Great Yarmouth
Third River Crossing Order 202[*]

Document NCC/GY3RC/EX/099:
Response to Written Submissions from the Environment Agency at Deadline 8

Planning Act 2008

Infrastructure Planning

The Infrastructure Planning (Examination Procedure) Rules 2010

Planning Inspectorate Reference Number: TR010043

Author: Norfolk County Council

Document Reference: NCC/GY3RC/EX/099

Date: 20 March 2020

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Foreword

This Response to the Written Submissions made by the Environment Agency at Deadline 8 relates to an application ('the Application') submitted by Norfolk County Council ('the Council' / 'the Applicant') to the Secretary of State for a Development Consent Order ('DCO') under the Planning Act 2008.

If made by the Secretary of State, the DCO would grant development consent for the construction, operation and maintenance of a new bascule bridge highway crossing over the River Yare in Great Yarmouth, and which is referred to in the Application as the Great Yarmouth Third River Crossing (or 'the Scheme').

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Glossary of Abbreviations and Defined Terms

AEP	Annual Exceedance Probability
DCO	Development Consent Order
The Applicant	Norfolk County Council (in its capacity as Highway Authority and promoter of the Scheme)

1 Introduction

1.1 Purpose of this Report

1.1.1 This response, submitted for Deadline 9 of the Examination, contains the Applicant's responses to the Written Submissions made by the Environment Agency (REP8-004) at Deadline 8, 13th March 2020.

1.1.2 This response provides further details regarding:

- Flood depth difference and extents in the event of a breach of flood defences; and
- The indicative number of properties which may be affected by flooding in the event of a breach of flood defences.

1.1.3 The full methodology and the results of the tidal residual (breach) analysis undertaken by the Applicant to respond to the queries raised by the Environment Agency, as part of the examination process, is detailed in the Applicant's Response to Written Representations submitted by the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003).

2 Flood Depth Difference and Extents

2.1.1 The flood difference figures that the Applicant provided in Appendix A of Applicant's Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003) (Figures 17 to 20) did not extend to the full extent of the area flooded in areas where the flood extent 'with Scheme' extends beyond the 'baseline' flooded extent. This is because the difference values could only be calculated where flooding extents overlap. Hence, in areas where no flooding was simulated in the event, the mapping process reduced the outer extent shown on the figures.

2.1.2 The maximum velocity and flood hazard maps provided in Appendix A of Applicant's Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003) (notably Figures 3 to 16 and 21 to 28) show the full flood extents for both the 'baseline' and the 'with Scheme' events.

2.1.3 The Applicant has therefore prepared a total of eight figures, shown in Appendix A to this Report, which depict maximum flood depths for both the 'baseline' and 'with Scheme' events for the four individual breach locations. The four breach locations are the same breach locations as those analysed previously by the Applicant and shown in Figure 2.1 of Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003).

2.1.4 The Appendix A figures confirm the extent of 'baseline' and 'with Scheme' flooding which match the extents shown in the maximum velocity and flood hazard maps shown in Appendix A of Applicant's Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003) (notably Figures 3 to 16 and 21 to 28).

3 Properties and Tidal Residual (Breach) Flooding

3.1.1 The Applicant has estimated the number of properties flooded as a result of each tidal breach using the Ordnance Survey Address Base Plus[1] dataset and an assumed uniform threshold height of 300 mm for all properties. The 300 mm threshold height for the properties is considered representative of the height above ground level that flood water must reach before entering a property. In order to provide a conservative estimate of the properties affected by flooding, the number of properties does not take account of the proposed demolition of the residential and commercial / business properties which form part of the Scheme (as shown on Figure 14.4 of the Volume III of the Environmental Statement (Document Reference 6.2, Planning Inspectorate Reference APP-170)).

3.1.2 The results for the baseline and with-Scheme are given in Table 3.1.

Table 3.1: Indicative Number of Properties Flooded for each Breach Location

Breach Location	Number of Properties	
	Baseline	With-Scheme
1	115	77
2	31	46
3	21	21
4	44	33

[1]Ordnance Survey (2020). AddressBase. Available at: https://www.ordnancesurvey.co.uk/business-government/products/addressbase procured in May 2018.

4 Conclusion

4.1.1 The figures showing maximum flood depth, as included in Appendix A, do not affect the results or the conclusions drawn in the Applicant's Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003).

4.1.2 The figures show that the extent of the 'baseline' and 'with Scheme' flooding in the event of a breach of the existing flood defences does not change from the maximum velocity and flood hazard figures shown in Figures 3 to 16 and 21 to 28 of Appendix A of the Applicant's Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003).

4.1.3 Table 1 shows that the number of properties flooded as a result of a tidal breach decreases by between 38 and 11 properties for breaches north of the bridge (locations 1 and 4) compared to the baseline as the Scheme acts to obstruct flows.

4.1.4 South of the bridge, there is no change in the number of properties flooded due to a breach at location 3 and an increase of 15 properties due to a breach at location 2. The additional properties flooded for a breach at location 2 are located along South Denes Road and Southgates Road, and in the area where flooding extends north of Queens Road into Blackfriars Road.

