Autumn 2022

Regional Water Resources Plan–Eastern and Midlands

Strategic Environmental Assessment

Environmental Report – Appendices A to G

Tionscadal Éireann
Project Ireland
2040

Data disclaimer: This document uses best available data at time of writing. Some sources may have been updated in the interim period. As data relating to population forecasts and trends are based on information gathered before the Covid 19 Pandemic, monitoring and feedback will be used to capture any updates. The National Water Resources Plan will also align to relevant updates in applicable policy documentation.

Baseline data included in the RWRP-EM has been incorporated from numerous sources including but not limited to; National Planning Framework, Central Statistics Office, Regional Spatial and Economic Strategies, Local Authority data sets, Regional Assembly data sets and Irish Water data sets. Data sources will be detailed in the relevant sections of the RWRP-EM. 2019 was selected as the base year to align with the planning period (2019-2025) of the NWRP.

Limitation: This report has been prepared on behalf of, and for the exclusive use of Jacobs' Client (Irish Water), and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

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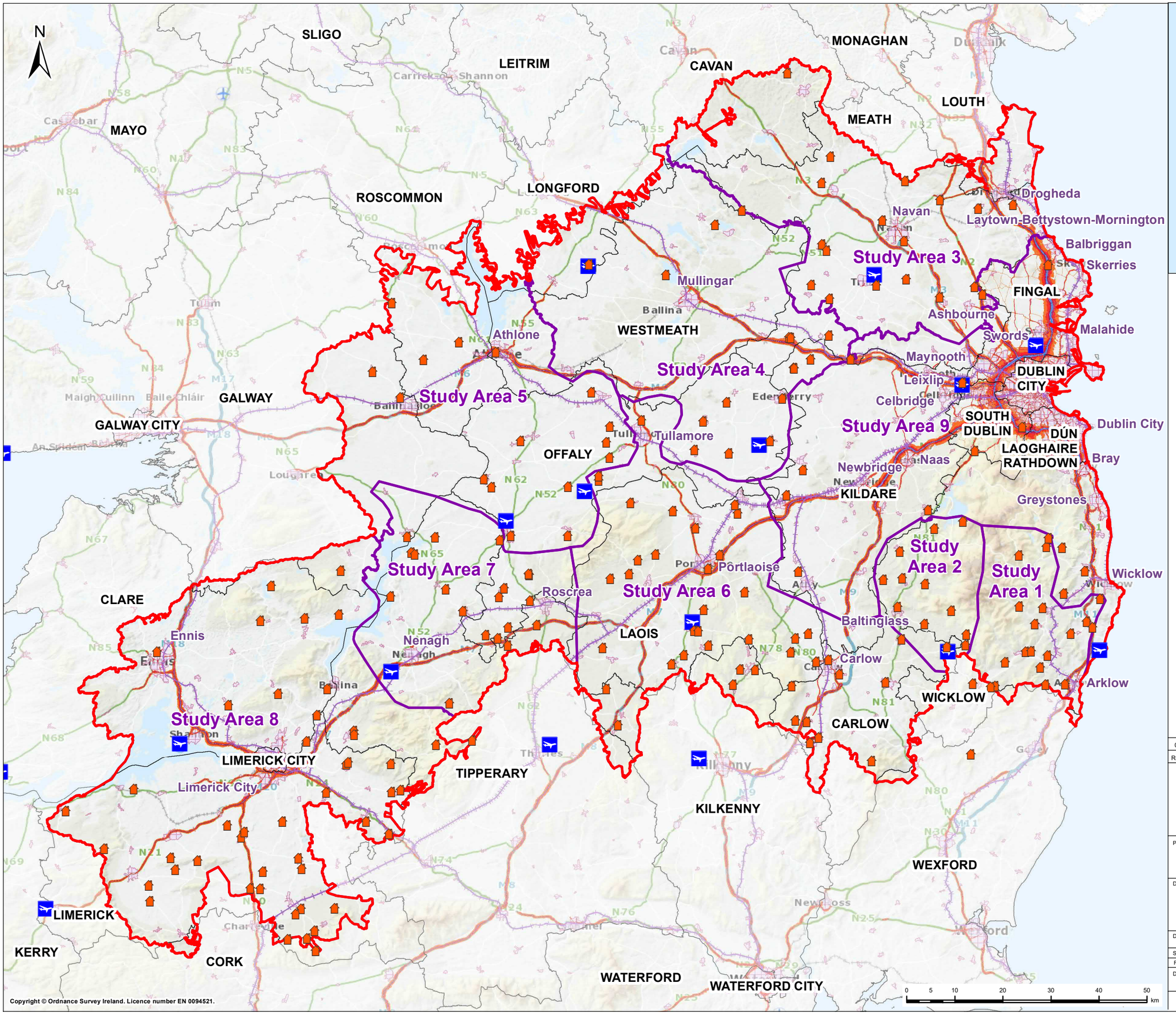

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	01/09/2021	DRAFT	RL	MO	RV	BF

UISCE ÉIREANN : IRISH WATER

Project
REGIONAL WATER RESOURCES PLAN
EASTERN & MIDLANDS

Drawing Title
POPULATION, HEALTH AND MATERIAL ASSETS (BUILT) CONTEXT – OVERVIEW

Drawing Status: DRAFT

Scale @A3	1:750,000	DO NOT SCALE
Filepath		

Drawing No.
FIGURE 5.1

N

36 Erne

06 Newry, Fane, Glyde and Dee

26C Upper Shannon (Upper)

26F Upper Shannon (Inny)

SA3

07 Boyne

08 Nanny-Delvin

30 Corrib

26D Upper Shannon (Suck)

26E Upper Shannon (Lough Ree)

SA4

26G Upper Shannon (Mid Shannon)

SA5

25A Lower Shannon (Brosna)

09 Liffey and Dublin Bay

SA9

29 Galway Bay South East

25B Lower Shannon (Little Brosna)

14 Barrow

SA2

10 Avoca-Vartry

25C Lower Shannon (Lough Derg)

SA7

SA6

SA1

28 Mal Bay

27 Shannon Estuary North

15 Nore

12 Slaney & Wexford Harbour

SA8

25D Lower Shannon & Mulkear

11 Owenavorragh

24 Shannon Estuary South

16 Suir

23 Tralee Bay-Feale

18 Blackwater (Munster)

0 5 10 20 30 40 50 km

RWRP-NW

RWRP-EM

RWRP-SE

RWRP-SW

Legend

Eastern & Midlands Region boundary

Study area boundary

Water Framework Directive (WFD) Catchment

WFD River Waterbody

Ecological Status or Potential, 2013-2018

High

Good

Moderate

Poor

Bad

Unassigned

WFD Lake, Transitional or Coastal Waterbody

Ecological Status or Potential, 2013-2018

High

Good

Moderate

Poor

Bad

Unassigned

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	08/06/2022	DRAFT	RL	MO	RV	BF

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Project

REGIONAL WATER RESOURCES PLAN
EASTERN & MIDLANDS

Drawing Title

WATER CONTEXT:
SURFACE WATERBODIES - OVERVIEW

Drawing Status **DRAFT**

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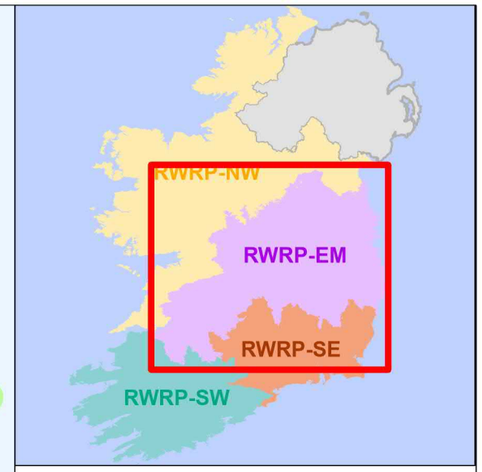
FIGURE 5.2a



Legend

- Eastern & Midlands Region boundary
- Study area boundary
- Water Framework Directive (WFD) Catchment

WFD River Waterbody
Approved Risk Projection
- At risk
- Not at risk
- Review

WFD Lake, Transitional or Coastal Waterbody
Approved Risk Projection
- At risk
- Not at risk
- Review

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Project
REGIONAL WATER RESOURCES PLAN
EASTERN & MIDLANDS

Drawing Title
SURFACE WATERBODIES AT RISK
(EPA, APRIL 2018)

Drawing Status: **FINAL**

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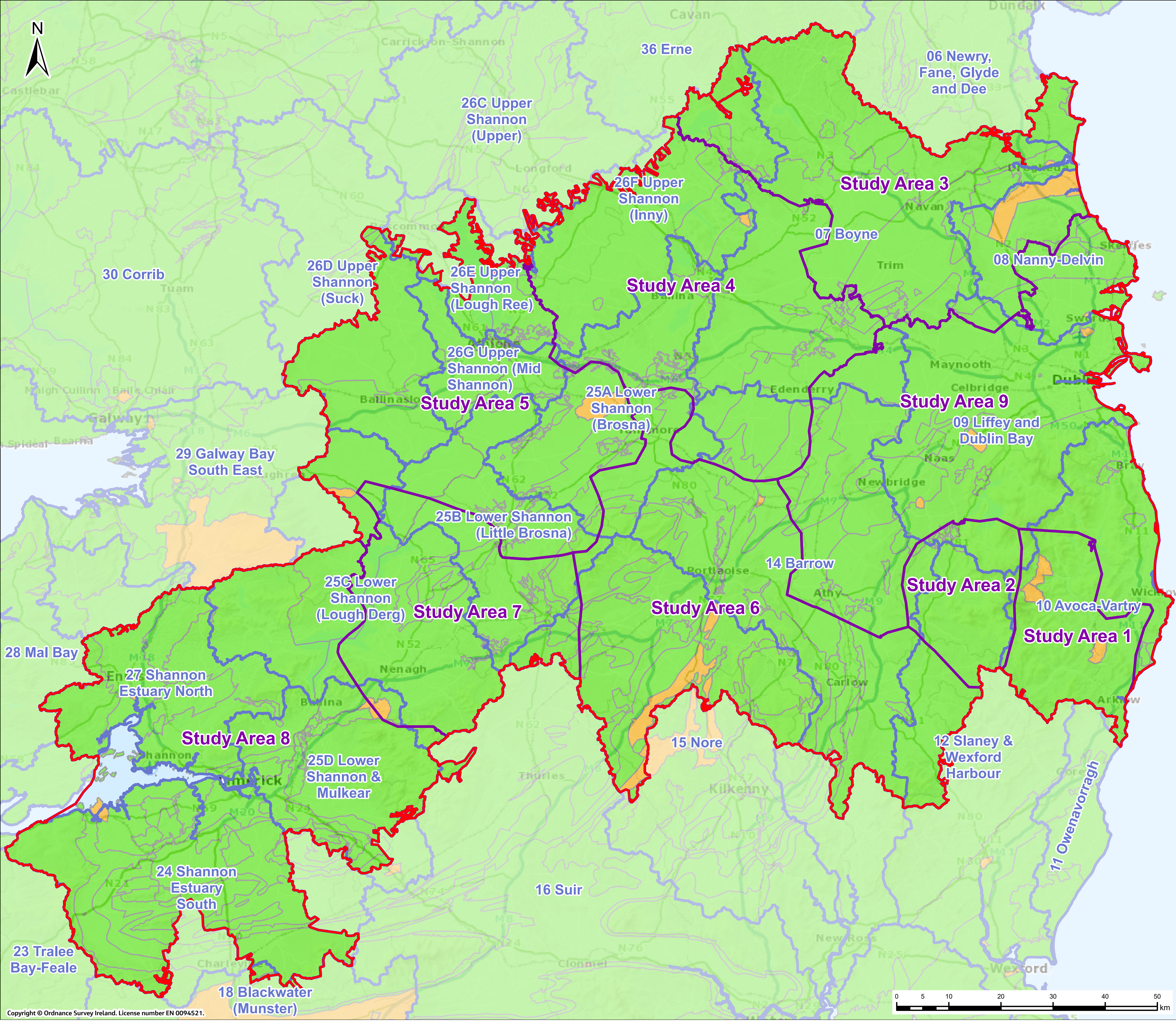
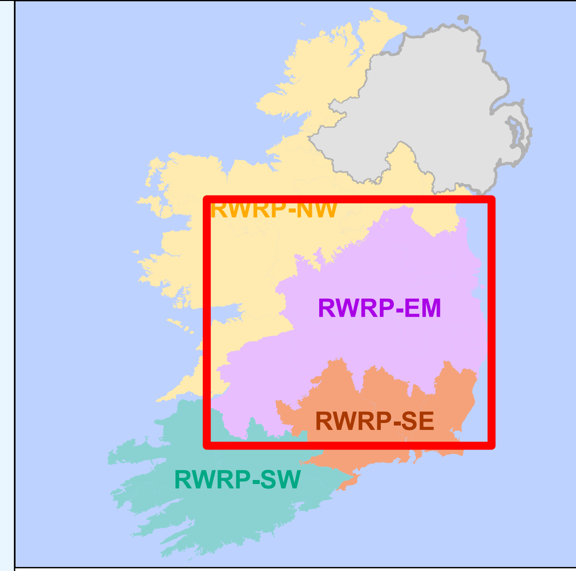
FIGURE 5.2b





Legend

- Eastern & Midlands Region boundary
- Study area boundary
- Water Framework Directive (WFD) Catchment

Ground Waterbody

Overall Groundwater Status 2013-2018

- Good
- Poor

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	06/06/2022	DRAFT	RL	MO	RV	BF

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REGIONAL WATER RESOURCES PLAN
EASTERN & MIDLANDS

Drawing Title
WATER CONTEXT:
GROUNDWATER - OVERVIEW

Drawing Status
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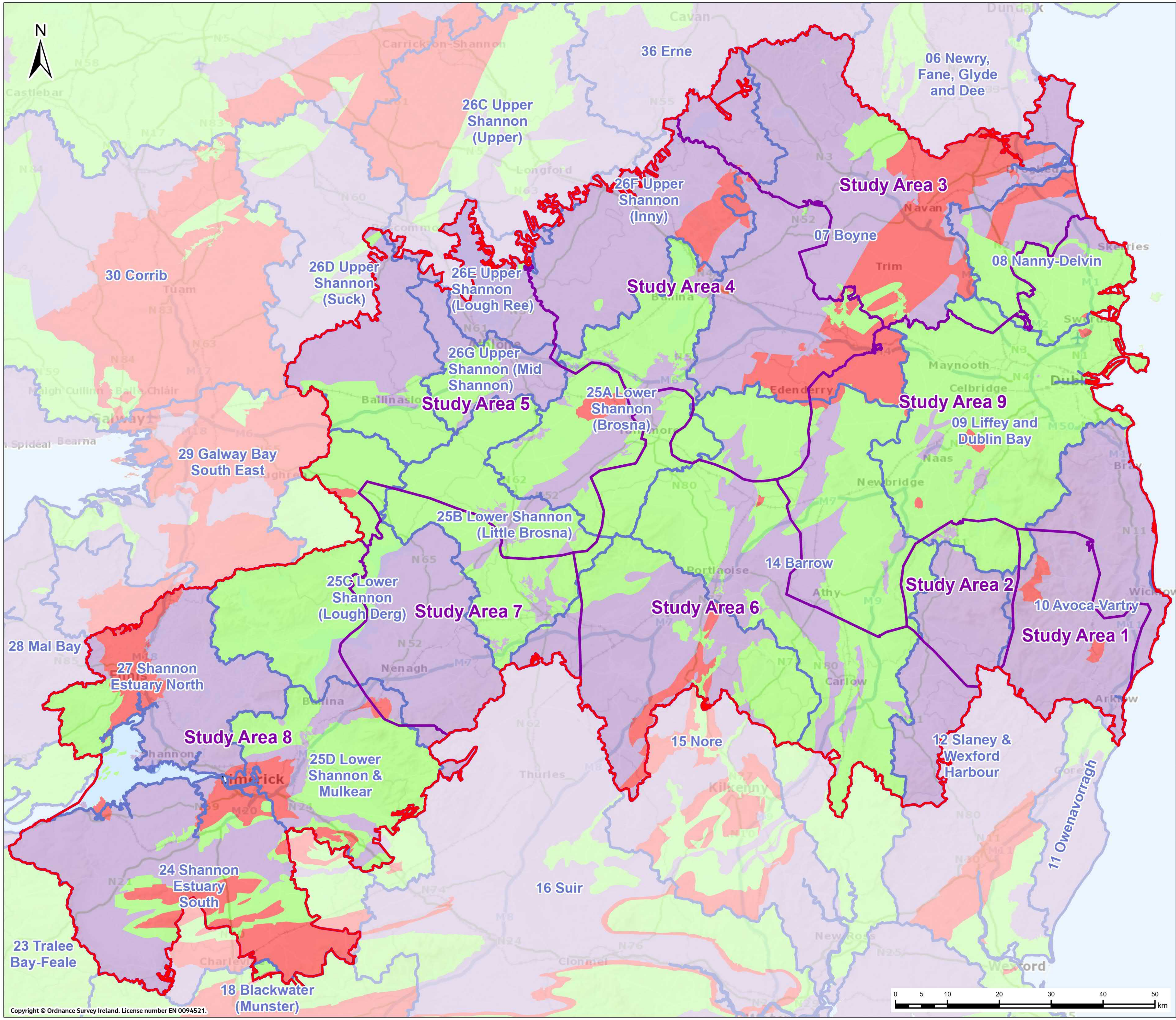
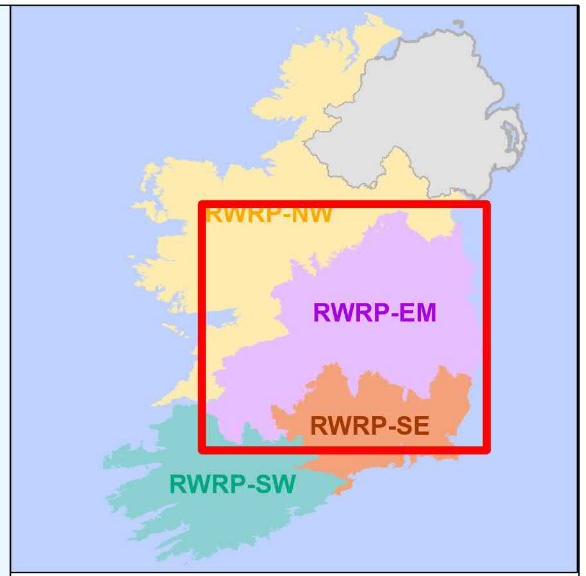

