

Proposed Water Monitoring Programme – June 2022

Coolnabacky, Timahoe, Co. Laois



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Client: Electricity Supply Borad Networks (ESB)

Location: Coolnabacky, Timahoe, Co. Laois

Date: 17th June 2022

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Document Control

PROJECT NUMBER: IE2219		DOCUMENT REF: IE2219-5340			
Revision	Purpose Description	Originated	Checked	Reviewed	Date
2.0	ISSUE	J Keohane	W O'Dwyer	W O'Dwyer	17/06/2022
1.0	Draft	J Keohane	W O'Dwyer	W O'Dwyer	14/06/2022

Contents

1.	Introduction	1
2.	Environmental Setting	1
2.1.	Topography	1
2.2.	Hydrology	2
2.3.	Hydrogeology	5
3.	Monitoring	6
3.1.	Proposed Monitoring Locations	6
3.2.	Proposed Monitoring Approach	7

List of Figures

Figure 1 – Site Location	1
Figure 2 – Hydrology.....	2
Figure 3 – Catchment	2
Figure 4 – Local Hydrological Mapping.....	3
Figure 5 – Site Hydrology & Drainage	4
Figure 6 – Tufa Springs.....	5

Appendices

Appendix A – Drawings

1. Introduction

IE Consulting have been engaged by ESB Networks to provide water monitoring services, related to the construction of a sub-station at Coolnaback, Timahoe, Co. Laois.

This document sets out the context, proposed monitoring locations, parameters measured in-situ and by laboratory analysis, and the frequency and reporting of monitoring.

It is acknowledged that any monitoring programme needs to be adaptable and flexible to conditions prevailing on the site at any one time and provision for this flexibility is built into the programme.

2. Environmental Setting

2.1. Topography

The site lies in a low lying, mostly flat area which extends east and north of the site, although the surrounding land to the south and west becomes hummocky within 150m to 200m of the site. The geomorphology is glacio-fluvial in origin. There is higher ground to the south of Timahoe and east of the site, toward Stradbally, as shown below in Figure 1.

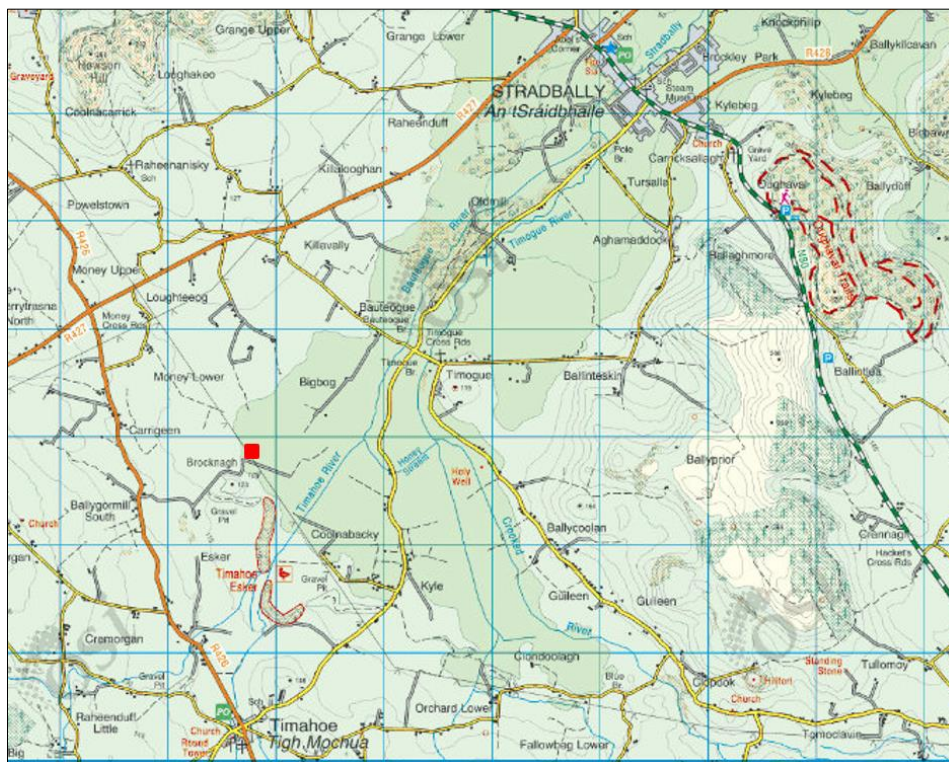


Figure 1 – Site Location

2.2. Hydrology

The site lies on the western side of the Timahoe River, which is a tributary of the River Barrow, as shown in Figure 2.