4.1.5 In summary, only a breach at location 2 would lead to any increase in properties likely to be flooded as a result of a tidal breach. At all other locations the number of properties affected is likely to decrease or stay broadly the same in the 'baseline' and 'with-Scheme' events. The presence of the Scheme for a breach at Location 1 gives a large reduction to the number properties flooded, from 115 in the 'baseline' to 77 (a reduction of 38 properties with the Scheme).

4.1.6 The breach locations were selected on the basis that each would reflect a reasonable 'worst case' and there was no basis upon which to assume that one location is more likely to breach than others. When viewed collectively the results given in Table 3.1 indicate that overall the 'with-Scheme' compared to the 'baseline' tends to reduce the total number of properties at risk following a tidal breach of the flood defences at the four locations modelled.

4.1.7 The flood hazard classes do not change as a result of the Scheme as explained in the Applicant's Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003).

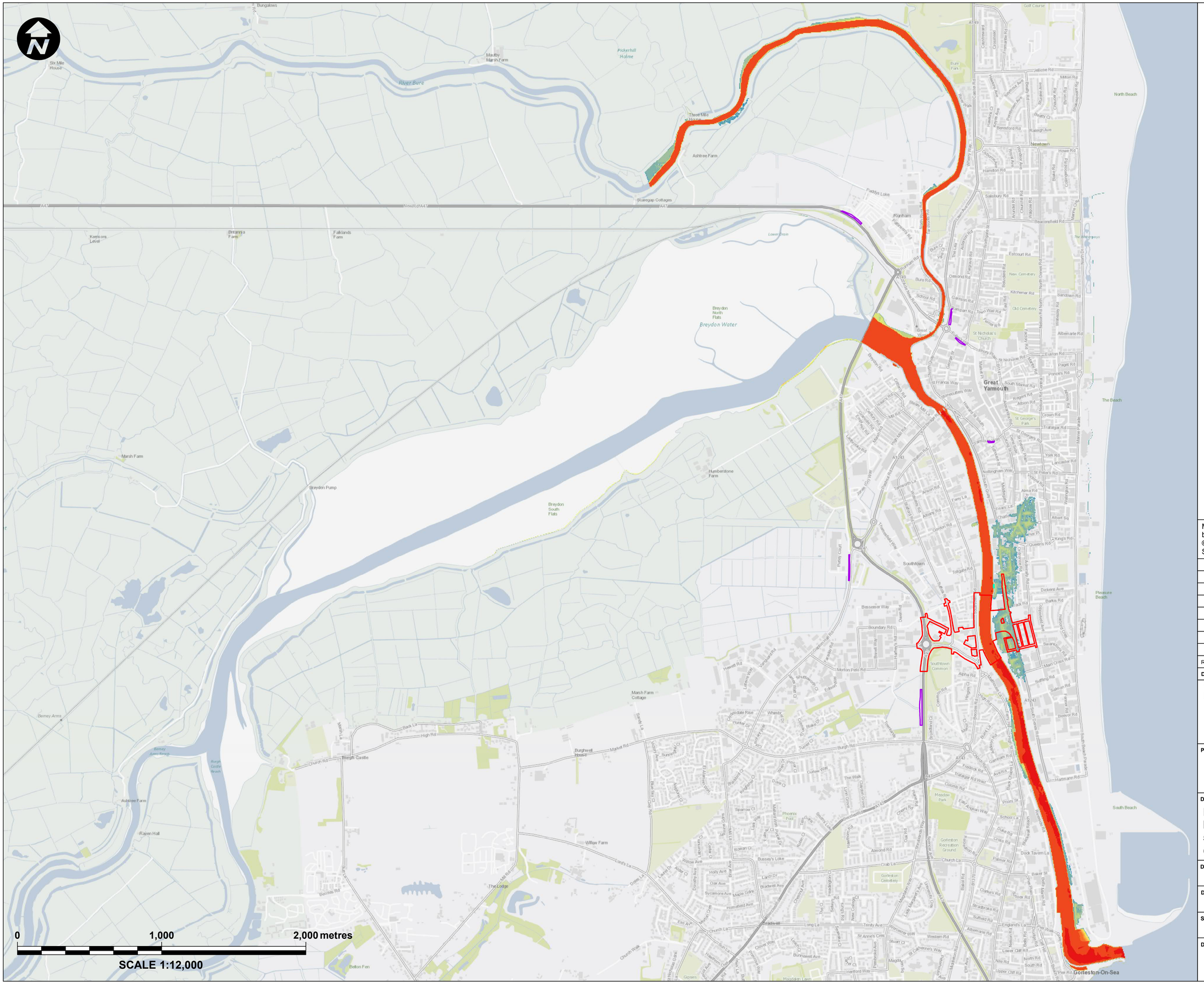
4.1.8 The changes to the numbers of properties affected in the different scenarios modelled, in particular the increase in the number of properties following a breach at location 2, will be addressed through measures identified in the preparation of the Emergency Preparedness and Response Plan, pursuant to Requirement 10 of the draft DCO (Document Reference NCC/GY3RC/EX/090). It should be acknowledged that measures are already in place for properties currently at risk from existing tidal (residual) breach (as shown in Figure 2 of Appendix A to this document) in the 'baseline' event (i.e. without the Scheme). Such measures are documented in the Norfolk Tactical Flood Plan (2018) and the Norfolk Emergency Response Guidance (2016), both produced by the Norfolk Resilience Forum Severe Weather and Flood Risk Group.

