

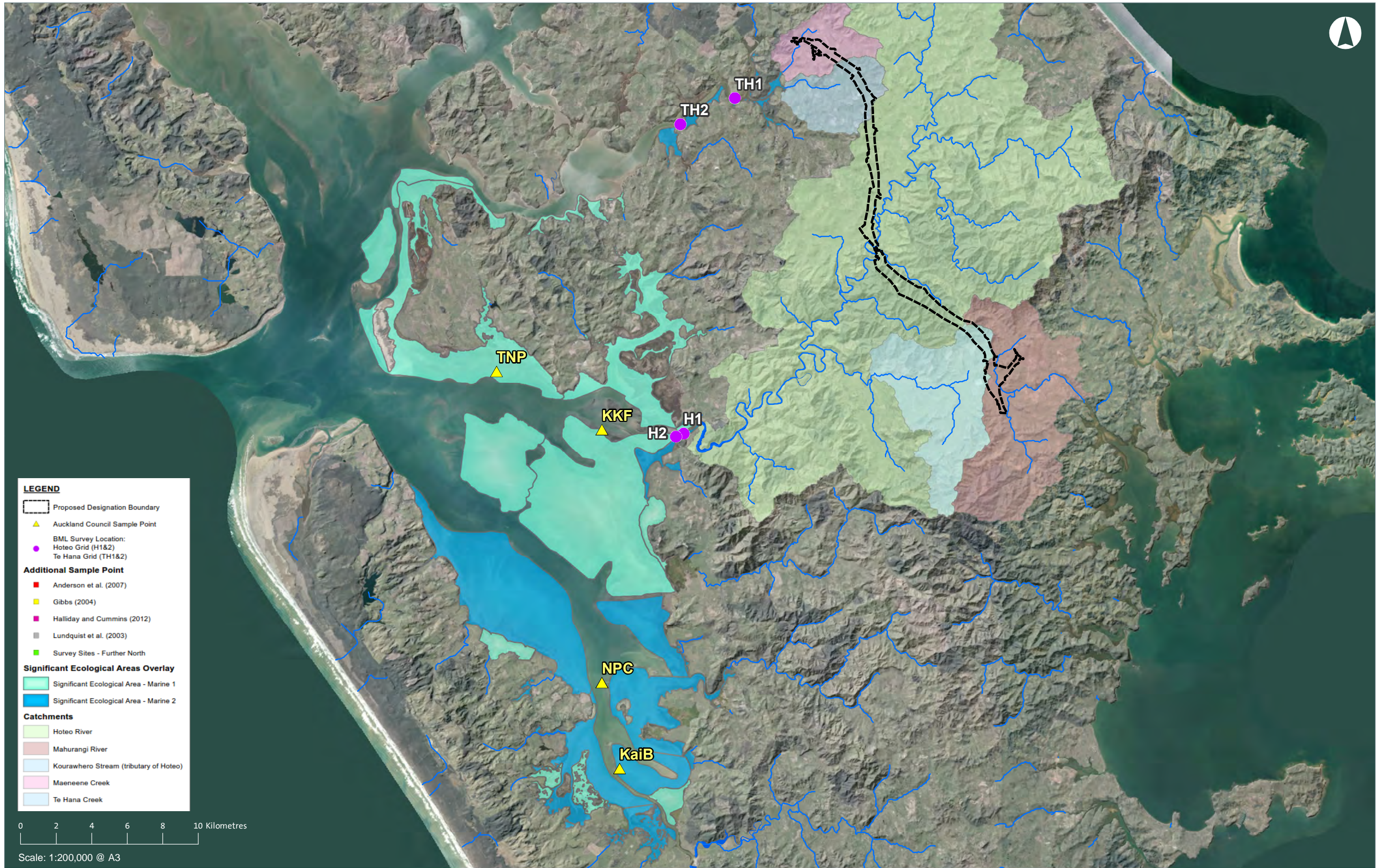
LEGEND

- Proposed Designation Boundary
- ▲ Auckland Council Sample Point
- BML Survey Location:
Hotoe Grid (H1&2)
Te Hana Grid (TH1&2)
- Additional Sample Point**
- Anderson et al. (2007)
- Gibbs (2004)
- Halliday and Cummins (2012)
- Lundquist et al. (2003)
- Survey Sites - Further North
- Significant Ecological Areas Overlay**
- Significant Ecological Area - Marine 1
- Significant Ecological Area - Marine 2
- Catchments**
- Hotoe River
- Mahurangi River
- Kourawhero Stream (tributary of Hotoe)
- Maeneene Creek
- Te Hana Creek

0 2 4 6 8 10 Kilometres

Scale: 1:200,000 @ A3

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Drawn MDu	Drafting Check JB*	Designed SDL*	Design Check DR*															
Approved BN*		Date JULY 2019																
Scale 1:200,000			Original Size A3															
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0	FOR RMA APPROVALS	MDu	JB*	BN*	07/09													
No	Revision	Drawn	Checked	Approved	Date													



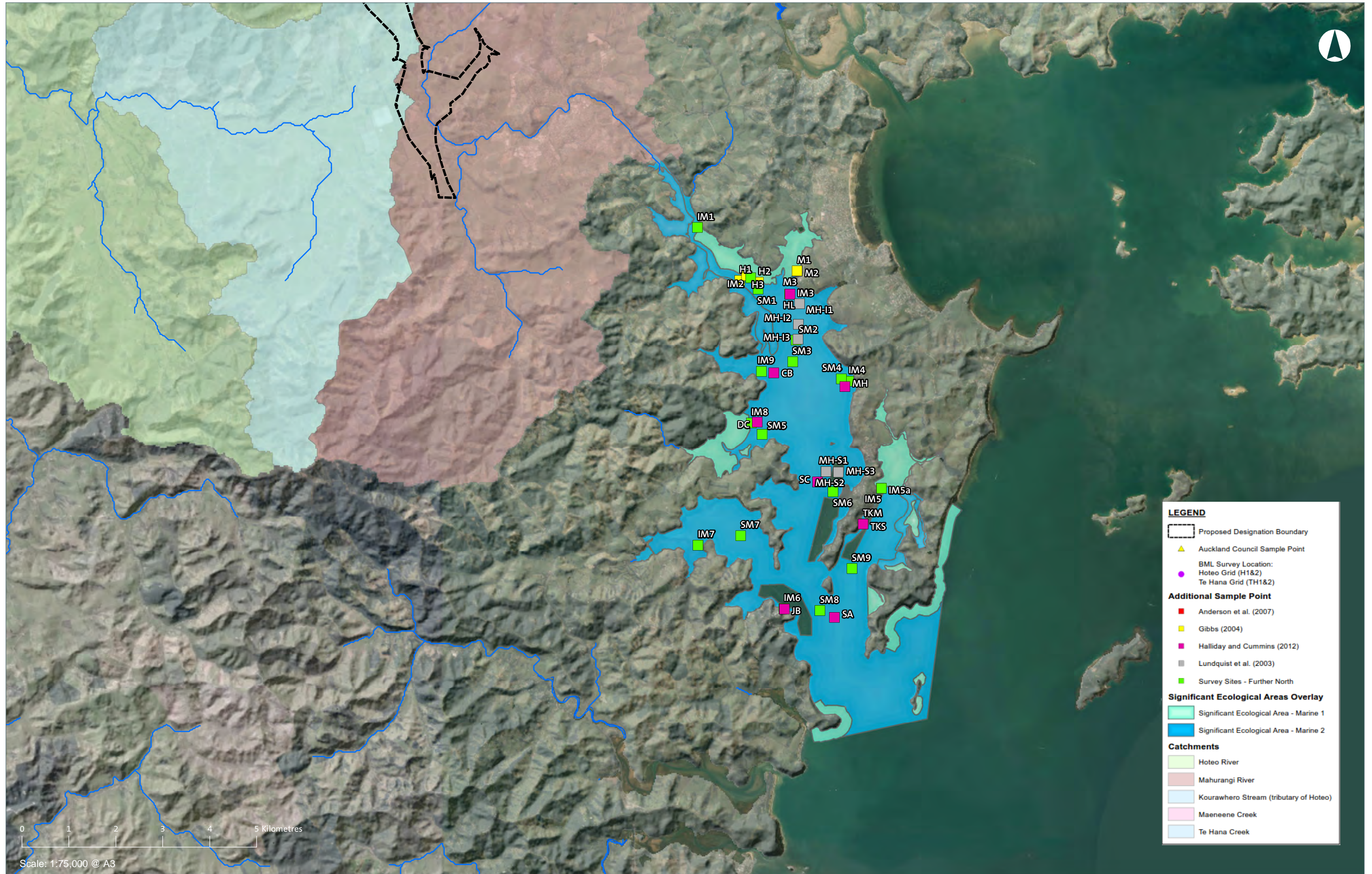
LEGEND

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- Kourawhero Stream (tributary of Hoteo)
- Maeneene Creek
- Te Hana Creek

0 2 4 6 8 10 Kilometres

Scale: 1:200,000 @ A3

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0 FOR RMA APPROVALS No Revision Drawn Checked Approved Date	MDu JB* BN* 07/19 Drawn Checked Approved Date							