Figure 2 – Hydrology

The contributing catchment of this watercourse in the vicinity of the site is shown in Figure 3.

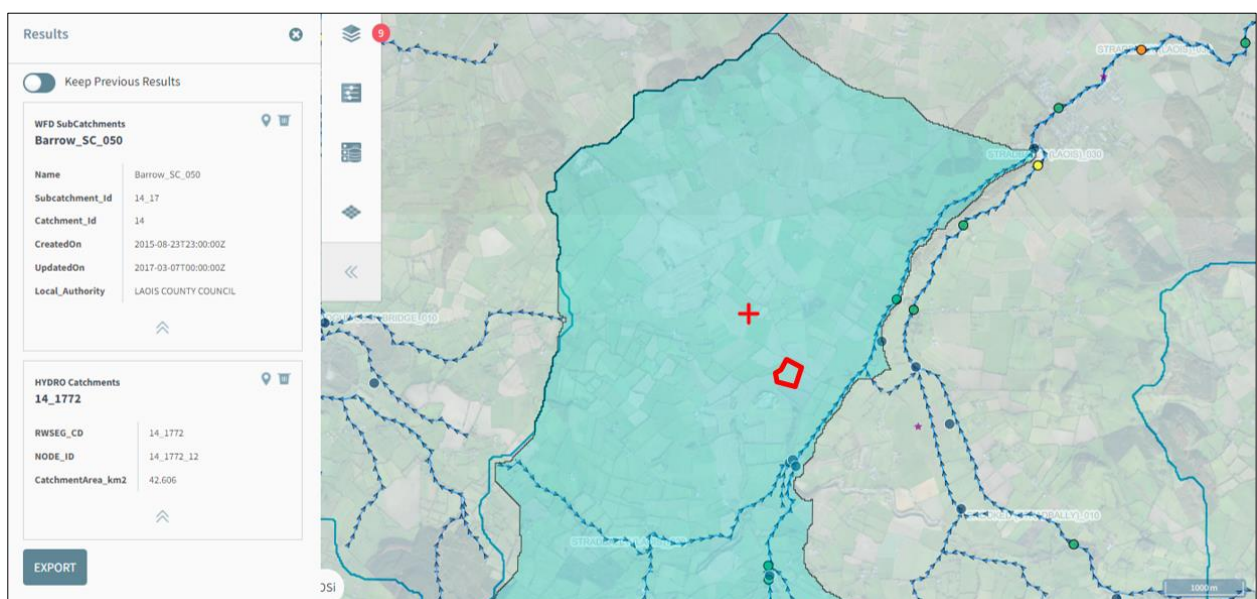


Figure 3 – Catchment

The Timahoe River flows in an approximately northerly direction 500m east of the site. The Timahoe River in turn joins the Honey Stream which flows in from the east and the combined flow becomes the Bauteoge River.