4.1.9 The findings are consistent with the Flood Risk Assessment (Document Reference 6.2, Planning Inspectorate Reference APP-135) as the maximum flood depth, maximum velocity and flood hazard remain unchanged. This document purely explains the depth difference figures presented in Appendix A of the Applicant's Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003) and reports the indicative number of properties that are flooded as a result of a tidal breach of the flood defences.

4.1.10 The information provided in this document does not change the conclusions given in the Applicant's Response to Written Representations from the Environment Agency at Deadline 6 (Document Reference NCC/GY3RC/EX/078, Planning Inspectorate Reference REP7-003), specifically, that:

- The results of the tidal (breach) analysis for the 5% AEP event, as presented in Section 3 of the aforementioned document, confirm the judgements made in preparing the Flood Risk Assessment (Document Reference 6.2, Planning Inspectorate Reference APP-135); and
- The tidal (residual) breach risks will be mitigated for in the Emergency Preparedness and Response Plan, pursuant to Requirement 10 of the draft DCO (Document Reference NCC/GY3RC/EX/082, Planning Inspectorate Reference REP7-007).

Appendix A



Key:

- Principal Application Site
- Satellite Application Sites

Maximum Flood Depth (m)

- Less than 0.02
- 0.02 - 0.1
- 0.1 - 0.3
- 0.3 - 0.5
- 0.5 - 1.0
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- Greater than 10

REVISION	DRAWN	CHECKED	APPROVED	DATE

DESCRIPTION

Norfolk County Council
Tom McCabe
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Community and Environmental Services
Norfolk County Council
County Hall, Martineau Lane
Norwich NR1 2SG

PROJECT TITLE

GREAT YARMOUTH THIRD RIVER CROSSING

DRAWING TITLE

FIGURE 1 (APPENDIX A) - BASELINE PRESENT DAY SCENARIO, 5% AEP MODELLED FLOOD DEPTHS (LOCATION 1)