LEGEND

- Proposed Designation Boundary
- Auckland Council Sample Point
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Hoteo Grid (H1&2)
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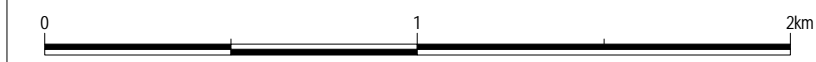
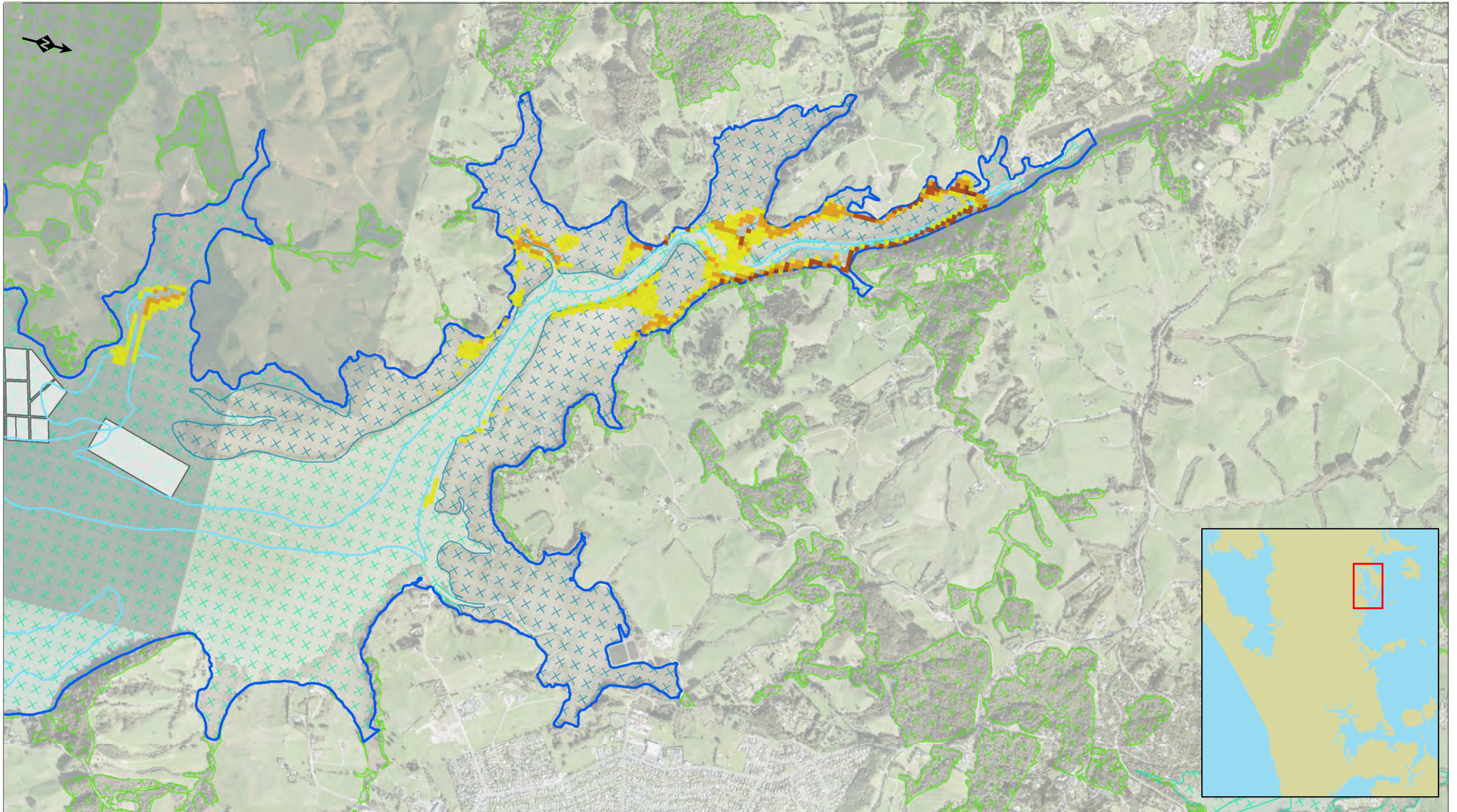
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Project	WARKWORTH TO WELLSFORD PROJECT				
Title	MARINE ECOLOGICAL ASSESSMENT MAHURANGI HARBOUR				
Contract:	PA4156	Drawing No:	ME-013	Sheet:	3 OF 3
Rev:	0				



LEGEND

- Area of Additional Deposition above 10mm
- Area of Additional Deposition above 5mm
- Area of Additional Deposition above 3mm
- Aquaculture Farms
- Low Astronomical Tide
- Mean High Water Springs
- Significant Ecological Areas**
- Terrestrial [rp/dp]
- Marine 1 [rcp]
- Marine 2 [rcp]

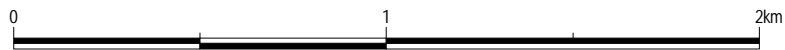
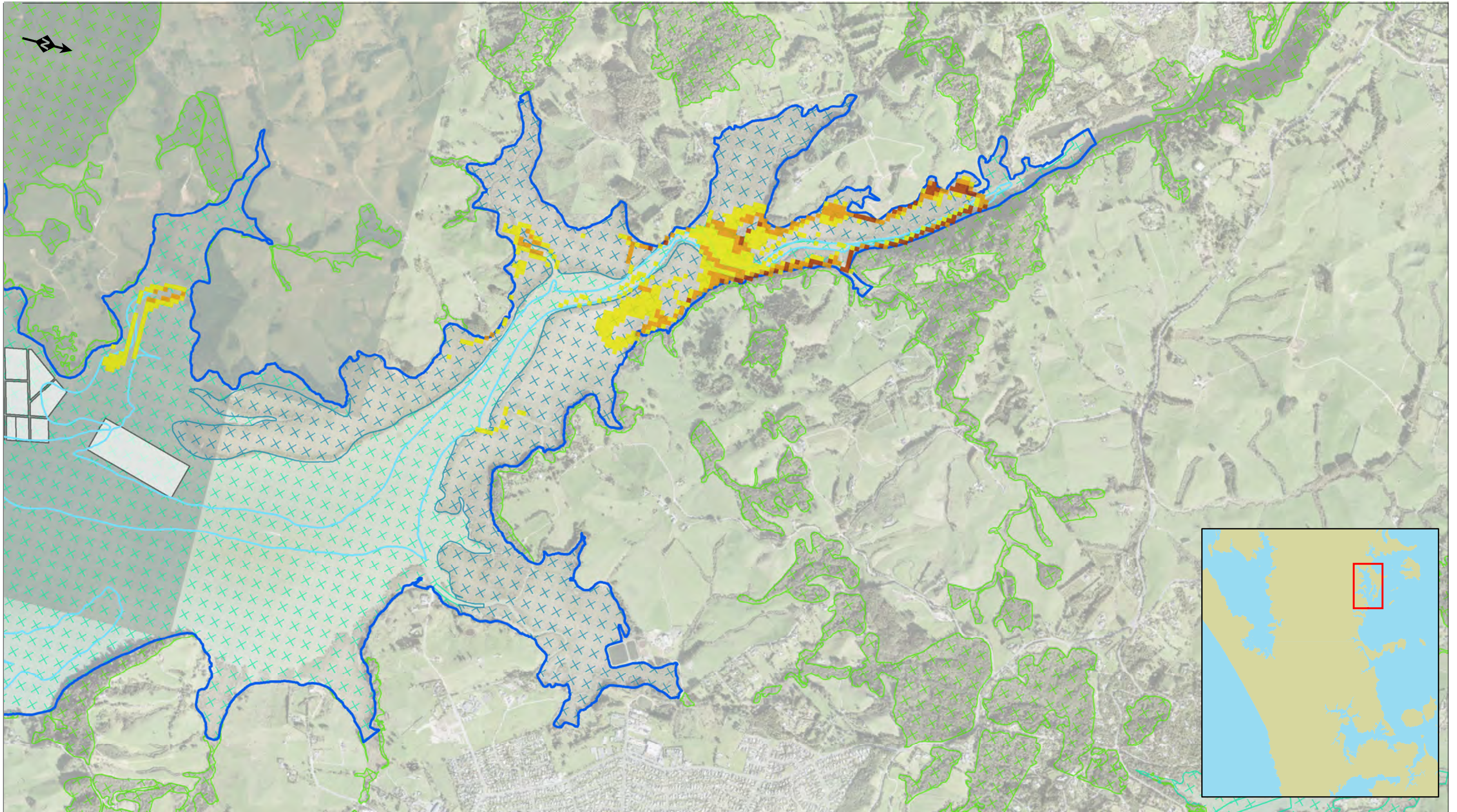
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Project	WARKWORTH TO WELLSFORD PROJECT		
Title	MAHURANGI SEDIMENT DEPOSITION SCENARIO: 10 year Rainfall Event of 3 day Duration Calm Winds and Short Term Baseline Scenario		
Contract:	PA4156	Drawing No:	ME-014
Sheet:	1 OF 8	Rev:	0



LEGEND

- Area of Additional Deposition above 10mm
- Area of Additional Deposition above 5mm
- Area of Additional Deposition above 3mm
- Aquaculture Farms
- Low Astronomical Tide
- Mean High Water Springs
- Significant Ecological Areas**
- Terrestrial [rp/dp]
- Marine 1 [rcp]
- Marine 2 [rcp]

