Deskstudy

Lower Suck

Priority Area for Action

(AFA0169)

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Western Team

River Suck at Ballyforan

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Disclaimer

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1 Introduction

1.1 Background to the Priority Area for Action

The Lower Suck Priority Area for Action (PAA) spans across counties Roscommon and Galway. It extends from Fuerty, Athleague and Ballgar in the North to Castleblakeney, Ballymacward and Ahascragh in the West, Aughrim, Laurencetown and Ballinasloe in the South to Dysart and Taughmaconnell to the East and is an area of approximately 539 km^2 (**Figure 1**). The PAA is bordered to the north by the Castlegar PAA, Raford PAA to the west and to the south by the Ballinure PAA. The PAA forms part of the wider 26D_Upper Shannon Catchment and is within the boundary of the sub catchments listed in **Table 1**.

The PAA selected for focused work during the 2nd cycle river basin management plan includes 9 water bodies: Ballyglass_010, Ahascragh_030, Killegan Trib North_010, Killeglan_010, Derrymullan Stream_020, Suck_140, Culliaghbeg_010, Suck_150 and Suck_160. It has been proposed by Roscommon and Galway County Councils and LAWPRO to add the following 9 water bodies to the PAA in the 3rd cycle implementation of the River Basin Management Plan, therefore for completeness, the following water bodies are also included within this deskstudy, although fieldwork will not be undertaken until the 3rd cycle when the River Basin Management Plan covering 2022 to 2027 has been approved: Suck_120, Killaderry Stream_010, Lughanagh_010, Suck_130, Ahascragh_010, Ahascragh_020, Ahascragh_040, Derrymullan Stream_010 and Cuilleen Stream_010. The addition of these water bodies allows for better characterisation of the water bodies at sub catchment scale.

The Suck_120 in the North East is up around Ballygar and it flows south to Ballyforan where it becomes the Suck_130 and then the Suck_140 which flows through Ballinasloe, it then becomes the Suck_150 south of Ballinasloe before it is the Suck_160 where is exits the PAA south of Shannonbridge. Numerous rivers join the main channel as it flows south – Ballyglass_010, Killaderry Stream_010, Lughanagh_010, Killegan Trib North_010, Killeglan_010, Cuilleen Stream_010 and Culliaghbeg_010.

To the West of the PAA the Ahascragh_010 flows into the Ahascragh_020 which in turn flows into the Ahascragh_030 which then becomes the Ahascragh_040. The Ahascragh_040 flows into the Suck_140 north east of Ballinasloe. Derrymullan Stream_010 meets the Derrymullan_020 and joins the Suck_140 at Deerpark, Ballinasloe.

The WFD risk of these waterbodies is listed in **Table 1** and in **Figure 2**.

Table 1 Sub catchments within the Lower Suck PAA

Sub Catchment	Waterbodies included	Risk Status
26D_1 Suck_SC_070	Killaderry Stream_010	*Review*
	Lughanagh_010	*Review*
26D_2 Suck_SC_080	Ahascragh_010	*Not at Risk*
	Ahascragh_020	*Not at Risk*
	Ahascragh_030	*At Risk*
	Ahascragh_040	*Not at Risk*
	Derrymullan Stream_010	*At Risk*
	Derrymullan Stream_020	*At Risk*
26D_3 Suck_SC_100 26D_5 Suck_SC_090	Suck_150	*At Risk*
	Suck_160	*Review*
26D_5 Suck_SC_090	Ballyglass_010	*Review*
	Killegan Trib North_010	*Review*
	Killeglan_010	*At Risk*
	Cuilleen Stream_010	*At Risk*
	Culliaghbeg_010	*Review*
26D_1 Suck_SC_070 26D_5 Suck_SC_090	Suck_130	*Not at Risk*
26D_10 Suck_SC_050 26D_6_Suck_SC_060	Suck_120	*At Risk*
26D_2 Suck_SC_080 26D_5 Suck_SC_090	Suck_140	*At Risk*

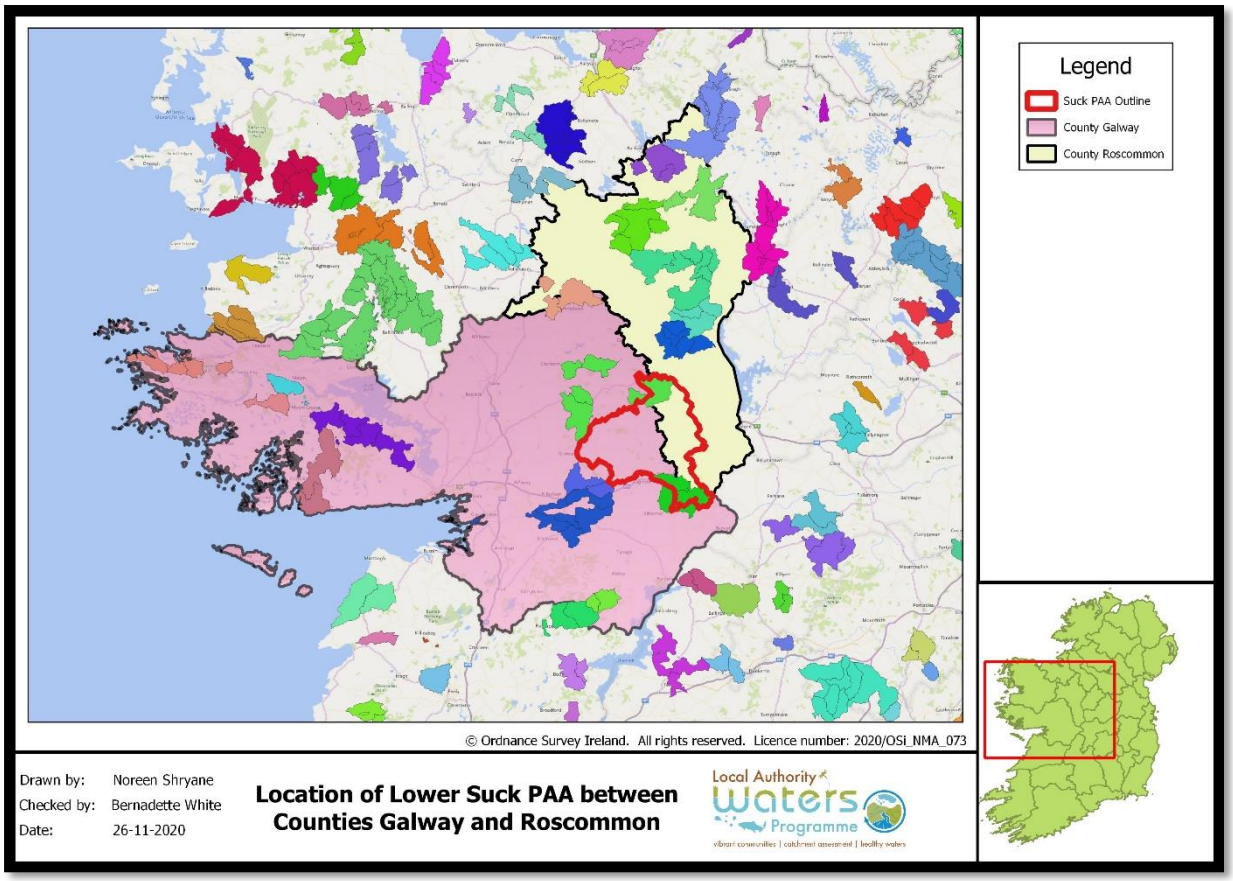

Figure 1 Lower Suck PAA Location

A catchment assessment workshop was held in Castlebar on 26th to 28th April 2017. It was attended by representatives of local authorities (Mayo, Galway, Roscommon, Leitrim, Sligo), LAWCO, Irish Water, IFI, Forest Service, Coillte, NPWS, Teagasc, GSI, DAFM, Marine Institute and EPA. Based on the draft River Basin Management Plan priorities, a set of agreed principles and the local priorities of the workshop attendees, 34 areas were recommended for action in the Western Region, of which the Lower Suck PAA was one. The Lower Suck PAA was selected, for the following reasons:

- MCPA issue at the drinking water abstraction on Suck_140.
- Two deteriorated water bodies.

1.2 PAA Summary

Table 2 summaries the risk classification, environmental objectives, ecological status, significant pressures (and sub-category) for each water body within the PAA. **Figure 2** and **Figure 3** illustrate the ecological status classification and risk classification for the Lower Suck PAA waterbodies. Seven significant pressure types have been identified in the PAA: Hydromorphology, extractive industry, agriculture, forestry, urban waste water, domestic waste water and anthropogenic.

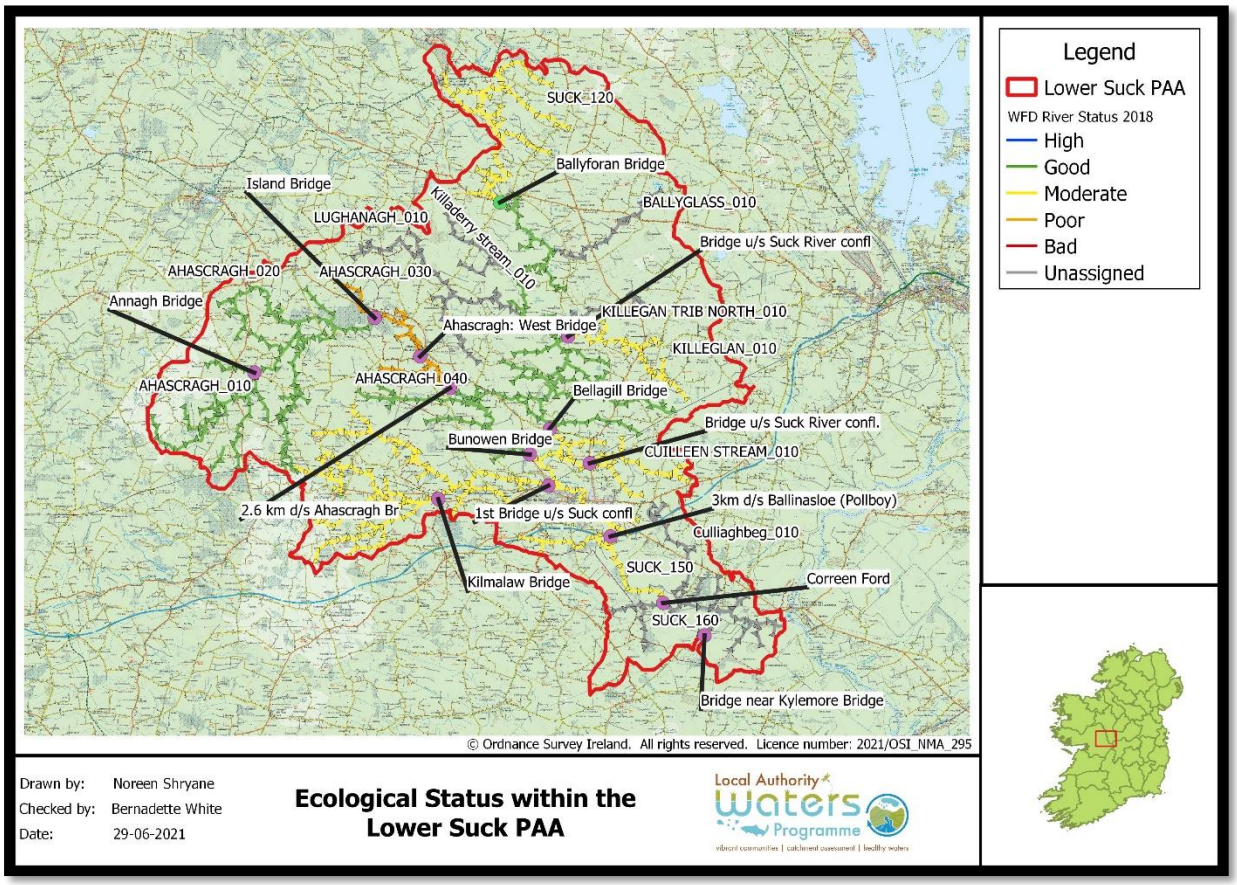

Figure 2 Lower Suck PAA Ecological Status

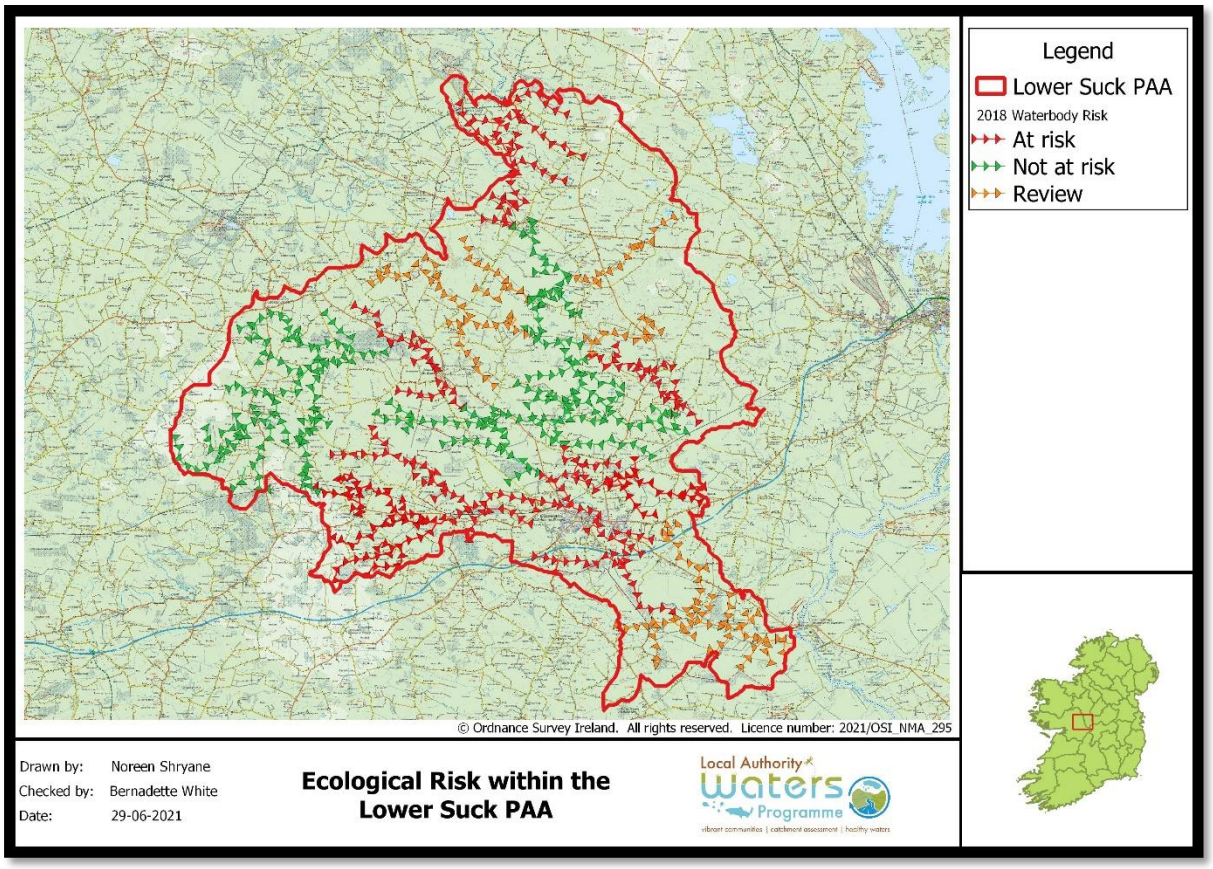

Figure 3 Lower Suck PAA Risk Map

1.3 Information Sources Consulted

Several information sources were consulted during the preparation of the desk study for the Lower Suck PAA including:

- WFD web application – EPA characterisation data.
- EPA Storyboards-3rd cycle.
- Google earth for time lapse aerial imagery.
- www.gsi.ie – groundwater body reports.
- Pers. Comms from Roscommon County Council.
- Pers. Comms from Galway County Council.
- Ahascragh Certificate of Authorisation application and enforcement documents.
- Ballygar Urban Waste Water Licence documentation.
- Ballinasloe Urban Waste Water Licence documentation.

Table 2 Summary of Risk and Ecological Status for the Waterbodies within the Lower Suck PAA

					Ecological Status									
WB Name	**WB Code**	**Water Body Type**	**3rd cycle risk**	**High Status obj.**	**2007-2009**	**2010-2012**	**2010-2015**	**2013-2018**	**2020 Q values**	**Pressure Category**	**Pressure Subcategory**	**Significant Pressure**	**Investigative Assessment**	**Date to meet Env. Objective**
Suck_120	IE_SH_26S071100	River	*At Risk*	No	M[1]	M	M	M	Q4	Hydromorphology	Channelisation	Yes	IA1 to IFI	2027
										Urban Waste Water	Agglomeration PE of 500 to 1,000	No		
Suck_130[2]	IE_SH_26S071200	River	*Not at Risk*	No	G	G	G	G	Q4	No Data Available	No Data Available	No Data Available	N/A	N/A
Killaderry Stream_010	IE_SH_26K050940	River	*Review*	No	U	U	U	U	N/A	Extractive Industry	Peat	Yes	IA3 to Galway County Council[3]	2027
Ballyglass_010	IE_SH_26B150840	River	*Review*	No	U	U	U	U	N/A	No Data Available	No Data Available	No Data Available	IA3 to LAWPRO	2027
Lughanagh_010	IE_SH_26L530780	River	*Review*	No	U	U	U	U	N/A	Agriculture	Pasture	Yes	IA3 to Galway County Council[4]	2027
										Forestry	Forestry	Yes		
										Extractive Industry	Peat	Yes		
Killegan Trib North_010	IE_SH_26K080460	River	*Review*	No	U	U	U	U	N/A	Extractive Industry	Peat	Yes	No Data Available	2027
										Agriculture	Pasture	Yes		
Killeglan_010	IE_SH_26K040200	River	*At Risk*	No	G	G	P	M	Q4	Extractive Industry	Peat	Yes	IA3 to LAWPRO	2027
										Agriculture	Pasture	Yes		
Ahascragh_010	IE_SH_26A010050	River	*Not at Risk*	No	G	G	G	G	Q4	No Data Available	No Data Available	No Data Available	N/A	N/A
Ahascragh_020	IE_SH_26A010200	River	*Not at Risk*	No	G	G	G	G	Q4	No Data Available	No Data Available	No Data Available	N/A	N/A

[1] M=Moderate, G=Good, U=Unassigned P=Poor
[2] Those waterbodies shaded in grey are not within the Suck PAA for the 2nd Cycle but they will be included in the 3rd cycle
[3] This waterbody is now assigned to LAWPRO
[4] This waterbody is now assigned to LAWPRO

					Ecological Status									
WB Name	**WB Code**	**Water Body Type**	**3rd cycle risk**	**High Status obj.**	**2007-2009**	**2010-2012**	**2010-2015**	**2013-2018**	**2020 Q values**	**Pressure Category**	**Pressure Subcategory**	**Significant Pressure**	**Investigative Assessment**	**Date to meet Env. Objective**
Ahascragh_030	IE_SH_26A010400	River	*At Risk*	No	P	P	M	P	Q3	Agriculture	Pasture	Yes	IA7 to LAWPRO IA1 to EPA	2027
										Urban Waste Water	Agglomeration PE<500	Yes		
										Domestic Waste Water	Single House Discharges	Yes		
										Hydromorphology	Channelisation	Yes		
Ahascragh_040	IE_SH_26A010500	River	*Not at Risk*	No	G	G	G	G	Q4	No Data Available	No Data Available	No Data Available	N/A	2027
Derrymullan Stream_010	IE_SH_26D070400	River	*At Risk*	No	G	G	G	M	Q4	Agriculture	Pasture	Yes	NA	2027
Derrymullan Stream_020	IE_SH_26D070700	River	*At Risk*	No	G	H	M	M	Q3-4	Anthropogenic	Unknown	Yes	N/A	2027
Suck_140	IE_SH_26S071400	River	*At Risk*	No	M	M	M	M	Q3-4	Industry	IPC	No	IA7 to LAWPRO IA1 to EPA	2027
										Hydromorphology	Channelisation	Yes		
Cuilleen Stream_010	IE_SH_26C170400	River	*At Risk*	No	M	G	G	M	Q3	Agriculture	Pasture	Yes	LAWPRO To determine[5]	2027
										Agriculture	Farmyards	Yes		
										Domestic Waste Water	Single House Discharges	Yes		
Suck_150	IE_SH_26S071500	River	*At Risk*	No	P	M	M	M	Q3-4	Extractive Industry	Peat	Yes	IA1 to LAWPRO	2027
										Hydromorphology	Channelisation	Yes		
										Industry	IPC	No		
Suck_160	IE_SH_26S071550	River	*Review*	No	U	U	U	U	N/A	Hydromorphology	Channelisation	Yes	IA3 to LAWPRO IA1 to EPA	2027
										Extractive Industry	Peat	Yes		

[5] For newly *At Risk* waterbodies the IA will be decided by LAWPRO and will be confirmed in Section 5 of this deskstudy.

					Ecological Status									
WB Name	**WB Code**	**Water Body Type**	**3rd cycle risk**	**High Status obj.**	**2007-2009**	**2010-2012**	**2010-2015**	**2013-2018**	**2020 Q values**	**Pressure Category**	**Pressure Subcategory**	**Significant Pressure**	**Investigative Assessment**	**Date to meet Env. Objective**
Culliaghbeg_010	IE_SH_26C090740	River	*Review*	No	U	U	U	U	N/A	Extractive Industry	Peat	Yes	IA3 to LAWPRO	2027

2 Receptor information and assessment

2.1 Context and Setting

The PAA extends from Fuerty, Athleague and Ballgar in the North to Castleblakeney, Ballymacward and Ahascragh in the West, Aughrim, Laurencetown and Ballinasloe in the South to Dysart and Taughmaconnell to the East. Land cover is primarily pasture with peat bogs scattered throughout the PAA, there are some pockets of coniferous and broadleaf forest throughout the PAA with inland marshes predominantly in the north east of the catchment. The urban areas are Ballgar in the north, and Ballinasloe in the South of the PAA with some smaller villages scattered throughout: Castleblakeney, Dysart, Ahascragh and Taughmaconnell.

There are numerous extractive sites within the Lower Suck PAA. These include industrial peat harvesting and quarries of which there are seven located around the Ballinasloe area. There are two Landfills within the PAA boundary (one south of Ballinasloe town(Pollboy Landfill) and the other 8km to the east of the town (Kilconnell Landfill)) and one landfill immediately outside of the boundary to the south west of the PAA (East Galway Residual Landfill).

There are ten abstractions in the 26D_2 subcatchment: Cloonatleva and CBC are groundwater abstractions in Ahascragh_020; Lowville and Ahascragh are groundwater abstractions in Ahascragh_030; Kilconnel water supply has two groundwater abstractions in Derrymullan Stream_010; Ballinabanaba, Claude/Cahermorris are two groundwater supplies in Derrymullan Stream_020; Ballinasloe is a surface water abstraction on Suck_140. A Groundwater Source Protection Zone is defined for Kilconnel water supply. The designated drinking water groundwater body underlying the north of the sub-catchment is the Suck South and Aughrim to the South of the sub-catchment.

There are numerous designations within the Lower Suck PAA; see **Figure 4** and **Figure 5** below.

NHAs: The main channel of the River Suck is part of the Suck River Callows NHA(site code 000222), Ballygar Bog (Site code 000229)to the north of the PAA, Castle French East Bog (001244) and Castle French West Bog NHAs(site code 000280, Annaghbeg Bog (site code002344) , Crit Island West (site code 000254) and Killure Bog (site code 001283).**pNHAs:** Ballinasloe Esker (Site Code 001779) , Callow Lough (Site Code 001239), Cloonascragh Fen and Black wood (Site Code 001247), Castlesampson Esker (Site Code001625), Feacle Turlough (Site Code 001634), Lough Croan Turlough(Site code 000610), Four Roads Turlough (Site Code 001637).**SACs:** Four roads Turlough SAC (Site code 001637), Lough Croan Turlough (Site code 000610), Killeglan Grassland (Site code 002214) and Castlesampson Esker (Site code 001625).**SPAs:** The main channel of the River Suck is part of the Suck River Callows SPA (Site code 0040970, Four roads Turlough (Site code 004140), and Lough Croan Turlough (Site code 004139). There are two European (Natura 2000) Sites: Glenloughaun Esker SAC; River Suck Callows SPA.

The Hymany Way extends from Portumna to Ballygar in length. It crosses the Ahascragh_030, Ahascragh_040, Derrymullan Stream_010 and Derrymullan Stream_020 sub basins. The Suck Valley way is an inland long-distance walking trail which follows the River Suck which drains from Lough O'Flynn, 7km west of the town of Castlerea in County Roscommon and flows through sweeping meanders and past many little islands to reach the River Shannon a kilometre below Shannonbridge. The trail is 105km in length and passes through the counties of Galway & Roscommon.

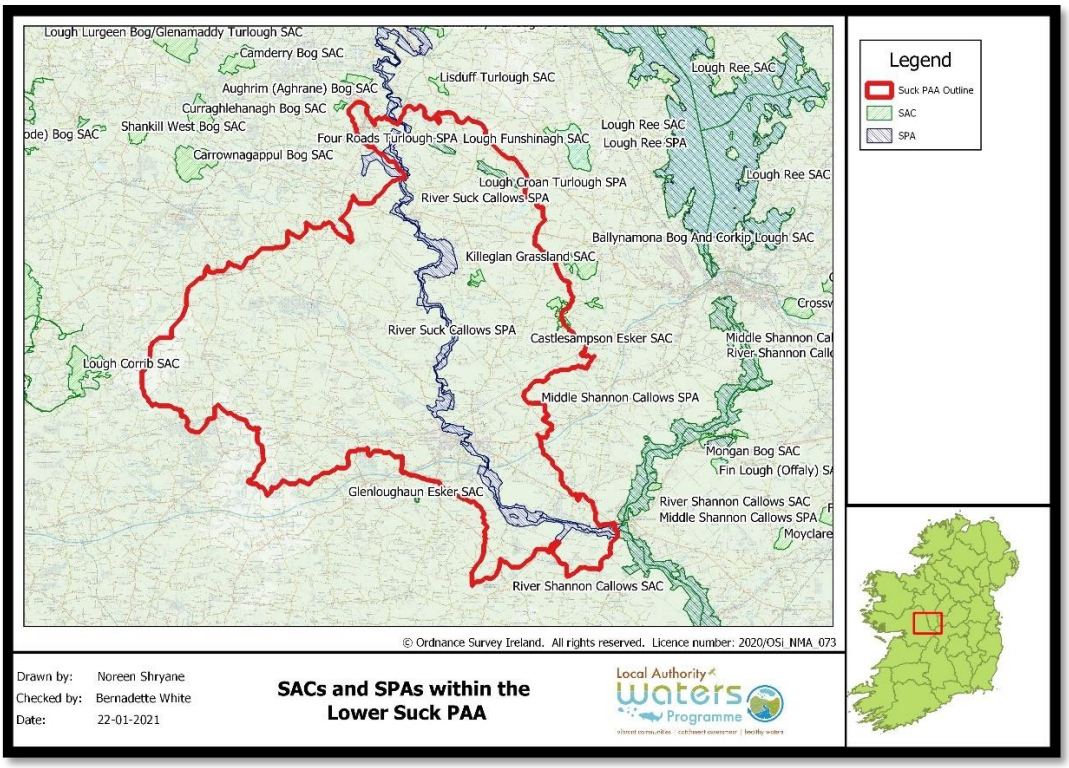

Figure 4 SACs and SPAs within Lower Suck PAA

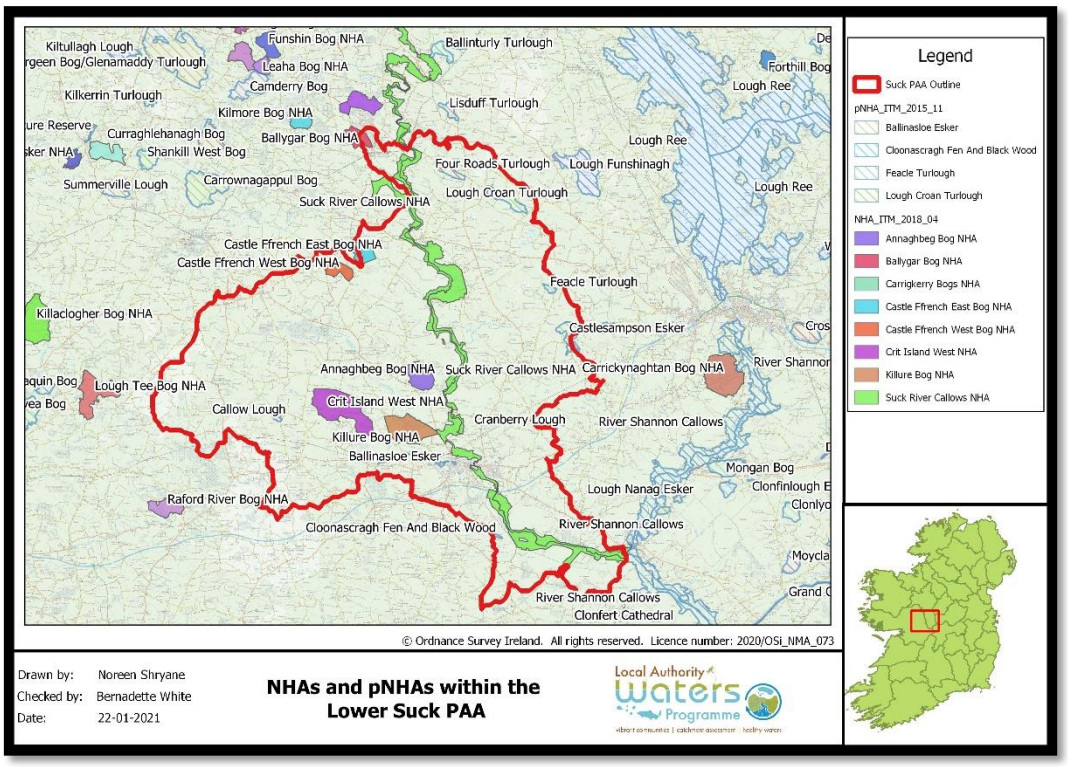

Figure 5 NHAs and pNHAs within Lower Suck PAA

2.2 Receptor Information Tables

The **Suck_120** waterbody has a good status objective but has been at moderate status since 2009. Fish are driving the ecological status of this waterbody. There were exceedances in the annual average for ammonia and orthophosphate at the two EPA monitoring stations in Ballygar (**Ballygar Stream- in Ballygar** and **d/s Ambient TPEFF1200D0371SW001)** since 2015. The potential significant issues in this waterbody are phosphate, ammonia, sediment, altered habitat due to the morphological changes and altered habitat due to hydrological changes due to the soils and hydrogeology of the subbasin and the presence of the District Drainage Scheme.