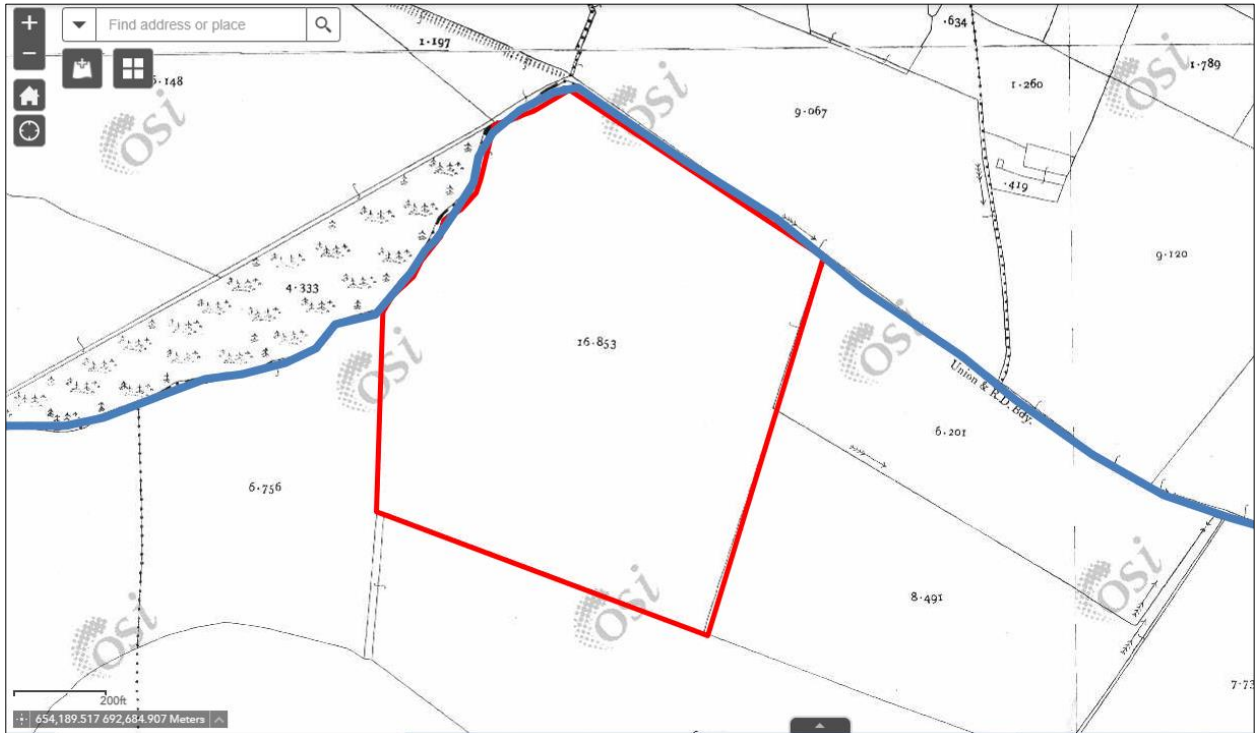


Figure 4 – Local Hydrological Mapping

Watercourses in the area have been modified and canalised in places, and arterial drainage has been used to improve the land and direct run-off towards the streams and rivers.

A natural unnamed watercourse skirts the northern, western and north-eastern boundary of the site flowing from west to east meeting the Timahoe River approximately 500m east of the site.

There are perimeter field drains along the western, southern and eastern boundaries of the site. The perimeter drains are typically 1.0m to 1.5m deep, and run mainly to the North towards the stream, as shown in Figure 5.

The key water features on the site, comprise (i) the main stream described above (ii) man made perimeter field drains that flow north into the main stream (iii) outflow from a tufa spring, that flows inside the north-western site boundary and exits the site through a gap in the perimeter ditch approximately 40m from the field corner. The outfall (not yet constructed) from the proposed settlement ponds will exit the site downstream of the Tufa Springs.