N
36 Erne
06 Newry, Fane, Glyde and Dee
26C Upper Shannon (Upper)
26F Upper Shannon (Inny)
Study Area 3
07 Boyne
08 Nanny-Delvin
30 Corrib
26D Upper Shannon (Suck)
26E Upper Shannon (Lough Ree)
Study Area 4
26G Upper Shannon (Mid Shannon)
Study Area 5
25A Lower Shannon (Brosna)
Study Area 9
09 Liffey and Dublin Bay
29 Galway Bay South East
25B Lower Shannon (Little Brosna)
14 Barrow
25C Lower Shannon (Lough Derg)
Study Area 7
Study Area 2
Study Area 6
10 Avoca-Vartry
Study Area 1
28 Mal Bay
27 Shannon Estuary North
Study Area 8
15 Nore
12 Slaney & Wexford Harbour
25D Lower Shannon & Mulkear
11 Owenavorragh
24 Shannon Estuary South
16 Suir
23 Tralee Bay-Feale
18 Blackwater (Munster)
0 5 10 20 30 40 50 km



Legend

- Eastern & Midlands Region boundary
- Study area boundary
- Water Framework Directive (WFD) Catchment

WFD Ground Waterbody

Approved Risk Projection

- At risk
- Not at risk
- Review

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	08/10/2021	FINAL	RL	MO	RV	BF

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Project
REGIONAL WATER RESOURCES PLAN EASTERN & MIDLANDS

Drawing Title
GROUND WATERBODIES AT RISK (EPA, APRIL 2018)

Drawing Status
FINAL

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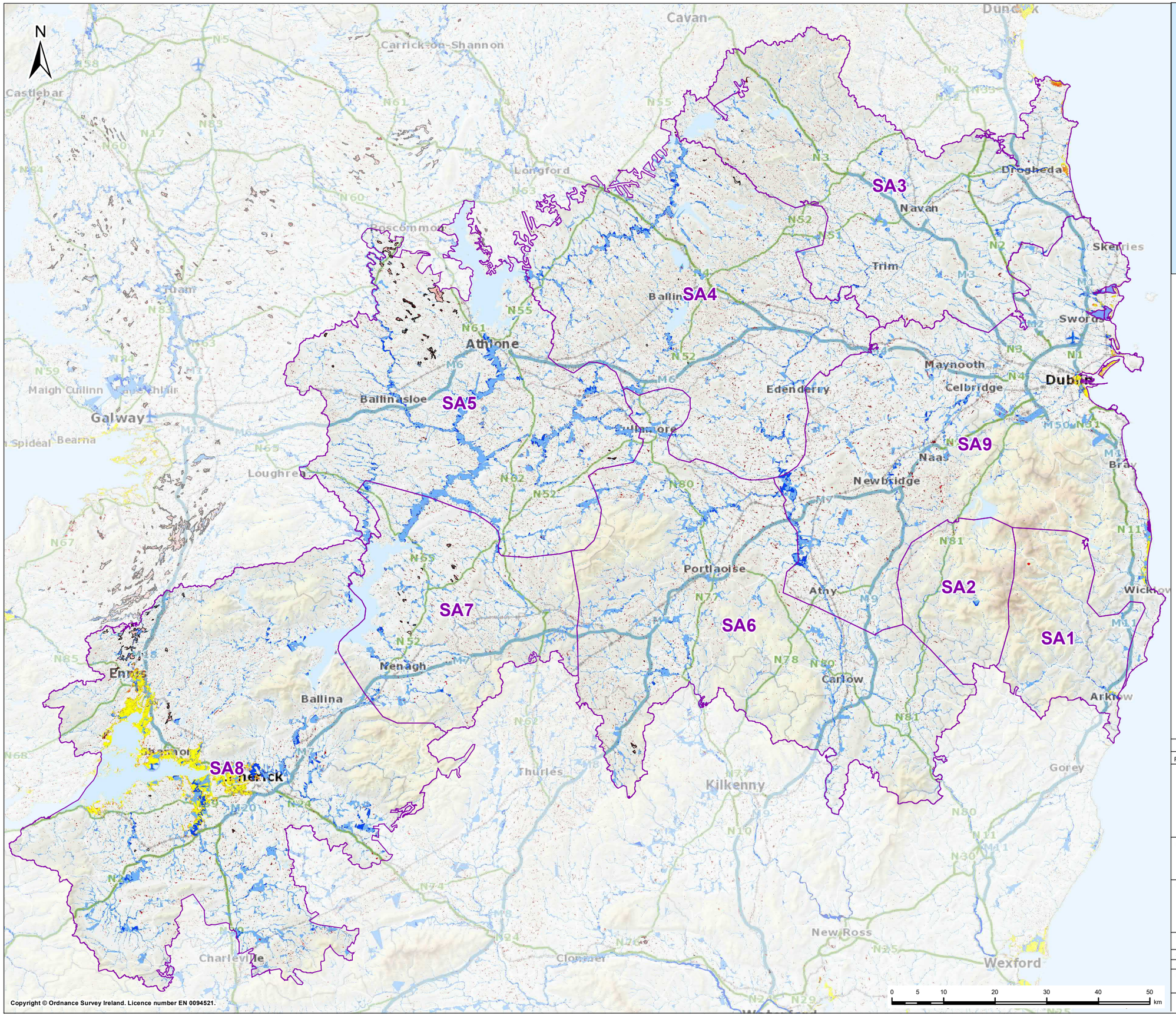
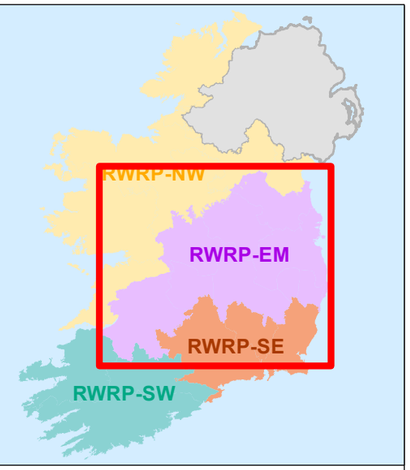
Drawing No.
FIGURE 5.3b





Legend

- Study area boundary
- Pluvial Flooding: 10% Annual Exceedance Probability (AEP)
- Pluvial Flooding: 1% Annual Exceedance Probability (AEP)
- Fluvial Flooding: 10% Annual Exceedance Probability (AEP)
- Fluvial Flooding: 1% Annual Exceedance Probability (AEP)
- Coastal Flooding: 10% Annual Exceedance Probability (AEP)
- Coastal Flooding: 1% Annual Exceedance Probability (AEP)
- Groundwater Flooding: High Probability
- Groundwater Flooding: Medium Probability

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REGIONAL WATER RESOURCES PLAN
EASTERN & MIDLANDS

Drawing Title

WATER CONTEXT:
FLOOD RISK

Drawing Status: **DRAFT**

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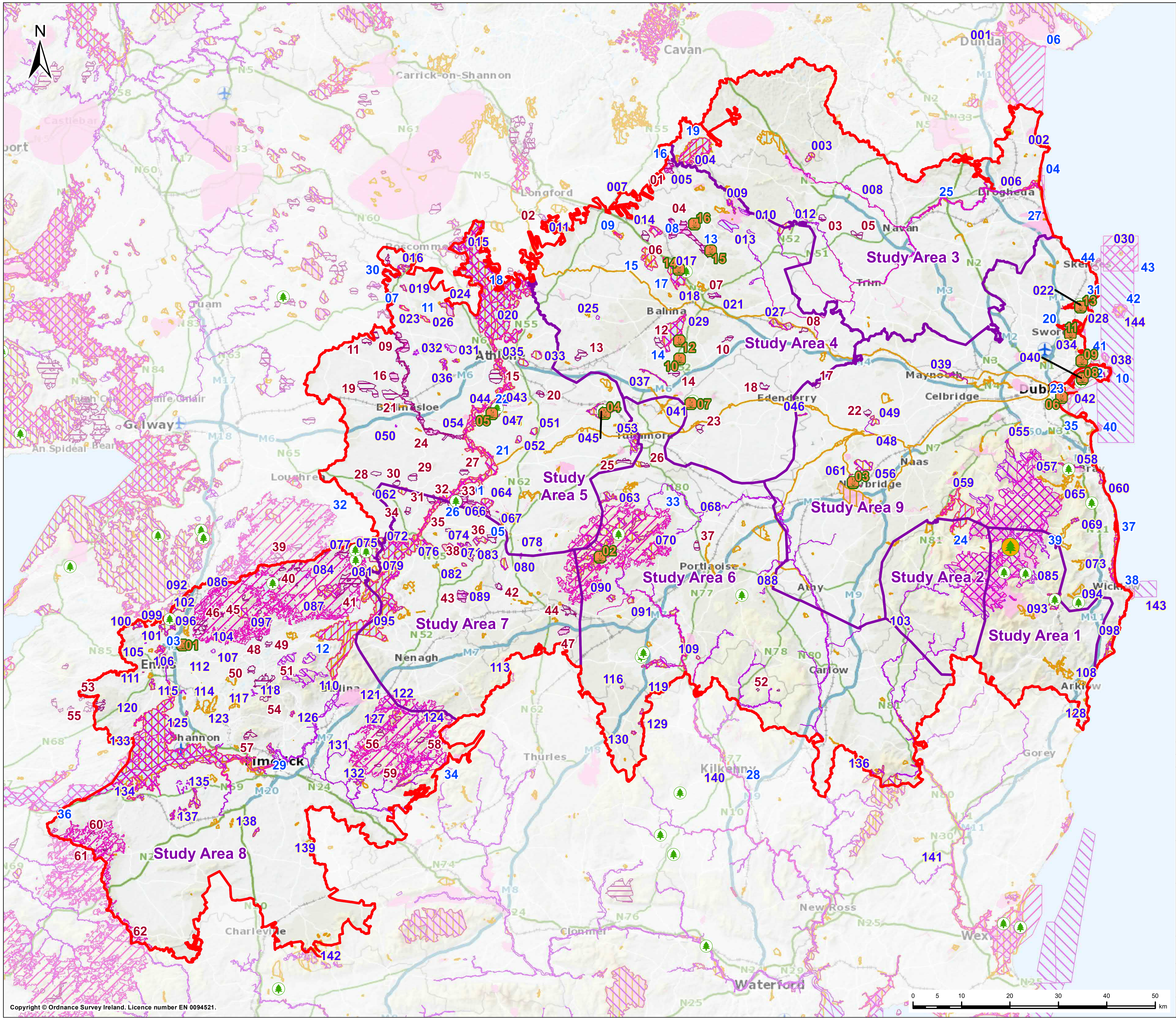
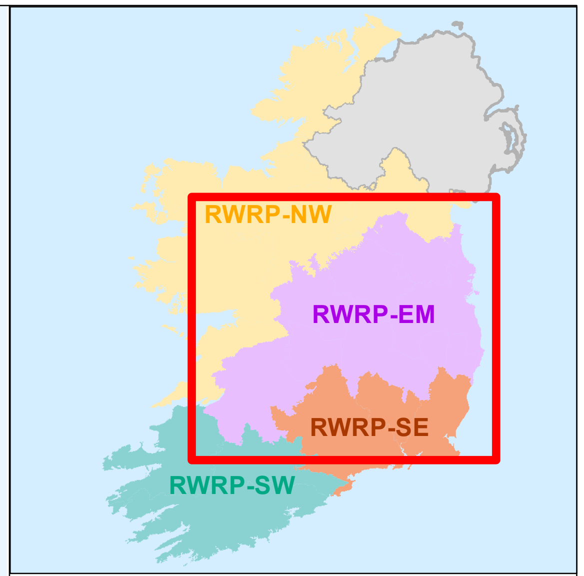
FIGURE 5.4





Legend

- Ramsar Site
- Wicklow Mountains National Park
- Nature Reserve
- Eastern & Midlands Region boundary
- Study area boundary
- Special Area of Conservation
- Special Protection Area
- Natural Heritage Area
- Proposed Natural Heritage Area
- Geological Heritage Site

Reference Labels Key

- xx : Ramsar Site Reference Label
- xx : NHA Reference Label
- xx : SPA Reference Label
- xx : SAC Reference Label

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	12/10/2021	DRAFT	RL	MO	RV	BF

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Project: REGIONAL WATER RESOURCES PLAN EASTERN & MIDLANDS

Drawing Title: BIODIVERSITY CONTEXT: OVERVIEW

Drawing Status: DRAFT

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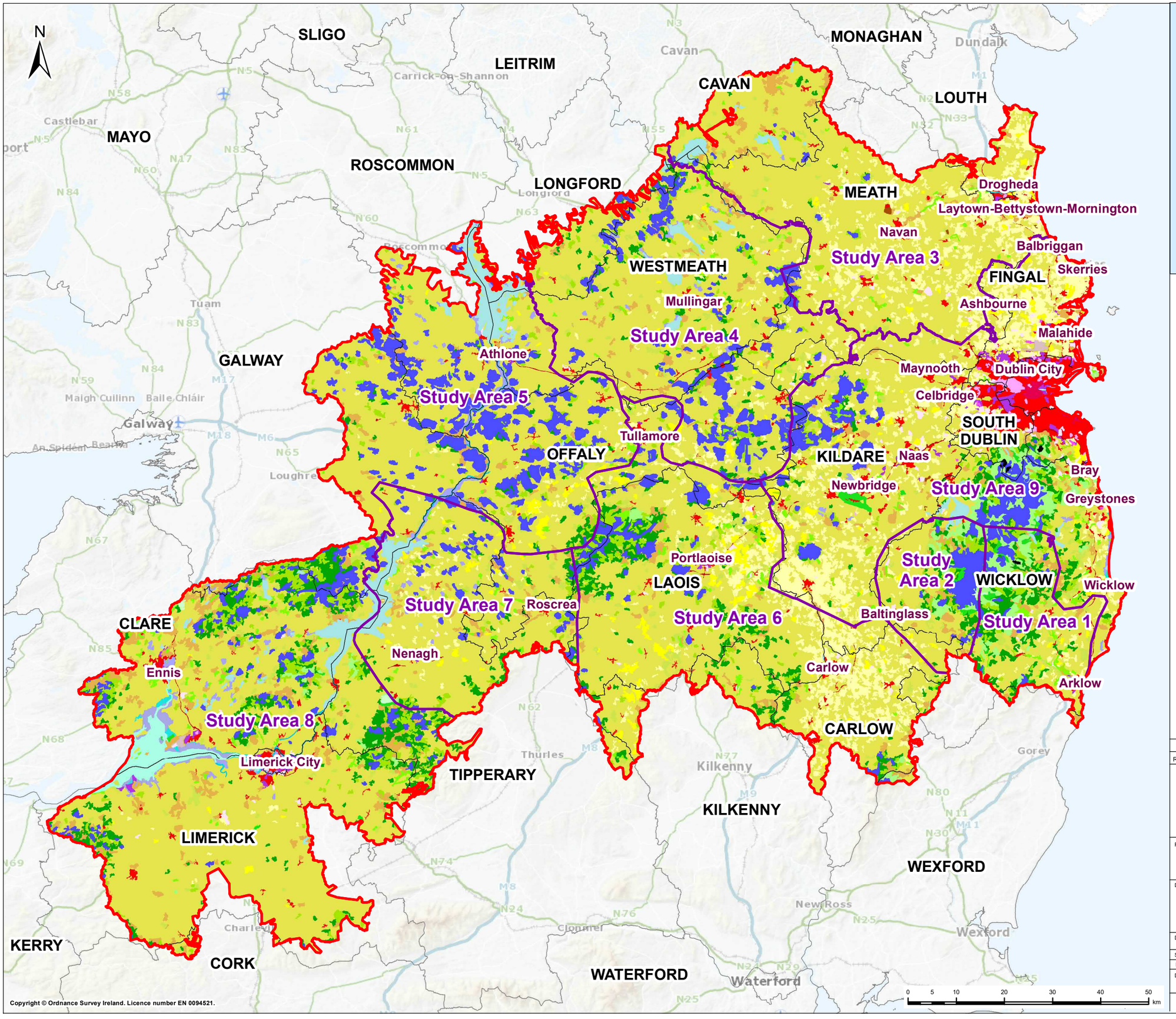

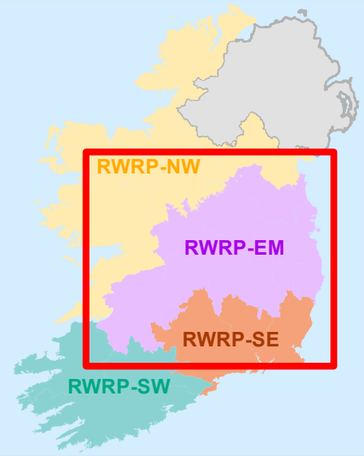

Legend

- Eastern & Midlands Region boundary
- Study area boundary
- Continuous urban fabric
- Discontinuous urban fabric
- Industrial or commercial units
- Road and rail networks
- Sea ports
- Airports
- Mineral extraction sites
- Dump
- Construction sites
- Green urban sites
- Sport and leisure facilities
- Non-irrigated land
- Pastures
- Complex cultivation patterns
- Land principally occupied by agriculture with areas of natural vegetation
- Broad-leaved forest
- Coniferous forest
- Mixed forest
- Natural grassland
- Moors and heaths
- Transitional woodland scrub
- Beaches dunes sand
- Bare rocks
- Sparsely vegetated areas
- Burnt areas
- Inland marshes
- Peat bogs
- Salt Marshes
- Intertidal flats
- Stream courses
- Water bodies
- Coastal lagoons
- Estuaries

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REGIONAL WATER RESOURCES PLAN
EASTERN & MIDLANDS

Drawing Title

MATERIAL ASSETS (NATURAL ASSETS)
CONTEXT - OVERVIEW

Drawing Status: **DRAFT**

Scale @A3	1:750,000	DO NOT SCALE
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Drawing No.