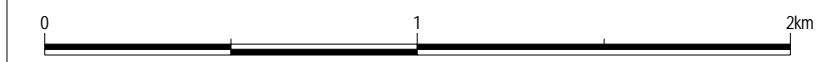
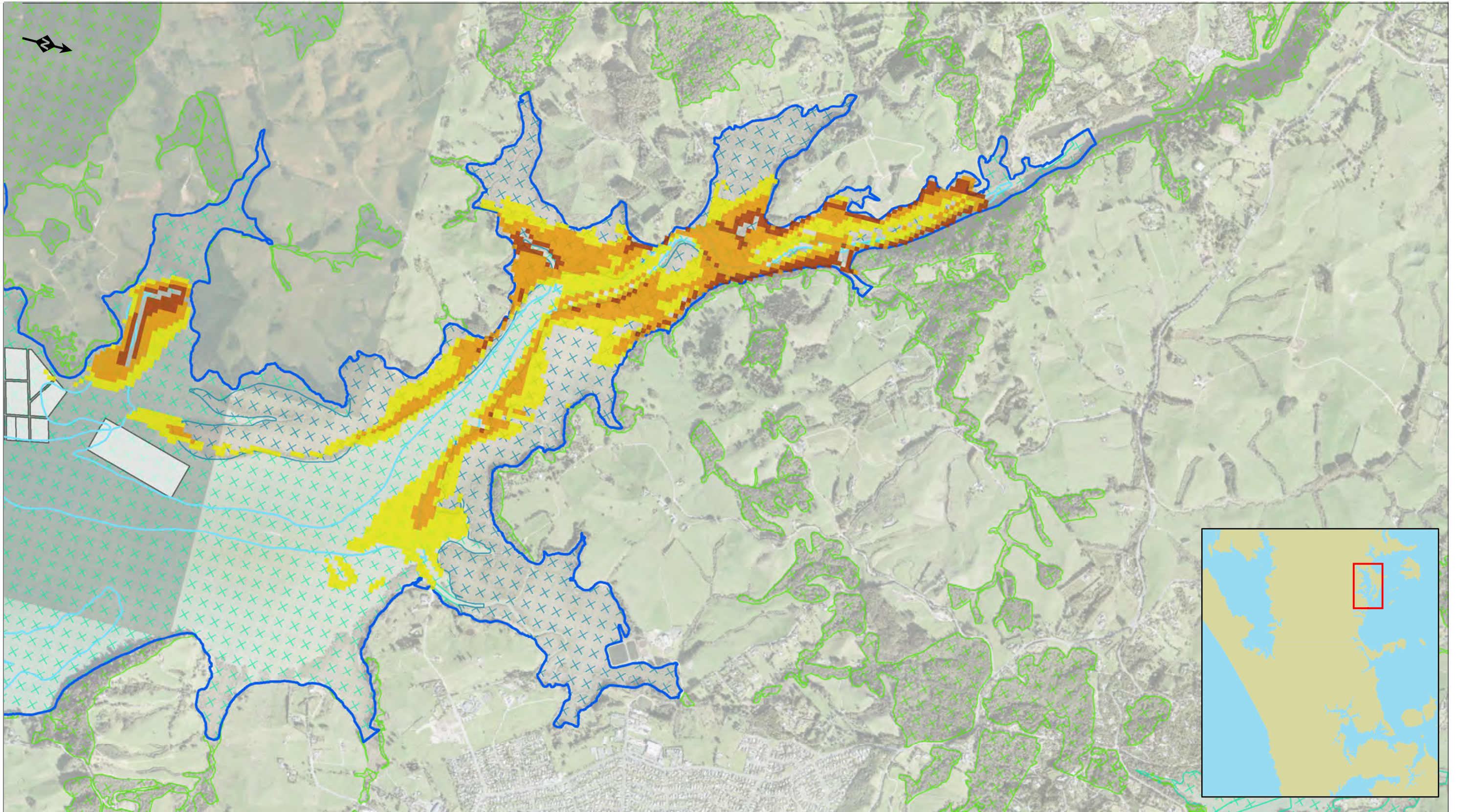
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				Approved	Date



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Designed	SDL*	Design	JB*
Check		Check	
Approved	BN*	Date	JULY 2019
Scale	NTS	This Drawing must not be used for Construction unless signed as Approved	Original Size A3

Project	WARKWORTH TO WELLSFORD PROJECT		
Title	MAHURANGI SEDIMENT DEPOSITION SCENARIO: 10 year Rainfall Event of 3 day Duration ENE Winds and Short Term Baseline Scenario		
Contract:	PA4156	Drawing No:	ME-015
Sheet:	2 OF 8	Rev:	0



LEGEND

- Area of Additional Deposition above 10mm
- Area of Additional Deposition above 5mm
- Area of Additional Deposition above 3mm
- Aquaculture Farms
- Low Astronomical Tide
- Mean High Water Springs
- Significant Ecological Areas**
- Terrestrial [rp/dp]
- Marine 1 [rcp]
- Marine 2 [rcp]

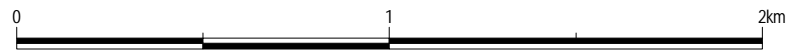
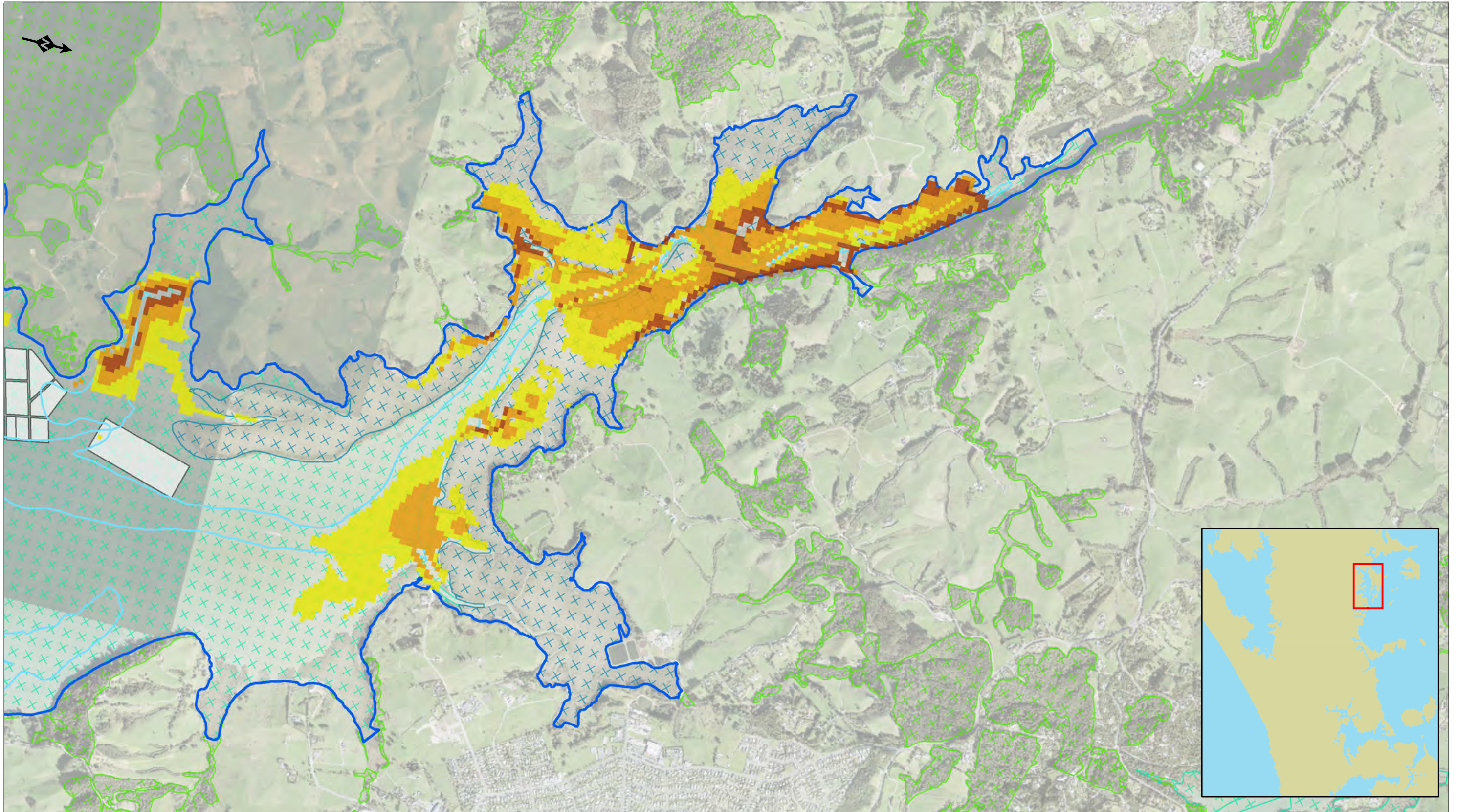
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Design Check				Design Check	JB*
Approved	BN*		Date	JULY 2019	
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Project	WARKWORTH TO WELLSFORD PROJECT				
Title	MAHURANGI SEDIMENT DEPOSITION SCENARIO: 50 year Rainfall Event of 3 day Duration Calm Winds and Short Term Baseline Scenario				
Contract:	PA4156	Drawing No:	ME-016	Sheet:	3 OF 8
Rev:	0				



LEGEND

- Area of Additional Deposition above 10mm
- Area of Additional Deposition above 5mm
- Area of Additional Deposition above 3mm
- Aquaculture Farms
- Low Astronomical Tide
- Mean High Water Springs
- Significant Ecological Areas**
- Terrestrial [rp/dp]
- Marine 1 [rcp]
- Marine 2 [rcp]

