This report has been cleared for submission to the Director by Marie O'Connor, Programme Manager.	
Signed: , Programme Officer	Dated: 22/09/2020

OFFICE OF ENVIRONMENTAL SUSTAINABILITY

INSPECTOR'S REPORT ON AN APPLICATION FOR A CERTIFICATE OF AUTHORISATION FOR A CLOSED LANDFILL

TO:	Dr. Eimear Cotter, Director
FROM:	Ewa Babiarczyk, Inspector, Environmental Licensing Programme
DATE:	22nd September 2020
RE:	Application by **Roscommon County Council** for a Certificate of Authorisation for a closed landfill at **Cloondacarra Beg, Castlerea, County Roscommon**. Certificate of Authorisation Register Number **H0394-01**.

1. Application details

Type of facility:	Closed landfill as defined in the Regulations[1].
Original site ownership	Roscommon County Council.
Current site ownership	Roscommon County Council.
Operator of closed landfill	Roscommon County Council operated this site since 1960 until 1999.
Proposed use post remedial works	Roscommon County Council intends to use this site for agricultural purposes such as a grazing land for animals.
Risk category of closed landfill:	High risk (class A) due to • migration of landfill leachate to surface waters.
Section 22 register number:	S22-02423
Grid Reference	568277 E and 777483 N
Application received:	6th December 2019
AA screening determination:	16th January 2020

[1] Waste Management (Certification of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008 (S.I. No. 524 of 2008).

Regulation 7(4) notice:	7th February 2020
Additional information received:	Regulation 7(4) Reply received on 11th May 2020. Unsolicited information was received on 28th January 2020 and 18th August 2020.
Name of Qualified Person:	Sean Moran, Credentials provided by Institute of Geologists of Ireland.
EPA site inspection:	No inspection was required.

2. Information on the closed landfill

Location of facility	The closed landfill is located 1.5km south of Castlerea, in the townland of Cloondacarra Beg, Co. Roscommon, 250m to the west of the N60 Road. The location of the landfill site is shown in Figure 1.
Period of landfilling	1960 to 1999.
Surrounding area	The site lies in a rural area and 40m to the south of the Harristown Stream which is a tributary of River Suck. The closed landfill borders with land drains which discharge into the Harristown Stream. The site is surrounded by agricultural lands, forestry and cutover peatlands, as shown in Figure 2. There is a number of domestic dwellings to the north and south west of the closed landfill. The closest domestic dwelling is located 280m north of the site.
Area of the closed landfill	The landfill site covers an area of 4.05 ha. The waste body developed in two phases, as shown in Figure 2. Phase A1 covers an area of 1.35 ha and operated from 1960 to 1988 and Phase A2 covers an area of 2.7 ha of which 1.8 ha was used for landfilling between 1988 and 1999.
Quantity of waste at the facility	Approximately 41,500 tonnes. 83,000m^3
Characterisation of waste deposited	The waste body comprises of municipal and commercial waste and sewage treatment sludge. The deposited waste includes organic material, paper, plastic, cinders, glass, metal, nappies, textiles and dog carcasses from a local pound. The approximate extent of the deposited waste is shown in Figure 3.

3. Site investigations

Current condition and appearance of closed landfill:	The closed landfill is covered with grass and scrub.
Site investigations	The site investigations carried out as part of Tier 2 and Tier 3