DRAWING STATUS

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NCC/GY3RC/EX/099 - Figure 1

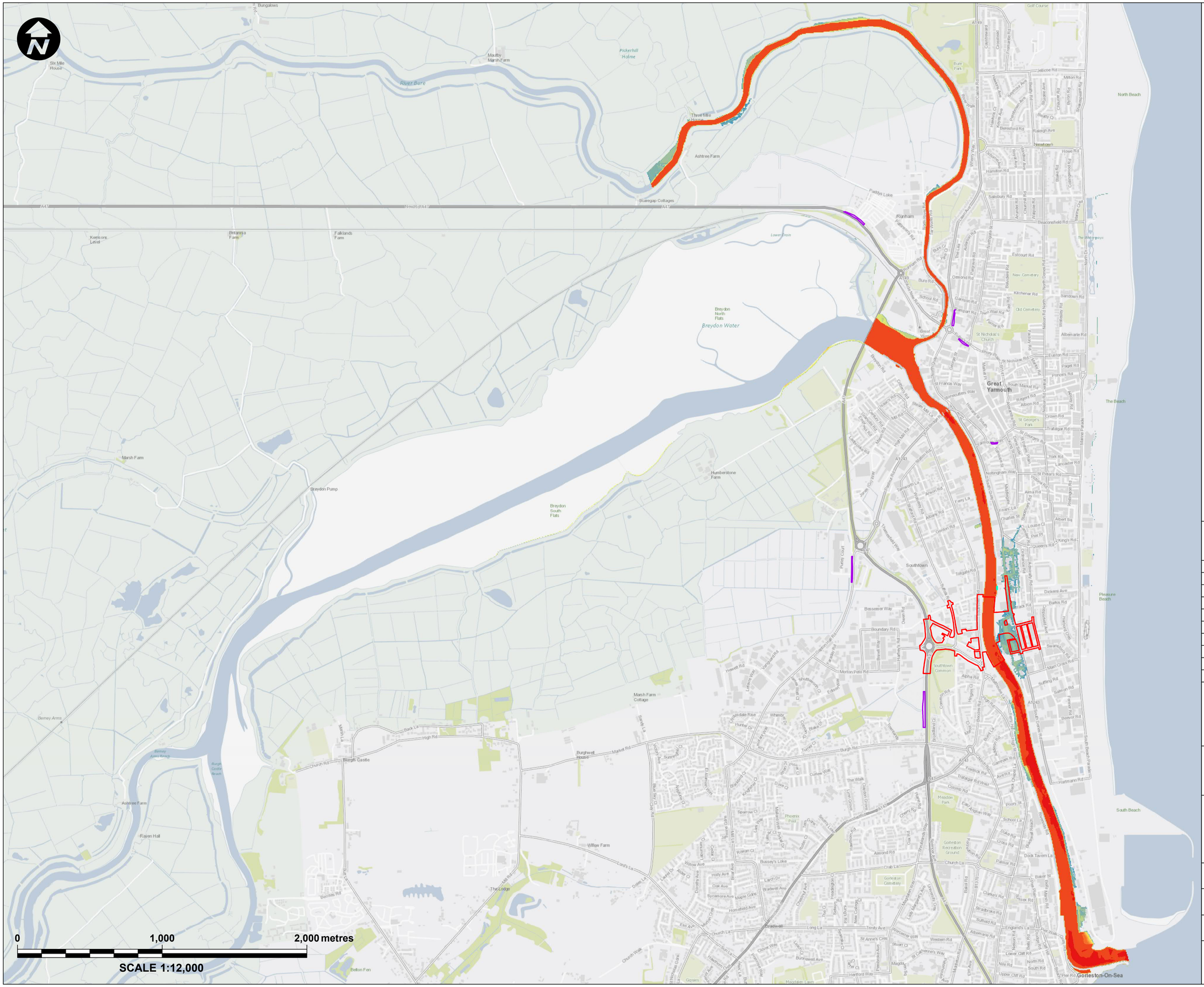

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FIGURE 2 (APPENDIX A) - BASELINE PRESENT DAY SCENARIO, 5% AEP MODELLED FLOOD DEPTHS (LOCATION 2)

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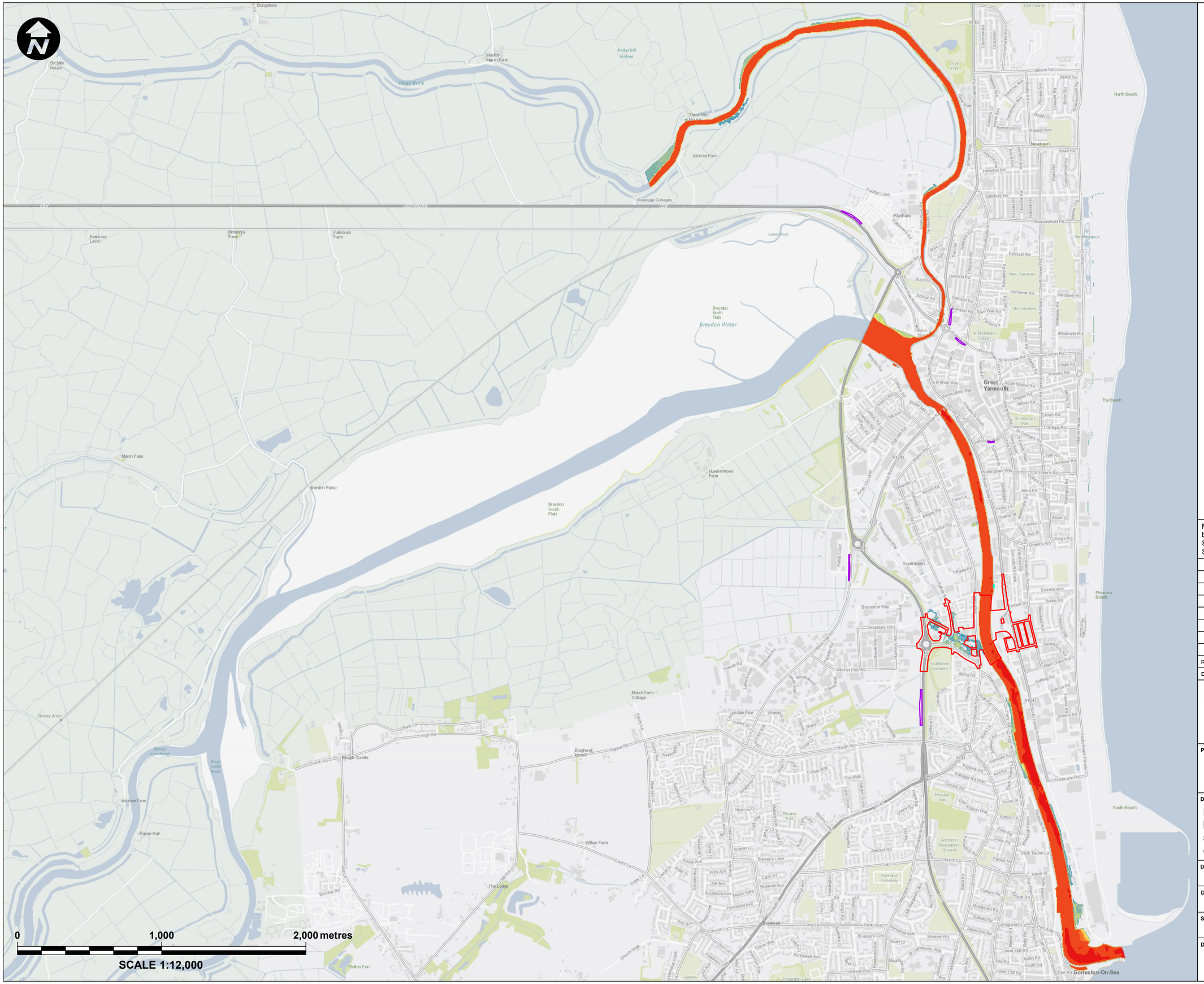