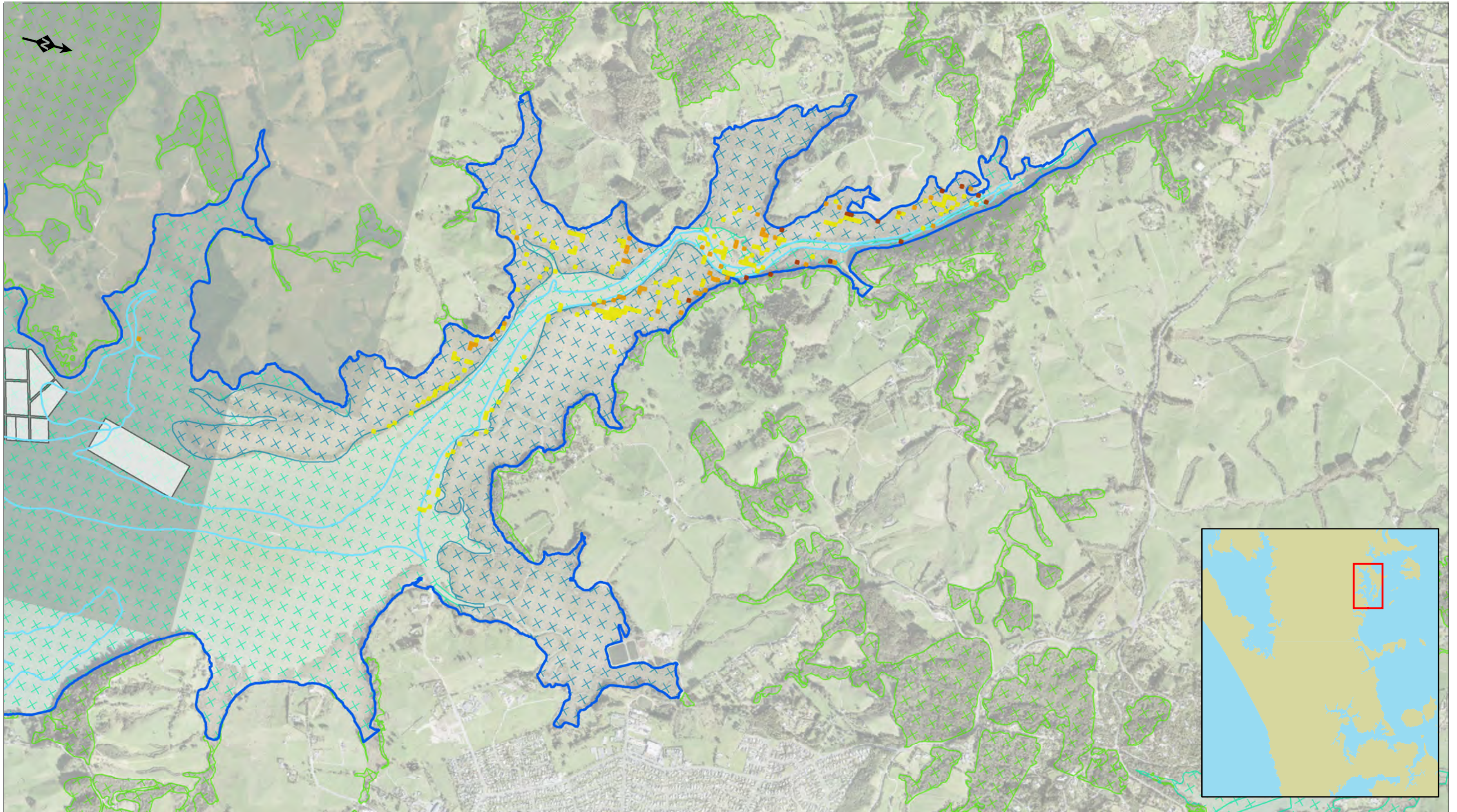
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Project	WARKWORTH TO WELLSFORD PROJECT				
Title	MAHURANGI SEDIMENT DEPOSITION SCENARIO: 50 year Rainfall Event of 3 day Duration ENE Winds and Short Term Baseline Scenario				
Contract:	PA4156	Drawing No:	ME-017	Sheet:	4 OF 8
Rev:	0				



LEGEND

- Area of Additional Deposition above 10mm
- Area of Additional Deposition above 5mm
- Area of Additional Deposition above 3mm
- Aquaculture Farms
- Low Astronomical Tide
- Mean High Water Springs
- Significant Ecological Areas**
- Terrestrial [rp/dp]
- Marine 1 [rcp]
- Marine 2 [rcp]

NOTES
Assume peak earthworks season

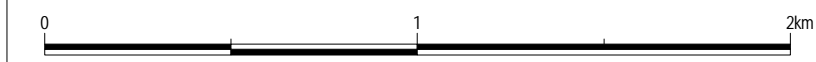
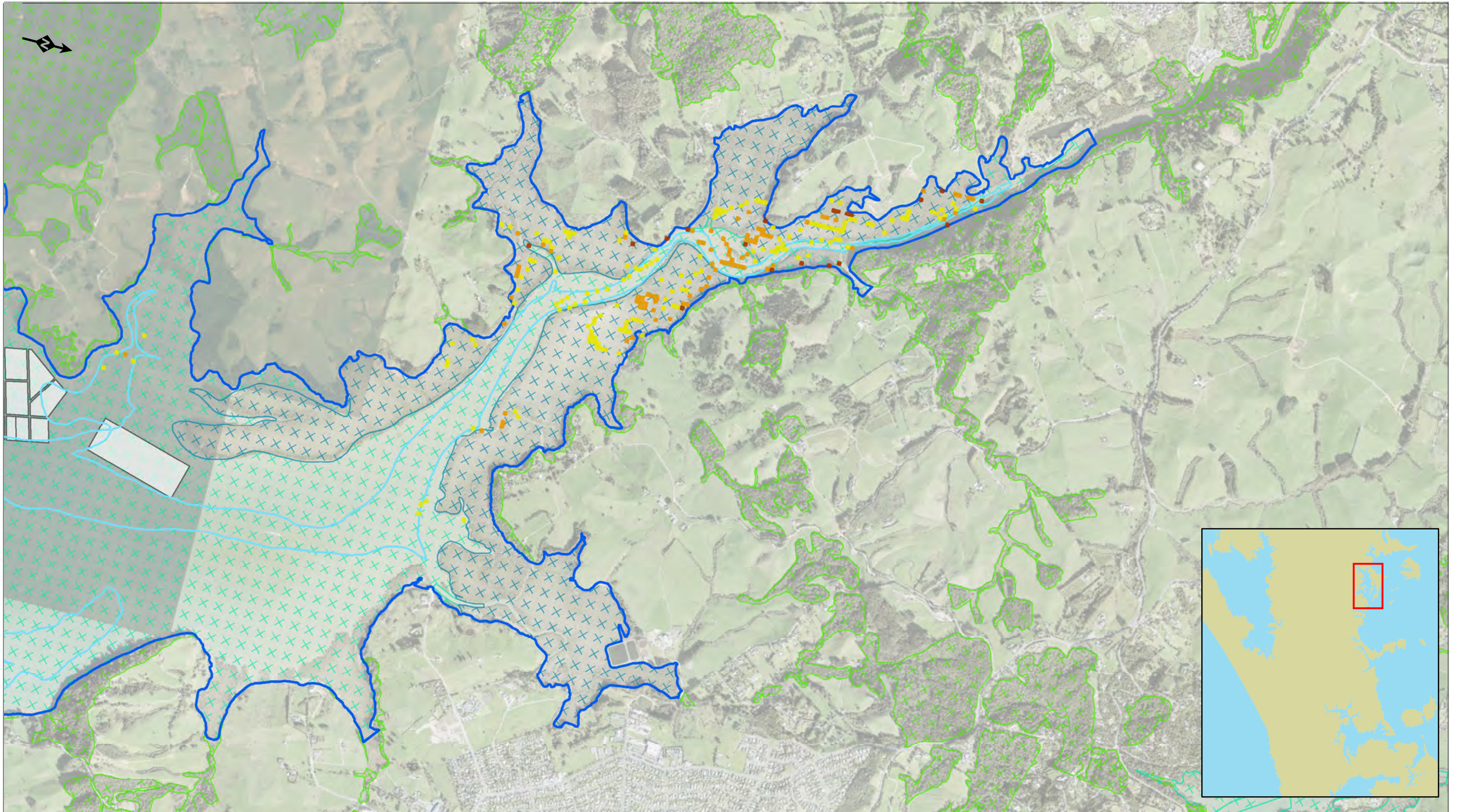
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Project	WARKWORTH TO WELLSFORD PROJECT				
Title	MAHURANGI SEDIMENT DEPOSITION SCENARIO: 10 year Rainfall Event of 3 day Duration Calm Winds and Short Term Construction Scenario				
Contract:	PA4156	Drawing No:	ME-018	Sheet:	5 OF 8
Rev:	0				



LEGEND

- Area of Additional Deposition above 10mm
- Area of Additional Deposition above 5mm
- Area of Additional Deposition above 3mm
- Aquaculture Farms
- Low Astronomical Tide
- Mean High Water Springs
- Significant Ecological Areas**
- Terrestrial [rp/dp]
- Marine 1 [rcp]
- Marine 2 [rcp]