FIGURE 5.6

N

Study Area 1

Study Area 2

Study Area 3

Study Area 4

Study Area 5

Study Area 6

Study Area 7

Study Area 8

Study Area 9

RWRP-NW

RWRP-EM

RWRP-SE

RWRP-SW

Legend

- Eastern & Midlands Region boundary
- Study area boundary

Gravel Aquifer

- Locally important gravel aquifer
- Regionally important gravel aquifer

Bedrock Aquifer

- Regionally Important Aquifer - Karstified (conduit)
- Regionally Important Aquifer - Karstified (diffuse)
- Regionally Important Aquifer - Karstified
- Regionally Important Aquifer - Fissured bedrock
- Locally Important Aquifer - Bedrock which is Generally Moderately Productive
- Locally Important Aquifer - Karstified
- Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
- Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones
- Poor Aquifer - Bedrock which is Generally Unproductive
- Lake

0 5 10 20 30 40 50 km

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	01/09/2021	DRAFT	RL	MO	RV	BF

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Project: REGIONAL WATER RESOURCES PLAN EASTERN & MIDLANDS

Drawing Title: HYDROGEOLOGY

Drawing Status: **DRAFT**

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Drawing No.: FIGURE 5.7

Appendix B MCA Environment Criteria Scoring Rules

B.1 Fine Screening MCA: Environmental Scoring Rules Applied

In the Framework Plan, Irish Water describe the Option Assessment Methodology that will be used to develop a national programme of proposed solutions for all of their water supplies. The solutions will be used to reduce or eliminate the Supply Demand Balance (SDB), Water Quality, Reliability and Sustainability risks.

The purpose of Irish Water's options assessment process is to consider the widest practicable range of solutions to resolve identified need within a given area. Environmental and social assessment criteria were included from the earliest stages of the screening process, with screening criteria being applied to filter out any options that are not feasible, or viable on environmental sustainability, resilience or deliverability grounds.

In the first stage of the options screening process the unconstrained options were identified to address need. These options were then subject to coarse screening against the criteria of resilience, deliverability and environment. Any unconstrained options were rejected at this stage if they were unviable in relation to one or more assessment criteria. The remaining options were progressed to further assessment through the fine screening process.

B.2 Fine Screening

The remaining options were subject to a more detailed Multi Criteria Assessment (MCA) at the Fine Screening Stage using desktop assessments of best available environmental data. The objective of the fine screening process is to ensure that all options which will progress to the feasible options list meet the following overarching criteria:

- Resilient;
- Feasible and Flexible;
- Progressible;
- Environmentally and socially viable; and
- Cost Effective.

These criteria were broken down into sub-criteria (see Table B-1) which were then rated between 3 and -3 depending on the option's impact (see Figure B-1).

For the environmental and social criteria, each topic was rated using specific rules covered in this Appendix to provide a basis for consistency and comparability. The fine screening process, assessment criteria and general scoring guide are provided in the Framework Plan.

Major Positive / Beneficial	Moderate Positive / Beneficial	Minor Positive / Beneficial	Neutral / Negligible Risk	Minor Risk	Moderate Adverse Risk	Major Adverse Risk
3	2	1	0	-1	-2	-3

Figure B-1 Fine Screening Rating

B.2.1 Limitations

This is a high-level desk based assessment using option descriptions and indicative locations and routings. The scoring guidance and rules are intended to help provide a consistent approach across a

large number of options of different types and levels of information. The MCA is a comparative assessment and does not replace requirements for more detailed or project level assessment. Option costings are based on unit cost values and provide a consistent approach for option comparison, these costs do not include environmental mitigation costs at this stage and these would expect to be developed as part of option design and assessment for feasibility and planning consent stages.

B.3 MCA Scoring Criteria

These scoring rules focus on the environmental and social criteria and are based on the SEA objectives. They provide more detail to support consistent scoring and take account of data available and the range of options under consideration.

B.3.1 Sustainability (Environmental and Social Impacts)

The criteria for Sustainability (Environmental and Social impacts) and the questions used to rate options within the criteria for the fine screening are shown in Table B-1.

Table B-1 Fine Screening Sustainability (Environmental and Social Impacts) Criteria

SEA Objective /Topic Headings	Scoring Questions
Sustainability (Environmental and Social impacts)	
Population, health, economy and recreation	P1: Will the option impact public health and quality of life, during construction?
	P2: Will the option impact public health and quality of life, during operation?
	P3: What is the impact on recreational amenities?
Water Environment: Quality and Resources	W1: Would the option or associated construction activities affect WFD Status of water body status, in terms of quantity and quality for surface water?
	W2: Would the option or associated construction activities affect WFD Status of water body status, in terms of quantity and quality for groundwater?
	W3: Would the option or associated construction activities affect WFD Status of water body status, in terms of hydro morphology?
	W4: Would this option reduce pressure on water environment through water savings?
	W5: Is there a potential for this option to increase flood risk – e.g. increase base flow or result in loss of flood plain?
	W6: Will Navigation be affected?
Biodiversity, Flora and Fauna	B1: Potential to result in adverse effects on the integrity of a European site?
	B2: Potential to impact on Annex species outside designated areas?
	B3: Potential to impact on National designated sites?
	B4: Potential to impact Biodiversity in all other areas?
	B5: Risk of INNS?
Material Assets	M1: Will the option make effective use of existing assets?

SEA Objective /Topic Headings	Scoring Questions
	M2: Will this option conflict with critical infrastructure, or does the option conflict with existing business, planned land use or valuable agricultural land?
Landscape and Visual	L1: Could this option impact the landscape character areas, townscape character areas or important views – detract or improve?
Climate Change	CC1: What is the level of construction and operational carbon emissions associated with the option – tonnes?
Culture, Heritage and Archaeology	CH1: Does this option avoid direct damage to, or detract from the setting of, designated cultural heritage assets, or does this contribute to protecting them?
Geology and Soils	G1: Would any designated or non-designated geological features, valuable soils, or contaminated land sites be affected?

So that the criteria could be rated comparatively across the Study Areas and options, it was important that a set of rules were followed in the rating process. The rules for the Sustainability (Environmental and Social impacts) criteria are shown in Table B-2 - Table B-9.

B.3.2 Population, Economy, Tourism and Recreation, and Human Health

Table B-2 Fine Screening Questions for P1, P2 and P3

Fine Screening Question P1	Criteria	Data Sources	Score	
Will the option impact public health and quality of life, during construction?	• Level of concern about temporary risks to health, for example in relation to disturbance or loss of access due to construction or increased risk from poor water quality and risks of flooding during construction. • Ratings should be assigned relative to schemes/options under consideration rather than to absolute values. • Check GIS for impacts on roads/towns and whether they are urban/rural. • No construction would be for example an abstraction increase with no associated works.	• IW GIS layer on settlements and amenities • Consideration to scale of the option and sensitivity of the area • Are options located in close proximity to settlements (distance <2km)? • Are options routed through settlements?	3	N/A
			2	N/A
			1	N/A (no positive impact from construction works)
			0	No or minimal construction
			-1	Rural – small scale construction/upgrade and/or remote from sensitive receptors
			-2	Urban – large scale construction/upgrade and near sensitive receptors
			-3	No foreseeable -3 impact for this criterion. Construction impact expected to be temporary and subject to standard mitigation
Fine Screening Question P2	**Criteria**	**Data Sources**	**Score**	
	• Level of concern about risks to health, for example in	• IW GIS layers on settlements and amenities	3	N/A

Will the option impact public health and quality of life, during operation?	relation to water quality, water borne disease transmission, insect borne disease transmission, recreational and agricultural land take, and risks of flooding. • Ratings should be assigned relative to schemes/options under consideration rather than to absolute values. • Benefits: improved Level of service or water quality /access is an overall objective through options in combination. • Unlikely to be sufficient information for individual options on for allocation of +2/+3 scoring. Positive scores where WTPs on RAL are upgraded.	• Are options located in close proximity to settlements (distance <2km)? • Are options routed through settlements?	2	N/A
			1	Upgrades to WTP/new WTP likely to result in improved water quality/reliability
			0	Below ground assets in rural/urban area, upgrades to existing sites or new sites within industrial areas
			-1	New above ground assets in rural areas near sensitive receptors
			-2	New above ground assets in urban areas near sensitive receptors
			-3	Unlikely for individual options to score -3 as standard mitigation expected to be applied.
Fine Screening Question P3	**Criteria**	**Data Sources**	**Score**	
What is the impact on recreational amenities?	• Type of land take • Duration of land take • Level of impact on recreational amenity	• IW GIS layer for amenities (based on Failte Ireland information) and GIS layer for walking trails.	3	N/A
			2	N/A
			1	Potential for a net improvement to amenity provision (informal or formal recreation)

	• Improvement or creation of new recreation amenity (however this potential for should be improvement would need to be indicated in the option design. IW reservoirs for water supply normally have restrictions for recreational use this so cannot be assumed as a benefit for impoundments or bunded reservoirs for example)	• Is the option located within close distance of an amenity marked on the layer? • Layers may not accurately reflect all amenities in an area.	0	No change
			-1	Temporary amenity area loss/loss of access to amenity area during construction
			-2	Reduction/restriction of amenity
			-3	Permanent amenity area loss

* Extra costs associated

B.3.3 Water Environment: Quality and Resources

Table B-3 Fine Screening Questions W1, W2, W3, W4 and W5

Fine Screening Question W1	Criteria	Data Sources	Score	
Would the option or associated construction activities affect WFD Status of water body status, in terms of quantity and quality for surface water?	• Based on standards outlined in WFD: % of Q95 – detailed scoring guide takes account of WFD water body status and whether a river or lake waterbody. • Potential to contribute to meeting WFD objectives	• Catchments.ie for additional information on catchments • IW GIS layer for surface water WFD status. • Check Hydrotool/Hydronet to ensure that proposed abstraction is within 10% of Q95.	3	N/A
			2	N/A
			1	Option involves removing existing surface water abstraction identified as at risk of over abstraction
			0	=<5% Q95 OR No abstraction from surface water
			-1	5-7.5% Q95
			-2	7.5-10% Q95

	considered based on review of potential over abstraction risk from existing abstractions. • Unlikely to be sufficient information for allocation of +2/+3 scoring for individual options		-3	>10% of Q95 also preventing a return to good status*	
Fine Screening Question W2	**Criteria**	**Data Sources**	**Score**	**Bedrock**	**Gravels**
Would the option or associated construction activities affect WFD Status of water body status, in terms of quantity and quality for groundwater?	• % of average recharge. • WFD Assessment of Impact & Assignment of Risk Categories Table 4 • Option = Proposed Q [Ml/d] • Review of sustainability of groundwater abstractions • Unlikely to be sufficient information for allocation of +2/ +3 scoring for individual options	• Check underlying aquifer and 'Average Recharge' (GSI) • Groundwater Working Group Document No. 5, 2005)	3	N/A	N/A
			2	N/A	N/A
			1	Option involves removing existing groundwater abstraction identified as at risk of over abstraction	
			0	<2% OR No abstraction from groundwater	<2% OR No abstraction from groundwater
			-1	<10%	<20%
			-2	<30%	<30%
			-3	>30%	>30%
Fine Screening Question W3	**Criteria**	**Data Sources**	**Score**		
Would the option or associated construction activities affect		• Catchments.ie for additional information on catchments	3	N/A	
			2	N/A	

WFD Status of water body status, in terms of hydromorphology?	• Option type and its perceived effect on hydromorphology • Potential benefits from river restoration/ removal of barriers such as weirs where this is feasible and there is agreement with parties responsible for the structures. • Unlikely to be sufficient information for allocation of +2/+3 scoring for individual options	• IW GIS layer for groundwater WFD status, groundwater risk status, and surface water WFD status.	1	Option likely to contribute to WFD objectives by removing barriers or structures such as weirs or by including river restoration
			0	No change to hydromorphology
			-1	Lower intake on lake abstraction – new infrastructure
			-2	New river abstraction and intake structure
			-3	Impoundment option – online with loss of river channel
Fine Screening Question W4	**Criteria**	**Data Sources**	**Score**	
Would this option reduce pressure on water environment through water savings?	• Does the option include leakage reduction or a reduction in abstraction? • Positive score if option includes mains replacement reducing leakage or a reduction in abstraction – supporting objectives of use less and lose less. * • *Water savings options are not currently considered as Irish Waters leakage	• EPA Hydrometric data (initially) • Qube Model	3*	N/A
			2*	N/A
			1	Unlikely to be sufficient information to score positive benefits for water savings from individual options
			0	No water savings associated with this option
			-1	N/A

	reduction targets were included in their supply demand balance calculations for this iteration of the Framework Plan. • (note negative effects on environment addressed through criteria W1,2 3 and 4)		-2	N/A
			-3	N/A
Fine Screening Question W5	**Criteria**	**Data Sources**	**Score**	
Is there a potential for this option to increase flood risk – e.g. increase base flow or result in loss of flood plain?	• OPW Rules • Floodinfo.ie to determine whether option would result in loss of flood plain • Option supporting retention of water in upper catchment • Option providing storage capacity for flood water	• OPW online resource for flood mapping and previous flood events (not used at this stage) • Floodinfo.ie for flood mapping and previous flood events	3	Unlikely to be sufficient information for allocation of +3 scoring
			2	Unlikely to be sufficient information for allocation of +2 scoring
			1	Option provides additional flood storage or promotes retention of water in upper catchment
			0	No loss of flood plain or change to flood risk (e.g. upgrade of existing infrastructure)
			-1	Above ground asset adjacent to/on flood plain with potential for loss of flood plain or effect on drainage
			-2	Loss of flood storage area with some added risk of downstream flooding
			-3	Loss of flood storage area with potential added risk to downstream settlements/urban areas
Fine Screening Question W6	**Criteria**	**Data Sources**	**Score**	

Will Navigation be affected?	• Potential for impacts on navigable waterways – based on proximity of works to navigable waterways and type of works.	• Navigable Waterways GIS information	3	N/A
			2	N/A
			1	N/A
			0	No impact on navigable waterways expected
			-1	Navigation could potentially be affected by option such as a new abstraction on a navigable waterway but impacts likely to be avoidable through siting and design
			-2	Navigation could potentially be affected by option due to reduced water levels in navigable waterway
			-3	Navigation would potentially be affected by option due to proposed structures or reduced water levels in navigable waterways

B.3.4 Biodiversity, Flora and Fauna

Table B-4 Fine Screening Questions B1, B2, B3, B4 and B5

Fine Screening Question B1	Criteria	Data Sources	Score *	
Is there potential for the option to result in adverse effects on the integrity of a European site?	• Undermining the sites conservation objectives through direct or indirect effect pathways. • Direct loss of habitat or supporting habitat.	• NPWS GIS Database for European Designated sites including SACs and SPAs • SAC/SPA Conservation Objectives	3	N/A
			2	N/A
			1	Potential for benefits to designated site from removal or reduction of an impact - thereby improving the conservation status or condition of a European site.
			0	No potential for option to impact on European site