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FIGURE 3 (APPENDIX A) - BASELINE PRESENT DAY SCENARIO, 5% AEP MODELLED FLOOD DEPTHS (LOCATION 3)

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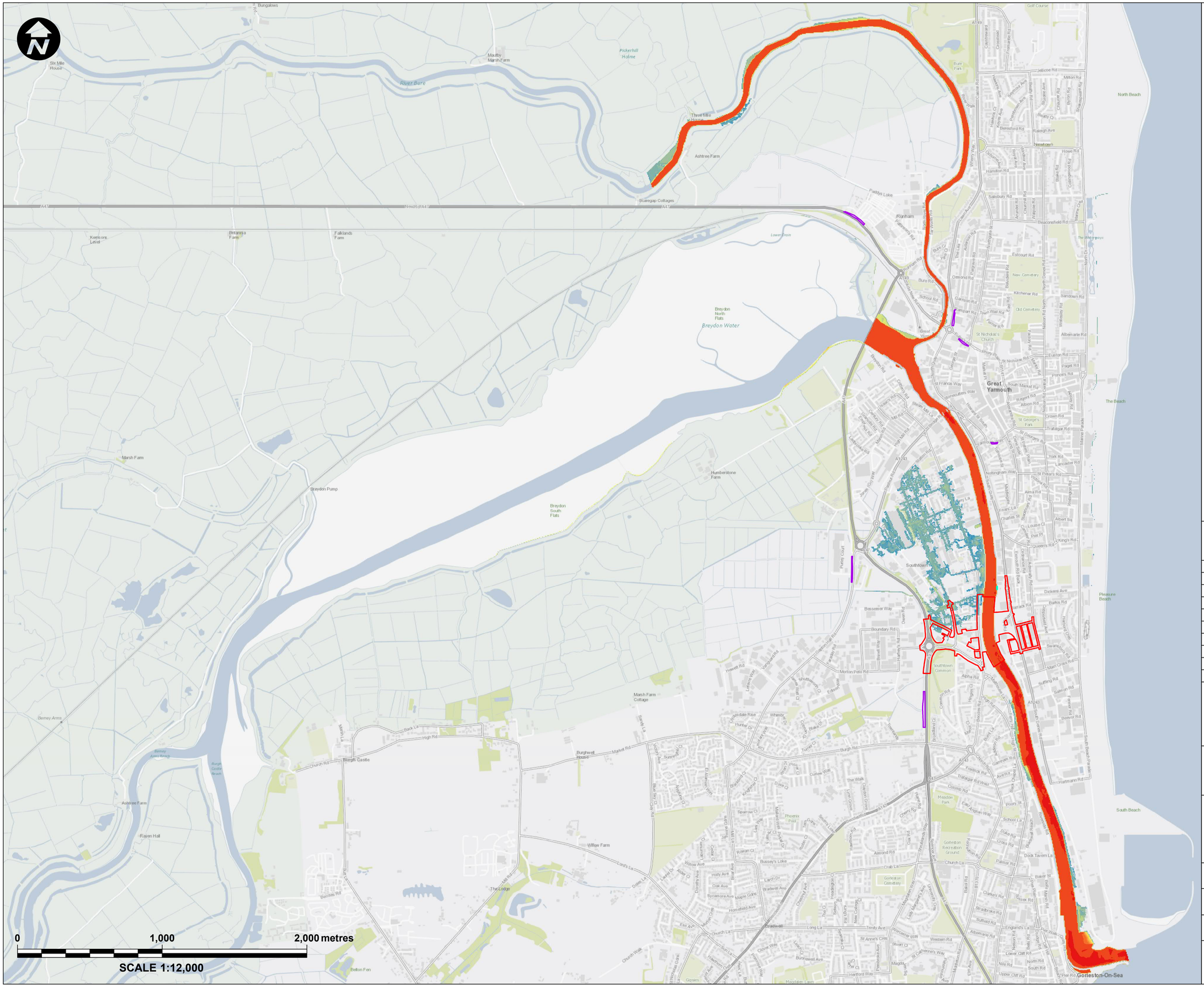

Key:

- 🟥 Principal Application Site
- 🟪 Satellite Application Sites

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FIGURE 4 (APPENDIX A) - BASELINE PRESENT DAY SCENARIO, 5% AEP MODELLED FLOOD DEPTHS (LOCATION 4)