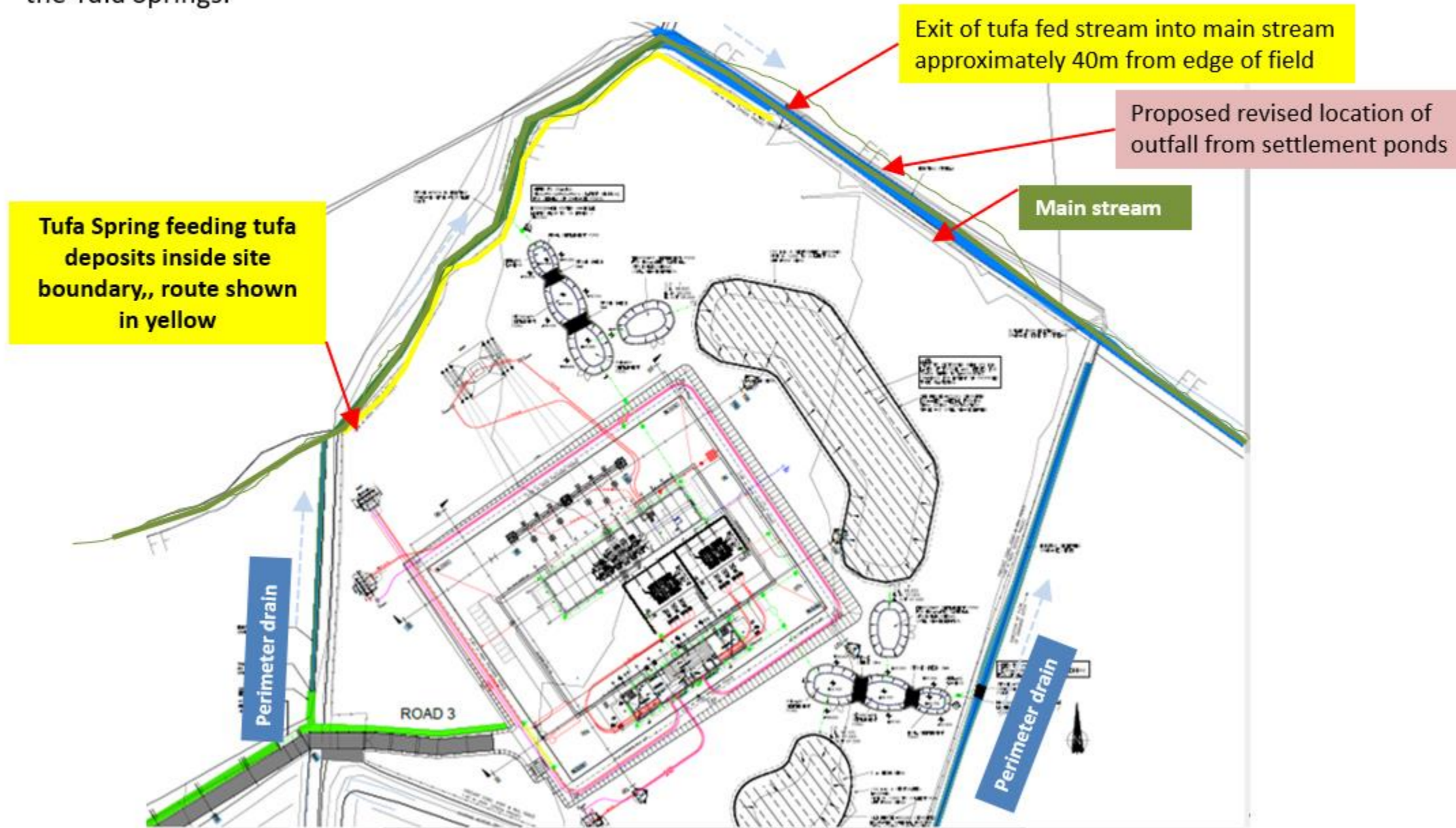


Figure 5 – Site Hydrology & Drainage

2.3. Hydrogeology

The underlying bedrock geology of the site comprises limestone of the Ballyadams Formation. Rock is approximately 9m below ground level on the site.

Subsoils consist of Alluvium (sand silt and gravels) to 3m approx. overlying stiff boulder CLAY from 3m approx. to 9m.

The bedrock aquifer beneath the site is mapped as an Rkd (Regionally Important Aquifer – Karstified-diffuse). The GSI also maps the area as being in a sand and gravel aquifer, but site specific studies have confirmed that the sand and gravel deposits on site do not comprise an aquifer.

A survey of all perimeter drains and the main stream encountered evidence of tufa deposits in the watercourses as shown in yellow below, which suggests that many of the surface water features are groundwater fed.