	• Mortality of Qualifying Interest species (QIs). • Changes to water quality, both qualitatively and quantitatively. • Changes in hydrology impacting on water dependant species and habitats (ground water dependant terrestrial ecosystems -GWDTE). • Unlikely to be sufficient information for allocation of +2 or +3 positive scoring for level of benefit		-1	Hydrological link to European site (SAC/SPA). No direct habitat loss within European site. No works within a European site. Potential for disturbance to QI species outside European site (e.g. mobile QI species otter, birds etc.). Impacts can be mitigated
			-2	No direct habitat loss within European site. Temporary works within or adjacent to European site or direct crossing of river European site. Potential for temporary disturbance to QI species within European site. Impacts can be mitigated
			-3	In some instances, impacts may not be fully known or understood without further detailed site assessment. Site assessment could identify potential adverse effects on site integrity (AESI) for which mitigation or alternative option may be required
Fine Screening Question B2	**Criteria**	**Data Sources**	**Score**	
Is there potential for the option to impact Annex I habitats or Annex II/ IV species outside European sites?	• Undermining the favourable conservation status of species and habitats listed on the annexes of the Habitats Directive (e.g. species and habitats listed in Article 17 reports). • Direct habitat loss • Disturbance to species	• NPWS GIS Layer - Ecosystem Provision • National Biodiversity Data Centre (NBDC) • NPWS Article 17 GIS Layer	3	N/A
			2	N/A
			1	Potential benefits to Annexed species through for example removal of obstructive weir or addition of fish pass
			0	No potential for option to impact on Annex I habitats or Annex II/ IV species
			-1	Disturbance to Annex I habitats or Annex II/ IV species

	• Disturbance to or loss of commuting or foraging habitat • Direct mortality of species • Unlikely to be sufficient information for allocation of +2 or +3 scoring of level of benefit			Disturbance to or loss of commuting or foraging habitat used by Annexed species
			-2	Direct mortality of Annexed species outside of European sites
			-3	Unlikely to be sufficient information for allocation of -3 scoring therefore level of negative impact currently not measurable
Fine Screening Question B3	**Criteria**	**Data Source**	**Score**	
Is there potential for the option to impact on a Nationally Designated site (e.g. NHAs, pNHAs).	• Undermining the conservation of national designated sites. • Direct impact on designated site (e.g. direct loss of habitat) • Disturbance (e.g. spread of invasive species from adjacent sites). • Unlikely to be sufficient information for allocation of +2 or +3 scoring of level of benefit	• NPWS GIS layer -NHAs, pNHAs. • GIS layer – foss wetland	3	N/A
			2	N/A
			1	Potential for benefits to designated site from enhancement or removal of an effect such as from an existing abstraction
			0	No impact on national designated sites expected
			-1	No direct loss of habitat within designated area. Indirect (temporary) impact.
			-2	Direct loss of habitat within designated area. Direct (permanent) impact.
			-3	No -3 scoring as there will be avoidance and/or mitigation to prevent significant impact on National Designated sites.
Fine Screening Question B4	**Criteria**	**Data Sources**	**Score**	
	• Outside of European and Nationally designated sites	• GIS layer – foss wetland/aerial photography	3	Potential to create new high value habitat on a large scale

Is there potential for the option to impact on Biodiversity in all other areas	• Loss of significant areas of ecologically valuable habitat and/or by undermining biodiversity objectives outlined in local or national plans (e.g. county development plans) • Direct habitat loss (e.g. hedgerows/woodlands other semi-natural habitats) • Disturbance to species protected under the wildlife act (e.g. badger, common frog, newts, nesting birds etc.) • Direct mortality of species protected under the wildlife act (e.g. badger, common frog, newts, nesting birds etc.) • Positive scoring for overall biodiversity enhancements where sufficient information is available for the options.	• National Biodiversity Data Centre (NBDC)	2	Potential to create new high value habitat on a small scale
			1	Potential to improve biodiversity through enhancement of existing habitat or improving connectivity
			0	No impact on biodiversity expected
			-1	Temporary loss of habitat or temporary disturbance to species.
			-2	Permanent loss of habitat and or direct mortality of species protected under the wildlife act.
			-3	No -3 scoring as there will be avoidance and/or mitigation to prevent biodiversity loss as included in the option design.
Fine Screening Question B5	**Criteria**	**Data Sources**	**Score**	
Is there potential for the option to spread invasive non-native species?	• Species listed on the third schedule of the Hab+A94:C102itats Regulations 2011, (S.I. 477)	• National Biodiversity Data Centre	3	N/A
			2	N/A
			1	N/A

	Regs 49 & 50 Prohibition on dispersal of certain species. • Presence of highly invasive species e.g. Japanese knotweed (JK), Himalayan balsam (HB), zebra mussel (ZM) etc). • Unlikely to be sufficient information for scoring positive benefits from removal of invasive species		0	No risk of spreading invasive species (e.g. tankering of water) OR no high risk options. Irish Water do not allow transfer of raw water between catchments
			-1	No major risk identified e.g. no records of key invasive (JK, HB, ZM etc.) identified on NBDC. However, site assessment would still be required to rule out presence of invasive at project level.
			-2	Risk identified e.g. records of key invasive species (JK, HB, ZM etc.) identified on NBDC.
				Significant cost to eradicate
				H.B. J.K. and aquatic species. Can mitigate for this however, associated time constraint and cost.
			-3	No high-risk options such as raw-water transfer are removed through Coarse Screening

* Score of -1, -2 or -3 = potential likely significant effects (LSEs) have been identified at fine screening stage in the absence of mitigation (stage 1 of the AA process cannot take mitigation into account).

0 score: those options scoring 0 are those unlikely to result in likely significant effects (LSEs) on a European site (based on desktop review). During the optioneering process Irish Water identify if these 0 scoring options meet the “Objectives of the Plan” and are assessed as having no potential impact on a European Site, it is automatically adopted as the Preferred Approach at WRZ level.

-1 score: potential for LSE (generally construction related impacts) identified. However, it is considered that these LSEs will not result in adverse effects on site integrity (AESI) with standard best practice project specific mitigation (for example pollution control compliant with legislation to protect the general environment and not always specifically for European sites or their qualifying interest features). These options are not considered to lead AESI based on the plan level rules/protective measures applied and desktop information available at the time of assessment.

-2 score: potential for LSE (generally construction related impact) identified. However, it is considered that these s LSEs will not result in AESI with standard best practice project specific mitigation. These options are not considered to lead AESI based on the plan level rules/protective measures applied and desktop information available at the time of assessment.

-3 score: potential for LSEs that may be harder to mitigate or where uncertainty around potential impacts remains (uncertainty may remain until site level assessments are carried out) and although deemed feasible through Stage 2, may require a higher burden of site based proof to succeed if it ever progresses to project level. As part of the feedback loop from the Natura Impact Statement for the Plan, any sites with a -3 score are noted and a better approach to these options identified where possible (e.g. an option that meets the Plan objectives and doesn't score -3). Where there are no options that meet this criterion the -3 options are progressed as the Preferred Approach. For such options mitigation in the form of avoidance is provided within the Plan, for example should potential adverse effects on European sites be identified at the project level from such an option the Plan will have identified other options that could be progressed at the project level if required.

B.3.5 Material Assets

Table B-5 Fine Screening Questions M1 and M2

Fine Screening Question M1	Criteria	Data Sources	Score	
Will the option make effective use of existing assets?	• Negatively scored if additional infrastructure required e.g. new WTP, pipeline, boreholes. • Neutral score if existing assets utilised • Positive score for improved efficiency and allowing decommissioning of old/failing assets • Unlikely to be sufficient information for allocation of +2 or +3 scoring of level of benefit	• IW GIS layers	3	N/A
			2	N/A
			1	Rationalisation of existing assets
			0	Component upgrade within existing site
			-1	Brownfield Site, WTP upgrade, new/replaced network <20km
			-2	Greenfield Site new WTP, new/replaced network 20-50km
			-3	New WTP with limited life span (e.g. Lough Talt). Significant above ground assets (desal), new/replaced network >50km
Fine Screening Question M2	**Criteria**	**Data Sources**	**Score**	
Will this option conflict with critical infrastructure, or does the	• IW GIS layer on land use can highlight areas where	• IW GIS layers • Myplan.ie	3	N/A
			2	N/A

option conflict with existing business, planned land use or valuable agricultural land. (see W6 for Navigation impact)	agricultural land may be disrupted. • IW GIS layer for existing water infrastructure • Cannot assess planned land use on IW GIS but can use Myplan.ie to check how land is zoned in a number of different areas • Cumulative impacts on other plans and projects will be assessed separately.		1	Unlikely to have positive impact
			0	No long term impact on critical infrastructure or operations – such as below ground assets where land can be reinstated
			-1	Loss of agricultural land. New above ground assets that will change land use
			-2	Loss to amenities, parks and designated sites or below ground works on land with strategic use.
			-3	Land with strategic use potential and above ground infrastructure

B.3.6 Landscape and Visual

Table B-6 Fine Screening Questions L1

Fine Screening Question L1	Criteria	Data Sources	Score	
Could this option impact the landscape character areas, townscape character areas or important views – detract or improve?	• Does the option entail new assets e.g. WTP, pipeline and boreholes? • Proximity to settlements • Are there any landscape considerations in this area? • Score more negatively if located in a sensitive landscape.	• Datasets/Documents exist for some counties (e.g. Wicklow) but no central map with all counties • IW GIS layers	3	Unlikely to be sufficient information for allocation of +3 scoring
			2	Unlikely to be sufficient information for allocation of +2 scoring
			1	Rationalisation involving removal of above ground structures
			0	No additional visual impact – such as upgrade within an existing site
			-1	Temporary View Impact i.e. construction of below ground assets
			-2	New above ground assets

Fine Screening Question L1	Criteria	Data Sources	Score	
			-3	New significant above ground assets in landscape amenity areas

B.3.7 Climate Change

Table B-7 Fine Screening Questions CC1

Fine Screening Question CC1	Criteria	Data Sources	Score	
What is the level of construction and operational carbon emissions associated with the option – tonnes?	• Carbon cost information to be used if available for fine screening otherwise scoring based on indicators of construction and operational scale from initial option descriptions • New large WTPs scored negatively based on energy requirements. • Energy intensive processes such as desalination and effluent reuse to be reflected in scoring • Note: Carbon calculations for embodied and operational carbon and NPV costings undertaken	• Option descriptions	3	N/A
			2	N/A
			1	N/A
			0	Small increases in abstraction at existing sites <10m3/d or small scale upgrades.
			-1	Increases in abstraction, pumping water through <20km of network, increase in abstraction to from 0.1 to 10Ml/d
			-2	Significant new/increases in abstraction (>10 to 50Mld), pumping water through >20-50km of network

Fine Screening Question CC1	Criteria	Data Sources	Score	
	after fine screening and used as an input for the approach development rather than the MCA carbon scoring. • There might be opportunity for reducing carbon through the use of renewable energy sources. If this information is not available for scoring it will be highlighted in the assessment for consideration either for a specific scheme or in relation to opportunities across a WRZ/study area/region.		-3	Significant new/increases in abstraction (>50Ml/d), pumping water through >50km of network or energy intensive treatment such as desalination

B.3.8 Cultural Heritage

Table B-8 Fine Screening Questions CH1

Fine Screening Question CH1	Criteria	Data Sources	Score	
Does this option avoid direct damage to, or detract from the setting of, designated cultural	• Is the option located in proximity distance of these sites?	• IW GIS layers for National Monuments in State Care and NIAHs	3	N/A
			2	N/A
			1	N/A

Fine Screening Question CH1	Criteria	Data Sources	Score	
heritage assets, or does this contribute to protecting them?	• Unknown archaeological risk is not scored at this stage but to be considered at later assessment stages. • Unlikely to be sufficient information to score any benefits such as improvements to access to sites.	• Online historic environment viewer	0	No or low risk to cultural heritage sites
			-1	New above ground assets close to heritage site (NIAH/SMR) – potential to detract from setting
			-2	New above ground/below ground asset close to heritage site (NIAH/SMR) that would not result in a loss of site but would involve a large amount of archaeological input
			-3	New above ground/below ground asset resulting in loss of NIAH/SMR site (e.g. a pipeline through an earthworks site)

B.3.9 Geology and Soils

Table B-9 Fine Screening Questions G1

Fine Screening Question G1	Criteria	Data Sources	Score	
Would any designated or non-designated geological features, valuable soils, or contaminated land sites be affected?	• Loss of valuable geological sites or risks from contaminated sites and loss of soils resources. • Lack of detail on design and routing at this stage so not possible to assess to sufficiently to compare options other than to check	• Online GSI database • IW GIS layers for soils, geological features	3	N/A
			2	N/A
			1	N/A
			0	No or low risk to geological heritage sites

Fine Screening Question G1	Criteria	Data Sources	Score	
	geological features are avoided. • Further assessment of impact on soils or risks from contaminated land would be required at a more detailed assessment stage.		-1	New above ground assets close to geological heritage site – potential to detract from setting. Some risk to archaeological interest from below ground construction
			-2	New above ground/below ground asset within geological heritage site that would not result in a loss of site but would involve a large amount of input
			-3	New above ground/below ground asset resulting in loss of geological heritage site

Appendix C Preferred Approaches for the Study Areas

Note: SA options are also known as ‘group options’

C.1 SA1 Preferred Approach

WRZ	SA1 Preferred Approach	
	Option Description	SA Option
3400SC0001: Arklow Public Supply	SA1-081 Abandon Aughrim WTP, New GW Source and Upgrade Arklow Ballyduff WTP to Feed Aughrim and Arklow	14
3400SC0006: Aughrim Annacurra Public Supply	SA1-082 Abandon Aughrim WTP, New GW Source and Upgrade Arklow Ballyduff WTP to Feed Aughrim and Arklow	14
3400SC0007: Avoca Ballinaclash Public Supply	SA1-17c Rationalise WTPs and Feed from Vartry	3
3400SC0012: Redcross Conary Public Supply	SA1-57c Rationalise WTPs and Feed from Vartry	3
3400SC0017: Barndarrig Public Supply	SA1-087 Rationalisation of Barndarrig WTP to Vartry WTP	3
3400SC0018: Ballycoog Public Supply	SA1-030 Increase GW Abstraction and Upgrade Ballycoog WTP	-
3400SC0020: Thomastown Public Supply	SA1-066 Increase GW Abstraction at Thomastown	-
3400SC0021: Kirikee Public Supply	SA1-050	-

WRZ	SA1 Preferred Approach	
	Option Description	SA Option
	New GW Abstraction and Upgrade Kirikee WTP	
3400SC0025: Ballinteskin Public Supply	SA1-23c Rationalise WTPs and Feed from Vartry	3
3400SC0027: Ballinapark Public Supply	SA1-020 Abandon Ballinapark WTP and feed from Avoca	-
3400SC0030: Killavaney Public Supply (Arklow)	SA1-069 Upgrade Killavaney WTP for Water Quality Purposes - No Deficit	-
3400SC0031: Ballyclogh Public Supply	SA1-027 New GW Abstraction and Upgrade Ballyclogh WTP	-
3400SC0032: Killavaney Public Supply (Tinahely)	SA1-070 Upgrade Killavaney WTP for Water Quality Purposes - No Deficit	-
3400SC0033: Ballymorris Public Supply	SA1-083 Abandon Aughrim WTP, New GW Source and Upgrade Arklow Ballyduff WTP to Feed Aughrim and Arklow	14
3400SC0035: Kilballyowen (Aughrim) Public Supply	SA1-042 New GW Abstraction and Upgrade Kilballyowen WTP	-
3400SC0046: Rathdrum Public Supply	SA1-53c Rationalise WTPs and Feed from Vartry	3
3400SC0047: Laragh Annamoe Public Supply	SA1-51c & SA1-52c Rationalise WTPs and Feed from Vartry	3

WRZ	SA1 Preferred Approach	
	Option Description	SA Option
3400SC0002: Tinahely Regional Supply	SA1-071 Upgrade WTPs for water quality Purposes - No Deficit	-

C.2 SA2 Preferred Approach

WRZ	SA2 Preferred Approach	
	Option Description	SA Option
0100SC0005: Hacketstown	SA2-30d Supply from Rathvilly (New Shannon Source dependent via Carlow Town)	-
3400SC0003: Baltinglass Public Supply	SA2-001 New GW Abstraction	-
3400SC0004: Dunlavin Public Supply	SA2-07b Rationalisation Ballymore Eustace - Hollywood	2
3400SC0005: Hollywood Donard Public Supply	SA2-11b Rationalisation Ballymore Eustace - Hollywood	2
3400SC0008: Ballyknockan Valleymount Public Supply	SA2-013 Increase GW abstraction	-
3400SC0009: Stratford Public Supply	SA2-017 Increase GW abstraction	-
3400SC0011: Kiltegan Public Supply	SA2-038 Upgrade Kiltegan Public Supply WTP for Water Quality Purposes	-