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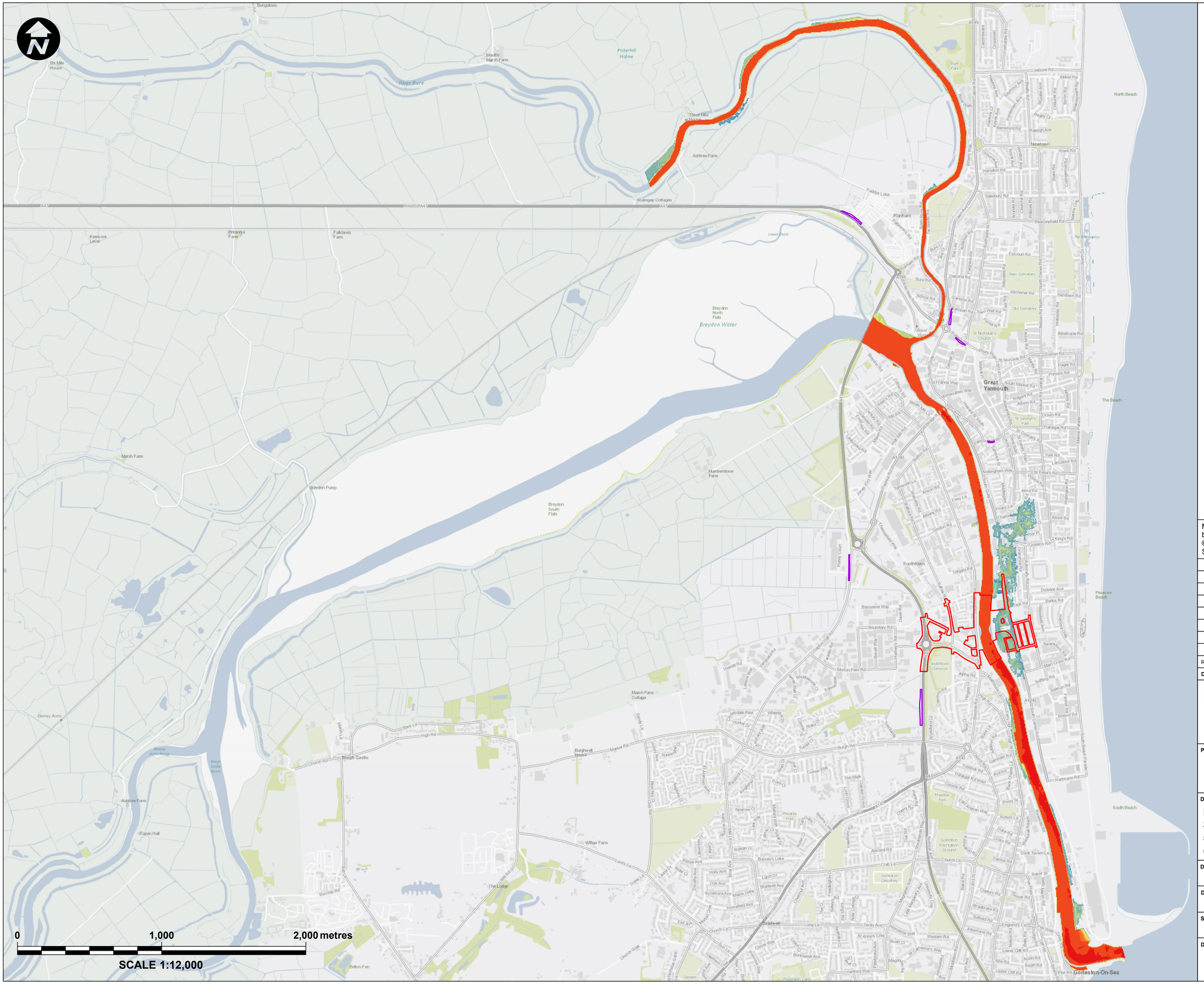

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FIGURE 5 (APPENDIX A) - WITH SCHEME PRESENT DAY SCENARIO, 5% AEP MODELLED FLOOD DEPTHS (LOCATION 1)

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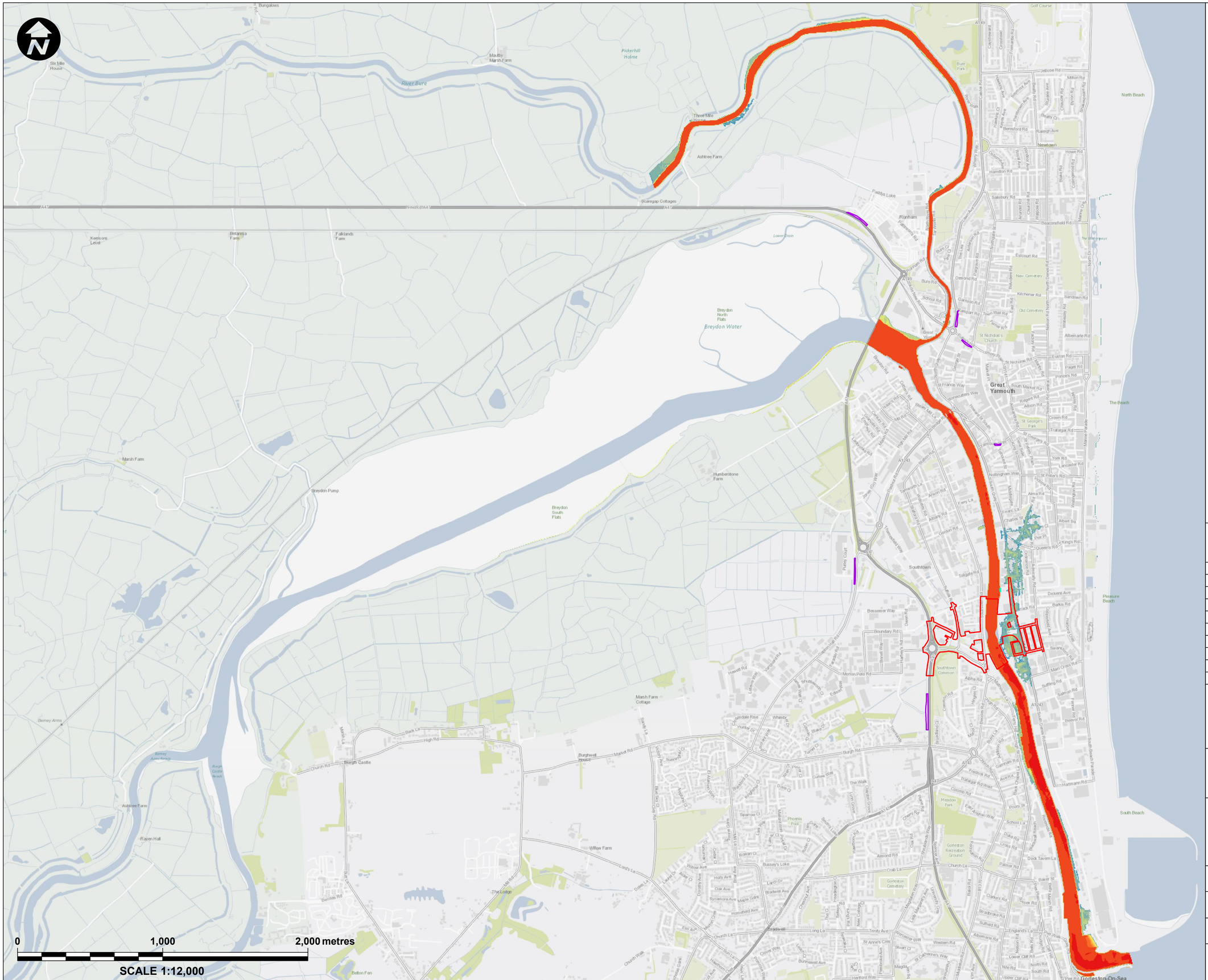

