

M5 Junction 10 Improvements Scheme

Environmental Statement

Appendix 8.1 Flood Risk Assessment - Part 2 of 2

TR010063 – APP 6.15

Regulation 5 (2) (e)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Volume 6
October 2024



Gloucestershire
COUNTY COUNCIL

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Infrastructure Planning Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

M5 Junction 10 Improvements Scheme Development Consent Order 202[x]

6.15 Environmental Statement:

Appendix 8.1 Flood Risk Assessment - Part 2 of 2 (Clean)

Regulation Number:	Regulation 5(2)(e)
Planning Inspectorate Scheme Reference	TR010063
Application Document Reference	TR010063/APP/6.15
Author:	M5 Junction 10 Improvements Scheme Project Team

Version	Date	Status of Version
Rev 0	December 2023	DCO Application
Rev 1	October 2024	Deadline 5

Contents

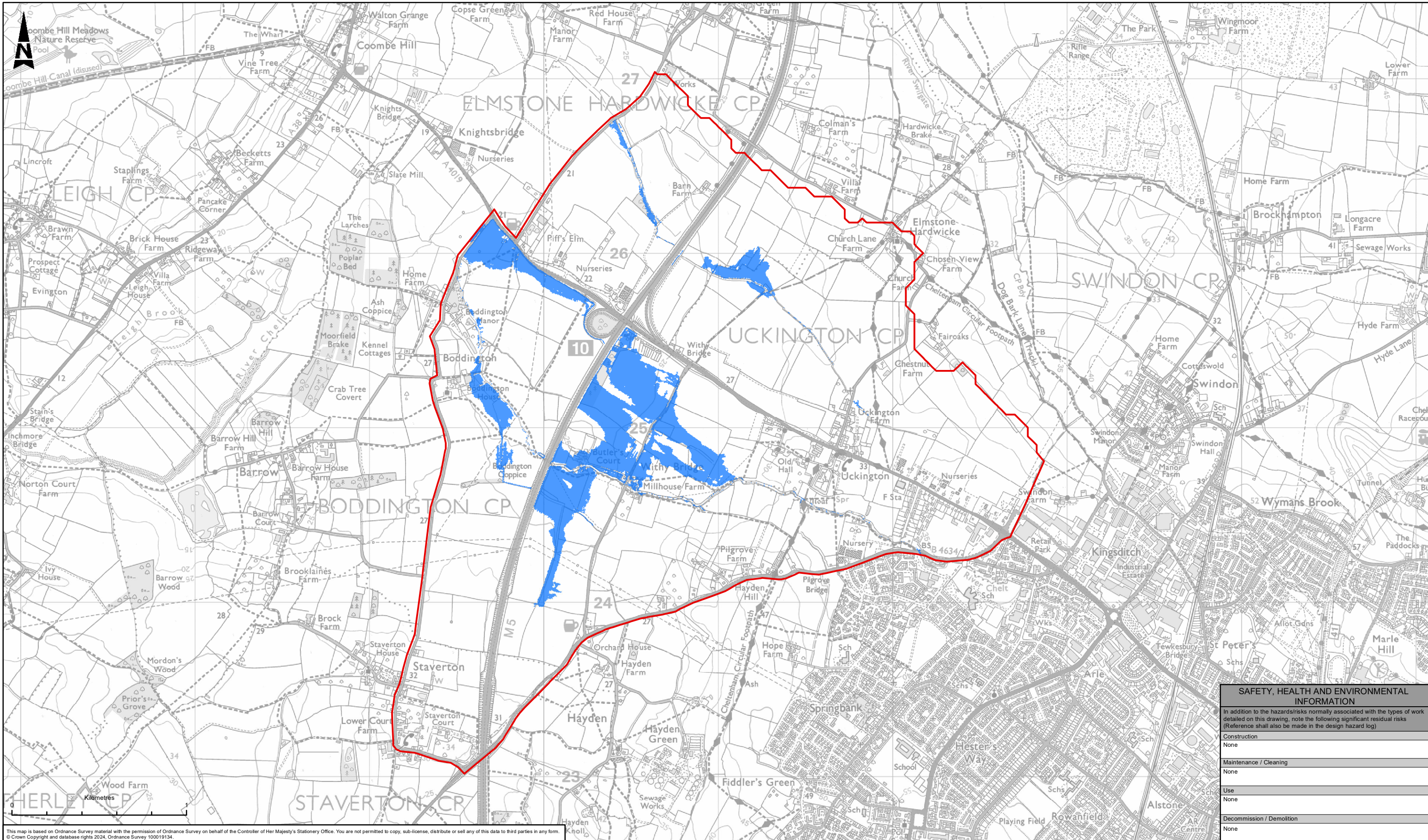
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Appendix 8.1 B. FRA Figures

Figure reference	Document title	Sheet	Document number	Revision
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4-5	Location of points for result reporting	1 of 1	GCCM5J10-ATK-EWE-ZZ-GS-GI-000031	0
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5-7	1% AEP Scheme flood risk depth map – future with 53% climate change	1 of 1	GCCM5J10-ATK-EWE-ZZ-GS-GI-000039	0
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LEGEND

MODEL DOMAIN

1 IN 30 YEAR RETURN PERIOD

NOTE:

FLOOD ZONE 3B AS DERIVED FROM HYDRAULIC MODELLING USING 3.3% ANNUAL EXCEEDANCE PROBABILITY EVENT (1 IN 30-YEAR RETURN PERIOD).

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)	
Construction	None
Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
	PUBLISHED	P01	KS	NJ	CC	TT	17/07/24