Table 3 Outline of parameters influencing water quality in the Suck_120

Waterbody		***Suck_120***		
Risk Category		***At Risk***		
Environmental Objective		***Good***		
Included in the PAA		**Yes**		
Monitoring station		**Ballygar Stream- in Ballygar**	**d/s ambient TPEFF1200D0371SW001**	**Ballyforan Bridge**
Monitoring station type		*Pre-WFD*	*Investigative*	*Surveillance and Operational*
Biological Status		No Data	No Data	
Q values	*2009*			
	2010			
	2011			4
	2012			
	2013			
	2014			4-5
	2015			
	2016			
	2017			4
	2018			
	2020			4
Water chemistry				
Monitoring station		**Ballygar Stream- in Ballygar**	**d/s ambient TPEFF1200D0371SW001**	**Ballyforan Bridge**
PO_4+	*2010*	-	-	0.019
	2011	-	-	0.018
Ecological Threshold ≤0.025 (high status) ≤0.035 (good status) as an annual mean	*2012*	-	-	0.016
	2013	-	-	0.014
	2014	-	-	0.010
	2015	0.035	0.240	0.014
mg P/L	*2016*	0.020	0.195	0.013
	2017	-	-	0.012
	2018	0.030	0.295	0.011
	2019	0.018	0.163	0.015
Baseline PO4		**0.103**	**0.893**	**0.014**
NH_4+	*2010*	-	-	0.021
	2011	-	-	0.018

Waterbody		*Suck_120*		
Risk Category		***At Risk***		
Environmental Objective		***Good***		
Included in the PAA		**Yes**		
Monitoring station		**Ballygar Stream- in Ballygar**	**d/s ambient TPEFF1200D0371SW001**	**Ballyforan Bridge**
Ecological Threshold ≤0.040 (high status) ≤0.065 (good status) as an annual mean mg N/L	*2012*	-	-	0.022
	2013	-	-	0.017
	2014	-	-	0.021
	2015	0.050	1.410	0.042
	2016	0.295	1.123	0.019
	2017	-	-	0.018
	2018	0.070	1.568	0.016
	2019	0.043	0.955	0.031
Baseline NH4		**0.458**	**5.056**	**0.023**
NO_3- *Indicative* Ecological Threshold 3.5 for good status as an annual mean (none for high status at this point) mg N/L	*2010*	No Data	No Data	0.547
	2011			0.610
	2012			0.428
	2013			0.560
	2014			0.557
	2015			0.694
	2016			0.453
	2017			0.512
	2018			0.526
	2019			0.762
Baseline NO_3		No Data	No Data	**0.565**
Hydromorphology				
RHAT		-	-	0.625 (2014) 0.734 (2020)
Evidence of drainage (OPW Scheme, Drainage District or other)		Suck Drainage District Scheme intersects this sub basin. Information taken from aerial imagery and the OSI drainage layer would suggest that there is an extensive network of land drains which are flowing into the main Suck_120 river channel. These new channels are draining agricultural land and peatland.		
Comments		The Status driver of this waterbody is fish, which is at moderate status.		The Status driver of this waterbody is fish, which is at moderate status. Moderate MQI Class (MQI V2)
Conceptual model required (Y/N)		Yes		
Ecological Status				
2010 – 2015		**Moderate**		
2013 – 2018		**Moderate**		
EPA Biologist comments		-	-	August 2020: This station is a Potamon type which is highly calcareous. Slight to moderate substrate siltation was noted. "*Quite a bit of Scirpus*[6]" noted in channel. *Conditions were satisfactory from Ballyforan Bridge (1100) to Bellagill Bridge (1200)(Suck_130).*

[6] Scirpus is a widely distributed annual or perennial sedge

Waterbody	*Suck_120*		
Risk Category	*At Risk*		
Environmental Objective	*Good*		
Included in the PAA	Yes		
Monitoring station	Ballygar Stream- in Ballygar	d/s ambient TPEFF1200D0371SW001	Ballyforan Bridge
Significant issue: monitoring point	phosphate ammonia sediment altered habitat due to the morphological changes altered habitat due to hydrological changes		
Significant issue: Waterbody	phosphate ammonia sediment altered habitat due to the morphological changes altered habitat due to hydrological changes		

The **Suck_130** river water body has a good status objective and is currently at good status since 2009. This waterbody is *Not at Risk* of meeting its environmental objective therefore local catchment assessments will not take place.

The **Killaderry Stream_010** is unassigned with no hydrochemistry data available. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia and sediment could be potential issues due to the soils and hydrogeology of the subbasin.

Table 4 Outline of parameters influencing water quality in the Suck_130 and Killaderry Stream_010

Waterbody	*Suck_130*				*Killaderry Stream_010*
Risk Category	*Not at Risk*				*Review*
Environmental Objective	*Good*				*Good*
Included in the PAA	Yes				Yes
Monitoring station	SUCK - Bridge W. of Feevagh	Br SW Gortanabla	Br E Cloonaddron	Bellagill Bridge	KILADERRY STREAM - Interstitial, Br u/s from Suck R conf.
Monitoring station type	*Pre-WFD*	*Investigative*	*Investigative*	*Operational*	*Investigative*
Biological Status Q values					No Data
Water chemistry					
Monitoring station	SUCK - Bridge W. of Feevagh	Br SW Gortanabla	Br E Cloonaddron	Bellagill Bridge	KILADERRY STREAM - Interstitial, Br u/s from Suck R conf.
PO_4+					No Data
NH_4+					No Data

Waterbody	*Suck_130*				*Killaderry Stream_010*
Risk Category	*Not at Risk*				*Review*
Environmental Objective	*Good*				*Good*
Included in the PAA	Yes				Yes
Monitoring station	SUCK - Bridge W. of Feevagh	Br SW Gortanabla	Br E Cloonaddron	Bellagill Bridge	KILADERRY STREAM - Interstitial, Br u/s from Suck R conf.
NO_3-					No Data
Hydromorphology					
RHAT	-	-	-	-	-
Evidence of drainage (OPW Scheme, Drainage District or other)	Suck Drainage District Scheme intersects this sub basin				Suck Drainage District Scheme intersects this sub basin
Comments					Poor MQI Class (MQI V2)
Conceptual model required (Y/N)	Yes				Yes
Ecological Status					
2010 – 2015	Good				Unassigned
2013 – 2018	Good				Unassigned
EPA Biologist comments	-	-	-	-	None
Significant issue: monitoring point[7]					ammonia phosphate sediment
Significant issue: Waterbody					ammonia phosphate sediment

The **Ballyglass_010** is unassigned with no hydrochemistry data available. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia and sediment could be potential issues due to the soils and hydrogeology of the subbasin.

The **Lughanagh_010** is unassigned with no hydrochemistry data available. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia and sediment could be potential issues due to the soils and hydrogeology of the subbasin.

The **Killegan Trib North_010** is unassigned with no hydrochemistry data available. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia, sediment and altered habitat due to morphological changes could be potential issues due to the soils and hydrogeology of the subbasin and the presence of the District Drainage Scheme.

[7] Due to the lack of hydrochemistry, both the significant issues at the monitoring station and the waterbody scale are potential issues having completed the Conceptual Model.

Table 5 Outline of parameters influencing water quality in the Ballyglass_010, Lughanagh_010 and Killeglan Trib North_010

Waterbody	*Ballyglass_010*	*Lughanagh_010*	*Killeglan Trib North_010*
Risk Category	***Review***	***Review***	***Review***
Environmental Objective	***Good***	***Good***	***Good***
Included in the PAA	**Yes**	**Yes**	**Yes**
Monitoring station	**BALLYGLASS_26 - Interstitial, 1st br u/s from Suck R conf.**	**LUGHANAGH - Interstitial, Lissyegan Br**	**KILLEGAN TRIB NORTH - Interstitial, Br d/s from Killeglan 26 R conf.**
Monitoring station type	*Investigative*	*Investigative*	*Investigative*
Biological Status			
Q values	No Data	No Data	No Data
Water chemistry			
Monitoring station	**BALLYGLASS_26 - Interstitial, 1st br u/s from Suck R conf.**	**LUGHANAGH - Interstitial, Lissyegan Br**	**KILLEGAN TRIB NORTH - Interstitial, Br d/s from Killeglan 26 R conf.**
PO_4+	No Data	No Data	No Data
NH_4+	No Data	No Data	No Data
NO_3-	No Data	No Data	No Data
Hydromorphology			
RHAT	-	-	-
Evidence of drainage (OPW Scheme, Drainage District or other)	Suck Drainage District Scheme intersects this sub basin	Suck Drainage District Scheme intersects this sub basin	Suck Drainage District Scheme intersects this sub basin
Comments	Moderate MQI Class (MQI V2)	Moderate MQI Class (MQI V2)	Moderate MQI Class (MQI V2)
Conceptual model required (Y/N)	Yes	Yes	Yes
Ecological Status			
2010 – 2015	**Unassigned**	**Unassigned**	**Unassigned**
2013 – 2018	**Unassigned**	**Unassigned**	**Unassigned**
EPA Biologist comments	-	-	-
Significant issue: monitoring point[8]	ammonia phosphate sediment	ammonia phosphate sediment	ammonia phosphate sediment altered habitat due to the morphological changes
Significant issue: Waterbody	ammonia phosphate sediment	ammonia phosphate sediment	ammonia phosphate sediment

[8] Due to the lack of hydrochemistry, both the significant issues at the monitoring station and the waterbody scale are potential issues having completed the Conceptual Model.

Waterbody	*Ballyglass_010*	*Lughanagh_010*	*Killeglan Trib North_010*
Risk Category	***Review***	***Review***	***Review***
Environmental Objective	***Good***	***Good***	***Good***
Included in the PAA	**Yes**	**Yes**	**Yes**
Monitoring station	**BALLYGLASS_26 - Interstitial, 1st br u/s from Suck R conf.**	**LUGHANAGH - Interstitial, Lissyegan Br**	**KILLEGAN TRIB NORTH - Interstitial, Br d/s from Killeglan 26 R conf.**
			altered habitat due to the morphological changes

The **Killeglan_010** has a good status objective and is currently at moderate status. There is no hydrochemistry data available. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that sediment, ammonia and altered habitat due to morphological changes could be potential issues due to the soils and hydrogeology of the subbasin and the presence of the District Drainage Scheme.

Table 6 Outline of parameters influencing water quality in the Killeglan_010

Waterbody		***Killeglan_010***
Risk Category		***At Risk***
Environmental Objective		***Good***
Included in the PAA		**Yes**
Monitoring station		**Bridge u/s Suck River confl**
Monitoring station type		*Operational*
Biological Status		
Q values	*2009*	-
	2010	-
	2011	4
	2012	-
	2013	-
	2014	3
	2015	-
	2016	-
	2017	3-4
	2018	
	2020	4
Water chemistry		
Monitoring station		**Bridge u/s Suck River confl**
PO_4+		*No Data Available*
NH_4+		*No Data Available*
NO_3-		*No Data Available*
Hydromorphology		
RHAT		-

Waterbody	*Killeglan_010*
Risk Category	***At Risk***
Environmental Objective	***Good***
Included in the PAA	**Yes**
Monitoring station	**Bridge u/s Suck River confl**
Evidence of drainage (OPW Scheme, Drainage District or other)	Suck Drainage District Scheme intersects this sub basin
Comments	Moderate MQI Class (MQI V2)
Conceptual model required (Y/N)	Yes
Ecological Status	
2010 – 2015	**Poor**
2013 – 2018	**Moderate**
EPA Biologist comments	August 2020:The Killeglan River was satisfactory where sampled upstream of its confluence with the River Suck (qv). There is a potamon habitat at this station with slight to moderate siltation. September 2017:The Killeglan, upstream of the Suck river confluence (0200), improved slightly from poor to moderate ecological conditions. However, conditions are still unsatisfactory in a river previously found to be of satisfactory ecological quality for almost 25 years.
Significant issue: monitoring point[9]	sediment ammonia altered habitat due to morphological changes
Significant issue: Waterbody	Sediment ammonia altered habitat due to morphological changes

The **Ahascragh_010** waterbody has a good status objective and is currently at good status since 2009. This waterbody is *Not at Risk* of meeting its environmental objective therefore local catchment assessments will not take place.

The **Ahascragh_020** waterbody has a good status objective and is currently at good status since 2009. This waterbody is *Not at Risk* of meeting its environmental objective therefore local catchment assessments will not take place.

The **Ahascragh_030** waterbody has a good status objective and is currently at Poor status since 2017. The macroinvertebrates are driving the status.

The EPA operational station (2.6 km d/s Ahascragh Br) was last at Good Status (Q4) in 1999:There has been no exceedances in the annual averages for ortho-phosphate or ammonia since 2010. There were no exceedances in the EQS mean for ammonia from 2016 to 2020 except for one spike which also exceeded the 95%ile on the 26th of November 2018. There has been no breach of either the EQS Mean or 95%ile for ortho-phosphate since 2016. There were two exceedances in the EQS mean for BOD one

[9] Due to the lack of hydrochemistry, both the significant issues at the monitoring station and the waterbody scale are potential issues having completed the Conceptual Model.

in 2019 and the other in 2020. There is also hydrochemistry data available for the next EPA operational station upstream (Ahascragh: West Bridge). There has been no exceedances in the annual averages for ortho-phosphate or ammonia since 2010. There is a downward trend for ammonia and ortho-phosphate at this station. The ammonia has been below both EQSs from 2016 to 2020. The ortho-phosphate exceeded the EQS mean once in 2019. The BOD exceeded the EQS mean once in 2020.

The potential significant issues in this waterbody are phosphate, ammonia, sediment, altered habitat due to the morphological changes due to the soils and hydrogeology of the subbasin and the presence of the District Drainage Scheme.

The **Ahascragh_040** waterbody has a good status objective and is currently at good status since 2009. This waterbody is *Not at Risk* of meeting its environmental objective therefore local catchment assessments will not take place.

Table 7 Outline of parameters influencing water quality in the Ahascragh_010, Ahascragh_020, Ahascragh_030 and Ahascragh_040

Waterbody		***Ahascragh_010***	***Ahascragh_020***	***Ahascragh_030***		***Ahascragh_040***
Risk Category		***Not at Risk***	***Not at Risk***	***At Risk***		***Not at Risk***
Environmental Objective		***Good***	***Good***	***Good***		***Good***
Included in the PAA		**Yes**	**Yes**	**Yes**		**Yes**
Monitoring station		**Annagh Bridge**	**Island Bridge**	**Ahascragh: West Bridge**	**2.6 km d/s Ahascragh Br**	**Bunowen Bridge**
Monitoring station type		*Operational*	*Operational*	*Operational*	*Operational*	*Operational*
Biological Status						
Q values	*2009*					
	2010					
	2011				3	
	2012					
	2013					
	2014				3-4	
	2015					
	2016					
	2017				3*	
	2018					
	2020				3	
Water chemistry						
Monitoring station		**Annagh Bridge**	**Island Bridge**	**Ahascragh: West Bridge**	**2.6 km d/s Ahascragh Br**	**Bunowen Bridge**
PO_4+ Ecological Threshold ≤0.025 (high status) ≤0.035 (good status) as an annual mean mg P/L	*2010*			*0.011*	0.009	
	2011			*0.006*	0.006	
	2012			*0.014*	0.013	
	2013			*0.009*	0.013	
	2014			*0.017*	0.009	
	2015			*0.010*	0.012	
	2016			*0.011*	0.010	
	2017			*0.010*	0.010	
	2018			*0.008*	0.010	
	2019			*0.023*	0.013	

Waterbody		*Ahascragh_010*	*Ahascragh _020*	*Ahascragh_030*		*Ahascragh_040*
Risk Category		***Not at Risk***	***Not at Risk***	***At Risk***		***Not at Risk***
Environmental Objective		***Good***	***Good***	***Good***		***Good***
Included in the PAA		**Yes**	**Yes**	**Yes**		**Yes**
Monitoring station		**Annagh Bridge**	**Island Bridge**	**Ahascragh: West Bridge**	**2.6 km d/s Ahascragh Br**	**Bunowen Bridge**
Baseline PO_{4+}				***0.012***	**0.011**	
NH_4+ Ecological Threshold ≤0.040 (high status) ≤0.065 (good status) as an annual mean mg N/L	*2010*			*0.051*	0.034	
	2011			*0.024*	0.019	
	2012			*0.026*	0.022	
	2013			*0.027*	0.033	
	2014			*0.022*	0.028	
	2015			*0.046*	0.038	
	2016			*0.018*	0.020	
	2017			*0.025*	0.024	
	2018			*0.017*	0.050	
	2019			*0.029*	0.026	
Baseline NH_{4+}				***0.029***	**0.029**	
NO_3- *Indicative* Ecological Threshold 3.5 for good status as an annual mean (none for high status at this point) mg N/L	*2010*			*0.785*	0.782	
	2011			*1.243*	1.143	
	2012			*0.665*	0.736	
	2013			*0.795*	0.662	
	2014			*1.087*	0.889	
	2015			*0.945*	1.053	
	2016			*0.466*	0.512	
	2017			*0.716*	0.812	
	2018			*0.666*	0.670	
	2019			*1.190*	1.166	
Baseline NO^{3-}				***0.856***	**0.843**	
Hydromorphology						
RHAT		-	-	-	-	-
Evidence of drainage (OPW Scheme, Drainage District or other)		None	Ahascragh District Drainage Scheme intersects this sub basin	Ahascragh District Drainage Scheme intersects this sub basin	Ahascragh District Drainage Scheme intersects this sub basin	Ahascragh District Drainage Scheme intersects this sub basin
Comments		Moderate MQI Class (MQI V2)	Poor MQI Class (MQI V2)	Poor MQI Class (MQI V2)	Moderate MQI Class (MQI V2) EPA biologist suspects in, addition to existing nutrient issues, that dredging and clearance of vegetation in channel are the reason for the decline in status.	Moderate MQI Class (MQI V2)
Conceptual model required (Y/N)		Yes	Yes	Yes	Yes	Yes
Ecological Status						

Waterbody	*Ahascragh_010*	*Ahascragh _020*	*Ahascragh_030*		*Ahascragh_040*
Risk Category	***Not at Risk***	***Not at Risk***	***At Risk***		***Not at Risk***
Environmental Objective	***Good***	***Good***	***Good***		***Good***
Included in the PAA	**Yes**	**Yes**	**Yes**		**Yes**
Monitoring station	**Annagh Bridge**	**Island Bridge**	**Ahascragh: West Bridge**	**2.6 km d/s Ahascragh Br**	**Bunowen Bridge**
2010 – 2015	**Good**	**Good**	**Moderate**	**Moderate**	**Good**
2013 – 2018	**Good**	**Good**	**Poor**	**Poor**	**Good**
EPA Biologist comments	September 2017: Satisfactory ecological conditions persisted at this station on the Ahascragh in 2017 .		None	July 2020: The Ahascragh River was generally in good condition apart from the stretch immediately downstream of the Ahascragh Waste Water Treatment Plant (0400). The river is a slow flowing 'potamon' type river over much of its length with the mayfly Ephemera danica present in the slower flowing reaches. There was heavy siltation noted. September 2017:There has been a decline in status downstream of Ahascragh (0400). Dredging and clearance of the vegetation at 0400 likely contributed to the decline in condition as well as excessive nutrients.	September 2017: Satisfactory ecological conditions persisted at this station on the Ahascragh in 2017 .
Significant issue: monitoring point			sediment phosphate ammonia altered habitat due to morphological changes		
Significant issue: Waterbody			sediment phosphate ammonia altered habitat due to morphological changes		

The **Derrymullan_010** waterbody at the EPA operational station (Kilmalaw Bridge) improved from Moderate status (Q3-Q4*) in 2006 to Good Status (Q4) in 2008, 2011 and 2014. It then declined to Moderate status in 2017 (Q3-4). There is no hydrochemistry for this waterbody. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia and sediment could be potential issues due to the soils and hydrogeology of the subbasin.

The **Derrymullan_020** waterbody at the EPA operational station (1st Bridge u/s Suck confluence) improved from Good Status (Q4) in 2008 to High Status (Q4-5) in 2011. It then declined to Moderate status in 2014 (Q3-4) and has remained at this status in 2018. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia and sediment could be potential issues due to the soils and hydrogeology of the subbasin.

The **Suck_140** waterbody at the EPA operational station **(3km d/s Ballinasloe (Poolboy))** has seen a cycle of decline and improvements in the Q Value since 2002. This waterbody was last at Good status in 1978. The waterbody was at Poor status in 2005 (Q3) and then improved to Moderate status (Q3-4) in 2008 and has remained at this status in the last number of monitoring periods including 2020.The potential significant issues in this waterbody are sediment, altered habitat due to the morphological changes and altered habitat due to hydrological changes due to the presence of the District Drainage Scheme.

Table 8 Outline of parameters influencing water quality in the Derrymullan_010, Derrymullan_020 and Suck_140

Waterbody		***Derrymullan_010***	***Derrymullan_020***	***Suck_140***		
Risk Category		***At Risk***	***At Risk***	***At Risk***		
Environmental Objective		***Good***	***Good***	***Good***		
Included in the PAA		**Yes**	**Yes**	**Yes**		
Monitoring station		**Kilmalaw Bridge**	**1st Bridge u/s Suck confl**	**Upstream of TPEFF1200D0032SW001 &TPEFF1200D0032SW002**	**SUCK - Ballinasloe Bridge**	**3km d/s Ballinasloe (Pollboy)**
Monitoring station type		*Operational*	*Operational*	*Investigative*	*Pre -WFD*	*Operational*
Biological Status						
Q values	*2009*			No Data	Pre 2005	
	2010					
	2011	4	4-5			3-4
	2012					
	2013					
	2014	4	3-4			3-4
	2015					
	2016					
	2017	3-4	3-4			3-4
	2018					
	2020	4	3-4			3-4
Water chemistry						
Monitoring station		**Kilmalaw Bridge**	**1st Bridge u/s Suck confl**	**Upstream of TPEFF1200D0032SW001 &TPEFF1200D0032SW002**	**SUCK - Ballinasloe Bridge**	**3km d/s Ballinasloe (Pollboy)**
PO_4+ Ecological Threshold ≤0.025 (high status)	*2010*	*No Data*	*0.017*	-	-	0.019
	2011		*0.007*	-	-	0.018
	2012		*0.015*	-	-	0.016
	2013		*0.014*	-	-	0.014
	2014		*0.021*	-	-	0.010
	2015		*0.013*	*0.021*	0.027	0.014
	2016		*0.030*	*0.030*	0.022	0.013
	2017		*0.011*	*0.007*	0.008	0.012

Waterbody		*Derrymullan_010*	*Derrymullan_020*	*Suck_140*		
Risk Category		***At Risk***	***At Risk***	***At Risk***		
Environmental Objective		***Good***	***Good***	***Good***		
Included in the PAA		**Yes**	**Yes**	**Yes**		
Monitoring station		**Kilmalaw Bridge**	**1st Bridge u/s Suck confl**	**Upstream of TPEFF1200D0032SW001 &TPEFF1200D0032SW002**	**SUCK - Ballinasloe Bridge**	**3km d/s Ballinasloe (Pollboy)**
≤0.035 (good status) as an annual mean mg P/L	2018		*0.009*	*0.009*	0.012	0.013
	2019		*0.028*	*0.017*	0.017	-
Baseline PO_4+			***0.017***	***0.017***	**0.017**	**0.014**
NH_4+ Ecological Threshold ≤0.040 (high status) ≤0.065 (good status) as an annual mean mg N/L	*2010*	*No Data*	*0.042*	-	-	0.021
	2011		*0.023*	-	-	0.018
	2012		*0.025*	-	-	0.022
	2013		*0.036*	-	-	0.017
	2014		*0.033*	-	-	0.021
	2015		*0.058*	*0.022*	0.017	0.042
	2016		*0.045*	*0.037*	0.035	0.019
	2017		*0.032*	*0.028*	0.024	0.018
	2018		*0.055*	*0.053*	0.032	0.014
	2019		*0.041*	*0.038*	0.051	-
Baseline NH_4+			***0.039***	***0.036***	**0.032**	**0.021**
NO_3- *Indicative* Ecological Threshold 3.5 for good status as an annual mean (none for high status at this point) mg N/L	*2010*	*No Data*	*1.283*	No Data	No Data	No Data
	2011		*1.762*			
	2012		*1.039*			
	2013		*1.046*			
	2014		*1.387*			
	2015		*1.202*			
	2016		*0.938*			
	2017		*1.061*			
	2018		*0.982*			
	2019		*1.920*			
Baseline NO_3-			***1.262***			
Hydromorphology						
RHAT		-	-	-	-	-
Evidence of drainage (OPW Scheme, Drainage District or other)		None	Suck District Drainage Scheme intersects this sub basin	Suck District Drainage Scheme intersects this sub basin	Suck District Drainage Scheme intersects this sub basin	Suck District Drainage Scheme intersects this sub basin
Comments		Good MQI Class (MQI V2)	Moderate MQI Class	Good MQI Class (MQI V2)	Poor MQI Class (MQI V2)	

Waterbody	*Derrymullan_010*	*Derrymullan_020*	*Suck_140*		
Risk Category	***At Risk***	***At Risk***	***At Risk***		
Environmental Objective	***Good***	***Good***	***Good***		
Included in the PAA	**Yes**	**Yes**	**Yes**		
Monitoring station	**Kilmalaw Bridge**	**1st Bridge u/s Suck confl**	**Upstream of TPEFF1200D0032SW001 &TPEFF1200D0032SW002**	**SUCK - Ballinasloe Bridge**	**3km d/s Ballinasloe (Pollboy)**
		(MQI V2)			
Conceptual model required (Y/N)	Yes	Yes	Yes		
Ecological Status					
2010 – 2015	**Good**	**Moderate**	**Moderate**		
2013 – 2018	**Moderate**	**Moderate**	**Moderate**		
EPA Biologist comments	July 2020: The upper site sampled on the Derrymullan (0200) showed an improvement in ecological condition with satisfactory conditions recorded in 2020 again. September 2017: An unwelcome decline from good ecological condition in 2014 to moderate in 2017 was noted on the Derrymullan at station 0400. Overabundance of macrophytes and DO saturation indicative of nutrients. Diffuse agri suspected.	July 2020: No change was noted at the lower site near the railway station in Ballinasloe Slight siltation was noted. The river substratum is highly calcareous. The water was turbid. The catchment has a varied land use with intensive agriculture, worked bogs, coniferous forests and quarrying. September 2017: Moderate condition continued at the lower site (0700).	-	-	July and August 2020: The last two sites downstream of Ballinasloe, Pollboy (1400) and Correen Ford (Suck_150), were unchanged but moderately polluted. There was slight substrate siltation.
Significant issue: monitoring point[10]	sediment ammonia phosphate	sediment ammonia phosphate	sediment altered habitat due to hydrological changes altered habitat due to morphological changes		
Significant issue: Waterbody	sediment ammonia phosphate	sediment ammonia phosphate	sediment altered habitat due to hydrological changes altered habitat due to morphological changes		

The **Cuilleen Stream_010** waterbody has one EPA operational monitoring station (Bridge u/s Suck river confluence). The waterbody declined from Good status (Q4) in 2006 to Moderate status (Q3-4) in 2008. It then improved to Good status in 2011, remained at Good status in 2014 and then declined to Moderate status in 2017. There is no hydrochemistry for this station. The significant issues in this

[10] Due to the lack of hydrochemistry, both the significant issues at the monitoring station and the waterbody scale are potential issues having completed the Conceptual Model.

waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia and sediment could be potential issues due to the soils and hydrogeology of the subbasin.