WRZ	SA2 Preferred Approach	
	Option Description	SA Option
3400SC0014: Rathdangan	SA2-035 WTP Upgrade	-
3400SC0015: Knockananna Public Supply	SA2-20a Increase GW abstraction	-
3400SC0019: Grangecon Public Supply	SA2-024 Increase GW abstraction	-
3400SC0023: Knockanarrigan Davidstown Public Supply	SA2-028 New GW abstraction	-
3400SC0052: Knocknagilky Public Supply	SA2-040 Increase GW Abstraction	-

C.3 SA3 Preferred Approach

WRZ	SA3 Preferred Approach	
	Option Description	SA Option
2300SC0006: Athboy	SA3-098 New Shannon Source Transfer, Interconnection and Rationalisation	23
0200SC0015: Bailieboro RWSS	SA3-077 New Groundwater Abstraction at Crossreagh	-
2300SC0007: Ballivor	SA3-099 New Shannon Source Transfer, Interconnection and Rationalisation	23

WRZ	SA3 Preferred Approach	
	Option Description	SA Option
2300SC0005: Kells-Oldcastle	SA3-097 New Shannon Source Transfer, Interconnection and Rationalisation	23
2300SC0011: Kilmessan	SA3-101 New Shannon Source Transfer, Interconnection and Rationalisation	23
2300SC0027: Moynalty	SA3-088 Upgrade Moynalty WTP for Water Quality Purposes	-
2300SC0055: Navan-Midmeath	SA3-100 New Shannon Source Transfer, Interconnection and Rationalisation	23
2300SC0009: Slane	SA3-047 Groundwater Enhancement at Slane	-
2100SC0001: South Louth & East Meath	SA3-096 New Shannon Source Transfer, Interconnection and Rationalisation	23
2300SC0045: St Louis, National School, Rathkenny	SA3-089 Upgrade Moynalty WTP for Water Quality Purposes	-
2300SC0014: Trim	SA3-102 New Shannon Source Transfer, Interconnection and Rationalisation	23

C.4 SA4 Preferred Approach

WRZ	SA4 Preferred Approach	
	Option Description	SA Option
3200SC0003: Ballany	SA4-010 New connection point from NSS connecting to Ballany	1
3200SC0001: Mullingar Regional	SA4-36a New connection point from NSS connecting to Mullingar Regional	1
2300SC0012: Clonard/ Abbeysfields Housing Estate	SA4-046 New connection point from NSS connecting to Clonard/Abbeysfields Housing Estate	1
2300SC0016: Longwood WS	SA4-052 New connection point from NSS connecting to Longwood	1
2300SC0018: Enfield	SA4-053 New connection point from NSS connecting to Enfield	1
1400SC0005: Clonuff	SA4-099 No deficit - water quality upgrade required only	-
1400SC0004: Ardcarraig Clogherinkoe	SA4-060 New connection point from NSS connecting to Ardcarraig Clogherinkoe	1
2500SC0005: Edenderry & Rhode	SA4-66 New connection point from NSS connecting to Edenderry & Rhode	1
2500SC0014: Daingean	SA4-071 New connection point from NSS connecting to Daingean	1

WRZ	SA4 Preferred Approach	
	Option Description	SA Option
2500SC0007: Clonbullogue	SA4-098 No deficit - water quality upgrade required only	-
2500SC0006: Walsh Island	SA4-077 New connection point from NSS connecting to Walsh Island	1
2000SC0003: Ballymahon	SA4-020 Rationalise Ballymahon To Mullingar WRZ	1
2500SC0004: Geashill	SA4-063 New connection point from NSS connecting to Geashill	1

C.5 SA5 Preferred Approach

WRZ	SA5 Preferred Approach	
	Option Description	SA Option
1200SC0005: Ahascragh	SA5-002 Increase GW Abstraction at Ahascragh by 0.5Ml/d	-
3200SC0002: Athlone	SA5-09a Increase River Shannon SW Abstraction and Upgrade Athlone WTP - 5.0Ml/d	-
1200SC0006: Ballinasloe	SA5-17a Increase Abstraction from River Suck - 2.3Ml/d	-
2500SC0001: Banagher	SA5-080 & SA5-081 Replace WTP to Address Water Quality Issue	-

WRZ	SA5 Preferred Approach	
	Option Description	SA Option
2500SC0015: Birr/Kinnitty	SA5-025 Increase abstraction from the River Camcor and upgrade WTP to supply Birr and Kinnity	-
2500SC0016: Clara/Ferbane	SA5-084 No deficit. WTP upgrade only	-
2500SC0003: Kilcormac	SA5-033 Increase GW Abstraction at Kilcormac - 0.4Ml/d	-
2600SC0001: Mount Talbot/Four Roads	SA5-37b Increase GW Abstraction at Mount Talbot Spring - 0.5Ml/d	-
2500SC0017: Rahan	SA5-086 New GW abstraction to meet partial deficit for Rahan and Upgrade WTP	-
2600SC0006: South Roscommon (Lisbrock and Killeglan)	SA5-082 & SA5-083 New GW at Killeglan and Lisbrock and upgrade of WTP	18

C.6 SA6 Preferred Approach

WRZ	SA6 Preferred Approach	
	Option Description	SA Option
0100SC0001: Carlow Town	SA6-193 Connect to New Shannon Source via Srowland	-
0100SC0002: Leighlinbridge	SA6-197 WTP upgrade only	-

WRZ	SA6 Preferred Approach	
	Option Description	SA Option
0100SC0003: Old Leighlin	SA6-019 Increase GW abstraction to supply deficit - yield assessments required	-
0100SC0004: Bilboa	SA6-024 New GW abstraction to supply full demand	-
0100SC0008: Bagenalstown	SA6-191 WTP Upgrade	-
0100SC0011: Carlow Central Regional	SA6-033 New GW abstraction to supply deficit, to the Barrow gravels just south of Carlow Town	-
1500SC0006: Urlingford-Johnstown WS	SA6-038 New GW abstraction to supply deficit and improve water quality	-
1500SC0009: Clogh-Castlecomer WS	SA6-45a New GW abstraction/wellfield to supply deficit	-
1500SC0018: Galmoy-Rathdowney PWS	SA6-53a Increase GW abstraction to supply deficit	-
1600SC0001: Portlaoise PWS	SA6-57a New GW abstraction/wellfield development	-
1600SC0003: Rosenallis PWS	SA6-064 Increase GW abstraction to supply deficit	-
1600SC0004: Mountmellick 1 PWS	SA6-69a Increase GW abstraction to supply deficit	-

WRZ	SA6 Preferred Approach	
	Option Description	SA Option
1600SC0005: Portarlington 1 PWS	SA6-077 Increase GW abstraction to supply deficit	-
1600SC0006: Arles 2 PWS	SA6-86a Increase GW abstraction to supply deficit - yield assessments required	-
1600SC0007: The Strand PWS	SA6-090 Increase GW abstraction to supply deficit	-
1600SC0008: Coolanagh PWS	SA6-094 Increase GW abstraction to supply deficit	-
1600SC0010: Borris in Ossory PWS	SA6-099 Increase GW abstraction to supply deficit	-
1600SC0011: Camross PWS	SA6-104 Increase GW abstraction to supply deficit	-
1600SC0014: South East Regional PWS	SA6-105 Increase GW abstraction to supply deficit	-
1600SC0015: Swan PWS	SA6-113a Increase GW abstraction to supply deficit	-
1600SC0016: Mountrath	SA6-122 Rationalise Cloonin Hill, Drim and Knocks into 1 WTP to add resilience. Require source protection.	-
1600SC0017: Abbeyleix South	SA6-126 Increase GW abstraction to supply deficit	-

WRZ	SA6 Preferred Approach	
	Option Description	SA Option
1600SC0018: Ballinakill	SA6-139 Interconnect Ballinakill with Durrow WRZ for increased resilience	53
1600SC0019: Durrow	SA6-144e Increase GW abstraction at Fermoyle WTP to supply deficit	53
1600SC0020: Abbeyleix North	SA6-149 Increase GW abstraction to supply deficit	-
1600SC0021: Ballyroan	SA6-156 Increase GW abstraction to supply deficit - Ballyroan Spring	-
2500SC0002: Tullamore	SA6-180c Supply Tullamore from New Shannon Source	52
2500SC0002: Tullamore	SA6-180a Supply Tullamore from New Shannon Source	-
2500SC0013: Mountbolus PWS	SA6-184 New connection point from New Shannon Source connecting to Mountbolus	52

C.7 SA7 Preferred Approach

WRZ	SA7 Preferred Approach	
	Option Description	SA Option
1200SC0030: Portumna	SA7-055 Increase abstraction and Upgrade WTP	-

WRZ	SA7 Preferred Approach	
	Option Description	SA Option
2500SC0010: Dunkerrin / Moneygall	SA7-54b New Shannon Source Connection	5
2500SC0012: Coolderry PWS	SA7-044 Increase abstraction from Coolderry Well and upgrade Coolderry WTP (Roscrea Gravels groundwater body)	-
2900SC0002: Roscrea RWSS	SA7-063 No Deficit - Upgrade WTP	-
2900SC0003: Templederry	SA7-060 Templederry WTP Upgrade	-
2900SC0043: Lorrha/Rathcabbin	SA7-023 New GW abstraction from Birr groundwater body (karstic bedrock) and upgrade Riverstown WTP to supply deficit	-
2900SC0045: Greyford Source to Crotta	SA7-36b New Shannon Source Connection	4
2900SC0046: Cloughjordan	SA7-43a New Shannon Source Connection	4
2900SC0050: Nenagh RWSS	SA7-061 Nenagh WTP Upgrade	-
2900SC0051: Terryglass	SA7-014 New GW abstraction to supply full demand and abandon existing sources	-

C.8 SA8 Preferred Approach

WRZ	SA8 Preferred Approach	
	Option Description	SA Option
1900SC0029: Adare	SA8-192 Limerick City not in deficit. Upgrade and supply to neighbouring WRZs (South West Regional, Foynes Shannon and Adare)	10
1900SC0017: Athlacca Water Supply	SA8-179 Not in deficit - Upgrade WTP only	-
1900SC0035: Ballingarry	SA8-149 Increase GW abstraction at Ballingarry Spring (Ballingarry groundwater body - productive fissured bedrock) and upgrade existing Ballingarry Spring WTP to partly supply deficit	-
1900SC0009: Bruff Water Supply	SA8-052 Increase GW abstraction at Finn's Well (poorly productive aquifer) and upgrade Finn's Well WTP	-
1900SC0016: Bruree Water Supply	SA8-068 Increase GW abstraction at Bruee BH (Bruree groundwater body - productive fissured bedrock) and upgrade Bruree PS WTP	-
1900SC0037: Murroe/Cappamore/Foileen	SA8-040 & SA8-199 Supply spare capacity from Limerick City to neighbouring WRZs, rationalising Cappamore Murroe, Pallasgreen and Doon	8
1900SC0020: Carrigkerry Water Supply	SA8-098 Increase GW abstraction from Carrigkerry Spring (poorly productive aquifer) and upgrade Carrigkerry WTP	-
1900SC0028: Croom PWS	SA8-177	-

WRZ	SA8 Preferred Approach	
	Option Description	SA Option
	Rationalise to Limerick City	
1900SC0004: Doon Water Supply	SA8-138 Supply spare capacity from Limerick City to neighbouring WRZs, rationalising Cappamore Murroe, Pallasgreen and Doon	8
0300SC0020: Ennis	SA8-001 & SA8-172 Increase GW abstraction at Drumcliffe Springs (Ennis groundwater body - karstic bedrock) and upgrade Drumcliffe WTP to partly supply deficit. Advanced leakage reduction. SA8-172 leakage option needs to be implemented in conjunction with a local GW option SA8-001 or SA8-002 in order to meet full deficit.	-
0300SC0015: Feakle PWS	SA8-021 Increase GW abstraction from Feakle public supply new BH (poorly productive aquifer) and upgrade existing Bauragegaun Pump Station WTP	-
1900SC0007: Fedamore Water Supply	SA8-051 New GW abstraction from Fedamore groundwater body (karstic) and upgrade Fedamore WTP/new WTP	-
0300SC0014: Flagmount PWS	SA8-20a Increase GW abstraction from Flagmount BH (poorly productive aquifer) and upgrade existing Flagmount Reservoir Site WTP	-
1900SC0024: Foynes/Shannon Estuary PWS	SA8-105 Limerick City not in deficit. Upgrade and supply to neighbouring WRZs (South West Regional, Foynes Shannon and Adare)	10

WRZ	SA8 Preferred Approach	
	Option Description	SA Option
1900SC0015: Glenosheen/Jamestown/ Kilmallock	SA8-065 Not in deficit - supply spare capacity to neighbouring WRZs	16
1900SC0022: Glin Water Supply	SA8-100 Increase GW abstraction from Glin BH (poorly productive bedrock) and upgrade existing Glin WTP	-
2900SC0005: Kilcommon	SA8-163 Increase GW abstraction at Kilcomman (poorly productive aquifer) and upgrade WTP	23
1900SC0034: Kilfinnane Ardpatrick Water Supply	SA8-114 Rationalise Kilfinnane Ardpatrick to Kilmallock WRZ (rationalise to Jamestown WTP (Mount Russell BH), approx. distance 4km, network upgrades required)	16
0300SC0024: Killaloe PWS	SA8-027 Rationalise Killaloe WRZ to Newport WRZ via Killaloe bridge	12
1900SC0001: Limerick City Environs PWS	SA8-17f Limerick City not in deficit. Upgrade and supply to neighbouring WRZs (South West Regional, Foynes Shannon and Adare)	10
1900SC0014: Martinstown Water Supply	SA8-059 Increase GW abstraction at Martinstown BH (poorly productive aquifer) and upgrade Martinstown WTP	-
0300SC0017: Mountshannon PWS	SA8-024 Increase GW abstraction from existing Mountshannon BH (poorly productive aquifer) and upgrade Cloonmirran Pumphouse WTP	-

WRZ	SA8 Preferred Approach	
	Option Description	SA Option
2900SC0066: Newport RWSS	SA8-118 Rationalise Newport to New Shannon Source	12
0300SC0019: O'Briensbridge PWS	SA8-31a Rationalise O'Briensbridge WRZ to Limerick City WRZ (approx. distance 2.5km, new watermains and network upgrades required)	-
1900SC0005: Pallasgreen Water Supply	SA8-049 Supply spare capacity from Limerick City to neighbouring WRZs, rationalising Cappamore Murroe, Pallasgreen and Doon	8
1900SC0036: Rathkeale	SA8-145 Increase GW abstraction at Kilcolman Spring and upgrade existing Kilcolman WTP to supply deficit (new artesian well)	-
0300SC0016: Scarriff PWS	SA8-022 Increase GW abstraction from existing BHs (poorly productive aquifer) and upgrade Scarriff WTP	-
0300SC0006: Shannon/Sixmilebridge	SA8-009 Increase abstraction at Castle Lake and upgrade Castle Lake WTP to supply deficit	-
1900SC0019: South West Regional	SA8-084 Limerick City not in deficit. Upgrade and supply to neighbouring WRZs (South West Regional, Foynes Shannon and Adare)	10
2900SC0068: Upperchurch	SA8-166 Rationalise Upperchurch to Kilcommon WRZ (distance 1km, new watermains and network upgrades required)	23

WRZ	SA8 Preferred Approach	
	Option Description	SA Option
1200SC0036: Woodford	SA8-120 Increase existing GW	-

C.9 SA9 Preferred Approach

WRZ	SA9 Preferred Approach
	Option Description
GDA	SA9-084 New Shannon Source - EMR C Parteen Basin – 200 Ml/d; Boosted supply (1PS to TPR)
	Networks Upgrade 1 New Shannon Source - Dublin City Trunk Mains - Option A

Appendix D SEA Mitigation Measures

SEA options assessment assumes the implementation of standard mitigation measures, such as operation of water sources in line with regulatory requirements and the use of good construction practice. Examples of standard measures expected to be embedded in the design and development of infrastructure options are listed in Table D-1.

Table D-1 Embedded standard mitigation

Mitigation assumptions
Studies and surveys
Feasibility and scheme option studies, including detailed pipeline routing, siting and technology options to avoid effects on designated sites and species.
Studies, surveys and consultation on environmental effects of proposed development following relevant good practice guidance to inform design, identify relevant mitigation and to support appropriate planning permission, EIA and licencing processes.
Investigation, monitoring and modelling studies for groundwater and surface water abstractions to be agreed where relevant in context of schemes meeting WFD no deterioration requirements and RBMP objectives and to support AA requirements.
Short term/construction impacts
Local residents provided with due notice of construction works.
Ensure safe access for pedestrians, cyclists and equestrians, providing diversions where necessary.
Implementation of traffic management measures to minimise disruption to minor roads, including, where possible, limitation of works within peak periods or times.
Use of construction techniques that avoid or minimise disruption to major infrastructure and river crossings, such as directional drilling (where appropriate).
Any disruption to the road to be agreed in advance with transport authorities and traffic management plans to be used where needed.
No works to take place within curtilage of designated cultural heritage sites without necessary consents in place. Directional drilling where needed. Archaeological watching briefs during ground works where agreed as needed to address risk with planning authorities.
No works to take place within or in close proximity to designated sites without necessary consents in place and impacts to be avoided through detailed routing and trenchless construction approaches or timing to avoid disturbance where appropriate.
Appropriate permissions and consents to be obtained for all works which may affect a European protected species or nationally protected species.
A suitably qualified and experienced ecological clerk of works (ECoW) to carry out site supervision works during activities that affect sensitive habitats and species, ensure that site specific mitigation identified following surveys is undertaken.
Appropriate watercourse consents and environmental permits to be obtained for construction activities in or near water.