Description	Status
	PUBLISHED

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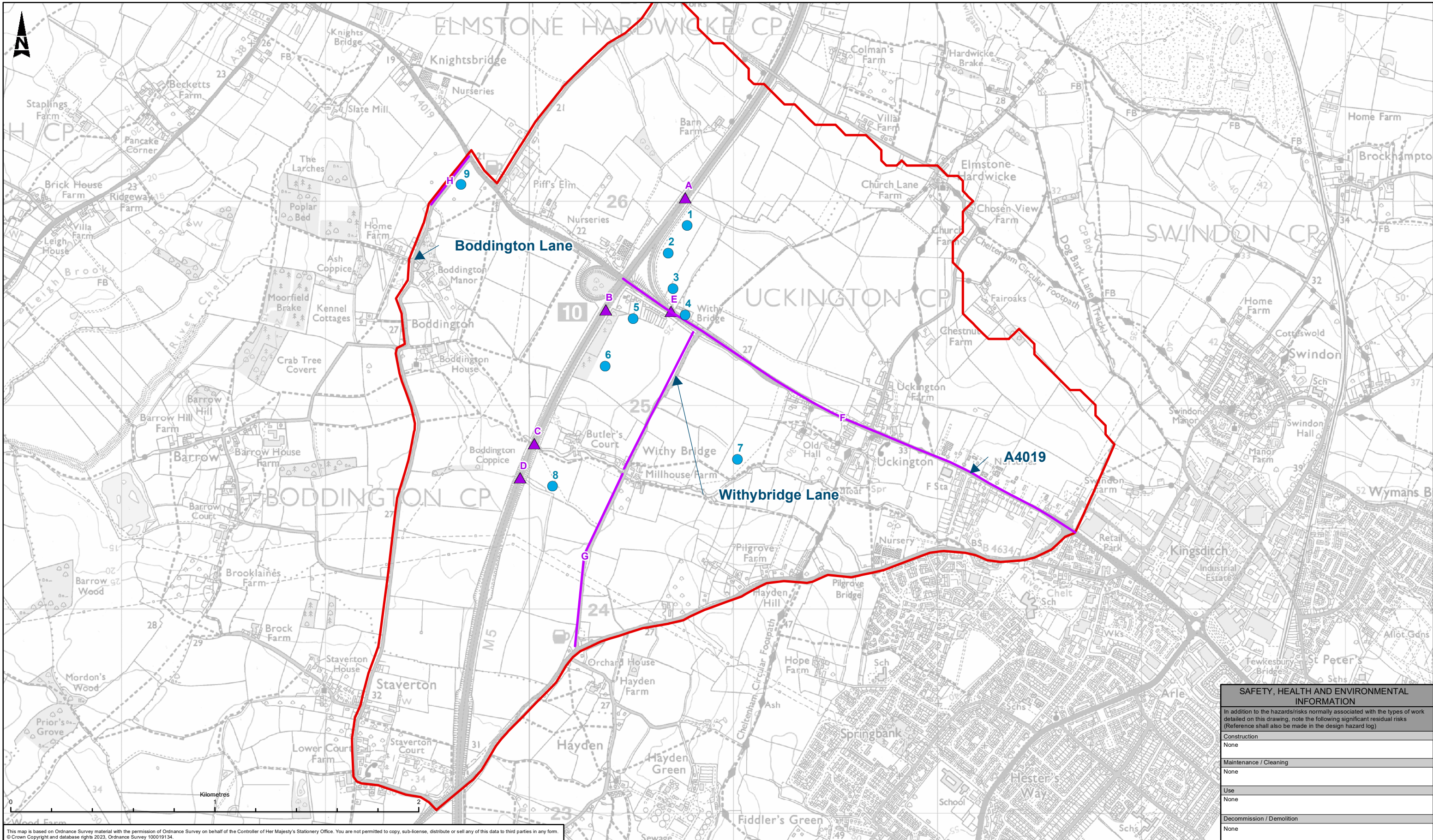
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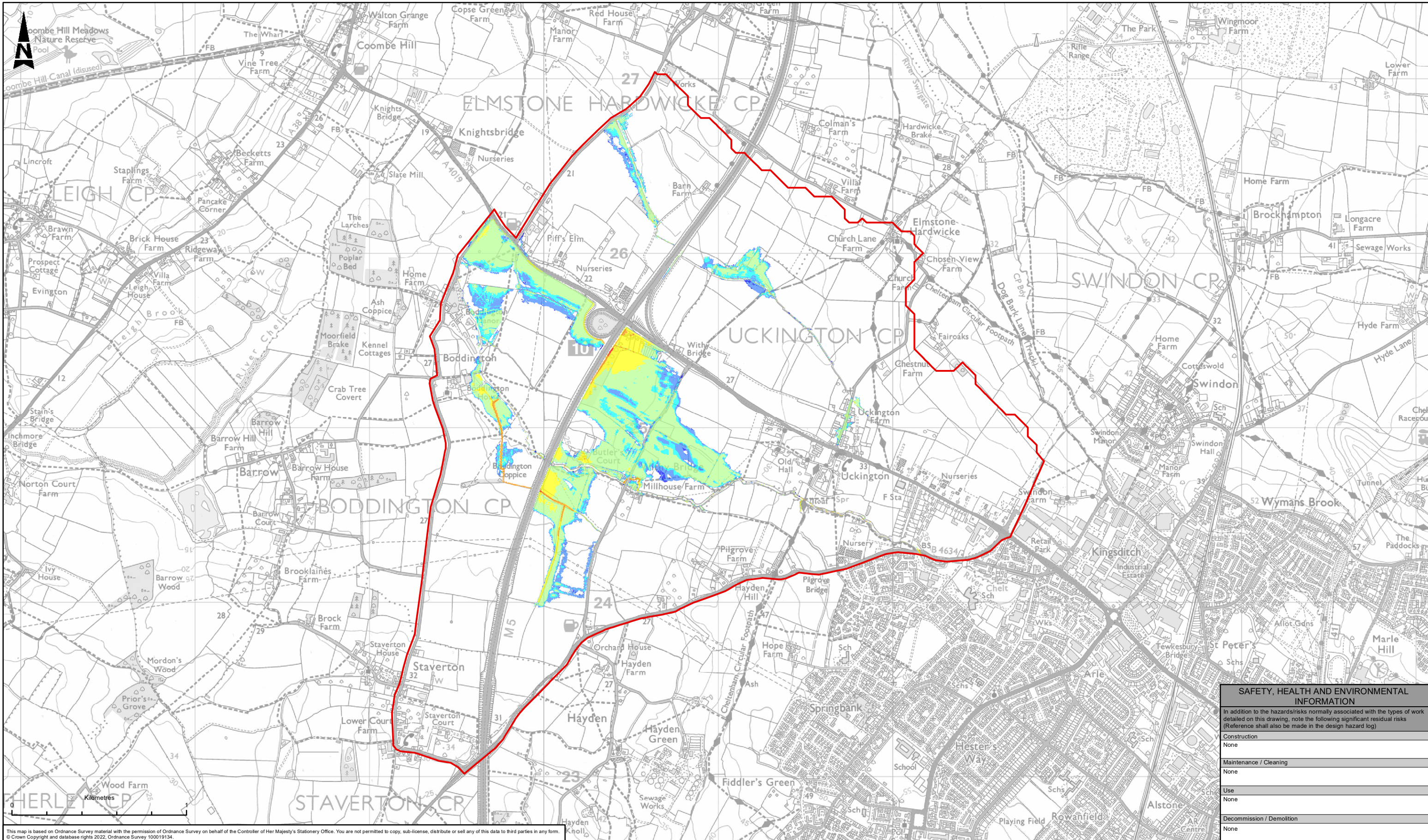
Project Title	M5 Junction 10 Improvements Scheme
Drawing Title	FIGURE 4.4 FLOOD ZONE 3B
Drawing Number	Project Originator Volume GCCM5J10 - ATK - EWE - ZZ - GS - GI - 400003
Original Size	A3
Scale	1:20,000
Project Ref	5214106
Sheet	1 of 1
Rev	P01



