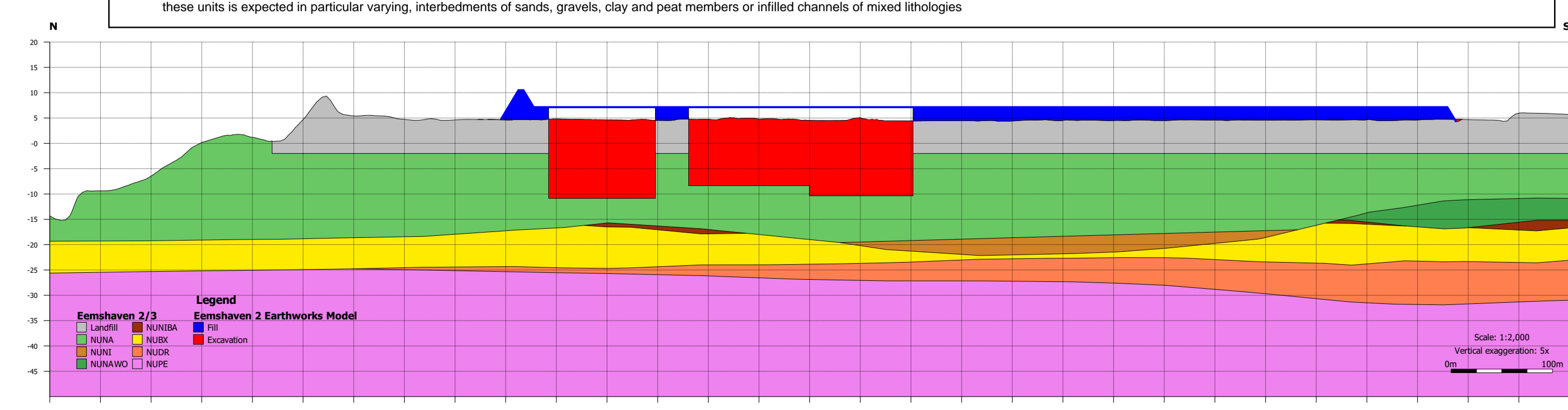
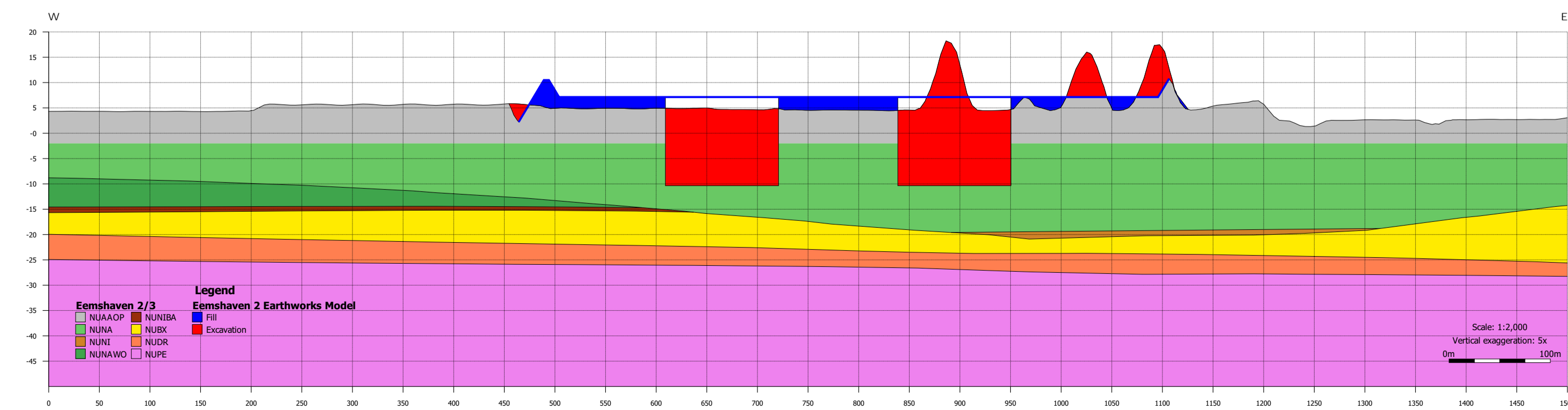
n/a Geological Unit not initially expected immediately beneath the proposed Nuclear Island location



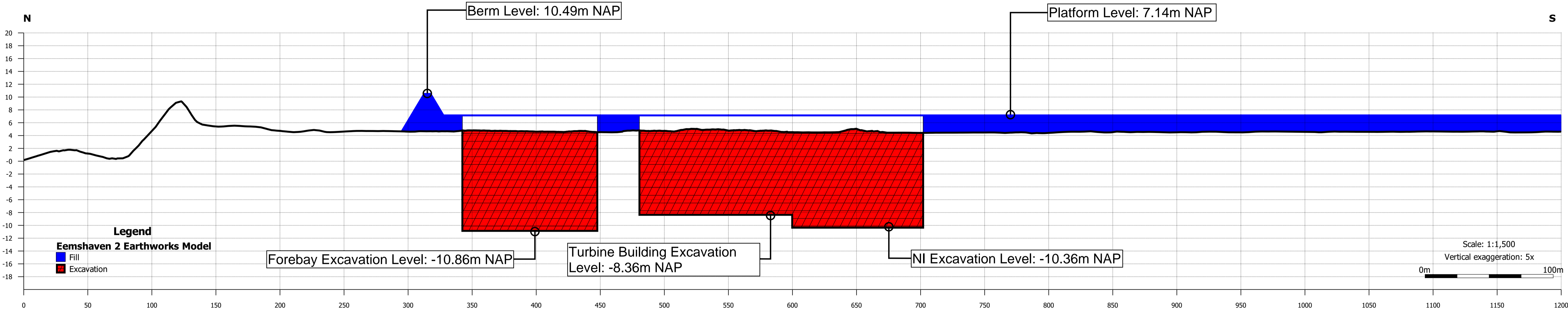
Eemshaven 2 Site Boundary Ground Model Isometric View

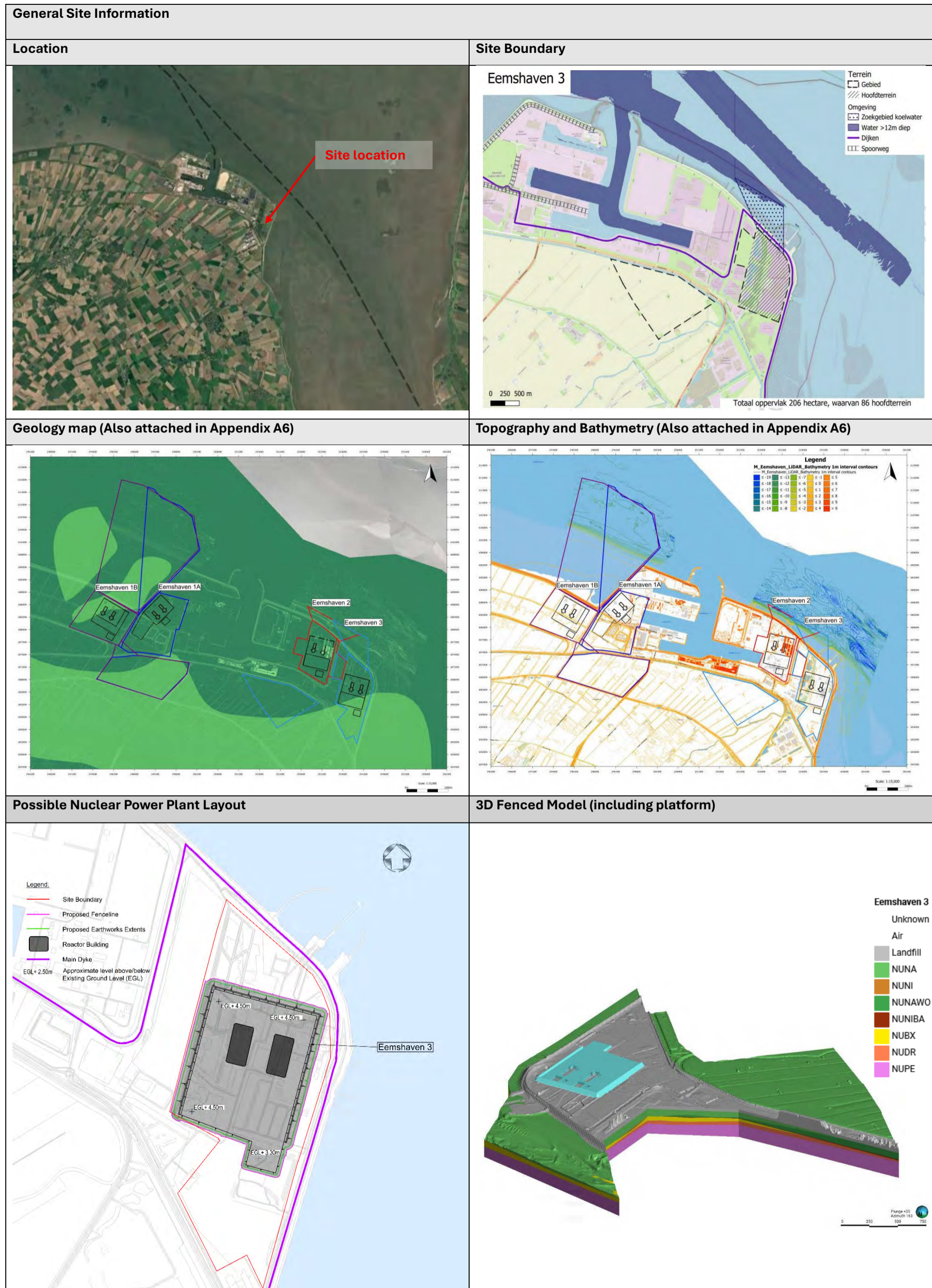
Eemshaven 2 Site Boundary Fence Ground Model Isometric View

- Notes:
- To be read in conjunction with Work Package 6: Multi-site Preliminary Technical Evaluation for the Construction of Earthworks Platforms.
  - Topography generated from the Actueel Hoogtebestand Nederland (AHN) dataset. Resolution has been reduced to 5m for modelling efficiency. Bathymetry generated from Deltares based on Netherlands Hydrographic Office (NLHO). Site boundaries are based on GIS information provided by Deltares.
  - Initial geological interpretation based on TNO – GDN (2025) BRO GeoTOP v1.6.1. TNO geological model.
  - The geological detailed interpretation is based on Deltares detailed geological sections.
  - Conceptual ground model depths, elevations and thickness expected at the nuclear island location, based on the interpretation of the geological model, high variability is expected outside the area.
  - There is limited verification that can be undertaken on the historical ground investigation data and the varying levels of detail that has been used by the Geological Survey of the Netherlands and Deltares
  - The continuity and variability of ground model units between exploratory holes is unknown. Although there is a relatively high confidence in the lateral extent of the broad Geological Units defined in Deltares interpretation reports, variation within these units is expected in particular varying, interbedments of sands, gravels, clay and peat members or infilled channels of mixed lithologies

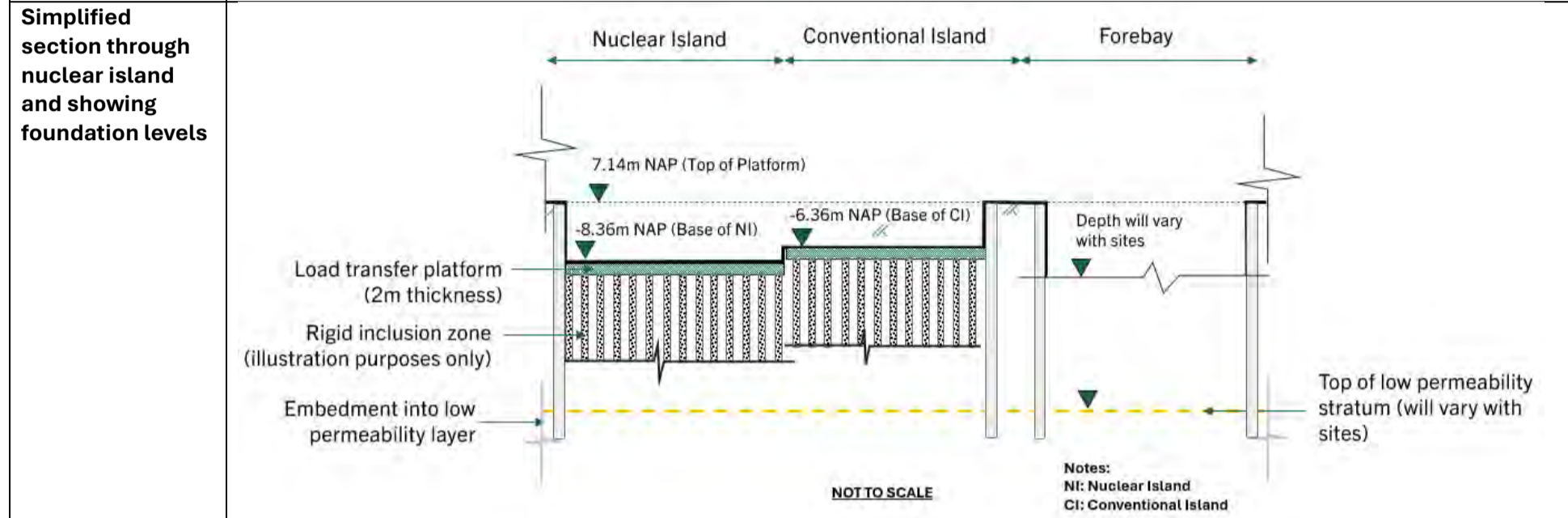
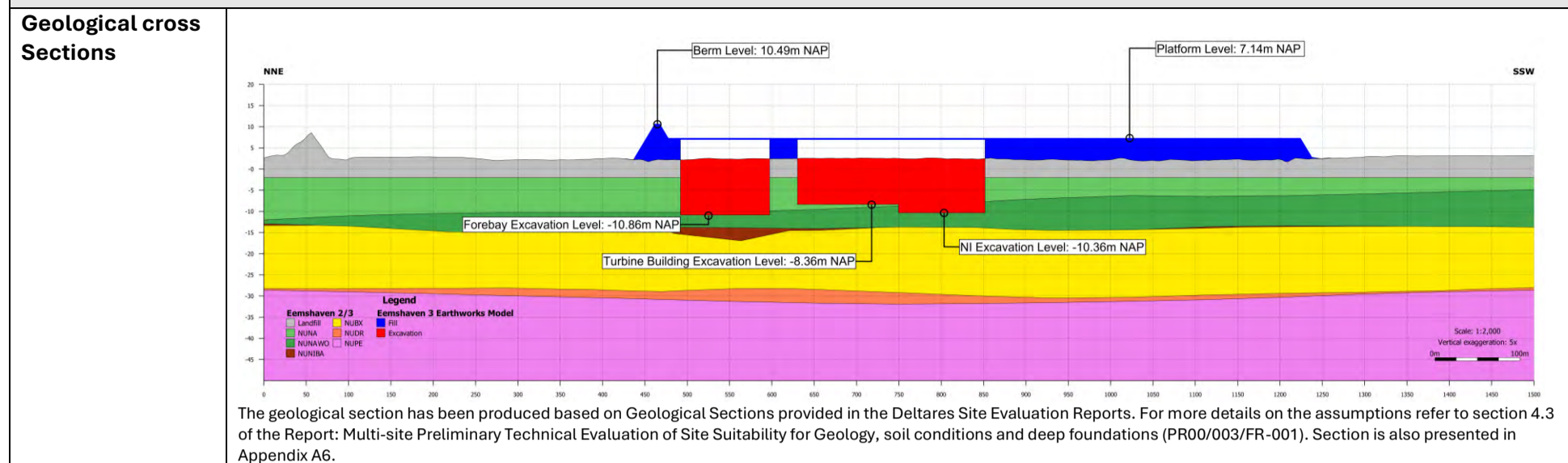


# Eemshaven 2 Earthworks Long Section (N-S)





Geology, soil conditions and Deep Foundations



Criteria	Score (RAG)	Weighting	Weighted score
<b>NI Foundation Suitability</b>			
Rigid Inclusions	5	2	10
Open battered excavation	2	1	2
<b>Ground risks</b>			
Liquefaction	8	3	24
Ground variability	2	2	4
<b>Total weighted score = 40</b>			
<b>Confidence Level of Ground model (RAG)</b>			
Limited but adequate: At least two deep BHs/CPTs 30m apart and upto 25m depth within the footprint of the site boundary			
<b>Financial impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for execution of the foundations is estimated to be Class 1 Low based on the ranges identified by KGG (See section 5.4 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/003/FR-001)</li> </ul>			
<b>Time impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for execution of the foundations is estimated to be Class 2 Medium based on the ranges identified by KGG (See section 5.3 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Technical Feasibility Report (Ref: PR00/003/FR-001).</li> </ul>			
<b>Key risks</b>			
<ul style="list-style-type: none"> <li>High lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements.</li> <li>Weak layer below the foundation level (i.e., Peat).</li> <li>Open battered excavation presents challenges due to granular slope conditions and hydraulic connectivity with the sea.</li> </ul>			

Title: Eemshaven 3 Technical Factsheet

Design Basis Flood Level and Platform							
Schematic Typical Section							
	Static earthworks quantities	Topsoil stripping (BCM) - m <sup>3</sup>	Bulk earthworks Excavation (BCM) - m <sup>3</sup>	Import (BCM) - m <sup>3</sup>	Available Fill (CCM) - m <sup>3</sup>	Required filling (CCM) - m <sup>3</sup>	Balance - m <sup>3</sup>
	154,000	839,000	2,904,000	3,556,000	3,556,000	-	797,000
Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters							
Criteria	RAG		Weighting		Overall Risk rating		
<b>Groundwater</b>							
Groundwater control requirements	3		3		9		
<b>Earthworks logistics</b>							
Logistics (Accessibility and plant movement)	5		1		5		
Area for stockpiling	5		1		5		
Temporary works area	3		2		6		
<b>Earthworks design</b>							
Earthworks re-use potential	4		2		8		
Contaminated soils risk	6		2		12		
<b>Onsite constraints</b>							
Existing utilities	3		1		3		
Existing structures	3		1		3		
<b>Total Weighted score = 51</b>							
<b>Financial impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 Medium based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Time impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 3 High based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Key risks</b>							
<ul style="list-style-type: none"> <li>Temp. works area – very limited space.</li> <li>Existing utilities &amp; structures – exiting Power Plant.</li> </ul>							

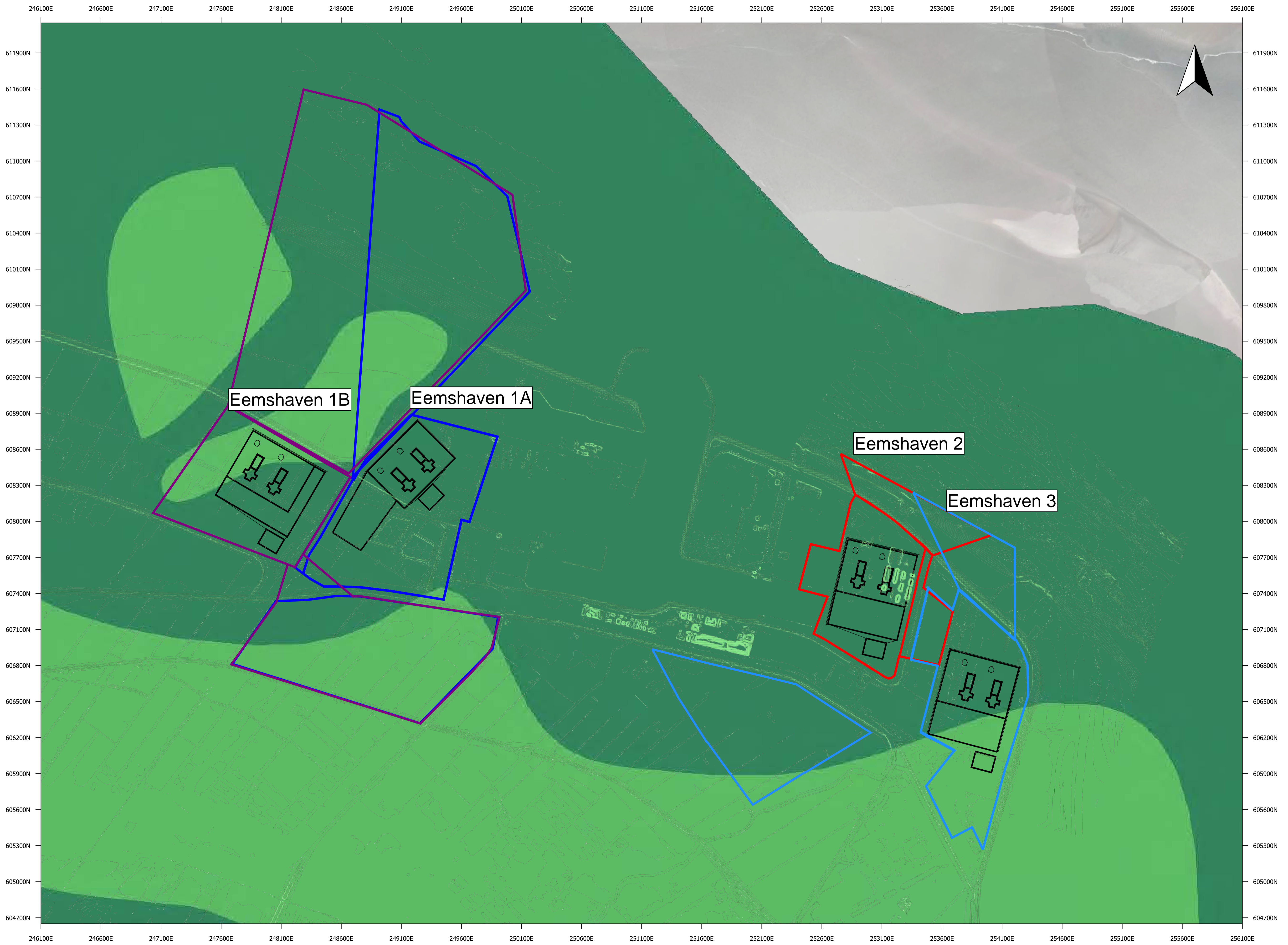
**Title: Eemshaven 3 Technical Factsheet**

<b>Overall Scoring summary (PR00/003/FR-001 &amp; PR00/006/FR-001)</b>	
<b>Total score</b>	<b>91</b>
<b>Total number of Red (High risk) criteria</b>	<b>6</b>
<b>Total number of Amber (Medium risk) criteria</b>	<b>5</b>
<b>Total number of Green (Low risk) criteria</b>	<b>1</b>

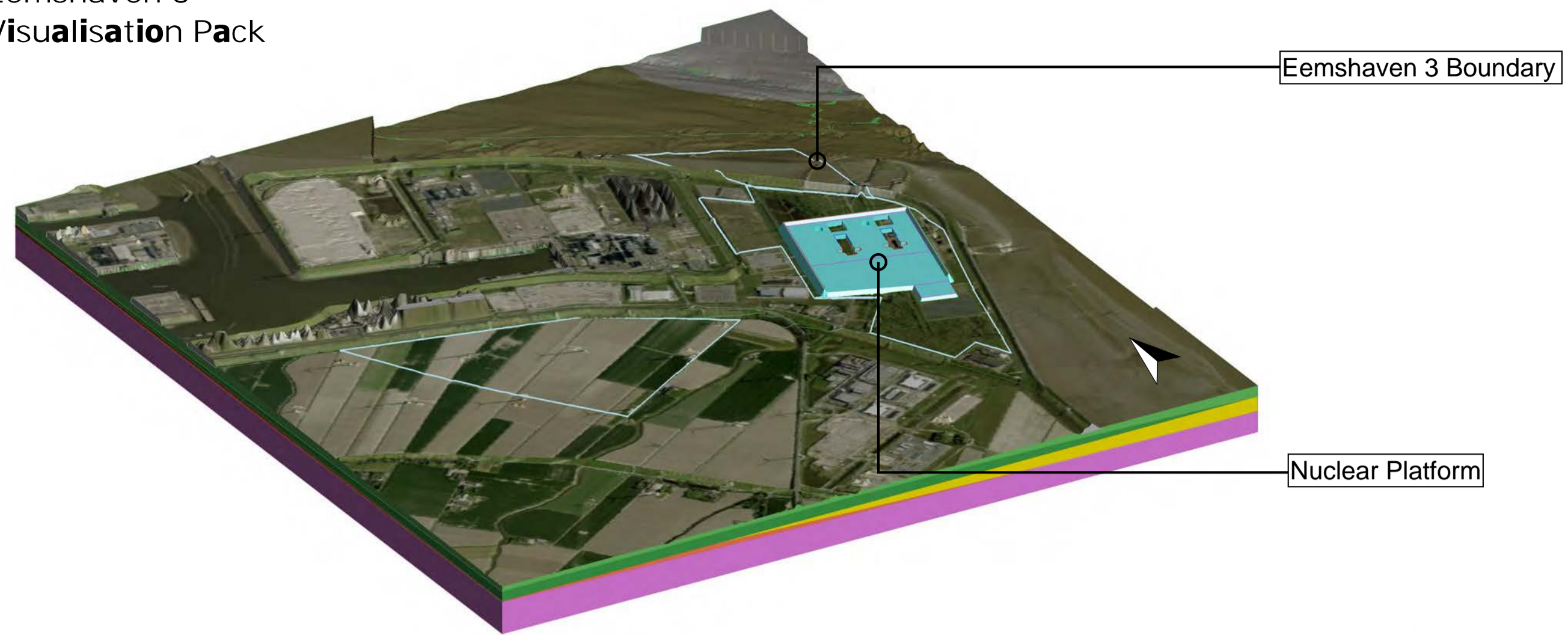
# APPENDIX A6

Units geological map	
<b>Holocene units</b>	
d	Coastal dune sand <span style="background-color: yellow;">ds</span> <span style="background-color: yellow;">dg</span>
s	Beach and foreshore deposits <span style="background-color: yellow;">s</span>
g	Tidal channel deposits <span style="background-color: lightgreen;">g</span>
o	Tidal deposits <span style="background-color: lightgreen;">o</span> <span style="background-color: lightgreen;">ovg*</span> <span style="background-color: lightgreen;">ovo*</span> <span style="background-color: lightgreen;">oo*</span>
<p><i>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</i></p>	
<b>Pleistocene and older units (onshore and at base of tidal channels)</b>	
BX1-4	Various glacial (aeolian) sand units (Boxtel Fm) <span style="background-color: yellow;">BX1</span> <span style="background-color: yellow;">BX2</span> <span style="background-color: yellow;">BX3</span> <span style="background-color: yellow;">BX4</span>
SY	Middle Pleistocene sandy fluvial sediments (Stramproy Fm) <span style="background-color: pink;">SY</span>
WA	Early and Middle Pleistocene fluvial sediments (Waalre Fm) <span style="background-color: purple;">WA</span>
MO	Plio-Pleistocene coastal and shallow-marine sands (Maassluis and Oosterhout formations) <span style="background-color: blue;">MO</span>
BR	Miocene fine shallow-marine glauconite sands (Breda Fm) <span style="background-color: orange;">BR</span>
RTD	Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations) <span style="background-color: grey;">RTD</span>
<b>Pleistocene and older units (offshore underneath Holocene marine deposits)</b>	
KR2	Coarse-grained Late Pleistocene fluvial deposits <span style="background-color: blue;">KR2</span>
EE2	Open marine sandy and shell-rich Last Interglacial sediments. <span style="background-color: yellow;">EE2</span>
RTD	Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations) <span style="background-color: grey;">RTD</span>