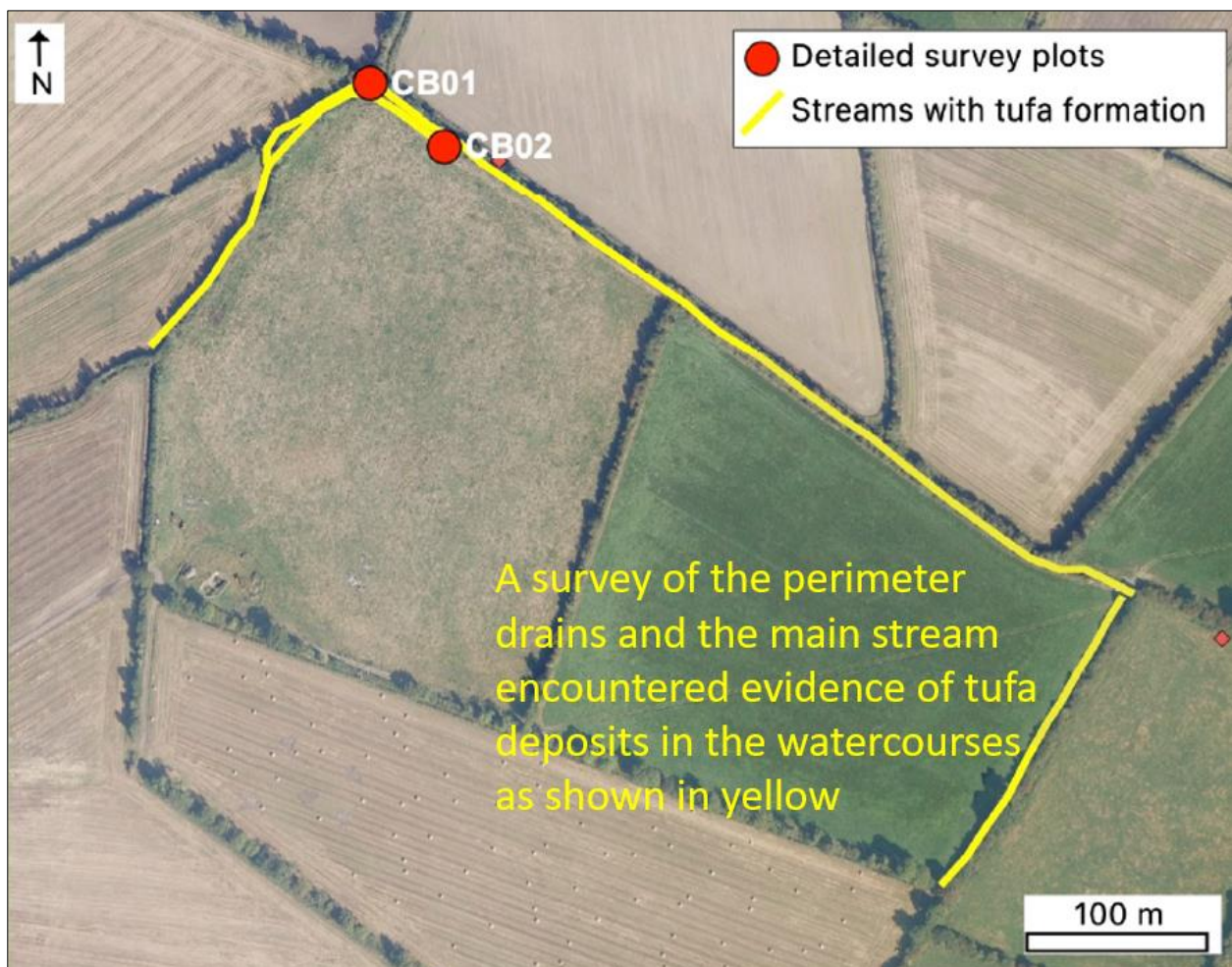


Figure 6 – Tufa Springs

3. Monitoring

3.1. Proposed Monitoring Locations

Five surface water monitoring locations are proposed, labelled SW1-SW5 as shown on Figure 7.

The proposed groundwater monitoring points comprise 3 boreholes specially constructed within the shallow sediments (1-3) in the Tufa spring area. A borehole that extends 9m through the sediments as far as rock (BH4), and the proposed water supply well (yet to be drilled)

Groundwater monitoring points are shown on Figure 8.

Further details are shown on ESB Networks Drawing No. PE493-D108-098-001-003 in Appendix A.