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LEGEND MODEL DOMAIN FLOW RESULTS FLOW RESULTS DEPTH RESULTS	Description Status: Revision Drawn Checked Reviewed Authorised Issue Date PUBLISHED		Drawing Suitability PUBLISHED ATKINS Member of the SNC-Lavalin Group 5th Floor, Block 5 Shire Hall Bearland Gloucester GL1 2TH Tel: 08000 514 514 www.atkinsglobal.com Copyright © Atkins Limited (2023)	Status A1	Project Title M5 Junction 10 Improvements Scheme
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Description Status: Revision Drawn Checked Reviewed Authorised Issue Date PUBLISHED		Client 	Drawing Title FIGURE 4-5 LOCATION OF POINTS FOR RESULT REPORTING		
Description Status: Revision Drawn Checked Reviewed Authorised Issue Date PUBLISHED					
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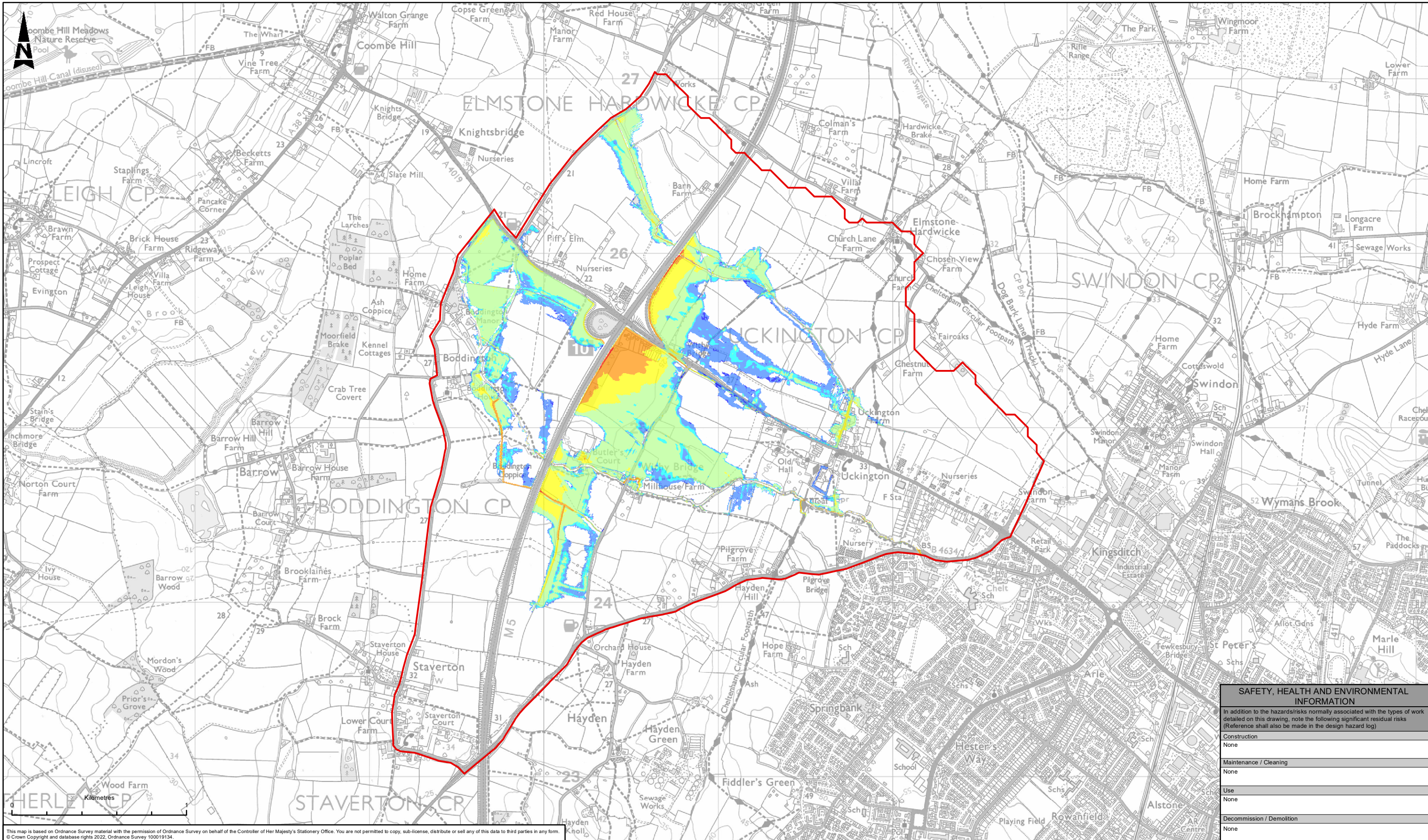
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LEGEND MODEL DOMAIN 1 IN 100 YEAR DEPTH RESULTS 0 - 10mm 10 - 50mm 50 - 100mm 100 - 500mm 500 - 1000mm 1000 - 2000mm > 2000mm	<table border="1"> <tr> <th>Description</th> <th>Status</th> <th>Revision</th> <th>Drawn</th> <th>Checked</th> <th>Reviewed</th> <th>Authorised</th> <th>Issue Date</th> </tr> <tr> <td>PUBLISHED</td> <td>A1</td> <td>P01</td> <td>SD</td> <td>NJ</td> <td>CC</td> <td>TT</td> <td>03/07/23</td> </tr> </table>	Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date	PUBLISHED	A1	P01	SD	NJ	CC	TT	03/07/23	<table border="1"> <tr> <th colspan="2">Drawing Suitability</th> <th>Status</th> <th>Project Title</th> </tr> <tr> <td colspan="2">PUBLISHED</td> <td>A1</td> <td>M5 Junction 10 Improvements Scheme</td> </tr> </table>	Drawing Suitability		Status	Project Title	PUBLISHED		A1	M5 Junction 10 Improvements Scheme										
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5th Floor, Block 5 Shire Hall Bearland Gloucester GL1 2TH Tel: 08000 514 514 www.atkinsglobal.com																																				
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		1:20,000	Ref: 5214106	1 of 1	P01																															



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LEGEND

MODEL DOMAIN

1 IN 100 YEAR + 53% CC DEPTH RESULTS

- 0 - 10mm
- 10 - 50mm
- 50 - 100mm
- 100 - 500mm
- 500 - 1000mm
- 1000 - 2000mm
- > 2000mm

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
PUBLISHED	A1	P01	SD	NJ	CC	TT	03/07/23

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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

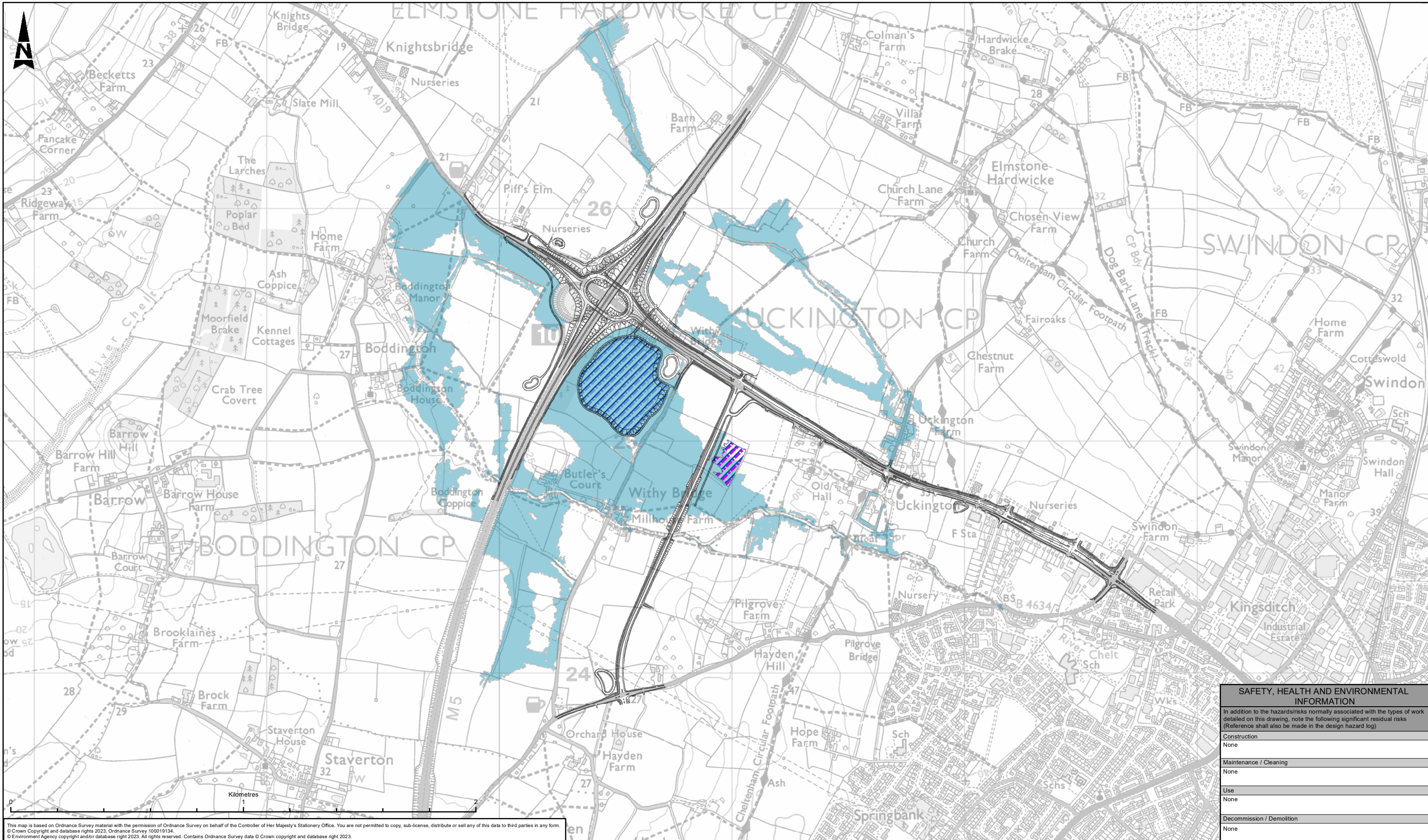
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Construction	None
Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