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FIGURE 6 (APPENDIX A) - WITH SCHEME PRESENT DAY SCENARIO, 5% AEP MODELLED FLOOD DEPTHS (LOCATION 2)

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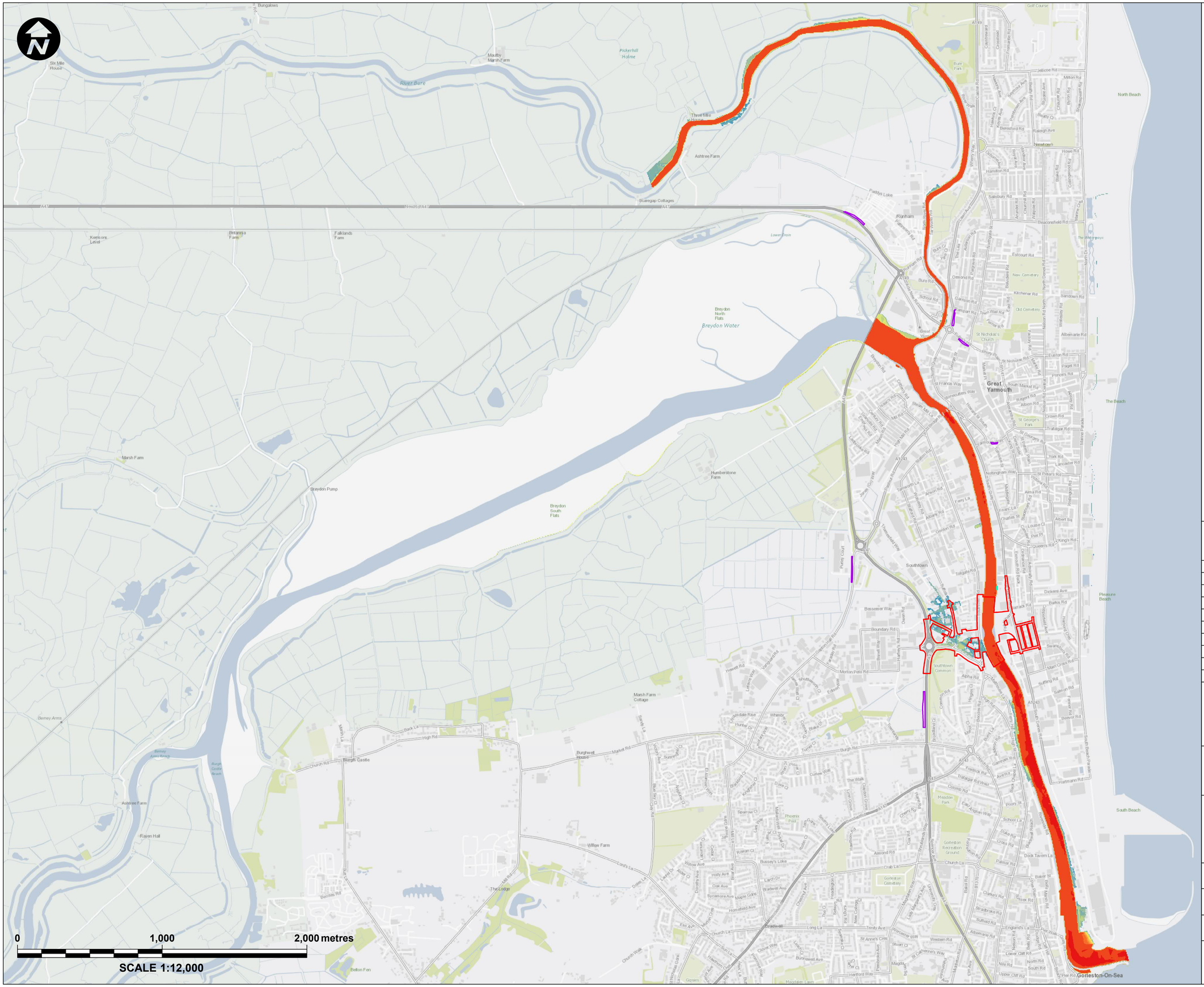