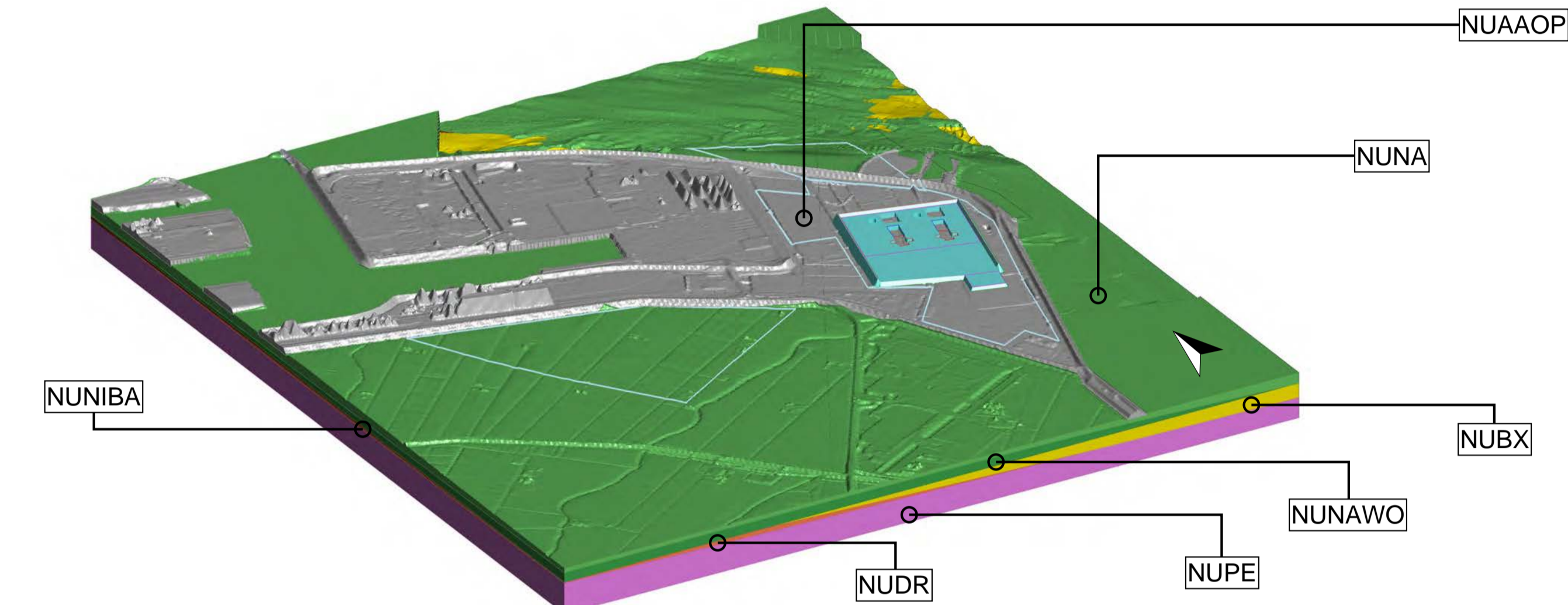
# Eemshaven Plan View



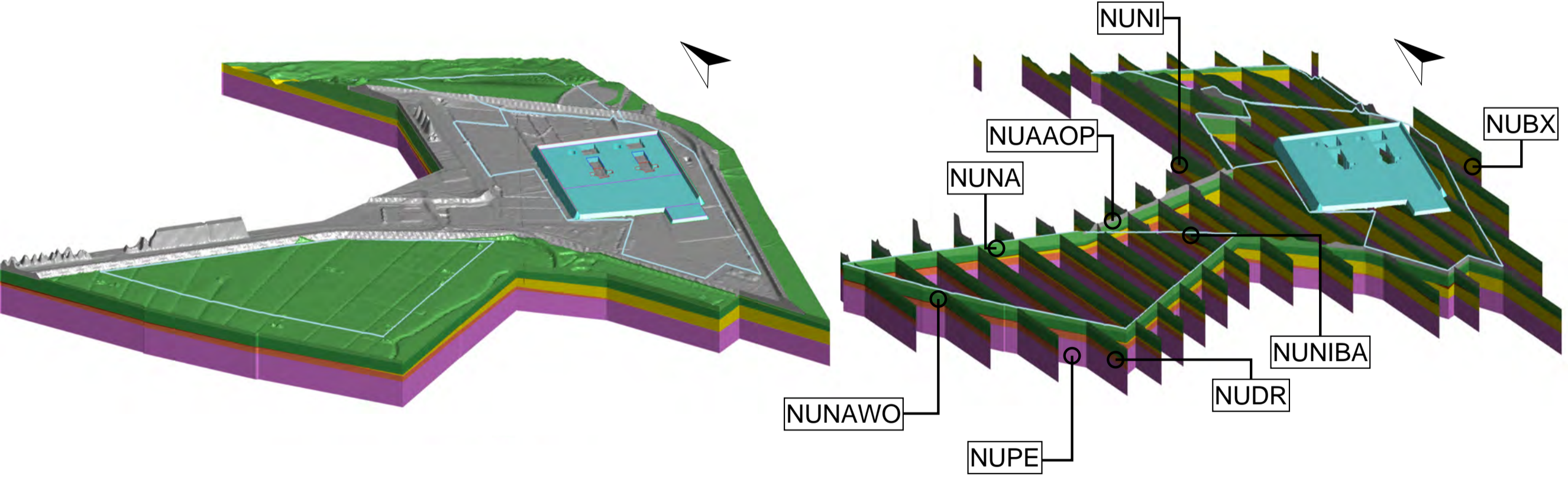
# Eemshaven 3 - Visualisation Pack



Aerial Isometric View

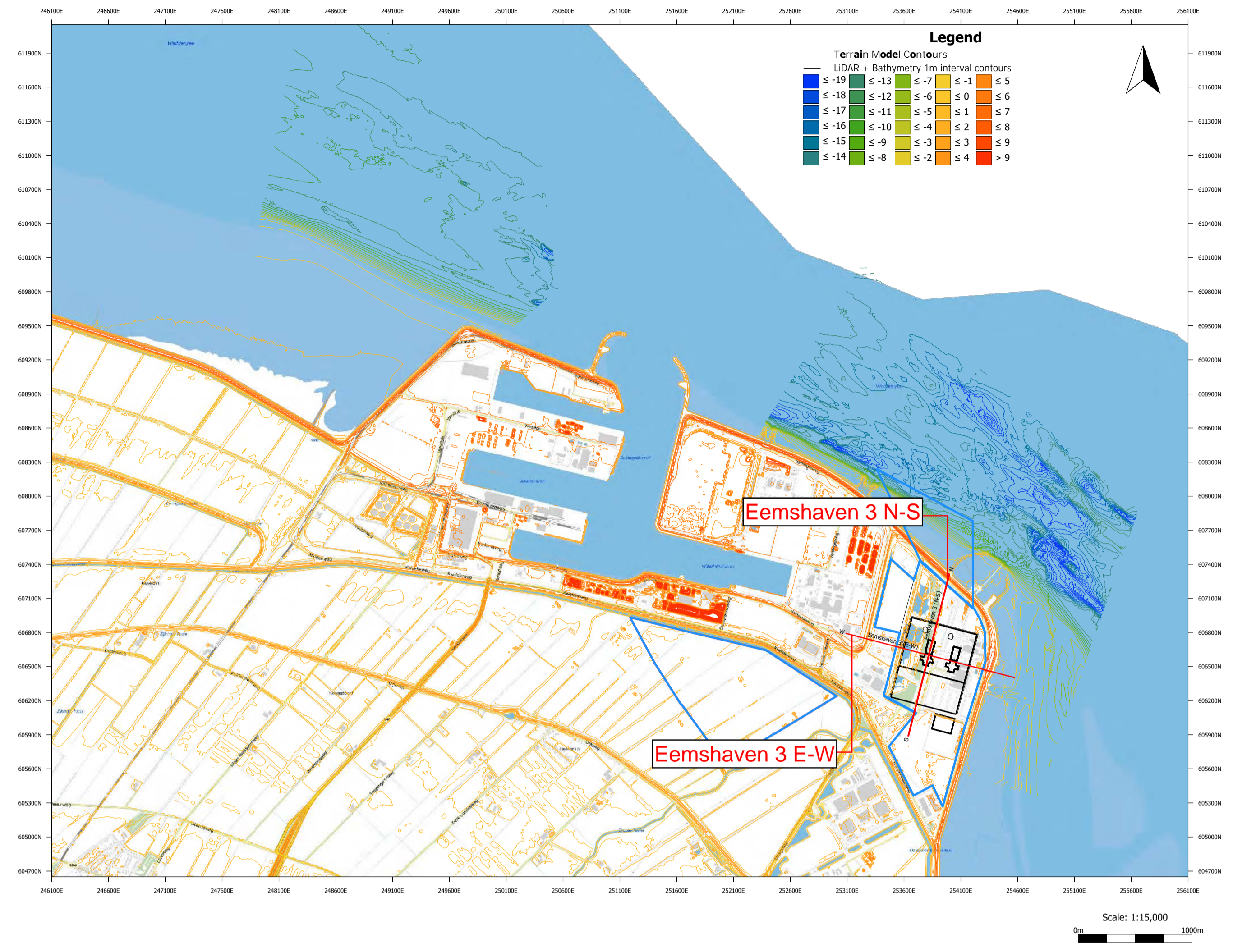


Eemshaven 3 Site Ground Model Isometric View



Eemshaven 3 Site Boundary Ground Model Isometric View

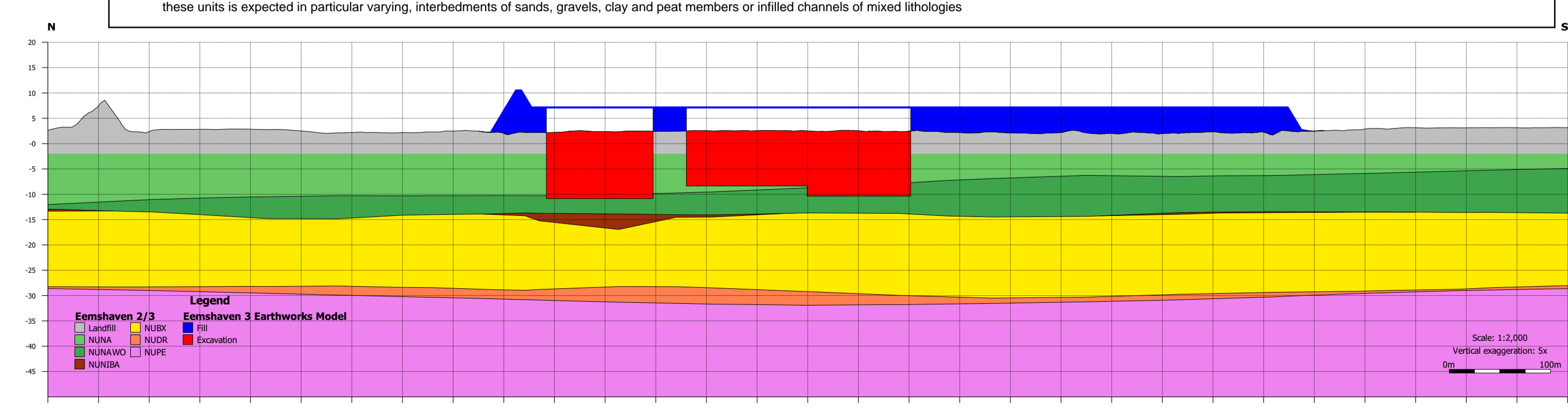
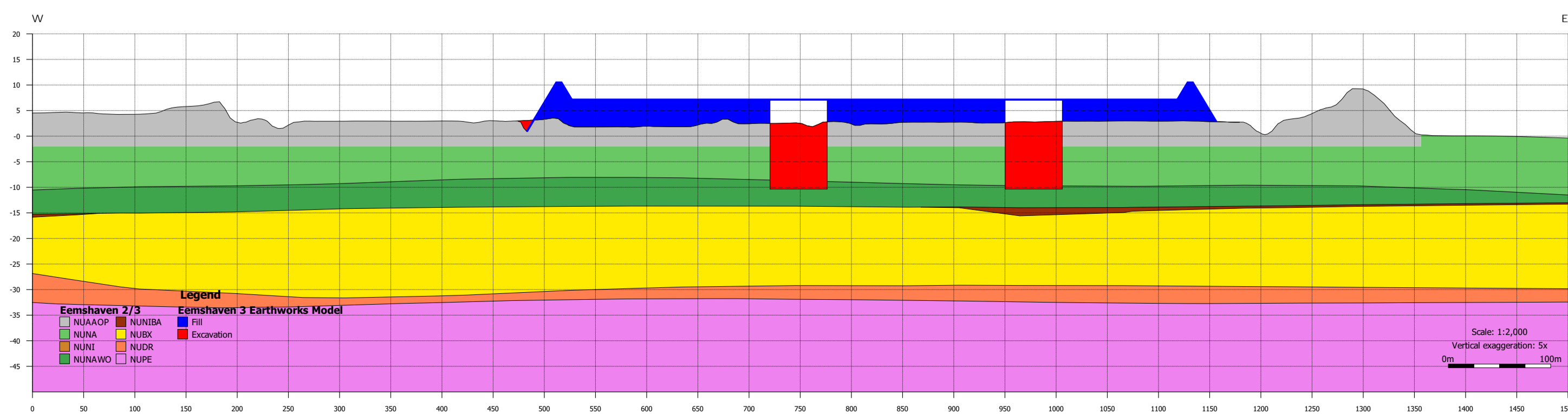
Eemshaven 3 Site Boundary Fence Ground Model Isometric View



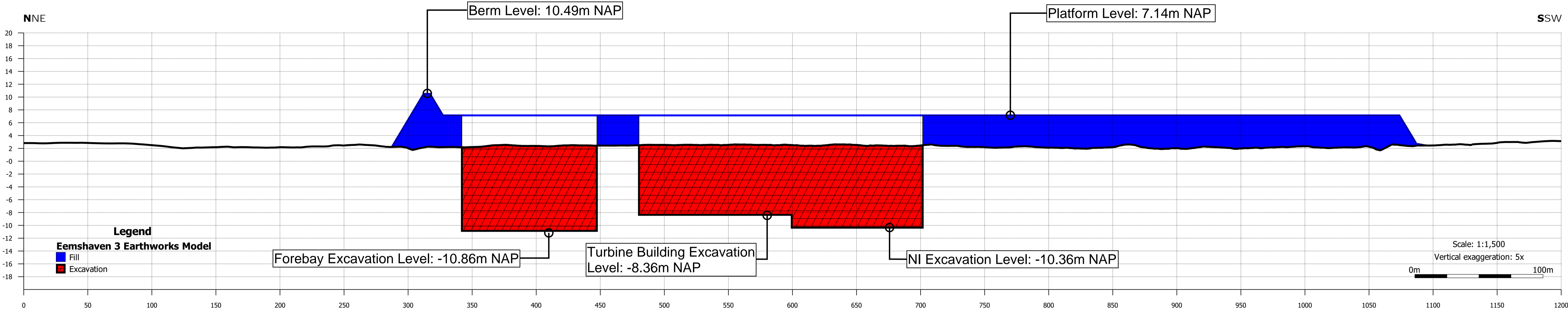
Geological Code	Formation Name	Description	Depth Top (m bgj)	Depth Base (m bgj)	Elevation Top (m NAP)	Elevation Base (m NAP)	Thickness (m)
NUA A (Landfill)	Anthropogenic Ground	Reworked anthropogenic material	0.0	4.5	2.5	-2.0	4.5
NUNA	Naaldwijk Formation	Highly variable, grey fine to medium sand, with grey to blue silt and clay layers, discontinuous peat layers	4.5	10.7	-2.0	-8.2	6.2
NUNAWO	Wormer Member of the Naaldwijk Formation	Fine sand, silty, clayey, intercalated silt and clay layers	10.7	16.3	-8.2	-13.8	5.6
NUNI	Niuekoop Formation	Brown to black peat and other organics	n/a	n/a	n/a	n/a	n/a
NUNIBA	Niuekoop Formation basal peat	Basal peat found on-shore from -14 to -15m NAP	n/a	n/a	n/a	n/a	n/a
NUBX	Boxtel Formation	Light yellow to dark brown very fine to medium sand, silty, some peat and gyttja layers	16.3	32.2	-13.8	-29.7	15.9
NUDR	Drente Formation	Clay and fine-grained to coarse sand, locally gravel or peat and brown-coal seams. There is a general trend from coarse- to fine-grained sediments towards the north and west.	32.2	34.3	-29.7	-31.8	2.2
NUPE	Peelo Formation	Yellowish/brownish grey very fine to very coarse sand, with subordinate gravel layers	34.3	Not proven	-31.8	Not proven	Not proven

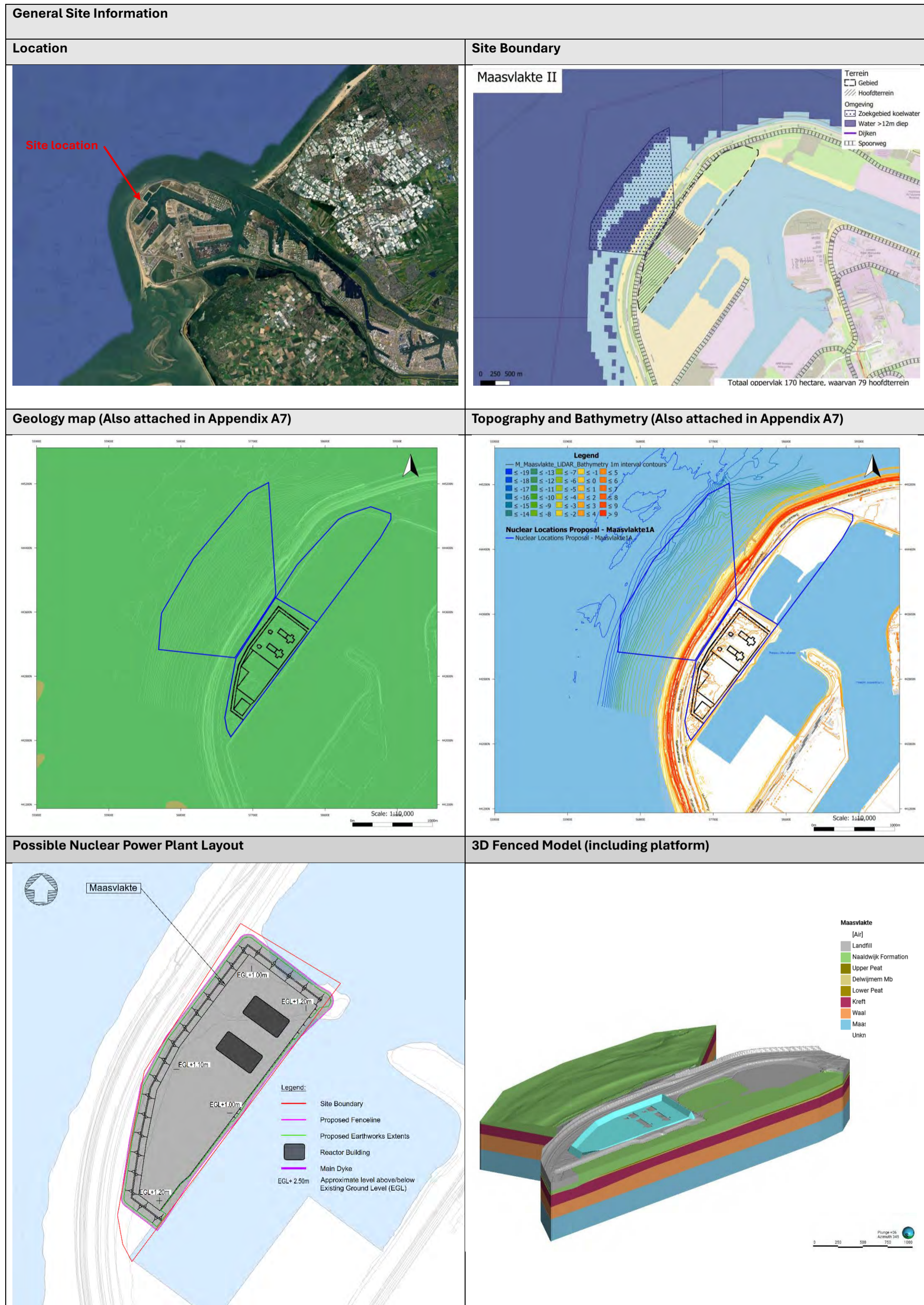
n/a Geological Unit not initially expected immediately beneath the proposed Nuclear Island location

- Notes:
- To be read in conjunction with Work Package 6: Multi-site Preliminary Technical Evaluation for the Construction of Earthworks Platforms.
  - Topography generated from the Actueel Hoogtebestand Nederland (AHN) dataset. Resolution has been reduced to 5m for modelling efficiency. Bathymetry generated from Deltares based on Netherlands Hydrographic Office (NLHO). Site boundaries are based on GIS information provided by Deltares.
  - Initial geological interpretation based on TNO – GDN (2025) BRO GeoTOP v1.6.1. TNO geological model.
  - The geological detailed interpretation is based on Deltares detailed geological sections.
  - Conceptual ground model depths, elevations and thickness expected at the nuclear island location, based on the interpretation of the geological model, high variability is expected outside the area.
  - There is limited verification that can be undertaken on the historical ground investigation data and the varying levels of detail that has been used by the Geological Survey of the Netherlands and Deltares
  - The continuity and variability of ground model units between exploratory holes is unknown. Although there is a relatively high confidence in the lateral extent of the broad Geological Units defined in Deltares interpretation reports, variation within these units is expected in particular varying, interbedments of sands, gravels, clay and peat members or infilled channels of mixed lithologies



