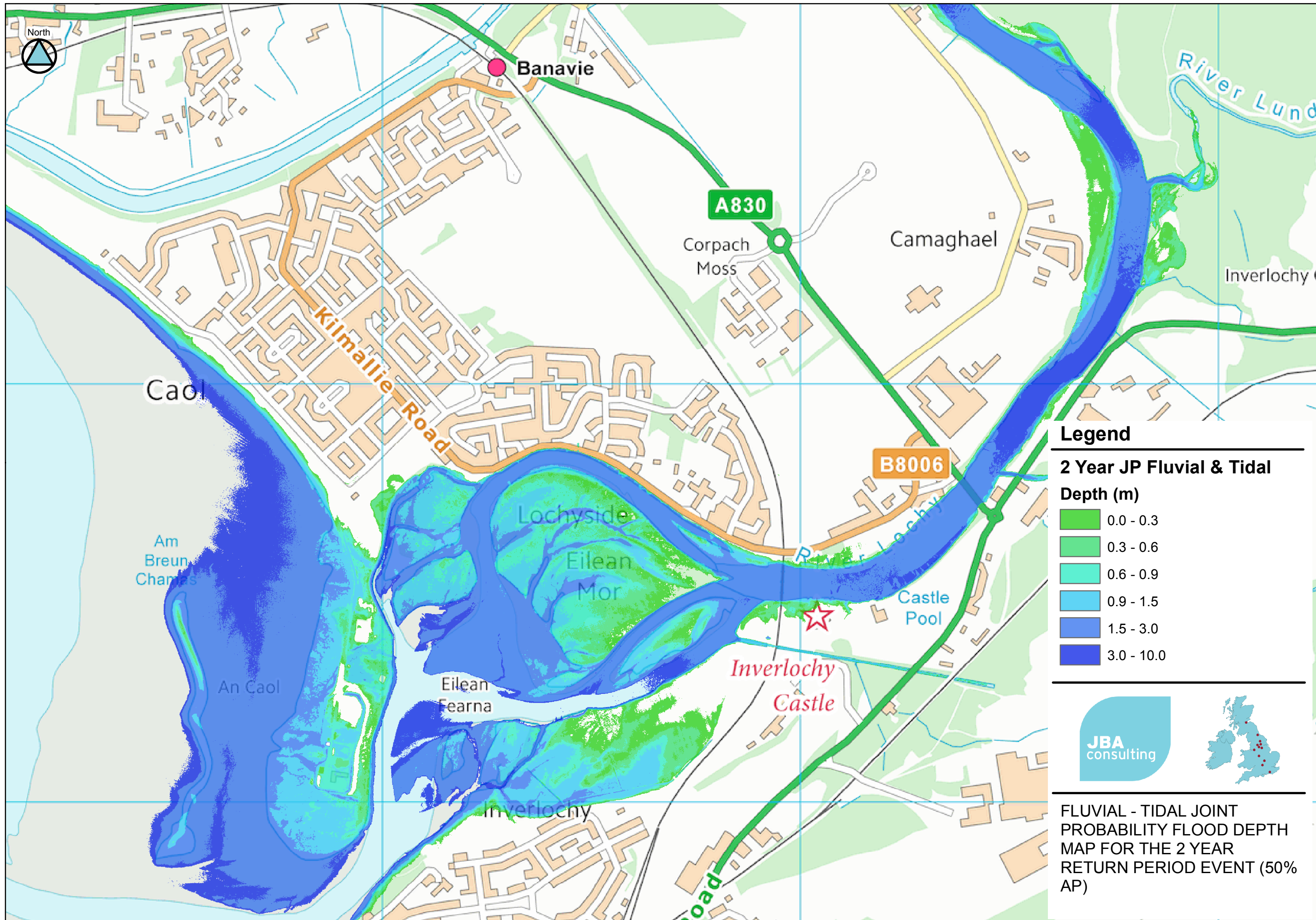


## C.5 Fluvial - tidal joint probability

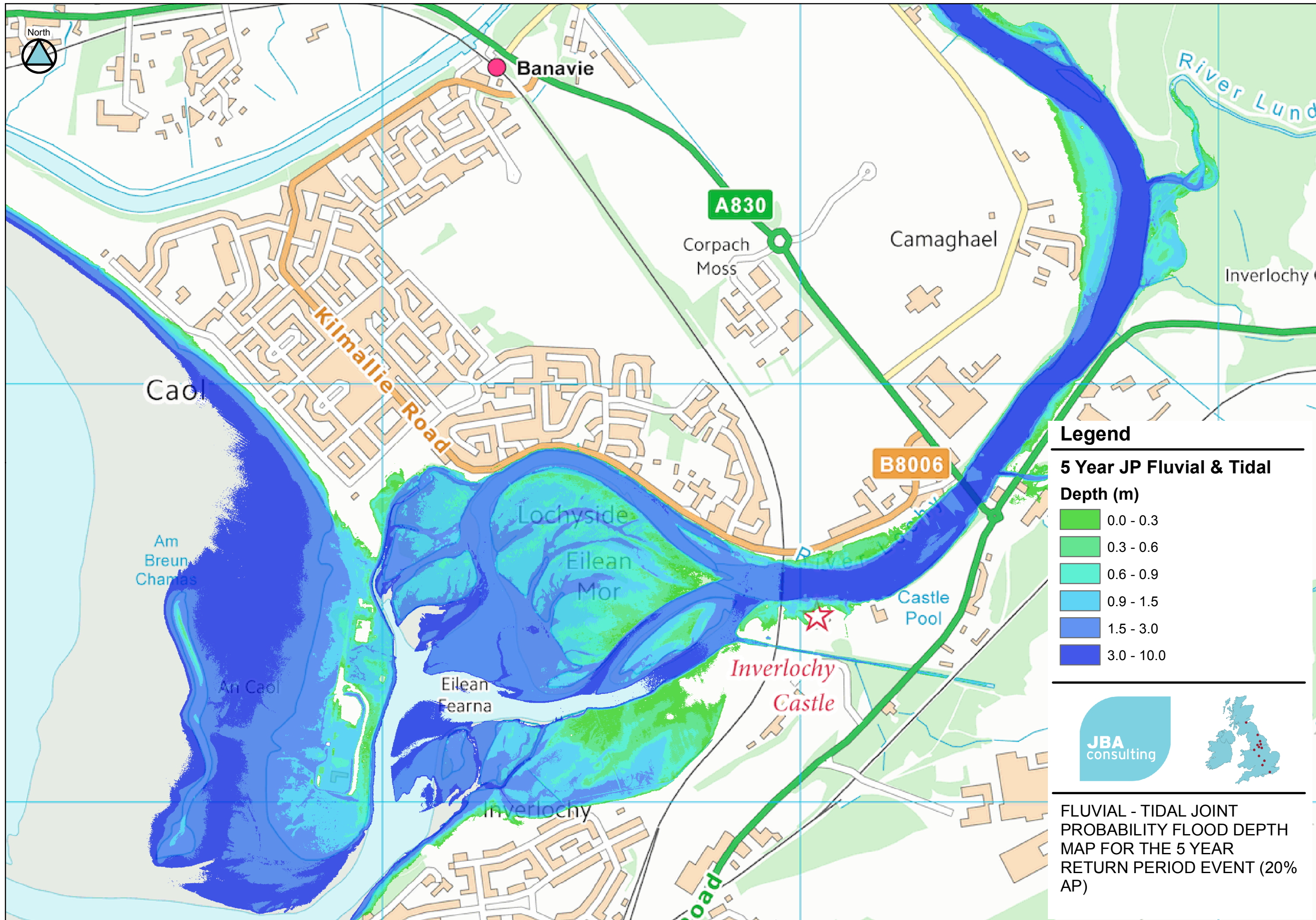
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0 250 500 Meters

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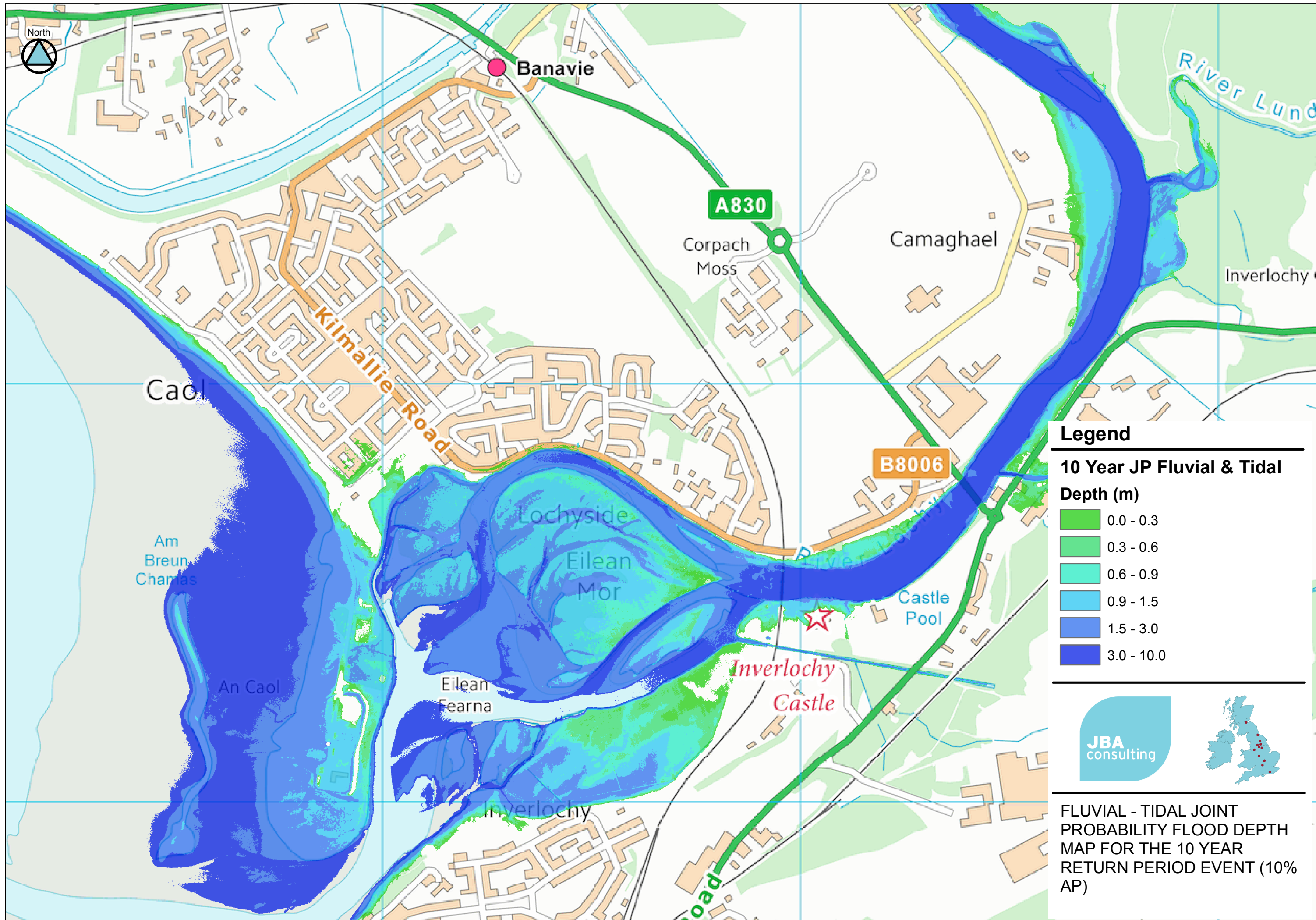