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FIGURE 7 (APPENDIX A) - WITH SCHEME PRESENT DAY SCENARIO, 5% AEP MODELLED FLOOD DEPTHS (LOCATION 3)

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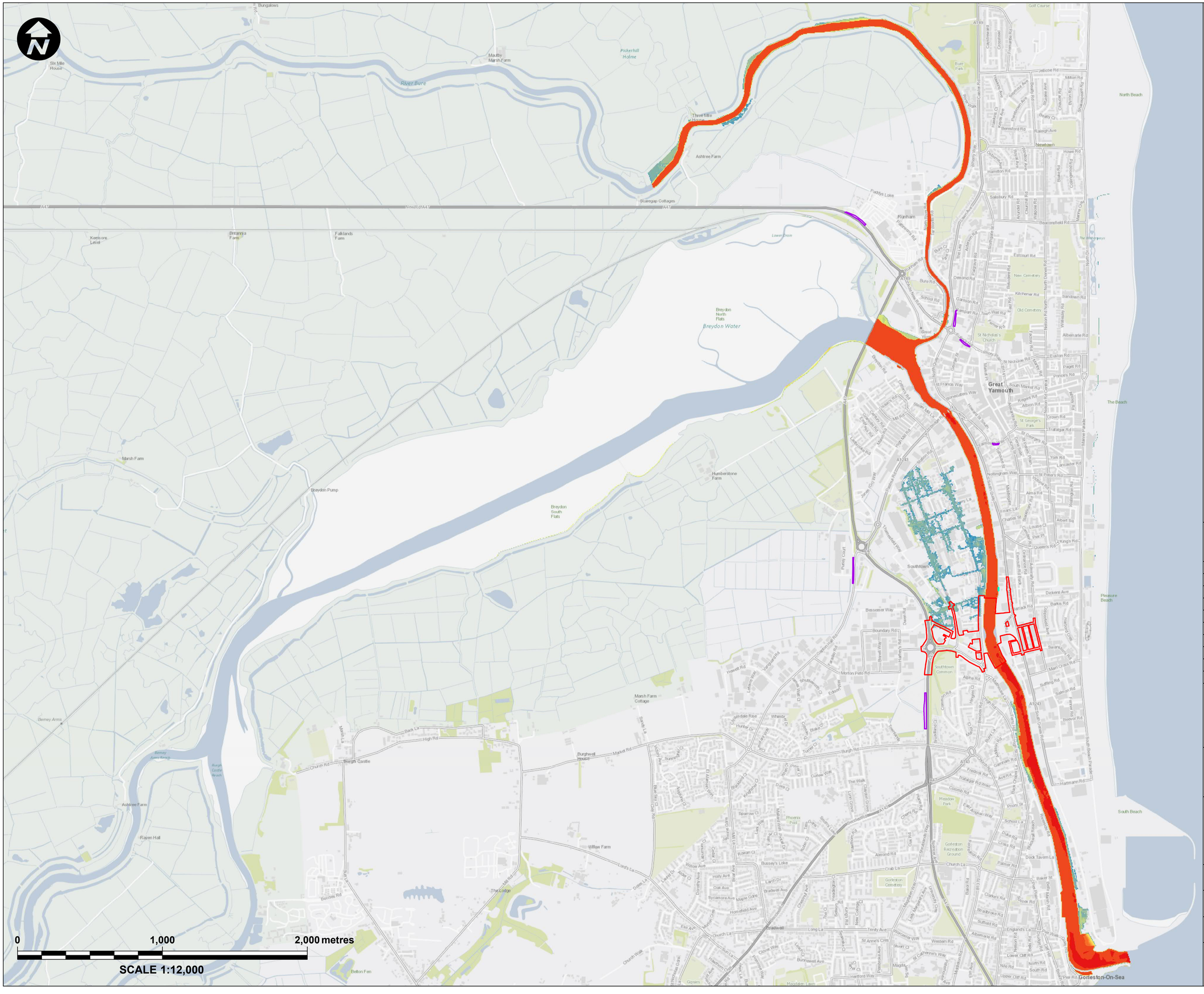

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FIGURE 8 (APPENDIX A) - WITH SCHEME PRESENT DAY SCENARIO, 5% AEP MODELLED FLOOD DEPTHS (LOCATION 4)

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NCC/GY3RC/EX/099 - Figure 8