Consent for noisy works to be obtained and noise barriers used where required.
Best practice measures to control noise, air and water pollution in accordance with guidance.
Long-term mitigation (outside permanent footprints)
Full reinstatement of all footpaths and recreational areas.
Full reinstatement of all habitat types, including hedgerows, and provision of compensation habitat where appropriate.
All river abstraction points to be fitted with fish screens.
Full reinstatement of landscape features, and good management practice for the long-term restoration of landscape features.
Full restoration of agricultural land and previously undeveloped land.
Appropriate abstraction licence to be obtained for new, increased or traded licences.
New built infrastructure to incorporate the appropriate flood defence measures.

Table D-2 illustrates the mitigation measures that specifically respond to the significant environmental effects identified for each SEA topic within the nine SAs of Region/Group 4.

Table D-2 Group/Region 4 significant impacts and corresponding mitigation measures

SEA Topic (abridged)	Significant Impact Identified in SEA	Mitigation Measures
Population & Health	Construction-stage disruption to access routes and recreational areas Construction-stage noise disturbance, dust and extra traffic Changes to drinking water quality caused by WTPs at risk of failure	• Regular community liaison • Construction Environmental Management Plan, Traffic Management Plan • Drinking water safety plans, catchment management, leakage reduction programmes, drought management actions – see EAP • Design of upgraded plant to meet drinking water standards
Water	Draw-down of groundwater levels caused by abstraction Abstraction of surface water with risk to reduce flow or water levels Impacts on water quality from surface water runoff or drawdown of water levels Increase in flood risk due to construction of new infrastructure or changes to drainage affecting flood risk during operation.	• All abstractions to be operated within the defined sustainability levels • Detailed studies required to determine abstraction regime that will not result in significant negative impacts on surface water or groundwater waterbody WFD status and how WFD objectives can be supported – see climate resilience measure below • Use of treatment and dispersal technologies appropriate to the source effluent and receiving waters • Improvements to residuals management • Implementation of best practice pollution prevention guidance, e.g. IFI 2016, CIRIA C532 • Emergency Pollution Response Plan

SEA Topic (abridged)	Significant Impact Identified in SEA	Mitigation Measures
		• Environmental flow linked abstraction limits to minimise impact on summer low flows or fish migration periods • Catchment management to improve water quality where relevant • Locate new infrastructure away from areas of high flood risk. Where this is unavoidable, implement appropriate flood protection measures
Biodiversity	Loss or fragmentation of habitats within development footprint Disturbance to wildlife during construction Discharges of pollutants into water bodies and subsequent impacts on aquatic biodiversity Spread of invasive species during construction works	• Location and design of development to take account of designated sites or important habitats • Project level AA screening/AA required • Pre-construction Surveys/Seasonal Restrictions/ECoW • Ecology surveys, CEMPs and consultation to inform site-specific location, design and mitigation • Construction site reinstatement to include biodiversity enhancement and habitat connectivity measures where possible. • INNS Management Plan and biosecurity protocols in relation to water quality and biological sampling • Environmental flow linked abstraction limits to minimise impact on summer low flows or fish migration periods
Landscape	Impacts on local landscapes and visual amenity during construction	• Design of new plant to minimise visual effects and agree design with local authorities • Use landscape screening if appropriate, to reduce visual impacts during construction • Tree protection fencing • Lighting management • Link provision of biodiversity and land use reinstatement and enhancement to landscape opportunities where possible
Material assets	Disruption to infrastructure or access to infrastructure, access routes, public spaces and agricultural land	• Refine site locations and pipeline alignments to avoid built and natural assets • WRZ configuration – rationalisation opportunities for assets, waste and energy use, sustainable source use – see EAP
Climate change	Reduced resilience to climate change impacts Increase in greenhouse gas emissions	• Design criteria to emphasise climate change resilience • Prepare and implement a Climate Change Adaptation and Mitigation Strategy – see WSSP • Climate Sensitive Catchments Project, leakage reduction programmes, drought management actions – see EAP

SEA Topic (abridged)	Significant Impact Identified in SEA	Mitigation Measures
		• Development of operational procedures for new groundwater abstraction which seek to limit abstraction volumes under conditions of environmental stress. Further research and assessment work required to inform development of operational procedures • Consider potential for use of renewable energy sources and energy efficiency measures to reduce carbon footprint during construction and operation
Cultural heritage	Loss or damage to cultural heritage assets within construction footprint	• Maintenance of access to cultural heritage assets during construction • Locations of known archaeological interest/value, or areas where archaeological work is planned, will be signposted/fenced off to avoid unintentional damage • Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of application, the developer will inform the local planning authority and inform the project team of a solution that protects the significance of the new discovery, as far as practicably possible • Further cultural heritage and archaeological assessment and consultation to influence site location, design, pipeline alignment etc

Appendix E Environmental and Social Costs

E.1 Introduction

This methodology sets out the approach to estimating the environmental and social (E&S) costs for individual options for Irish Water. It uses an ecosystem services approach, and uses both data relating to UK-based studies and Irish-based studies.

The aim of the calculations was to capture and value significant residual impacts in relation to ecosystem services. The availability of options data and robust ecosystem services values mean that potential impacts on three ecosystem services are valued:

- Climate regulation – woodland;
- Traffic impacts – opportunity cost of time due to road congestion from roadworks; and
- Food – crops and livestock.

(Note: Carbon emissions are addressed separately and are calculated alongside the construction and operational costs for the options).

Valuation of potential impacts on recreation and biodiversity were excluded from the E&S costs to avoid double counting, as potential effects on recreational amenities are captured within the Multi-Criteria Analysis (Environmental/Population, health, economy and recreation category).

There is the potential for additional ecosystem services categories to be captured within the E&S costs if additional time was available to undertake research into the availability of additional relevant studies.

As the actual route selection and site selection for the options has not yet been carried out, the E&S costs are based on the best available geographic information. A number of assumptions have been made in terms of land type and the size of the land take. Once route and site selection have taken place, the E&S costs can be refined to reflect this updated information.

The E&S costs were provided as a snapshot for one year – they are included in the EBSD model where they are discounted to produce the costs over the required time period.

The E&S costs are presented in 2018 prices, as 2018 is the most recent available data for the GDP deflator. If the E&S costs are required in a different base year to facilitate comparison of costs, assumptions could be made to convert them to the required base year.

The following section looks at individual impact categories in more detail.

E.2 Methodology

E.2.1 Climate regulation – woodland

The climate regulation/woodland impacts are calculated as an annual value – the impact of any woodland lost will continue to be felt in terms of loss of carbon sequestration.

The carbon sequestration rate per hectare of woodland is used to calculate the value of climate regulation for three categories of woodland – broadleaved, coniferous and mixed forest.

For coniferous and broadleaved, the values are calculated as weighted averages of the carbon sequestration rate for young and adult trees. The carbon sequestration rate is taken from the UK Forestry Commission's Woodland Carbon Code Carbon Look-Up Tables (2013) and is weighted by the

proportion of young and adult trees (UK Forestry Commission's National Inventory of Woodland and Trees, 2003).

The mixed forest carbon sequestration rate is the weighted average of the coniferous and broadleaved sequestration rates, based on the biomass stocks of living coniferous and broadleaved trees.

Table E-1 Carbon sequestration assumptions

Assumption	Value	Unit	Study year
Total area of young coniferous trees	84,221	Hectares	2003
Total area of adult coniferous trees	1,228,121	Hectares	2003
Total area of young broadleaved trees	26,879	Hectares	2003
Total area of adult broadleaved trees	510,299	Hectares	2003
Carbon sequestration rate for young coniferous trees	2.64	tCO2e/ha	2013
Carbon sequestration rate for adult coniferous trees	4.47	tCO2e/ha	2013
Carbon sequestration rate for young broadleaved trees	2.20	tCO2e/ha	2013
Carbon sequestration rate for adult broadleaved trees	4.71	tCO2e/ha	2013
Biomass stocks in living coniferous trees in GB	218	Million tonnes oven dry	2013
Biomass stocks in living broadleaved trees in GB	208	Million tonnes oven dry	2013

The non-traded value of carbon is used as there is no market for carbon sequestration – it is the social cost.

The carbon cost is taken from the PSC Central Technical References and Economic Appraisal Parameters document[1], published by the Department of Public Expenditure and Reform.

The non-trade price of carbon is uplifted to 2018 prices using the GDP deflator for Ireland published by the World Bank[2]; 2018 prices were selected, as this was the most recent year for the GDP deflator.

E.2.2 Traffic impacts – opportunity cost of time due to road congestion from roadworks

The traffic impacts are calculated as a one-off value – this is because these impacts will only be realised during construction.

The number of vehicles per day, speed of pipe laying and time of delay at roadworks for different road types are used with the average value of time per hour to calculate the cost of congestion.

The number of vehicles per day are taken from the UK Department for Transport's 'Road Traffic Estimates: Great Britain 2017'. The speed of pipe laying has been informed by professional judgement

[1] https://www.gov.ie/en/publication/public-spending-code/
[2] https://data.worldbank.org/indicator/NY.GDP.DEFL.ZS?locations=IE

and is assumed to be 30m/day. The time of delay at roadworks is presented by type of road – motorway, A road, B road, minor road – averaging the values for urban and rural roads[3].

Table E-2 Traffic assumptions

Assumption*	Value	Unit	Study year
Number of vehicles per day on a motorway (passing a reference point)	88,000	Vehicles	2017
Number of vehicles per day on an A road (passing a reference point)	35,500	Vehicles	2017
Number of vehicles per day on a B road (passing a reference point)	14,000	Vehicles	2017
Number of vehicles per day on a minor road (passing a reference point)	1,600	Vehicles	2017
Average time delay at road works for motorway	0.06	Hours/vehicle	2005
Average time delay at road works for A road	0.06	Hours/vehicle	2005
Average time delay at road works for B road	0.03	Hours/vehicle	2005
Average time delay at road works for minor road	0.004	Hours/vehicle	2005

*Road categories adapted where appropriate to reflect traffic levels

The average value of time per hour is calculated using the value of time from Transport Infrastructure Ireland's 'Project Appraisal Guidelines for National Roads Unit 6.11'[4], and apportioning it by the vehicle miles by type of vehicle for Great Britain[5]. Data for Ireland for vehicle miles was not readily available. This produced an estimate for the value of time per hour for an average vehicle.

The length of pipe laid which intersects different types of road was provided through GIS data.

E.2.3 Food – crops and livestock

The food/crops and livestock impacts are calculated as an annual value – the impact of any agricultural land lost will continue to be felt in terms of loss of productive agricultural land.

The area of land take for each option was calculated using information on the proposed new infrastructure – water treatment plants, desalination plants, pumping stations, groundwater treatment plants, boreholes and reservoirs. As the geographic information for each option is only indicative at this stage, it was assumed that all of the proposed land take was agricultural land.

The value of the agricultural land was calculated using information on the indicative monetary estimates of the gross margins (£/hectare) for selected crops from the Multi-Coloured Manual[6]. An average of the gross margin for different arable land types was used.

[3] Goodwin, P. (2005) Utilities' street works and the cost of traffic congestion, London, National Joint Utilities Group. Available at: http://www.njug.org.uk/wp-content/uploads/93.pdf
[4] https://www.tiipublications.ie/library/PE-PAG-02030-01.pdf
[5] Data table TRA4213 in Department for Transport (2017) 'Road Traffic Estimates: Great Britain 2017' available from https://www.gov.uk/government/statistics/road-traffic-estimates-in-great-britain-2017
[6] https://www.mcm-online.co.uk/handbook/

Table E-3 Agricultural land MCM assumptions

MCM group	Gross margin (£/ha) 2017 prices	MCM group assumption
Winter wheat	758	Assumes 9t/ha
Extensive arable	741	Assumes wheat 70%, oil seed rape 20%, beans 10% by area
Intensive arable	1370	Assumes wheat 66%, sugar beet 17%, potatoes and vegetables 17% by area

This was uplifted to 2018 prices using the GDP deflator for Ireland published by the World Bank[7]. 2018 prices were selected, as this was the most recent year for the GDP deflator. It was converted to euros using the Bank of England's euro/sterling spot exchange rate[8].

[7] https://data.worldbank.org/indicator/NY.GDP.DEFL.ZS?locations=IE
[8] https://www.bankofengland.co.uk/boeapps/database/fromshowcolumns.asp?Travel=NIxSUx&FromSeries=1&ToSeries=50&DAT=RNG&FD=1&FM=Jan&FY=2010&TD=28&TM=Jul&TY=2020&FNY=&CSVF=TT&html.x=167&html.y=37&C=DMD&Filter=N

Appendix F Policy, Plan and Programme Review

F.1 National and Regional Level

Theme	Policies, Plans and Programmes
All aspects	1. EU Sustainability Policy 2. UN Sustainable Development Goals 3. Our Sustainable Future, a Framework for Sustainable Development for Ireland 4. Strategic Environmental Assessment Directive (2001/42/EC) 5. European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 S.I. No. 435/2004 (as amended 2011 S.I. No. 200/2011) 6. Planning and Development (Strategic Environmental Assessment) Regulations 2004 S.I. No. 436/2004 (as amended 2011 S.I. No. 201/2011) 7. Environmental Impact Assessment Directive (2014/52/EU) 8. European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 S.I. No. 296/2018 (as amended S.I. No. 646/2018) 9. Environmental Liability Directive (2004/35/EC) 10. European Communities (Environmental Liability) Regulations 2008 S.I. No. 547/2008 (as amended 2015 S.I. No. 293/2015) 11. European Green Deal 12. Water Services Act, 2013 (as amended 2017) 13. Ireland 2040: Our Plan, National Planning Framework 14. Water Services Policy Statement 2018 - 2025 15. National Spatial Strategy for Ireland 2002-2020 (Department of the Environment and Local Government, 2002) 16. Regional Spatial and Economic Strategies 17. Planning and Development Act 2000 (as amended) 18. Planning and Development Regulations 2001 (as amended) 19. Capital Investment Plan 2016-2021 20. Climate Action Plan 2021 21. Ireland's Environment - An Integrated Assessment 2020
Population, economy, tourism and recreation and human health	22. Aarhus Convention 23. Drinking Water Directive (2020/2184) 24. European Union (Drinking Water) Regulations 2014 S.I. No. 122/2014 (as amended 2017 S.I. No. 464/2017) 25. EPA Drinking Water Advice Note No. 8: Developing Drinking Water Safety Plans (2011) 26. Groundwater Protection Schemes (1999) 27. World Health Organization Guidelines for Drinking Water Quality (4th edition, 2017)

Theme	Policies, Plans and Programmes
	28. Water safety plan manual: step-by-step risk management for drinking-water suppliers (2009) 29. Irish Water - Water Services Strategic Plan 2015 30. Irish Water - National Wastewater Sludge Management Plan 31. Irish Water - Lead in Drinking Water Mitigation Plan 32. Healthy Ireland Framework 2019-2025 33. Draft Agri-Food Strategy 2030 34. Food Vision 2030 35. Food Wise 2025 36. Food Harvest 2020 37. Fàilte Ireland's 10 Year Tourism Strategy 38. Fàilte Ireland Visitor Experience Development Plans 39. EU Tourism Policy 40. National Countryside Recreation Strategy 41. Tourism Policy Statement 42. Tourism Development and Innovation. A Strategy for Investment 2016-2022 43. Tourism Action Plan 2019-2021 44. Waterways Ireland Tourism Masterplan for the River Shannon 2020-2030
Water environment	45. Water Framework Directive (2000/60/EC) 46. European Communities (Water Policy) Regulations 2003 S.I. No. 722/2003 (as amended 2010 S.I. No. 326/2010) 47. European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261/2018) 48. River Basin Management Plan 2018-2021 and Draft River Basin Management Plan 2022-2027 for consultation published September 2021 49. General Scheme of the Water Environment (Abstractions) Bill 2020 50. Bathing Water Directive (2006/7/EC) 51. Bathing Water Quality Regulations 2008 S.I. No. 79/2008 (as amended 2016 S.I. No. 163/2016) 52. Floods Directive (2007/60/EC) 53. European Communities (Assessment and Management of Flood Risks) Regulations 2010 S.I. No. 122/2010 54. Nitrates Directive (91/676/EEC and derogation 2018/209) 55. European Union (Good Agricultural Practice for Protection of Waters) Regulations 2014 S.I. No. 31/2014 (as amended 2020 S.I. No. 529/2020) 56. Urban Wastewater Treatment Directive (91/271/EEC as amended 98/15/EEC) 57. Urban Waste Water Treatment Regulations 2001 S.I. No. 254/2001 (as amended 2010 S.I. No. 48/2010) 58. Marine Strategy Framework Directive (2008/56/EC)