The **Suck_150** waterbody has one EPA operational monitoring station (Correen Ford). This waterbody was last at High status in 1978 and has seen a cycle of improvement and decline since then. The waterbody was at Poor status (Q3) in 2008 and improved to Moderate status (Q3-4) in 2011 and remained at this status for 2014,2017 and 2020. The conceptual model (Section 4) would suggest that phosphate, ammonia, sediment, altered habitat due to morphological changes and altered habitat due to hydrological changes could be potential issues due to the soils and hydrogeology of the subbasin and due to the presence of the District Drainage Scheme.

The **Suck_160** waterbody has one pre-WFD station for which there are no Q values or hydrochemistry as the waterbody is unassigned. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia, sediment, altered habitat due to morphological changes and altered habitat due to hydrological changes could be potential issues due to the soils and hydrogeology of the subbasin and due to the presence of the District Drainage Scheme.

The **Culliaghbeg_010** waterbody has two Pre -WFD stations for which there are no Q values or hydrochemistry as the waterbody is unassigned. The significant issues in this waterbody are unknown. The conceptual model (Section 4) would suggest that phosphate, ammonia, sediment and altered habitat due to morphological changes could be potential issues due to the soils and hydrogeology of the subbasin and due to the presence of the District Drainage Scheme.

Table 9 Outline of parameters influencing water quality in the Cuilleen Stream_010, Suck_150, Suck_160 and Culliaghbeg_010

Waterbody		***Cuilleen Stream_010***	***Suck_150***	***Suck_160***	***Culliaghbeg_010***	
Risk Category		*At Risk*	*At Risk*	***Review***	***Review***	
Environmental Objective		***Good***	***Good***	***Good***	***Good***	
Included in the PAA		**Yes**	**Yes**	**Yes**	**Yes**	
Monitoring station		**Bridge u/s Suck River confl.**	**Correen Ford**	**SUCK - Creggan 3.3km u/s Shannon R confl**	**Br East Cloonfad**	**Br East Oldtown**
Monitoring station type		*Operational*	*Operational*	*Pre-WFD*	*Investigative*	*Investigative*
Biological Status						
Q values	*2009*			No Data	No Data	No Data
	2010					
	2011	4	3-4			
	2012					
	2013					
	2014	4	3-4			
	2015					
	2016					
	2017	3-4	3-4			
	2018					
	2020	3	3-4			
Water chemistry						
Monitoring station		**Bridge u/s Suck River confl.**	**Correen Ford**	**SUCK - Creggan 3.3km u/s Shannon R confl**	**Br East Cloonfad**	**Br East Oldtown**

Waterbody		*Cuilleen Stream_010*	*Suck_150*	*Suck_160*	*Culliaghbeg_010*	
Risk Category		*At Risk*	*At Risk*	***Review***	***Review***	
Environmental Objective		***Good***	***Good***	***Good***	***Good***	
Included in the PAA		**Yes**	**Yes**	**Yes**	**Yes**	
Monitoring station		**Bridge u/s Suck River confl.**	**Correen Ford**	**SUCK - Creggan 3.3km u/s Shannon R confl**	**Br East Cloonfad**	**Br East Oldtown**
PO_4+ Ecological Threshold ≤0.025 (high status) ≤0.035 (good status) as an annual mean mg P/L	*2010*	*No Data*	*0.007*	*No Data*	*No Data*	*No Data*
	2011		*0.005*			
	2012		*0.012*			
	2013		*0.008*			
	2014		*0.006*			
	2015		*0.017*			
	2016		*0.009*			
	2017		*0.009*			
	2018		*0.005*			
	2019		*0.010*			
Baseline PO_4+			***0.009***			
NH_4+ Ecological Threshold ≤0.040 (high status) ≤0.065 (good status) as an annual mean mg N/L	*2010*	*No Data*	*0.116*	*No Data*	*No Data*	*No Data*
	2011		*0.019*			
	2012		*0.029*			
	2013		*0.036*			
	2014		*0.033*			
	2015		*0.050*			
	2016		*0.025*			
	2017		*0.019*			
	2018		*0.061*			
	2019		*0.027*			
Baseline NH_4+			***0.042***			
NO_3- *Indicative* Ecological Threshold 3.5 for good status as an annual mean (none for high status at this point) mg N/L	*2010*	*No Data*	*0.897*	*No Data*	*No Data*	*No Data*
	2011		*0.869*			
	2012		*0.774*			
	2013		*0.699*			
	2014		*0.674*			
	2015		*0.856*			
	2016		*0.658*			
	2017		*0.798*			
	2018		*0.460*			
	2019		*0.996*			
Baseline NO_3-			***0.768***			
Hydromorphology						
RHAT		-	-	-	-	-
Evidence of drainage (OPW Scheme, Drainage District or other)		Hymo–Q station is on MQI reach classed as Poor due to being within an area of cut peat.(MQI V2).	-	Kellysgrove District Drainage Scheme intersects this sub basin	-	-
Comments		Poor MQI Class (MQI V2)	High MQI Class (MQI V2)	High MQI Class (MQI V2)	Good MQI Class (MQI V2)	Moderate MQI Class (MQI V2)

Waterbody	*Cuilleen Stream_010*	*Suck_150*	*Suck_160*	*Culliaghbeg_010*	
Risk Category	*At Risk*	*At Risk*	***Review***	***Review***	
Environmental Objective	***Good***	***Good***	***Good***	***Good***	
Included in the PAA	**Yes**	**Yes**	**Yes**	**Yes**	
Monitoring station	**Bridge u/s Suck River confl.**	**Correen Ford**	**SUCK - Creggan 3.3km u/s Shannon R confl**	**Br East Cloonfad**	**Br East Oldtown**
Conceptual model required (Y/N)	Yes	Yes	Yes	Yes	Yes
Ecological Status					
2010 – 2015	**Good**	**Moderate**	**Unassigned**	**Unassigned**	**Unassigned**
2013 – 2018	**Moderate**	**Moderate**	**Unassigned**	**Unassigned**	**Unassigned**
EPA Biologist comments	August 2020: The Cuilleen Stream declined in quality compared with 2017. A cattle access point at the bridge is partly responsible for the poor condition of the stream but other factors also influence it. September 2017:A decline from satisfactory ecological condition was noted in 2017 in Cuilleen Stream, a tributary of the Suck. Sedimentation as a result of clearance of a tributary may be a contributing factor.	July and August 2020: Correen Ford (1500), was unchanged but moderately polluted.	-	-	-
Significant issue: monitoring point[11]	sediment ammonia phosphate	sediment ammonia phosphate altered habitat due to morphological changes altered habitat due to hydrological changes	sediment ammonia phosphate altered habitat due to morphological changes altered habitat due to hydrological changes	sediment ammonia phosphate altered habitat due to morphological changes	
Significant issue: Waterbody	sediment ammonia phosphate	sediment ammonia phosphate altered habitat due to morphological changes altered habitat due to hydrological changes	sediment ammonia phosphate altered habitat due to morphological changes altered habitat due to hydrological changes	sediment ammonia phosphate altered habitat due to morphological changes	

[11] Due to the lack of hydrochemistry, both the significant issues at the monitoring station and the waterbody scale are potential issues having completed the Conceptual Model.

3 Significant Pressures

3.1 Initial Characterisation

3.1.1 Hydromorphology (Sub Category - Channelisation)

Hydromorphology has been identified as a significant pressure on the following waterbodies: Suck_120, Ahascragh_030, Suck_140, Suck_150 and Suck_160. Channelisation involves widening, deepening and/or straightening of the river channel, in addition to the removal of in-channel obstructions. There are three district drainage schemes within the Lower Suck PAA: Suck District Drainage, Ahascragh District Drainage and Kellysgrove District Drainage (**Figure 6**). The Kellysgrove DD Scheme encompasses approximately 2.5km of the Suck_160 waterbody to the west of the sub basin.

EPA Characterisation identified Altered habitat due to Hydrological changes and Altered habitat due to Morphological changes impacts on the **Suck_120**.Fish is driving the status on this waterbody. The majority of this waterbody has an MQI Key Impact as "Channel Morphology – Historic Modification "which involves the over deepening and over widening of the river channel that flow through reclaim peat. The surveillance and monitoring Station (**Ballyforan Bridge**) has a moderate Morphological Quality Index (MQI) class (MQI V2). This station has a standard weighting with a high impact for the presence of OPW Channels (District Drainage). The RHAT score in 2011, 2014 and 2017 was 0.625. The RHAT assessment for the waterbody is detailed in ***Table 10***.

Table 10 RHAT Assessment of the Suck_120

Suck_120 (Sampling point – Ballyforan Bridge)		
Attribute	**Indicative Status**	**Comments**
Channel Form Score	Good	Good recovery
Channel Vegetation Score	Good	No woody habitats, but good range of vegetation types
Channel Substrate Condition Score	Good	As expected for type
Channel Barriers to Continuity Score	Good	Bridge present but probably <15% straightened or over-widened
Bank Structure Left	Good	Historic re sectioning/re naturalisation
Bank Structure Right	Good	Historic re sectioning/re naturalisation
Bank Vegetation Left	Poor	Grazed grassland and few trees except on U/S LHS
Bank Vegetation Right	Poor	Grazed grassland and few trees except on U/S LHS
Riparian Landcover Left	Poor	
Riparian Landcover Right	Poor	
Floodplain Connectivity Left	Good	
Floodplain Connectivity Right	Good	

EPA Characterisation identified Altered habitat due to Morphological changes and other significant impacts (Sediment) on the **Ahascragh_030**. The upstream EPA Operational station (**Ahascragh: West Bridge**) has a poor MQI Class (MQI V2) within the Ahascragh Drainage District. This station has a peat weighting with a high impact for the presence of: 1. A bridge 2. An embankment (2.4km in length) and 3. OPW Channels (District Drainage). The downstream EPA operational station (**2.6Km d/s Ahascragh Bridge**) has a moderate MQI class (MQI V2), within the Ahascragh Drainage District. This station has

a peat weighting with a high impact for the presence of: 1. A farm bridge and 2. OPW Channels (District Drainage).The EPA Biologist noted channel maintenance works on this river system in September 2018. Siltation was noted as a result of 'Dredging and clearance of the vegetation at 0400 likely contributed to the decline in conditions as well as excessive nutrients'. The Q value assigned to this site was 3*, indicative of poor conditions. A suffix was assigned to the Q-Value assessment indicating something worthy of special attention, typically heavy siltation of the substratum.[12] A Pers. Comms from Galway County Council confirmed that maintenance works on the Ahascragh DD were undertaken from 2016 to 2018 commencing upstream of Ahascragh Village & working back towards Ballinasloe . The works in the vicinity of EPA monitoring station (2.6Km d/s Ahascragh Bridge) were undertaken in 2017.

EPA Characterisation identified Altered habitat due to Hydrological changes and Altered habitat due to Morphological changes impacts on the **Suck_140.**The EPA Operational station (**3KM d/s Ballinasloe (Poolboy)** is has a Poor MQI Class within the Suck District Drainage scheme (MQI V2). The station has a standard weighting with a high impact for: 1. 4 weirs and a bridge 2. 4 confining walls 3. A navigational channel and 4. OPW Channels (District drainage). A Pers. Comms from Galway County Council confirmed that 1.5km of channel cleaning took place on the Suck_140 (Cullen Stream- between **Bridge u/s Suck river confl** (Which is the operational station for Cuilleen Stream_010) downstream to the confluence of the main channel on theSuck_140) in late August/September 2020.

EPA Characterisation identified Altered habitat due to Hydrological changes and Altered habitat due to Morphological changes impacts on the **Suck_150.**Kellysgrove Drainage District scheme is within this water body. According to Eden, *Channel clearing in pre 2009 and works carried out in 2012 but locations unknown*. However, according to the DD Scheme layer the Suck_150 is not within a DD Scheme except for approximately 600m in its headwaters. *Navigation is an issue here (IFI - Hymo). This river is Heavily modified as with Suck_140.* The EPA operational station (**Correen Ford**) sits in the middle of three High MQI Class reaches (MQI V2).

EPA Characterisation identified Altered habitat due to Hydrological changes and Altered habitat due to Morphological changes impacts on the **Suck_160.** Kellysgrove Drainage District scheme is within this water body. *Channel clearing in pre 2009 and works carried out in 2012 but locations unknown.* In September 2020, Galway County Council undertook maintenance works along a 2.5 km combined section of the Cloonescragh River and minor tributaries which form part of the Kellysgrove Drainage District. The Cloonescragh River is a tributary of the Suck_160 and confluences with the main river suck channel downstream of Correen Ford. The works included the removal of vegetation/weed growth, topping silt berms, reshaping banks as required, pruning back trees and removal of blockages and other foreign debris along the river channel.[13] The Pre-WFD station (**SUCK - Creggan 3.3km u/s Shannon R confl**) is 4km downstream of the Cloonescragh River and it is on a reach of High MQI Class (MQI V2).

The Suck_140, Suck_150 and Suck_160 are navigation channels which connect Ballinasloe to the River Shannon. There are impacts to the channel morphology for these waterbodies which involves straightening, over widening and over deepening the channel to accommodate boats. If over-widened, the river channel may no longer be able to transport sediment due to reduction of flows particularly within low gradient environments. In these scenarios, siltation will be evident as high

[12] EPA Ecology Monitoring and Assessment -
[13] Kellysgrove District Drainage Cloonescragh River and Channel Maintenance 2020 Word Document

levels of fine sediment will have settled on the river bed. If over deepened a river channel, water will no longer be able to spill out onto the floodplain, the volume of water in the channel increases, flood peaks are much greater and water rapidly transports itself through the system. This can lead to an increase in shear stress (i.e. the force of water on the river bed and banks), and therefore an increase in erosion. Furthermore, as water cannot spill out onto the floodplain and deposit its fine sediment load, siltation can occur during low flow conditions.[14]

It also worth noting even though hydromorphology is not a significant pressure on the **Derrymullan_020** that maintenance was also carried out in late August/September 2020 on the Deerpark section in Ballinasloe. Channel cleaning was undertaken on 3.5km of the river. This section of the river is part of the Suck District Drainage scheme.

Typical Works executed include:

i. Removal of blockages and obstructions to flow caused by wood debris, thick vegetation growth and other foreign objects,
ii. Reinstatement of isolated short sections of embankment that have slipped into the river channel, generally caused by livestock or fallen trees,
iii. Topping deposits of silt or gravel that have built up in the river channel and
iv. Cutting back trees and other vegetation that is growing out of the river bank or overhanging the river.

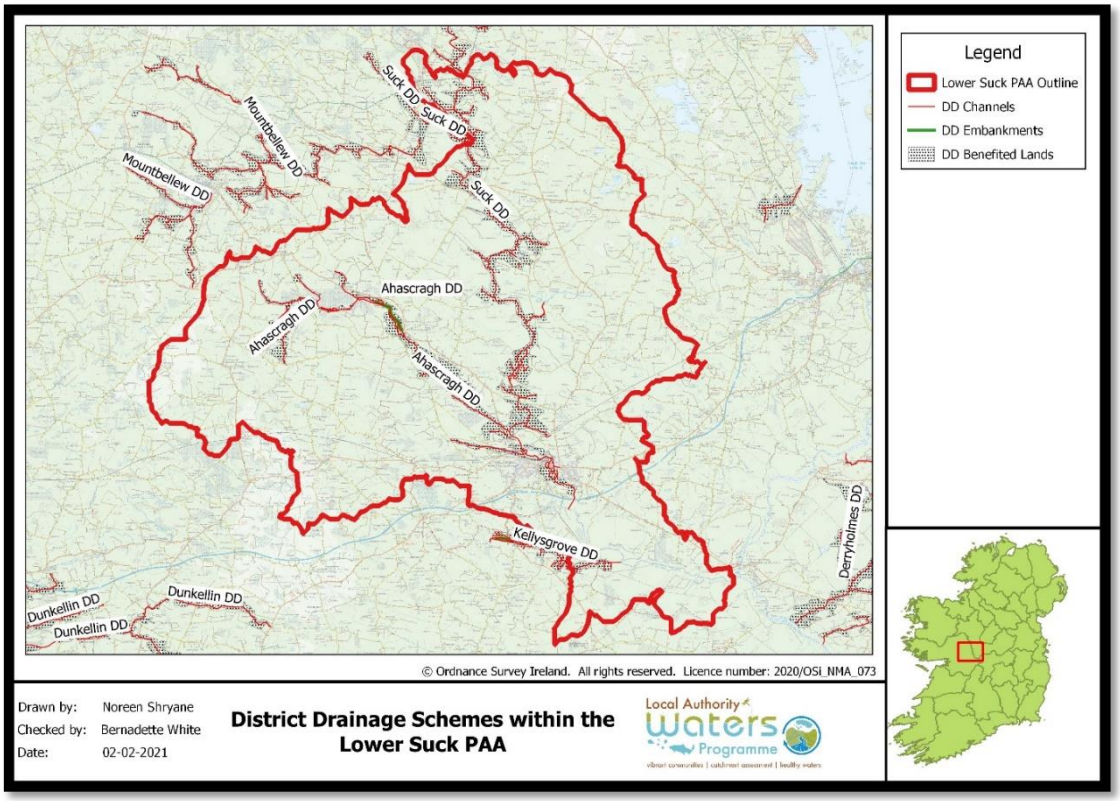

Figure 6 District Drainage Schemes within the Lower Suck PAA

[14] 2018 CSMU EPA, Local Catchment Assessment- Guidance on Further Characterisation

3.1.2 Extractive Industry (Sub Category- Peat)

Extractive industry has been identified as a significant pressure on the Killaderry Stream_010, Lughanagh_010,Killegan Trib North_010, Killeglan_010, Suck_150, Suck_160 and Culliaghbeg_010. EPA Characterisation identified Nutrient Pollution and Altered habitat due to Morphological changes impacts on all these waterbodies.

There is an extensive network of industrial peatland within the PAA (**Figure 7**) which are managed by the Bord na Mona Blackwater Group. The physical setting of these waterbodies means that they flow through these peatlands. This combined with a drainage network from the peatlands which have a direct pathway to the river itself can lead to issues. The dominant sub soils type in these sub basins is Cutover peat (CUT) and limestone till (TLs). Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Blackwater bog group (Ref. P0502-01). As part of the licence Conditions, decommissioning and rehabilitation must be undertaken to ensure the permanent rehabilitation of the cutaway bog lands within the licensed area.

Hydrochemistry is only available for the Suck_150. The EPA Operational Station (Correen Ford) is downstream of Kellysgrove Bog and Culliaghmore Bog. The ammonia did not exceed either the Mean or 95%ile EQS between 2016 and 2020 except for one breach in both on the 24th of September 2018.This exceedance may be linked to precipitation recorded at Poolboy Lock 5.6km upstream of Correen Ford. There was 12.7mm of rainfall on the 20th of September 2018.[15] This may have led to an ammonia flushing in the peat drains leading to the main channel. It is important to note that there were numerous occasions in 2018 when the rainfall accumulation was higher than 12.7mm and it did not result in ammonia exceedances. The ortho-phosphate did not exceed either EQS from 2016 to 2020. The BOD has not exceeded either EQS since May 2017.

In the 2018 AER for the Blackwater Group, there was one instance of trigger levels reached for Chemical Oxygen Demand (COD) which is >100mg/l in the Castlegar Bog which is situated in the Suck_130 sub basin. The Surface water site 121 in the Castlegar Bog exceeded the COD limit in Q3 2018 at 121mg/l. In the 2019 AER, there were no instances associated with the peatlands within the PAA. There was a few surface water sites that came near to the COD trigger level but there were no breaches. In the 2020 AER, there were suspended solids exceedances but there is no water quality monitoring data within the AER which states the location of these. The surface monitoring data for 2020 will be analysed once it becomes available to LAWPRO.

Several bogs within the Blackwater bogs licensed area (P0502-01) have been identified as having bog restoration value. Bog restoration work (drain-blocking) has been completed in sub-sections of **Clonboley I, Clonboley II** (Knock Bog and Clera Island Bog) and **Killeglan (**Killegan Trib North_010 and Killeglan_010 sub basins). Restoration work at the Newtown/Lough Gore (Suck_130 sub basin) network of bogs is ongoing and proving successful. In the **Killeglan Bog** (Cuckoo Hill) 66ha of ditched high bog out of 126ha was rewetted.

Kellysgrove Bog in the Suck_150 sub basin was drained in the 1980s in anticipation of industrial peat production but no peat harvesting ever took place. Bord na Móna now do not intend to carry out any industrial peat extraction at Kellysgrove. The primary rehabilitation goal and outcome for Kellysgrove

[15] Historical Data - Met Éireann - The Irish Meteorological Service

Bog is environmental stabilisation of the site. This will be achieved via raised bog restoration within the former high bog area. [16]

Garryduff Bog in the Suck_160 sub basin was drained and developed for industrial peat production in the 1960s and has been in active peat production since 1968. Industrial peat production ceased in 2019. Industrial peat extraction has now completely ceased at Garryduff. The primary rehabilitation goal and outcome for Garryduff Bog is environmental stabilisation of the site and optimising climate action benefits. This will be achieved via intensive re-wetting and wetland creation. [17]

Castlegar Bog in the Suck_130 sub basin was drained and developed for industrial peat production in the 1990s and has been in active peat production since the 2004. Industrial peat production permanently ceased in 2019. The primary rehabilitation goal and outcome for Castlegar Bog is environmental stabilisation of the site and optimising climate action benefits. This will be achieved via intensive deep peat rewetting. [18]

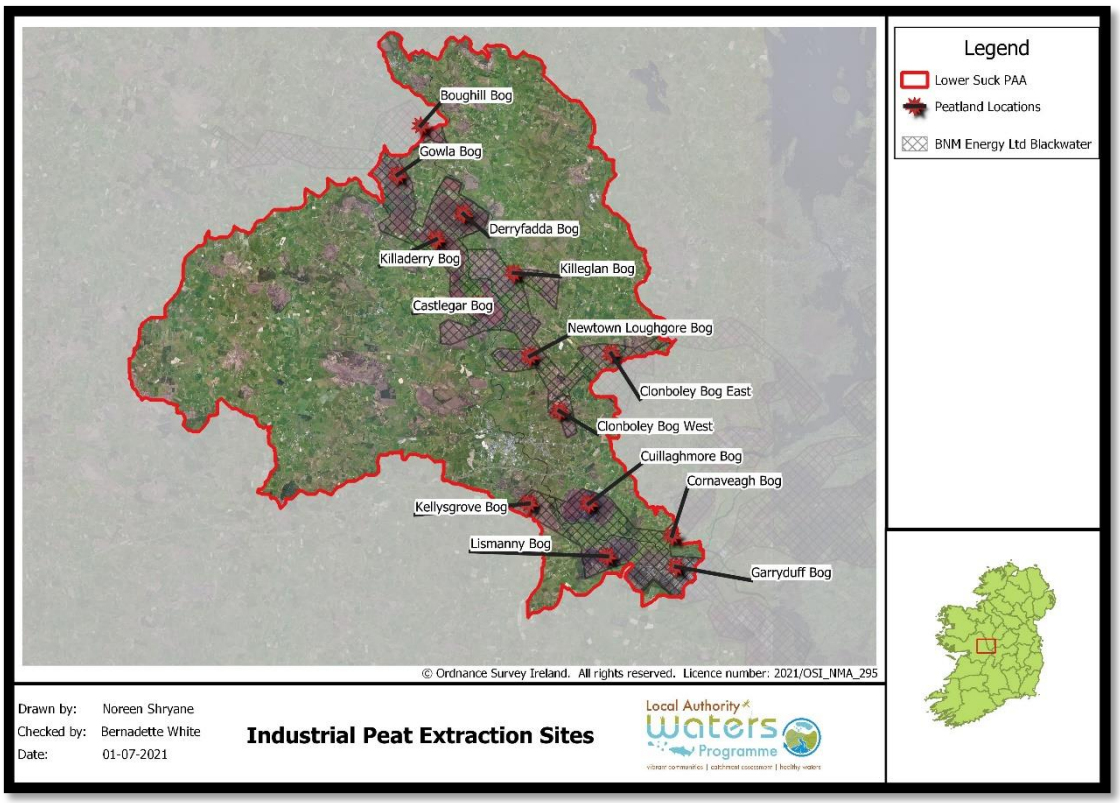

Figure 7 Peat Extractive Industries within the Lower Suck PAA

3.1.3 Agriculture (Sub Category- Pasture and Farmyards)

Agriculture has been identified as a significant pressure on the Lughanagh_010, Killegan Trib North-010, Killeglan_010, Ahascragh_030, Derrymullan Stream_010, Cuilleen Stream_010.

[16] Kellysgrove Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2020
[17] Garryduff Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2020
[18] Castlegar Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2020

The dominant soils in the Lower Suck PAA are deep well drained mineral, deep poorly drained mineral, poorly drained mineral soils with peaty topsoil and cutaway peat. The near surface phosphate susceptibility is high for most of the PAA (Rank 1-3) with the dominant pathway being overland flow for phosphate due to the extensive presence of peat and poorly drained soils in the PAA (**Figure 8**). There are some smaller pockets of high susceptibility for near surface and sub surface nitrate scattered throughout the PAA on the well-drained soils (**Figure 9** and **Figure 10**) . In the main Suck River channel, there is mineral alluvium however there is 90% "Cutover peat" along all the river channels and in the surrounding land drainage network. This indicates that ammonia and sediment may be an issue also.

There are 5 herdowners within the PAA with a derogation. The average farm size is 77kgs N/Ha. There are approximately 20 herd owners farming between the 170kgs-210kgs of nitrogen per hectare (None of these have an approved derogation) and 8 herdowners farming above 210kgs. Of the 8 herdowners farming above the 210kgs only 2 of these have a derogation. While the remaining 6 herdowners do not have a derogation[19], they are required by law (Nitrates Directive) to have one. One possible explanation for this is that these herdowners may have lost rented or leased land while still maintaining the same livestock numbers. The reduction in land would have increased the nitrogen per hectare over the 170kgs of N/hectare. This information is based on the 2019 LPIS data.

EPA Characterisation identified nutrient pollution impacts on the **Lughanagh_010** and **Ahascragh_030**. The sub basins are a mix of peat and poorly drained along the river channel and well drained in the wider sub basins. There is 1 derogation farm in the Ahascragh_030 sub basin (2019 LPIS data). There is no notable land use changes in either sub basin. The highest PIP P rank (Rank 1-3) is linked to pasture along the main channel in the Ahascragh_030 sub basin.

EPA Characterisation identified nutrient pollution and other significant impacts (Sediment) on the **Killegan Trib North_010.** The EPA Biologist noted diffuse agricultural pollution and siltation suspected. However, there is no Q value data for this waterbody. Roscommon CoCo noted some farm visits carried out in area and DWWTS inspection with Associated improvement works completed. The sub basin is a mix of peat and poorly drained along the river channel and well drained in the wider basin. There are no derogation farms in the Killegan Trib North sub basin (2019 LPIS data).

EPA Characterisation identified nutrient pollution and other significant impacts (Sediment) on the **Killeglan_010.** The impact assessment indicated that there was no notable changes in landuse. The EPA Storyboard for the 3rd cycle River Basin Management Plans (RBMP) indicates from the EPA biologist that diffuse agricultural pollution and siltation was suspected. There was moderate shading which resulted in little plant growth. The DO was low at 89%. The river was deepened and widened historically. The nitrate and phosphate Pollution Impact Potential (PIP) was relatively low in this WB. The sub basin is predominately well drained with a pocket of peat and poorly drained areas along the river channel and flood plain. There are no derogation farms in the Killeglan_010 sub basin (2019 LPIS data).