# Eemshaven 3 Earthworks Long Section (N-S)

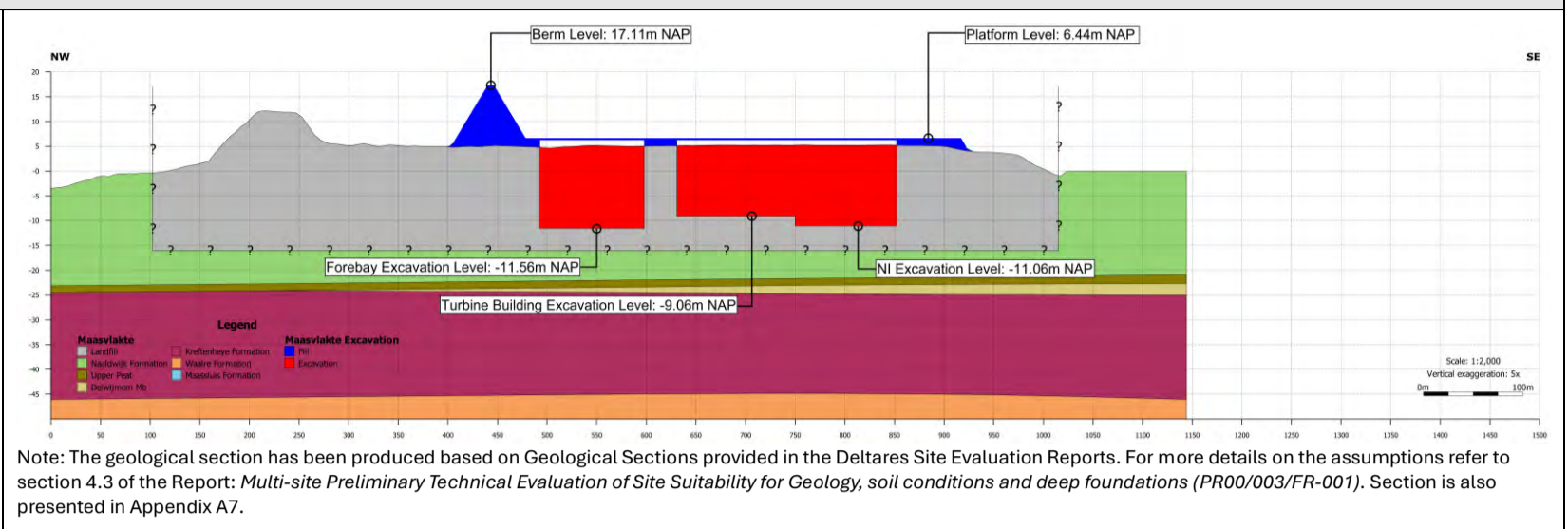




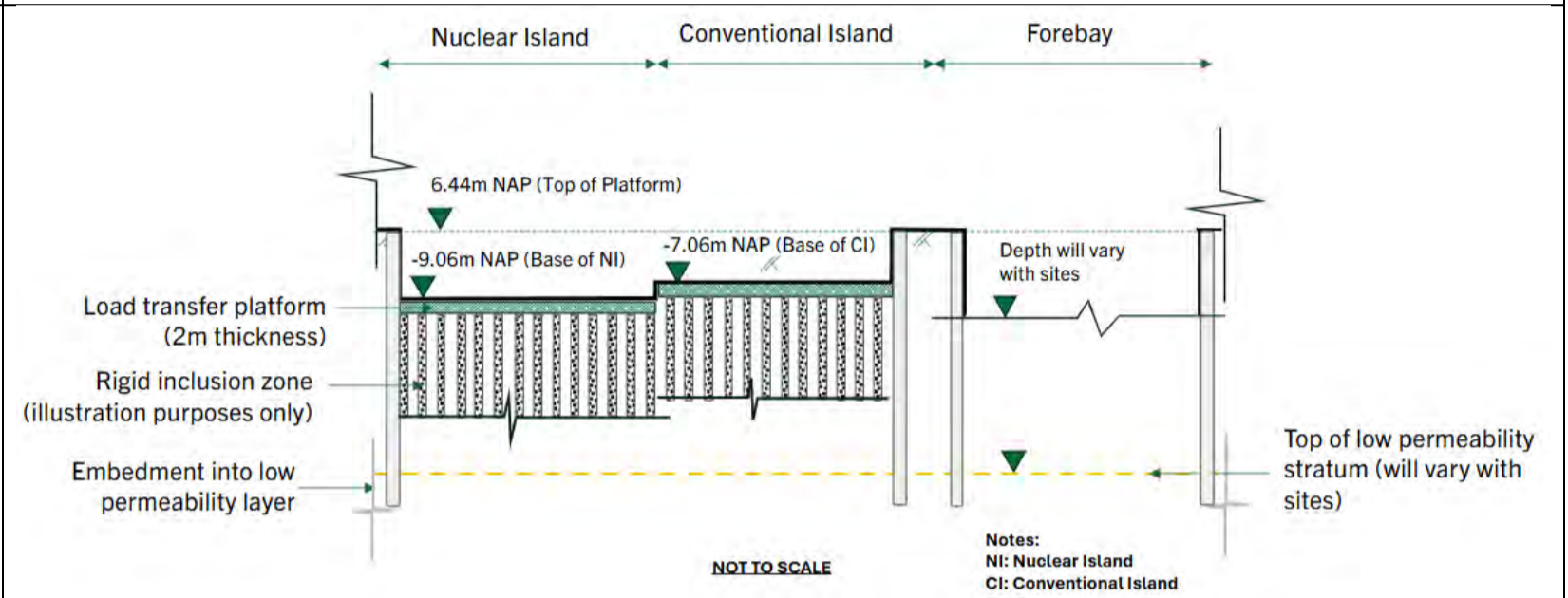
**Title: Maasvlakte Technical Factsheet**

**Geology, soil conditions and Deep Foundations**

**Geological cross Sections**



**Simplified section through nuclear island and showing foundation levels**



Criteria	Score (RAG)	Weighting	Weighted score
<b>NI Foundation Suitability</b>			
Rigid Inclusions	1	2	2
Open battered excavation	2	1	2
<b>Ground risks</b>			
Liquefaction	4	3	12
Ground variability	4	2	8
<b>Total weighted score = 24</b>			
<b>Confidence Level of Ground model (RAG)</b>			
Limited but adequate: At least two deep BHs/CPTs 30m apart and up to 25m depth within the footprint of the site boundary			
<b>Financial impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for execution of the foundations is estimated to be Class 1 (Low) based on the ranges identified by KGG (See section 5.4 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/003/FR-001).</li> </ul>			
<b>Time impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for execution of the foundations is estimated to be Class 2 (Medium) based on the ranges identified by KGG (See section 5.3 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Technical Feasibility Report (Ref: PR00/003/FR-001).</li> </ul>			
<b>Key risks</b>			
<ul style="list-style-type: none"> <li>Weak layer below the foundation level (i.e., Peat)</li> <li>Lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements</li> <li>Subsidence risk is present and ongoing, primarily due to the recent construction of the port over organic soils. This may affect long-term settlement behaviour and foundation performance.</li> <li>Open battered excavation very challenging (space constrains, granular non compacted slopes with high hydraulic connectivity with the sea).</li> </ul>			

**Title: Maasvlakte Technical Factsheet**

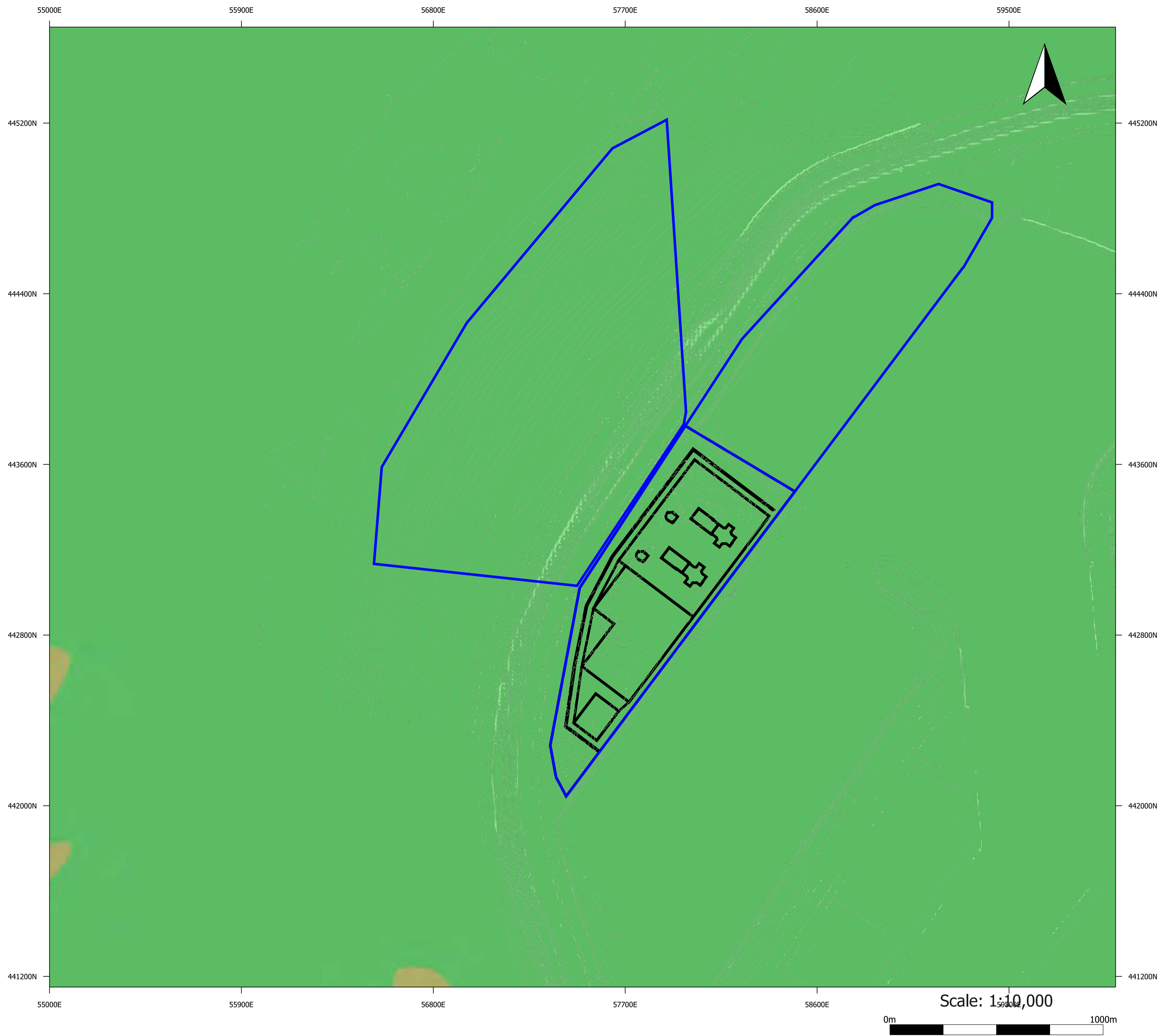
Design Basis Flood Level and Platform							
<b>Schematic Typical Section</b>							
<b>Static earthworks quantities</b>	<b>Topsoil stripping (BCM) – m<sup>3</sup></b>	<b>Bulk earthworks Excavation (BCM) - m<sup>3</sup></b>	<b>Import (BCM) - m<sup>3</sup></b>	<b>Available Fill (CCM) - m<sup>3</sup></b>	<b>Required filling (CCM) - m<sup>3</sup></b>	<b>Balance - m<sup>3</sup></b>	<b>Required landscaping (CCM) - m<sup>3</sup></b>
	-	958,000	1,845,000	2,680,000	2,680,000	-	928,000
	Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters						
<b>Criteria</b>	<b>RAG</b>		<b>Weighting</b>		<b>Overall Risk rating</b>		
<b>Groundwater</b>							
Groundwater control requirements	2		3		6		
<b>Earthworks logistics</b>							
Logistics (Accessibility and plant movement)	8		1		8		
Area for stockpiling	7		1		7		
Temporary works area	7		1		1		
<b>Earthworks design</b>							
Earthworks re-use potential	8		2		16		
Contaminated soils risk	8		2		16		
<b>Onsite constraints</b>							
Existing utilities	8		1		8		
Existing structures	7		1		7		
<b>Total Weighted score = 82</b>							
<b>Financial impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 (Medium) based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Time impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 3 (High) based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Key risks</b>							
<ul style="list-style-type: none"> <li>Need to confirm suitability of landfill material for re-use.</li> <li>Hydraulic placement of fill material to the North-East required to complete land reclamation.</li> <li>Ground water control measures extremely challenging.</li> </ul>							

**Title: Maasvlakte Technical Factsheet**

<b>Overall Scoring summary (PR00/003/FR-001 &amp; PR00/006/FR-001)</b>	
<b>Total score</b>	<b>106</b>
<b>Total number of Red (High risk) criteria</b>	<b>3</b>
<b>Total number of Amber (Medium risk) criteria</b>	<b>2</b>
<b>Total number of Green (Low risk) criteria</b>	<b>7</b>

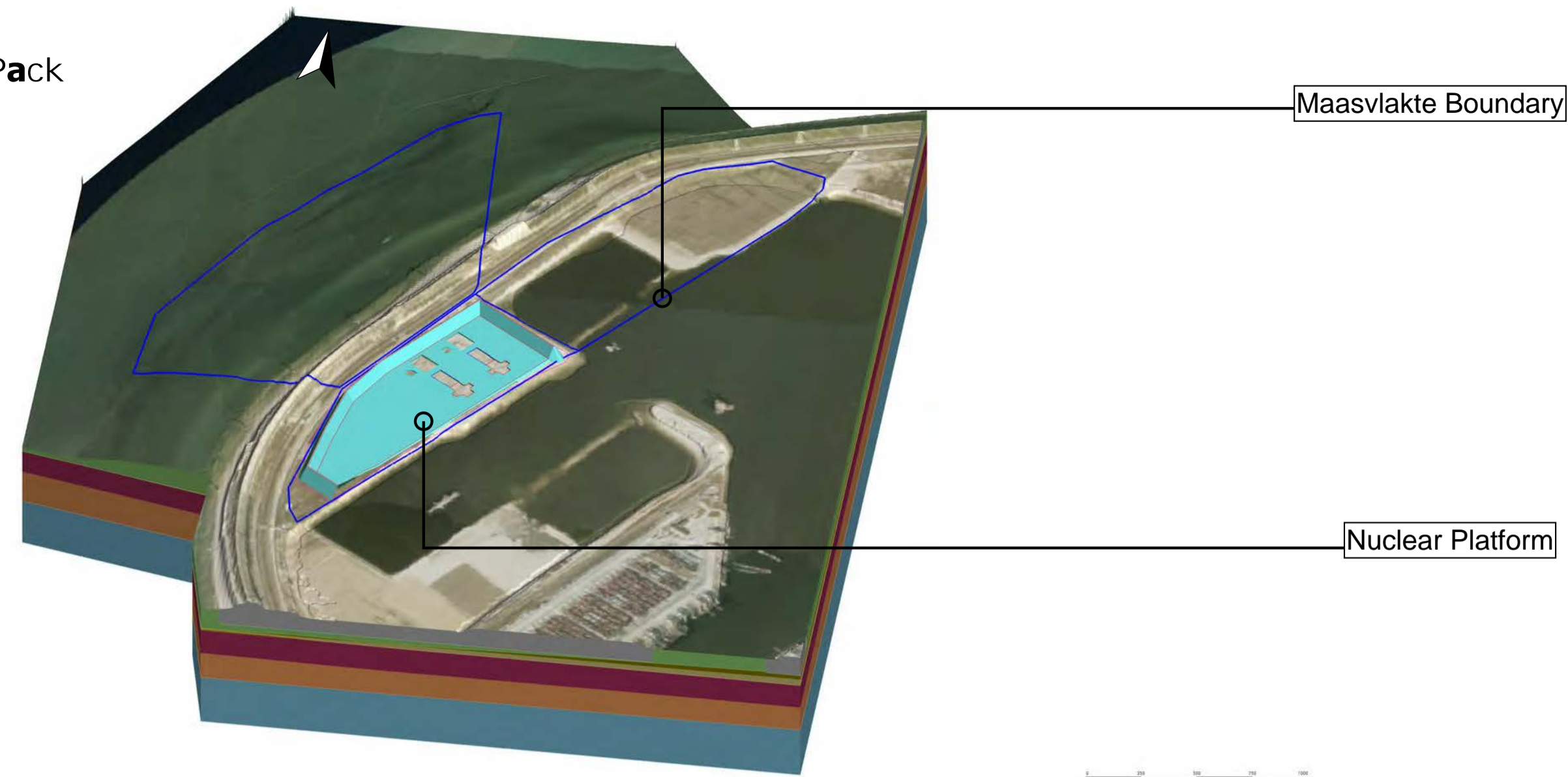
# APPENDIX A7

Units geological map						
<b>Holocene units</b>						
d	Coastal dune sand	ds	dsg	dg	da	
s	Beach and foreshore deposits	s	sg			
g	Tidal channel deposits	g				
o	Tidal deposits	o	os	ovg*	ovo*	oo*
v	Coastal peat	vg*	vo*			
b	Sandy fluvial channel deposits	b				
k	Overbank deposits	kvo*	kg*			
*	Indicating older deposits	g*	o*			
<p>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</p>						
<b>Pleistocene units (underneath Holocene marine deposits)</b>						
KR1	Solid fine-grained Late Pleistocene flood deposits			KR1		
KR2	Coarse-grained Late Pleistocene fluvial deposits			KR2		
EE2	Open marine sandy and shell-rich Last Interglacial sediments.			EE2		