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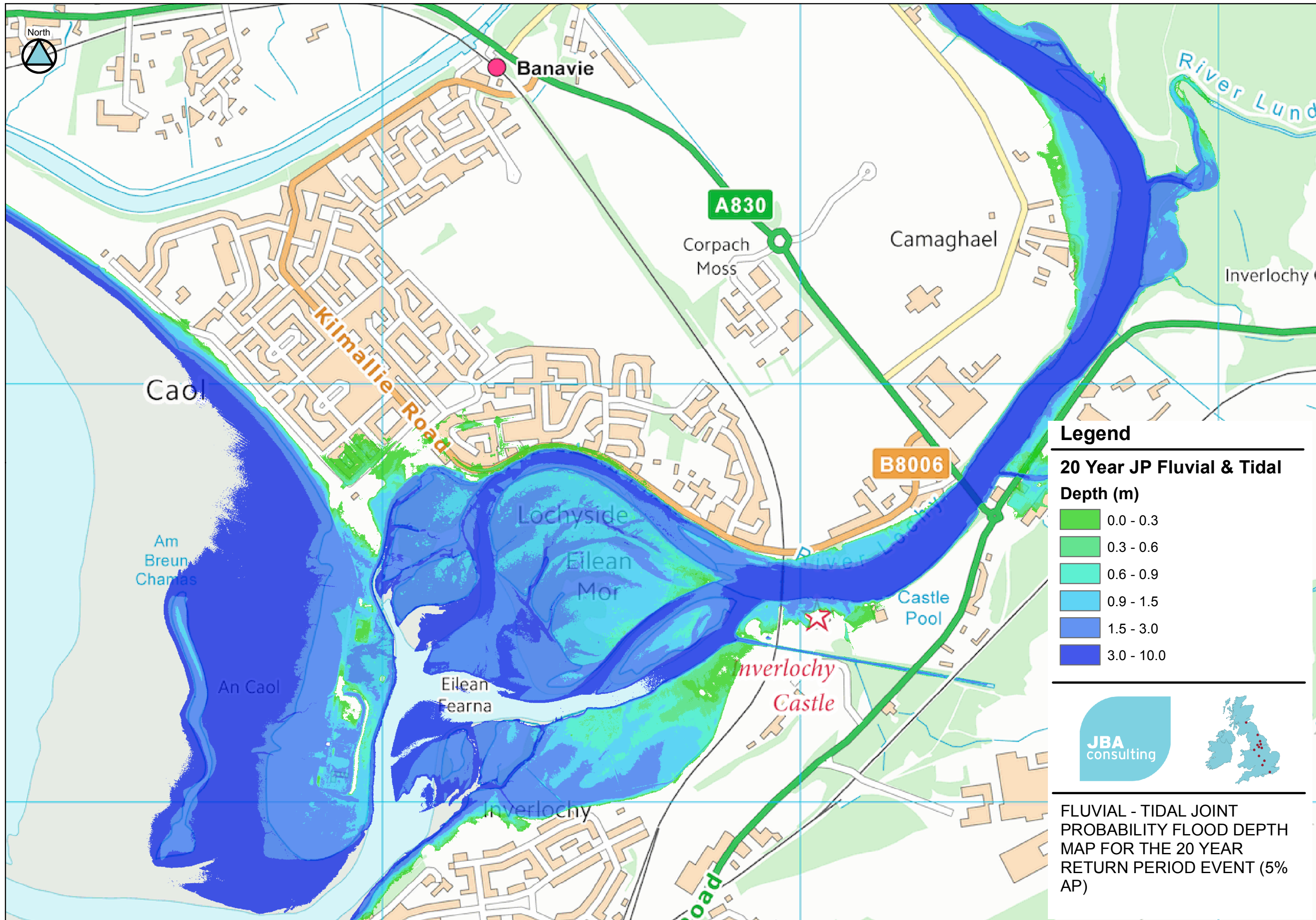




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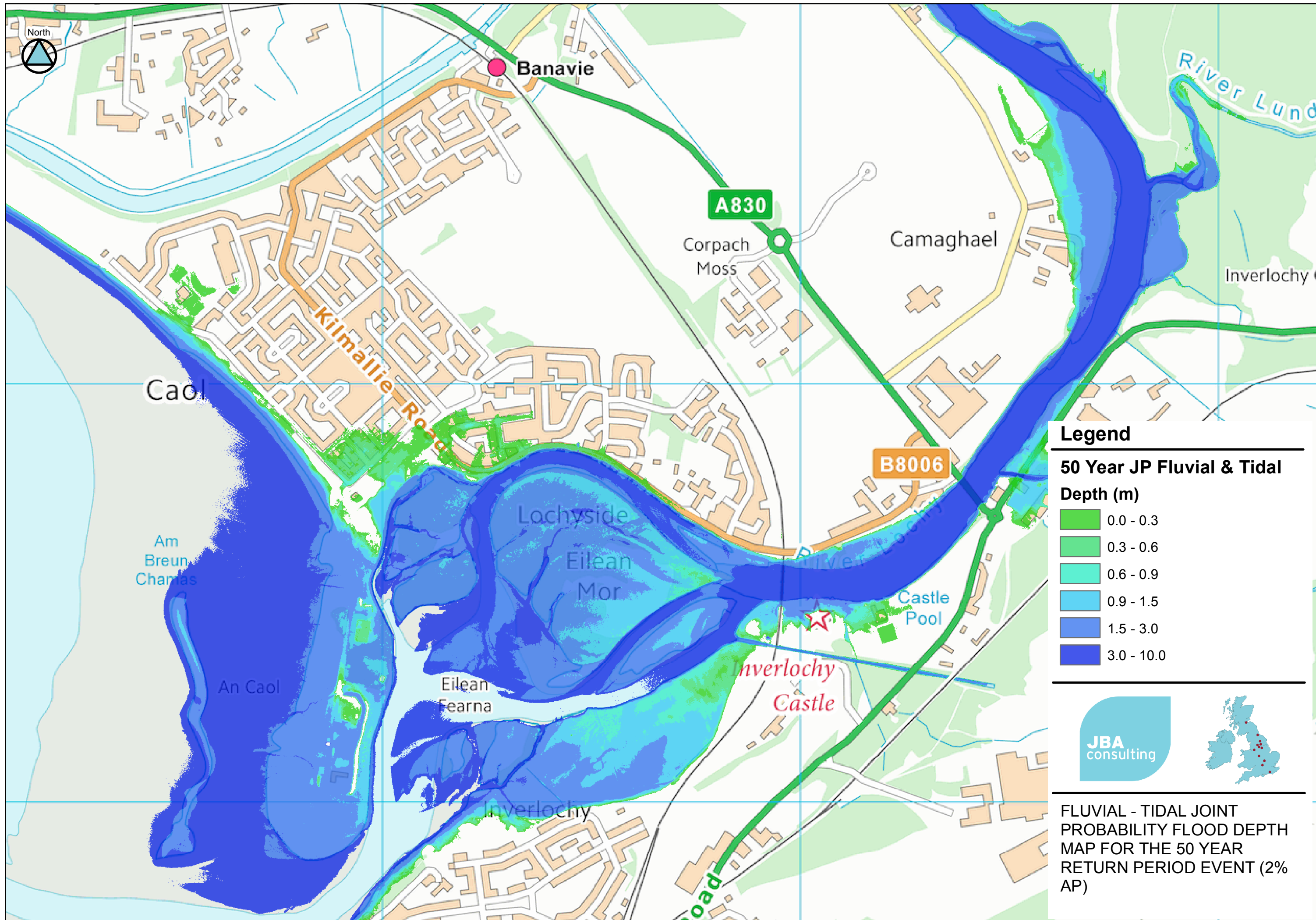