Theme	Policies, Plans and Programmes
	59. European Communities (Marine Strategy Framework) Regulations 2011 S.I. No. 249/2011 (as amended 2018 S.I. No. 648/2018) 60. Groundwater Directive (2006/118/EC) 61. European Communities Environmental Objectives (Groundwater) Regulations 2010 S.I. No. 9/2010 (as amended 2016 S.I. No. 366/2016) 62. Catchment Flood Risk Management (CFRAM) Programme 63. Flood Risk Management Plans 64. Draft Fourth Nitrates Action Programme 65. National Marine Planning Framework 66. Maritime Spatial Planning Directive 2014/89/EU 67. Marine and Coastal Access Act 2009 68. UK Marine Strategy
Biodiversity, flora and fauna	69. International and European Council Conventions 70. EU Biodiversity Strategy for 2030 71. The Habitats Directive (92/43/EEC) 72. The Birds Directive (2009/147/EC) 73. European Communities (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/2011(as amended 2015 S.I. No. 355/2015) 74. Green Infrastructure: Enhancing Europe's Natural Capital Strategy 75. Creating Green Infrastructure for Ireland: Enhancing Natural Capital for Human Wellbeing 76. Wildlife Act 1976 (as amended including 2010) 77. Fisheries Consolidation Act, 1959 78. Other National Biodiversity related regulations 79. National Biodiversity Action Plan 2017-2021 80. All-Ireland Pollinator Plan 2021-2025
Material assets	81. Waste Framework Directive (2008/98/EC) 82. Infrastructure and Capital Investment Plan 2016-2021 83. Waste Management Acts 1996 – 2005 84. Ireland 2040: Our Plan, National Planning Framework 85. National Peatland Strategy 86. Forestry Programme 2014-2020 87. Waste Action Plan for a Circular Economy 88. National Hazardous Waste Management Plan 2014-2020 89. Draft National Hazardous Waste Management Plan 2021 – 2027
Landscape and visual amenity	90. European Landscape Convention 91. National Landscape Strategy for Ireland 2015-2025
Air quality	92. Ambient Air Quality Directive (2008/50/EC)

Theme	Policies, Plans and Programmes
	93. Air Quality Standards Regulations 2011 S.I. No. 180/2011 94. Industrial Emissions Directive (2010/75/EU) 95. European Union (Industrial Emissions) Regulations 2013 S.I. No. 138/2013
Noise	96. Environmental Noise Directive (2002/49/EC) 97. European Communities (Environmental Noise) Regulations 2018 S.I. No. 549/2018
Climate change	98. The Kyoto Protocol 99. Paris Agreement 2015 100. EU Energy and Climate (2020) Package 2009 101. The Climate Action and Low Carbon Development Act 2015 102. Climate Action and Low Carbon Development (Amendment) Bill 2021 103. National Climate Change Adaptation Framework including the Sectoral Adaptation Plans including the Climate Change Adaptation for the Health Sector 2018-2024 104. Ireland's National Policy Position on Climate Action and Low Carbon Development (2014) 105. National Mitigation Plan, 2017 106. Energy White Paper: Delivering a Sustainable Energy Future for Ireland – The Energy Policy Framework 2007-2020 107. National Renewable Energy Action Plan (Directive 2018/2001) 108. European Union (Renewable Energy) Regulations 2020 S.I. No. 365/2020 109. Offshore Renewable Energy Development Plan (2014) and Interim Review (2018) 110. Irish Water Sustainable Energy Strategy 111. National Climate Action Plan 2021 112. European Green Deal
Cultural heritage (archaeological and architectural)	113. EU Conventions on Archaeological, Architectural and Cultural Heritage 114. Planning and Development Acts 115. Heritage Act 2018 116. National Monuments Act 2004 (as amended) 117. Architectural Heritage and Historic Monuments Act 1999
Geology and soils	118. Planning and Development Act 119. Action Plan for Rural Development
Transboundary	120. Planning Act (NI) 2011 121. Regional Development Strategy: Building a Better Future, 2035 122. Northern Ireland's Climate Change Adaptation Programme 2019 - 2024 123. The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009 124. Water Abstraction and Impoundment (Licensing) (Amendment) Regulations (Northern Ireland) 2007 125. The Water Supply (Water Quality) Regulations (Northern Ireland) 2017

Theme	Policies, Plans and Programmes
	126. NI Water (2020) Our Strategy 2021-2046 127. NI Water (2020) Water Resource and Supply Resilience Plan 128. Fisheries Act (NI) 2016 129. NI Draft Flood Risk Management Plan 2021-2027 130. Marine Act (Northern Ireland) 2013 131. UK Marine Policy Statement 132. Draft Marine Plan for Northern Ireland

F.2 Local Level

Theme	Policies, Plans and Programmes
All aspects	1. Wicklow County Development Plan 2021-2027 (emerging) 2. Wicklow County Development Plan 2016-2022 (adopted) 3. Wexford County Development Plan 2021-2027 (emerging) 4. Wexford Development Plan 2013-2019 5. Carlow County Council Development Plan 2015-2021(adopted) 6. Kildare County Development Plan 2017-2023 (adopted) 7. Cavan County Development Plan 2014-2020 (adopted) 8. Cavan County Development Plan 2022-2028 (emerging) 9. Louth County Development Plan Review 2015-2021 (adopted) 10. Louth County Development Plan 2021-2027 (emerging) 11. Fingal Development Plan 2017-2023 (adopted) 12. Westmeath County Development Plan 2014-2020 (adopted) 13. Westmeath County Development Plan 2021-2027 (emerging) 14. Meath County Development Plan 2013-2019 (adopted) 15. Meath County Development Plan 2020-2027 (emerging) 16. Longford County Development Plan 2015-2021 (adopted) 17. Longford County Development Plan 2021-2027 (emerging) 18. Offaly County Development Plan 2014-2020 (adopted) 19. Offaly County Development Plan 2021-2027 (emerging) 20. Galway County Development Plan 2015-2021 (adopted) 21. Galway County Development Plan 2022-2028 (emerging) 22. Roscommon County Development Plan 2014-2022 (as varied) (adopted) 23. Roscommon County Development Plan 2021-2027 (emerging) 24. South Tipperary Development Plan 2009 (as varied) (adopted) 25. North Tipperary County Development Plan 2010 (as varied) (adopted) 26. Laois County Development Plan 2017-2023 (adopted) 27. Review of Laois County Development Plan 2017-2023 (emerging)

Theme	Policies, Plans and Programmes
	28. Kilkenny County Development Plan 2014-2020 (as varied) (adopted) 29. Kilkenny City and County Development Plan 2021-2027 (emerging) 30. Clare County Development Plan 2017-2023 (as varied) (adopted) 31. Clare County Development Plan 2022-2028 (emerging) 32. Cork City Development Plan 2015-2021 (adopted) 33. Cork City Development Plan 2022-2028 (emerging) 34. Dublin City Development Plan 2016-2022 (adopted) 35. Dublin City Development Plan 2022-2028 (emerging) 36. South Dublin County Council Development Plan 2016-2022 (adopted) 37. Dun Laoghaire County Development Plan 2016-2022 (adopted) 38. Dun Laoghaire County Development Plan 2022-2028 39. Limerick City and County Development Plan 2022-2028 (emerging) 40. Joint Spatial Plans, Local Area Plans and Town Development Plans (not listed individually)
Population, economy, tourism and recreation and human health	41. Healthy Ireland for Louth Plan 2018-2022 42. Fingal Tourism Strategy 2015-2018 43. Fingal Tourism Statement 2017-2022 44. Westmeath Tourism Strategy 2016-2020 45. Lough Ree and the Mid-Shannon Spirit Level. Wet and Wild Lands: A Shared Ambition 46. Offaly Tourism Strategy 47. Roscommon Tourism Strategy 2017-2022 48. Healthy Tipperary Strategy 2018-2020 49. Tourism Strategy for County Laois 2006-2010 50. Grow Dublin Tourism Alliance Progress and Action Plan 51. South Dublin Tourism Strategy 52. Dun Loghaire-Rathdown Tourism and Marketing Strategy 2017-2022 53. Strategic Integrated Framework Plan for the Shannon Estuary (SIFP) 54. Limerick 2030 Vision: An Economic and Spatial Plan for Limerick 55. Limerick Tourism Development Strategy 56. Glin Public Realm and Tourism Plan 57. Ireland's Ancient East Path to Growth
Biodiversity, flora and fauna	58. Bray Head Special Amenity Order 59. County Wicklow Heritage Plan 2017-2022 60. Wexford County Council Biodiversity Action Plan 2013-2018 61. Louth Heritage Plan 62. Fingal Heritage Plan 2018-2023 63. Westmeath Biodiversity Action Plan 2014-2020

Theme	Policies, Plans and Programmes
	64. Westmeath Heritage Plan 2018-2023 65. Lough Ree and the Mid-Shannon Spirit Level. Wet and Wild Lands: A Shared Ambition 66. County Meath Heritage Plan 2015-2020 67. County Meath Biodiversity Action Plan 2015-2020 68. County Meath Community Level Biodiversity Action Plans (numerous – not listed individually) 69. Biodiversity Action Strategy for Offaly 70. Offaly Heritage Plan 2017-2021 71. Galway County Heritage and Biodiversity Plan 2017-2022 72. County Roscommon Heritage Plan 2017-2021 73. Tipperary County Development Plan 2022-2028 (emerging) 74. Tipperary County Heritage Plan 2017-2021 75. Laois Heritage Plan 2014-2019 76. Laois Heritage Plan 2020-2025 (emerging) 77. Kilkenny County Council Cultural Strategy. Arts, Heritage and Libraries 78. Clare County Heritage Plan 2017-2023 79. Clare County Biodiversity Plan 2017-2023 80. Cork County Heritage Plan 2005-2010 81. County Cork Biodiversity Action Plan 2009-2014 82. Cork City Heritage Plan 2015-2020 83. Dublin City Heritage Plan 2002-2006 84. Dublin City Council Biodiversity Action Plan 2015-2020 85. Dublin City Council Invasive Species Action Plan 2016-2020 86. South Dublin County Heritage Plan 2010-2015 87. South Dublin Draft Biodiversity Action Plan 2020-2026 (consultation draft) 88. Dalkey Islands Conservation Plan 2010-2024 89. Dun Laoghaire-Rathdown County Council Parklife: A policy for enhancing Biodiversity in Parks and Greenspaces 90. Dun Laoghaire-Rathdown Biodiversity Action Plan 2009-2013 91. Westfield Wetlands Management Plan (emerging) 92. Strategic Integrated Framework Plan for the Shannon Estuary (SIFP) 93. Limerick Heritage Plan 2017-2023 94. Limerick City Council Biodiversity Plan
Material assets	95. Connacht-Ulster Regional Waste Management Plan 2015-2021 96. Eastern-Midlands Waste Management Plan 2015-2021 97. Southern Region Waste Management Plan 2015-2021

Theme	Policies, Plans and Programmes
Landscape and visual amenity	98. Bray Head Special Amenity Order 99. Louth Landscape Character Assessment 100. Lough Ree and the Mid-Shannon Spirit Level. Wet and Wild Lands: A Shared Ambition 101. Tara Skyrne Proposed Landscape Conservation Area 102. Landscape Character Assessment for Tipperary 103. County Clare Landscape Character Assessment 104. Strategic Integrated Framework Plan for the Shannon Estuary (SIFP)
Air quality	105. Dublin Regional Air Quality Management Plan for improvement in levels of Nitrogen Dioxide in ambient air quality
Noise	106. Wexford County Council Draft Noise Action Plan 2019-2023 107. County Cavan Noise Action Plan 108. Noise Action Plan 2018 109. Offaly County Council Noise Action Plan 2018-2023 110. Roscommon County Council Noise Action Plan 2013-2018 111. Kilkenny Noise Action Plan 2019-2023 112. Limerick City and Council Noise Action Plan 2018-2023
Climate change	113. County Wicklow Climate Change Adaptation Strategy 2019-2024 114. Wexford County Council Climate Change Adaptation Strategy 2019-2024 115. Carlow County Council Climate Adaptation Strategy 2019-2024 116. Kildare County Climate Change Adaptation Strategy 2019-2024 117. Cavan County Climate Change Adaptation Strategy 118. Climate Change Adaptation Strategy for Louth 119. Fingal Climate Change Action Plan 2019-2024 120. Westmeath Climate Change Adaptation Strategy 2019-2024 121. Meath County Council Climate Action Strategy 2019-2024 122. Longford Climate Change Adaptation Strategy 123. Offaly Climate Change Adaptation Strategy 2019-2024 124. Galway County Council Climate Adaptation Strategy 2019-2024 125. Roscommon Climate Change Adaptation Strategy 2019-2024 126. Tipperary Renewable Energy Strategy 2016 127. Tipperary County Council Climate Adaptation Strategy 2019-2024 128. Tipperary Sustainable Energy Action Plan 2017-2020 129. Kilkenny County Climate Change Adaptation Strategy 2019-2024 130. Cork County Council Climate Adaptation Strategy 2019-2024 131. Cork City Climate Change Adaptation Strategy 2019-2024 132. Cork City Sustainable Energy and Climate Action Plan

Theme	Policies, Plans and Programmes
	133. South Dublin County Council Climate Change Action Plan 2019-2024 134. Dun Laoghaire-Rathdown Climate Change Action Plan 2019-2024 135. Limerick City and County Council Climate Change Adaptation Strategy 2019-2040
Cultural heritage (archaeological and architectural)	136. Trim Town Walls Conservation Plan 137. Killeigh Historic Landscape Character Assessment 138. Offaly Historic Landscape Characterisation 139. Timahoe Monastic Site Conservation Plan 2018 140. Fort Protector Portlaoise Conservation Plan Phase 1 and Phase 2 141. Limerick City Walls Conservation Management Plan (2008) 142. County Heritage Plans as listed under the Biodiversity, flora and fauna topic area

Note: there are no local levels plans specific to the water or geology and soils topic areas. Plans of this nature tend to be regional or national level.

Appendix G SEA Scoping Consultation Responses

Consultee	Submission comment	Response
General comments		
Environmental Protection Agency	A note that in reference to the relevant aspects of Chapter 7 of the SOER2020, Irish Water needs to consider water quality in the identification of deficiencies and needs in relation to water supply in the eastern and midlands region.	Identification of water quality deficiencies and needs in relation to water supply have been considered and referenced within SEA Report and the draft RWRP and the assessment of deficiencies has informed the identification of solution to address water quality treatment needs as well as quantity.
Environmental Protection Agency	Recommendation that in finalising the Plan and integrating the findings of the SEA into the Plan, the relevant recommendations, key issues and challenges described in SOER2020 should be taken into account by Irish Water, particularly those relating to Climate Action, Life on Land and Life below Water.	Sustainable Development Goals were including in the PPP review and listed in Appendix E.1. Additional reference has been added to section 3 to highlight their influence and specific relevant goals are added to section 4.2 which covers the key environmental trends of relevance to the RWRP-EM as identified from the SOER 2020.
Environmental Protection Agency	It is recommended that SEA aligns with the relevant objectives and policy commitments of the National Planning Framework, the Regional Spatial and Economic Strategy, national commitments on climate change mitigation and adaptation, as well as any relevant sectoral, regional and local adaptation plans. A schematic presenting these links and inter-relationships is recommended.	SEA Report has taken into account the policy commitments in the general approach taken and the SEA objectives and assessment methodology. The NPF and RSES as well as relevant national, regional and sectoral climate adaptation and mitigation plans are included as key influences. A schematic showing these links is now included in SEA Environmental Report and the draft RWRP.
Environmental Protection Agency	A recommendation to consider and reference a list of guidance available on the EPA website to assist in the preparation of the SEA environmental report including guidance on SEA statements and monitoring, climatic factors, alternatives and cumulative effects.	Irish Water developed the methodology for the assessment in accordance with the mentioned EPA guidance which has now been referenced within the SEA Report.
Environmental Protection Agency	A recommendation for implementation of, annual or biannual report publications in between review periods for the Plan as well as aligning Plan implementation monitoring and reporting with the environmental monitoring required under the SEA legislation.	A commitment to undertake annual reviews is included in the recommendation to provide feedback and progress reporting against the environmental monitoring plan and is included as part of the monitoring and feedback process committed to in the draft RWRP-EM
Environmental Protection Agency	A suggestion for amendments of wording in some of the text.	Amendments made (See Table 6.5 SEA Objectives)