EPA Characterisation identified nutrient pollution and other significant impacts (Sediment) on the **Cuilleen Stream_010.** The impact assessment indicated that N & P PIP was predominantly low across this waterbody, however there are areas of highest rank P PIP (particularly Surface Water) coinciding

[19] The derogation is based on all the land the herdowner is farming subject to their Basic Payment Application in that year of applying for the derogation. Some of this land may be outside of the PAA.

with pastures in the centre of and to the south West of the sub-basin. The EPA Biologist noted nutrient pollution and siltation from diffuse agricultural activity suspected as primary pressure. The 2017 EPA Biological assessment noted sedimentation as a result of clearance of a tributary may be a contributing factor. The soils in the sub basin are predominately peat.

Roscommon County Council have noted that land use changes including the importing of large amounts of chicken manure for vegetable production in recent years, including very poor storage practices was a likely issue, although these issues were resolved in 2018. A watching brief may be required here. The most notable land use change (Corine 12-18) was an area upstream of the deteriorated station (Bridge u/s Suck River confl.) of 32 Ha which changed from Conifer to transitional woodland with potential felling and replanting issues.

EPA Characterisation identified nutrient pollution on the **Derrymullan Stream_010.** The impact assessment indicated that the predominant landuse is pastoral, high P PIP is limited to the southern portion of the sub-basin. There is one derogation farm in the sub basin (2019 LPIS data). The Sub basin is predominately well drained in the northern section and an area of poorly drained soil to the southern boundary. There was a 1% increase in forestry and 1% decrease in Agriculture which suggests potential planting upstream of monitoring station. The EPA biologist noted indication of nutrients and diffuse agriculture suspected. There was an overabundance of macrophytes and DO saturation was indicative of nutrients.

The FarmPEAT[20] (**Farm P**ayments for **E**cological and **A**gricultural **T**ransitions) Project is developing a locally-led, innovative, results-based farm scheme for farmers who manage lands that surround some of Ireland's finest remaining raised bogs. The programme will reward farmers for improved management of habitats on peat soils along with other important landscape features such as eskers, field boundaries and watercourses. Clonboley Bog East in the Suck_130 and Killegaln_010 sub basins is part of the project area.

[20] FarmPEAT Project

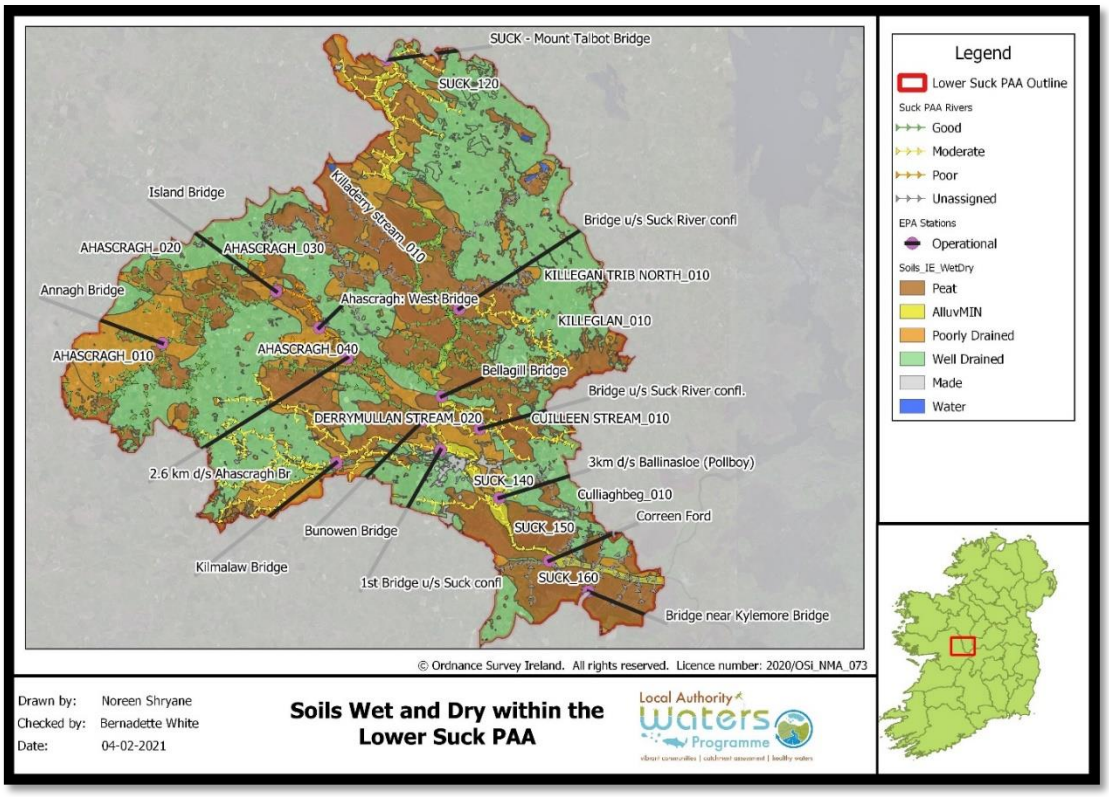

Figure 8 Soils Wet and Dry Map for the Lower Suck PAA

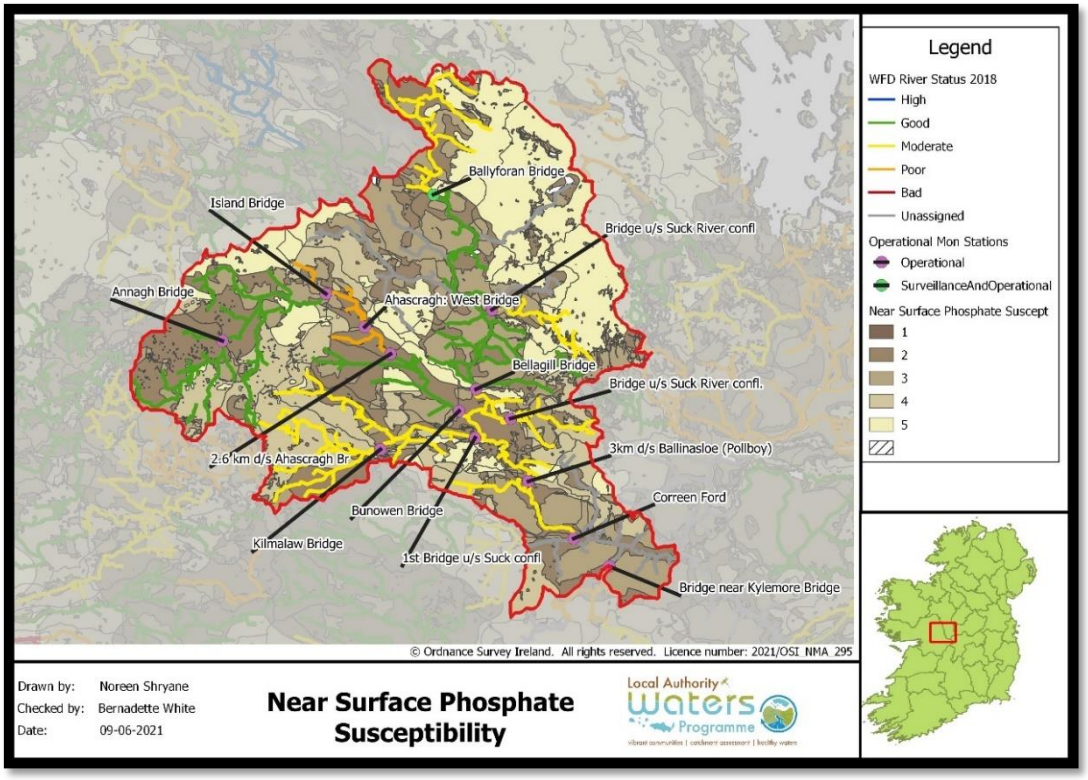

Figure 9 Near surface phosphate susceptibility for the Lower Suck PAA

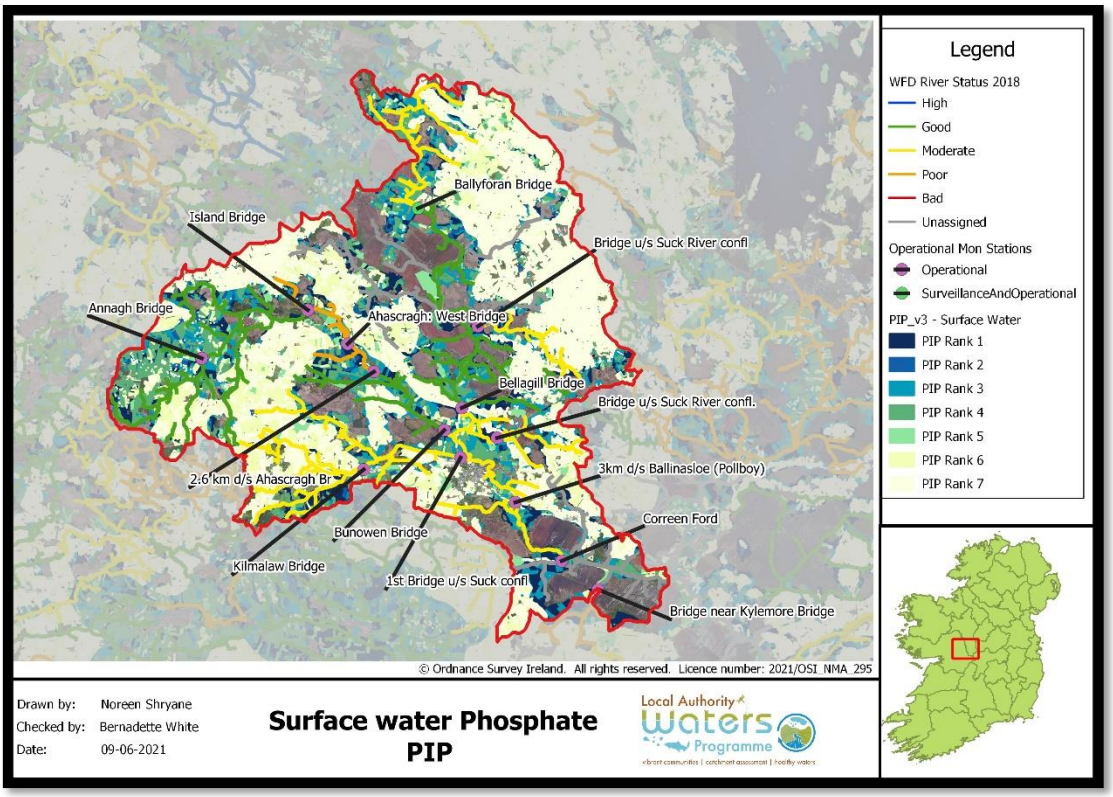

Figure 10 Surface water Phosphate PIP for the Lower Suck PAA

3.1.4 Domestic Waste Water (Sub Category- Single House Discharges)

Domestic Waste Water for Single House discharges has been identified as a significant pressure for the Ahascragh_030 and the Cuilleen Stream_010.

EPA Characterisation identified nutrient pollution impacts on the **Ahascragh_030** with Septic tanks mapped on areas of high susceptibility. The Ahascragh_030 has the highest risk zone in the PAA (Rank 1A and 1B).This is due to a concentration of inadequate septic tank systems being located on areas of poorly draining soils and subsoils or on shallow bedrock, where soil percolation is unable to mitigate the discharge. The significant issue associated with this is excess nutrients. There is a very high likelihood of inadequate percolation in the Ahascragh_030 sub basin due to predominately peat and poorly drained soils. A Pers. Comms from Galway County Council has informed LAWPRO that there were no inspections in 2020 and for 2021 to date (April 2021). This area will be crossed referenced with the risk zones and the National Inspection Plan (NIP) and it will be added to the areas to be inspected going forward.

EPA Characterisation identified nutrient pollution impacts on the **Cuilleen Stream_010.** There is a moderate likelihood of inadequate percolation in the sub basin. Roscommon County Council have informed LAWPRO that because the area is not a high-risk zone it does not fit into the NIP. A review of the risk zones and NIP will take place in the coming weeks with a view to complete more inspections in this area in 2021 (April 2021).

There are clusters of DWWTS Inspections under the National Inspection Plan in Ballinasloe with a few of these non-compliant. There is a very high likelihood of inadequate percolation to the west and

south of the PAA on peat, poorly drained and well drained soils (**Figure 11**). DWWTS may very well be a significant issue across a significant portion of the PAA and not the Ahascragh_030 and Cuilleen Stream_010 alone.

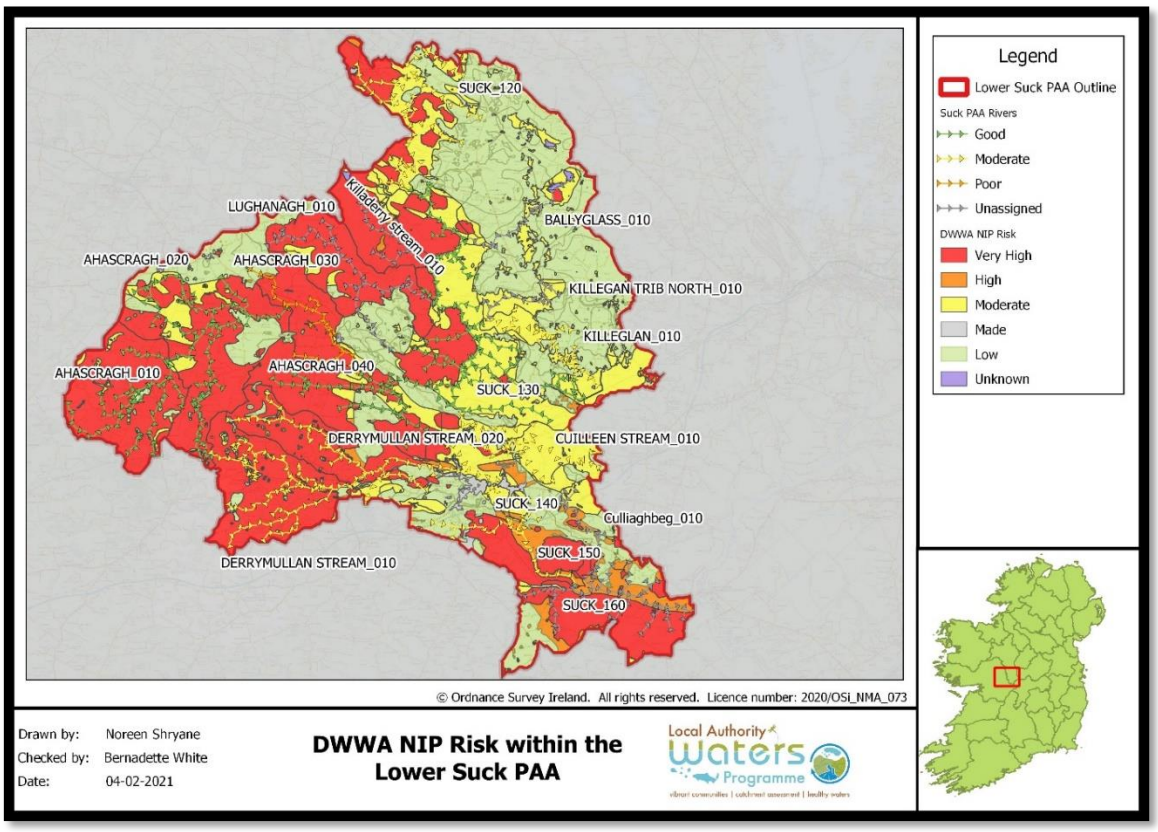

Figure 11 Inadequate Percolation risk within the Lower Suck PAA

3.1.5 Forestry (Sub Category - Forestry)

Forestry has been identified as a significant pressure on the **Lughanagh_010** waterbody. EPA Characterisation identified nutrient pollution and altered habitat due to morphological changes impacts. The only obvious land use change is located 2.6 km upstream of the monitoring station (**LUGHANAGH - Interstitial, Lissyegan Br**), where 13.8Ha of pasture converted to transitional woodland scrub sometime between 2012 and 2018.

Within Coillte plantations, the main species planted within the sub basin is Sitka Spruce as illustrated in **Figure 12** below. The second most common species is Ash. For Sitka Spruce and Ash, the majority of planting took place in the 1990's (**Table 11**) and therefore would have been subject to new Forest Service guidelines regarding buffer zone management along watercourses e.g. within the buffer zone, ground preparation and other forest operations curtailed in order to protect water quality. In addition, drainage channels leading from the site must taper out before entering the buffer zone.

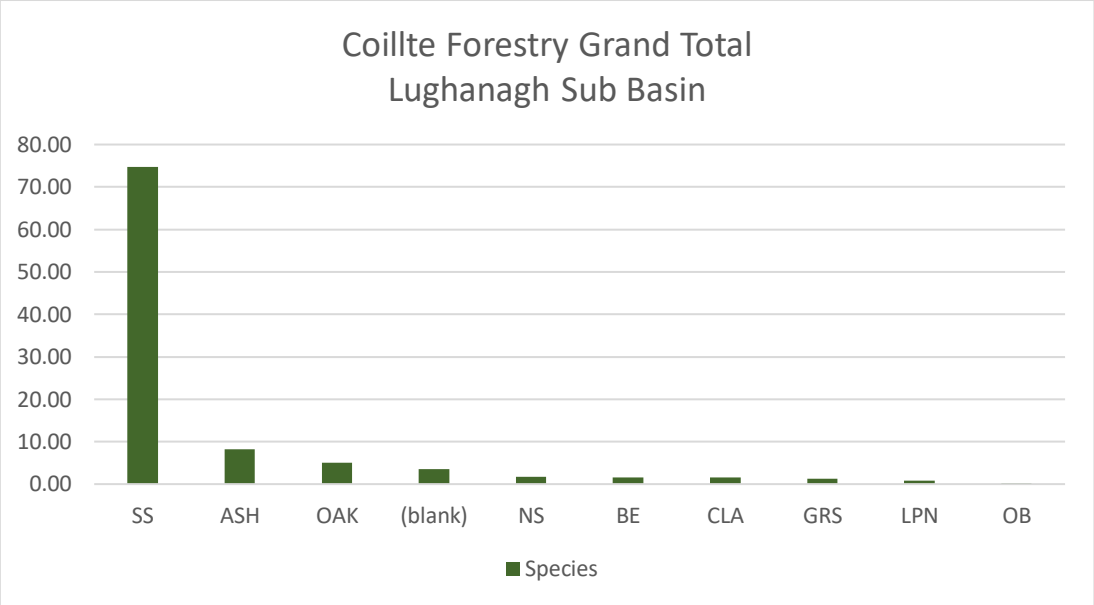

Figure 12 Species type by area (hectare) within Coillte forestry in the Lughanagh_010 Sub Basin

Table 11 Profile of Coillte forestry planting within the Lughanagh_010 Sub Basin

Sum of Hectare		
Row Labels	**Sitka Spruce**	**Ash**
1978	1.78	
1981		8.24
1987	3.10	
1994	17.27	
1996	35.95	
1997	6.59	
1999	10.03	
Total	**74.71**	**8.24**

Within private plantations, the main species planted within the sub basin is Sitka Spruce as illustrated in **Figure 13** below. The second most common species is Conifer young spruce. For Sitka Spruce and Conifer young spruce (CYS) the majority of planting took place in the 1990's (**Table 12)** and therefore would have been subject to new Forest Service guidelines regarding buffer zone management along watercourses e.g. within the buffer zone, ground preparation and other forest operations curtailed in order to protect water quality. In addition, drainage channels leading from the site must taper out before entering the buffer zone.

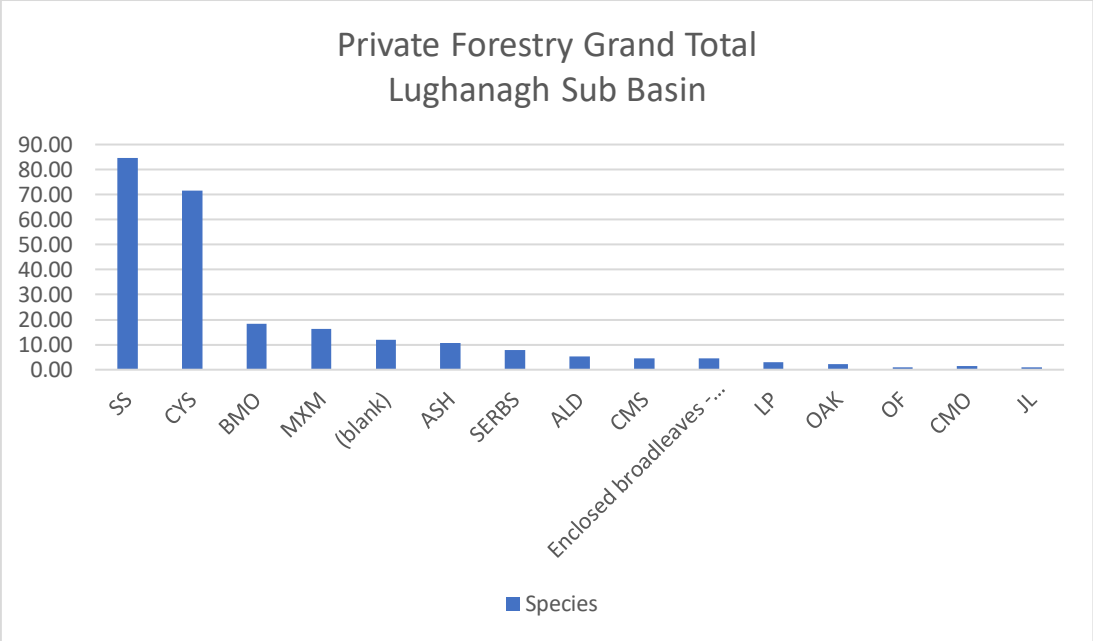

Figure 13 Species type by area (hectare) within private forestry in the Lughanagh_010 Sub Basin

Table 12 Profile of private forestry planting within the Lughanagh_010 Sub Basin

Sum of Hectare		
Row Labels	**Sitka Spruce**	**CYS**
		71.62
1992	4.63	
1993	6.15	
1994	10.04	
1996	11.58	
1998	7.79	
2002	6.62	
2007	4.69	
2009	7.27	
2010	2.39	
2011	4.43	
2013	3.16	
2014	15.88	
Total	**84.63**	**71.62**

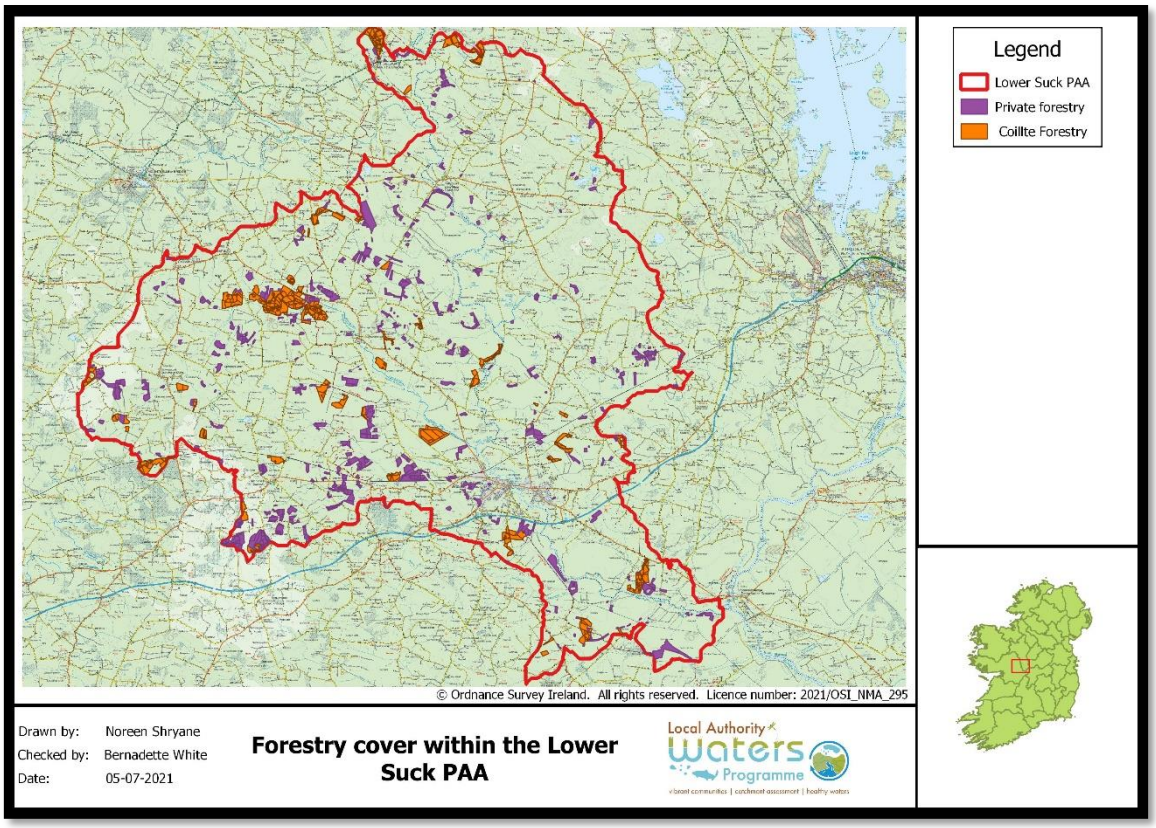

Figure 14 Forestry Cover within the Lower Suck PAA

3.1.6 Anthropogenic (Unknown)

Anthropogenic has been identified as a significant pressure on the Derrymullan_020 waterbody. EPA Characterisation identified Other significant impacts. Derrymullan Stream_020 has deteriorated in status from High Status in the 2010-2012 monitoring period to Moderate status in the 2010-2015 monitoring period, however there are no indications of nutrient or siltation issues, and therefore the specific pressure that has driven the biology status requires further investigation. The only notable land use change in the sub basin between 2012 and 2018 was the planting of approximately 89ha of private coniferous forest which was originally transitional woodland scrub. These areas are upstream of the EPA operational monitoring station.

3.1.7 Urban Waste Water (Agglomeration PE<500)

The Ahascragh Agglomeration has been identified as a significant pressure on the Ahascragh_030 river waterbody. EPA Characterisation identified nutrient and organic pollution impacts. The impact assessment on EDEN details that in 2010-2015 Cycle 2 that nutrient enrichment was recorded downstream of the discharge with operational issues noted at this WWTP. For the 2013-2018 Cycle 3 Update; the EPA Operational station (**2.6km d/s Ahascragh Bridge**) , which is approximately 1.5km d/s of the discharge, deteriorated from Moderate to Poor in 2017. Ortho-phosphate concentrations are low in this waterbody, however, an ecological survey in 2017 noted signs of nutrient enrichment. The Plant is on the EPA Priority List as no treatment/preliminary treatment is in place and has been identified under the National Certificate of Authorisation programme (NCAP) as requiring improvements.

The existing WwTP consist of primary treatment only and has a current population equivalent of 341 (July 2016) and the capacity of the plant is approximately 500 p.e. The network has 2 pumping stations which do not have an emergency overflow built into them. The EPA Office of Environmental Enforcement (OEE) 2018 site visit report details the following*: Irish Water stated during heavy rainfall, the pumps may be unable to cope with the large flows and the pump chambers can flood and overflow to ground at the pump station. In addition, the sewer line can back up and discharge via the storm water overflow located at Main Street Bridge. This discharges to the Mill Race Stream, which is a tributary of the Ahascragh River. To date such incidents have not been reported to the EPA.* The wastewater is pumped to an Imhoff tank South east of the village. The settled sludge is removed from the tank 6 times a year and taken to Ballinasloe WwTP for further treatment.

There has been issues with the duty and standby pumps between May 2018 and May 2019. The pumps became air locked and thus could not pump forward resulting in an uncontrolled release to ground. These incidents were not reported to the EPA*. Irish Water stated in future pumping station incidents will be reported to the EPA.*
There are three discharges within the agglomeration, one primary discharge (SW1) and two SWOs, (one located in the village and a SWO associated with the Imhoff tank which discharges via SW1).

The upstream compliance monitoring for the COA is undertaken 120m upstream of the primary discharge point and the downstream compliance monitoring location is undertaken 128m downstream of the primary discharge point (**Figure 15**). A site visit took place in June 2019 with the EPA and LAWPRO. Chemical analysis of water samples taken from the receiving water upstream and downstream of the discharge points on the day of the site visit did not show any deterioration in water quality. During the inspection, it was noted that the pump station is susceptible to surcharges due to lack of storm water storage/controls in the network. Irish Water have stated that the WWTP will be upgraded by 2023 to provide for secondary treatment. Any upgrade works should also include the pump station and storm water storage/controls. Irish Water shall take all necessary measures to ensure that discharges from the Ahascragh agglomeration (Reg. No. A0548-01) do not prevent the receiving waters from meeting their environmental objectives. LAWPRO carried out a local catchment assessment in the form of macroinvertebrate sampling, visual assessments and stream walks upstream and downstream of the discharge, to assist in determining whether or not the agglomeration is a significant pressure on the waterbody. The downstream site had a higher SSIS score (6.4) compared to the upstream site (3.2). The downstream site was a riffle compared to a glide habitat upstream. The presence of Isoperla and the absence of Asellus at the downstream site led to a higher score. EPA biological monitoring results indicates that the water quality declines downstream of the WwTP (**2.6km d/s Ahascragh Bridge)** but improves again by **Bunowen Bridge** which is approximately 8km downstream of the WwTP Discharge.