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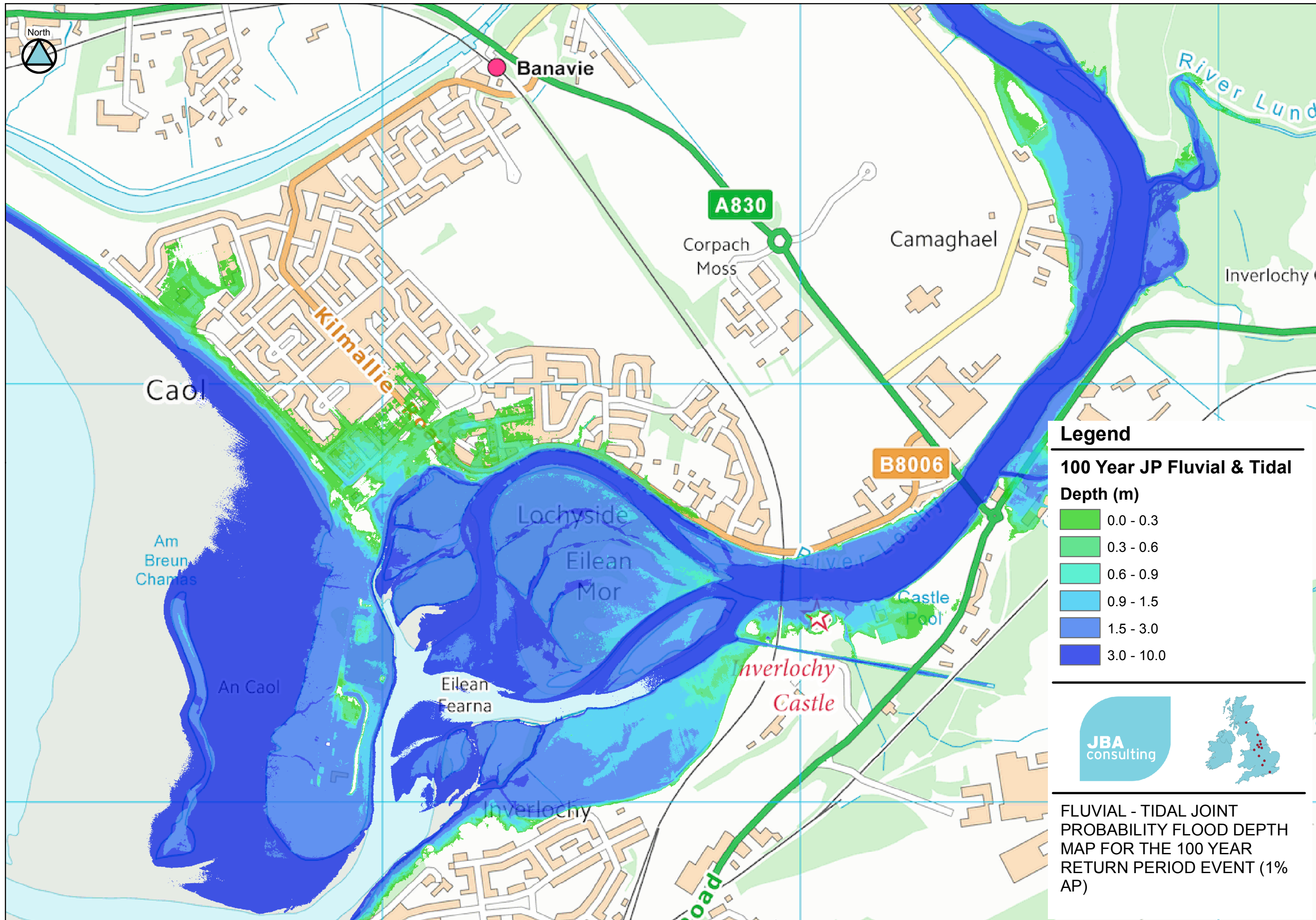




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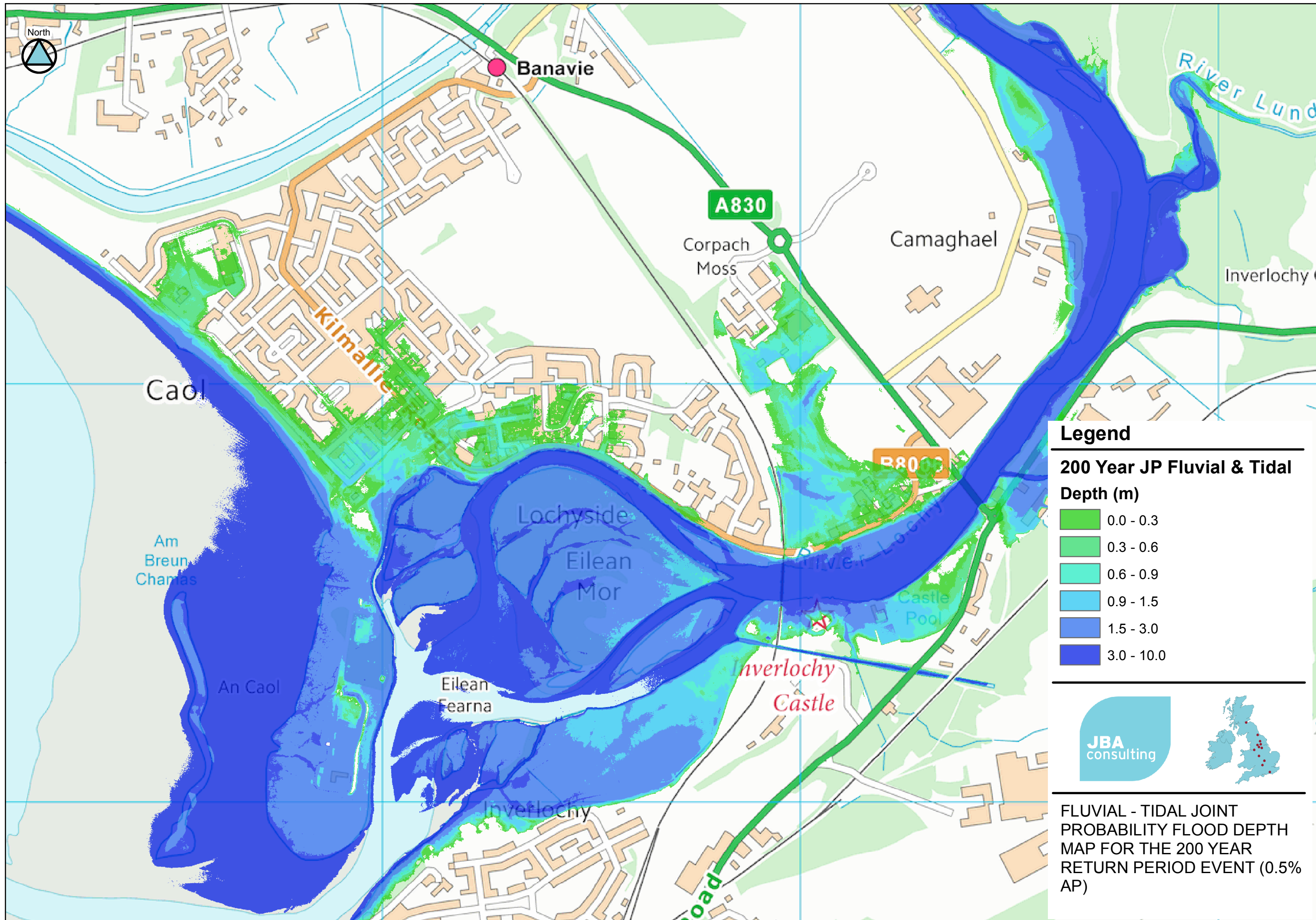




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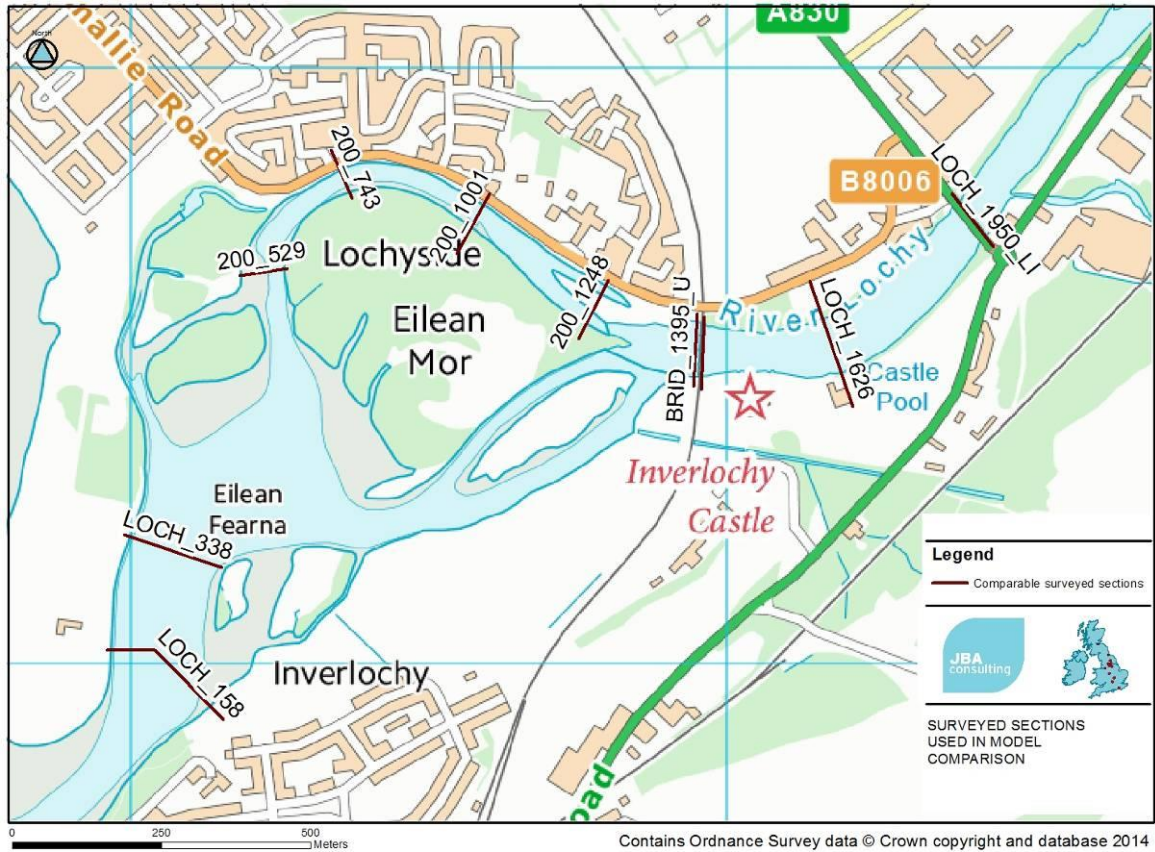
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## D Appendix - Cross sectional differences