NOTES

Assume peak earthworks season

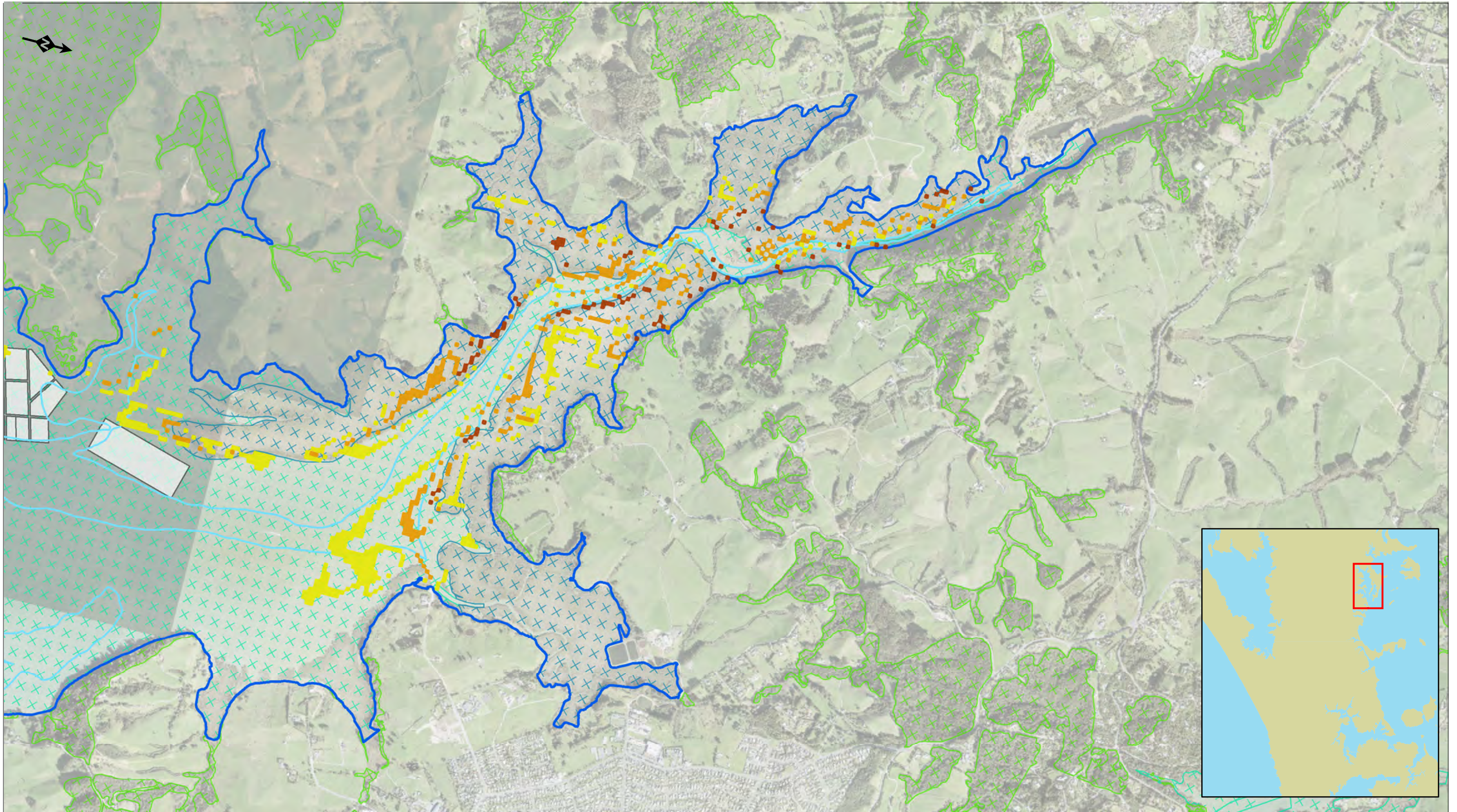
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Design Check				Design Check	JB*
Approved	BN*		Date		
			JULY 2019		
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Project	WARKWORTH TO WELLSFORD PROJECT				
Title	MAHURANGI SEDIMENT DEPOSITION SCENARIO: 10 year Rainfall Event of 3 day Duration ENE Winds and Short Term Construction Scenario				
Contract	PA4156	Drawing No:	ME-019	Sheet:	6 OF 8
Rev:	0				



NOTES
Assume peak earthworks season

LEGEND

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- Marine 1 [rcp]
- Marine 2 [rcp]

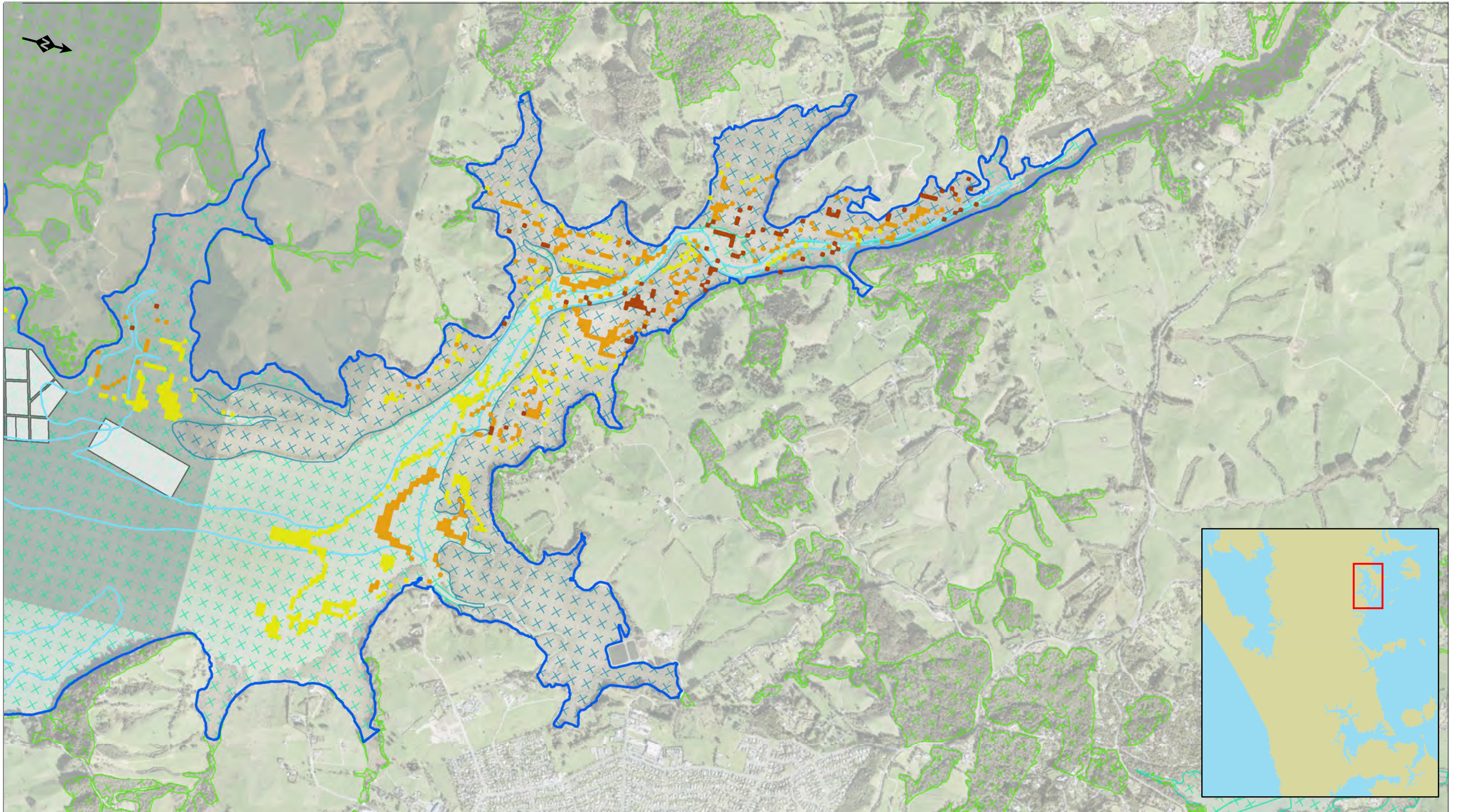
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Design Check				Design Check	JB*
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Project	WARKWORTH TO WELLSFORD PROJECT				
Title	MAHURANGI SEDIMENT DEPOSITION SCENARIO: 50 year Rainfall Event of 3 day Duration Calm Winds and Short Term Construction Scenario				
Contract:	PA4156	Drawing No:	ME-020	Sheet:	7 OF 8
Rev:	0				



LEGEND

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- Terrestrial [rp/dp]
- Marine 1 [rcp]
- Marine 2 [rcp]