Currently over 300 wheelie bins of untreated wastewater is discharged to the (Bunowen) Ahascragh River per day[21]. There is also a storm water overflow in the village which operates during times of rainfall and discharges unscreened and untreated wastewater to the Mill Stream which is upstream of the drinking water abstraction point on the Bunowen (Ahascragh) River.

The Ahascragh Sewerage Scheme is currently in the design and pre planning stage for the following improvements:

[21] Ahascragh Sewerage Scheme | Our Projects | Irish Water

- Upgrading of the existing wastewater treatment plant to provide secondary treatment that will serve a population equivalent of 470
- Improvements to the storm water overflow which will involve works to ensure compliance under the relevant standards
- Improvements to the existing main pumping station including pumps, mechanical plant and a storm water storage tank
- Testing and commissioning of the works

An assimilative capacity calculation was performed using upstream notional clean figures and treatment removal efficiency and estimated effluent concentrations[22]. There was no assimilative capacity issue and no headroom issue with this plant for BOD, ortho-phosphate and ammonia. Based on LAWPRO's decision tree for the assessment of urban wastewater as a significant pressure, the deskstudy indicates that UWW is a significant pressure and the impact will be assessed through LCA using the Certificate of Authorisation methodology.

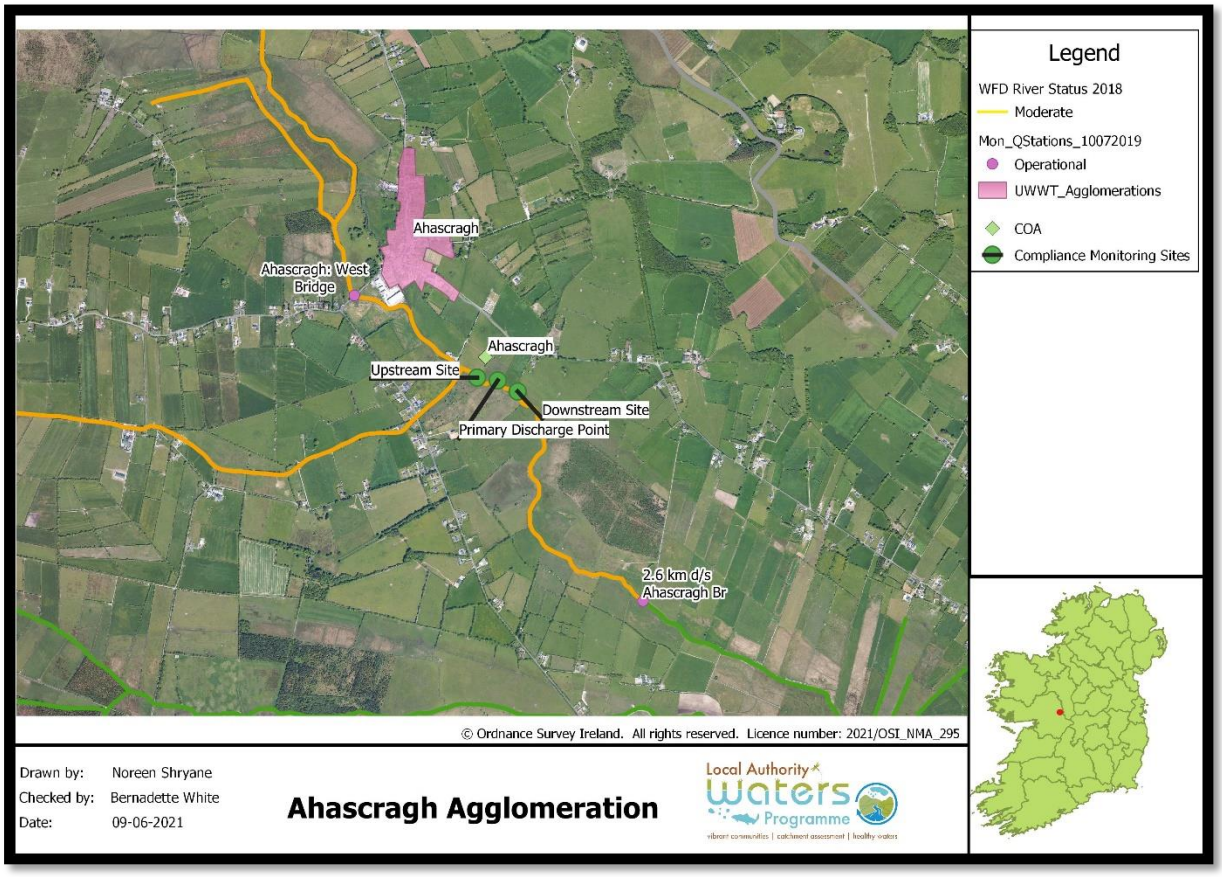

Figure 15 Ahascragh agglomeration map

[22] LAWPRO Assessment of Urban Wastewater as Significant pressure (Focusing on Primary Discharge)

3.2 Other issues and pressures in the PAA

3.2.1 Pesticides

One of the selection reasons for this PAA was due to pesticide exceedances associated with the Ballinasloe Public Water Supply at the drinking water abstractions on the Ahascragh_040 and Suck_140 . The Ballinasloe Water supply exceeded the pesticide in drinking water threshold (**Table 13**) once in 2017 and once in 2018 and for 3 consecutive months in 2019 for MCPA. In 2020, the water supply exceeded the threshold once for glyphosate (**Table 14**). The analysis is of treated water. The LCA will include observations of pesticide misuse or overuse near waterbodies and their drainage networks.

Table 13 Pesticide exceedance thresholds

Pesticides (individual)	0.10	µg/l
Aldrin, dieldrin, heptachlor and heptachlor epoxide[1]	0.030	µg /l
Pesticides - Total	0.50	µg/l

Table 14 Pesticide exceedances in the Ballinasloe Public Water Supply (Ahascragh_040, Suck_140)[23]

Year	2017	2018	2019	2020	2021
Mar	NR				
April	NR	MCPA 0.016	MCPA 0.113	NR	MCPA <0.005
May	MCPA 0.066	MCPA 0.01	MCPA 0.108	MCPA 0.01	MCPA 0.01
Jun	MCPA 0.081	MCPA 0.113	MCPA 0.108	MCPA <0.005	
July	MCPA 0.044	MCPA 0.012		MCPA 0.05	
Aug	MCPA 0.364	MCPA <0.005		Glyphosate 0.17	
Sept	MCPA 0.056	MCPA 0.054		MCPA <0.012	
Oct	MCPA 0.053	MCPA 0.019		MCPA 0.031	
Nov	MCPA 0.016	MCPA <0.005		MCPA <0.012	

In 2019, ASSAP with the assistance of LAWPRO held two farm events walks, one in Ballinasloe and the other in Athleague on Sustainable Control of Rushes and other Grassland Weeds. The events focused on the use of weed lickers, boom sprayers, flail mower on quad, sprayer inspections, buffer zones, best practice and water quality.

[23] Source: Irish Water, Q2 2019, Q3 2020, Q2 2021

3.2.2 Hydromorphology – Land drainage

The presence of land drainage may lead to an increase in the amount of water and fine sediment that enters a river water body if that feature is connected to the water body. This in turn can alter hydrological and sediment regimes which subsequently may alter morphological conditions. There is an extensive land drainage network throughout the PAA as illustrated in **Figure 16.**

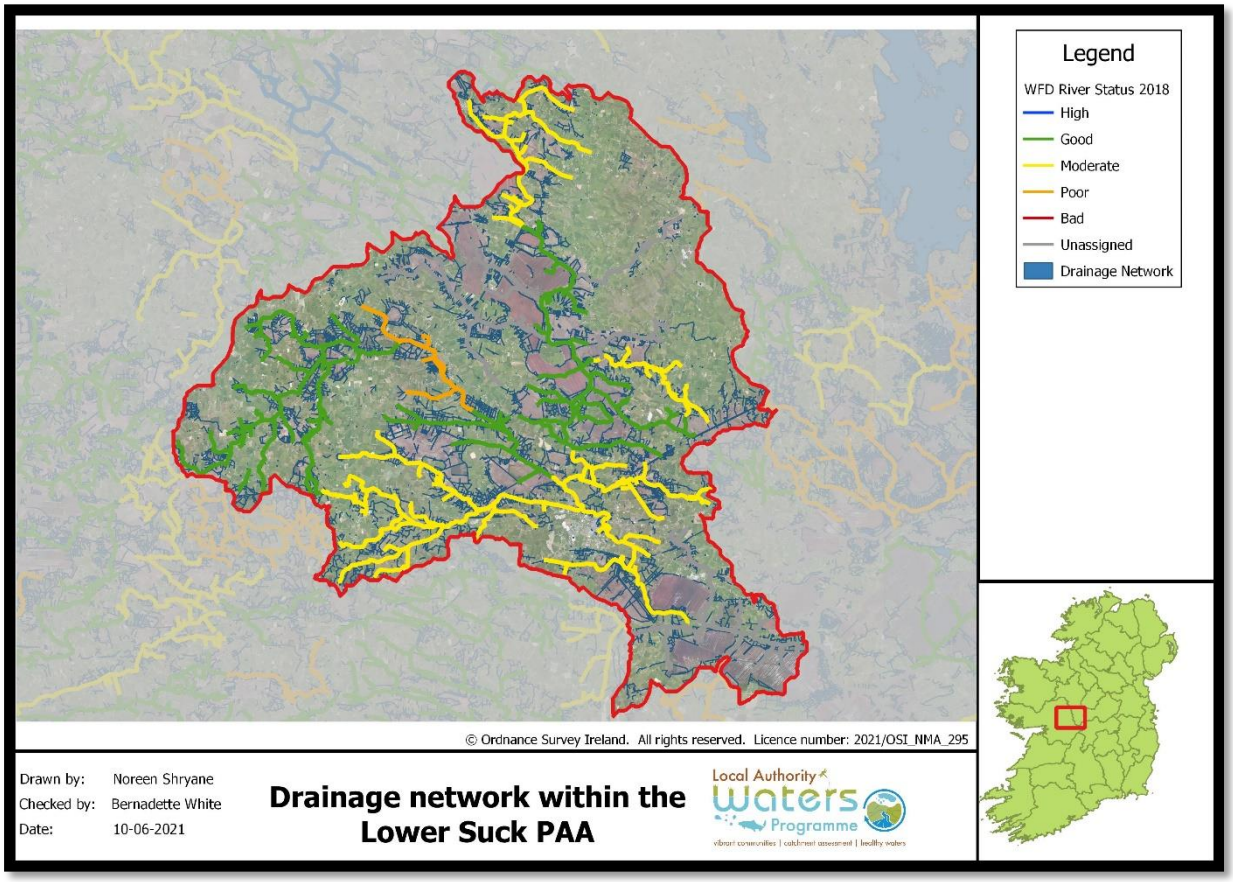

Figure 16 Land drainage network within the Lower Suck PAA

3.2.3 Urban Waste Water (Agglomeration PE of 500 -1000)

The Ballygar WwTp was not identified as a significant pressure at the initial characterisation stage. The reason for this is the chemistry still indicates that the mean annual concentrations for ortho - phosphate and ammonia are below the EQS for High status.

The WWTP is located in the upper reach of a tributary of the Suck_120 (**Figure 17**).The Plant Design PE 360 but the Agglomeration PE is 744 so it would appear overloaded. The treatment plant in was constructed circa the early 1960's. The treatment works comprises a traditional percolating filter system preceded by primary treatment in an Imhoff tank and is followed by secondary treatment in humus tanks. The treatment system was originally designed to treat a population equivalent of approximately 350. Raw wastewater gravitates to the treatment plant via a combined 300mm sewer through mechanical screens. The main flow discharges into the Imhoff tank, while surplus flows overflow via a storm sewer to the treated effluent chamber. Settled sewage is siphoned from the Imhoff tank to the two percolating filters operating in parallel using an ejector system. Sludge is taken by tanker approximately monthly for further treatment to Tuam WwTP.

There were exceedances in BOD, COD and suspended solids in 2018 and 2019. *The WWTP is non-compliant with the ELV's set in the Wastewater Discharge Licence with the Plant being under capacity and not fit for purpose (2019 Irish Water AER) .* Based on ambient monitoring results; a deterioration in ammonia and ortho-phosphate concentrations downstream of the effluent discharge was noted in the 2019 AER. The upstream ambient monitoring is undertaken 280m upstream of the WwTP and the downstream ambient monitoring is undertaken 130m downstream of the WwTP (EPA Investigative Station: TPEFF1200D0372SW001) (**Figure 17**).

An assimilative capacity calculation was performed using 2019 AER data. There was a serious assimilative capacity and headroom issue with this plant for BOD, ortho-phosphate and ammonia. Based on LAWPRO's decision tree for the assessment of urban wastewater as a significant pressure, the deskstudy indicates that UWW is a significant pressure and the impact will be assessed through LCA using our LCA methodology.

It is proposed to upgrade the existing WwTP to provide for a design loading of 1,100 PE. As part of the upgrade WwTP works it is expected that, a new inlet works, primary settlement tank, biological filter, final settlement tank and sludge drying beds will be installed. The completion date is post 2024.

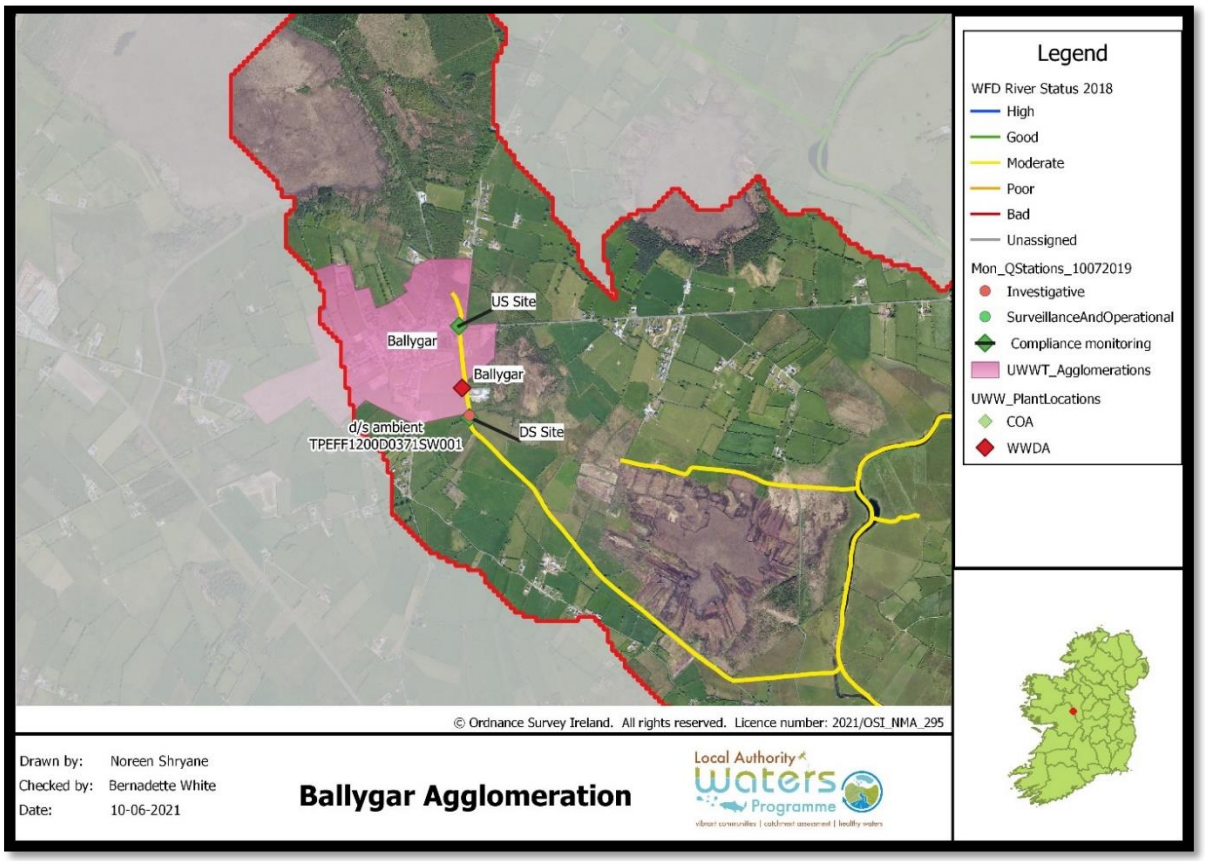

Figure 17 Ballygar agglomeration map

3.2.4 Urban Waste Water (Agglomeration PE >10,000)

The Ballinasloe WwTP was not identified as a significant pressure at the initial characterisation stage. The WwTP is located on the eastern outskirts of the town and on the southern bank of the Suck_140 (**Figure 18**). The plant was upgraded to cater for a design loading from a population equivalent of 13,500 in 2006 (Phase 1 upgrade). The inlet and outlet works were designed for an ultimate population equivalent of 18,000. The agglomeration is served by 2 wastewater treatment plants. The primary WWTP has a capacity of 13,500PE and the capacity of the second WWTP is unknown. The treatment processes include the following:- WWTP 1: Preliminary Treatment (screening & grit removal), Secondary Treatment (conventional activated sludge) and Nutrient Removal (chemical dosing for phosphorus removal). The WWTP 2 has Primary Treatment (Imhoff tank).

In 2016 WWTP 1 was non-compliant with the ELV's set in the wastewater discharge licence. There were 3 samples non-compliant with the ELVs in relation to ortho-phosphate and ammonia N. The non-compliance is due to breakdown of equipment. An OEE audit which took place in 2017 found that the discharge from the secondary discharge point was not discontinued (Condition 5.4 and Schedule C of licence) and advised that this be done as soon as practicably possible. The EPA opened a compliance investigation (Ref: CI001135) regarding this matter and Irish Water have stated they are progressing plans to connect the secondary discharge to the sewer network (2019 OEE Audit Report). In 2017 WWTP 2 was non-compliant with the ELV's set in the wastewater discharge licence. There were 33 samples non-compliant with the ELVs in relation to BOD (mg/l), COD (mg/l), TSS (mg/l). The non-compliance is due to this plant has only primary settlement. In 2019, based on ambient monitoring results; a deterioration in Ortho-Phosphate concentrations downstream of the effluent discharge was noted. A deterioration in water quality has been identified; however, it is not known if it is caused by the WWTP.

The upstream compliance monitoring is undertaken at the EPA investigative monitoring station (Upstream of TPEFF1200D0032SW001 &TPEFF1200D0032SW002) and the downstream compliance monitoring is undertaken at the EPA operational station (3km d/s Ballinasloe (Pollboy). There has been no exceedances in the annual mean EQS for ammonia or orthophosphate at either station since 2010 however there has been some individual exceedances in ammonia and BOD since 2018 at the upstream and downstream stations.

Ballinasloe WWTP receives leachate from Pollboy and Kilconnell Landfills in County Galway. It has accepted leachate from Pollboy Landfill in Ballinasloe for the past number of years but has only started to accept leachate from Kilconnell Landfill since the end of 2016. The leachate from Pollboy Landfill enters the plant via a rising main to the inlet chamber of the WWTP. Leachate is pre-treated in the landfill leachate lagoon using aerators to reduce the concentration of methane. The volume of leachate received from Pollboy Landfill for 2016 was measured at 43,800 m 3 (AER 2016). Pollboy landfill has been closed for a number of years and therefore its leachate is a low strength leachate (0-200 mg N/l). All parameters measured are below the activated sludge inhibition threshold levels.

Leachate from Kilconnell Landfill is transported to the WWTP via tankers. Kilconnell Landfill is an active landfill and its leachate is of a medium strength (201-1,000 mg N/l). All parameters measured are below the activated sludge inhibition threshold levels with the exception of ammonia. Leachate from Kilconnell landfill is drip fed to the treatment process stream from a holding tank. The final effluent from the plant was non-compliant for one sample of ammonia and two samples of ortho-phosphate in 2016. However, this was due to a breakdown of plant equipment and the non-compliances in are

not considered to be due to the discharge of leachate. The final effluent was compliant for all parameters in 2015.

An assimilative capacity calculation was performed using 2019 and 2020 AER Data. There was no assimilative capacity or headroom issue with this plant. Based on LAWPRO's decision tree for the assessment of urban wastewater as a significant pressure, the deskstudy indicates that UWW is a significant pressure and the impact will be assessed through LCA using our LCA methodology.

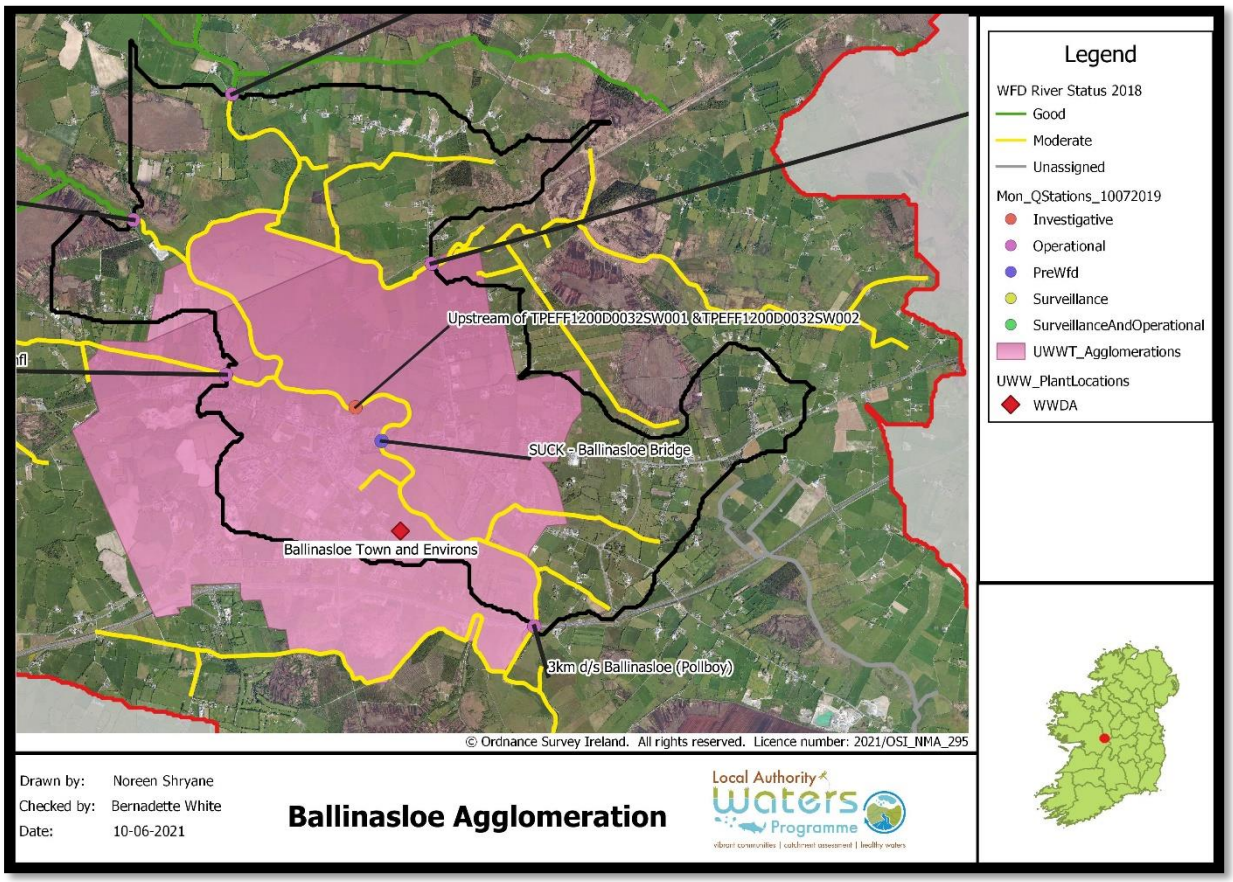

Figure 18 Ballinasloe agglomeration map

3.2.5 Poolboy Landfill

Poolboy landfill is approximately 1.5 kilometres south of Ballinasloe. The landfill is not identified as a significant pressure however EPA surface and groundwater monitoring results from 2018-2020 shows elevated ammonia, ortho-phosphate, and BOD readings across a number of sites. The 23-hectare site accommodates a mounded landfill facility which ceased operations (from 31st December 2005) and has now been capped. The landfill comprises of both an unlined portion (c.7.1 hectares) and a lined portion (c.3.3 hectares). Leachate is collected from both portions of the landfill. In the case of the lined landfill leachate is collected from each of the lined cells and pumped to the leachate lagoon. In the case of the unlined section the underlying groundwater contaminated with the leachate flows in a north-easterly direction where it is captured by an interceptor drain system which runs along the southern boundary (to capture leachate run-off from the southern slopes of the landfill) and eastern

boundary of the site. Leachate collected in the interceptor drain is likewise pumped to the leachate settlement lagoon. This then further pumped to the Ballinasloe Wastewater Treatment Facility approximately 1 kilometre to the north-east of the landfill. A small stream, the Loughbrown Stream flows along the southern boundary of the site. It discharges into the River Suck approximately 2km away.

An application for an Integrated Constructed Wetland (ICW) was submitted by Galway County Council to An Bord Pleanála in July 2016 and has been approved with conditions one of which is that no leachate from the proposed ICW shall be discharged to the Loughbrown Stream.

There were no exceedances in the surface or groundwater Emission limit values (ELVs) in the 2020 Annual Environmental Return (AER). In the 2019 AER, there were elevations in the DO, ammonia and COD at SW1,SW3,SW4, SW6 and SW8 and elevated conductivity, chloride and ammonia at the groundwater wells. In the 2018 AER, there were no exceedances in the surface water parameters however there were exceedances in ammonia, total solids, potassium, calcium, manganese, nickel, zinc, cadmium, lead and mercury at MW6. There were exceedances at MW3 for ammonia, cyanide, total solids, potassium, calcium, manganese, nickel, zinc, cadmium, lead and mercury. The nearest downstream EPA monitoring station is **Correen Ford** on the Suck_150 (**Figure 19**). The EPA monitoring results do not indicate an issue with ammonia or orthophosphate at this station. In order to see if the nutrients are coming from the same source a statistical correlation was under taken. There is a weak correlation between ammonia and BOD (R2 = 0.1745) and between ammonia and orthophosphate (R2 = 0.000004) which suggests they are not originating from the same source.