Project Title: M5 Junction 10 Improvements Scheme

Drawing Title: FIGURE 4-7
1% AEP BASELINE FLOOD RISK DEPTH
MAP - FUTURE WITH 53% CLIMATE CHANGE

Project	Originalator	Volume		
GCCM5J10 - ATK - EWE				
ZZ - GS - GI - 000035				
Location	Type	Role	Number	
A3	1:20,000	Ref: 5214106	1 of 1	
Original Size:	Scale:	Project Ref:	Sheet:	Rev:
A3	1:20,000	5214106	1 of 1	P01



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LEGEND

- SCHEME ALIGNMENT
- COMPENSATORY FLOODPLAIN
- FLOOD STORAGE AREA
- DESIGN EVENT (1% AEP + 53% CC)

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)

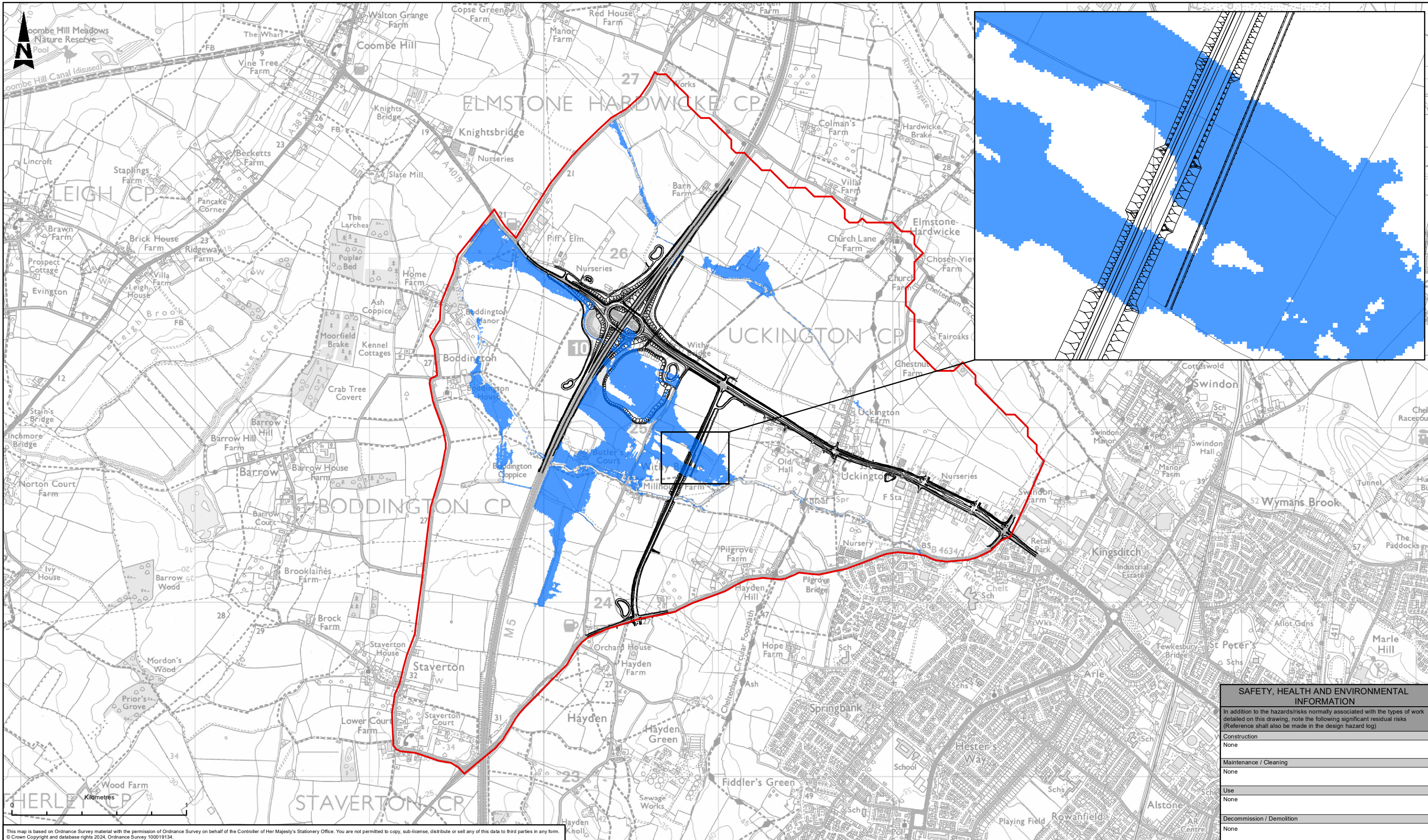
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Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
PUBLISHED	A1		JM	NJ	CC	LJ	03/07/23

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Project Title	M5 Junction 10 Improvements Scheme
Drawing Title	FIGURE 5-1 FLOOD COMPENSATION
Drawing Number	Project Originator Volume GCCM5J10-ATK-EWE-ZZ-GS-GI-000032
Original Size	A3
Scale	1:15,000
Project Ref	5214106
Sheet	1 of 1
Rev	P02



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LEGEND

- SCHEME ALIGNMENT
- MODEL DOMAIN
- 1 IN 30 YEAR RETURN PERIOD**
-

NOTES:

1. FLOOD ZONE 3B AS DERIVED FROM HYDRAULIC MODELLING USING 3.3% ANNUAL EXCEEDANCE PROBABILITY EVENT (1 IN 30-YEAR RETURN PERIOD).
2. SCHEME IS SHOWN SUPER IMPOSED FOR REFERENCE. FZ3B IS SHOWN HERE TO REFLECT THE BASELINE CONDITIONS.
3. INSET TO INDICATE RELATIVE POSITIONING OF THE LINK ROAD CULVERTS WITH FZ3B - INDIVIDUAL BARRELS ARE NOT SHOWN.
4. SCHEME CULVERTS WERE LOCATED AND NUMBERED TO CONVEY THE DESIGN FLOOD.
5. WITH-SCHEME MODELLING WAS USED TO DEMONSTRATE THE IMPACT OF THE LINK ROAD ON BASELINE FLOOD RISK.