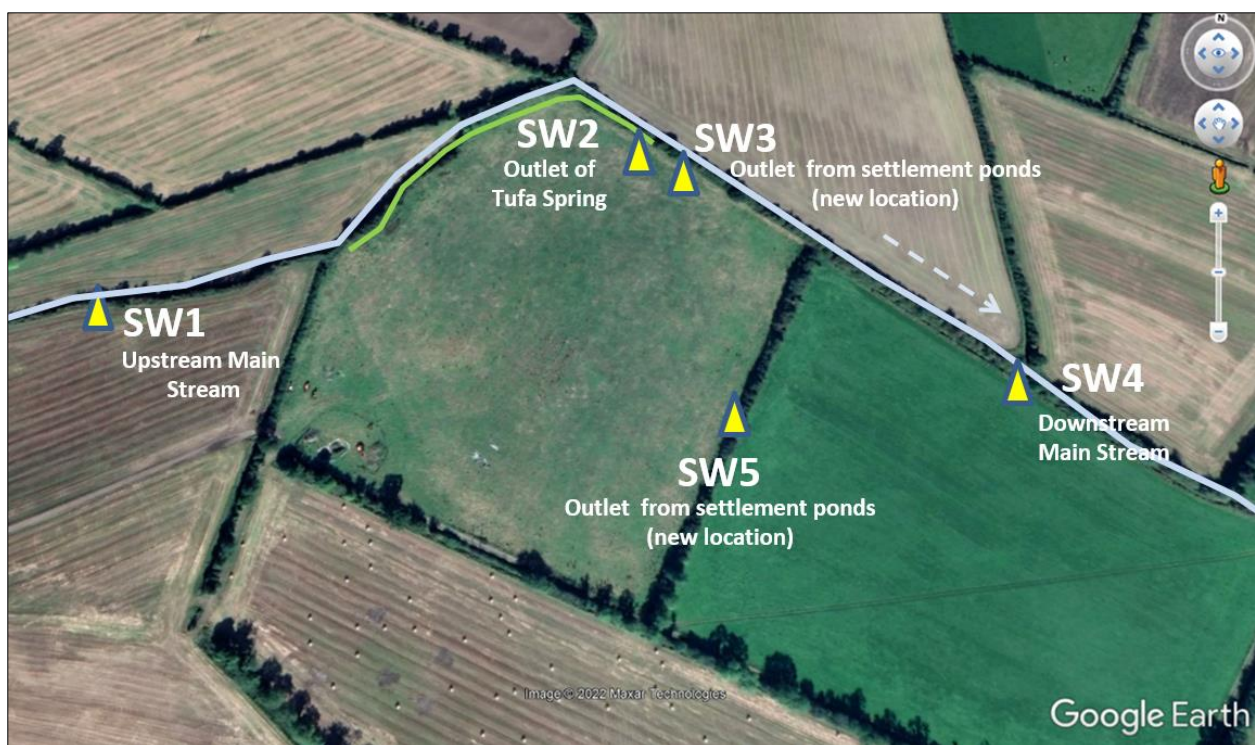


Figure 7 – Surface Water Monitoring

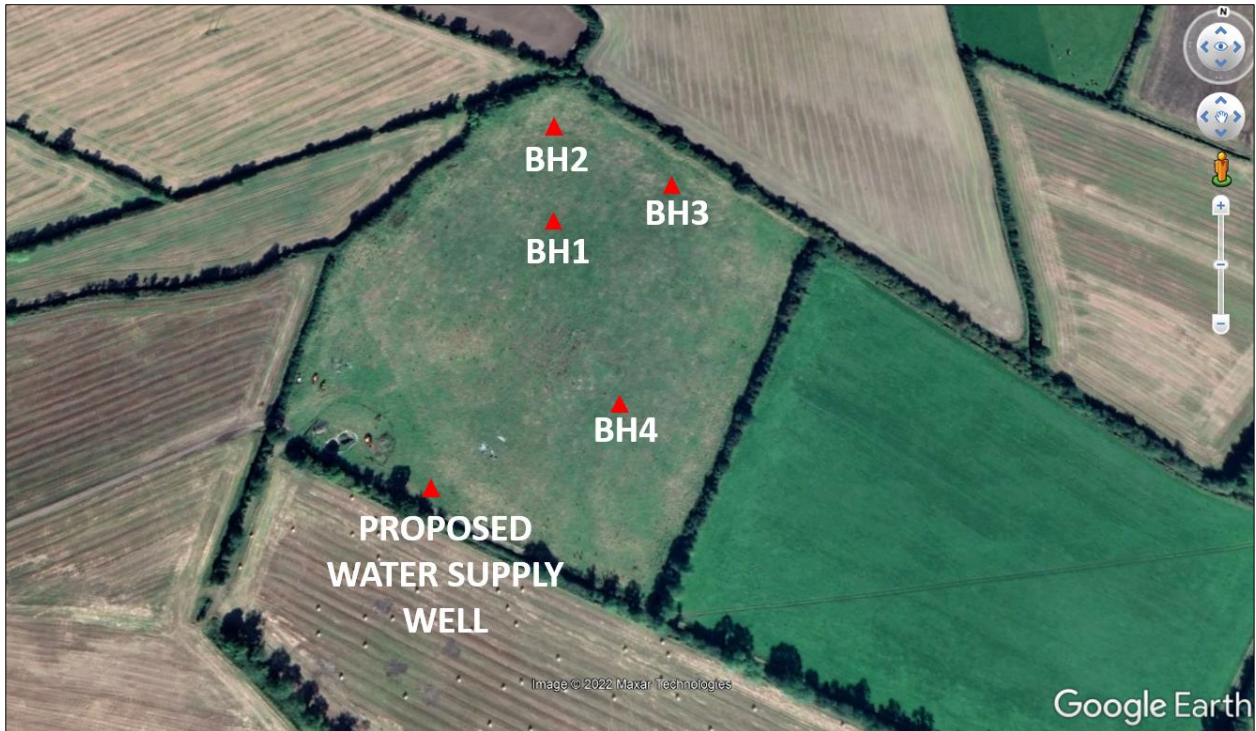


Figure 8 – Groundwater Monitoring Plan

3.2. Proposed Monitoring Approach

Method

The proposed approach to monitoring on the site will involve the following:

- Visual, to examine for oil sheen, excess suspended solids or discolouration, turbidity
- In situ measurement: DO, pH, EC, Turbidity, Temperature, and groundwater level monitoring
- Sampling and analysis:
 - pH, Conductivity, Chloride, Sodium, Sulphate, Calcium, Magnesium, Potassium, Ammoniacal N-NH₄, Alkalinity, Nitrate and Phosphorous, Total TPH
 - To standards BS EN ISO 5667 for Surface Water and BS EN ISO 19458 for Groundwater.
 - Analysis will be at an INAB or UKAS accredited laboratory

Frequency

The frequency of monitoring will be as follows:

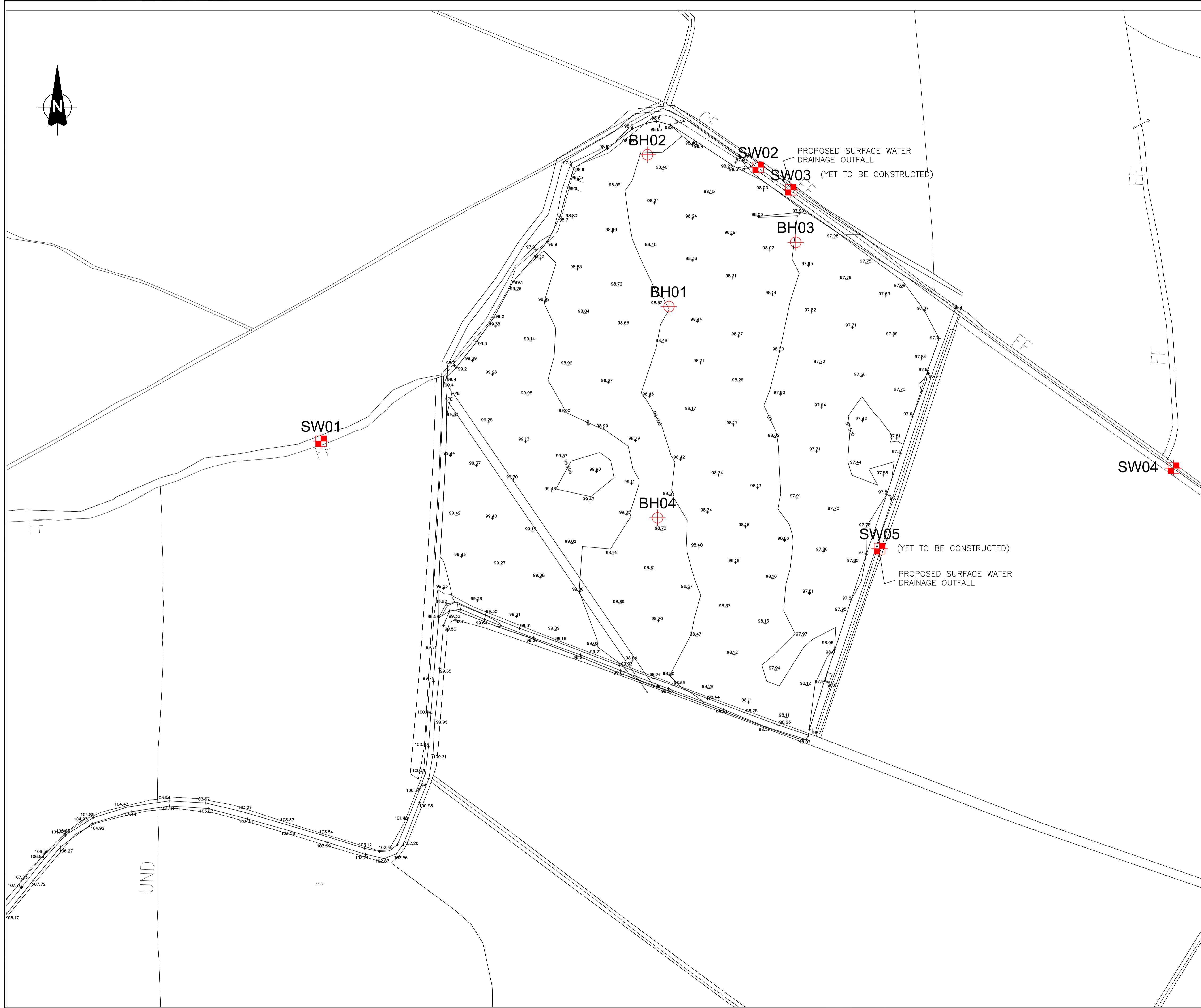
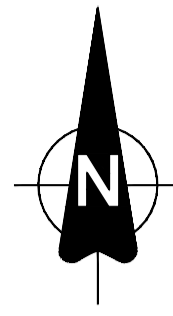
- Visual daily of all watercourses and outfall from settlement pond by site Engineer. The Ecological Clerk of Works (when appointed) will monitor all waterbodies on site and manage same. Contact details will be forwarded to Laois C. C, when appointed.
- Monthly visual and in-situ measurement only
- Quarterly surface water sampling
- Quarterly groundwater sampling
- Higher frequency if warranted by more intense construction activity or heavy rainfall
- Reduced frequency as main civils works decline
- Reduced frequency monitoring through commissioning until hand over to O&M