Table 15 Surface Water Monitoring at Pollboy Landfill (OEE Site visit reports)

Date	Station	Ammonia (mg/L)	BOD (mg/L)	Ortho-phosphate (mg/L)
05/05/2020	Surface Water 8	0.064	1.1	0.013
05/05/2020	Surface Water 1	0.072	1.9	0.011
05/05/2020	RC3 (Groundwater)	11	-	<0.01
05/05/2020	MW1 (Groundwater)	7.3	-	0.045
05/05/2020	RC2 (Groundwater)	1.2	-	0.020
28/11/2019	Surface Water 8	0.089	<6	0.01
28/11/2019	Surface Water 1	3.7	6.1	0.010
28/11/2019	RC2 (Groundwater)	1.2	-	0.011
28/11/2019	RC3 (Groundwater)	10	-	0.024
28/11/2019	MW1 (Groundwater)	7.2	-	<0.01

Date	Station	Ammonia (mg/L)	BOD (mg/L)	Ortho-phosphate (mg/L)
08/03/2018	Surface Water 1	0.41	2.2	<0.01
08/03/2018	Surface Water 8	0.12	1.5	<0.01
08/03/2018	MW1 (Groundwater)	7.0	-	<0.01
08/03/2018	RC2 (Groundwater)	1.3	-	<0.01
08/03/2018	RC3 (Groundwater)	10	-	Not recorded

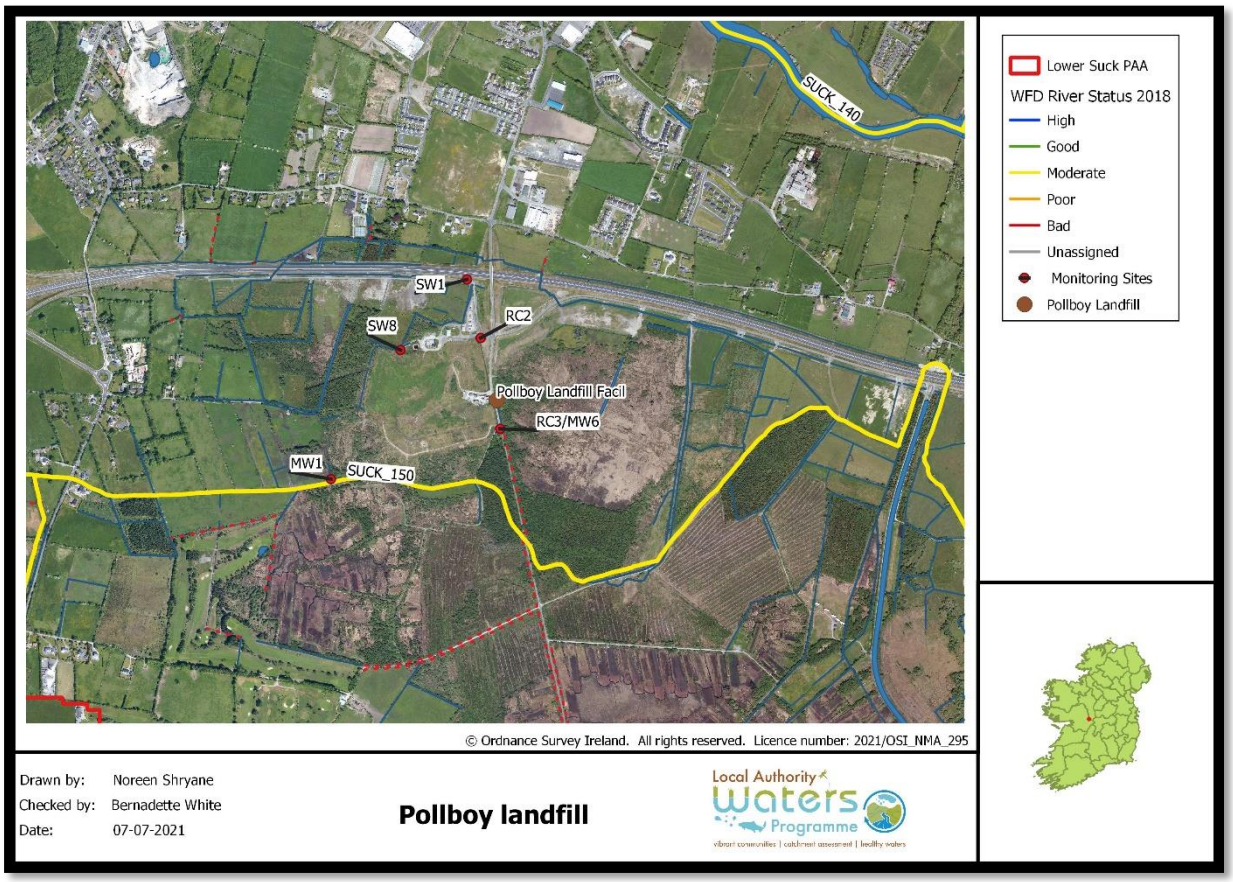

Figure 19 Poolboy Landfill

3.2.6 Industrial Pollution Control Licenses

Woodfarm Fencing Supplies (WFS) Ltd. is a wood processing and timber treatment plant at Clonbrock, Co. Galway. The IPC license was acquired on 27 March 1998 for carrying out activities involving "the treatment or protection of wood, involving the use of preservatives, with a capacity exceeding 10 tonnes per day". It is noted that WFS operates a business involving the preservation of wood and wood products with chemicals at a capacity of less than 75 m3 per day.

The 2013 Technical Amendment Hydrogeology Report for P0352-01[24] made the following findings:

- There are potential contaminant sources on site in the form of wood preservative solutions and hydrocarbon fuels. It is possible that some residual contaminant sources may be present within the subsoil.
- There are potential contaminant sources off site in the form of onsite wastewater treatment systems and various agricultural activities, including a manure heap and slatted shed adjacent to the eastern boundary of the current working area.
- The water quality data suggest that groundwater pollution may have occurred at the site. The pollution, if deriving from the site activities, is likely to have resulted from accidental spills and leaks associated with the site treatment processes. Detections of man-made components of wood preservatives which have not been used on site since 2004 in groundwater samples from 2006 onwards suggest that there may be some residual subsoil contamination.

Analysis and interpretation of the trends in the concentrations of the parameters/substances of concern ammonia, arsenic, boron, chromium, copper, benzylammonium chloride, tebuconazole & propiconazole, and lindane at the groundwater monitoring boreholes BH01 and BH02 and the surface water monitoring locations SW03 and SW04 indicates that there is no ongoing risk of soil or groundwater contamination associated with the site for any of these parameters.

Petrol Range Organic (PRO) and Diesel Range Organic (DRO) compounds were detected in the groundwater borehole BH01, which suggests that there is residual hydrocarbon contamination of the subsoil in the vicinity of the borehole. The source is considered to be from the historical wood treatment facilities which were located just to the east of borehole BH01. Water quality data for the BH02, SW03 and SW04 show that PRO concentrations are below the detection limit.

Water quality data for SW04 show that DRO concentrations slightly exceed the EPA Interim Guideline Value (IGV) Total Petroleum Hydrocarbons (TPH) threshold. The transport pathway is considered to be the capture of contaminated infiltrating water by buried surface water drainage beneath the site area which then provides a preferential pathway allowing the contaminated infiltration to discharge to the land drain running from the north-east corner of the site to SW04. This pathway could be broken by removing the preferential pathway which allows some contaminated site drainage to migrate north via land drains as far as SW04, i.e. by removing any drainage pipework from the land drain back as far as the northeast corner of the site boundary and then backfilling the land drain with subsoil.

[24] IPPC Licence Surrender – Report on Independent Closure Audit (October 2020)

3.2.7 Section 4s

There is one section 4 (**Thomas Hibbitt W/394/05**) within the Ahascragh_020 sub basin for a residential development at Pairc an Tobair in the village of Caltra. There are currently twelve houses built within the development (July 2021). There have been numerous exceedances of the discharge licence limits for BOD, suspended solids, total nitrogen, total phosphorus and orthophosphate (**Table 16**). There is no monitoring data since 2016. The discharge licence does not have a limit value for ammonia and it is not possible to get a figure for ammonia. The specification of the treatment plant installed did not mention ammonia. There is no flow meter at the treatment plant. The discharge licence application received during 2005 stated that the max flow to the plant per day would be 9m^3/day. It was not possible to undertake assimilative capacity calculations for this section 4 due to its distance from the Ahascragh River and the lack of hydrological connectivity.

Table 16 Compliance Monitoring for Thomas Hibbitt

Parameter	Discharge License limit	19th November 2015	15th December 2016
Ammonia N	Not available	-	-
BOD	20mg/l	40	29
Ortho-phosphate	1mg/l	-	8.11
Suspended Solids	30mg/l	67	4
Total Nitrogen	15mg/l	64.8	73.2
Total phosphorus	2mg/l	7.9	9.6

There are 2 Section 4s (**Mid-West Farmers Co-op Ltd (W043/78)** and **Ballinderry Nursing Home (W318/98)**) within the Derrymullan_010 sub basin. The Arrabawn Dairies facility in Kilconnell received a court fine when IFI staff noticed a discharge of polluting matter entering the Deerpark River in October 2019. Results from samples showed higher than recommended levels for a number of parameters, including Biochemical Oxygen Demand (BOD), ammonia and suspended solids.[25] There are no limits in the current discharge licence for ammonia, orthophosphate or total nitrogen or a max flow to the plant in the current discharge licence W 043/78. The discharge licence for Mid-West Farmers Co-op Ltd (Arrabawn) is currently under review (July 2021). This will be ongoing for some time due to the volume of effluent being discharged. Recent documents received by GCC stated that the current volume of discharge is 400m^3/day, which is sizeable.

Table 17 Compliance Monitoring for Mid-West Farmers Co-Op Ltd.

Parameter	Discharge License limit	21st March 2018	4th December 2019	25th November 2020
Ammonia N	Not available	31	38.92	0.13
BOD	25mg/l	40	6.4	3.3
Ortho-phosphate	Not available	0.291	0.073	0.01
Suspended Solids	35mg/l	31	38	3
Total Nitrogen	Not available	36.3	44	1.4
Total phosphorus	1mg/l	1.12	1.1	0.23

[25] Arrabawn Dairies fined following pollution of river - Agriland.ie

Ballinderry Nursing Home has a new effluent treatment plant installed since June 2020. There have been numerous exceedances of the discharge licence limits for BOD, suspended solids and total phosphorus (**Table 18**) prior to 2020. There are no limit values in the discharge licence for ammonia, orthophosphate or total nitrogen and there is no max flow to the treatment plant in the current discharge.

Table 18 Compliance Monitoring for Ballinderry Nursing Home

Parameter	Discharge License limit	21st June 2016	4th May 2017	3rd May 2018	22nd June 2021
Ammonia N	Not available	-	-	41.2	0.096
BOD	25mg/l	40	91	224	7
Ortho-phosphate	Not available				0.066
Suspended Solids	35mg/l	28	53	117	9
Total Nitrogen	Not available	25	-	55.2	6.8
Total phosphorus	2mg/l	12.5	13.8	21.6	0.91

There is one section 4 (**Western Health Board- St Brigids Hospital W05/78**) within the Suck_140 sub basin. There are no limit values in the discharge licence for ammonia, orthophosphate or total nitrogen and there is no flow data for this treatment plant. The plant is old and the volume of effluent being discharged to the plant is small as the Hospital is closed with just a few people who are still working at the Hospital.

Table 19 Compliance Monitoring for St Brigids Hospital

Parameter	Discharge License limit	7th July 2016	4th May 2017	11th November 2020
Ammonia N	Not available	-	0.007	3.83
BOD	25mg/l	<2	4	42
Ortho-phosphate	Not available	-	0.593	0.43
Suspended Solids	35mg/l	<2	5	34
Total Nitrogen	Not available	1.24	0.71	5.4
Total phosphorus	2mg/l	0.8	1	1.34

There is one Section 4 in the Suck_130 sub basin (**O'Connor Meat Products Ltd (Liffey Meats) WP-03-11**). There is ongoing enforcement around this discharge licence and compliance with limits. An assessment of the data will be undertaken once the data is received.

Table 20 Annual Mean Compliance Monitoring for Liffey Meats

Parameter	Discharge License limit	2018	2019	2020
Ammonia N	0.5mg/l	18.77	4.01	1.37
BOD	10mg/l	5.37	1.98	2.19
Ortho-phosphate	0.3mg/l	0.59	0.05	0.03

Suspended Solids	10mg/l	10.01	7.10	4.50
Nitrate	11mg/l	29.49	8.85	3.99

There is one Section 4 in the Suck_150 sub basin (**Ballinasloe Golf Club W475/13**).

Table 21 Annual Mean Compliance Monitoring for Ballinasloe Golf Club

Parameter	Discharge License limit	21st June 2016 After P.F	4th May 2017 Before P.F	4th May 2017 After P.F	3rd May 2018 Before P.F	3rd May 2018 After P.F	4th Dec 2019 Before P.F	25th Nov 2020 Before P.F
Ammonia N	2mg/l	-	31.9	21.5	57.6	2.39	0.102	2.69
BOD	5mg/l	4	12	19	20	8	**410**	3.3
Ortho-phosphate	1mg/l	-	0.085	0.056			2.24	0.038
Suspended Solids	5mg/l	59	26	96	78	37	785	11

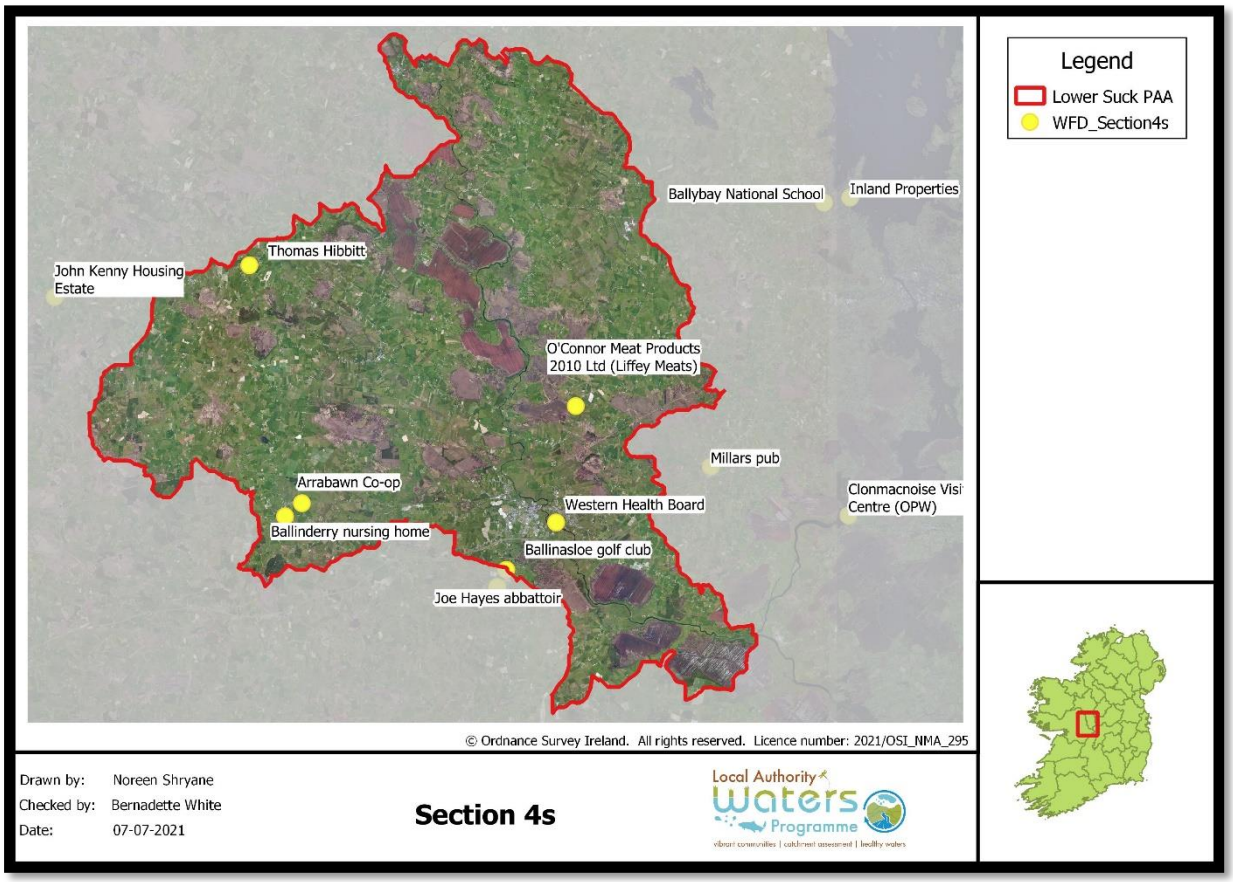

Figure 20 Section 4s within the Lower Suck PAA

3.2.8 Developer Provided Infrastructure

There is one developer provided infrastructure (DPI)[26] site within the Lower Suck PAA, Cuil na Cille in Ballygar which consists of 18 units. In July 2019 the Minister of Housing Planning and Local Government announced the commencement of a new investment programme – the *Multi-Annual Developer Provided Water Services Infrastructure Resolution Programme 2019-2021.* The purpose of the programme is to facilitate the resolution of DPI estates, in a sustainable manner, to support the taking-in-charge of these estates. This DPI does not appear to be in the bid inclusion for 2020-2021.

This housing estate is not connected to Ballygar WWTP. The planning permission granted for this estate stated that it would be served by a Bord na Mona effluent treatment plant for the present time. Planning permission also stated that when Ballygar WwTP is upgraded this estate must then be connected the WwTP. A Pers. Comms from Galway County Council (GCC) has informed me that this might be some time, so GCC will follow up with a view to getting the treatment plant serving this estate, issued with a discharge licence under the Water Pollution Act, 1977 (as amended) (July 2021).

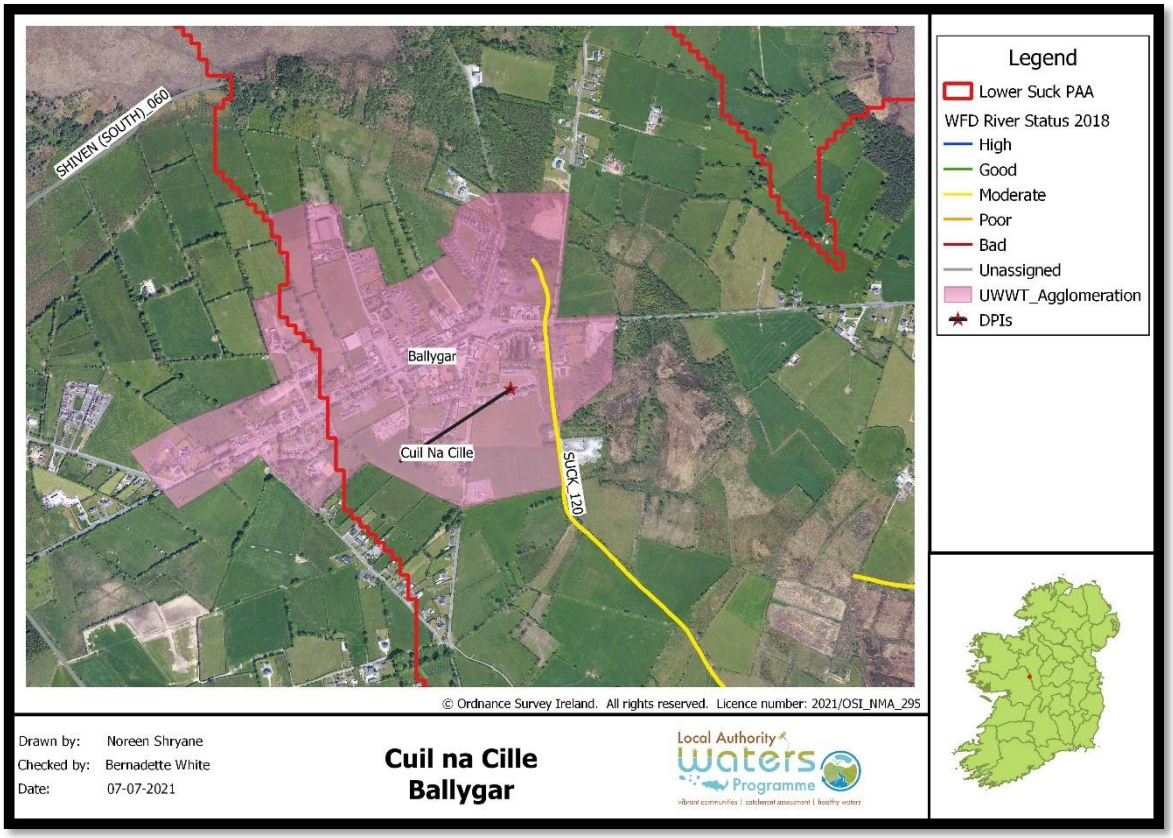

Figure 21 Cuil na Cille DPI

[26] A particular category of housing estate served by standalone water services infrastructure, provided by the developer of the estate - which is not connected to the public (Irish Water) water services network.

4 Pathway Information and analysis/ Conceptual Model

4.1 Overview of Pathways in the PAA

The regional pathway framework is provided by the aquifers in the PAA and sub-compartments are determined by soil drainage and groundwater vulnerability. For this PAA, two compartments **Table 22** and **Figure 22** with two sub compartments have been identified.

The Suck PAA consists of three different aquifer types which are as follows:

- Regionally Important Aquifer – Karstified (Conduit) (RKc)
- Locally Important Aquifer- Karstified (Lk)
- Locally Important Aquifer-Bedrock which is moderately productive only in local zones (LI)

The first compartment comprises of both the Regionally Important Aquifer – Karstified (Conduit) (RKc) and the Locally Important Karstified Acquifer (Lk). The RKc aquifer is the dominant acquifer type in the PAA. The RKc acquifer is contained within the Suck South groundwater body. This GWB is composed primarily of Dinantian Pure Bedded Limestones(DPBL). Compartment 1A is on the peat and poorly drained soils while Compartment 1B is on the well-drained soils. Karstification is widespread in this GWB. Current records of karst features are considered to represent only a fraction of existing features. As with most karstic systems, permeability and transmissivity data are very variable. The aquifer supports a large number of high and intermediate yielding springs. In karstified Pure Bedded Limestone such as that found in this GWB, enlargement of the fracture network by solution, and the generally well connected and widespread fracture systems result in a highly permeable aquifer with rapid groundwater flow.[27]

The second compartments comprises a Locally Important Aquifer. This acquifer is predominately within the Aughrim groundwater body with a smaller area within the Suck South GWB. This GWB is composed primarily of dinantian upper impure limestone (DUIL) with a smaller area of dinantian pure unbedded limestones (DPUL) to the south east of the PAA. Compartment 2A is on the peat and poorly drained soils while Compartment 2B is on the well-drained soils. There is no data on hydrogeological properties specific to this GWB available. In this area transmissivity in the DUIL is expected to be low.[28] The DUIL and DPUL of this GWB are more than several hundreds of metres thick. However, most groundwater flows in an upper zone of about 15 m, comprising a weathered zone of a few metres thick and a zone of interconnected fissures that extends approximately 10 m below this.

Soil drainage across Compartment 1B and 2B is moderately to well drained fine to coarse loamy drift with limestones. The dry soils are comprised of deep well drained mineral soils, deep poorly drained mineral soils and poorly drained mineral souls with peaty topsoil. Subsoils are limestone till. Soil drainage across Compartment 1A and 2A is comprised of poorly drained cutaway peat from raised bog.

The majority of the sub-catchment subsoil permeability is moderate to low, with some scattered areas throughout the PAA where it is <3m to bedrock. Groundwater vulnerability is high to extreme where the subsoils are <3m to bedrock as there is little if any attenuation. The remainder of the sub-

[27] Suck South GWB: Summary of Initial Characterisation. GSI
[28] Aughrim GWB: Summary of Initial Characterisation. GSI

catchment vulnerability is low to moderate. Susceptibility for transporting nitrate along the sub surface and near surface water pathway is predominantly low with the exception of the well-drained soils in Compartment 1B and 2B which are highly susceptible to transporting nitrate.

High risk areas for phosphate loss to surface water coincide with the peat, poorly drained and mineral alluvium areas. Phosphate is more likely to flow overland to surface waters rather than being retained in the soil and subsoil. PIP maps for phosphate in surface water indicates moderate to high-risk areas (Rank 1-3) throughout the PAA. PIP maps for nitrate in surface water and groundwater indicate moderate to low-risk ranking throughout the PAA. There are high risk areas in both surface and ground water where the depth to bedrock is <3m.

There are numerous mapped karst features by GSI within the PAA, including 13 turloughs, 7 tracer lines, approximately 60 springs and 50 swallow holes.

The dominant pathway is overland flow for phosphate due to the extensive presence of deep poorly drained mineral soils and poorly drained mineral souls with peaty topsoil. Near surface phosphate susceptibility is high for most of the PAA. The Critical Source Areas (CSAs) occur in the poorly drained areas, where the diffuse agricultural loads and the density of small point sources are the greatest. The land drainage network is a critical pathway for nutrients and sediment loss to the river. In the well-drained soils, there is moderate subsurface nitrate susceptibility with some very small patches of very high susceptibility.

Table 22 Pathways Conceptual Model for Lower Suck PAA

		Compartment 1A	Compartment 1B	Compartment 2A	Compartment 2B
Pathway Info	Aquifer	Regionally Important Aquifer – Karstified (Conduit) (RKc) Locally Important Aquifer- Karstified (Lk)	Regionally Important Aquifer – Karstified (Conduit) (RKc) Locally Important Aquifer-Karstified (Lk)	Locally Important Aquifer-Bedrock which is moderately productive only in local zones (LI)	Locally Important Aquifer-Bedrock which is moderately productive only in local zones (LI)
	Topography	Flat to Undulating	Flat to Undulating	Flat to Undulating	Flat to Undulating
	Soil	BminDW	Cut BminPDPT	BminPD BminPDPT Cut	BminDW
	Soil Wet/dry	Peat and Poorly drained Small areas of AlluvMin	Well drained	Peat and Poorly drained Small areas of AlluvMin	Well drained
	Subsoil	TLs Cut AlluvMin	TLs KaRck	TLs Cut AlluvMin	TLs KaRck
	Subsoil Permeability	Moderate Low	Moderate Not applicable, depth to bedrock <3m	Moderate Low	Moderate Low
	Rock Unit	Dinantian Pure bedded limestone	Dinantian Pure bedded limestone	Dinantian Pure Unbedded limestone Dinantian Upper Impure Limestones	Dinantian Pure Unbedded limestone Dinantian Upper Impure Limestones
	Groundwater vulnerability	Low to Moderate	High to X Extreme	Low to Moderate	High to X Extreme
	Karst	Swallow holes Enclosed depressions Springs	Swallow holes Enclosed depressions Turloughs Springs	Swallow holes Enclosed depressions	Enclosed Depressions Swallow holes Turloughs Springs

		Compartment 1A	Compartment 1B	Compartment 2A	Compartment 2B
	Hydrology ▪ **Drainage Density**	High	Low	High	Moderate
	PO4 Susceptibility to Surface Water	High to Moderate Rank 2-3	Low Rank 4-5	High Rank 2-3	Low Rank 4-5
	NO3 susceptibility to Surface Water	Low Rank 4-5	Moderate Rank 3-4	Low Rank 4-5	High to Moderate Rank 2-4
	PO4 PIP	High to Moderate Rank 1-4	Low Rank 4-7	High to Moderate Rank 1-4	Low Rank 4-7
	NO3 PIP	Low Rank 5-7	High to Low Rank 1-6	Low Rank 5-7	High to Low Rank 1-6
	Flowpaths	Overland Flow Drains	Near Surface and Groundwater Flow	Overland Flow Drains	Near Surface and Groundwater Flow
	Likely CSAs	Rank 1-2 PIP Areas	Rank 1-2 PIP Areas Depth to Bedrock<3m	Rank 1-2 PIP Areas	Rank 1-2 PIP Areas Depth to Bedrock<3m
	Direct (e.g. pipe)	Ballygar WwTP Ahascragh WwTP Ballinasloe WwTP Section 4s	Ballyforan WwTP Ballinasloe WwTP Section 4s	Ballinasloe WwTP Section 4s	Section 4s
Location of Monitoring Point		RS26S071000 Suck_120 RS26K040200 Killeglan_010 RS26A010050 Ahascragh_010 RS26A010200 Ahascragh_020 RS26A010300 Ahascragh_030 RS26A010400 Ahascragh_040 RS26A010500 Ahascragh_040 RS26D070400 Derrymullan_010 RS26D070700 Derrymullan_020	RS26S071200 Suck_120 RS26C170400 Cuilleen Stream_010	RS26S071400 Suck_140 RS26S071500 Suck_150	RS26S071400 Suck_140
Significant Issue[29]		Sediment Ammonium Orthophosphate Altered habitat due to Morphological changes	Nitrate Altered habitat due to Morphological changes	Sediment Ammonium Orthophosphate Altered habitat due to Morphological changes	Nitrate

[29] These are potential issues having re viewed the Conceptual Model

	Compartment 1A	Compartment 1B	Compartment 2A	Compartment 2B
	Altered habitat due to hydrological changes	Altered habitat due to hydrological changes	Altered habitat due to hydrological changes	

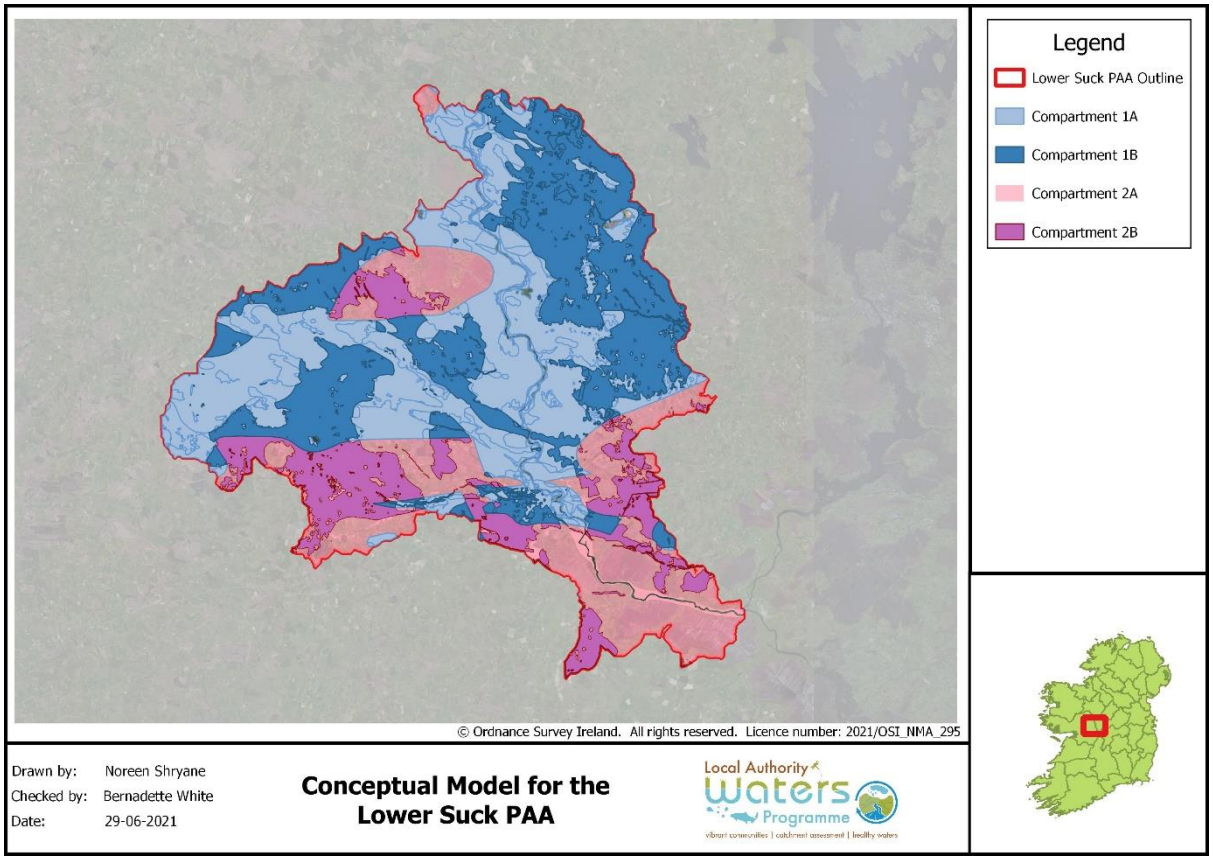

Figure 22 Compartment Map for Lower Suck PAA

5 Interim Story of the PAA

5.1 Introduction

The Lower Suck Priority Area for Action (PAA) spans across counties Roscommon and Galway. It extends from Fuerty, Athleague and Ballgar in the North to Castleblakeney, Ballymacward and Ahascragh in the West, Aughrim, Laurencetown and Ballinasloe in the South to Dysart and Taughmaconnell to the East. The 2nd cycle PAA includes the river water bodies: Ballyglass_010, Ahascragh_030, Killegan Trib North_010, Killeglan_010, Derrymullan Stream_020, Suck_140 and Culliaghbeg_010, Suck_150 and Suck_160. It has been proposed to add the following additional water bodies to the PAA in the 3rd cycle implementation of the River Basin Management Plan: Suck_120, Killaderry Stream_010, Lughanagh_010, Suck_130, Ahascragh_010, Ahascragh_020, Ahascragh_040, Derrymullan Stream_010, Cuilleen Stream_010. Local catchment assessment will be carried out on 2nd cycle water bodies only in 2021, and subject to River Basin Management Plan sign off, the 3rd cycle proposed water bodies will then be included at that stage.