### D.1 Cross section irregularities

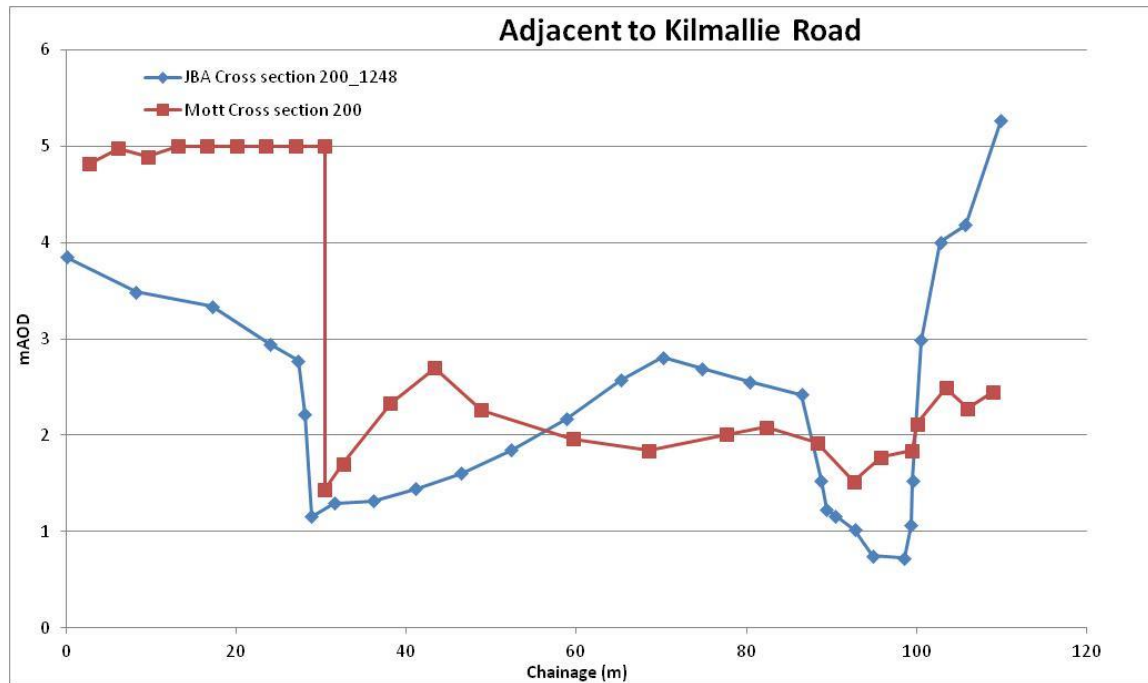
Refer to Figure D-1 for a location map of compared cross sections.

Figure D-2: Cross sections used to compare water surface elevations between models

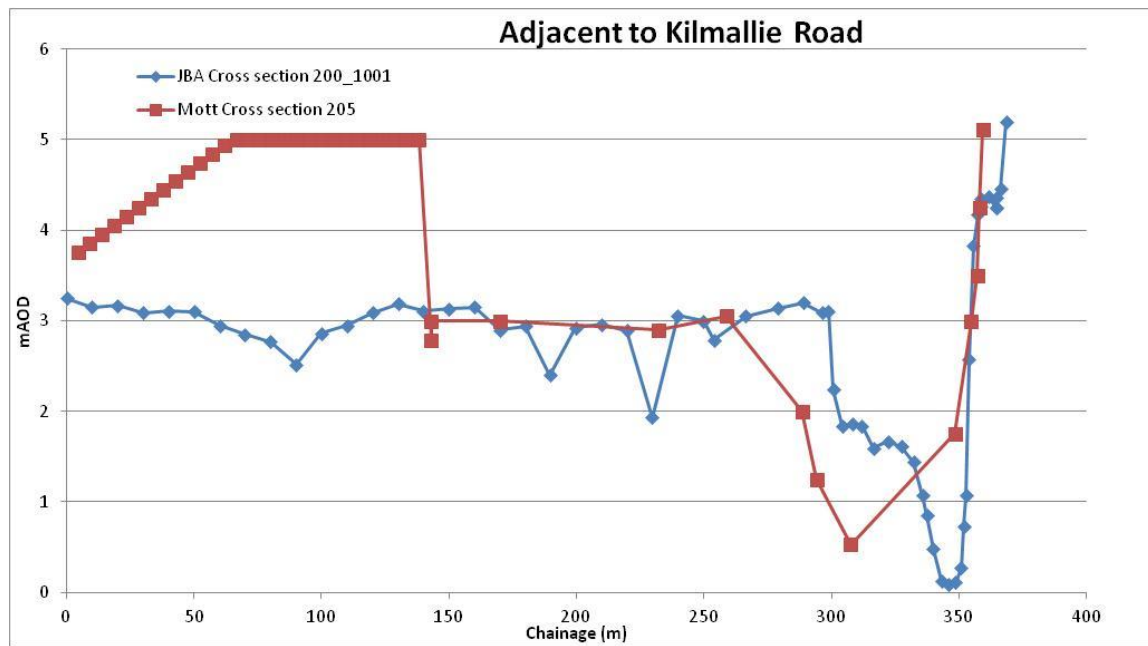




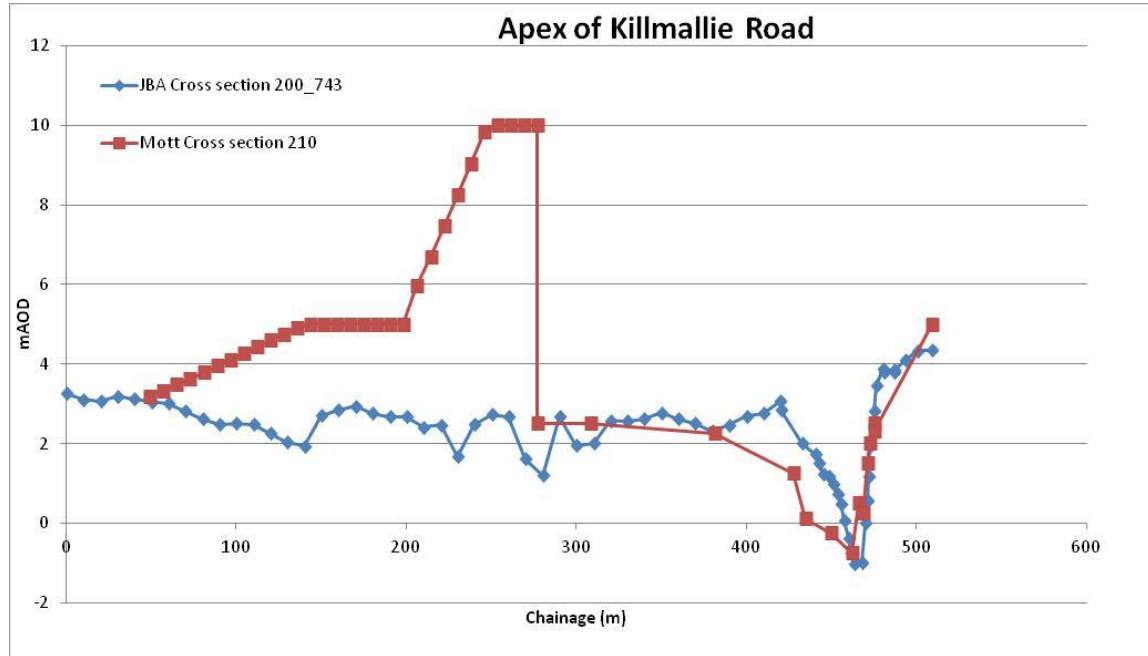
Cross section 200\_1248



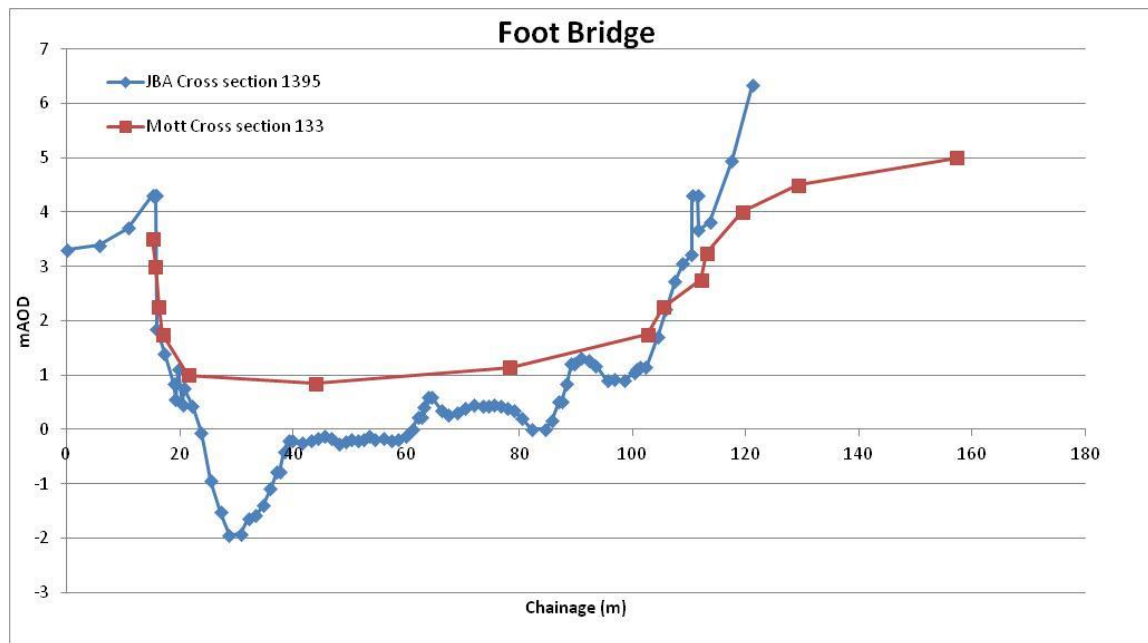
Cross section 200\_1001



Cross section 200\_743



Cross section LOCH\_1395



Further and more detailed cross section comparison is available in a separate document called "2013s7413-E-N002-Detailed cross section verification v2".