Reporting

- All incidents regarding environmental issues to be reported immediately to Laois County Council Environment Section (057-8664000) on the day of the incident, or Ann Marie Callan (086-7966282) or Rory O'Callaghan (986-1438394)
- IE Consulting will perform a QA/QC check on the results of analysis
- A Monthly report will be prepared
- IE Consulting will maintain a database of water quality and water levels,
- Monitoring results will be shared with Laois C.C each quarter

Appendix A

Drawings



- NOTES:
1. NO EXCAVATION SHALL TAKE PLACE WITHOUT A PERMIT TO EXCAVATE UNDER CMP13.
 2. NO EXCAVATION WORK SHALL COMMENCE UNTIL THE CONTRACTOR HAS CONSULTED UP TO DATE SERVICE DRAWINGS AND CARRIED OUT AN ELECTROMAGNETIC (EML) SCAN. (TO INCLUDE CENTRAL SITE DRAWING)
 3. EXCAVATIONS WITHIN 500 m OF SUSPECTED OR KNOWN BURIED SERVICES SHALL BE CARRIED OUT BY HAND.
 4. ACCESS TO TEST LOCATIONS REQUIRES TRAVELING UNDER LIVE OVERHEAD LINES AND EQUIPMENT. ACCESS ROUTES, EXCAVATION METHODOLOGIES AND RISK REDUCTION MEASURES SHALL BE IN ACCORDANCE WITH ESN CODE OF PRACTICE "AVOIDANCE OF ELECTRICAL HAZARDS WHEN WORKING BENEATH OVERHEAD LINES" IN CONJUNCTION WITH DRAWING No. PG406-D100-051-001
 5. THIS DRAWING TO BE READ IN CONJUNCTION WITH DOCUMENT REFERENCE DRA
 6. CONDITIONS OF PLANNING PERMISSION SHALL BE DISCHARGED PRIOR TO COMMENCEMENT OF WORKS.
 7. COMPLIANCE OF PLANNING PERMISSION SHALL BE CONFIRMED PRIOR TO COMMENCEMENT OF WORKS.
 8. COORDINATES REFER TO ITM.
 9. THE LOCATION OF THE WATER SUPPLY BOREHOLE (BH04) IS PROVISIONAL. EXACT LOCATION SHALL BE CONFIRMED.

- BH-XX BOREHOLE
- SW-XX WATER SAMPLING POINT

	COORDINATE (A)	
	EASTING	NORTHING
BH01	653762.000	692995.000
BH02	653750.000	693080.000
BH03	653833.000	693031.000
BH04	653755.620	692876.750
SW01	653567.155	692919.644
SW02	653811.956	693072.980
SW03	653830.259	693060.418
SW04	654044.694	692904.551
SW05	653880.025	692859.447

REV	DATE	REVISION DESCRIPTION	DRN	PROD	VER	APP
3	JUN. 22	MINOR REVISIONS				
2	JUN. 22	WATER SAMPLING LOCATIONS SW3 & SW5 & BOREHOLE BH4 ADDED				
1	MAY. 22	WATER SAMPLING LOCATIONS ADDED				
0	JUN. 21	ISSUED FOR CONSTRUCTION				

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PURPOSE OF ISSUE - PRELIMINARY UNLESS INDICATED
 CLIENT APPROVAL PLANNING TENDER CONSTRUCTION AS-BUILT

CLIENT **ESB NETWORKS**

PROJECT **Coolnabacky 400 kV Station**

CONTRACT **ENABLING WORKS**

DRAWING TITLE **COOLNABACKY 400 kV SUBSTATION CIVIL SITE BOREHOLES & WATER SAMPLING LOCATIONS**

PRODUCTION UNIT **Civil & Environmental Engineering**

DRAWN	PRODUCED	VERIFIED	APPROVED	APPROVAL DATE
J.Byrne	J.Byrne	B.Murphy	M.Pull	17/06/2022
CLIENT REF	NO. OF SHTS	SIZE	SCALE	
TC224903	1	A1	1:1000	

DRAWING NUMBER **PE493-D108-098-001-003**