5.2 Suck_120

The Suck_120 waterbody is *At Risk* of failing to achieve its good status objective. The water body has been at moderate status since 2009. EPA characterisation identified hydromorphology as the significant pressure. There has been historic channelisation of the water body via the Suck District Drainage. The conceptual model shows that the river sub basin predominantly lies within the peat and poorly drained soils which lie over a karstified conduit aquifer. Agriculture is the predominant landuse in the subbasin.

5.3 Suck_130

The Suck_130 waterbody is at good status and it is currently *Not at Risk* therefore limited local catchment assessments will be undertaken to ensure that this status recovery is being maintained.

5.4 Killaderry Stream_010

The Killaderry Stream_010 waterbody is at *Review* as it is not currently monitored as part of WFD monitoring programmes. EPA characterisation identified Extractive Industries (Peat) as a significant pressure. The conceptual model shows that the river sub basin lies within peat and poorly drained soils which lie over both a karstified conduit acquifer and a locally important acquifer. Peatland is the predominant land cover within the subbasin.

5.5 Ballyglass_010

The Ballyglass_010 waterbody is at *Review* as it is not currently monitored as part of WFD monitoring programmes. The conceptual model shows that the river sub basin lies predominantly within well drained soils which lie over a karstified conduit aquifer. Agriculture is the predominant landuse in the subbasin.

5.6 Lughanagh_010

The Lughanagh_010 waterbody is at *Review* as it is not currently monitored as part of WFD monitoring programmes. EPA characterisation identified agriculture, forestry and extractive industry (peat) as significant pressures. The conceptual model shows that the river sub basin lies within a mix of well drained and peat and poorly soils which lie over both a karstified conduit acquifer and a locally important acquifer. Agriculture is the predominant landuse in the subbasin with some scattered areas of peatland and forestry.

5.7 Killegan Trib North_010

The Killegan Trib North_010 waterbody is at *Review* as it is not currently monitored as part of WFD monitoring programmes. EPA characterisation identified agriculture and extractive industry (peat) as significant pressures. The conceptual model shows that the river sub basin lies within a mix of well drained and peat and poorly soils which lie over a karstified conduit acquifer. Agriculture is the predominant landuse in the subbasin with some scattered areas of peatland.

5.8 Killeglan_010

The Killeglan_010 waterbody is *At Risk* of failing to achieve its good status objective. The water body is currently at moderate status (2013-2018). EPA characterisation identified extractive industries (peat) and agriculture as the significant pressures. The conceptual model shows that the river sub basin predominantly lies within the well-drained soils which lie over a karstified conduit aquifer. Agriculture is the predominant landuse in the subbasin with some scattered areas of peat bogs.

5.9 Ahascragh_010

The Ahascragh_010 waterbody is at good status and it is currently *Not at Risk* therefore limited local catchment assessments will be undertaken to ensure that this status recovery is being maintained.

5.10 Ahascragh_020

The Ahascragh_020 waterbody is at good status and it is currently *Not at Risk* therefore limited local catchment assessments will be undertaken to ensure that this status recovery is being maintained.

5.11 Ahascragh_030

The Ahascragh_030 waterbody is *At Risk* of failing to achieve its good status objective. The water body is currently at poor status (2013-2018). EPA characterisation identified agriculture, urban waste water, domestic waste water and hydromorphology as the significant pressures. There has been historic channelisation of the water body via the Ahascragh District Drainage. The conceptual model shows that the river sub basin predominantly lies within the poorly drained soils which lie over a karstified conduit aquifer. Agriculture is the predominant landuse in the subbasin.

5.12 Ahascragh_040

The Ahascragh_040 waterbody is at good status and it is currently *Not at Risk* therefore limited local catchment assessments will be undertaken to ensure that this status recovery is being maintained.

5.13 Derrymullan_010

The Derrymullan_010 waterbody is *At Risk* of failing to achieve its good status objective. The water body is currently at moderate status (2013-2018). EPA characterisation identified agriculture as the significant pressure. A Watching Brief is required for this waterbody. The conceptual model shows that the river sub basin predominantly lies within the well-drained soils which lie over a locally important acquifer. Agriculture is the predominant landuse in the subbasin.

5.14 Derrymullan_020

The Derrymullan_020 waterbody is *At Risk* of failing to achieve its good status objective. The water body is currently at moderate status (2013-2018). EPA characterisation identified anthropogenic unknown as the significant pressure. The lower sections of the river near Ballinasloe have been historically channelised via the Suck District Drainage. The conceptual model shows that the river sub basin is a mix of well-drained and poorly drained soils which lie over a locally important acquifer. Agriculture is the predominant landuse in the subbasin.

5.15 Suck_140

The Suck_140 waterbody is *At Risk* of failing to achieve its good status objective. The water body is currently at moderate status (2013-2018). EPA characterisation identified hydromorphology as the significant pressure. There has been historic channelisation of the water body via the Suck District Drainage. The conceptual model shows that the river sub basin is a mix of well-drained and poorly drained soils which lie over a karstified conduit acquifer. Agriculture is the predominant landuse in the subbasin with Ballinasloe Town to the south of the subbasin.

5.16 Cuilleen Stream_010

The Cuilleen Stream_010 waterbody is *At Risk* of failing to achieve its good status objective. The water body is currently at moderate status (2013-2018). EPA characterisation identified agriculture and domestic waste water as the significant pressures. An IA7 has been assigned by LAWPRO for Cuilleen Stream_010 and this survey work is proposed for the 3rd cycle RBMP implementation. The conceptual model shows that the river sub basin is a mix of well-drained and poorly drained soils which lie over a locally important aquifer. Agriculture and peatland are the predominant landuses in the subbasin.

5.17 Suck_150

The Suck_150 waterbody is *At Risk* of failing to achieve its good status objective. The water body is currently at moderate status (2013-2018). EPA characterisation identified extractive industry (peat)

and hydromorphology as the significant pressures. There has been historic channelisation of the water body via the Suck District Drainage. The conceptual model shows that the river sub basin is predominately poorly drained soils which lie over a locally important aquifer. Agriculture and peatland are the predominant landuses in the subbasin.

5.18 Suck_160

The Suck_160 waterbody is at *Review* as it is not currently monitored as part of WFD monitoring programmes. EPA characterisation identified extractive industry (peat) and hydromorphology as significant pressures. There has been historic channelisation of the water body via the Suck District Drainage. The conceptual model shows that the river sub basin lies within predominantly peat and poorly soils which lie over a locally important aquifer. Peatland is the predominant land cover within the subbasin.

5.19 Culliaghbeg_010

The Culliaghbeg_010 waterbody is at *Review* as it is not currently monitored as part of WFD monitoring programmes. EPA characterisation identified extractive industry (peat) as the significant pressure. The conceptual model shows that the river sub basin lies within a mix of well drained and peat and poorly soils which lie over a locally important aquifer. Agriculture is the dominant landuse in the subbasin.

6 Work Plan

6.1 Suck_120

The LCA strategy for the water body includes seasonal sampling using SSIS, chemistry analysis and catchment walks. The LCA will start at the downstream EPA monitoring station (Ballyforan Bridge). Other LCA stations are strategically located throughout the catchment to capture any potential impacts from the significant pressures (**Table 23** and **Figure 23**).

Table 23 LCA Sites for Suck_120

Station	Station Name	SSIS/ RA	Chemistry	Reason
SK120.1	Ballyforan Bridge (Surveillance and Operational)	Yes	Yes	▪ Confirm condition at EPA monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
SK120.2	Ballygar Stream - Br u/s Suck R confl. (Pre- WFD)	Yes	Yes	▪ Verify condition at site. ▪ Obtain Water chemistry (Specifically BOD, COD, ammonia, ortho P, nitrate and suspended solids), to establish if nutrients are a significant issue.
SK120.3	d/s ambient TPEFF1200D0371SW001 (Investigative)	Yes	Yes	▪ Verify condition at site. ▪ Obtain Water chemistry (Specifically BOD, COD, ammonia, ortho P, nitrate and suspended solids), to establish if nutrients are a significant issue.
SK120.4	Ballygar Stream- in Ballygar (Pre-WFD)	Yes	Yes	▪ Verify condition at site. ▪ Obtain Water chemistry (Specifically BOD, COD, ammonia, ortho P, nitrate and suspended solids), to establish if nutrients are a significant issue.

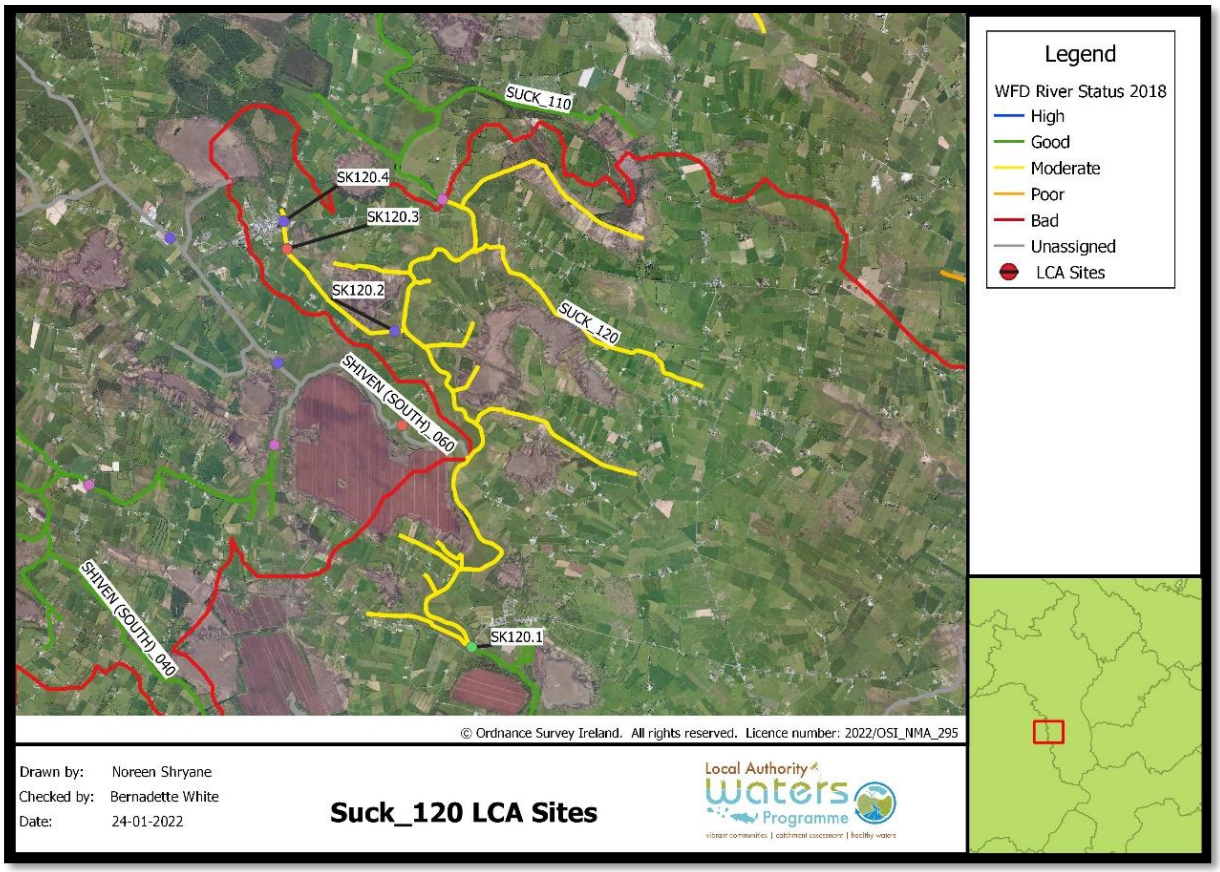

Figure 23 LCA Sites for Suck_120

6.2 Ballyglass_010

The LCA will focus on confirmation of whether this water body is impacted or not. If impacted, a proposal will be made for a suitable monitoring station to the EPA, and the water body will be retained for the 3rd cycle of the WFD in order to characterisation the pressures at the local scale. One site has been identified for LCA (**Table 24** and **Figure 24**).

Table 24 LCA Site for Ballyglass_010

Station	Station Name	SSIS/ RA	Chemistry	Reason
BG.1	570m u/s of EPA Investigative Station	Yes	Yes	▪ In order to establish the risk class of the water body conditions will be verified at this site using SSIS/RA and Chemistry (ortho-phosphate, ammonia and nitrate).[30] Will need three seasons of Chemistry for this site. ▪ If the site is impacted, no further sites upstream will be assessed, and recommendations will be put forward for further analysis in the 3rd cycle of the RBMP.

[30] Based on the IA3 Nutrient Monitoring Survey Decision Tree

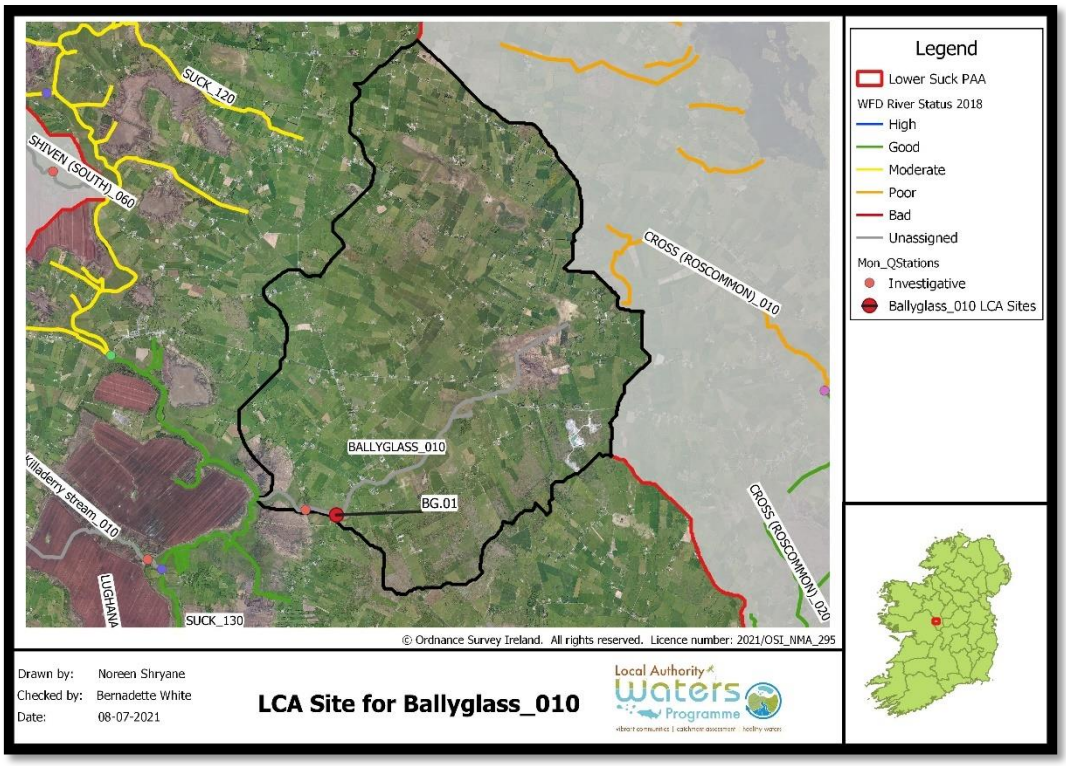

Figure 24 LCA Site for Ballyglass_010

6.3 Killegan Trib North_010

The LCA will focus on confirmation of whether this water body is impacted or not. If impacted, a proposal will be made for a suitable monitoring station to the EPA, and the water body will be retained for the 3rd cycle of the WFD in order to characterisation the pressures at the local scale. Two sites have been identified for LCA (**Table 25** and **Figure 25**).

Table 25 LCA Site for Killegan Trib North_010

Station	Station Name	SSIS/ RA	Chemistry	Reason
KTN.1	140m u/s of confluence	Yes	Yes	▪ This is the lowest site before the confluence with the Killeglan_010.
KTN.2	KILLEGAN TRIB NORTH - Interstitial, Br d/s from Killeglan 26 R conf. (Investigative)	Yes	Yes	▪ In order to establish the risk class of the water body conditions will be verified at this site using SSIS/RA and Chemistry (ortho-phosphate, ammonia and nitrate).[31] Will need three seasons of Chemistry for this site. ▪ If the site is impacted, no further sites upstream will be assessed, and recommendations will be put forward for further analysis in the 3rd cycle of the RBMP.

[31] Based on the IA3 Nutrient Monitoring Survey Decision Tree

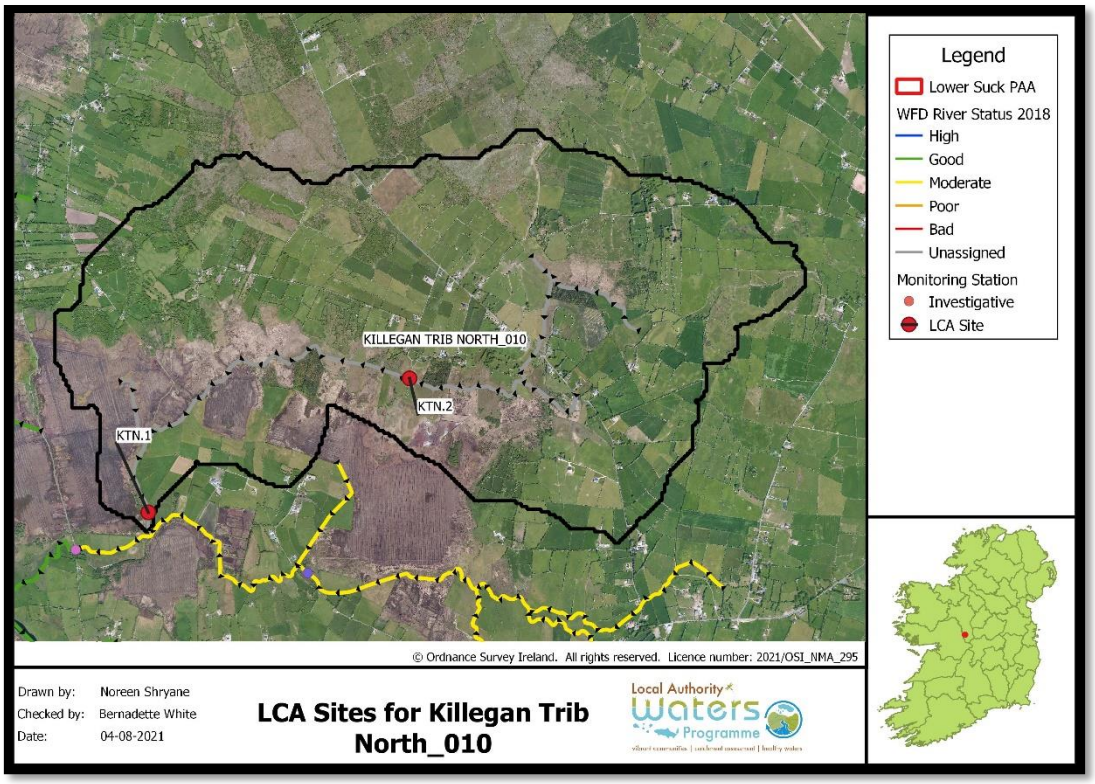

Figure 25 LCA Site for Killegan Trib North_010

6.4 Killeglan_010

The LCA needs to fill the hydrochemistry data gap which exists for this water body at the EPA monitoring point. The LCA will start at the downstream EPA monitoring station (Bridge u/s Suck River Confl) followed by a 2.2km catchment walk (CW) upstream to the next identified LCA monitoring station. Other LCA stations are strategically located throughout the river water body to capture any potential impacts and to assist in confirmation of issues and sources of pressures (**Table 26** and **Figure 26**).

Table 26 LCA Sites for Killeglan_010

Station	Station Name	SSIS/ RA	Chemistry	Reason
KG.1	Bridge u/s Suck River Confl (Operational)	Yes	Yes	▪ Verify condition at EPA monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue. There is no hydrochemistry for this station.
KG.2	Killeglan- Br NW of Camlagh House (Pre-WFD)	Yes	Yes	▪ Verify condition at EPA monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue. There is no hydrochemistry for this station.
▪ Catchment walk- 2.2km between KG.1 and KG.2 to identify land use and the drainage network as a potential pathway.				
KG.3	1.5km u/s of Site KG.2	Yes	Yes	▪ Verify condition at site using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue

Station	Station Name	SSIS/ RA	Chemistry	Reason
KG.4	River crosses local road near Dundonnell Castle	Yes	Yes	▪ Verify condition at site using SSIS. Obtain Water chemistry to establish if nutrients are a significant issue.
KG.5	1.36KM u/s of Site KG.4 (South Trib)	Yes	Yes	▪ Verify condition at site using SSIS. Obtain Water chemistry to establish if nutrients are a significant issue.
KG.6	1.36KM u/s of Site KG.4 (North Trib)	Yes	Yes	▪ Verify condition at site using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.

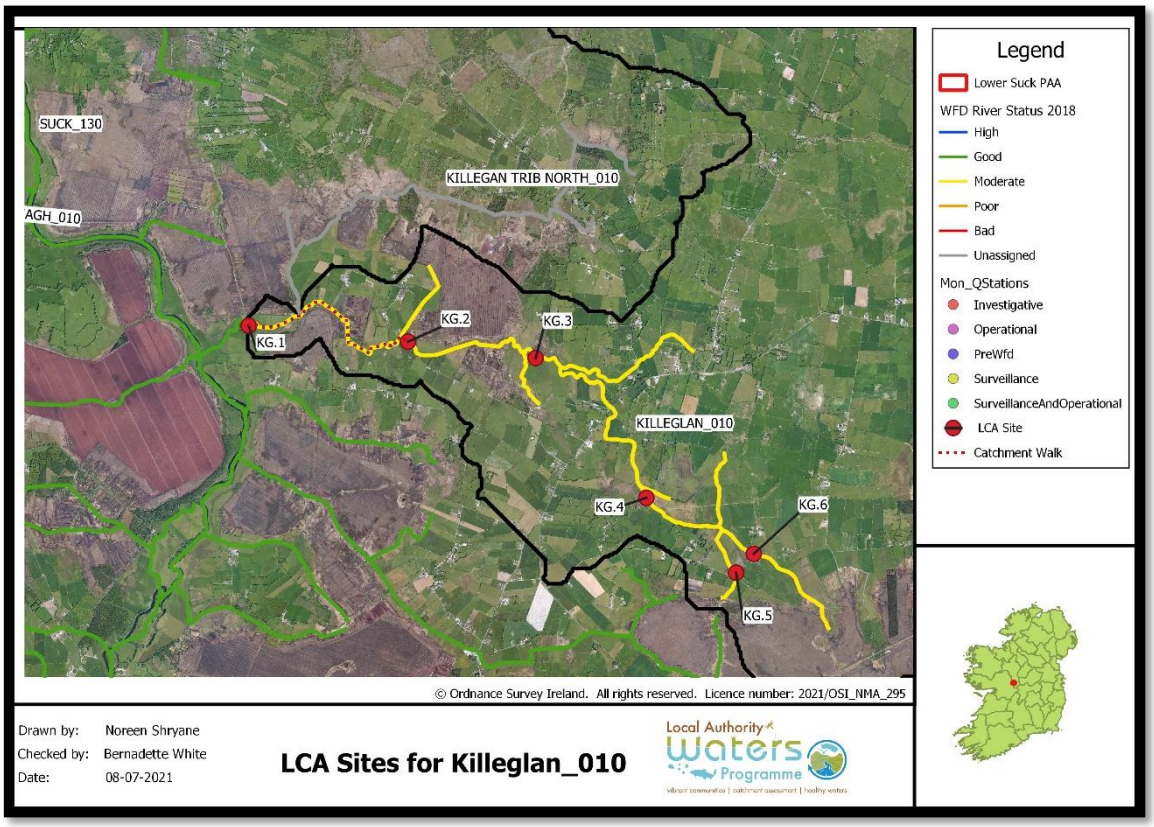

Figure 26 LCA sites for Killeglan_010

6.5 Ahascragh_030

The LCA strategy for the water body includes seasonal sampling using SSIS, chemistry analysis and catchment walks. The LCA will start at the downstream EPA monitoring station (2.6km d/s Ahascragh Bridge) followed by a 2.5km catchment walk upstream to the EPA Operational Station in Ahascragh village. Other LCA stations are strategically located throughout the catchment to capture any potential impacts from the significant pressures (**Table 27** and **Figure 27**).

Table 27 LCA Sites for Ahascragh_030

Station	Station Name	SSIS/ RA	Chemistry	Reason
AH30.1	2.6km d/s Ahascragh Bridge (Operational)	Yes	Yes	▪Verify condition at EPA monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
AH30.2	Downstream of Primary Discharge point for WwTP	Yes	Yes	▪Verify condition at site using SSIS. ▪Obtain Water chemistry to establish if nutrients are a significant issue.
AH30.3	Primary discharge point	Yes	Yes	▪ Locate the Primary Discharge point and conduct a visual assessment.
AH30.4	Upstream of Primary discharge point	Yes	Yes	▪ Verify condition at site using SSIS. Obtain Water chemistry to establish if nutrients are a significant issue.
AH30.5	330m u/s of confluence with main channel	Yes	Yes	▪ Verify condition at site using SSIS. Obtain Water chemistry to establish if nutrients are a significant issue.
AH30.6	Ahascragh: West Bridge (Operational)	Yes	Yes	▪ Verify condition at EPA Monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
▪ Catchment Walk – 2.5km of a CW between AH30.1 upstream to AH30.6 in wet and dry weather (Summer and Winter)				
AH30.7	2.26km u/s of AH30.6	Yes	Yes	▪Verify condition at site using SSIS. Obtain Water chemistry to establish if nutrients are a significant issue.
AH30.8	2.2km u/s of AH30.7	Yes	Yes	▪Verify condition at site using SSIS. ▪Obtain Water chemistry to establish if nutrients are a significant issue. ▪100m d/s of IPC Site.