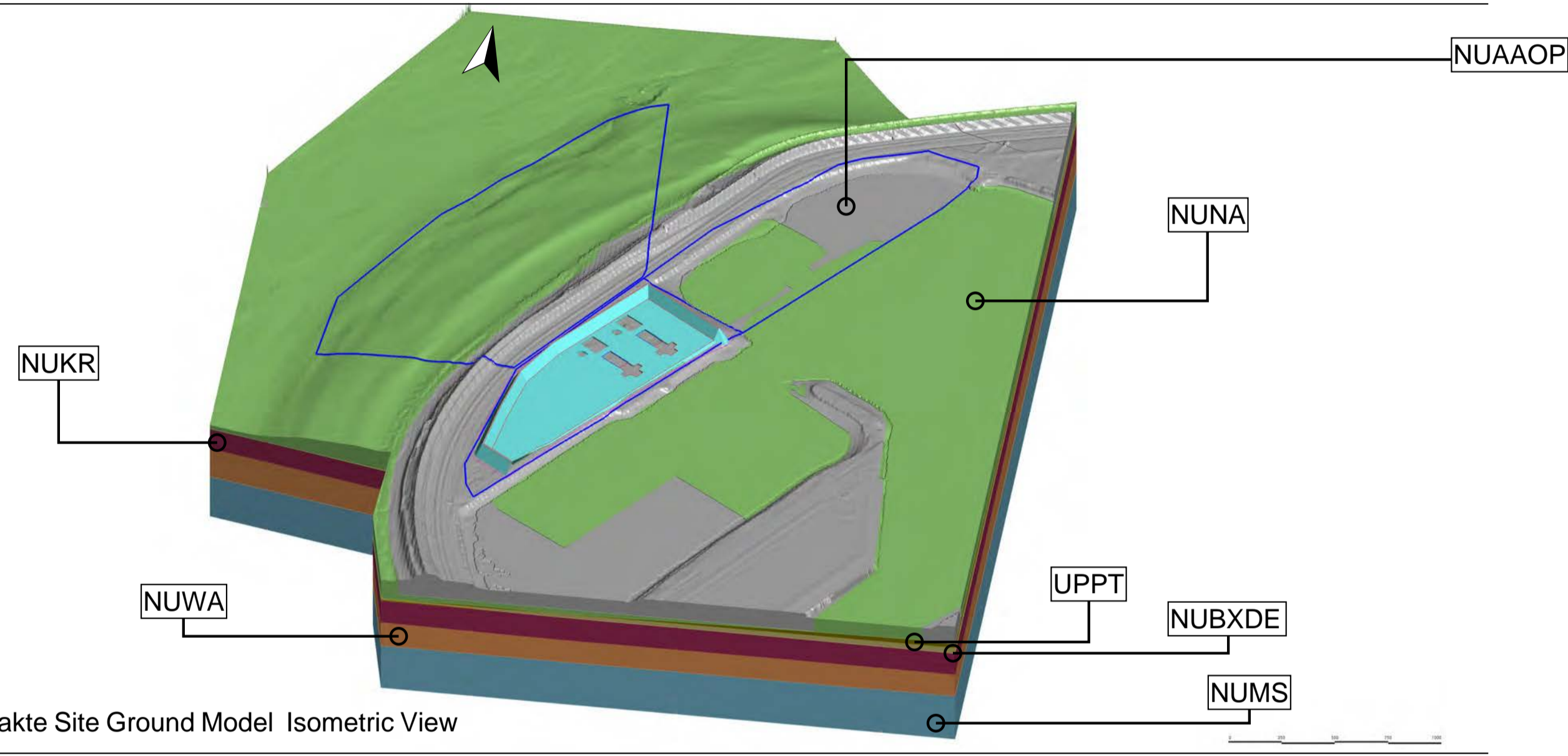


**Maasvlakte Plan View**

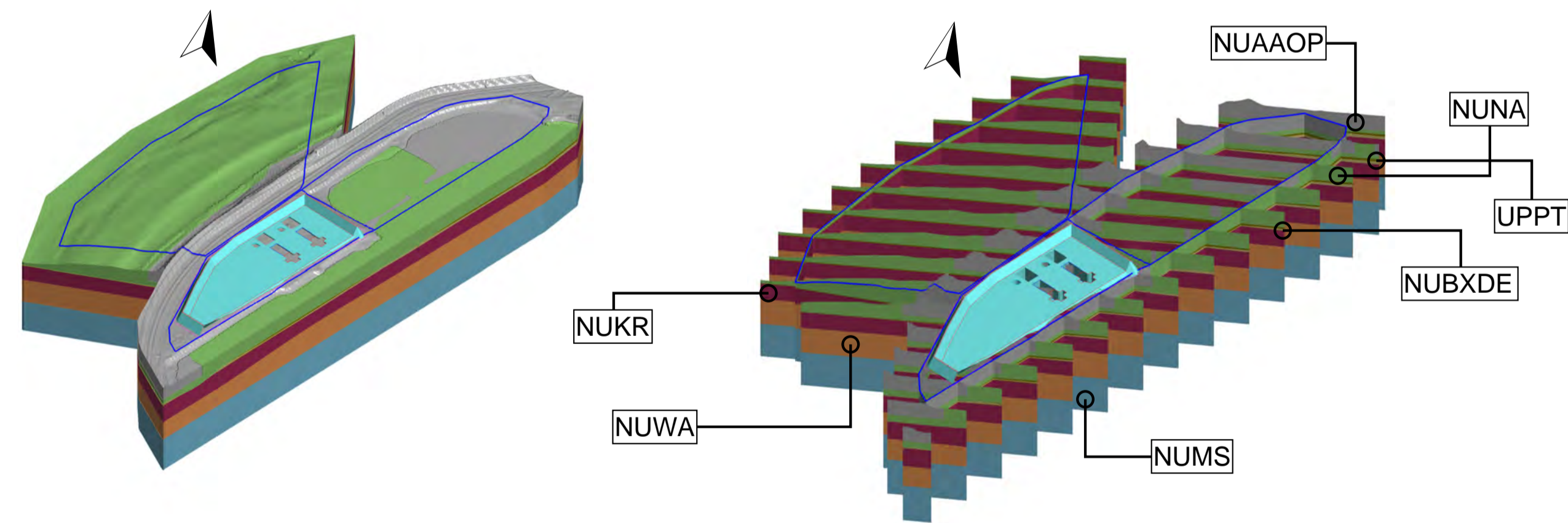
Maasvlakte -  
Visualisation Pack



Aerial Isometric View

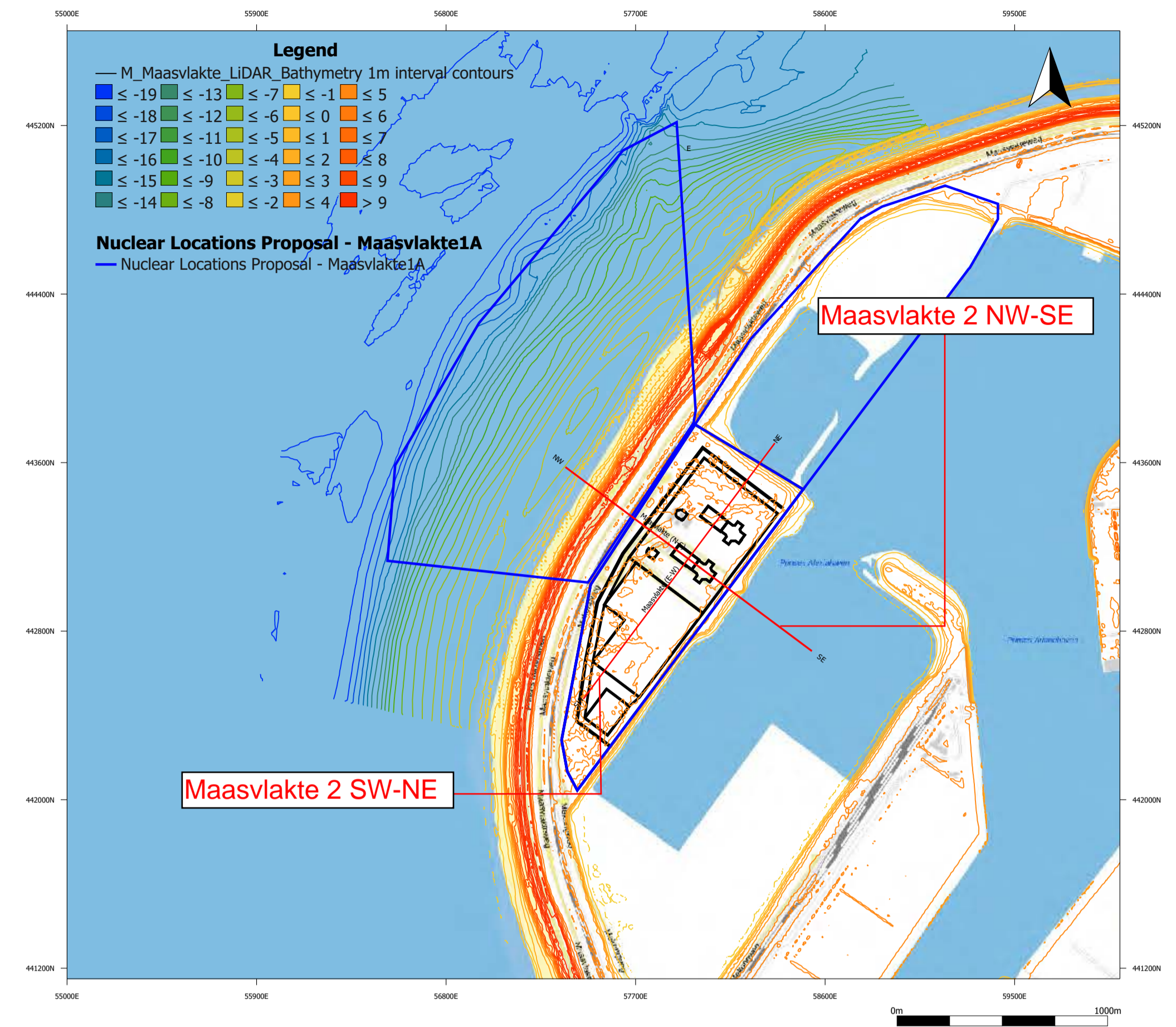
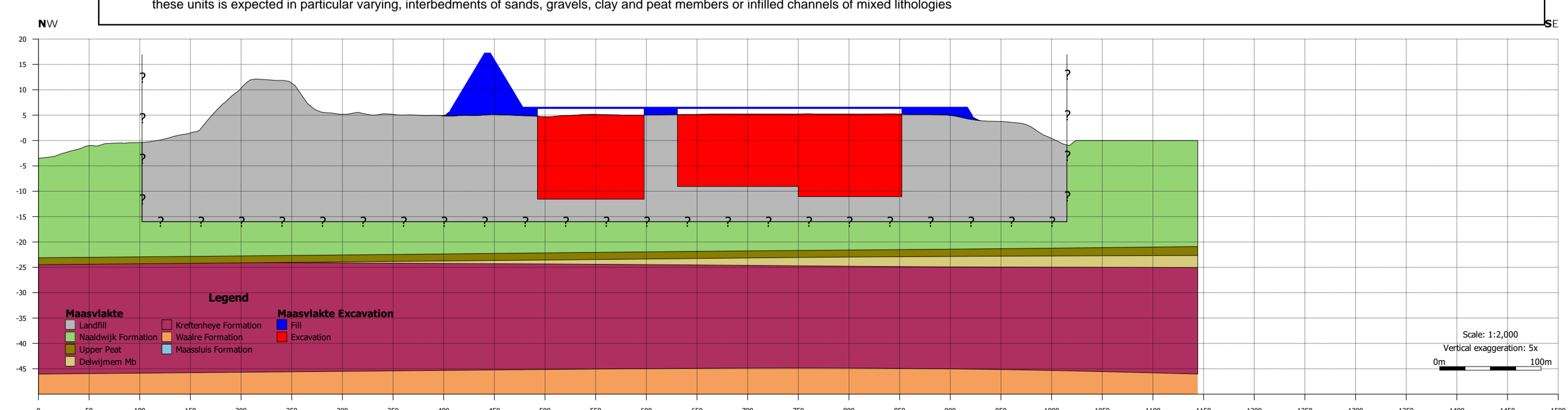
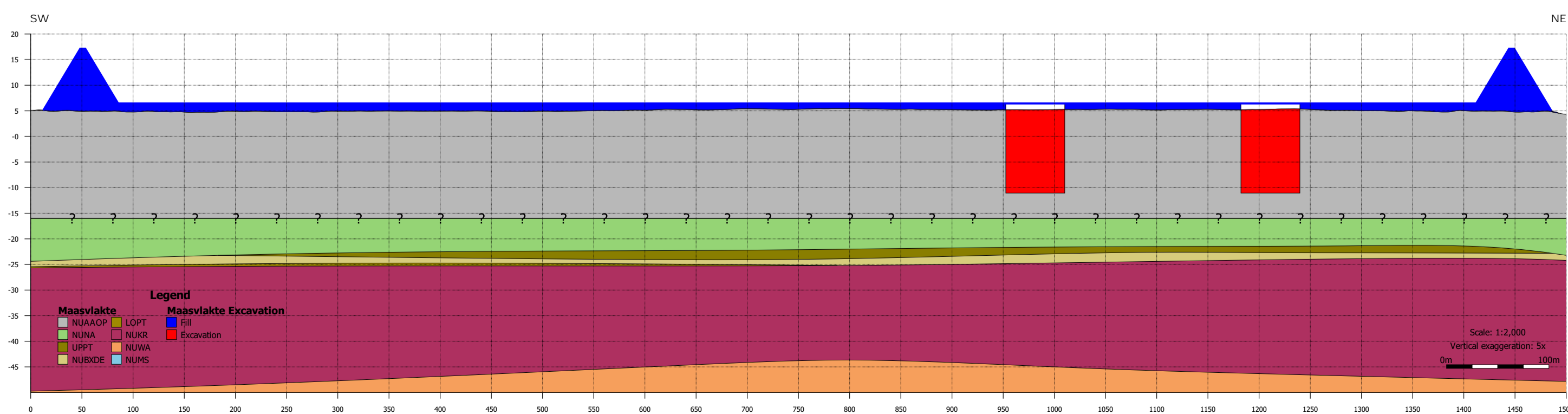


Maasvlakte Site Ground Model Isometric View



Maasvlakte Site Boundary Ground Model Isometric View

Maasvlakte Site Boundary Fence Ground Model Isometric View

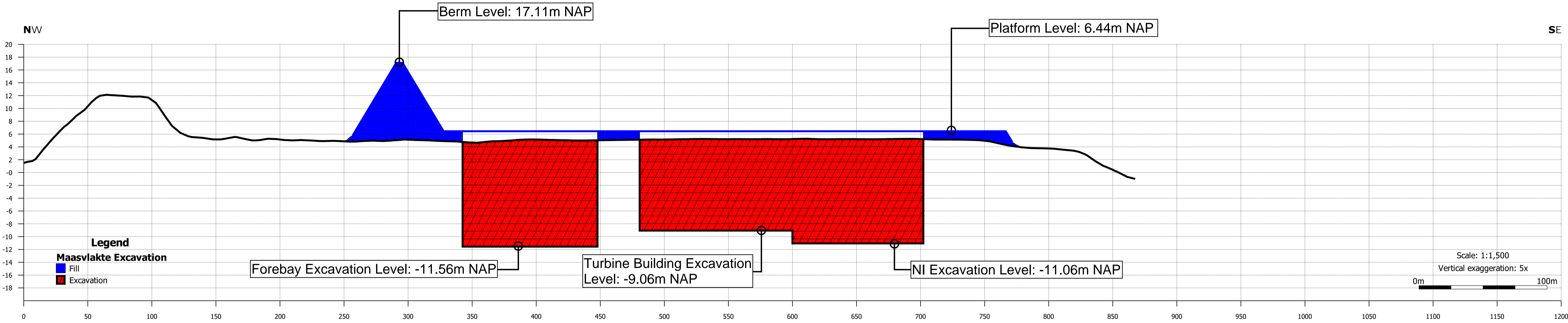


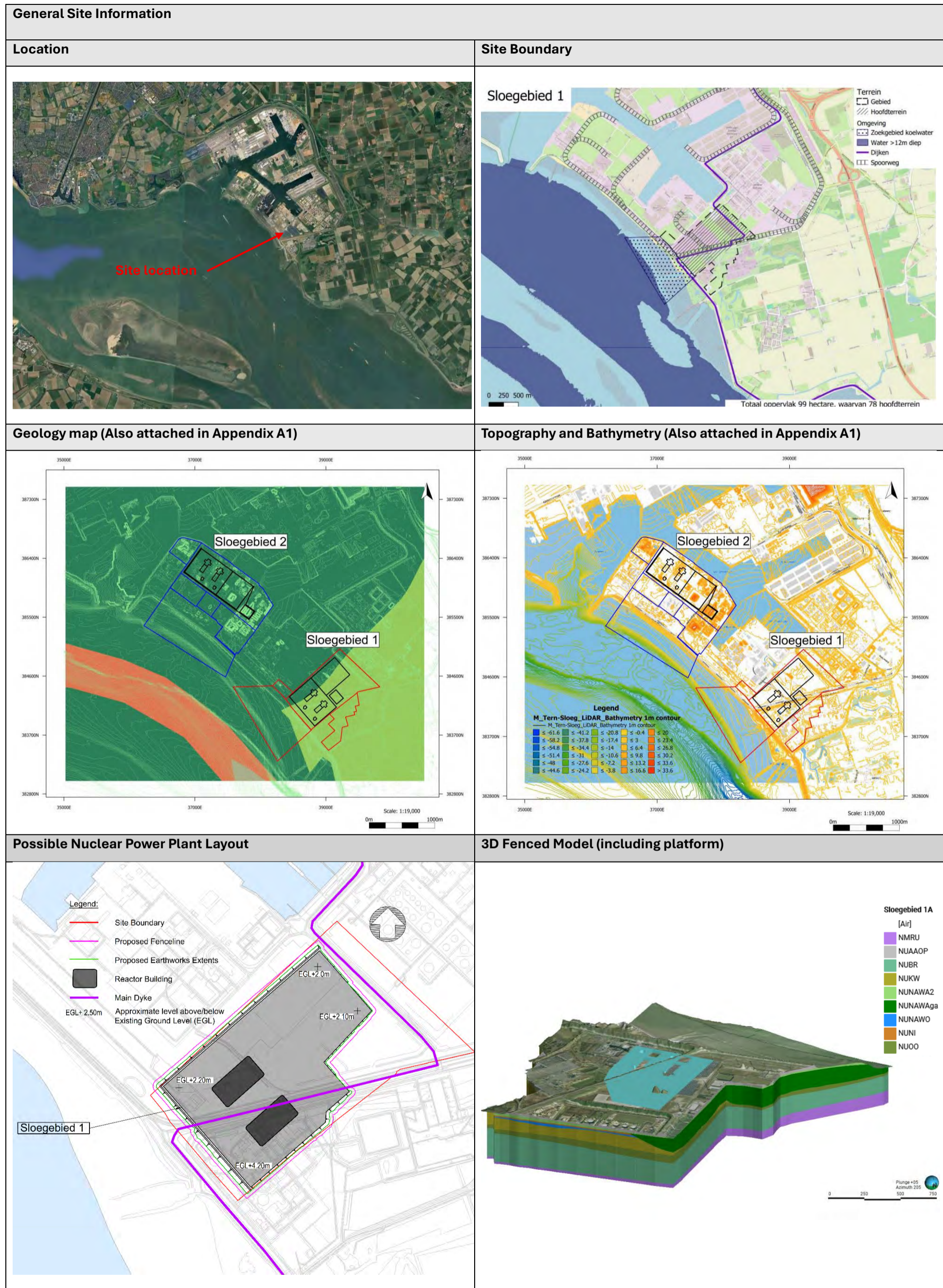
Geological Code	Formation Name	Description	Depth Top (m bg)	Depth Base (m bg)	Elevation Top (m NAP)	Elevation Base (m NAP)	Thickness (m)
NUAA (Landfill)	Anthropogenic Ground	Reworked anthropogenic material	0.0	21.2	5.2	-16.0	21.2
NUNA	Naaldwijk Formation	Highly variable, grey fine to medium sand, with grey to blue silt and clay layers, discontinuous peat layers	21.2	26.8	-16.0	-21.6	5.6
UPPT	Various	Undifferentiated peat horizons	26.8	28.2	-21.6	-23.0	1.4
NUBXDE	Delwinjen Member	Grey to brown fine to medium sand, moderately sorted, mostly non-calcareous but calcareous near base, sporadic silt layers or granule laminae.	28.2	30.0	-23.0	-24.8	1.8
NUKR	Krefenheye Formation	Yellowish grey to greyish brown medium to very coarse sand, moderately to very gravelly. Locally, fine to coarse gravel in lags. Subordinate silty clay beds and sporadic clayey peat layers.	30.0	50.1	-24.8	-44.9	20.1
NUWA	Waalre Formation	Stacked fining-upward sequences. Grey to greyish white very fine to very coarse sand, micaceous, multi-coloured with reddish particles in coarse fraction, locally gravelly (in lags). Bluish grey to brownish grey clay beds and laminae, silty to sandy, with sporadic peat layers and siderite.	50.1	87.9	-44.9	-82.6	37.8
NUMS	Maassluis Formation	Coarsening upward. Fining from southeast to northwest. Grey very fine to medium sand, usually micaceous and calcareous, shelly, slightly glauconitic. Intercalated light to dark grey clay, commonly silty or sandy, micaceous and calcareous with marine shells. Locally, basal gravel. Near the top, freshwater shells mixed with marine shells.	87.9	Not proven	-82.6	Not proven	Not proven

n/a Geological Unit not initially expected immediately beneath the proposed Nuclear Island location

- Notes:
- To be read in conjunction with Work Package 6: Multi-site Preliminary Technical Evaluation for the Construction of Earthworks Platforms.
  - Topography generated from the Actueel Hoogtebestand Nederland (AHN) dataset. Resolution has been reduced to 5m for modelling efficiency. Bathymetry generated from Deltares based on Netherlands Hydrographic Office (NLHO). Site boundaries are based on GIS information provided by Deltares.
  - Initial geological interpretation based on TNO - GDN (2025) BRO GeoTOP v1.6.1. TNO geological model.
  - The geological detailed interpretation is based on Deltares detailed geological sections.
  - Conceptual ground model depths, elevations and thickness expected at the nuclear island location, based on the interpretation of the geological model, high variability is expected outside the area.
  - There is limited verification that can be undertaken on the historical ground investigation data and the varying levels of detail that has been used by the Geological Survey of the Netherlands and Deltares
  - The continuity and variability of ground model units between exploratory holes is unknown. Although there is a relatively high confidence in the lateral extent of the broad Geological Units defined in Deltares interpretation reports, variation within these units is expected in particular varying, interbedments of sands, gravels, clay and peat members or infilled channels of mixed lithologies

# Maasvlakte Earthworks Long Section (NW-SE)







**Title: Slogebied 1 Technical Factsheet**

Design Basis Flood Level and Platform							
<b>Schematic Typical Section</b>							
	<b>Static earthworks quantities</b>	<b>Topsoil stripping (BCM) – m<sup>3</sup></b>	<b>Bulk earthworks Excavation (BCM) - m<sup>3</sup></b>	<b>Import (BCM) - m<sup>3</sup></b>	<b>Available Fill (CCM) - m<sup>3</sup></b>	<b>Required filling (CCM) - m<sup>3</sup></b>	<b>Balance - m<sup>3</sup></b>
	-	956,000	1,295,000	2,155,000	2,155,000	-	926,000
	Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters						
<b>Criteria</b>	<b>RAG</b>		<b>Weighting</b>		<b>Overall Risk rating</b>		
<b>Groundwater</b>							
Groundwater control requirements	1		3		3		
<b>Earthworks logistics</b>							
Logistics (Accessibility and plant movement)	6		1		6		
Area for stockpiling	7		1		7		
Temporary works area	4		2		8		
<b>Earthworks design</b>							
Earthworks re-use potential	4		2		8		
Contaminated soils risk	6		2		12		
<b>Onsite constraints</b>							
Existing utilities	6		1		6		
Existing structures	3		1		3		
<b>Total Weighted score = 53</b>							
<b>Financial impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 (Medium) based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001)</li> </ul>							
<b>Time impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 4 (Very High) based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001)</li> </ul>							
<b>Key risks</b>							
<ul style="list-style-type: none"> <li>High lateral variability of ground conditions may require local adjustment of Rigid Inclusion lengths to control differential settlements.</li> <li>Presence of glauconitic sands (NUBR), with associated uncertainties in soil behaviour under load.</li> <li>Adjacent to the existing nuclear power plant, where deep excavation activities could pose risks of induced settlements or ground movement.</li> <li>Open battered excavation presents challenges due to granular slope conditions and hydraulic connectivity with the sea.</li> </ul>							

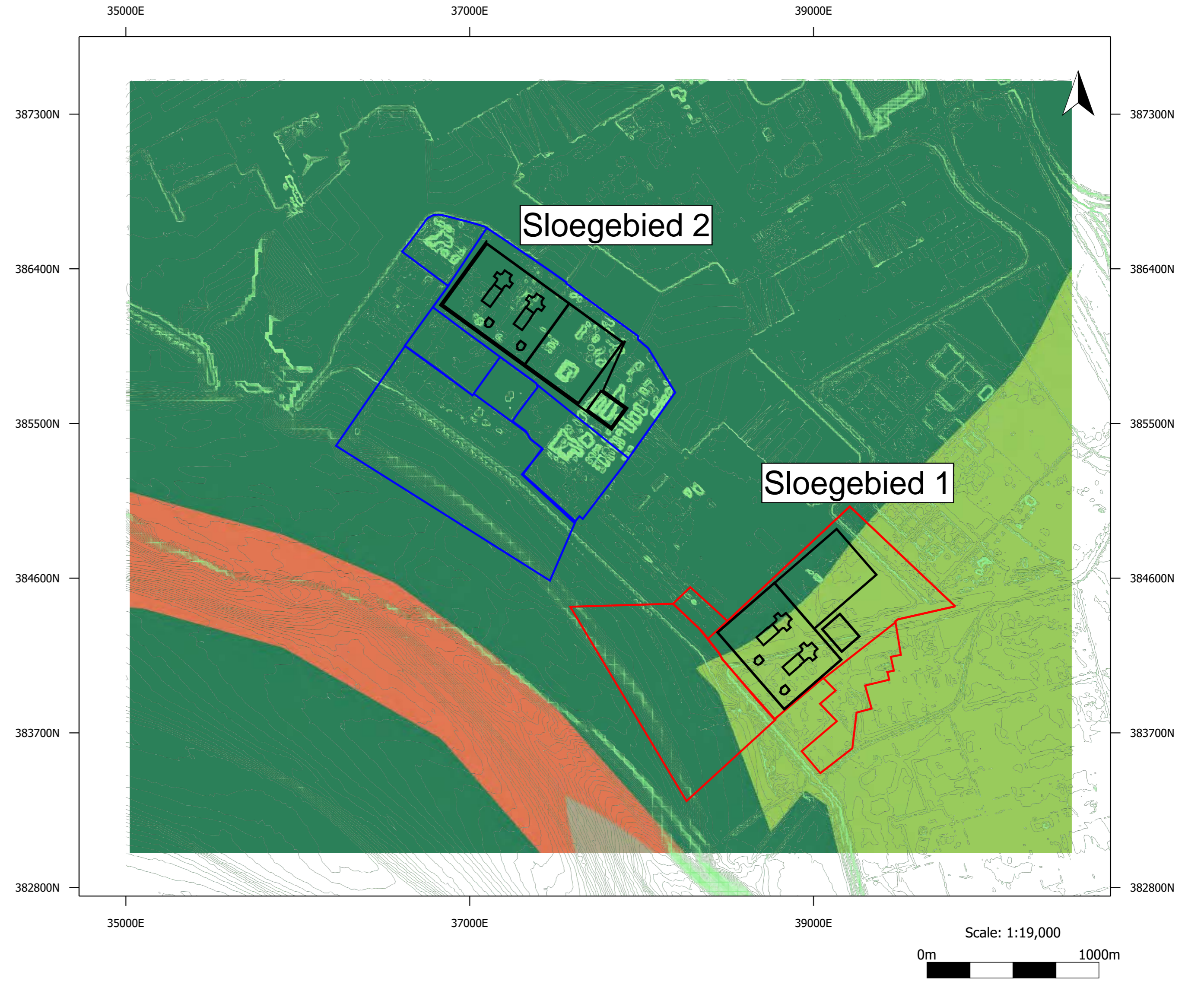
**Title: Sloegebied 1 Technical Factsheet**

<b>Overall Scoring summary (PR00/003/FR-001 &amp; PR00/006/FR-001)</b>	
<b>Total score</b>	<b>72</b>
<b>Total number of Red (High risk) criteria</b>	<b>5</b>
<b>Total number of Amber (Medium risk) criteria</b>	<b>6</b>
<b>Total number of Green (Low risk) criteria</b>	<b>1</b>

# APPENDIX A1

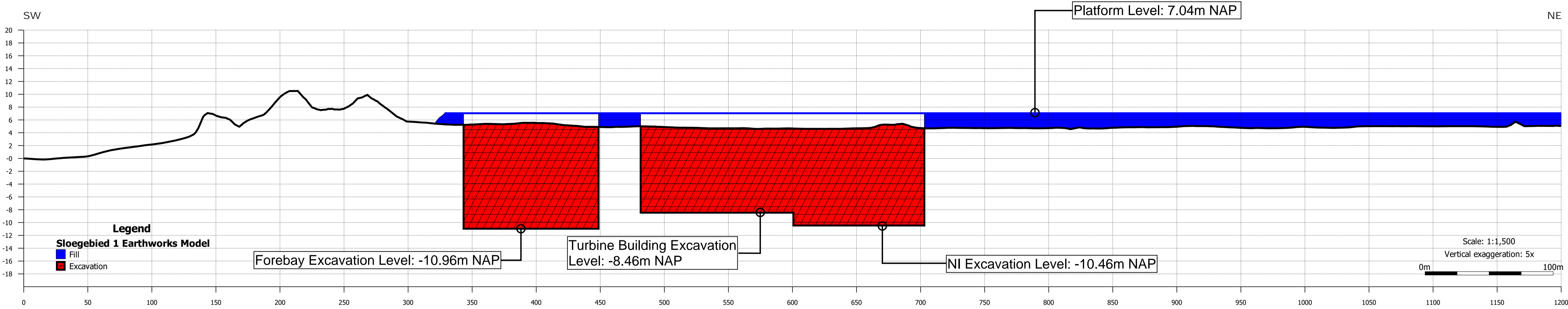
Units geological map			
<b>Holocene units</b>			
d	Coastal dune sand	ds	dg
s	Beach and foreshore deposits	s	
g	Tidal channel deposits	g	
o	Tidal deposits	o	ovg* ovo* oo*
<p>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</p>			
<b>Pleistocene and older units (onshore and at base of tidal channels)</b>			
BX1-4	Various glacial (aeolian) sand units (Boxtel Fm)	BX1	BX2 BX3 BX4
SY	Middle Pleistocene sandy fluvial sediments (Stramproy Fm)	SY	
WA	Early and Middle Pleistocene fluvial sediments (Waalre Fm)	WA	
MO	Plio-Pleistocene coastal and shallow-marine sands (Maassluis and Oosterhout formations)	MO	
BR	Miocene fine shallow-marine glauconite sands (Breda Fm)	BR	
RTD	Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD	
<b>Pleistocene and older units (offshore underneath Holocene marine deposits)</b>			
KR2	Coarse-grained Late Pleistocene fluvial deposits	KR2	
EE2	Open marine sandy and shell-rich Last Interglacial sediments.	EE2	
RTD	Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD	

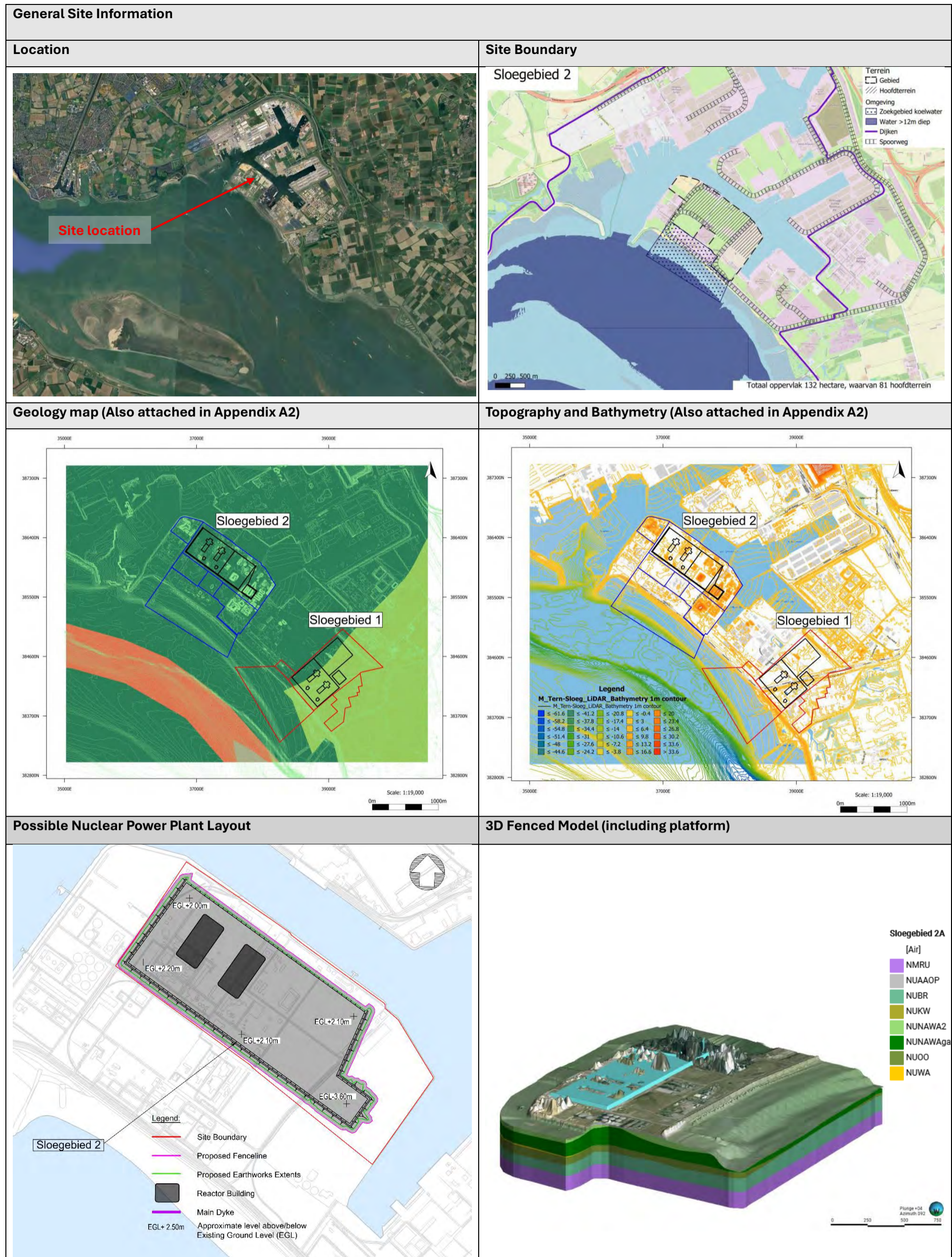
# Sloegbied Plan View





# Sloegebied 1A Earthworks Long Section (N-S)





**Title: Sloegebied 2 Technical Factsheet**

Geology, soil conditions and Deep Foundations			
<p><b>Geological cross Sections</b></p>	<p>Note: The geological section has been produced based on Geological Sections provided in the Deltares Site Evaluation Reports. For more details on the assumptions refer to section 4.3 of the Work Package 3 Report: <i>Multi-site Preliminary Technical Evaluation of Site Suitability for Geology, soil conditions and deep foundations (PR00/003/FR-001)</i>. Section is also presented in Appendix A2.</p>		
<p><b>Simplified section through nuclear island and showing foundation levels</b></p>	<p><b>NOT TO SCALE</b></p> <p>Notes: NI: Nuclear Island CI: Conventional Island</p>		
Criteria	Score (RAG)	Weighting	Weighted score
<b>NI Foundation Suitability</b>			
Rigid Inclusions	5	2	10
Open battered excavation	3	1	3
<b>Ground risks</b>			
Liquefaction	5	3	15
Ground variability	5	2	10
<b>Total weighted score = 38</b>			
<b>Confidence Level of Ground model (RAG)</b>			
Limited but adequate: At least two deep BHs/CPTs 30m apart and up to 25m depth within the footprint of the site boundary			
<b>Financial impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for execution of the foundations is estimated to be Class 1 (Low) based on the ranges identified by KGG (See section 5.4 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/003/FR-001)</li> </ul>			
<b>Time impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for execution of the foundations is estimated to be Class 2 (Medium) based on the ranges identified by KGG (See section 5.3 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Technical Feasibility Report (Ref: PR00/003/FR-001)</li> </ul>			
<b>Key risk</b>			
<ul style="list-style-type: none"> <li>Proximity of existing Gas Power Plant may complicate temporary excavation works.</li> <li>Presence of glauconitic sands (NUBR), with associated uncertainties in soil behaviour under load.</li> <li>Open battered excavation presents challenges due to granular slope conditions and hydraulic connectivity with the sea.</li> </ul>			