	assessments established the following facts: • landfill gas and landfill leachate are being generated within the waste body; • the landfill is capped with a material comprising brown sandy gravelly clay, peaty clay and clayey peat; • the majority of the site is underlined by peat; • the permeability testing concluded that the existing capping material is suitable for use as landfill capping material and can be compacted to meet the non-hazardous landfill capping permeability requirements; and • the landfill leachate is migrating via the surface water drainage system surrounding the closed landfill into the Harristown Stream.
Monitoring and analysis of samples (water, gas, waste):	Tier 1 Assessment was completed by the County Council in 2009 and reviewed as part of Tier 2 Site Investigations and Tier 3 Assessment which were completed in 2017. The following site investigations were carried out as part of Tier 2 and Tier 3 Assessments: • trial pit survey to assess the thickness and nature of the capping material (fourteen trial pits were excavated in 2017); • permeability testing on the capping material samples (two samples were taken (one from Area 1 and one from Area 2); • groundwater monitoring (carried out on 27th November 2017 and 8th August 2019); • leachate monitoring (carried out on 27th November 2017); • surface water sampling (carried out on 27th November 2017 and 8th August 2019); • gas monitoring (carried out on 1st December 2017, 8th August 2019 and 24th March 2020); and • ground water level survey (November 2017 and August 2019).
Hydrology	There are land drains flowing along the eastern, western and northern site boundary of the closed landfill. These drains discharge to the Harristown Stream (waterbody code IE_SH_26S070300) which flows 40m north of the site in a westerly direction. The Harristown Stream forms a tributary of the Suck River (waterbody code IE_SH_26S070300) and discharges into this river 1.4km downstream of the closed landfill. The status of the Harristown Stream, both upstream and downstream of the closed landfill is Poor. The status of the Suck River upstream of the confluence with the Harristown Stream is also Poor. However, the status of the Suck river at a location 50m downstream of the confluence with the Harristown Stream is High. The Suck River forms a part of the River Suck Callows SPA (Site Code: 004097) 31km downstream of the closed landfill.

	The surface water monitoring was carried out on 27th November 2017 and 8th August 2019 at five locations CSW1, CSW2, CSW3, CSW5 and CSW6, as shown in Figure 3. The 2017 monitoring results show exceedances of BOD at monitoring location CSW3, which is located upstream of the landfill in the land drain which flows along the western site boundary and discharges into the Harristown Stream. While the standard for BOD is 2.6 mg O_2/l (95%ile flow) as set out in European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, the recorded concentrations of this parameter was 3 mg/l. Also, the 2019 monitoring results shows exceedances of this parameter at CSW2, which is located downstream of the landfill on the land drain which runs along the eastern site boundary. The recorded concentration at CSW2 was 3 mg/l. The 2017 monitoring results also show exceedances of ammonia at all monitoring locations. While the standard for total ammonia is 0.140mg/l (95%ile flow) as set out in European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, the recorded concentrations were: 0.37mg/l at CSW1, 17.86mg/l at CSW2, 0.23mg/l at monitoring locations CSW3 and CSW4, and 1.11mg/l at CSW6. Ammonia concentrations recorded in 2019 exceeded the said standard at CSW1 and CSW2 and were recorded at, respectively, 0.61mg/l and 7.77mg/l. CSW1 is located downstream of the landfill on the same land drain as CSW3. The 'Updated Tier 2 and Tier 3 Environmental Risk Assessment' (hereafter referred to as 'The risk assessment') submitted by the applicant states that the elevated ammonia levels in the upgradient monitoring locations may be associated with run-off from the surrounding lands and the local peat environment. However, there was no difference in the concentration of ammonia recorded at CSW5 and CSW6 in 2019. CSW5 is located on the Harristown Stream upstream of the discharge locations from the two land drains, while CSW6 is located on the Harristown Stream, downstream of the discharge locations from the two land drains. Ammonia at 0.09mg/l was recorded at each of these two locations. The monitoring results also show exceedance of the standard for orthophosphate in 2019. While the standard for this parameter is 0.075mg/l (95%ile flow), as set out in European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, the recorded concentration of this parameter at CSW1 was 0.08mg/l. Furthermore, the monitoring results show exceedance of total cyanide in 2019. While the standard for this parameter is 0.01 mg/l (mean concentration) as set out in European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended, the recorded concentration of this parameter at CSW1 was 0.16mg/l. The monitoring results also show that in both monitoring rounds the concentrations of ammonia, chloride and potassium and manganese