NOTES
Assume peak earthworks season

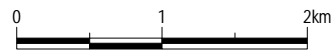
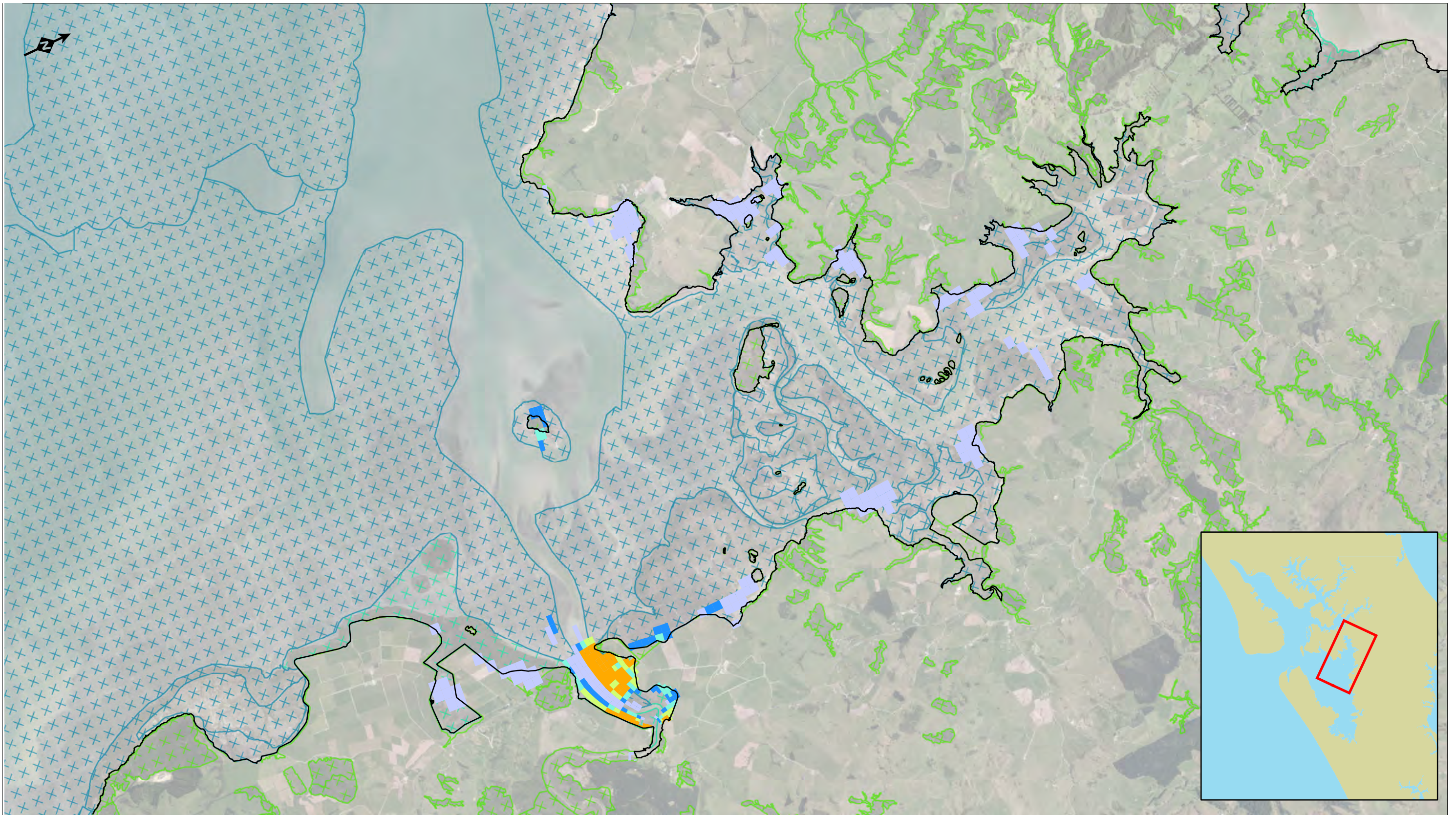
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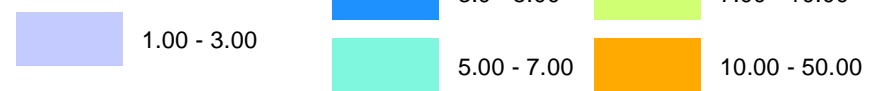
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Approved	BN*		Date	JULY 2019	
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Title	MAHURANGI SEDIMENT DEPOSITION SCENARIO: 50 year Rainfall Event of 3 day Duration ENE Winds and Short Term Construction Scenario				
Contract:	PA4156	Drawing No:	ME-021	Sheet:	8 OF 8
Rev:	0				

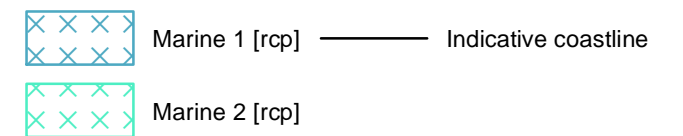


LEGEND

Baseline deposition (mm)



Significant Ecological Areas



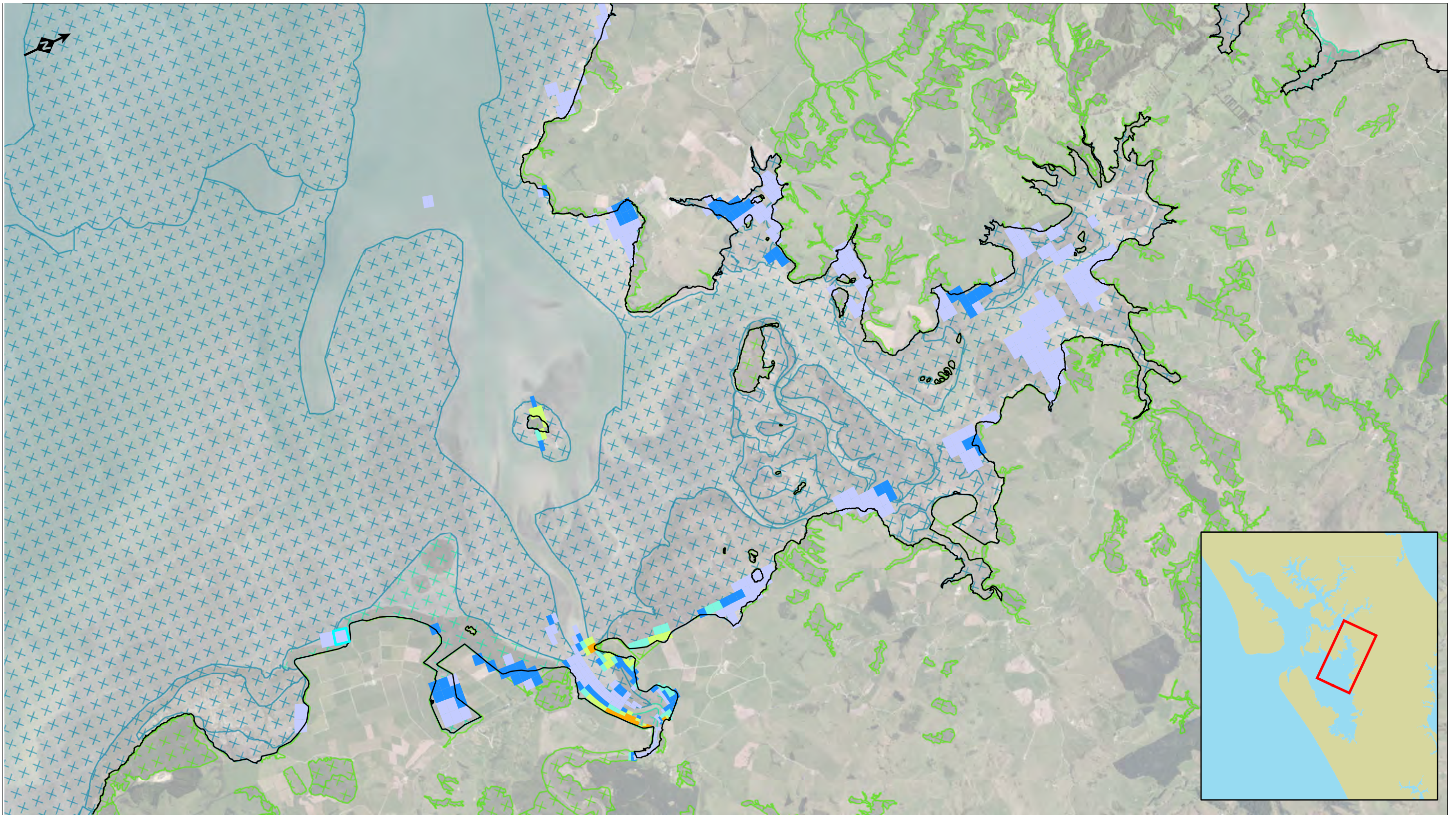
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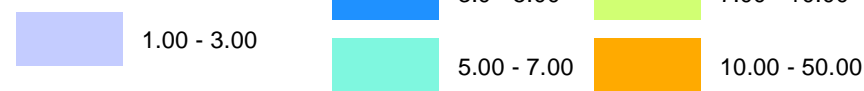
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Drawn NR	Drafting Check JB*	Designed MA*	Design Check DR*
Approved BN*		Date JULY 2019	
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Project	WARKWORTH TO WELLSFORD PROJECT		
Title	KAIPARA HARBOUR SEDIMENT DEPOSITION SCENARIO: 7 year simulation for the baseline 10 year ARI, SW wind event		
Contract:	PA4156	Drawing No:	ME-022
Sheet:	1 OF 6	Rev:	0

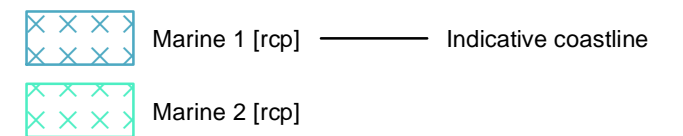


LEGEND

Baseline deposition (mm)