**Title: Sloegebiet 2 Technical Factsheet**

Design Basis Flood Level and Platform							
<b>Schematic Typical Section</b>							
<b>Static earthworks quantities</b>	<b>Topsoil stripping (BCM) – m<sup>3</sup></b>	<b>Bulk earthworks Excavation (BCM) - m<sup>3</sup></b>	<b>Import (BCM) - m<sup>3</sup></b>	<b>Available Fill (CCM) - m<sup>3</sup></b>	<b>Required filling (CCM) - m<sup>3</sup></b>	<b>Balance - m<sup>3</sup></b>	<b>Required landscaping (CCM) - m<sup>3</sup></b>
	-	961,000	1,042,000	1,920,000	1,920,000	-	931,000
	Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters						
<b>Criteria</b>	<b>RAG</b>		<b>Weighting</b>		<b>Overall Risk rating</b>		
<b>Groundwater</b>							
Groundwater control requirements	2		3		6		
<b>Earthworks logistics</b>							
Logistics (Accessibility and plant movement)	9		1		9		
Area for stockpiling	8		1		8		
Temporary works area	8		2		16		
<b>Earthworks design</b>							
Earthworks re-use potential	6		2		12		
Contaminated soils risk	5		2		10		
<b>Onsite constraints</b>							
Existing utilities	3		1		3		
Existing structures	5		1		5		
<b>Total Weighted score = 69</b>							
<b>Financial impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 (Medium) based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001)</li> </ul>							
<b>Time impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 3 (High) based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001)</li> </ul>							
<b>Key risk</b>							
<ul style="list-style-type: none"> <li>Earthworks re-use – Industrial legacy land use not favourable for earthworks re-use.</li> <li>Existing structures:                             <ul style="list-style-type: none"> <li>Existing Gas-Powered Plant to SE; and,</li> <li>Historical Power Plant onsite – could have retained buried foundations/utilities etc.</li> </ul> </li> </ul>							

**Title: Sloegebied 2 Technical Factsheet**

<b>Overall Scoring summary (PR00/003/FR-001 &amp; PR00/006/FR-001)</b>	
<b>Total score</b>	<b>107</b>
<b>Total number of Red (High risk) criteria</b>	<b>3</b>
<b>Total number of Amber (Medium risk) criteria</b>	<b>6</b>
<b>Total number of Green (Low risk) criteria</b>	<b>3</b>

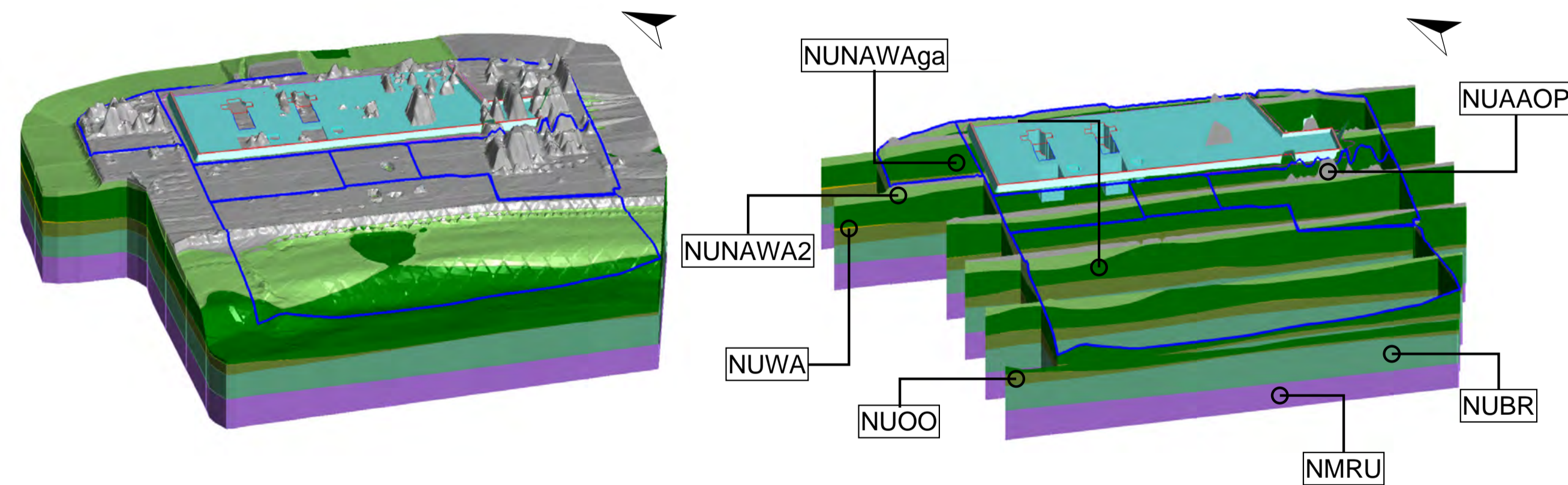
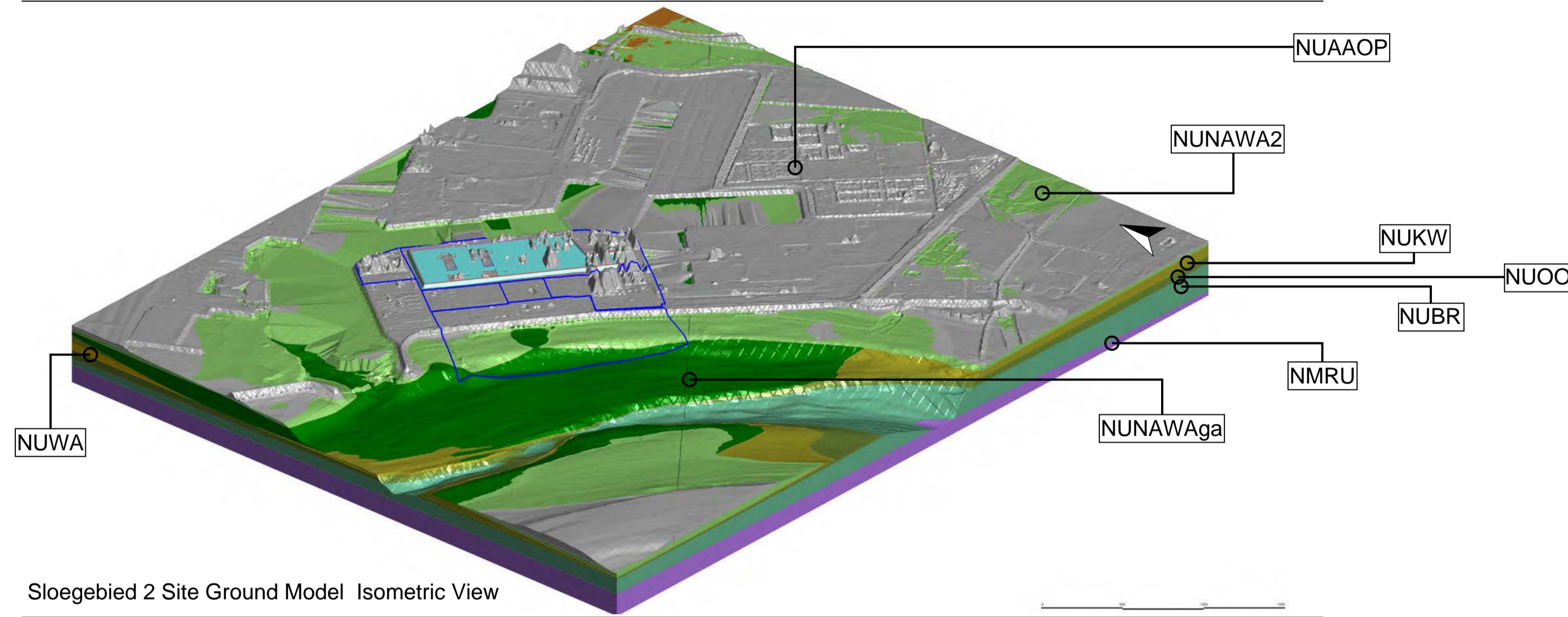
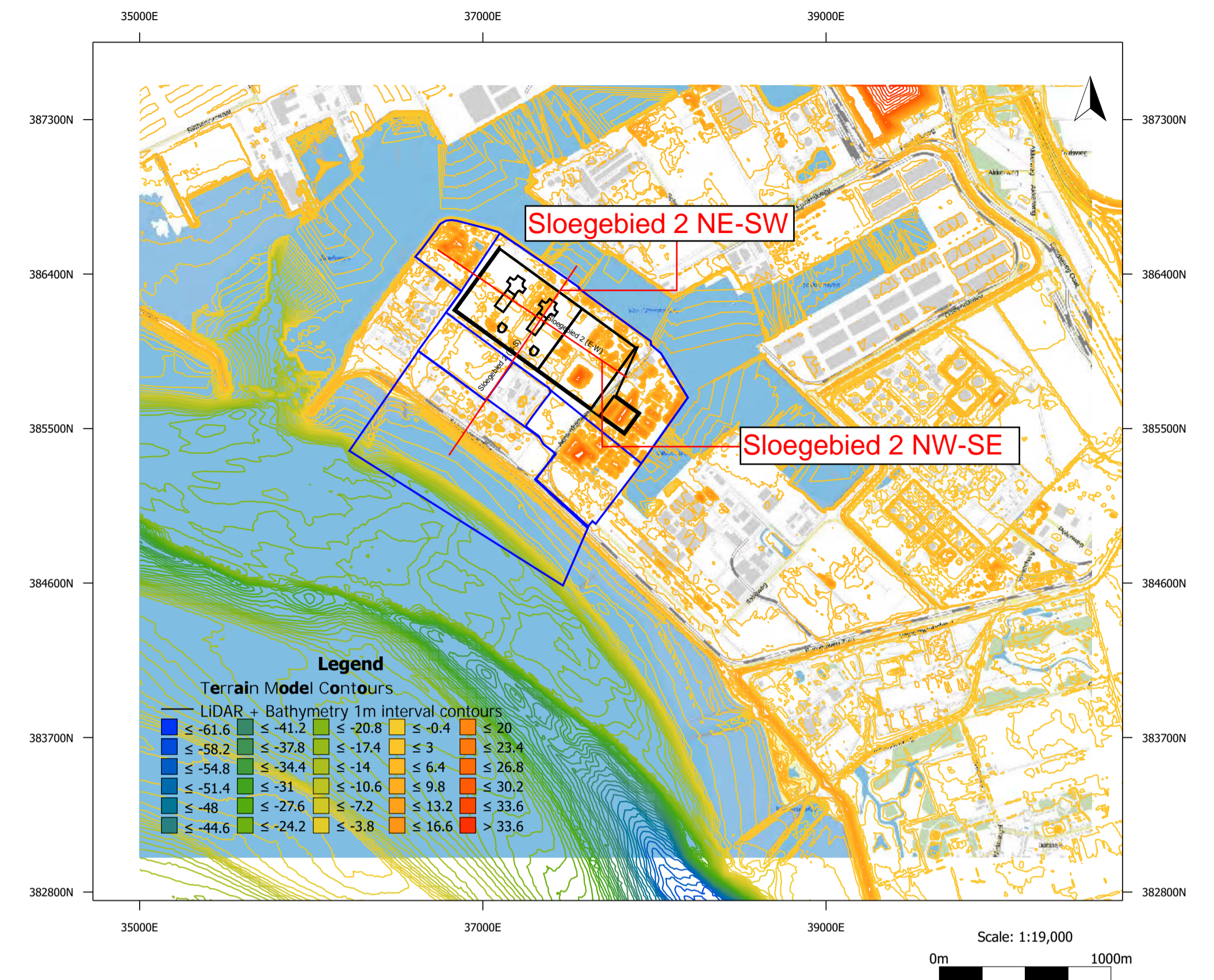
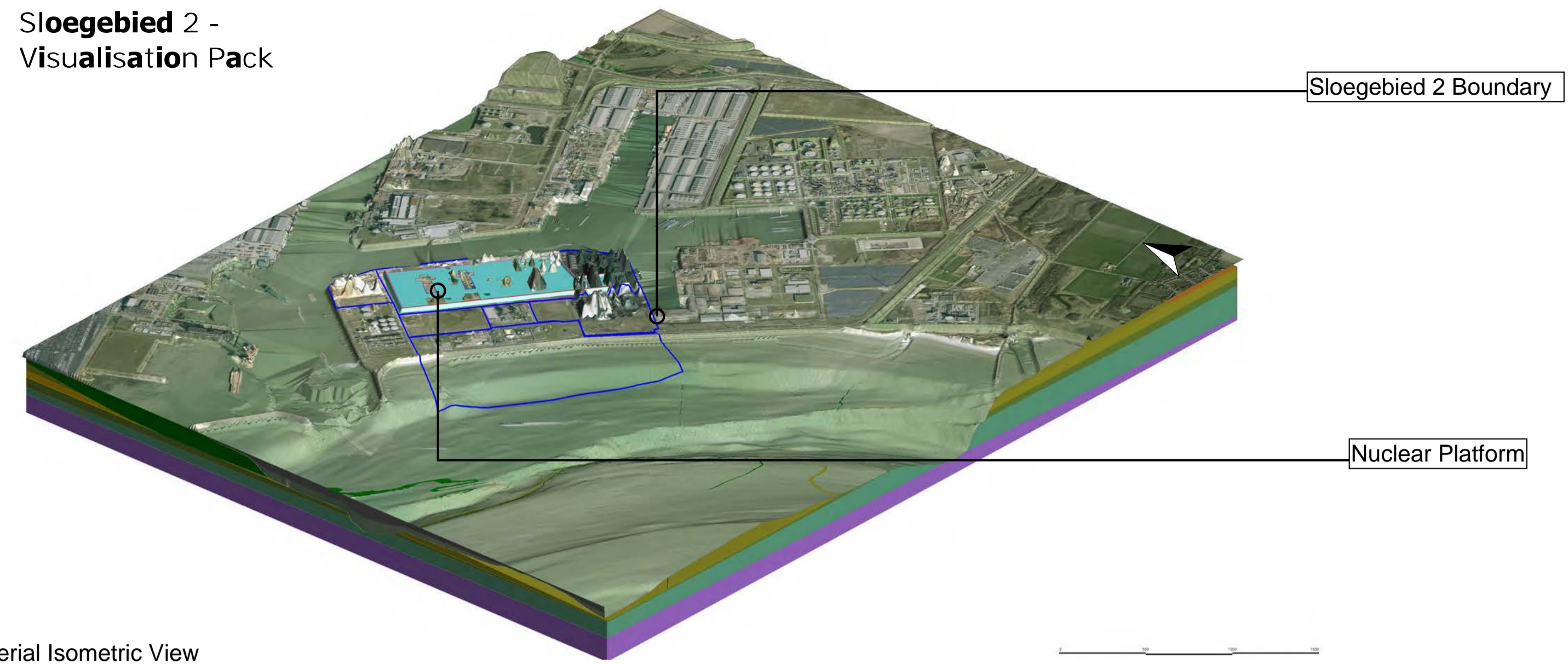
# APPENDIX A2

Units geological map	
<b>Holocene units</b>	
d Coastal dune sand	ds dg
s Beach and foreshore deposits	s
g Tidal channel deposits	g
o Tidal deposits	o ovg* ovo* oo*
<p><i>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</i></p>	
<b>Pleistocene and older units (onshore and at base of tidal channels)</b>	
BX1-4 Various glacial (aeolian) sand units (Boxtel Fm)	BX1 BX2 BX3 BX4
SY Middle Pleistocene sandy fluvial sediments (Stramproy Fm)	SY
WA Early and Middle Pleistocene fluvial sediments (Waalre Fm)	WA
MO Plio-Pleistocene coastal and shallow-marine sands (Maassluis and Oosterhout formations)	MO
BR Miocene fine shallow-marine glauconite sands (Breda Fm)	BR
RTD Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD
<b>Pleistocene and older units (offshore underneath Holocene marine deposits)</b>	
KR2 Coarse-grained Late Pleistocene fluvial deposits	KR2
EE2 Open marine sandy and shell-rich Last Interglacial sediments.	EE2
RTD Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD

# Sloegbied Plan View



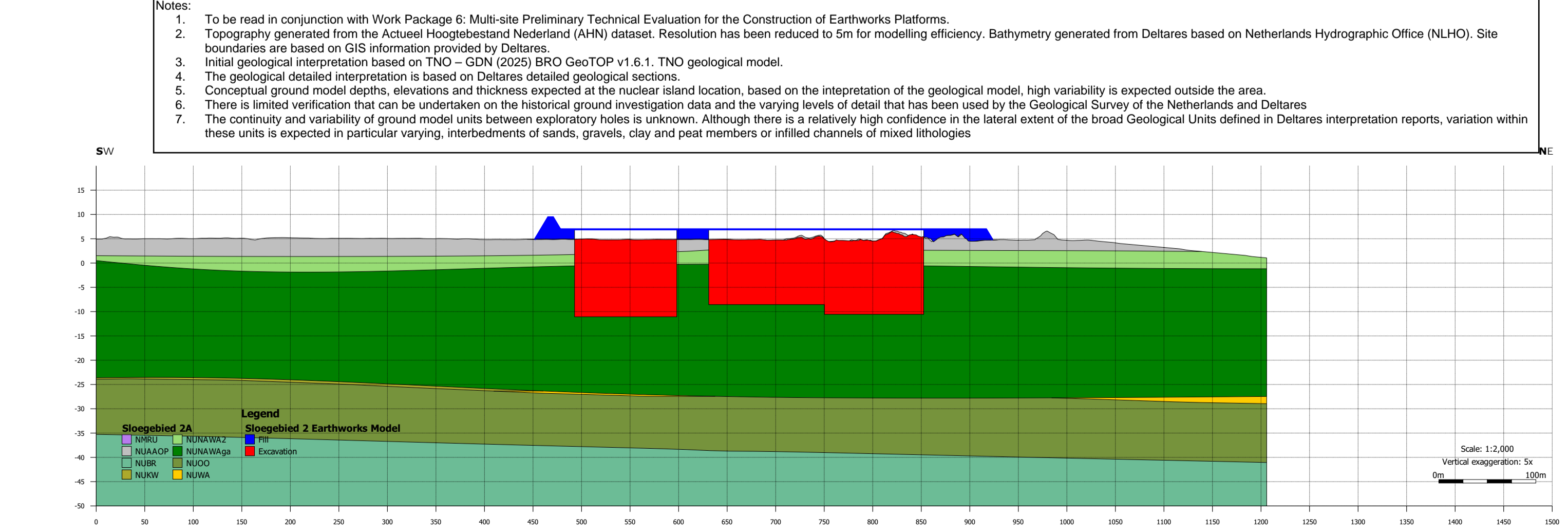
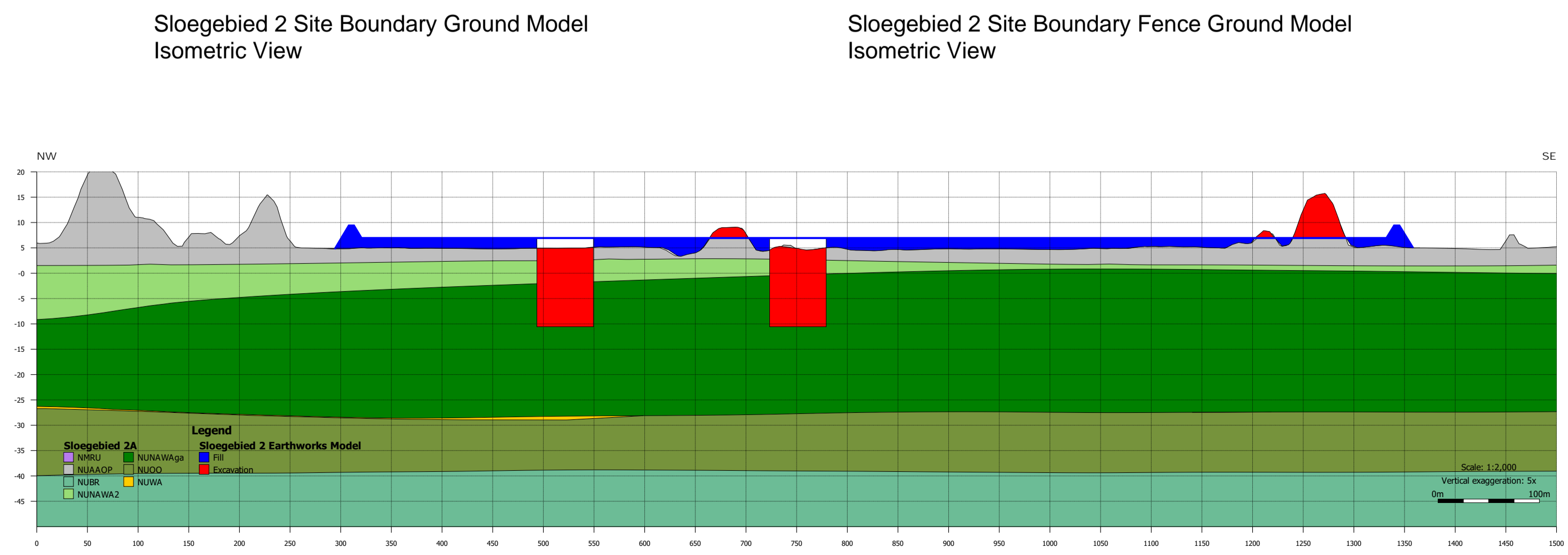
Sloegebied 2 - Visualisation Pack



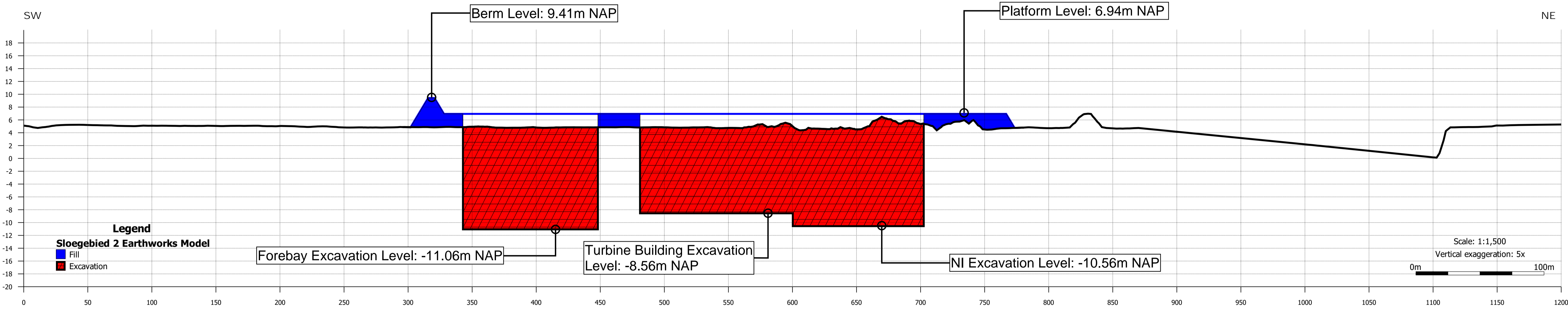
Geological Code	Formation Name	Description	Depth Top (m bg)	Depth Base (m bg)	Elevation Top (m NAP)	Elevation Base (m NAP)	Thickness (m)
NUA AOP	Anthropogenic sand	Reworked sand used as engineering fill for land reclamation. Has thin clay layers too	0.0	1.9	4.5	2.6	1.9
NUNAWO	Member of the Naaldwijk Fd	Fine sand, silty, clayey, intercalated silt and clay layers	1.9	4.9	2.6	-0.4	3.0
NUNAWA	n Member of the Naaldwijk Fd	Fine sand, clayey or silty, partly organic	n/a	n/a	n/a	n/a	n/a
NUNAWAga	Tidal sand (channel infill)	Loose and medium dense sands, may be prone to liquefaction	4.9	32.3	-0.4	-27.8	27.4
NUOO	Oosterhout Formation	Light grey to greyish green very fine to medium sand, locally clayey	32.3	43.8	-27.8	-39.3	11.5
NUNI	Niuewkoop Formation	Brown to black peat and other organics	n/a	n/a	n/a	n/a	n/a
NUKW	Koewacht Formation	Greenish grey to light brown fine to medium sand, slightly silty with local shell grit. Generally fining upward	n/a	n/a	n/a	n/a	n/a
NUWA	Waalre Formation	Sacked fining-upward sequences. Grey to greyish white very fine to very coarse sand, micaceous, multi-coloured with reddish particles in coarse fraction, locally gravelly (in lags). Bluish grey to brownish grey clay beds and laminae, silty to sandy, with sporadic peat layers and siderite.	n/a	n/a	n/a	n/a	n/a
NUBR	Breda Formation	Greyish to blackish green very fine to medium sand, silty	43.8	62.6	-39.3	-58.1	18.8
NMRU	Rupel Formation	Dark brown-grey silty clays, rich in pyrite (Part of NM - Middle North Sea Group)	62.6	Not proven	-58.1	Not proven	Not proven

n/a Geological Unit not initially expected immediately beneath the proposed Nuclear Island location