## **E Appendix - Economic Appraisal**

### Project Summary Sheet

Sheet Nr. 1

Prepared (date) 18/09/2014  
 Printed 22/09/2014  
 Prepared by JG  
 Checked by AEP  
 Checked date 22/09/2014

Client/Authority The Highland Council  
 Project name Caol FPS - Economic Appraisal  
 Project reference 2013s7413  
 Base date for estimates (year 0) Oct-2013  
 Scaling factor (e.g. £m, £k, £) £k  
 Initial Discount Rate 3.5%  
 Optimism bias adjustment factor 30.0%  
 (used for all costs, losses and benefits)  
 Variable

#### Costs and benefits of options

	Do Nothing	Option 1	Option 2	Option 3	Option 4
PV costs from estimates		4,766	4,766	5,119	
<b>Total PV Costs for appraisal (PVc)</b>		6,196	6,196	6,655	
PV damages (tangible losses)	-	2,494	4,208	2,469	
PV health impacts (intangible damages)	-	55	346	98	
<b>Total PV damages (PVd)</b>	-	2,548	4,553	2,567	
PV damage avoided (benefits)		12,178	10,174	12,160	
<b>Total PV benefits (PVb)</b>		12,178	10,174	12,160	
Net Present Value NPV		5,983	3,978	5,506	
<b>Average benefit/cost ratio</b>		1.97	1.64	1.83	

#### Brief description of options:

Do Nothing	Current conditions - Dual JP Events
Option 1	1:200 year SOP
Option 2	1:100 year SOP
Option 3	1:200 year SOP extended option
Option 4	

#### Original Notes:

- 1) Benefits will normally be expressed either in terms of damage avoided or asset values protected. Care is needed to avoid double counting
- 2) PV damage avoided is calculated as PV damage (No Project) - PV damage (Option)  
 PV asset protection benefits are calculated as PVa (Option) - PVa (No Project)  
 PV benefits calculated as PV damage avoided + PV asset protection benefits
- 3) Incremental benefit/cost ratio is calculated as:  

$$\frac{PVb(\text{current option}) - PVb(\text{previous option})}{PVc(\text{current option}) - PVc(\text{previous option})}$$

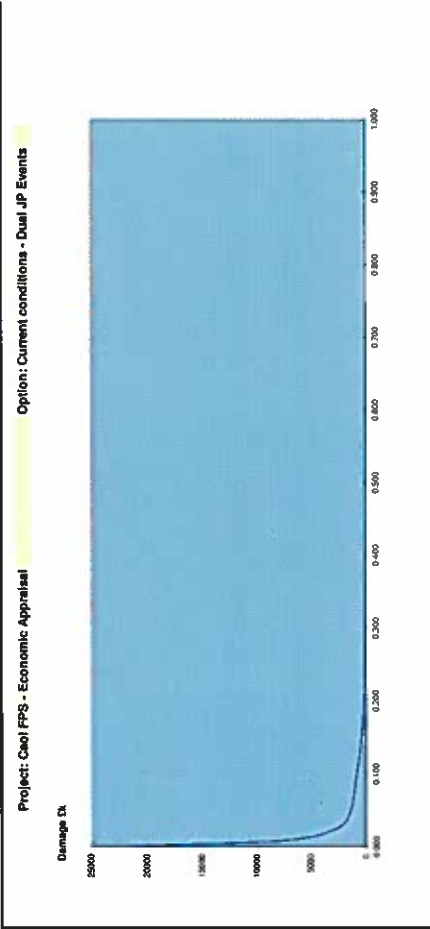


### Summary Annual Average Damage

Client/Reference:		Sheet No.:			
The Water Council		5			
Project Details:		Prepared (date):			
Cad FPS - Economic Appraisal		18/09/2014			
20/3/2013		22/09/2014			
Date for estimate (year 0)		Prepared by:			
DN		AGP			
Scale factor (e.g. DN, DA, S)		Checked by:			
3%		AGP			
Present Value factor		22/09/2014			
Applicable year (if time varying)		Checked date:			
1	1.000	1	1.000	500	11897
2	0.950	2	0.950	200	11335
3	0.900	3	0.900	100	10773
4	0.850	4	0.850	50	10211
5	0.800	5	0.800	25	9649
10	0.600	10	0.600	10	6418
15	0.450	15	0.450	5	4733
20	0.350	20	0.350	3	3550
25	0.280	25	0.280	2	2710
30	0.230	30	0.230	1	2044
35	0.190	35	0.190	1	1533
40	0.160	40	0.160	1	1133
45	0.130	45	0.130	1	828
50	0.110	50	0.110	1	600
55	0.090	55	0.090	1	440
60	0.080	60	0.080	1	320
65	0.070	65	0.070	1	230
70	0.060	70	0.060	1	170
75	0.050	75	0.050	1	120
80	0.040	80	0.040	1	80
85	0.030	85	0.030	1	50
90	0.020	90	0.020	1	30
95	0.010	95	0.010	1	10
100	0.000	100	0.000	1	0

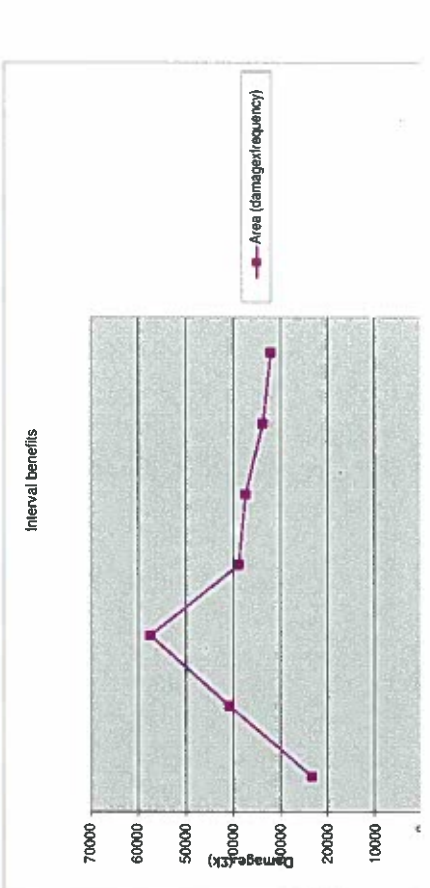
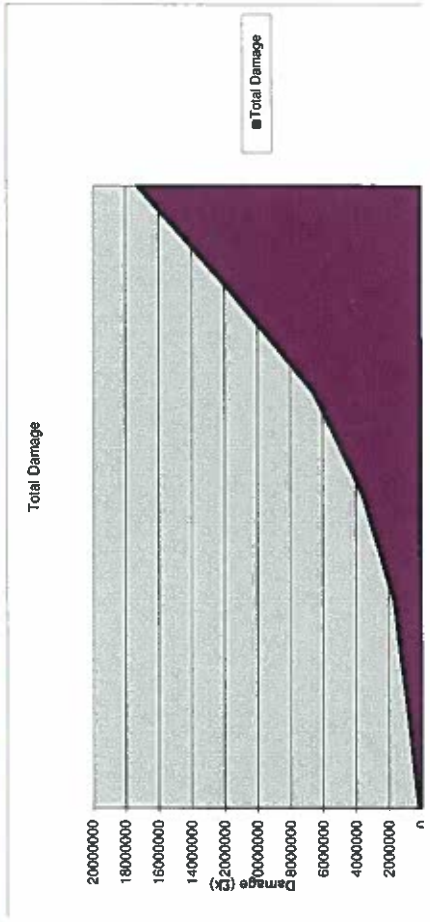
  

Category	Value
Structural damage	1298
Non-structural damage	5310
Emergency services	29,613
Vehicle damage	11,078
Business costs	115,189
Other damage	1,026
<b>Total annual damage</b>	<b>158,234</b>
Present value (assuming no change in damage or event frequency) @ 3%	113,026
Present value (assuming no change in damage or event frequency) @ 5%	81,654.7



Asset Annual Average Damage - Residential												Sheet Nr. 5a	
<b>Client/Authority</b> The Highland Council													
<b>Project name</b> Caol FPS - Economic Appraisal													
<b>Option:</b> Do Nothing Current conditions - Dual JP Events													
<b>Project reference</b> 2013s7413													
<b>Base date for estimates (year 0)</b> Oct-2013													
<b>Scaling factor (e.g. £m, £k, £)</b> £k													
<b>Discount rate</b> 3.5%													
<b>Present Value factor</b> 29.81													
<b>Applicable year (if time varying)</b> Prepared (date) 18/09/2014 Printed 22/09/2014 Prepared by JG Checked by AEP Checked date 22/09/2014													
<b>Return period</b> Average waiting time (yrs) between events/frequency per year 1 1.000 0.500 0.200 0.100 0.040 0.020 0.010 0.005 0.002 2 4014 151230 665608 1248081 2634123 4838730 8650623 12719915 5 1003.42 23288.49 40841.90 57410.69 37364.27 33723.38 32055.81 28152.69 10 4013.68 151229.57 665608.50 1248081.16 2634123.30 4838730.75 8650623.09 ##### 15432777.04 20 5473.05 206216.64 907623.75 1701883.47 3591890.54 6598091.89 ##### 21044134.77 50 4013.68 151229.57 665608.50 1248081.16 2634123.30 4838730.75 8650623.09 ##### 15432777.04 100 4013.68 151229.57 665608.50 1248081.16 2634123.30 4838730.75 8650623.09 ##### 15432777.04 Infinity 0 0 0 0 0 0 0 0 0 0													
<b>Total damage</b> Area (damages/frequency) 0 4014 151230 665608 1248081 2634123 4838730 8650623 12719915 15432777 1003.42 23288.49 40841.90 57410.69 37364.27 33723.38 32055.81 28152.69													
<b>Market Value</b> Residential property 0 4013.68 151229.57 665608.50 1248081.16 2634123.30 4838730.75 8650623.09 ##### 15432777.04 Total Residential (£k) (transferred to AAD) 5473.05 206216.64 907623.75 1701883.47 3591890.54 6598091.89 ##### 21044134.77 Capped Present Value 8724960.10 7298827.52 Annual Damage 292660.69 399072.12 11897355.59 9952681.21 Standard of protection 54.83													

**Notes**  
 Area calculations assume drop to zero at maximum frequency.  
 Default value for the highest possible damage assumes continuation of gradient for last two points, an alternative value can be entered, if appropriate.  
 One form should be completed for each option, including 'without project', and for each representative year if profile changes during scheme life  
 Annual damage should not exceed annual value for a property  
 This sheet links to Summary AAD