Significant Ecological Areas



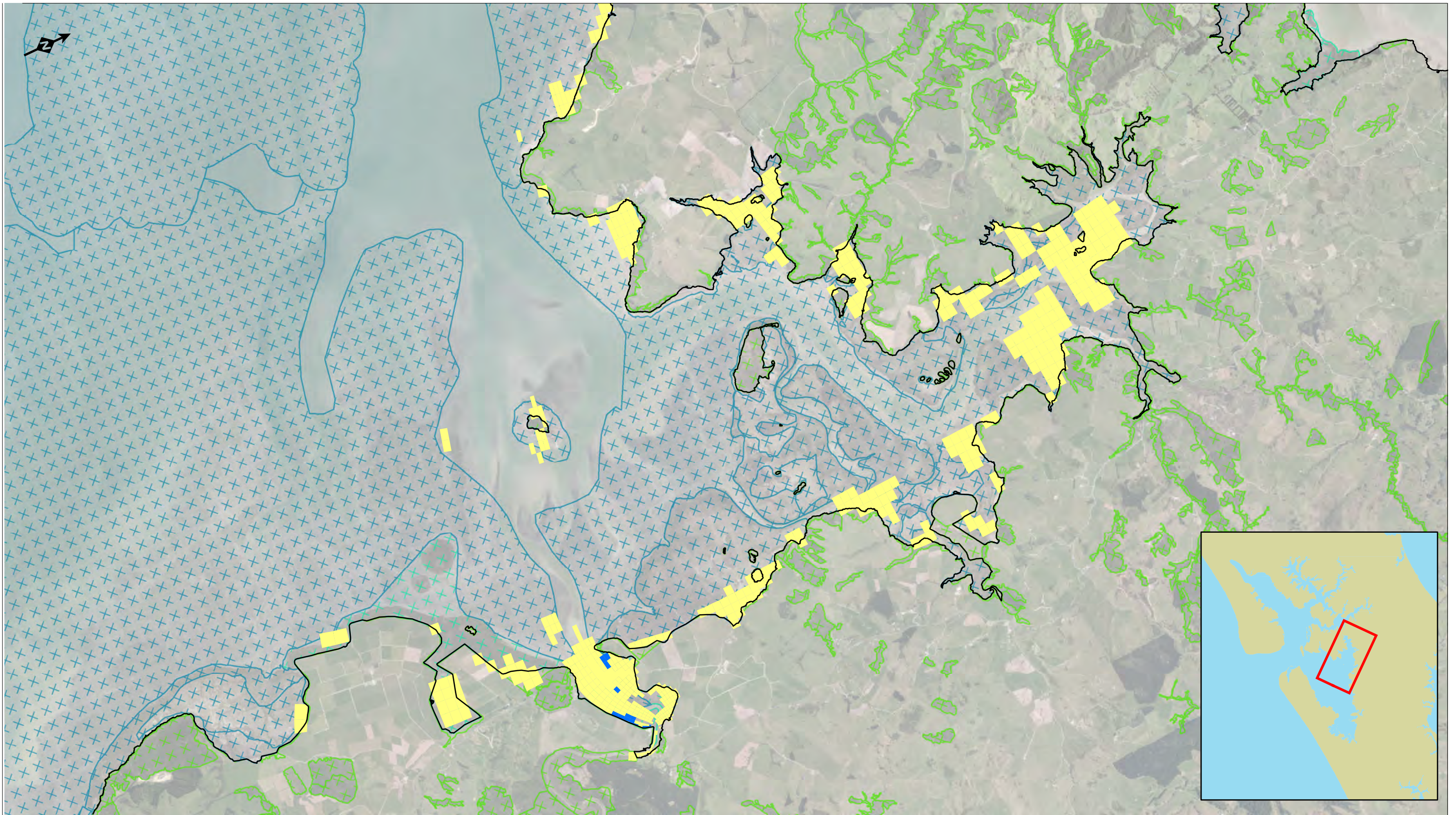
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Project	WARKWORTH TO WELLSFORD PROJECT		
Title	KAIPARA HARBOUR SEDIMENT DEPOSITION SCENARIO: 7 year simulation for the baseline 50 year ARI, SW wind event		
Contract:	PA4156	Drawing No:	ME-023
Sheet:	2 OF 6	Rev:	0



NOTES
Assume peak earthworks season

LEGEND

Additional deposition (mm)
 0.02 - 1.00
 1.00 - 3.00
 3.00 - 5.00

Significant Ecological Areas
 Terrestrial [rp/dp]

Marine 1 [rcp] Indicative coastline
 Marine 2 [rcp]

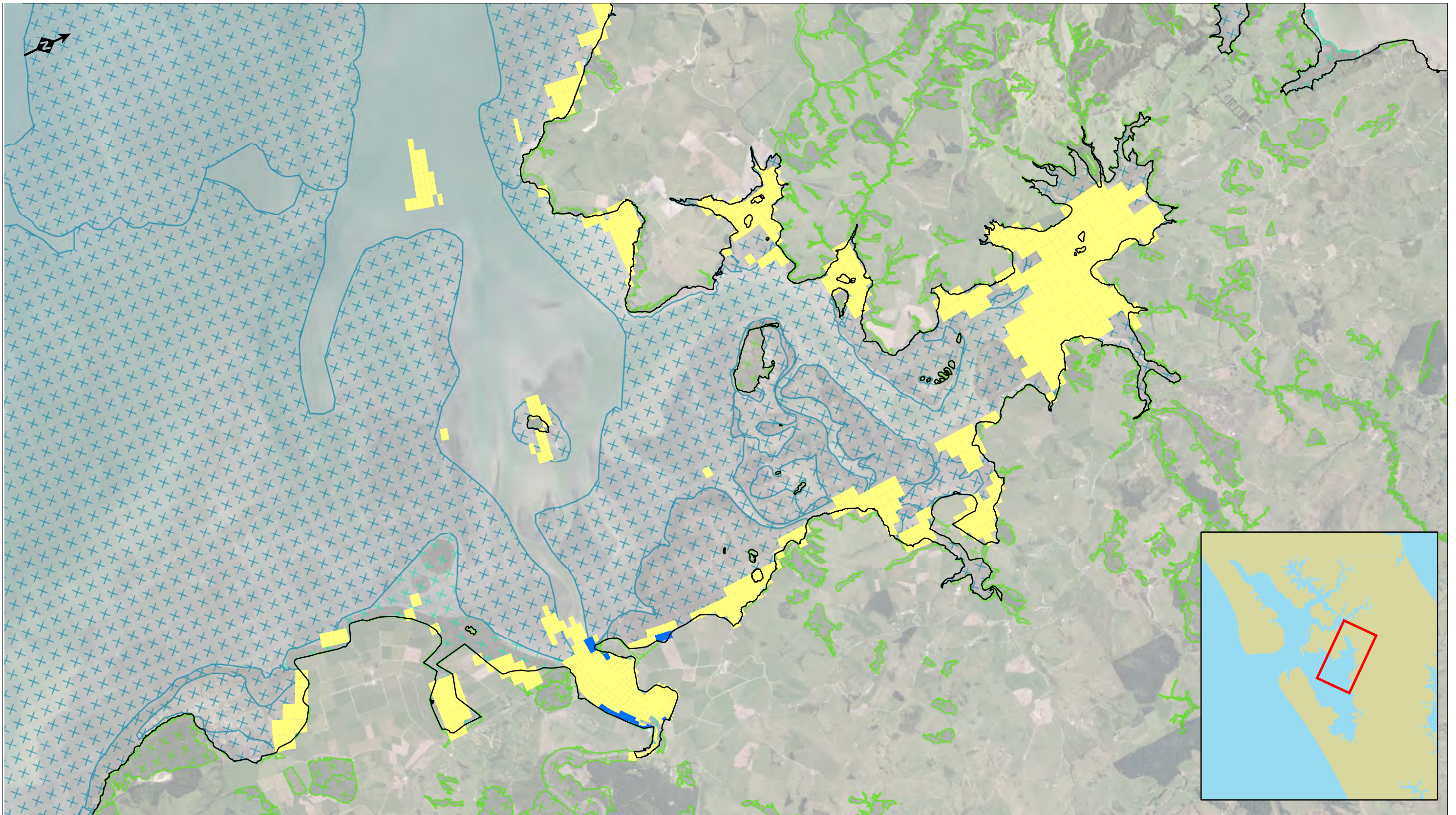
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Approved BN*		Date JULY 2019	
Scale NTS	This Drawing must not be used for Construction unless signed as Approved		Original Size A3

Project	WARKWORTH TO WELLSFORD PROJECT		
Title	KAIPARA HARBOUR SEDIMENT DEPOSITION SCENARIO: 7 year simulation for the additional deposition from project construction for the 10 year ARI, SW wind event		
Contract:	PA4156	Drawing No:	ME-024
Sheet:	3 OF 6	Rev:	0



NOTES
Assume peak earthworks season

LEGEND

Additional deposition (mm)
 0.02 - 1.00
 1.00 - 3.00
 3.00 - 5.00

Significant Ecological Areas
 Terrestrial [rp/dp]
 Marine 1 [rcp]
 Marine 2 [rcp]