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date

Drawing Suitability: **PUBLISHED** Status: **A1**

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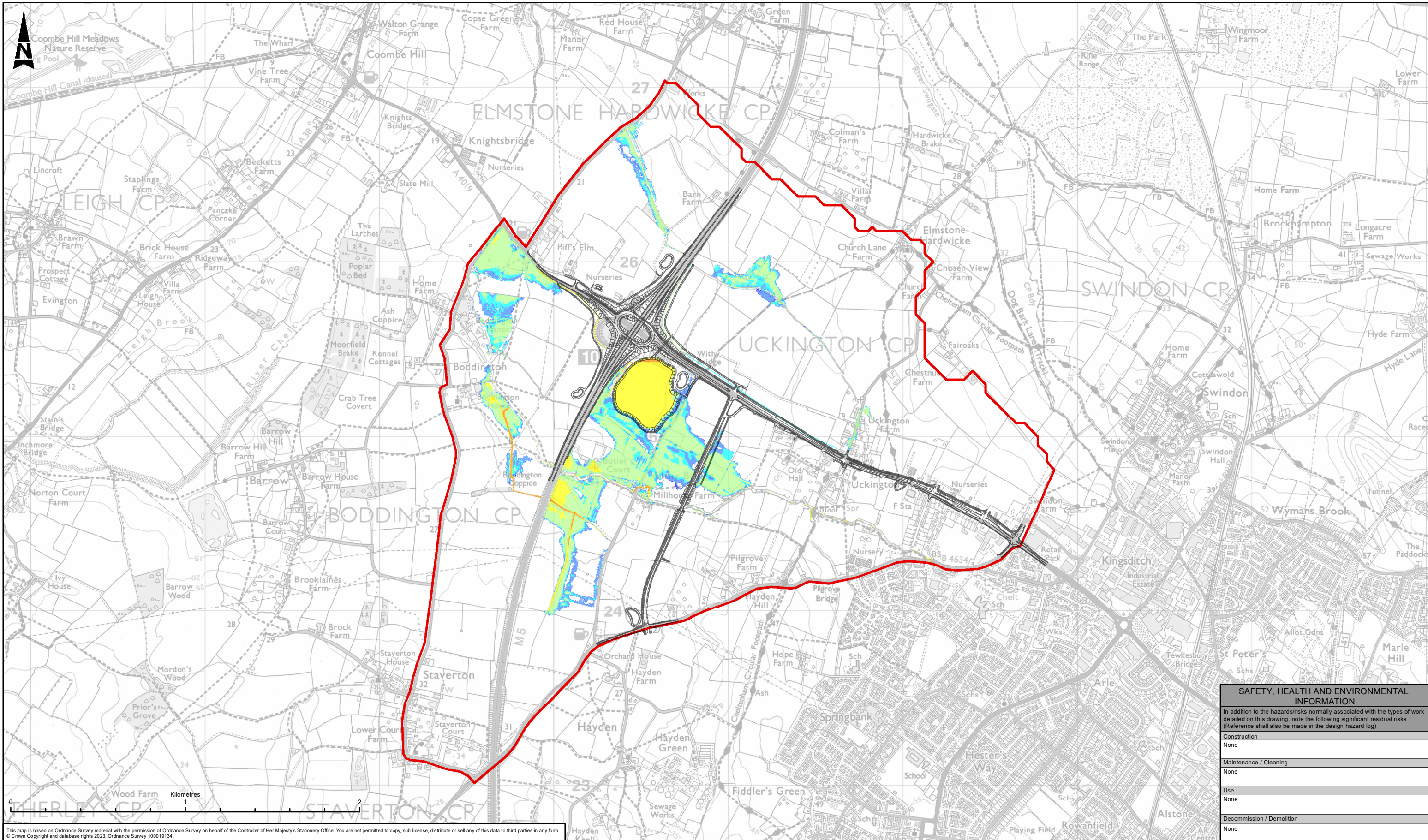
Construction	None
Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

Project Title: **M5 Junction 10 Improvements Scheme**

Drawing Title: **FIGURE 5.4 FLOOD ZONE 3B SHOWING RELATIONSHIP TO THE SCHEME**

Drawing Number: **GCCM5J10 - ATK - EWE ZZ - GS - GI - 400002**

Original Size: A3	Scale: 1:20,000	Project Ref: 5214106	Sheet: 1 of 1	Rev: P01
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LEGEND

— SCHEME ALIGNMENT
 □ MODEL DOMAIN

1 IN 100 YEAR DEPTH RESULTS

- 0 - 10mm
- 10 - 50mm
- 50 - 100mm
- 100 - 500mm
- 500 - 1000mm
- 1000 - 2000mm
- > 2000mm

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
PUBLISHED	A1	P03	JM	NJ	CC	LJ	03/07/23

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
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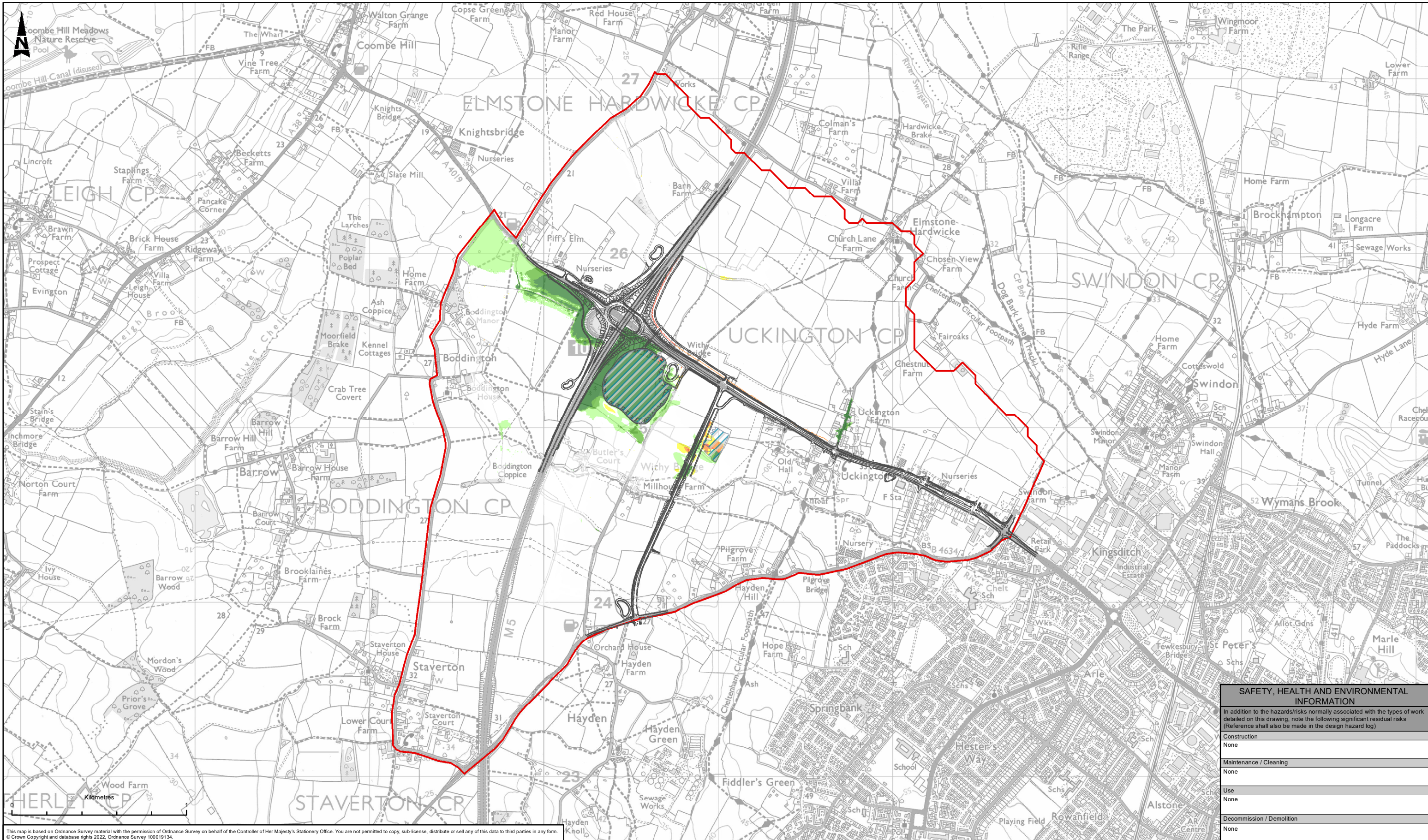
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Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