Asset Annual Average Damage - Industrial/Commercial										Sheet Nr.	5b	
Client/Authority The Highland Council												
Project name Caol FPS - Economic Appraisal												
Project reference 2013s7413												
Base date for estimates (year 0) Oct-13												
Scaling factor (e.g. £m, £k, £) £k												
Discount rate 3.5%												
Applicable year (if time varying) 0												
Option: Do Nothing    Current conditions - Dual JP Events												
Prepared (date) 18/09/2014												
Printed 22/09/2014												
Prepared by JG												
Checked by AEP												
Checked date 22/09/2014												
Average waiting time (yrs) between events/frequency per year												
	1	2	5	10	25	50	100	200	500	infinity		
Return period	1.000	0.500	0.200	0.100	0.040	0.020	0.010	0.005	0.002	0.000		
Annual probability	0.00	0.00	0.00	4000.00	4000.00	88300.00	134567.27	447156.59	669834.44	818286.35		
Total damage	0.00	0.00	0.00	240.00	240.00	923.00	1114.34	1454.31	1675.49	1488.12		
Area (damages/frequency)												
Market Value												
Industrial / commercial (direct)												
Total Ind - Com (£k)	0	0.00	0.00	4000.00	4000.00	88300.00	134567.27	447156.59	669834.44	818286.35		
(transferred to C1,2)												
Annual Damage										7095.25	211527.56	
Present Value												
Capped Present Value											197640.04	



**Asset Annual Average Damage - Residential** Sheet Nr. 5a

**Client/Authority**  
The Highland Council

**Project name**  
Caol FPS - Economic Appraisal

**Project reference**  
2013s7413

**Base date for estimates (year 0)**  
Oct-2013

**Scaling factor (e.g. £m, £k, £)**  
£k

**Discount rate**  
3.5%

**Present Value factor**  
29.81

**Applicable year (if time varying)**

**Option:**  
Do Nothing Current conditions - Dual JP Events

Prepared (date)  
Printed  
Prepared by  
Checked by  
Checked date

18/09/2014  
22/09/2014  
JG  
AEP  
22/09/2014

		Average waiting time (yrs) between events/frequency per year									
		1	2	5	10	25	50	100	200	500	infinity
Return period	Annual probability	1.000	0.500	0.200	0.100	0.040	0.020	0.010	0.005	0.002	0
Total damage	Area (damagexfrequency)	0	0	11	36	79	180	349	540	932	1194
			0.00	1.62	2.34	3.46	2.59	2.65	2.22	2.21	2.13

**Vehicle cost/house**  
£ 3600

Residential property	Damage £/k	Property count	Flood depth	Area	Damage	Count	Total
0	0	0	0	10.8	36	79.2	180
0	0	0	3	3	10	22	50
				349.2	97	540	932.4
				150	259		1194.00

**Summary Table**

**Evacuation Costs**

Return Period (years)	AEP	Properties Flooded	Low	Mid	High
1yr	1	0	0	0	0
1yr	1	0	0	0	0
2yr	0.5	6	7013	9918	16286
5yr	0.2	26	40441	56750	93397
10yr	0.1	42	96536	134461	221768
50yr	0.02	133	317961	442335	729805
100yr	0.01	208	566495	785925	1297727
200yr	0.005	269	854186	1182534	1953827
500yr	0.002	295	1116442	1541803	2549257
Infinity	0	295	1249089	1722169	2848843

### Summary Annual Average Damage

**Client/Reference:**  
The Highland Council

**Case File:** Economic Appraisal  
2013a/7413  
Date: Dec-2013

**Prepared (date):** 18/09/2014

**Prepared by:** JG

**Checked by:** JG

**Checked date:** 22/09/2014

**Options:**  
Option 1: Earth embankment and concrete wall to 200 year SOEP

**First mid-year of damage:** 0

**Last mid-year of period:** 99

**PV factor for mid-year 0:** 29.813

Damage Category	1	2	3	4	5	10	50	100	200	500	Intimty	Total PV
Functional direct damage (per damage)	0	0	0	0	0	0	0	0	0	0	0	0
Emergency services	0	0	0	0	0	0	0	0	0	0	0	0
Vehicle damage	0	0	0	0	0	0	0	0	0	0	0	0
Excavation costs	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total Damage</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Conversion to residential damages</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total damage (PV factor)</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total annual damage</b>	0	0	0	0	0	0	0	0	0	0	0	0
<b>Total annual damage (PV factor)</b>	0	0	0	0	0	0	0	0	0	0	0	0

**Notes:**

1. All calculations assume steps to zero at maximum frequency.

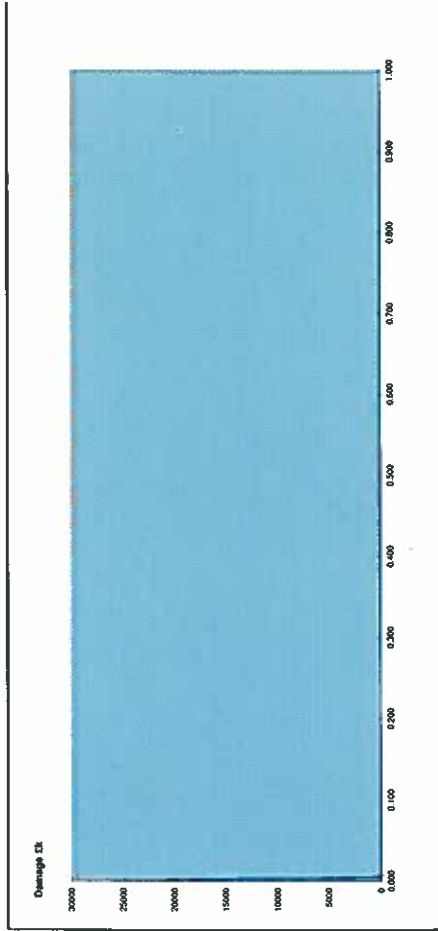
2. Other values for the highest possible damage assumes construction of gradient for best two points, an alternative value can be entered, if appropriate.

3. All items should be completed for each option, including without project, and for each representative year if profile changes over time.

4. Residential property, industrial/commercial (direct), and Other damages are limited in Asset AAD sheet and automatically linked to this sheet.

**Final Values:**

Total annual damage	0
Total annual damage (PV factor)	0
Asset AAD	0
Asset AAD (PV factor)	0

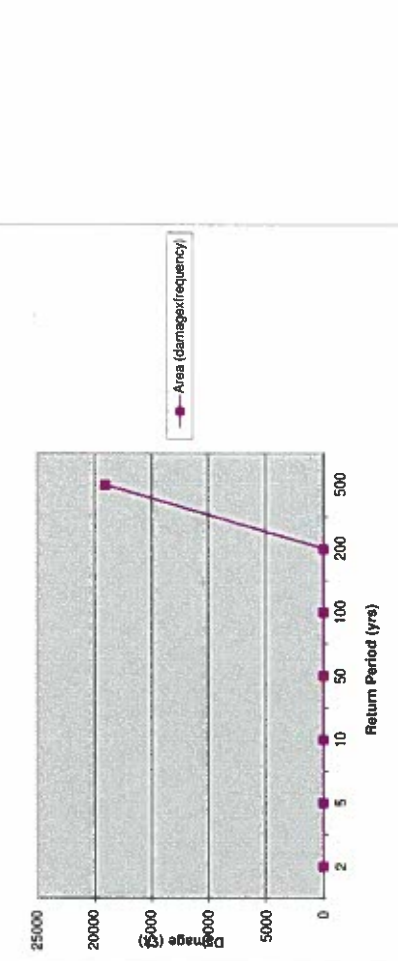
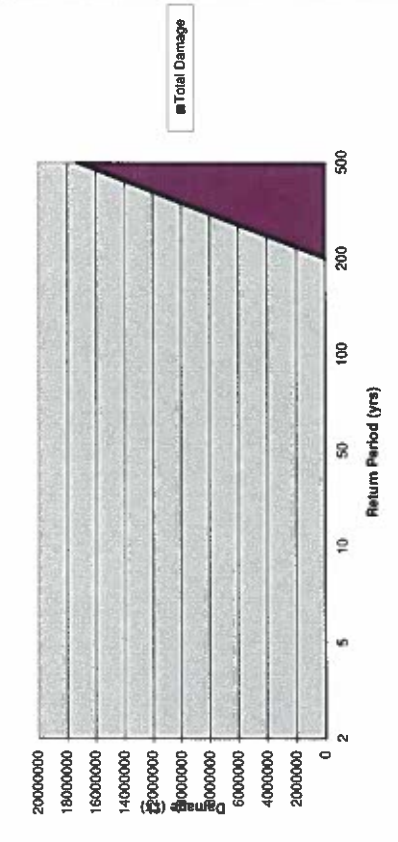




<b>Project name</b> Caol FPS - Economic Appraisal		<b>Option:</b> Option 1 Earth embankment and concrete wall to 200 year SOP	
<b>Project reference</b> 201357413 Oct-2013 £k 3.5% 29.81		<b>Prepared (date)</b> 18/09/2014 22/09/2014 Printed JG Prepared by AEP Checked by Checked date 22/09/2014	
<b>Base date for estimates (year 0)</b>		<b>Return period</b>	
<b>Scaling factor (e.g. £m, £k, £)</b>		<b>Annual probability</b>	
<b>Discount rate</b>		<b>Annual damage</b>	
<b>Present Value factor</b>		<b>Annual damage</b>	
<b>Applicable year (if time varying)</b>		<b>Annual damage</b>	
<b>Area (damage x frequency)</b>		<b>Annual damage</b>	
<b>Market Value</b>		<b>Annual damage</b>	
<b>Residential property</b>		<b>Annual damage</b>	
<b>Total Residential (£k) (transferred to AAD)</b>		<b>Present Value</b>	
<b>DI</b>		<b>Present Value</b>	
		<b>Standard of protection</b>	
		<b>Intangible damages (£k/yr)</b>	