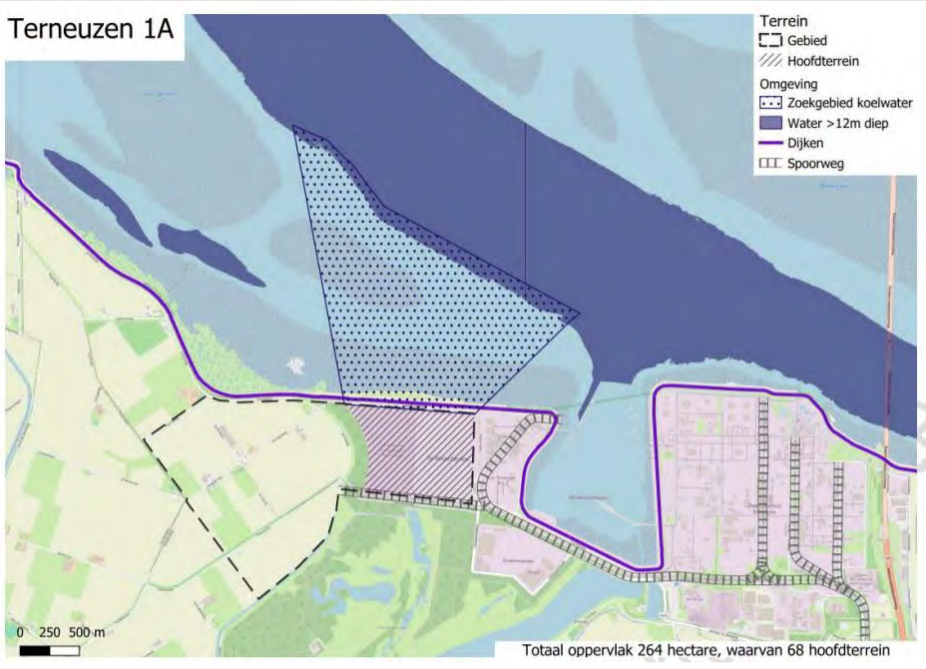
- Notes:
- To be read in conjunction with Work Package 6: Multi-site Preliminary Technical Evaluation for the Construction of Earthworks Platforms.
  - Topography generated from the Actueel Hoogtebestand Nederland (AHN) dataset. Resolution has been reduced to 5m for modelling efficiency. Bathymetry generated from Deltares based on Netherlands Hydrographic Office (NLHO). Site boundaries are based on GIS information provided by Deltares.
  - Initial geological interpretation based on TNO - GDN (2025) BRO GeoTOP v1.6.1. TNO geological model.
  - The geological detailed interpretation is based on Deltares detailed geological sections.
  - Conceptual ground model depths, elevations and thickness expected at the nuclear island location, based on the interpretation of the geological model, high variability is expected outside the area.
  - There is limited verification that can be undertaken on the historical ground investigation data and the varying levels of detail that has been used by the Geological Survey of the Netherlands and Deltares
  - The continuity and variability of ground model units between exploratory holes is unknown. Although there is a relatively high confidence in the lateral extent of the broad Geological Units defined in Deltares interpretation reports, variation within these units is expected in particular varying, interbedments of sands, gravels, clay and peat members or infilled channels of mixed lithologies



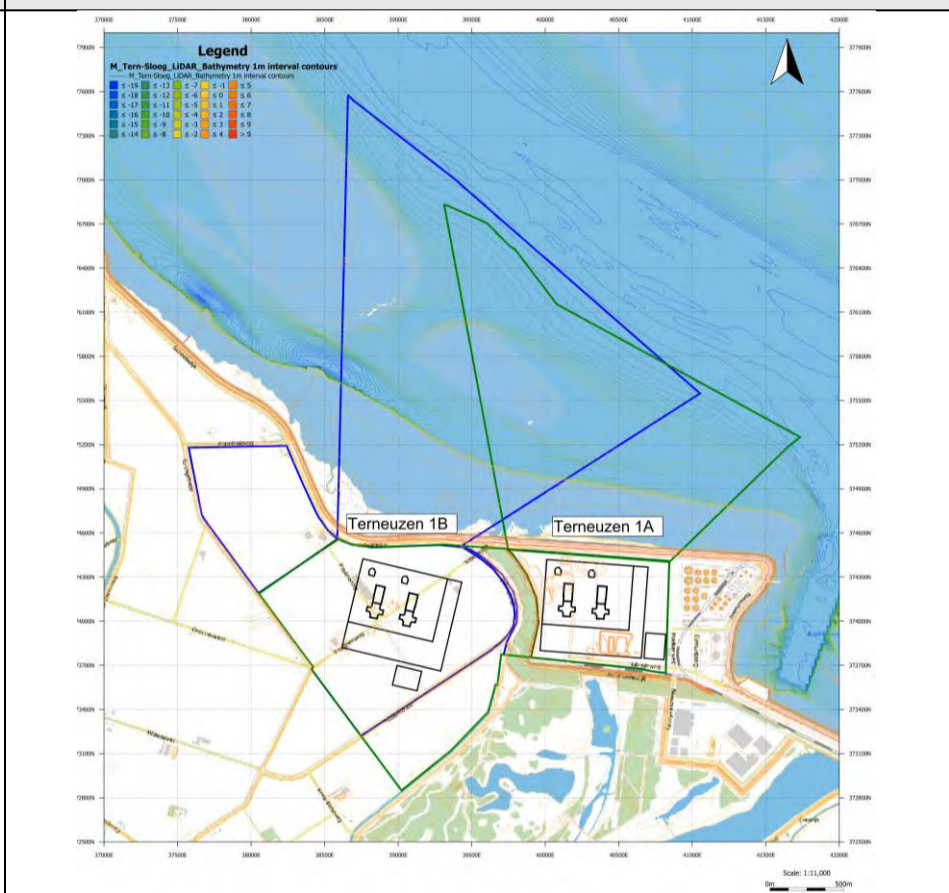
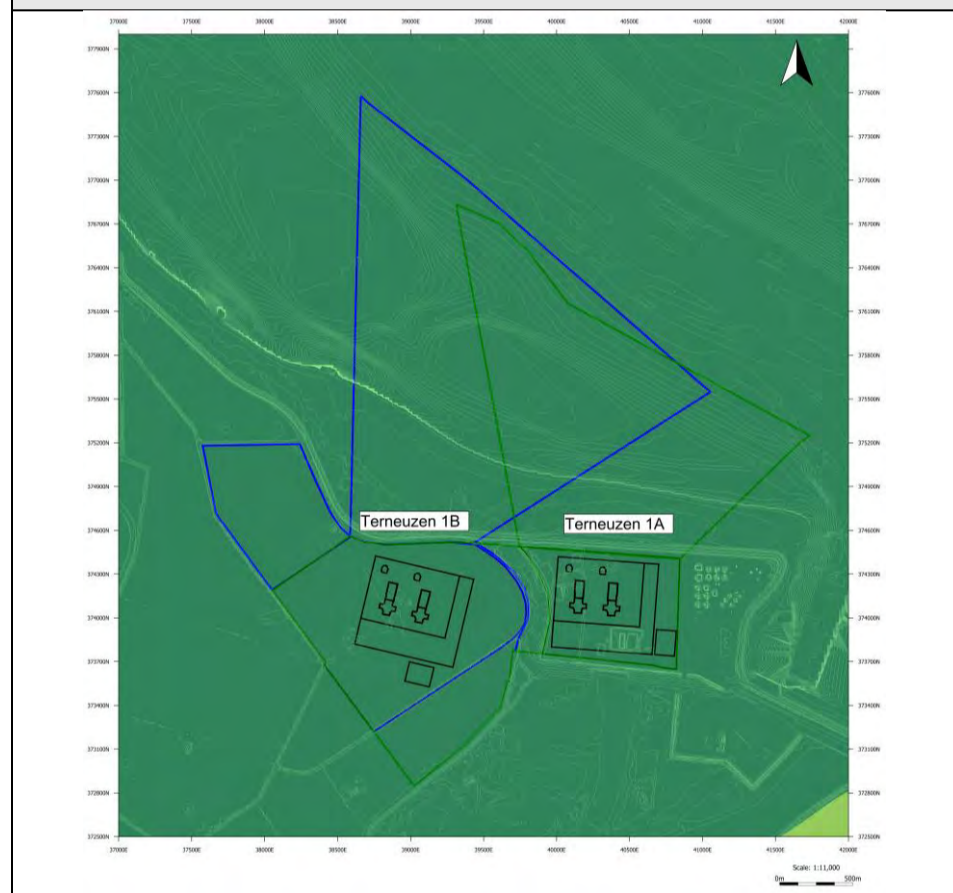
# Slogebied 2 Earthworks Long Section (SW-NE)



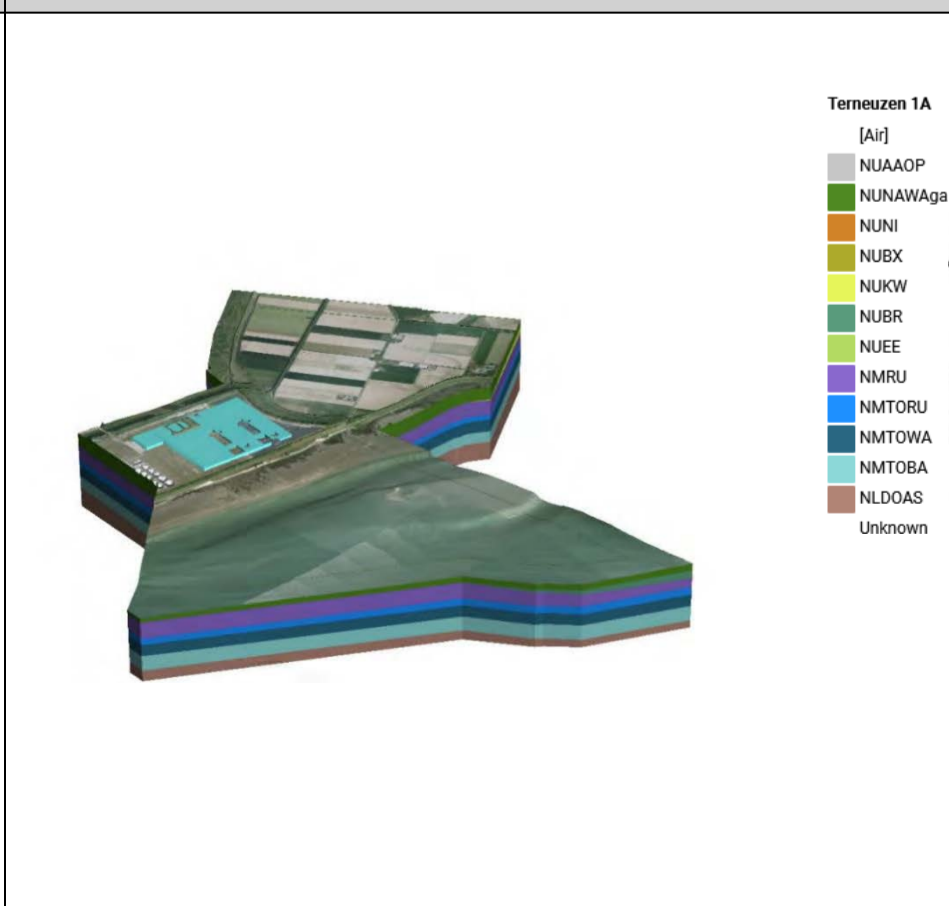
**General Site Information**

<p><b>Location</b></p> 	<p><b>Site Boundary</b></p>  <p>Totaal oppervlak 264 hectare, waarvan 68 hoofdterrein</p>
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**Geology map (Also attached in Appendix A8) | Topography and Bathymetry (Also attached in Appendix A8)**



**Possible Nuclear Power Plant Layout | 3D Fenced Model (including platform)**



Title: Terneuzen 1A Technical Factsheet

Geology, soil conditions and Deep Foundations			
<p><b>Geological cross Sections</b></p>	<p>Note: The geological section has been produced based on Geological Sections provided in the Deltares Site Evaluation Reports. For more details on the assumptions refer to section 4.3 of the Report: <i>Multi-site Preliminary Technical Evaluation of Site Suitability for Geology, soil conditions and deep foundations (PR00/003/FR-001)</i>. Section is also presented in Appendix A8.</p>		
<p><b>Simplified section through nuclear island and showing foundation levels</b></p>	<p>NOT TO SCALE</p> <p>Notes: NI: Nuclear Island CI: Conventional Island</p>		
Criteria	Score (RAG)	Weighting	Weighted score
<b>NI Foundation Suitability</b>			
Rigid Inclusions	7	2	14
Open battered excavation	2	1	2
<b>Ground risks</b>			
Liquefaction	4	3	12
Ground variability	6	2	12
<b>Total weighted score = 40</b>			
<b>Confidence Level of Ground model (RAG)</b>			
Extremely Limited: No BHs/CPTs up to 25m depth within the footprint of the site boundary			
<b>Financial impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for execution of the foundations is estimated to be Class 1 Low based on the ranges identified by KGG (See section 5.4 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/003/FR-001).</li> </ul>			
<b>Time impact classification (Rigid Inclusions as baseline)</b>			
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for execution of the foundations is estimated to be Class 2 Medium based on the ranges identified by KGG (See section 5.3 of PR00/003/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Technical Feasibility Report (Ref: PR00/003/FR-001).</li> </ul>			
<b>Key risks</b>			
<ul style="list-style-type: none"> <li>Limited Ground Investigation.</li> <li>Glaucinitic sands (NMTORU and NMRUBO) with associated uncertainties in soil behaviour under load.</li> <li>Soil parameters are not provided for NMTORU and NMRU.</li> <li>Open battered excavation challenging due to lack of space.</li> </ul>			

Title: Terneuzen 1A Technical Factsheet

Design Basis Flood Level and Platform							
<b>Schematic Typical Section</b>							
<b>Static earthworks quantities</b>	<b>Topsoil stripping (BCM) – m<sup>3</sup></b>	<b>Bulk earthworks Excavation (BCM) - m<sup>3</sup></b>	<b>Import (BCM) - m<sup>3</sup></b>	<b>Available Fill (CCM) - m<sup>3</sup></b>	<b>Required filling (CCM) - m<sup>3</sup></b>	<b>Balance - m<sup>3</sup></b>	<b>Required landscaping (CCM) - m<sup>3</sup></b>
	172,000	839,000	1,242,000	1,976,000	1,976,000	-	797,000
	Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters						
<b>Criteria</b>	<b>RAG</b>		<b>Weighting</b>		<b>Overall Risk rating</b>		
<b>Groundwater</b>							
Groundwater control requirements	6		3		18		
<b>Earthworks logistics</b>							
Logistics (Accessibility and plant movement)	6		1		6		
Area for stockpiling	8		1		8		
Temporary works area	8		2		16		
<b>Earthworks design</b>							
Earthworks re-use potential	5		2		10		
Contaminated soils risk	6		2		12		
<b>Onsite constraints</b>							
Existing utilities	5		1		5		
Existing structures	4		1		4		
<b>Total Weighted score = 79</b>							
<b>Financial impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 Medium based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Time impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 3 High based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Key risks</b>							
<ul style="list-style-type: none"> <li>Existing structures &amp; existing utilities – Solar farm present onsite and adjacent gas tanks.</li> <li>Logistics – limited road access. Likely requires new access roads for construction traffic to access site (if not rail or marine transport).</li> <li>Earthworks re-use – need to confirm suitability of landfill materials.</li> </ul>							

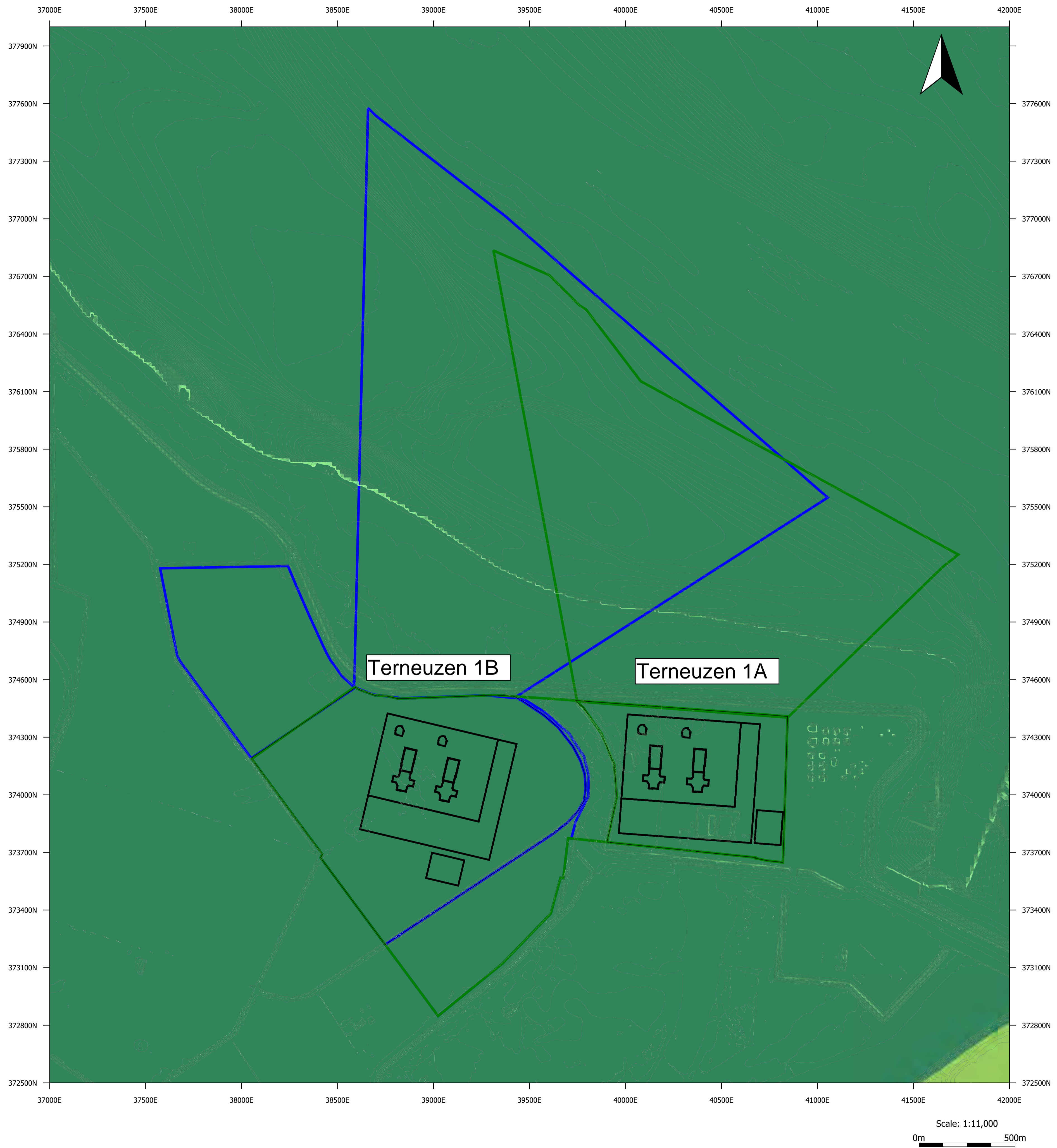
**Title: Terneuzen 1A Technical Factsheet**

<b>Overall Scoring summary (PR00/003/FR-001 &amp; PR00/006/FR-001)</b>	
<b>Total score</b>	<b>119</b>
<b>Total number of Red (High risk) criteria</b>	<b>1</b>
<b>Total number of Amber (Medium risk) criteria</b>	<b>8</b>
<b>Total number of Green (Low risk) criteria</b>	<b>3</b>

# APPENDIX A8

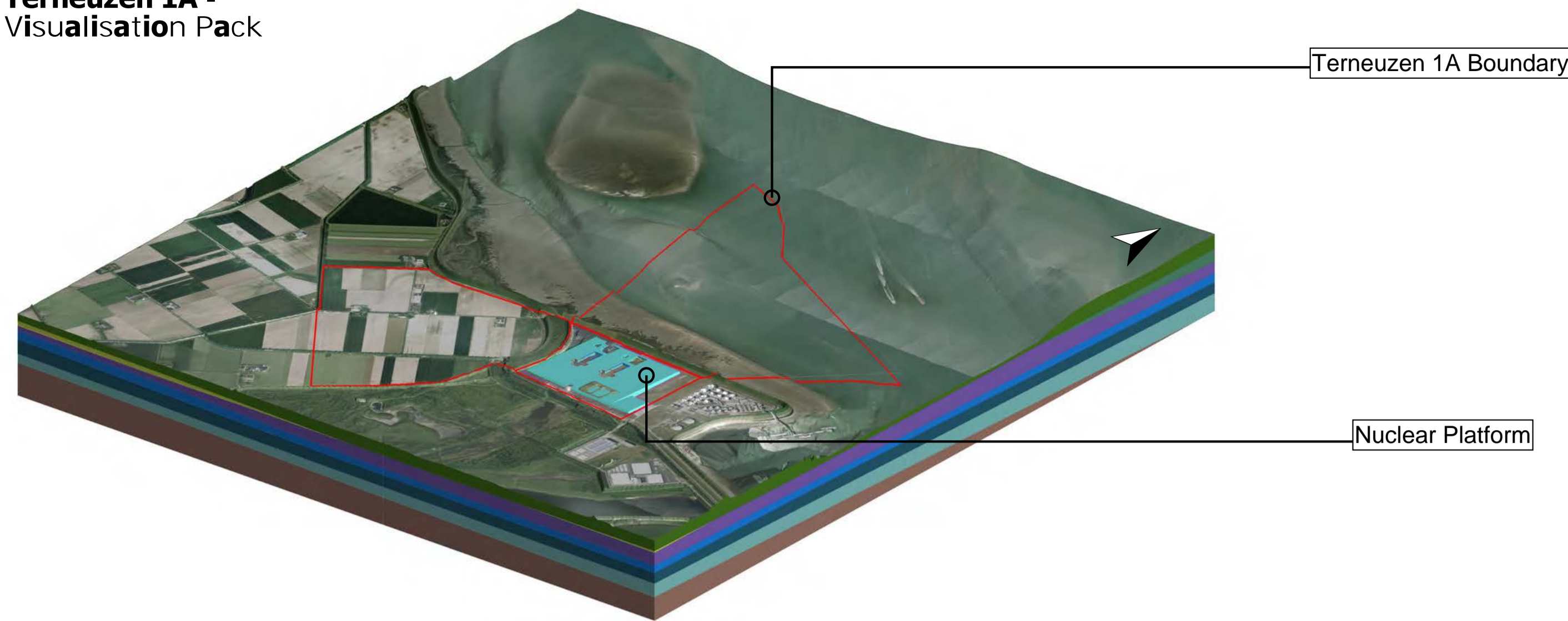
Units geological map	
<b>Holocene units</b>	
d Coastal dune sand	ds dg
s Beach and foreshore deposits	s
g Tidal channel deposits	g
o Tidal deposits	o ovg* ovo* oo*
<p>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</p>	
<b>Pleistocene and older units (onshore and at base of tidal channels)</b>	
BX1-4 Various glacial (aeolian) sand units (Boxtel Fm)	BX1 BX2 BX3 BX4
SY Middle Pleistocene sandy fluvial sediments (Stramproy Fm)	SY
WA Early and Middle Pleistocene fluvial sediments (Waalre Fm)	WA
MO Plio-Pleistocene coastal and shallow-marine sands (Maassluis and Oosterhout formations)	MO
BR Miocene fine shallow-marine glauconite sands (Breda Fm)	BR
RTD Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD
<b>Pleistocene and older units (offshore underneath Holocene marine deposits)</b>	
KR2 Coarse-grained Late Pleistocene fluvial deposits	KR2
EE2 Open marine sandy and shell-rich Last Interglacial sediments.	EE2
RTD Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations)	RTD