Project Title
M5 Junction 10 Improvements Scheme

Drawing Title
FIGURE 5-5
1% AEP SCHEME FLOOD RISK
DEPTH MAP - PRESENT DAY

Drawing Number
GCCM5J10 - ATK - EWE-ZZ - GS - GI - 000038

Location	Type	Project	Role	Number	Rev
A3	Scale	1:20,000	Ref: 5214106	Sheet: 1 of 1	P03



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Use	None
Decommission / Demolition	None

LEGEND

	SCHEME ALIGNMENT
	MODEL DOMAIN
	FLOOD STORAGE AREA

FLOOD LEVEL DIFFERENCE

	<-100 mm
	-50 to -100 mm
	-10 to -50 mm
	-10 to 10mm
	10 to 50 mm
	50 to 100mm
	>100 mm

DIFFERENCE = WITH-SCHEME FLOOD LEVELS MINUS BASELINE FLOOD LEVELS. POSITIVE RESULTS INDICATE A DETRIMENT TO FLOOD LEVELS, WHILST NEGATIVE RESULTS INDICATE A BETTERMENT TO FLOOD LEVELS.

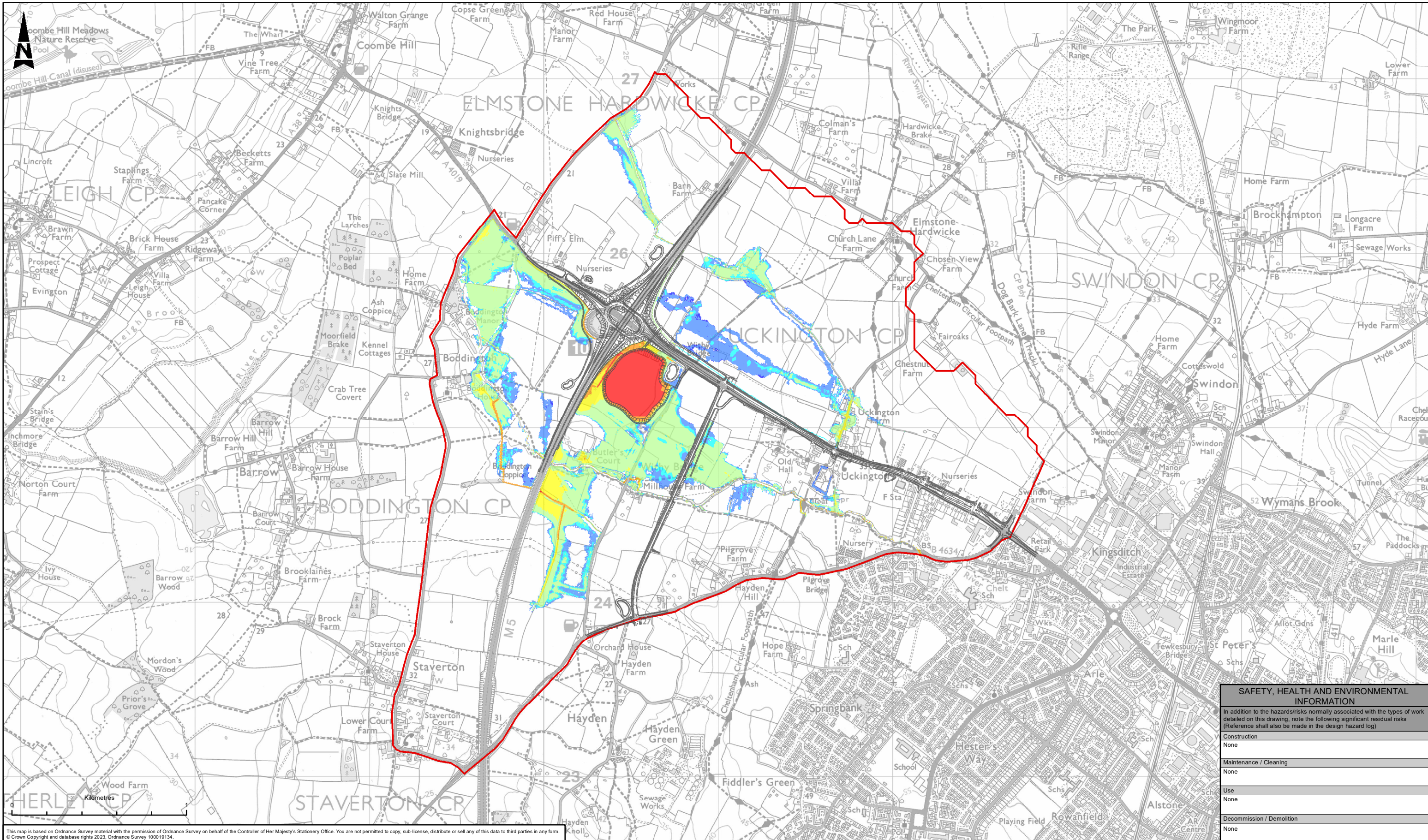
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Drawing Suitability: **PUBLISHED** Status: **A1**

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Client: **Gloucestershire COUNTY COUNCIL**

Project Title	M5 Junction 10 Improvements Scheme
Drawing Title	FIGURE 5-6 1% AEP LEVEL DIFFERENCE MAP - PRESENT DAY
Drawing Number	Project: GCCM5J10 - ATK - EWE Original: ZZ - GS - GI - 000036 Volume
Original Size: A3	Scale: 1:20,000 Project Ref: 5214106 Sheet: 1 of 1 Rev: P03



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LEGEND

- MODEL DOMAIN
- SCHEME ALIGNMENT

- 1 IN 100 YEAR + 53% CC DEPTH RESULTS**
- 0 - 10mm
 - 10 - 50mm
 - 50 - 100mm
 - 100 - 500mm
 - 500 - 1000mm
 - 1000 - 2000mm
 - > 2000mm

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

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Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