Return period	Annual probability	Annual damage	Present Value	Standard of protection	Intangible damages (£k/yr)
1	1.000	0.00	0.00		
2	0.500	0.00	0.00		
5	0.200	0.00	0.00		
10	0.100	0.00	0.00		
50	0.020	0.00	0.00		
100	0.010	0.00	0.00		
200	0.005	0.00	0.00		
500	0.002	0.00	0.00		
Infinity	0	0	0		
<b>Total damage</b>		<b>15432777</b>	<b>1408123.01</b>		<b>3.27</b>
<b>Area (damage x frequency)</b>		<b>28152.69</b>	<b>1920116.53</b>		
<b>Market Value</b>		<b>0.00</b>	<b>1920116.53</b>		
<b>Residential property</b>		<b>0.00</b>	<b>1920116.53</b>		
<b>Total Residential (£k) (transferred to AAD)</b>		<b>0.00</b>	<b>1920116.53</b>		
<b>DI</b>		<b>0.00</b>	<b>1920116.53</b>		

**Notes**  
 Area calculations assume drop to zero at maximum frequency.  
 Default value for the highest possible damage assumes continuation of gradient for last two points, an alternative value can be entered, if appropriate.  
 One form should be completed for each option, including 'without project', and for each representative year if profile changes during scheme life  
 Annual damage should not exceed annual value for a property  
 This sheet links to Summary AAD



<b>Project name</b>		Option 1												
Caol FPS - Economic Appraisal		Earth embankment and concrete wall to 200 year SOP												
<b>Project reference</b>		201387413												
<b>Base date for estimates (year 0)</b>		Oct-13												
<b>Scaling factor (e.g. £m, £k, £)</b>		£k												
<b>Discount rate</b>		3.5%												
<b>Applicable year (if time varying)</b>		0												
		Prepared (date)											18/09/2014	
		Printed											22/09/2014	
		Prepared by											JG	
		Checked by											AEP	
		Checked data											22/09/2014	
		Average waiting time (yrs) between events/frequency per year												
		1	1	2	5	10	50	100	200	500	infinity			
<b>Return period</b>		1.000	1.000	0.500	0.200	0.100	0.020	0.010	0.005	0.002	0.000			
<b>Annual probability</b>		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
<b>Total damage</b>		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	669834.44	818286.35			
<b>Area (damages/frequency)</b>		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1004.75	1488.12			
<b>Market Value</b>														
<b>Industrial / commercial (direct)</b>														
<b>Total Ind - Com (£k)</b>		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	669834.44	818286.35		
<b>(transferred to C1.2)</b>														
													Annual Damage £k/ year	
													2492.87	
													Present Value Damage £k	
													74318.87	
													Capped Present Value £k	
													74318.87	



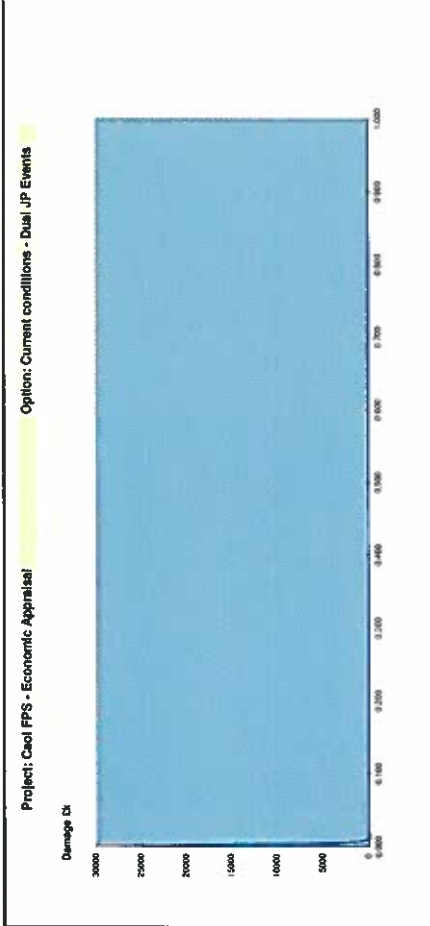
### Summary Annual Average Damage

**Client/Authority:** Council  
**Project Reference:** 2013/1413  
**Base case for estimate (year 0):** Oct-2013  
**Scaling factor (e.g. Dn, Dk, Ds):** Dk  
**Discount rate:** 3.5%  
**Preparation year:** 29.81  
**Available year (if base empty):** 29.81

**Printed (date):** 19/09/2014  
**Checked by:** ASP  
**Checked date:** 22/09/2014

Sheet No. 5

Description	Average annual damage (per year)										Total AAD
	1	2	5	10	25	50	100	200	500	Min/Max	
Direct damage	1.000	0.500	0.200	0.100	0.040	0.020	0.010	0.005	0.002	0	11897
Indirect damage	0	0	0	0	0	0	0	0	0	0	0
Emergency services	0	0	0	0	0	0	0	0	0	0	0
Vehicle damage	0	0	0	0	0	0	0	0	0	0	0
Evacuation costs	0	0	0	0	0	0	0	0	0	0	0
Loss of productivity	0	0	0	0	0	0	0	0	0	0	0
Loss of amenity	0	0	0	0	0	0	0	0	0	0	0
Loss of residential property	0	0	0	0	0	0	0	0	0	0	0
Loss of commercial property	0	0	0	0	0	0	0	0	0	0	0
Loss of other property	0	0	0	0	0	0	0	0	0	0	0
Loss of other assets	0	0	0	0	0	0	0	0	0	0	0
Loss of other liabilities	0	0	0	0	0	0	0	0	0	0	0
Loss of other intangible assets	0	0	0	0	0	0	0	0	0	0	0
Loss of other intangible liabilities	0	0	0	0	0	0	0	0	0	0	0
Loss of other intangible assets and liabilities	0	0	0	0	0	0	0	0	0	0	0
<b>Total AAD</b>											<b>11897</b>
<b>Total area with DI</b>											<b>28 813</b>
<b>PV Factor, as above</b>											<b>0.494</b>
<b>Present value (assuming no change in damage or event frequency) No DI</b>											<b>5907</b>
<b>Present value (assuming no change in damage or event frequency) With DI</b>											<b>5907</b>
<b>Area with no damage (No DI)</b>											<b>0</b>
<b>Area with damage (With DI)</b>											<b>28 813</b>
<b>Total area with DI</b>											<b>28 813</b>
<b>PV Factor, as above</b>											<b>0.494</b>
<b>Present value (assuming no change in damage or event frequency) No DI</b>											<b>5907</b>
<b>Present value (assuming no change in damage or event frequency) With DI</b>											<b>5907</b>



### Asset Annual Average Damage - Residential

Client/Authority The Highland Council		Sheet Nr. 5a	
Project name Caol FPS - Economic Appraisal		Options: Do Nothing Current conditions Dual JP Events	
Project reference 2013s7413		Prepared (date) 18/09/2014	
Base date for estimates (year 0) Oct-2013		Printed 22/09/2014	
Scaling factor (e.g. £m, \$k, £) 3.5%		Prepared by JG	
Discount rate 29.81		Checked by AEP	
Present Value factor		Checked date 22/09/2014	
Applicable year (if time varying)			

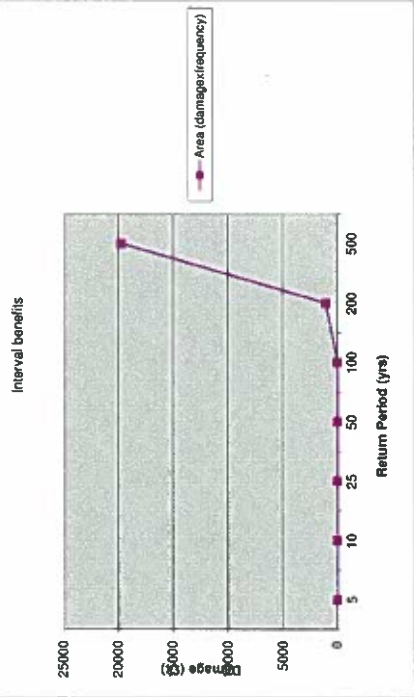
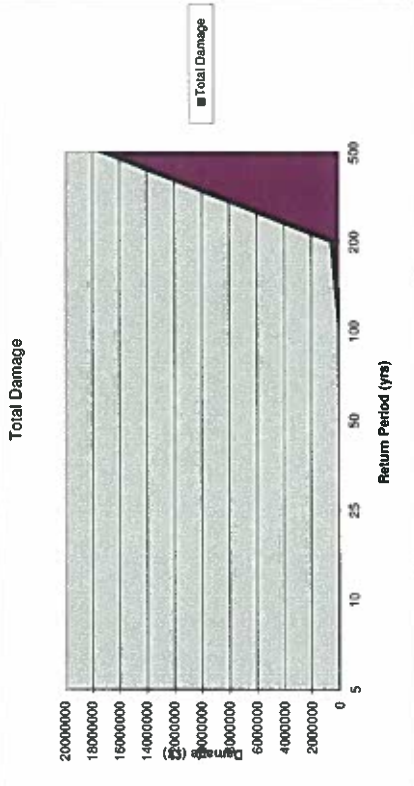
  

Return period	1	2	5	10	25	50	100	200	500	infinity
Annual probability	1.000	0.500	0.200	0.100	0.040	0.020	0.010	0.005	0.002	0
Average waiting time (yrs) between events/frequency per year										
Total damage (damage/frequency)	0	0	0	0	0	0	420260	12719915	20919685	20919685
Area (damage/frequency)	0	0	0	0	0	0	1050.65	19710.28	33639.60	33639.60

Residential property	Market Value (£k)	Damages £k	Annual Damage £k/year	Present Value Damage £k	Capped Present Value £k	Standard of protection	Intangible damages (£k/yr)
Total Residential (£k)	0	0.00	0.00	420260.41	1621817.84		3.54
(transferred to AAD)							
D1	0.00	0.00	0.00	573067.05	2211510.81		
				28526083.14	2211510.81		

Notes:  
 Area calculations assume drop to zero at maximum frequency.  
 Default value for the highest possible damage assumes continuation of gradient for last two points, an alternative value can be entered, if appropriate.  
 One form should be completed for each option, including 'without project', and for each representative year if profile changes during scheme life  
 Annual damage should not exceed annual value for a property  
 This sheet links to Summary AAD