Indicative coastline

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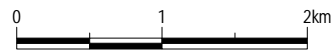
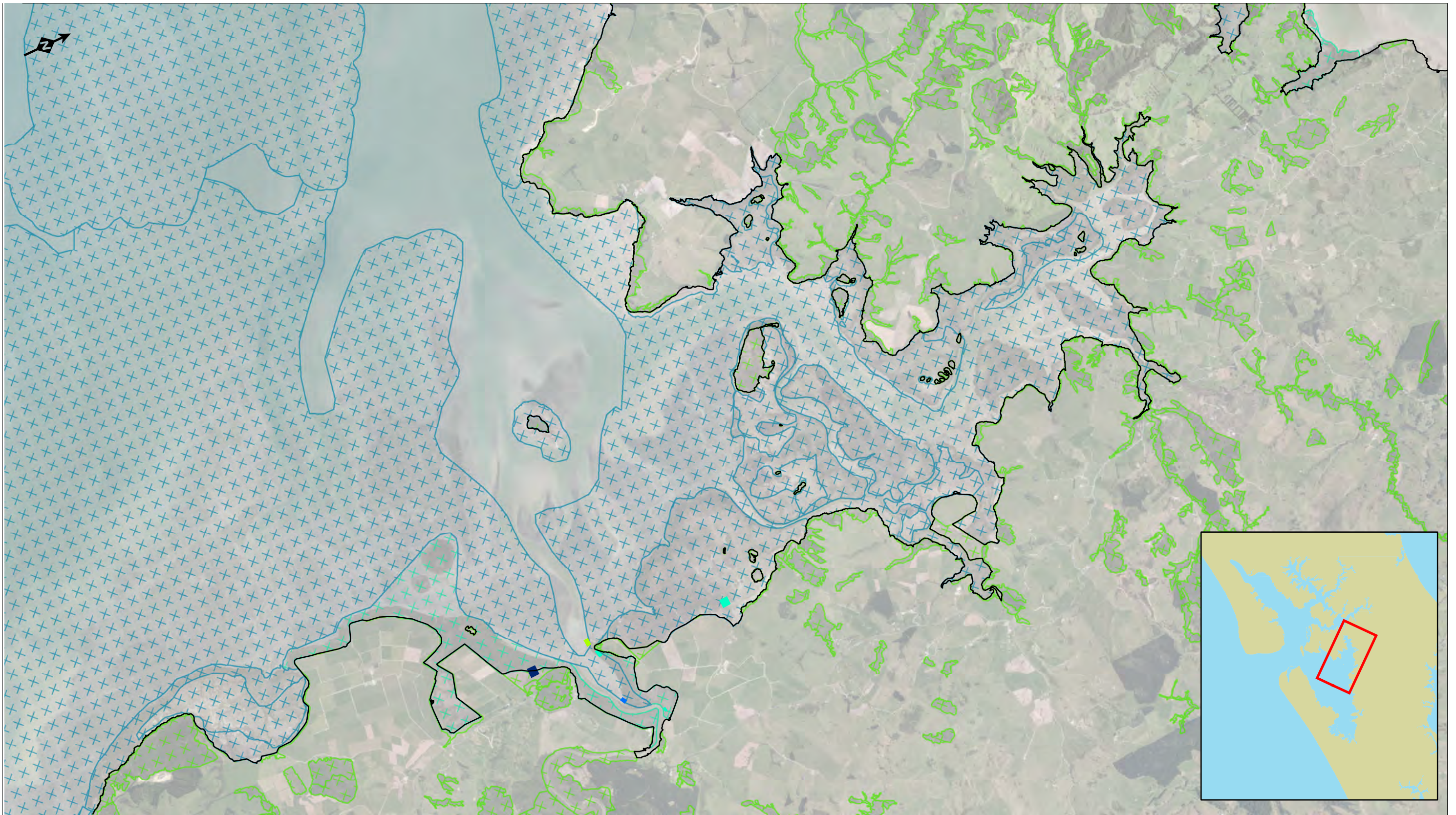
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Approved BN*		Date JULY 2019	
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Project	WARKWORTH TO WELLSFORD PROJECT			
Title	KAIPARA HARBOUR SEDIMENT DEPOSITION SCENARIO: 7 year simulation for the additional deposition from project construction for the 50 year ARI, SW wind event			
Contract:	PA4156	Drawing No:	ME-025	Sheet: 4 OF 6 Rev: 0



LEGEND

- Additional deposition (mm)**
- < 0.18
 - 0.19 - 0.22
 - 0.23 - 0.32
 - 0.33 - 0.42
 - 0.43 - 0.52
 - 0.53 - 0.62
- Significant Ecological Areas**
- Terrestrial [rp/dp]
 - Marine 1 [rcp]
 - Marine 2 [rcp]
 - Indicative coastline

NOTES
Assume peak earthworks season

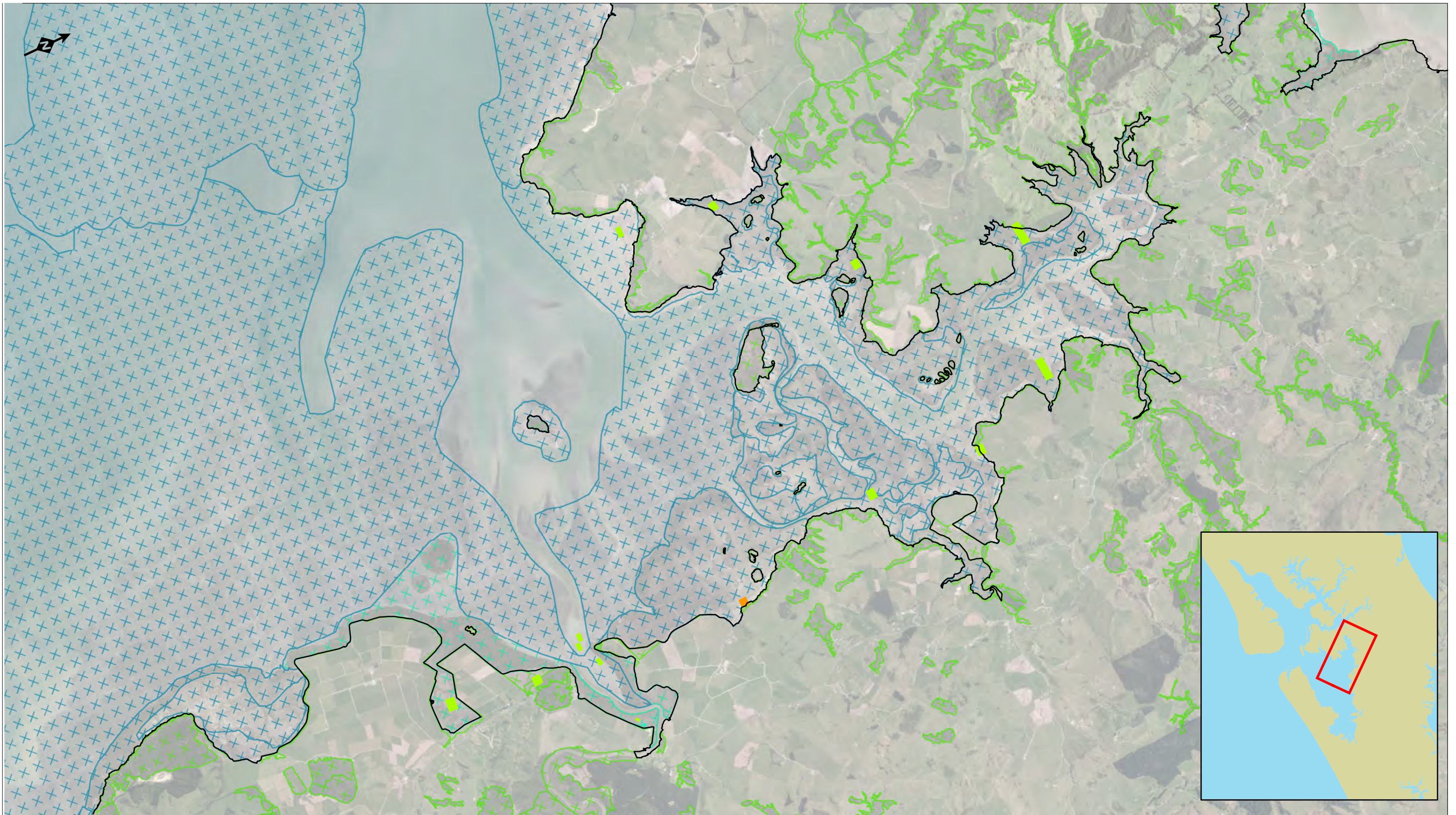
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Project WARKWORTH TO WELLSFORD PROJECT KAIPARA HARBOUR SEDIMENT DEPOSITION SCENARIO: Additional deposition for model cells where total deposition from project construction exceeds 3mm threshold for baseline at 10 year ARI, SW wind event	Contract: PA4156
Drawing No: ME-026	Sheet: 5 OF 6
Rev: 0	



LEGEND

Additional deposition (mm)

< 0.18

0.19 - 0.22

0.23 - 0.32

0.33 - 0.42

0.43 - 0.52

0.53 - 0.62

Significant Ecological Areas

Terrestrial [rp/dp]

Marine 1 [rcp]

Marine 2 [rcp]

Indicative coastline

NOTES
Assume peak earthworks season

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Project	WARKWORTH TO WELLSFORD PROJECT		
Title	Kaipara Harbour Sediment Deposition Scenario: Additional deposition for model cells where total deposition from project construction exceeds 3mm threshold for baseline at 50 year ARI, SW wind event		
Contract:	PA4156	Drawing No:	ME-027
Sheet:	6 OF 6	Rev:	0