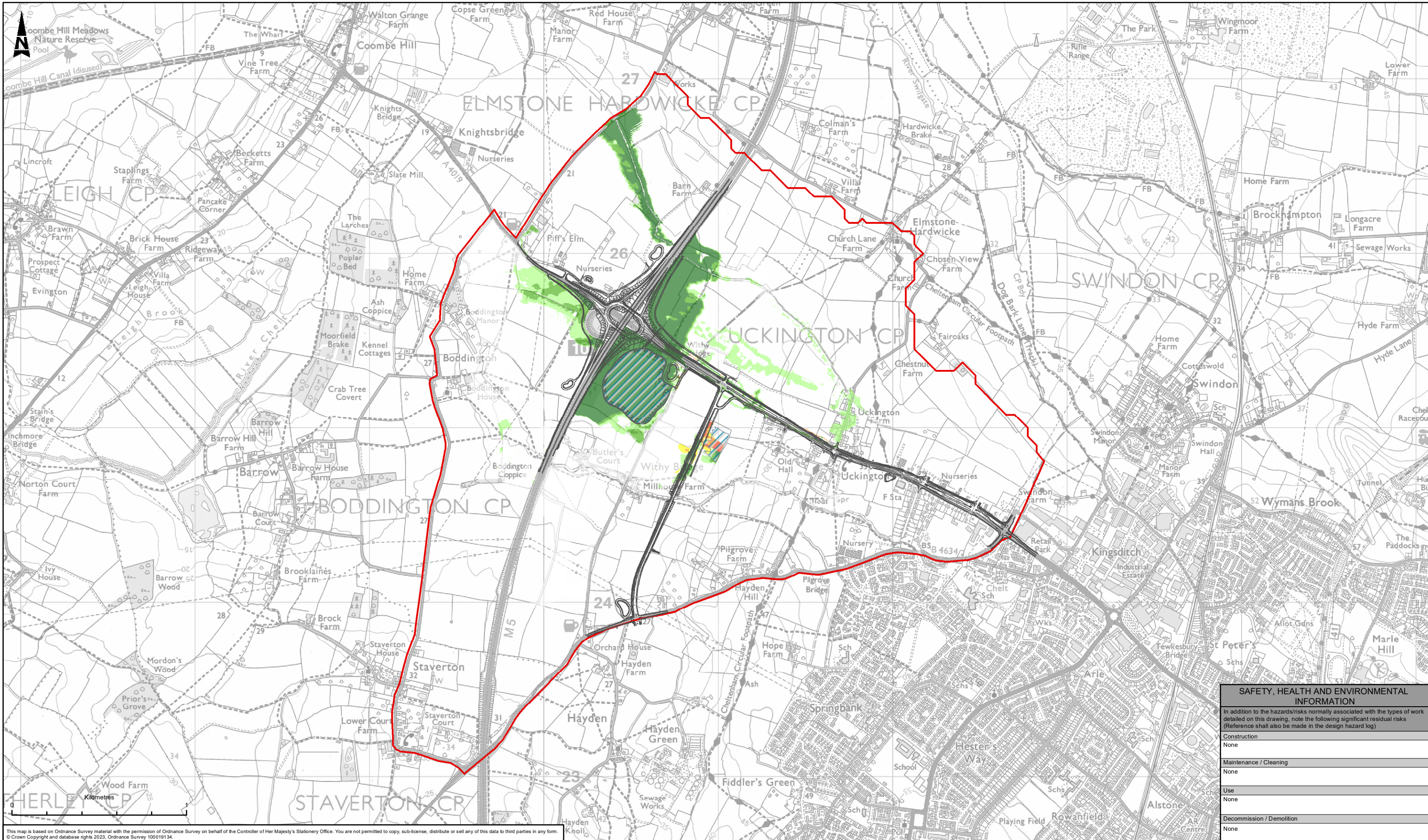
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Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
PUBLISHED	A1	P03	JM	NJ	CC	TT	03/07/23

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Project Title		M5 Junction 10 Improvements Scheme	
Drawing Title		FIGURE 5-7 1% AEP SCHEME FLOOD RISK DEPTH MAP - FUTURE WITH 53% CLIMATE CHANGE	
Project	Originator	Volume	
GCCM5J10 - ATK - EWE	ZZ - GS - GI - 000039		
Location	Type	Role	Number
A3	1:20,000	5214106	1 of 1
Original Size	Scale	Project Ref	Sheet
A3	1:20,000	5214106	P03



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LEGEND

- SCHEME ALIGNMENT
- ▭ MODEL DOMAIN
- ▨ FLOOD STORAGE AREA

FLOOD LEVEL DIFFERENCE

- <-100 mm
- 50 to -100 mm
- 10 to -50 mm
- 10 to 10mm
- 10 to 50 mm
- 50 to 100mm
- >100 mm

DIFFERENCE = WITH-SCHEME FLOOD LEVELS MINUS BASELINE FLOOD LEVELS.
 POSITIVE RESULTS INDICATE A DETRIMENT TO FLOOD LEVELS,
 WHILST NEGATIVE RESULTS INDICATE A BETTERMENT TO FLOOD LEVELS.

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
PUBLISHED	A1	P03	SD	NJ	CC	TT	17/07/23

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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

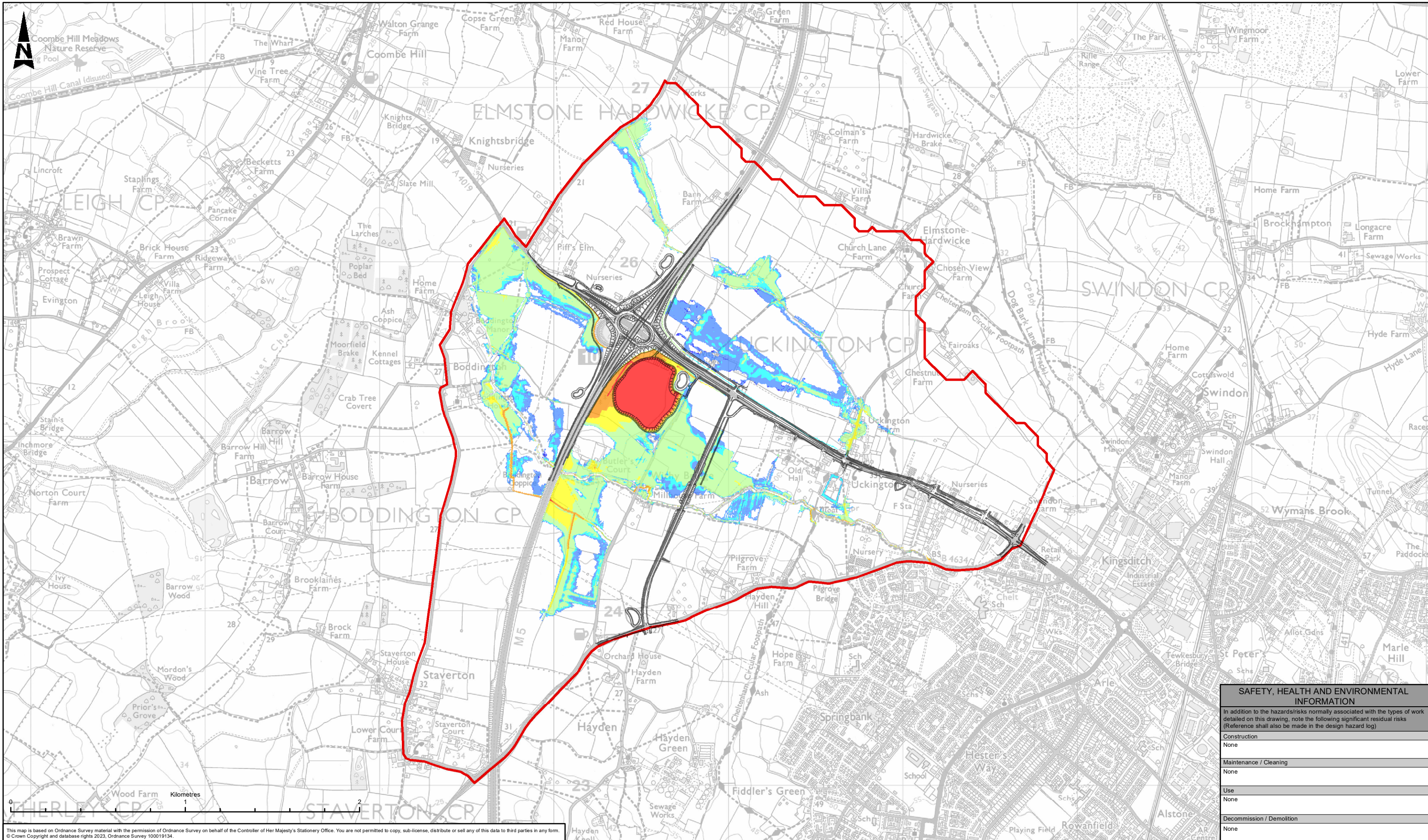
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)