# Terneuzen Plan View

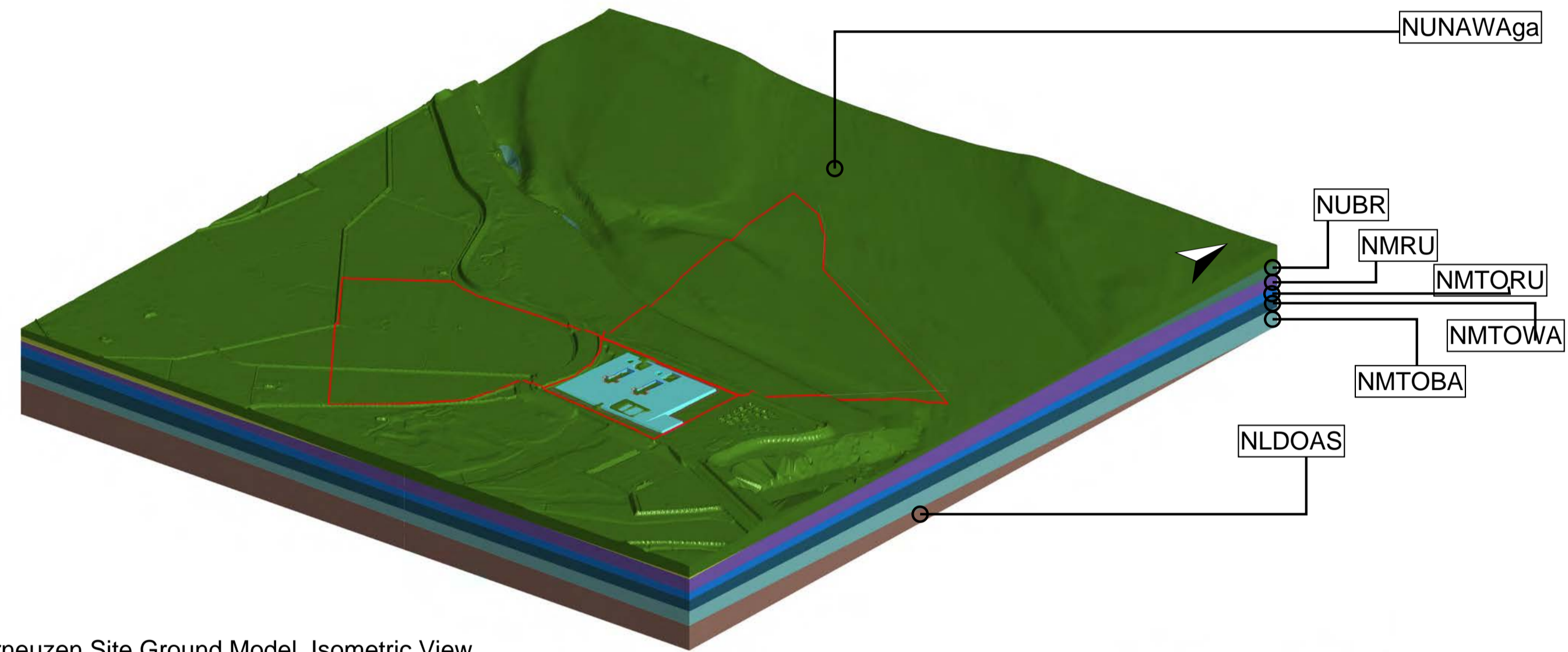


Scale: 1:11,000  
0m 500m

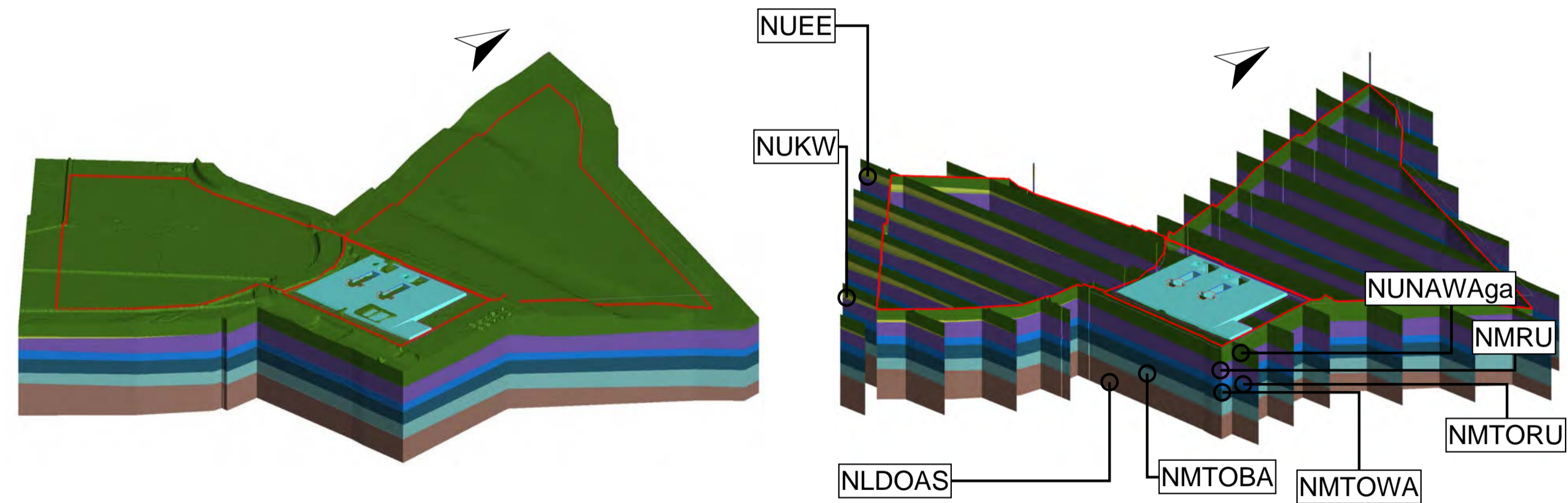
**Terneuzen 1A - Visualisation Pack**



Aerial Isometric View

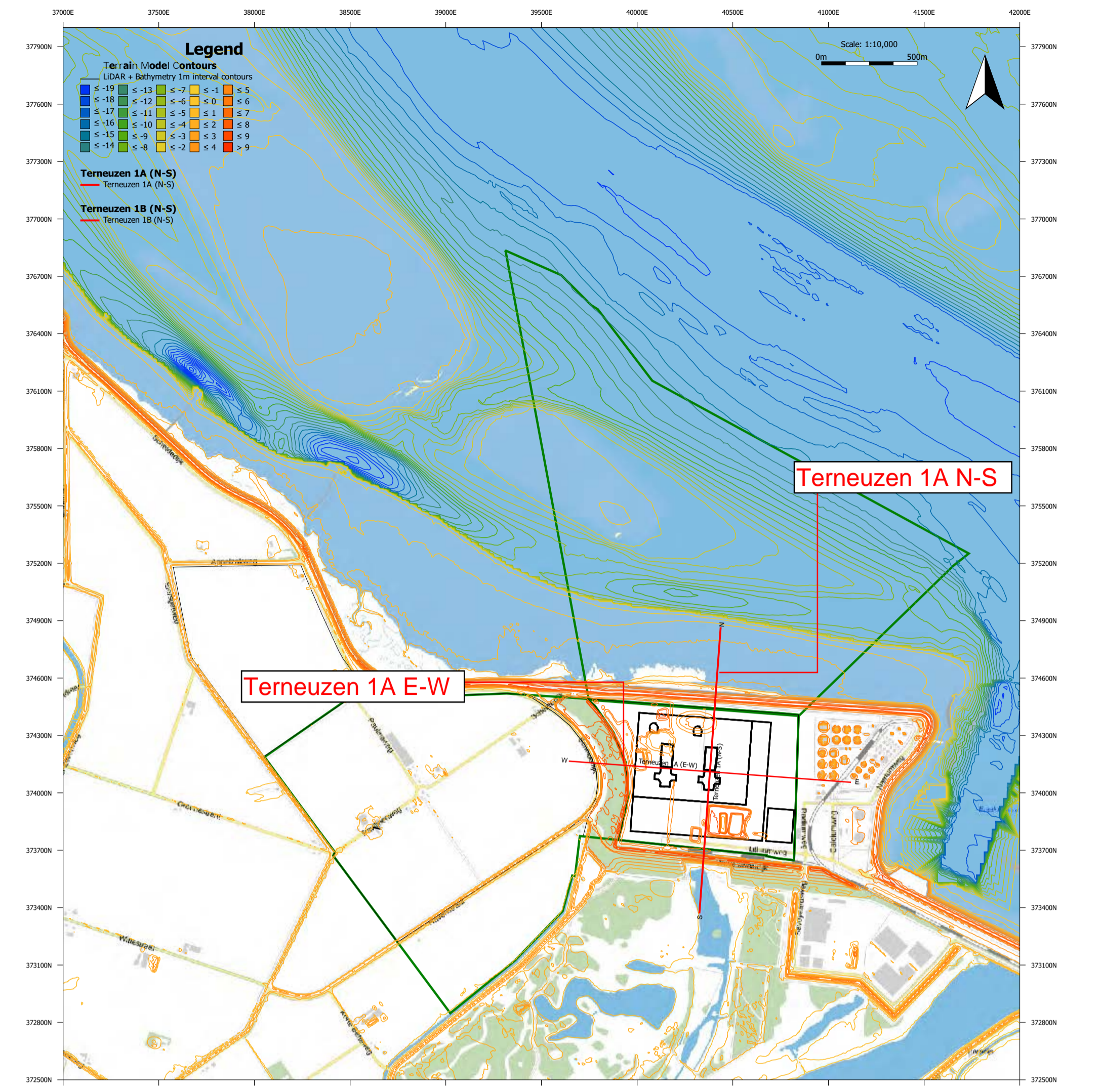
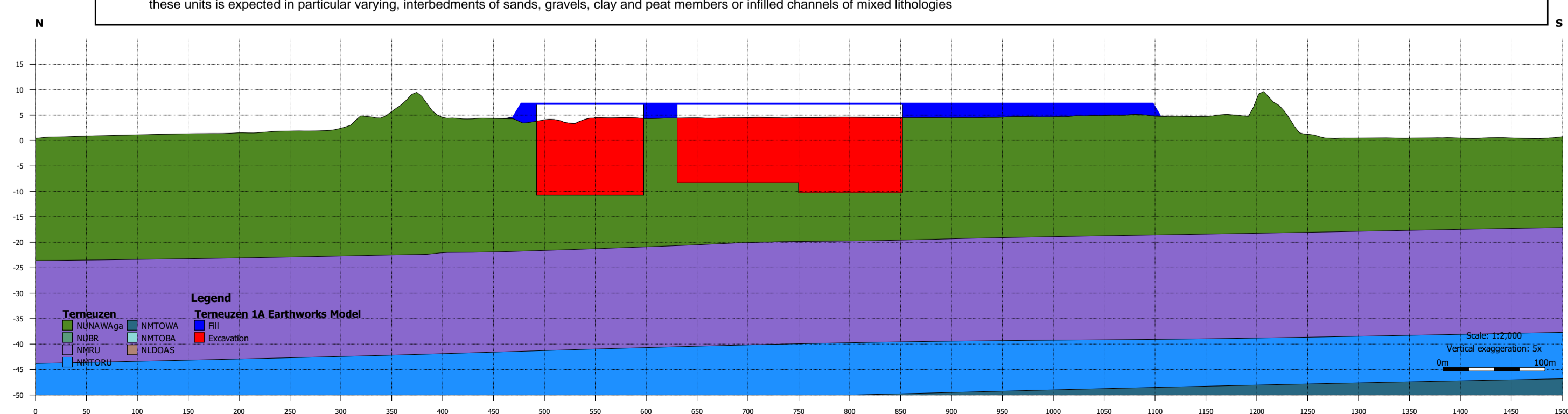
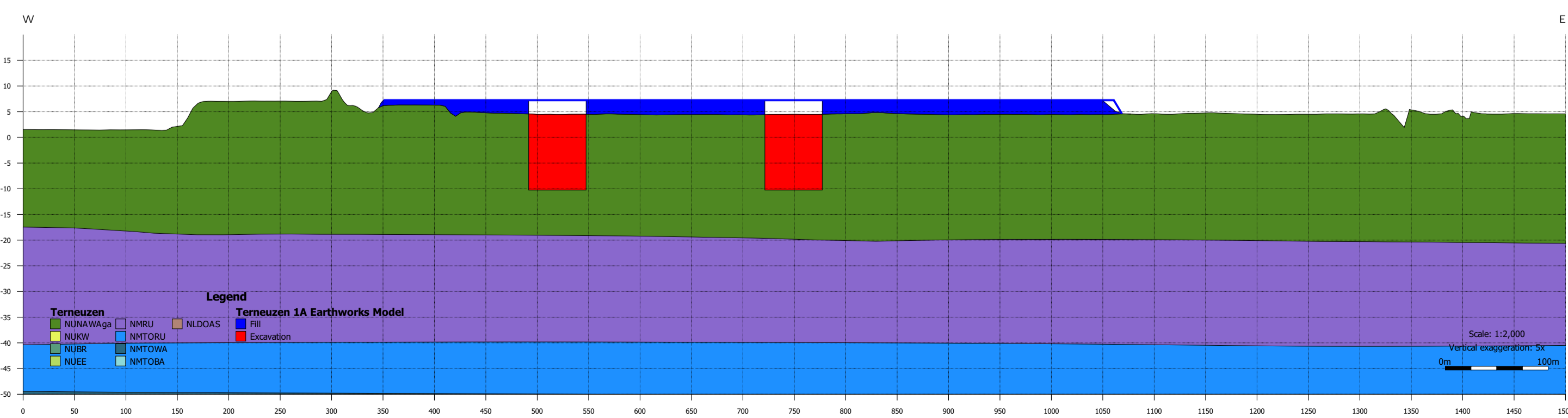


Terneuzen Site Ground Model Isometric View



Terneuzen 1A Site Boundary Ground Model Isometric View

Terneuzen 1A Site Boundary Fence Ground Model Isometric View



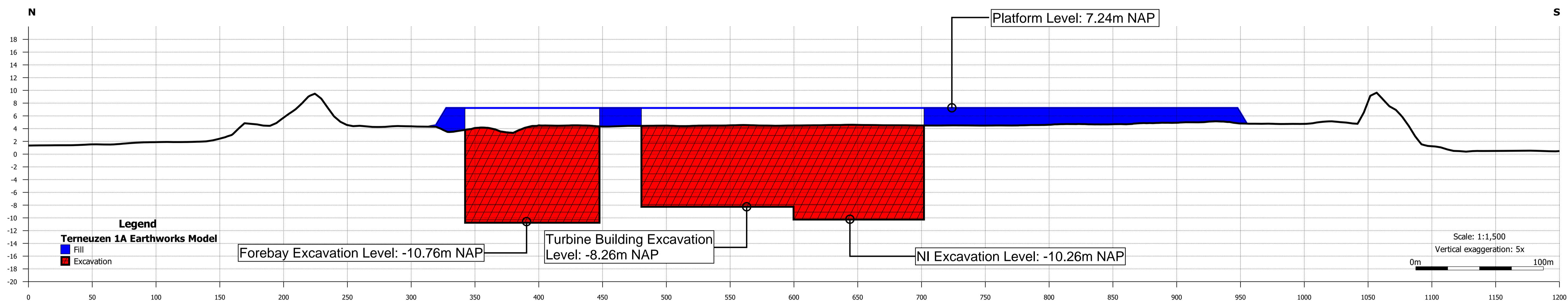
Geological Code	Formation Name	Description	Depth Top (m bg)	Depth Base (m bg)	Elevation Top (m NAP)	Elevation Base (m NAP)	Thickness (m)
NUIAOP	Anthropogenic sand	Reworked sand used as engineering fill for land reclamation. Has thin clay layers too	n/a	n/a	n/a	n/a	n/a
NUNAWaGa	Tidal sand (channel infill)	Loose and medium dense sands, may be prone to liquefaction	0.0	24.3	4.6	-19.7	24.3
NUNI	Niuewkoop Formation	Brown to black peat and other organics	n/a	n/a	n/a	n/a	n/a
NUBX	Boxtel Formation	Light yellow to dark brown very fine to medium sand, silty, some peat and gytja layers	n/a	n/a	n/a	n/a	n/a
PT	Various	Undifferentiated peat horizons	n/a	n/a	n/a	n/a	n/a
NUKW	Koewacht Formation	Greenish grey to light brown fine to medium sand, slightly silty with local shell grit. Generally fining upward	n/a	n/a	n/a	n/a	n/a
NUUE	Eem Formation	Grey fine to medium sand, some clay and silt	n/a	n/a	n/a	n/a	n/a
NUBR	Breda Formation	Greyish to blackish green very fine to medium sand, silty	n/a	n/a	n/a	n/a	n/a
NMRU	Rupel Formation	Dark brown-grey silty clays, rich in pyrite (Part of NM - Middle North Sea Group)	24.3	44.4	-19.7	-39.8	20.0
NMTORU	Ruisbroek Member	Alternating sand and clay layers - noted to have glauconite in Terneuzen report (presumed to be coarser sand as part of NMTO)	44.4	54.6	-39.8	-50.0	10.3
NMTOWA	Watervliet Member	Alternating sand and clay layers (presumed to be coarser sand as part of NMTO)	54.6	70.7	-50.0	-66.1	16.1
NMTOBA	Bassevelde Member	Alternating sand and clay layers (presumed to be coarser sand as part of NMTO)	70.7	87.0	-66.1	-82.5	16.3
NLDOAS	Asse Member	Dark-grey, green and brown, slightly calcareous clays, with an intercalated, glauconitic sand to sandstone body, which grades distally (north and northwest) into a marly unit. The lowermost part of the formation is characterised by tuffaceous clays and silts and is fine-grained (63-210 µm) sandy in a proximal position (mid and southern part NL).	87.0	Not proven	-82.5	Not proven	Not proven

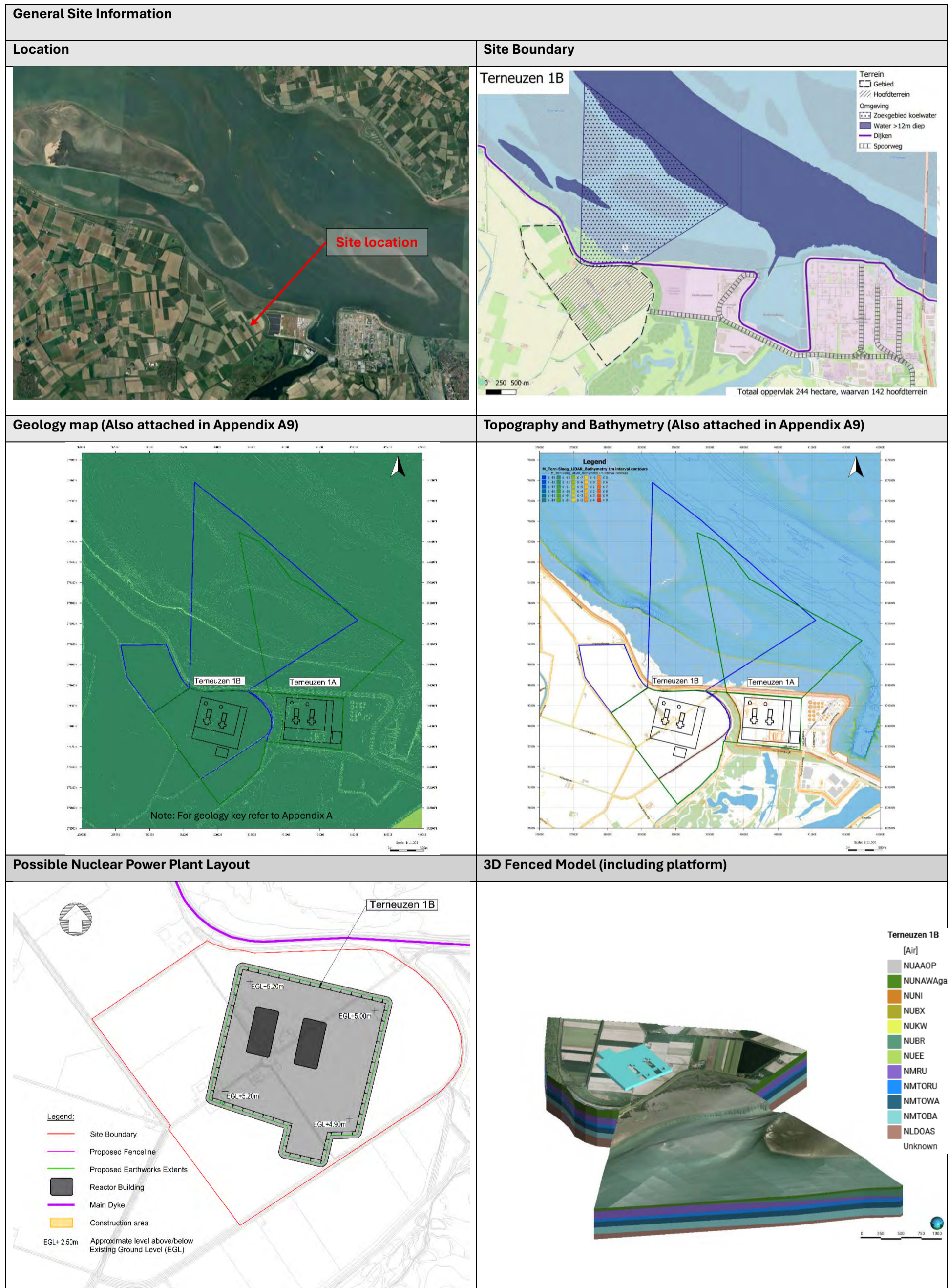
n/a Geological Unit not initially expected immediately beneath the proposed Nuclear Island location

Notes:

- To be read in conjunction with Work Package 6: Multi-site Preliminary Technical Evaluation for the Construction of Earthworks Platforms.
- Topography generated from the Actueel Hoogtebestand Nederland (AHN) dataset. Resolution has been reduced to 5m for modelling efficiency. Bathymetry generated from Deltares based on Netherlands Hydrographic Office (NLHO). Site boundaries are based on GIS information provided by Deltares.
- Initial geological interpretation based on TNO - GDN (2025) BRO GeoTOP v1.6.1. TNO geological model.
- The geological detailed interpretation is based on Deltares detailed geological sections.
- Conceptual ground model depths, elevations and thickness expected at the nuclear island location, based on the interpretation of the geological model, high variability is expected outside the area.
- There is limited verification that can be undertaken on the historical ground investigation data and the varying levels of detail that has been used by the Geological Survey of the Netherlands and Deltares
- The continuity and variability of ground model units between exploratory holes is unknown. Although there is a relatively high confidence in the lateral extent of the broad Geological Units defined in Deltares interpretation reports, variation within these units is expected in particular varying, interbedments of sands, gravels, clay and peat members or infilled channels of mixed lithologies

# Terneuzen 1A Earthworks Long Section (N-S)







Title: Terneuzen 1B Technical Factsheet

Design Basis Flood Level and Platform							
<b>Schematic Typical Section</b>							
<b>Static earthworks quantities</b>	<b>Topsoil stripping (BCM) – m<sup>3</sup></b>	<b>Bulk earthworks Excavation (BCM) - m<sup>3</sup></b>	<b>Import (BCM) - m<sup>3</sup></b>	<b>Available Fill (CCM) - m<sup>3</sup></b>	<b>Required filling (CCM) - m<sup>3</sup></b>	<b>Balance - m<sup>3</sup></b>	<b>Required landscaping (CCM) - m<sup>3</sup></b>
	356,000	839,000	2,879,000	3,531,000	3,531,000	-	797,000
	Notes: BCM = Bank Cubic Meters CCM = Compacted Cubic Meters						
<b>Criteria</b>	<b>RAG</b>		<b>Weighting</b>		<b>Overall Risk rating</b>		
<b>Groundwater</b>							
Groundwater control requirements	4		3		12		
<b>Earthworks logistics</b>							
Logistics (Accessibility and plant movement)	6		1		6		
Area for stockpiling	9		1		9		
Temporary works area	9		2		18		
<b>Earthworks design</b>							
Earthworks re-use potential	7		2		14		
Contaminated soils risk	8		2		16		
<b>Onsite constraints</b>							
Existing utilities	8		1		8		
Existing structures	7		1		7		
<b>Total Weighted score = 90</b>							
<b>Financial impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed, the financial impact classification for the earthworks phase is estimated to be Class 2 Medium based on the ranges identified by KGG (See section 5.6 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Time impact classification</b>							
<ul style="list-style-type: none"> <li>Based on the assessment performed the time impact classification for the earthworks phase is estimated to be Class 3 High based on the ranges identified by KGG (See section 5.5 of PR00/006/FR-001 for classification).</li> <li>Further supporting commentary is provided in the Report (Ref: PR00/006/FR-001).</li> </ul>							
<b>Key risks</b>							
<ul style="list-style-type: none"> <li>Logistics – limited road access. Likely requires new access roads for construction traffic to access site (if not rail or marine transport).</li> <li>Earthworks re-use – risk of peat in excavated material.</li> </ul>							