Consultee	Submission comment	Response
	We note the draft SEA Environmental Objectives as set out in Table 4.2 of the scoping report. In relation to the objective for water quality, we suggest amending it to refer to "…restore and improve waterbody status for rivers….". In relation to material assets, there is merit in considering amending as follows "Minimise impacts on other material assets and existing, and future, water abstractions." A number of the objectives make reference to "undertaking water services". We suggest amending this to refer to the "provision of water services".	
Environmental Protection Agency	A note that the SEA-related monitoring should address positive, negative and cumulative effects where they are likely to occur and should include provision for on-going review to facilitate an early response to any environmental issues that may arise. The Environmental Report should specify the monitoring frequency and responsibilities and include provisions for reporting on the monitoring. To avoid duplication in data collection, the same indicators should be used for the plan-related and SEA-related monitoring where possible.	Text added to SEA Report to clarify that the monitoring plan covers positive, negative and cumulative impacts. Annual reviews of implementation progress and environmental effects are identified along with responsibilities. These are integrated with the wider plan related monitoring and feedback.
Environmental Protection Agency	A recommendation to align the five-year review cycle for the Plan with reviews of other similar plans such as the River Basin Management Plan, Regional Economic and Spatial Strategies and National Planning Framework. The review cycle should also reflect the timing of the five-year Long-Term Climate Strategies, a requirement of the forthcoming Climate Action and Low Carbon Development (Amendment) Bill. Although some of the plans are referenced throughout the scoping report, timing of the reviews will be crucial to maximise multiple benefits and/or the identification of stressors. Aligning the reviews of the various plans would allow for plan makers to address the issues using a holistic approach.	The plans will be subject to ongoing review within the 5year plan cycle including annual review and the changes to related plans and policies and legislation or emerging issues will be part of this ongoing review and to allow early responses to influence plan making along with engagement in the respective consultation processes.
Environmental Protection Agency	A suggestion that further detail should be provided in the Environmental Report on the relevant environmental assessments to be carried out at the	Added additional sentence in section 10.1 Mitigation Measures 'Standard and specific mitigation measures identified include recommendations for further environmental

Consultee	Submission comment	Response
	project stage and relevant mitigation measures to be applied, as appropriate. There may be merit in exploring this issue further with the relevant Environmental Authorities during the Plan preparation and SEA processes.	assessment work to be undertaken at project stage to inform further inform mitigation development ' SEA recommendations include seeking catchment management schemes and aiming to build in and environmental enhancement opportunities into the project stage such as nature based solutions carbon reduction, zero carbon emissions targets, biodiversity enhancement and river restoration.
Geological Survey Ireland	Survey Ireland considers the impact of Irish Water's current surface water and groundwater abstractions and discharges on the water environment to be of fundamental importance to Strategic Environment Assessment and Appropriate Assessment. To understand the impact of Irish Water's current abstractions and discharges on the water environment, and therefore to be able to assess sustainability and resilience of future options, a catchment-scale cumulative assessment of all abstractions and discharges is required. Irish Water's approach is based at the Water Resource Zone scale and does not include the necessary catchment scale approach. Geological Survey Ireland notes that the four regional group areas and the smaller RWRP-EM study areas do not reflect natural water catchment boundaries. It is understood these boundaries are based on Water Resource Zone boundaries and Water Framework Directive catchment boundaries. However, it should be noted that any water balance or catchment based assessment of the impact of Irish Water's current or future abstractions and discharges on the water environment should be carried out on the entire natural water catchment, even where the catchment extends outside of the regional group areas or the study area.	Additional explanation added to of the draft RWRP-EM on how the Regional and Study Areas have been identified including consideration of WFD catchments
Geological Survey Ireland	A suggestion that groundwater flooding should be considered as well as surface water flooding in the Flood Risk topic. McCormack et al (2020) summarising the GSI's GWFlood project and groundwater flood mapping should be considered and referenced.	Irish Water considered both groundwater and surface water flooding and understands that there are ongoing efforts to better understand the role of karst groundwater systems in flooding within the Flood Risk topic. A new figure presenting areas with high and medium probability of pluvial, fluvial, coastal and groundwater flooding as well as the

Consultee	Submission comment	Response
		suggested reference has been added to the SEA Report.
Geological Survey Ireland	Geological Survey Ireland considers the impact of Irish Water's current surface water and groundwater abstractions and discharges on the water environment to be of fundamental importance to Strategic Environment Assessment and Appropriate Assessment. To understand the impact of Irish Water's current abstractions and discharges on the water environment, and therefore to be able to assess sustainability and resilience of future options, a catchment-scale cumulative assessment of all abstractions and discharges is required. Even if these assessments are considered via adherence to the Water Framework Directive (WFD) and the upcoming Abstractions Bill, Geological Survey Ireland suggest the assessments should be explicitly outlined and explained in the RWRP-EM. The potential impact of abstractions and discharges on the water environment is one of many factors which affect WFD status and risk categories. Therefore, it would be beneficial to explicitly outline and explain the assessments Irish Water are carrying out to understand the impact of their current and potential future abstractions and discharges on the water environment.	The assessments undertaken at this high level and their limitations are outlined in the SEA Environmental Report and appendices and the draft RWRP. This includes recognition that further investigation and assessment need to be undertaken both for individual option abstraction sustainability and wider catchment and cumulative effects
Geological Survey Ireland	Geological Survey Ireland suggest the "sustainability guidelines" which were used, in addition to WFD targets, to assess which surface water abstractions may be at potential risk should be described fully. It would also be useful to clarify what is meant by "being at potential risk" for the surface water abstraction identified.	Sustainability assessments undertaken for existing and new options are described in the SEA Environment Report with more detail in the Study Area Environmental Reviews including reference to the UKtag and the ground water assessments based on theoretical zones of contribution.
Environmental Protection Agency Geological Survey Ireland	Consultees noted the need to fully identify any significant data and knowledge gaps and include commitments to help address these on a priority basis during the implementation phase of the Plan. Furthermore, Geological Survey Ireland suggests there are sufficient data to provide Irish Water with a good understanding of Irish Water's abstractions and discharges on the	The SEA and draft RWRP identify priorities for improving monitoring and gathering better data. Limitations or data gaps and assumptions are identified. In terms of the adequacy of existing information the issue here is that it is not currently stored centrally, as it was historically collected and collated by Local Authorities. Irish Water is building a telemetry system

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	water environment, (and thus the implications for Irish water of the upcoming abstraction legislation) already.	which will aid bringing all this data together but this will take time.
Geological Survey Ireland	A note that the RWRP does not include an adequate attempt to understand the impact of upcoming abstraction legislation on groundwater resources. It is understood that the abstraction legislation is yet to be finalised and Irish Water does not hold all of the relevant information to assess the potential impacts of the upcoming legislation. However, at the moment the RWRP only considers potential conflicts with sustainability guidelines and WFD targets for surface water abstractions. The upcoming abstraction legislation will apply to groundwater supplies as well as surface water supplies and as such the RWRP should consider the impact this legislation may have on groundwater supplies.	Further information has been added on ground water abstraction section 5 of SEA Environmental report. The implications of the abstraction legislation are considered throughout the plan development and assessment process from the identification of options to sensitivity analysis on effects of uncertainty over the abstraction legislation implications and cumulative assessment of groundwater abstractions.
Geological Survey Ireland	A note that the potential impact of Irish Water's current and future abstractions and discharges on the water environment of fundamental importance to Strategic Environment Assessment and Appropriate Assessment. This aspect seems to be covered under the WFD water quality and resources objective in Table 4.2. However, the impact of Irish Water's current and future abstractions and discharges on the water environment is only one of many factors which affect WFD status and risk categories. Given the significance of these potential impacts on the water environment, Geological Survey Ireland suggest they should be considered explicitly and separately and that WFD quantitative and qualitative assessments should be considered individually.	Both water quality and resources are considered specifically sustainability of abstraction for surface water and for groundwater based and potential impacts on WFD status and on sources at risk. Context for the many other influences on water quality and resources is set out in the baseline in the SEA Environment Report and in the draft RWRP.
Geological Survey Ireland	In addition to Flood Risk under the Water Environment SEA topic GSI suggest Drought Risk should also be included. An SEA option / approach assessment question might include "Is there potential for this option/approach to increase the drought risk, for example decrease base flow?". GSI notes that compared to the equivalent	The baseline identifies drought risk and additional target and indicators have been included in the monitoring plan

Consultee	Submission comment	Response
	table in the NWRP, Table 4.3 has fewer references to droughts and suggests the objectives and indicators relating to drought should be included in the RWRP. For example, “Reduced frequency of drought orders requiring change to normal abstractions/compensation releases” in the Climate change adaptation objective or “Frequency and duration of drought orders” in the Protect and reduce risk to human health in undertaking water services objective.	
Department of Agriculture, Food and the Marine	A concern by the possible impacts the outflows of desalination plants may have on fisheries and coastal nursing/spawning species. The hypersalinated outflows would need to be treated appropriately to avoid any adverse impact on fish stocks. In the event that there were large losses of fish and fish eggs, this would be a major cause for concern.	These concerns have been taken into account in the assessment of desalination options.
Legislation, Plans and Policies		
Environmental Protection Agency	A recommendation to review and update the list of legislation in the scoping report and add the transposing Irish legislations.	The list of legislation, Plans, Policies and Programmes for the PPP review within the SEA Report has been updated and the transposing Irish legislation has been added.
Environmental Protection Agency	The following additional legislation should be considered also: • Climate Action and Low Carbon (Amendment) Bill 2021 • The interim actions for the Climate Action Plan 2019, as well as the forthcoming Climate Action Plan 2021.	The legislation and action plans have been added to the SEA Report in the PPP review and are included as key influences for the SEA and draft RWRP
Environmental Protection Agency	An observation that the Section on the Water Framework Directive does not consider water quality and focuses more on provision of water. This appears to be an oversight, as having better quality raw water means less costs and processes in water treatment and also results in greater treatment efficiency i.e. reduced volumes being abstracted. The environmental report should include water quality in the baseline data analysis.	The baseline analysis in the SEA Environment Report includes consideration of water quality including specific reference to pressures identified in SOER 2020. The benefits of improved raw water are recognized and potential to do more on catchment management initiatives and nature based solutions is specifically raised as a recommendation to take forward.
Environmental Protection Agency	A recommendation that the environmental report should consider the status quo / baseline with regard to existing water service provision i.e. what the asset base is, including water	The SEA Report considers baseline with regards to existing water provision. The SEA Report has now been updated with a reference to the existing water service provision including level of service and treatment deficiencies and RAL list with more

Consultee	Submission comment	Response
	mains, and level of treatment, in addition to the concerns of the RAL.	detail provided in the Study Area Environmental Review appendices.
Environmental Protection Agency	A recommendation that the environmental report should include the benefits from an indication of domestic versus non-domestic volumes supplied, any inter region transfers (included out of this study area) and interactions with the group water scheme sector (as there are some that are operated as group water schemes on behalf of Irish Water and vice versa). While it may not be possible to convey detail on these in the SEA, they warrant discussion nonetheless as they will be factors in the overall regional plan review.	The Group water scheme (GWS) sector covers the private group water schemes Irish Water considers options for connecting to GWSs and taking over GWSs and also where there are have deficits in WSZs that are fed from GWS owned sources and WTPs. This information is fed into the supply demand balance and option development.
Environmental Protection Agency	A recommendation to use the EPA OSI national land cover map, currently being developed by the EPA and partners, as addition to using Corine Land Dataset for further detailed habitats and land use information.	The EPA OSI national land cover map is not currently available, however it has been highlighted in the SEA Environmental Report review for use in future updating habitats and land use information once available.
Environmental Protection Agency	A recommendation that climate change risks identified by counties in the core baseline area should also include reference to water quality as a key risk area as climate change impacts from flooding and storm surges not only impact on land and water supply but also on the actual quality of the water itself, e.g. suspended solids, movement of contaminants, etc.	Whilst not specifically identified in county level plans, climate change induced risk of water contamination through changes such as increased sediment loads and release of nutrients from catchment soils and effects of flooding on water quality would be a consideration for the future and relevant particularly for catchment management approaches and wider land use management.
Drinking water quality		
Environmental Protection Agency Geological Survey Ireland	A recommendation to consider the changes incorporated in the recast Drinking Water Directive. Furthermore, greater emphasis could be placed on the Drinking Water Directive in relation to the environmental report and it should be considered as a key influence in addition to those plans and programmes already listed.	Irish Water considered changes included in the recast Drinking Water Directive and SEA Report now includes updated references. Drinking Water Directive is added to key national level influences listed in chapter 4.
Environmental Protection Agency	A recommendation that the baseline should include greater discussion of issues surrounding contaminants of existing and emerging concern which pose a threat to drinking water and to public health. For example, pesticides (of which there have been a number of exceedances in drinking water supplies in recent years), trihalomethane (THM) contamination, pharmaceuticals (including but not limited to	Section 5.4.1 in the baseline includes consideration of the current and emerging concerns for water quality The source risk assessments currently in development align with the DWD Recast and will offer a leading/ potential indicator of risk of contamination rather than 'lagging'/ at the customers tap. This will be approached using the source-pathway-receptor concept and considering sources of contaminants in the

Consultee	Submission comment	Response
	antimicrobials (relevance to Ireland's National Action Plan on Antimicrobial Resistance (iNAP) as well as the forthcoming successor iNAP2)), microplastics, pathogenic and antimicrobial resistant bacteria and parasites (STEC/VTEC, Cryptosporidium, Giardia, etc.). The environmental report should give greater recognition of these challenges, how they may impact supplies and how they may be managed into the future taking account of projected population growth, urbanisation, agricultural activity and climate change.	catchment. These risk assessments will span existing contaminants in the short term, e.g. pesticides, Cryptosporidium, E. coli and natural organic matter, with a view to expanding of contaminants of emerging concern (microplastics, pathogenic and antimicrobial resistant bacteria, 'forever chemicals'.
Geological Survey Ireland	A suggestion that following documents on drinking water safety and drinking water source protection should be considered: • World Health Organisation's Guidelines for Drinking Water Quality (2004) • Water Safety Plan Manual (2009) • EPA's Drinking Water Advice Note No 84 • Department of the Environment and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999	Irish Water will be taking forward guidance provided in these documents as options are taken forward and developed as projects. The PPP review has been updated to include the documents listed.
Water demand and growth		
Environmental Protection Agency	A suggestion that high-level environmental trends in the Eastern and Midlands Region should place a greater focus on growth and increased water demand as a result of that growth.	Irish Water recognises the additional pressures on the environment as a result of population and economic growth in regard to water demand and wider environment and potential for reducing abstraction pressure from at risk sources is considered as part of the process.
Consultation and engagement		
Geological Survey Ireland	Geological Survey Ireland offers a continuous hydrogeological support in terms of data, expertise and advice to Irish Water. As such, Geological Survey Ireland welcomes the inclusion in the SEA scoping document of Irish Water's plan to "work with the EPA and the Geological Survey of Ireland, to develop desktop and site investigation systems to better understand the sustainability of their groundwater sources". In light of this, GSI suggests	In recognition of the importance of multi-stakeholder engagement and collaboration in managing shared natural resources, Irish Water have formed a group of EPA, GSI, NFGWS, DHLG and Independent experts to provide steering on the strategy, objectives and high-level activities needed to ensure the concepts of the three pillars are consolidated.

Consultee	Submission comment	Response
	specific bilateral discussions between GSI and Irish Water.	
Environmental Protection Agency	A suggestion that Irish Water give hosts an SEA scoping workshop with key stakeholders likely to be impacted by the Plan and the statutory SEA environmental authorities as part of the SEA scoping process.	Stakeholder workshops were held on the SEA scoping report for the Framework plan and on the development of the options appraisal methodology. The draft RWRP and SEA Environmental report apply the methodology and a full programme of engagement with key stakeholders on the draft proposals will be part of the public consultation.
Geological Survey Ireland	Geological Survey Ireland welcomes the inclusion in the SEA scoping document of Irish Water's plan to "work with the EPA and the Geological Survey of Ireland, to develop desktop and site investigation systems to better understand the sustainability of their groundwater sources". The outputs of GSI's GW3D project will be directly relevant to this aspect of Irish Water's assessments."	Confirmed picked up in SEA. Added 'Over the coming years, Irish Water will work with the environmental regulator, the EPA and the Geological Survey of Ireland (GSI), to develop desktop and site investigation systems to better understand the sustainability of their groundwater sources (informed by data gathered as part of GSI's ongoing GW3D project) to section 5.4.2.
Environmental Protection Agency	EPA states that given the significance of the series of regional plans as key water services plans, the establishment of a signal environmental working group would provide oversight of the environmental monitoring and reporting for all of the regional plans A suggestion to consider the implementation stages of plans such as the Offshore Renewable Energy Development Plan (OREDP) and Food Wise 2025. Such a working group should be inherently linked to any such working groups associated with the National Water Resources Plan and the groups should work together in delivering the environmental monitoring required under the water resource plans.	In recognition of the importance of multi-stakeholder engagement and collaboration in managing shared natural resources, Irish Water have formed a group of EPA, GSI, NFGWS, DHLG and Independent experts to provide steering on the strategy, objectives and high-level activities needed to ensure the concepts of the three pillars are consolidated
Environmental Protection Agency	Under the SEA Regulations, Irish Water should consult with: • Environmental Protection Agency; • Minister for Housing, Local Government and Heritage; • Minister for Environment, Climate and Communications; • Minister for Agriculture, Food and the Marine; and, • Minister for Tourism, Culture, Arts, Gaeltacht, Sport and Media.	Irish Water consulted with all of these Bodies for scoping and all are included in the consultation document and will be part of the engagement process for the draft RWRP and SEA.