Construction	None
Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

Project Title
M5 Junction 10 Improvements Scheme

Drawing Title
FIGURE 5-8
1% AEP LEVEL DIFFERENCE MAP - FUTURE WITH 53% CLIMATE CHANGE

Project	Original	Volume
Location	Type	Role
Scale	Project Ref.	Sheet
Original Size	Scale	Project Ref.
A3	1:20,000	5214106
Sheet	Number	Rev.
1 of 1		P03



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LEGEND	
	SCHEME ALIGNMENT
	MODEL DOMAIN
1 IN 1000 YEAR DEPTH RESULTS	
	0 - 10mm
	10 - 50mm
	50 - 100mm
	100 - 500mm
	500 - 1000mm
	1000 - 2000mm
	> 2000mm

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)

Construction	None
Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date

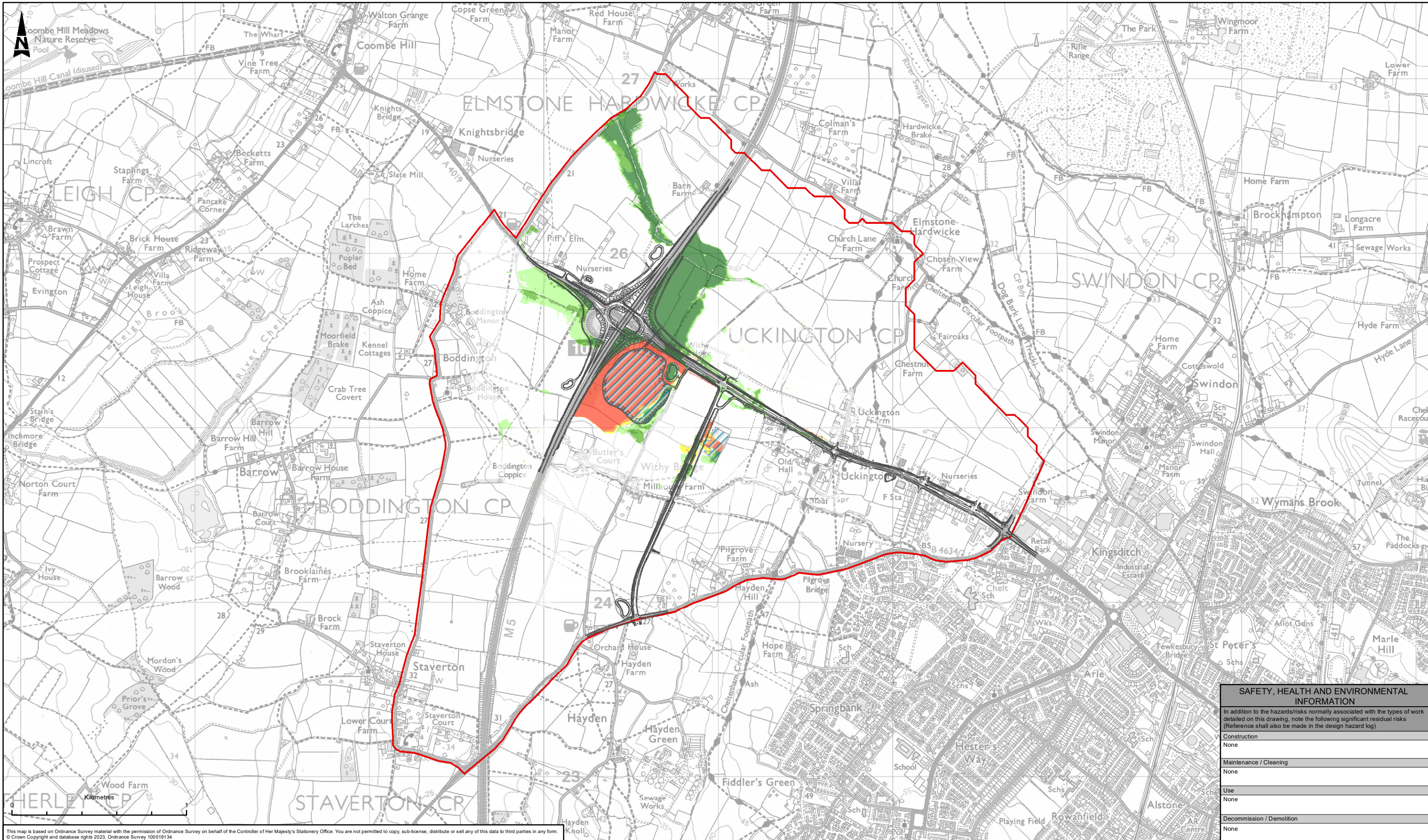
Drawing Suitability: **PUBLISHED** Status: **A1**

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Project Title	M5 Junction 10 Improvements Scheme
Drawing Title	FIGURE 5-9 0.1% AEP SCHEME FLOOD RISK DEPTH MAP - PRESENT DAY
Drawing Number	Project Originator Volume GCCM5J10 - ATK - EWE-ZZ - GS - GI - 000042
Original Size	A3
Scale	1:20,000
Project Ref	5214106
Sheet	1 of 1
Rev	P03



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LEGEND

	SCHEME ALIGNMENT
	MODEL DOMAIN
	FLOOD STORAGE AREA

FLOOD LEVEL DIFFERENCE

	<-100 mm
	-50 to -100 mm
	-10 to -50 mm
	-10 to 10mm
	10 to 50 mm
	50 to 100mm
	>100 mm

DIFFERENCE = WITH-SCHEME FLOOD LEVELS MINUS BASELINE FLOOD LEVELS.
 POSITIVE RESULTS INDICATE A DETRIMENT TO FLOOD LEVELS,
 WHILST NEGATIVE RESULTS INDICATE A BETTERMENT TO FLOOD LEVELS.

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)

Construction	None
Maintenance / Cleaning	None
Use	None
Decommission / Demolition	None

Description	Status	Revision	Drawn	Checked	Reviewed	Authorised	Issue Date
	PUBLISHED	P01	SD	NJ	CC	TT	18/07/23

Drawing Suitability: **PUBLISHED** Status: **A1**

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Project Title: **M5 Junction 10 Improvements Scheme**

Drawing Title: **FIGURE 5-10
 0.1% AEP LEVEL DIFFERENCE MAP**

Project	Original	Volume
Location	Type	Role
Scale	Project Ref	Sheet
Original Size	Scale	Project Ref
A3	1:20,000	5214106
Number	Rev	
1 of 1	P01	

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