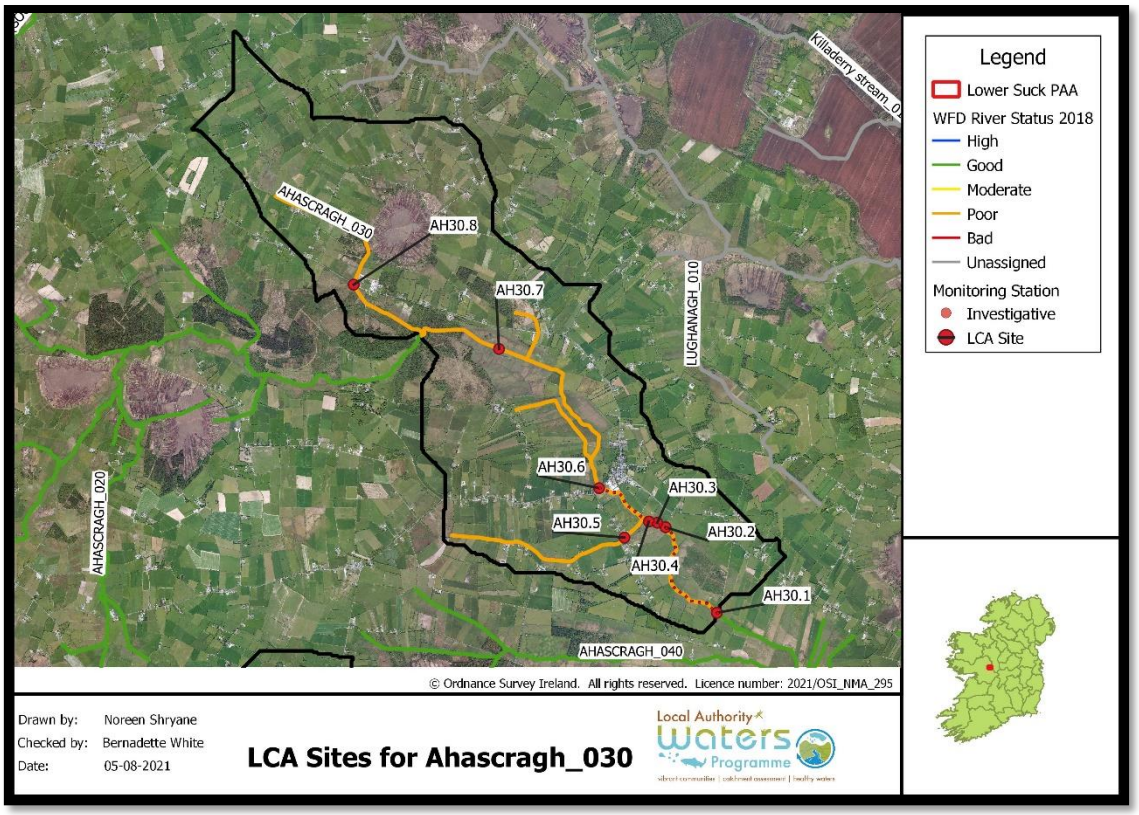

Figure 27 LCA sites for Ahascragh_030

6.6 Derrymullan Stream_020

The LCA strategy for the water body includes seasonal sampling using SSIS, chemistry analysis and catchment walks. The LCA will start at the downstream EPA monitoring station (1st bridge u/s Suck Confl). Other LCA stations are strategically located throughout the catchment to capture any potential impacts from the significant pressures (**Table 28** and **Figure 28**).

Table 28 LCA Sites for Derrymullan_020

Station	Station Name	SSIS/ RA	Chemistry	Reason
DM20.1	1st bridge us Suck Conf (Operational)	Yes	Yes	▪ Verify condition at EPA monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
DM20.2	Derrymullan Stream -Killure Bridge (Pre-WFD)	Yes	Yes	▪ Verify condition at EPA Monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
DM20.3	4.5km u/s of DM20.2	Yes	Yes	▪ Verify condition at site using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.

Station	Station Name	SSIS/ RA	Chemistry	Reason
DM20.4	1.5km u/s of DM20.3	Yes	Yes	▪ Verify condition at site using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.

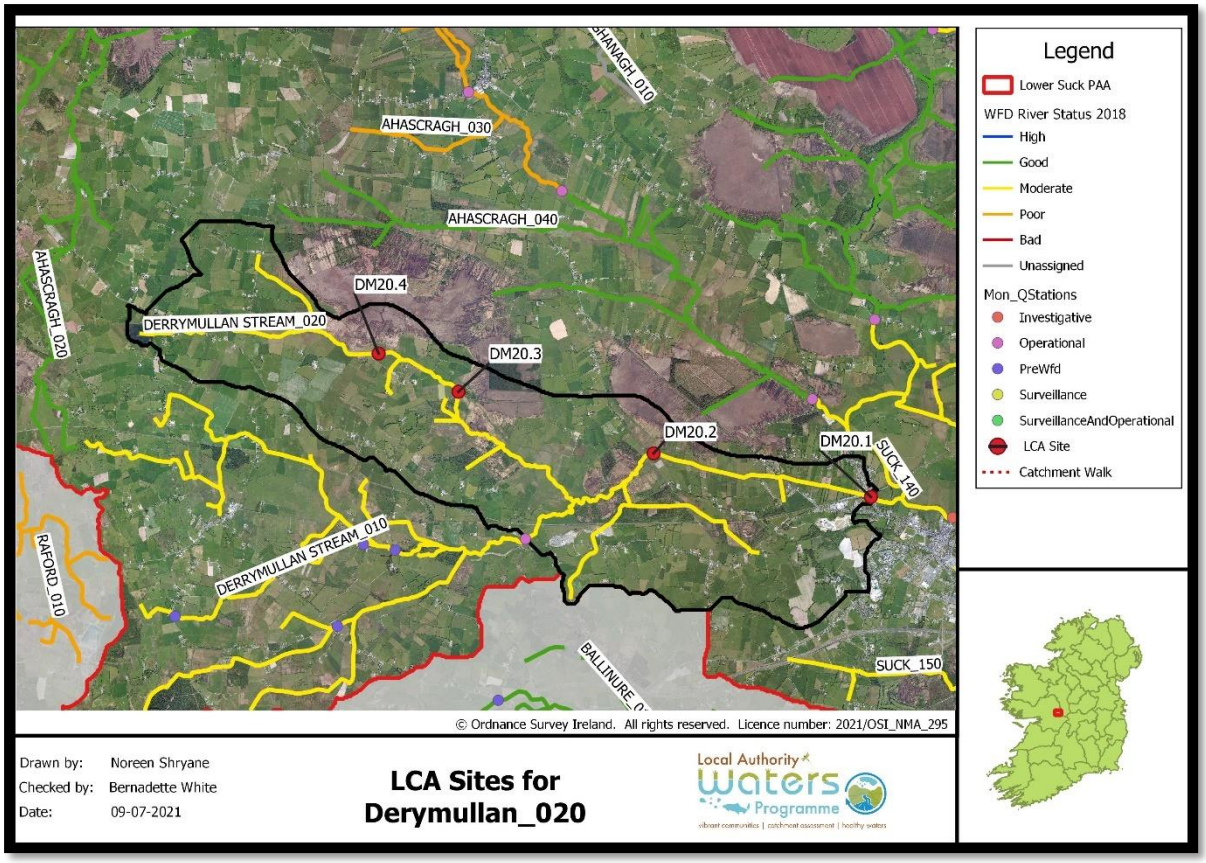

Figure 28 LCA Sites for Derrymullan_020

6.7 Suck_140

The LCA strategy for the water body includes seasonal sampling using SSIS, chemistry analysis and catchment walks. The LCA will start at the downstream EPA monitoring station (3km d/s Ballinasloe (Pollboy)). Other LCA stations are strategically located throughout the catchment to capture any potential impacts from the significant pressures (**Table 29** and **Figure 29**). It will not be possible to obtain kick samples in the main channel unless the water level is very low. Visual observations of land use and pesticide misuse will be undertaken in this sub basin.

Table 29 LCA Sites for Suck_140

Station	Station Name	SSIS/ RA	Chemistry	Reason
SK140.1	3km d/s Ballinasloe (Pollboy) (Operational)	No	Yes	▪ Verify condition at EPA monitoring station. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
SK140.2	d/s compliance monitoring for Ballinasloe WwTP	No	Yes	▪ Visual observations. ▪ Obtain Water chemistry (Specifically BOD, COD, ammonia, ortho P, nitrate and suspended solids), to establish if nutrients are a significant issue.
SK140.3	Primary Discharge Point	No	Yes	▪ Locate the Primary Discharge point and conduct a visual assessment.
SK140.4	u/s compliance monitoring for Ballinasloe WwTP	No	Yes	▪ Verify condition at site. ▪ Obtain Water chemistry (Specifically BOD, COD, ammonia, ortho P, nitrate and suspended solids), to establish if nutrients are a significant issue.
▪ Catchment walk of 170m between SK140.2 to SK140.4				
SK140.5	Suck- Ballinasloe Bridge(Pre-WFD)	No	Yes	▪ Verify condition at EPA monitoring station. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
SK140.6	Upstream of TPEFF1200D0032SW001 &TPEFF1200D0032SW002 (Investigative)	No	Yes	▪ Verify condition at EPA monitoring station. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
SK140.7	Bellagill Bridge (Operational)	No	Yes	▪ Verify condition at EPA monitoring station. ▪ Obtain Water chemistry to establish if nutrients are a significant issue

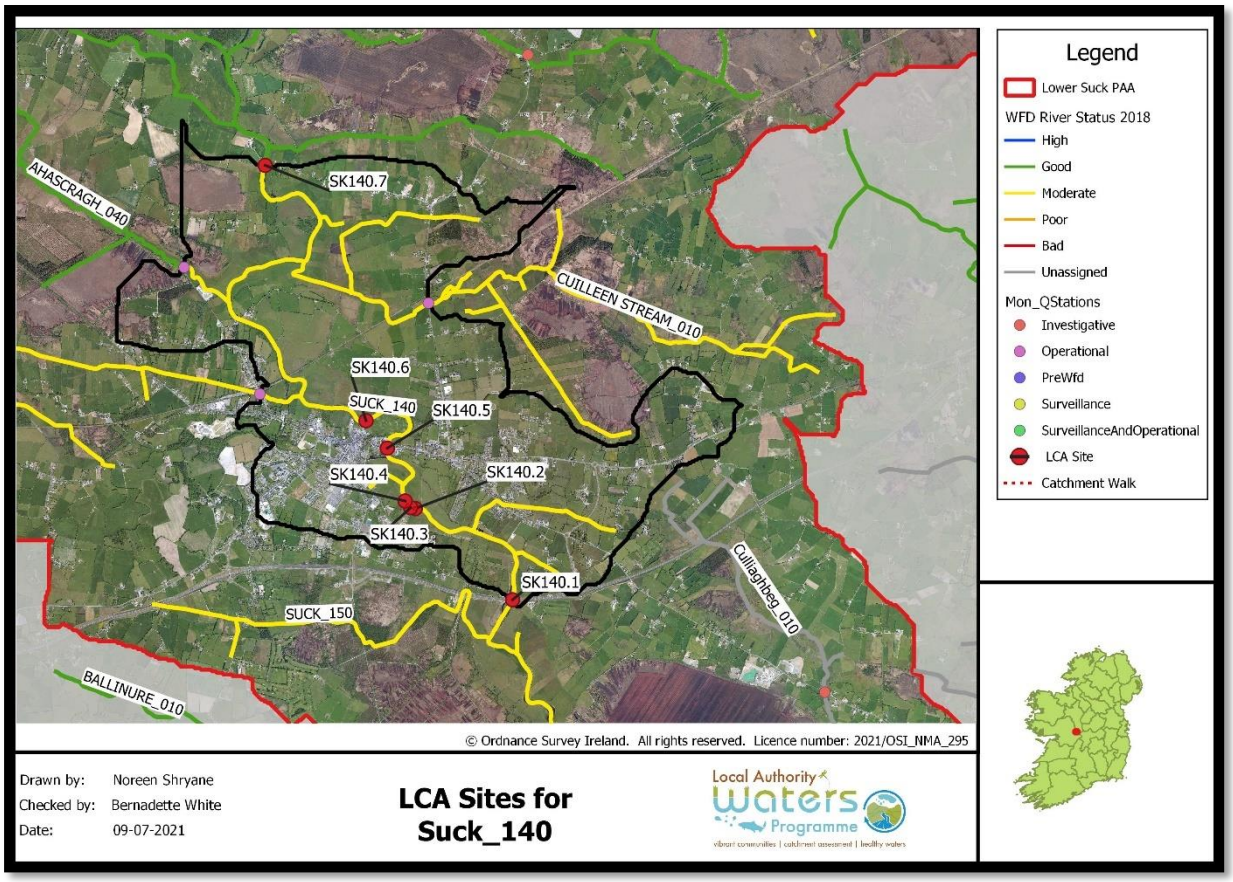

Figure 29 LCA sites for Suck_140

6.8 Culliaghbeg_010

The LCA will focus on confirmation of whether this water body is impacted or not. If impacted, a proposal will be made for a suitable monitoring station to the EPA, and the water body will be retained for the 3rd cycle of the WFD in order to characterisation the pressures at the local scale. One site has been identified for LCA (**Table 30** and **Figure 30**).

Table 30 LCA Sites for Culliaghbeg_010

Station	Station Name	SSIS/ RA	Chemistry	Reason
CB.1	75m us of outfall	No	Yes	▪ In order to establish the risk class of the water body conditions will be verified at this site using SSIS/RA and Chemistry (ortho-phosphate, ammonia and nitrate).[32] Will need three seasons of Chemistry for this site.
CB.2	Br East Cloonfad (Investigative)	Yes	Yes	▪ In order to establish the risk class of the water body conditions will be verified at this site using SSIS/RA and

[32] Based on the IA3 Nutrient Monitoring Survey Decision Tree

Station	Station Name	SSIS/ RA	Chemistry	Reason
				Chemistry (ortho-phosphate, ammonia and nitrate).[33] Will need three seasons of Chemistry for this site. ▪ If the site is impacted, no further sites upstream will be assessed, and recommendations will be put forward for further analysis in the 3rd cycle of the RBMP.

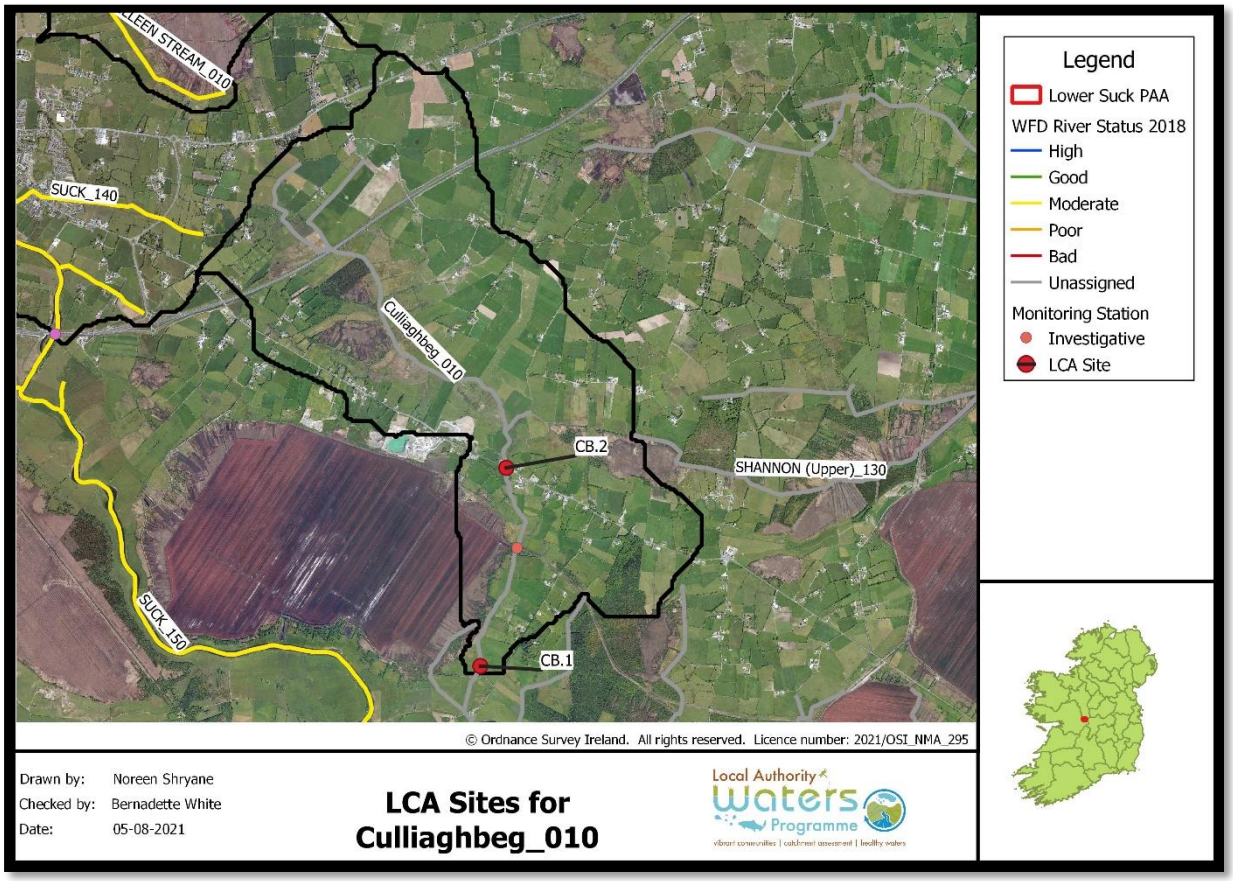

Figure 30 LCA Sites for Culliaghbeg_010

6.9 Suck_150

The LCA strategy for the water body includes seasonal sampling using SSIS, chemistry analysis and catchment walks. The LCA will start at the downstream EPA monitoring station (Correen Ford). Other LCA stations are strategically located throughout the catchment to capture any potential impacts from the significant pressures (**Table 31** and **Figure 31**).

[33] Based on the IA3 Nutrient Monitoring Survey Decision Tree

Table 31 LCA Sites for Suck_150

Station	Station Name	SSIS/ RA	Chemistry	Reason
SK150.1	Correen Ford (Operational)	Yes	Yes	▪ Verify condition at EPA monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
SK150.2	200m u/s of outfall with main channel	Yes	Yes	▪ Verify condition at site using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
SK150.3	D/S of Poolboy landfill	Yes	Yes	▪ Verify condition at site using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
SK150.4	U/S of Poolboy landfill	Yes	Yes	▪ Verify condition at site using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.

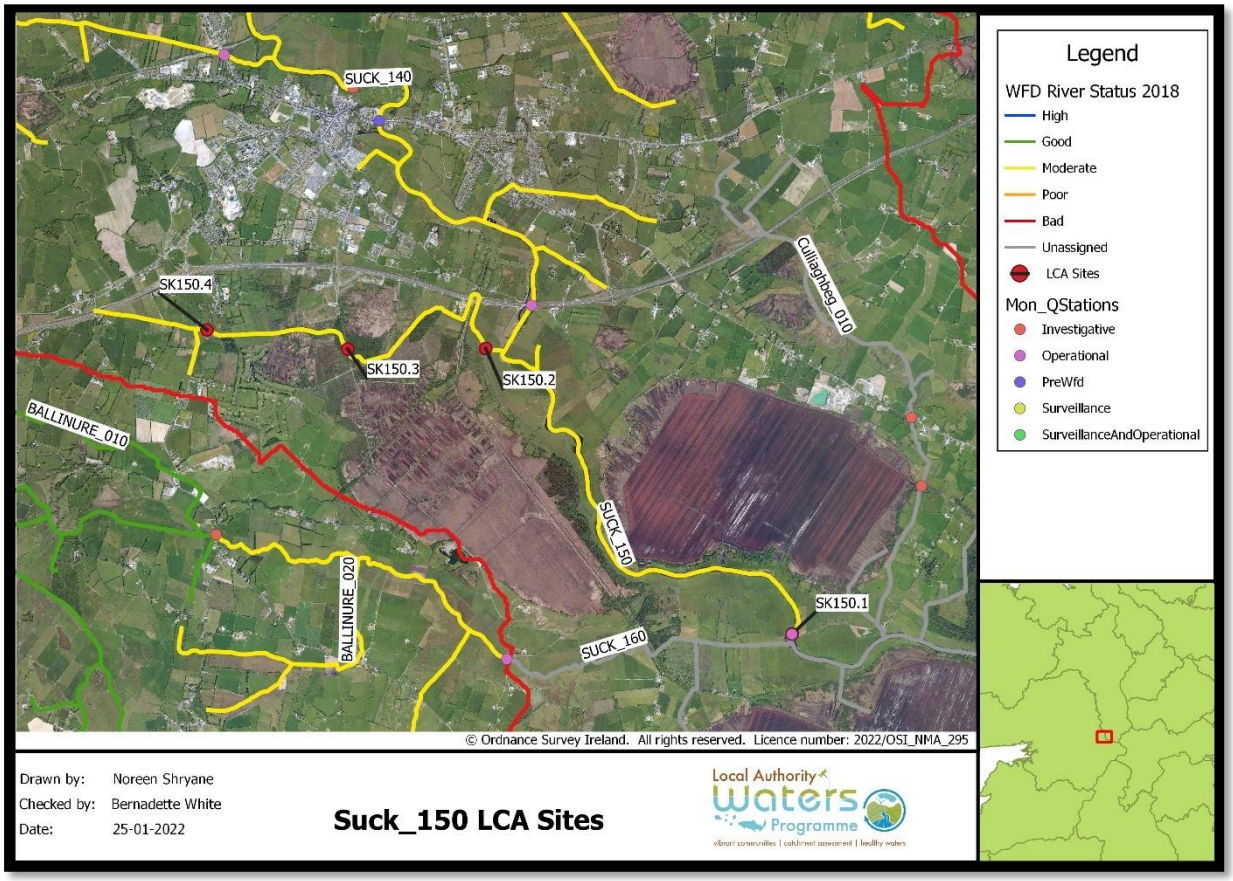

Figure 31 LCA Sites for Suck_150

6.10 Suck_160

The LCA strategy for the water body includes seasonal sampling using SSIS, chemistry analysis and catchment walks. The LCA will start at the downstream EPA monitoring station (SUCK - Creggan 3.3km u/s Shannon R confl). Other LCA stations are strategically located throughout the catchment to capture any potential impacts from the significant pressures (**Table 32** and **Figure 32**).

Table 32 LCA Sites for Suck_160

Station	Station Name	SSIS/ RA	Chemistry	Reason
SK160.1	SUCK - Creggan 3.3km u/s Shannon R confl (Pre-WFD)	No	Yes	▪ Verify condition at EPA monitoring station using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.
SK160.2	1.4km u/s of confluence with main channel	Yes	Yes	▪ Verify condition at site using SSIS. ▪ Obtain Water chemistry to establish if nutrients are a significant issue.

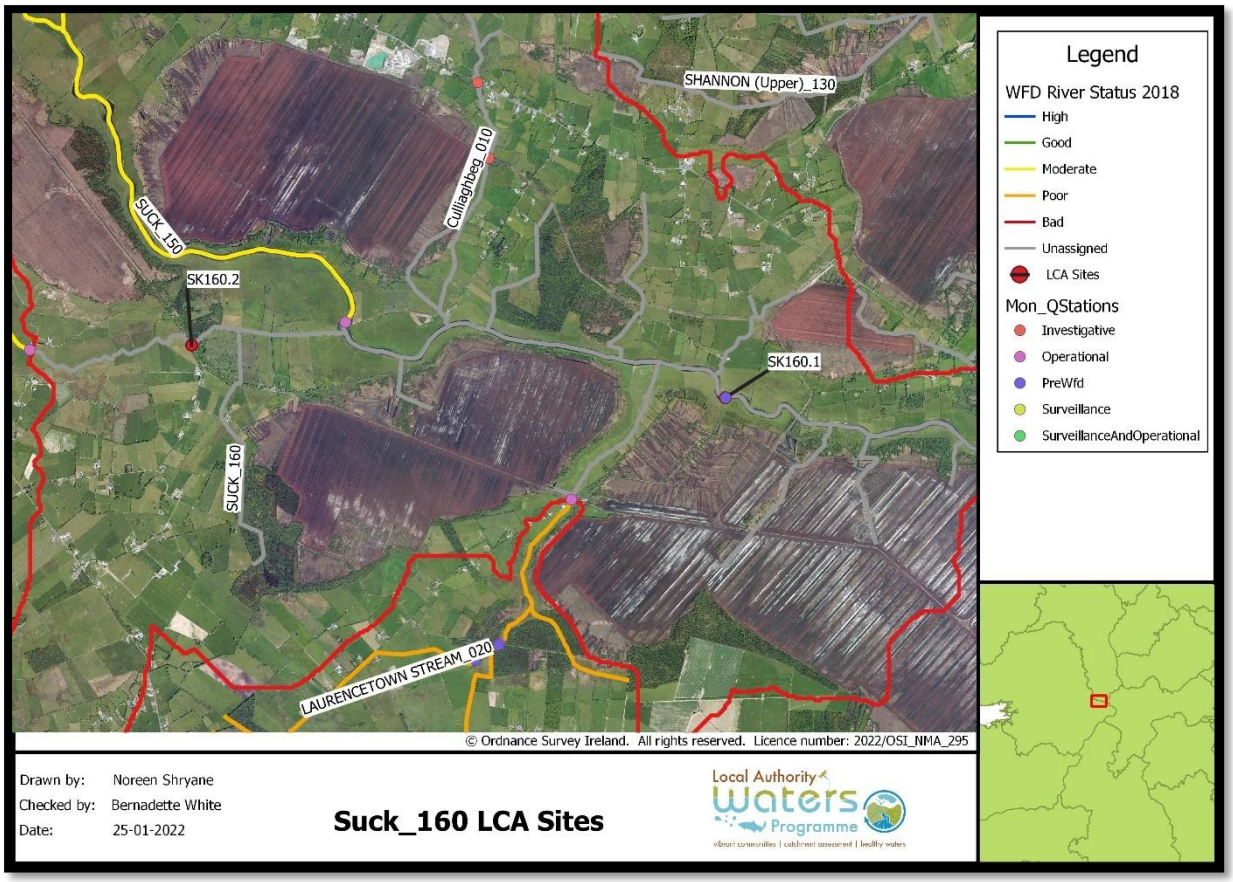

Figure 32 LCA Sites for Suck_160

6.11 Estimate Fieldwork Resources

A total of 40 LCA sites and 5 km of catchment walks have been identified for the initial local catchment assessment in the Lower Suck PAA. The resources required are summarised in **Table 33.** The findings will inform additional LCAs if required.

Table 33 Resource requirements for Summer 2021 local catchment assessment

Waterbody	No. of LCA Stations	Length Catchment Walk (km)	Resources required (No. of days x No. of persons)
Suck_120	4	0	1day x 2 people= 2
Ballyglass_010	1	0	
Killegan Trib North_010	2	0	
Culliaghbeg_010	2	0	
Killeglan_010	6	2.2Km	1day x 2 people= 2
Ahascragh_030	8	2.5Km	1day x 2 people= 2
Derrymullan Stream_020	4	0	1day x 2 people=1
Suck_140	7	0.17	1day x 2 people=1
Suck_150	4	0	1day x 2 people=1
Suck_160	2	0	
Total	**40**	**4.87Km**	**9 Days**

7 Communications

7.1 Submissions on Draft RBMP

Submissions, observations and comments made by interested parties on the draft River Basin Management Plan (RBMP) for Ireland 2018-2021 were reviewed to identify any significant concerns raised about the waterbodies within the PAA or the surrounding area during the consultation process. No submissions specific to the Lower Suck PAA waterbodies were made.

7.2 Community Information Meeting

A Community Information Meeting about the Lower Suck PAA was held over Zoom[34] on the 20th of November 2020. The meeting was attended by members of the public, local stakeholders (including OPW, Local Councillors and Teagasc) and Agricultural Sustainability Support and Advisory Programme (ASSAP). The meeting involved presentations from the Community Water Officer and the lead Catchments Scientist for the PAA followed by a question-and-answer session with the attendees. Questions/Comments raised during the meeting are outlined in **Table 34.**

Table 34 Questions/Comments raised at the Lower Suck PAA Community Information Meeting

Question/Comments
1. The Public representatives were complimentary of the Teagasc ASSAP approach with regard to the pesticide issue in the PAA.
2. The lack of progress on the Leachate traps at Poolboy Landfill was mentioned. It was felt this was important to progress given the nature of the material and its potential to pollute the river.

[34] Due to COVID-19 Restrictions