111.93  
0.05  
3336.78



Asset Annual Average Damage - Industrial/Commercial												Sheet Nr.	5b	
Client/Authority The Highland Council														
Project name Caol FPS - Economic Appraisal														
Project reference 2013s7413														
Base date for estimates (year 0) Oct-13														
Scaling factor (e.g. £m, £k, £) £k														
Discount rate 3.5%														
Applicable year (if time varying) 0														
Option: Do Nothing    Current conditions - Dual JP Events														
Prepared (date) 18/09/2014														
Prepared by JG														
Checked by AEP														
Checked date 22/09/2014														
Return period Annual probability														
Area (damagexfrequency)														
Market Value														
Industrial / commercial (direct)														
Total Ind - Com (£k) (transferred to C1,2)														
1	2	5	10	25	50	100	200	500	inifinity					
1.000	0.500	0.200	0.100	0.040	0.020	0.010	0.005	0.002	0.000					
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	288987.12	669834.44	923725.99		
Total damage														
Area (damagexfrequency)														
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	722.49	1438.25	1593.56		
Damages £k														
Annual Damage £k/year														
Present Value £k														
Capped Present Value £k														
Annual Damage £k/year												3754.30		
Present Value £k												111925.26		
Capped Present Value £k												111925.26		





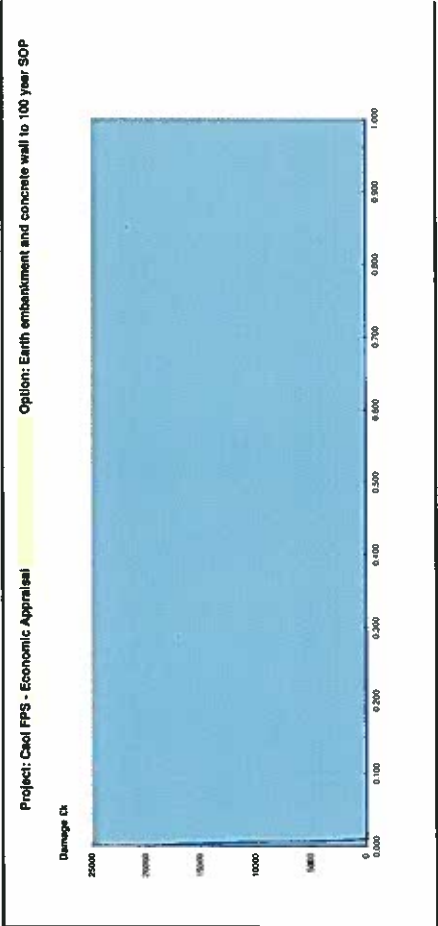
**Summary Table**

**Evacuation Costs**

Evacuation Costs

Return Period (years)	AEP	Properties Flooded	Low	Mid	High
1yr	1	0			0
1yr	1	0			0
2yr	0.5	0			0
5yr	0.2	0			0
10yr	0.1	0			0
50yr	0.02	0			0
100yr	0.01	0			0
200yr	0.005	8		27911	
500yr	0.002	358		1885739	
Infinity	0	359		2123251	

Summary Annual Average Damage						
Project Name	Client Reference	Project Dates	Client Ref.	Sheet No.	Total PVD	Option
Cash FFS - Economic Appraisal	2013/0413	18/03/2014		5		
Project Reference	007-0013	01/03/2014				
Start date for estimate (year 0)	1/3/14	22/09/2014				
Discount rate (e.g. 5%, 10%, 15%)	3.5%	JG				
Present Value Factor	29.81	AEP				
Applicable year (if same every year)		22/09/2014				
Option						
Option 3: Earth embankment and concrete wall to 100 year SOP						
First mid-year of damage:	0					
Last mid-year of damage:	99					
PV factor for mid-year 0:	29.813					
Average damage rates (incl. between events) per year						
Damage Category	1	2	3	4	5	Total
Residential direct damages	0	0	0	0	0	0
Commercial direct damages	0	0	0	0	0	0
Emergency services	0	0	0	0	0	0
Vehicle damage	0	0	0	0	0	0
Evacuation costs	0	0	0	0	0	0
Area (km <sup>2</sup> )	0.00	0.00	0.00	0.00	0.00	0.00
Area (m <sup>2</sup> )	0	0	0	0	0	0
UI conversion for residential damages	0	0	0	0	0	0
Total damage (M£) UI	0	0	0	0	0	0
Area (m <sup>2</sup> )	0	0	0	0	0	0
Area (m <sup>2</sup> )	0	0	0	0	0	0
Total area No DI	0	0	0	0	0	0
Total area with DI	0	0	0	0	0	0
PV Factor, as above	0	0	0	0	0	0
Present value (assuming no change in damage or event frequency) No DI	£111	£150	£118	£176	£214	£518
Present value (assuming no change in damage or event frequency) With DI	29.813	29.813	29.813	29.813	29.813	29.813
Weighted AAD	£111	£150	£118	£176	£214	£518
Weighted PVD	£111	£150	£118	£176	£214	£518



**Asset Annual Average Damage - Residential**

Sheet Nr. 5a

Client/Authority: The Highland Council  
 Project name: Cadl FPS - Economic Appraisal  
 Project reference: 2013/7413  
 Base date for estimates (year 0): Oct-2013  
 Scaling factor (e.g. £m, £k, £): £k  
 Discount rate: 3.5%  
 Present Value factor: 29.81  
 Applicable year (if time varying):

Option: Do Nothing Current conditions - Dual JP Events

Prepared (date): 18/09/2014  
 Prepared by: JG  
 Checked by: AEP  
 Checked date: 22/09/2014

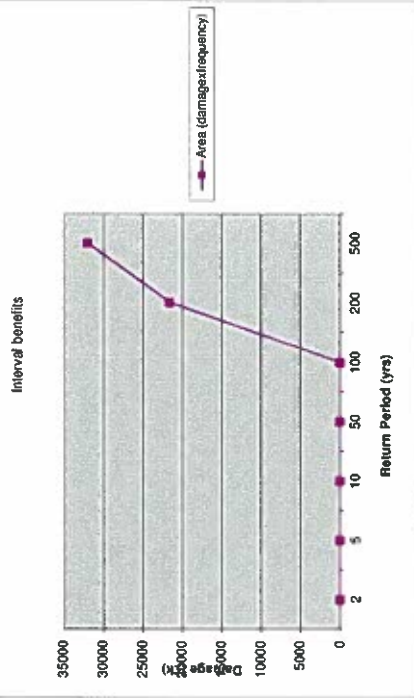
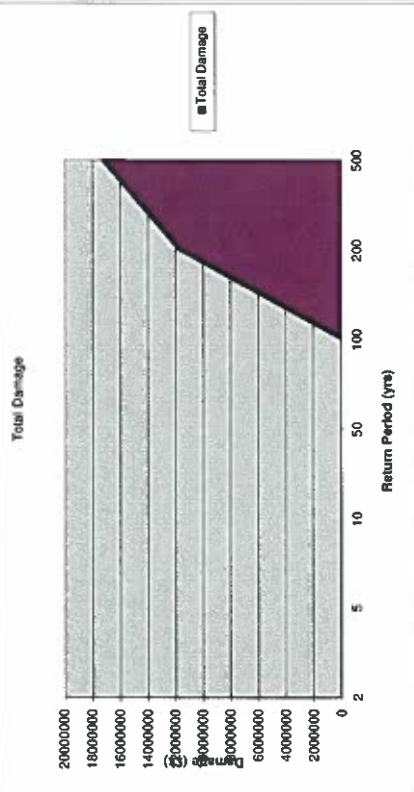
Return period	1	1	2	5	10	50	100	200	500	infinity
Annual probability	1.000	1.000	0.500	0.200	0.100	0.020	0.010	0.005	0.002	0

Average waiting time (yrs) between events/frequency per year	1	1	2	5	10	50	100	200	500	infinity
Total damage	0	0	0	0	0	0	0	8650623	12719815	15432777
Area (damaged/frequency)	0	0	0	0	0	0	0	21626.56	32055.81	26152.69

Residential property	Market Value	Damages £k	Annual Damage £k/year	Present Value Damage £k	Capped Present Value £k	Standard of protection	Intangible damages (£k/yr)
Total Residential (£k) (transferred to AAD)	0	0.00	0.00	0.00	81835.06	2439711.38	2439711.38
DI	0.00	0.00	0.00	0.00	111590.29	3326790.43	3326790.43

Notes

Area calculations assume drop to zero at maximum frequency.  
 Default value for the highest possible damage assumes continuation of gradient for last two points, an alternative value can be entered, if appropriate.  
 One form should be completed for each option, including 'without project', and for each representative year if profile changes during scheme life.  
 Annual damage should not exceed annual value for a property.  
 This sheet links to Summary AAD





Asset Annual Average Damage - Industrial/Commercial										Sheet Nr.	5b
Client/Authority The Highland Council											
Project Name Caol FPS - Economic Appraisal											
Project reference 2013s7413											
Base date for estimates (year 0) Oct-13											
Scaling factor (e.g. £m, \$k, \$) £k											
Discount rate 3.5%											
Applicable year (if time varying) 0											
Option: Do Nothing Current conditions - Dual JP Events											
Prepared (date) 18/09/2014											
Printed 22/09/2014											
Prepared by JG											
Checked by AEP											
Checked date 22/09/2014											
Return period											
Annual probability											
Average waiting time (yrs) between events: frequency per year											
1	1	2	5	10	50	100	200	500	Infinity		
1.000	1.000	0.500	0.200	0.100	0.020	0.010	0.005	0.002	0.000		
Total damage											
Area (damages/frequency)											
0.00	0.00	0.00	0.00	0.00	0.00	0.00	447156.59	669834.44	818286.35		
Market Value											
Industrial / commercial (direct)											
0	0.00	0.00	0.00	0.00	0.00	0.00	447156.59	669834.44	818286.35	4281.50	127642.38
Total Ind - Com (EX)											
(transferred to C1.2)											
Annual Damage £k/year											
Present Value Damage £k											
Capped Present Value £k											
127642.38											



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