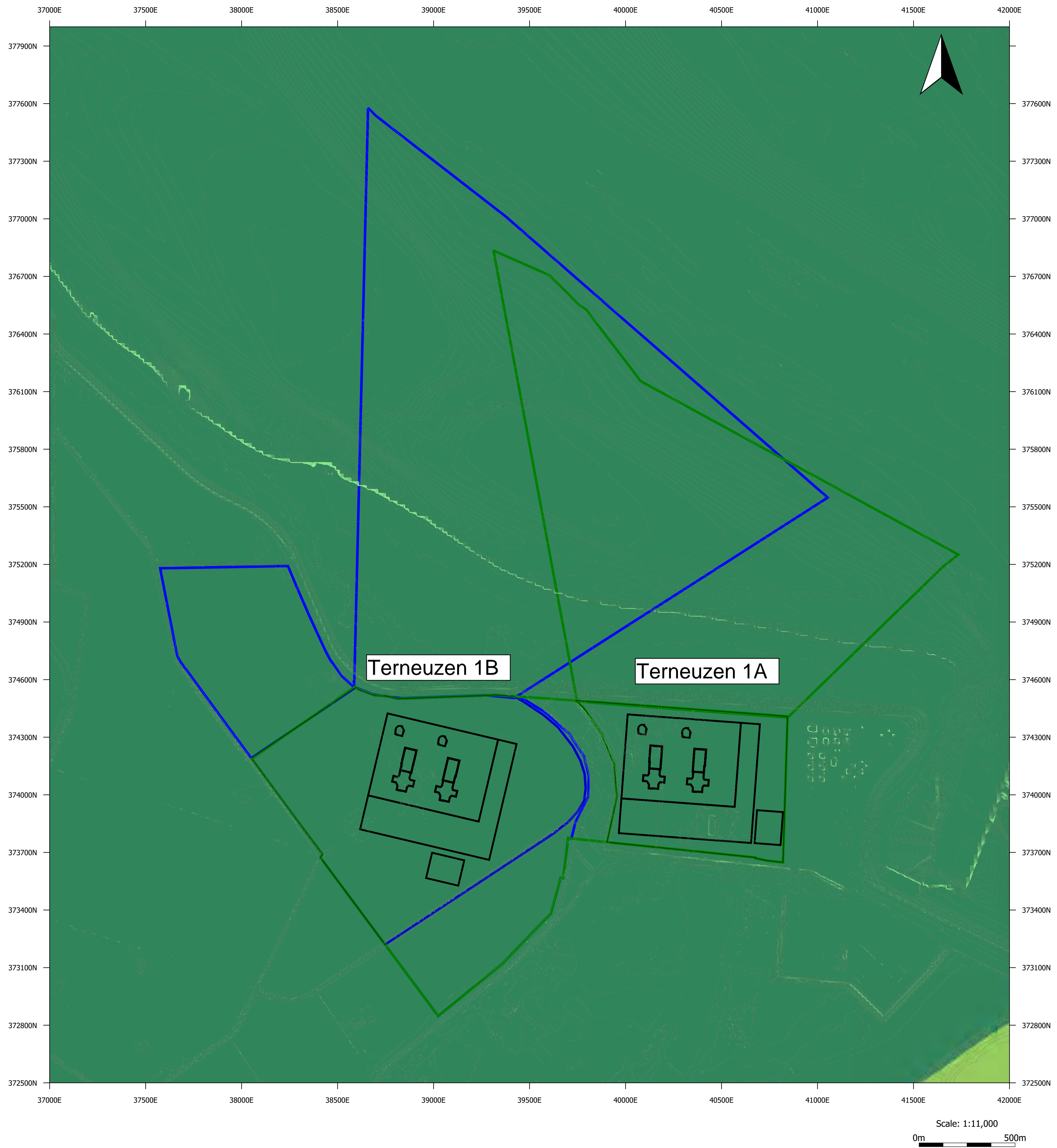
**Title: Terneuzen 1B Technical Factsheet**

<b>Overall Scoring summary (PR00/003/FR-001 &amp; PR00/006/FR-001)</b>	
<b>Total score</b>	<b>133</b>
<b>Total number of Red (High risk) criteria</b>	<b>0</b>
<b>Total number of Amber (Medium risk) criteria</b>	<b>6</b>
<b>Total number of Green (Low risk) criteria</b>	<b>6</b>

# APPENDIX A9

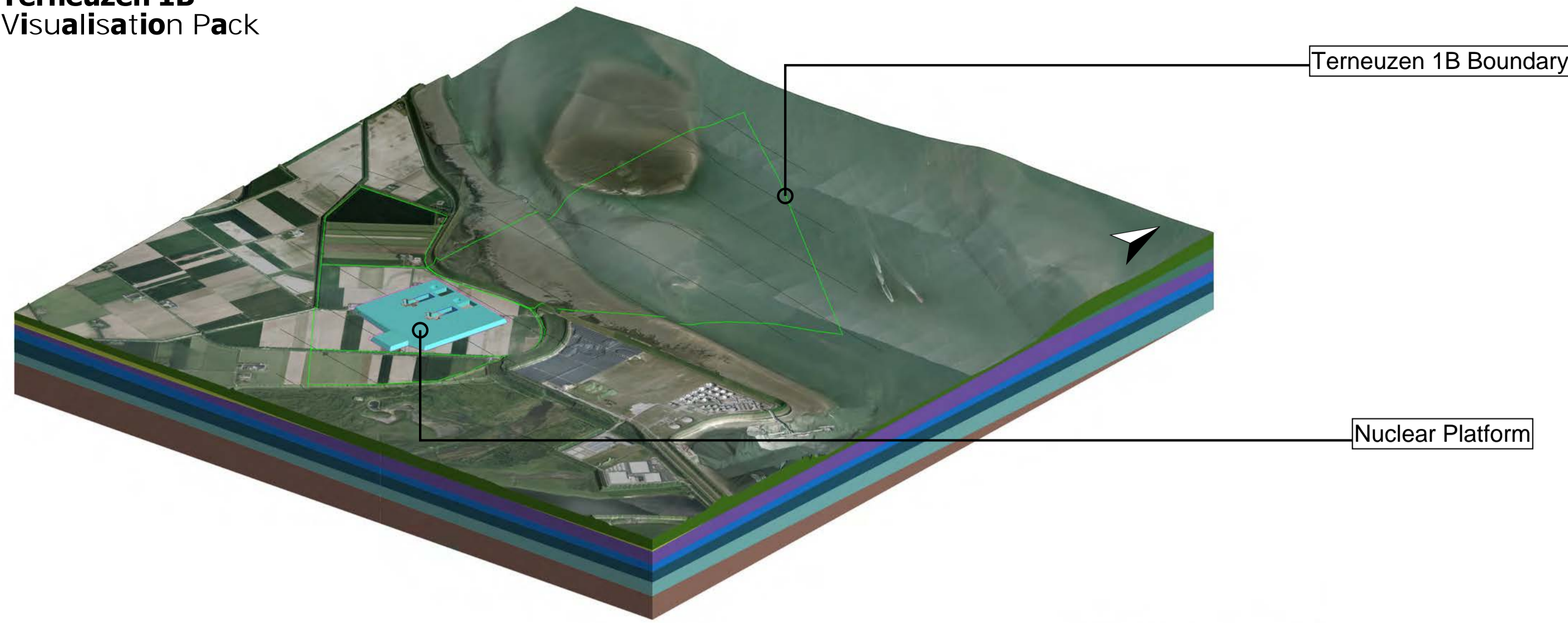
Units geological map	
<b>Holocene units</b>	
d	Coastal dune sand <span style="background-color: yellow;">ds</span> <span style="background-color: yellow;">dg</span>
s	Beach and foreshore deposits <span style="background-color: yellow;">s</span>
g	Tidal channel deposits <span style="background-color: green;">g</span>
o	Tidal deposits <span style="background-color: green;">o</span> <span style="background-color: green;">ovg*</span> <span style="background-color: green;">ovo*</span> <span style="background-color: green;">oo*</span>
<p><i>Note: The order of the letters in the multiletter codes indicates the top-to-bottom stacking order of the deposits. e.g. ds = Coastal dune sand (d) on top of beach and foreshore deposits (s). The star behind a letter indicates that this part of the code (e.g. g in ovg*) represents older Holocene deposits.</i></p>	
<b>Pleistocene and older units (onshore and at base of tidal channels)</b>	
BX1-4	Various glacial (aeolian) sand units (Boxtel Fm) <span style="background-color: yellow;">BX1</span> <span style="background-color: yellow;">BX2</span> <span style="background-color: yellow;">BX3</span> <span style="background-color: yellow;">BX4</span>
SY	Middle Pleistocene sandy fluvial sediments (Stramproy Fm) <span style="background-color: purple;">SY</span>
WA	Early and Middle Pleistocene fluvial sediments (Waalre Fm) <span style="background-color: purple;">WA</span>
MO	Plio-Pleistocene coastal and shallow-marine sands (Maassluis and Oosterhout formations) <span style="background-color: blue;">MO</span>
BR	Miocene fine shallow-marine glauconite sands (Breda Fm) <span style="background-color: red;">BR</span>
RTD	Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations) <span style="background-color: grey;">RTD</span>
<b>Pleistocene and older units (offshore underneath Holocene marine deposits)</b>	
KR2	Coarse-grained Late Pleistocene fluvial deposits <span style="background-color: blue;">KR2</span>
EE2	Open marine sandy and shell-rich Last Interglacial sediments. <span style="background-color: green;">EE2</span>
RTD	Eocene and Oligocene marine and clay-rich sediments (Rupel, Tongeren and Dongen formations) <span style="background-color: grey;">RTD</span>

# Terneuzen Plan View

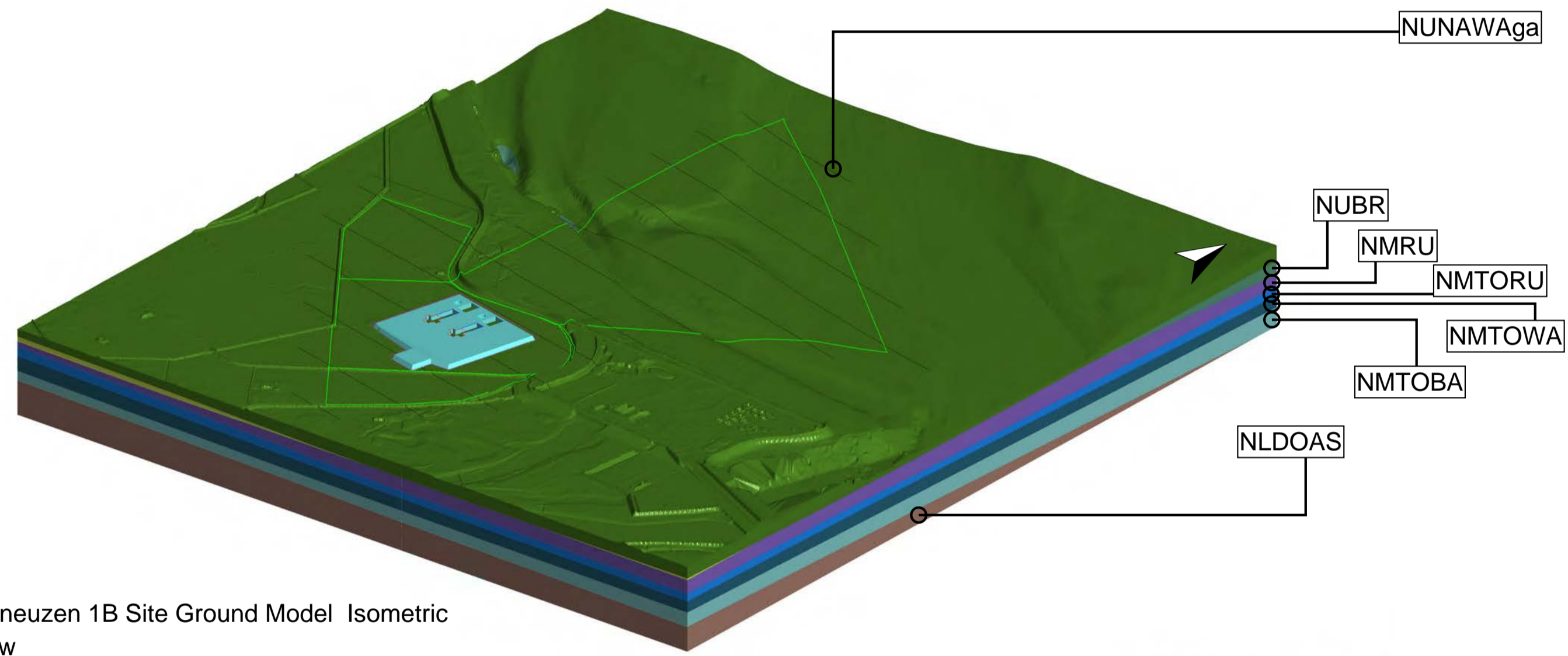


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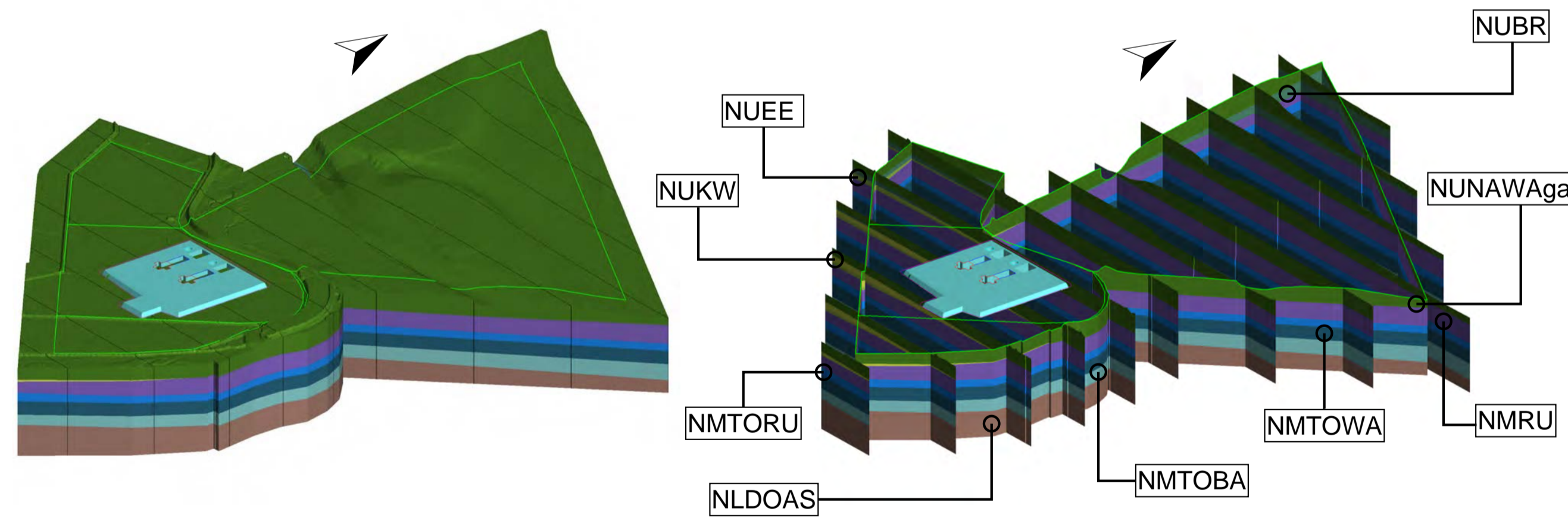
# Terneuzen 1B - Visualisation Pack



Aerial Isometric View

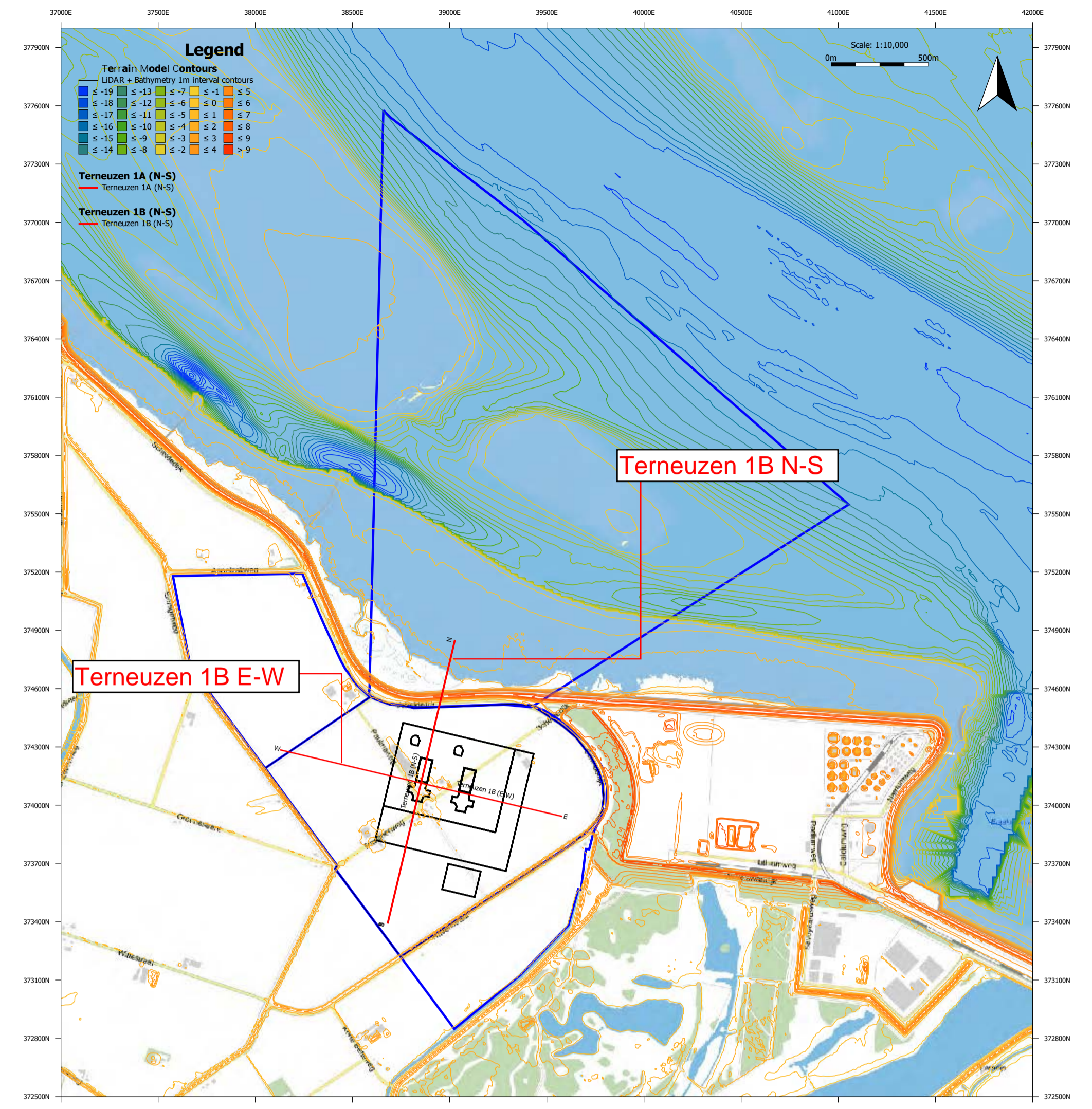


Terneuzen 1B Site Ground Model Isometric View



Terneuzen 1B Site Boundary Ground Model Isometric View

Terneuzen 1B Site Boundary Fence Ground Model Isometric View

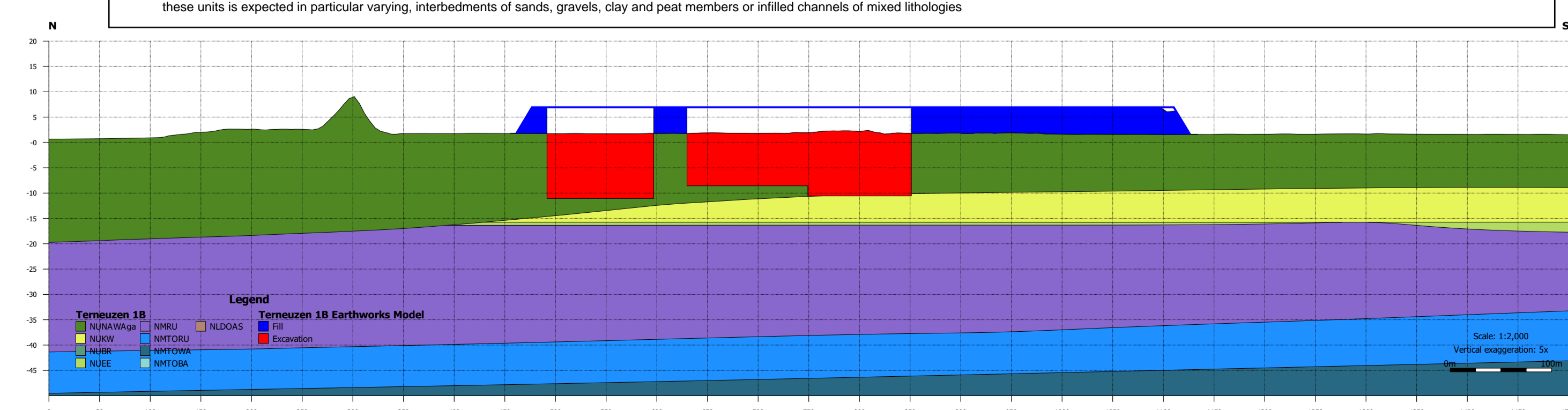
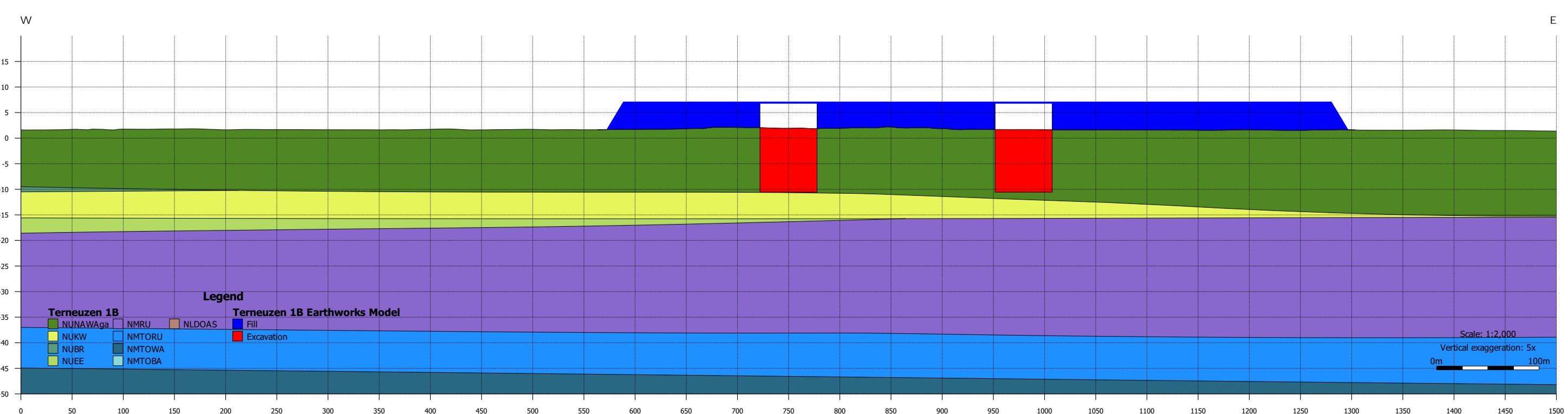


Geological Code	Formation Name	Description	Depth Top (m bg)	Depth Base (m bg)	Elevation Top (m NAP)	Elevation Base (m NAP)	Thickness (m)
NUAOP	Anthropogenic sand	Reworked sand used as engineering fill for land reclamation. Has thin clay layers too	n/a	n/a	n/a	n/a	n/a
NUNAWaGa	Tidal sand (channel infill)	Loose and medium dense sands, may be prone to liquefaction	0.0	12.5	2.2	-10.4	12.5
NUNI	Nieuwkoop Formation	Brown to black peat and other organics	n/a	n/a	n/a	n/a	n/a
NUBX	Boxtel Formation	Light yellow to dark brown very fine to medium sand, silty, some peat and gyttja layers	n/a	n/a	n/a	n/a	n/a
PT	Various	Undifferentiated peat horizons	n/a	n/a	n/a	n/a	n/a
NUKW	Koewacht Formation	Greenish grey to light brown fine to medium sand, slightly silty with local shell grit. Generally fining upward	12.5	17.9	-10.4	-15.8	5.4
NUee	Eem Formation	Grey fine to medium sand, some clay and silt	17.9	18.5	-15.8	-16.3	0.6
NUBR	Breda Formation	Greyish to blackish green very fine to medium sand, silty	n/a	n/a	n/a	n/a	n/a
NMRU	Rupel Formation	Dark brown-grey silty clays, rich in pyrite (Part of NM - Middle North Sea Group)	18.5	40.1	-16.3	-37.9	21.6
NMTORU	Ruisbroek Member	Alternating sand and clay layers - noted to have glauconite in Terneuzen report (presumed to be coarser sand as part of NMTO)	40.1	48.5	-37.9	-46.4	8.5
NMTOWA	Watervliet Member	Alternating sand and clay layers (presumed to be coarser sand as part of NMTO)	48.5	66.0	-46.4	-63.9	17.5
NMToba	Bassevelde Member	Alternating sand and clay layers (presumed to be coarser sand as part of NMTO)	66.0	81.2	-63.9	-79.0	15.2
NLDOAS	Asse Member	Dark-grey, green and brown, slightly calcareous clays, with an intercalated, glauconitic sand to sandstone body, which grades distally (north and northwest) into a marly unit. The lowermost part of the formation is characterised by tuffaceous clays and silts and is fine-grained (63-210 µm) sandy in a proximal position (mid and southern part NL).	81.2	Not proven	-79.0	Not proven	Not proven

n/a Geological Unit not initially expected immediately beneath the proposed Nuclear Island location

Notes:

- To be read in conjunction with Work Package 6: Multi-site Preliminary Technical Evaluation for the Construction of Earthworks Platforms.
- Topography generated from the Actueel Hoogtebestand Nederland (AHN) dataset. Resolution has been reduced to 5m for modelling efficiency. Bathymetry generated from Deltares based on Netherlands Hydrographic Office (NLHO). Site boundaries are based on GIS information provided by Deltares.
- Initial geological interpretation based on TNO - GDN (2025) BRO GeoTOP v1.6.1. TNO geological model.
- The geological detailed interpretation is based on Deltares detailed geological sections.
- Conceptual ground model depths, elevations and thickness expected at the nuclear island location, based on the interpretation of the geological model, high variability is expected outside the area.
- There is limited verification that can be undertaken on the historical ground investigation data and the varying levels of detail that has been used by the Geological Survey of the Netherlands and Deltares
- The continuity and variability of ground model units between exploratory holes is unknown. Although there is a relatively high confidence in the lateral extent of the broad Geological Units defined in Deltares interpretation reports, variation within these units is expected in particular varying, interbedments of sands, gravels, clay and peat members or infilled channels of mixed lithologies



# Terneuzen 1B Earthworks Long Section (N-S)