	were significantly higher at the downstream monitoring location CSW2 compared with the concentrations of these parameters recorded at the upstream monitoring location CSW3. The 2017 monitoring results further show that concentrations of sulphate, chloride, total oxidised nitrogen, BOD, COD, potassium, sodium and ammonia at the monitoring location CSW5 (upstream) were higher than the concentrations of these parameters at the monitoring location CSW6 (downstream). For example, concentration of ammonia at CSW5 was 0.23mg/l and 1.11 mg/l at the CSW6. The 2019 monitoring results show however, that the concentrations of most of the monitored parameters at CSW6 were the same, or less than the concentrations recorded at CSW5. The difference in water quality upstream and downstream of the site demonstrates that water quality in the Harristown Stream is being impacted by the closed landfill. However, the 2019 monitoring results show that this impact is not significant. Condition 3.8(d) requires monitoring of surface water at the locations upstream and downstream of the closed landfill on a quarterly basis.
Hydrogeology	The site overlies Suck South Groundwater Body (Groundwater body Code: IE_SH_G_225). The quality status of this groundwater body is good. The limestone bedrock beneath the site is classified as a Regionally Important Karstified Aquifer which is characterised by conduit flow (Rkc). The vulnerability rating for the bedrock aquifer beneath the site varies from Low in the eastern part of the site to High in the western part of the site. The risk assessment states that shallow groundwater was encountered in monitoring boreholes CBH3 and CBH6 at the depth of 0.9m below ground level and 2.2m below ground level, respectively, and a water-bearing, sand and gravel layer up to 4 m thick was encountered at 7.0 to 8.5 m below ground level. The risk assessment further states that the water bearing formation is confined by the overlying peat and glacial till and an upward hydraulic gradient is present. The risk assessment also states it is likely that shallow groundwater beneath the site discharges to the Harristown Stream and that the deeper groundwater in the bedrock flows to the north-north-west and discharges into the Suck river. Castlerea Regional Water Supply (PWS code: 2600PUB1016_1) abstracts water from the Silver/Longford Spring which is located 2km north-east of the closed landfill. The closed landfill is not located within a Source Protection Area for the spring. Due to the fact that the groundwater flow beneath the closed landfill flows towards north-north west, there will be no impact from the closed landfill on this water supply. There are no drinking water wells or boreholes downgradient of the closed landfill. The nearest private drinking water borehole is located

	600m, in a west-south-westerly direction, of the site. This well is used for agricultural and domestic purposes. Due to the fact that the groundwater flow beneath the closed landfill flows towards north-north west, there will be no impact from the closed landfill on this well. Condition 3.8(e) requires monitoring of groundwater quality upgradient and downgradient of the waste body.
Leachate and water quality:	Groundwater monitoring was carried out at monitoring wells MW1 and MW2, as shown in Figure 3, on 27th November 2017 and 8th August 2019. The following monitoring results refer to the elevated parameters and the parameters for which the concentrations recorded at the downgradient monitoring location MW2 were higher than the concentrations recorded at the upgradient monitoring location MW1, which indicates that the landfill is impacting on groundwater quality: • The 2017 monitoring results show exceedances of the threshold for arsenic of 7.5µg/l, as set out in the European Union Environmental Objectives (Groundwater) Regulations 2010, as amended. The recorded concentration of this parameter at MW1 was 15.1µg/l and 11.6µg/l at MW2. Although no exceedance of this parameter was recorded in 2019, the recorded concentration of this parameter at the downgradient monitoring location MW2 was higher than the concentration recorded at MW1. The concentration of arsenic was 3.5µg/l at MW1 and 7.3µg/l at MW2; • The concentration of boron at MW2 in 2019, although within the threshold of 750µg/l as set out European Union Environmental Objectives (Groundwater) Regulations 2010, as amended, was 4.1 times higher than the concentration recorded at MW1. The recorded concentration of this parameter at MW1 was 12µg/l and 49µg/l at MW2; • The concentration of potassium at MW2 exceeded interim guideline value (IGV)[1] for this parameter of 5mg/l at MW2 in 2019. The recorded concentration of potassium at MW2 was 5.3mg/l, which is 3.3 times higher than the concentration of this parameter at the upgradient location MW1, where the concentration of potassium was recorded at 1.6mg/l; • The concentration of sodium, although at both monitoring locations within the threshold of 150mg/l as set out European Union Environmental Objectives (Groundwater) Regulations 2010, as amended, was 19.1mg/l at MW1 and 27.6mg/l at MW2;

[1] As set out in the EPA publication 'Towards setting guideline values for the protection of groundwater in Ireland – Interim Report', 2003.

	• The monitoring results further show exceedances of IGV for chloride of 30 mg/l at both monitoring locations in 2017 and at MW2 in 2019. In 2017, the recorded concentration of chloride at MW1 was 39.4mg/l and 33.3mg/l at MW2. In 2019, the recorded concentration of this parameter at MW2 was 94mg/l. It is noted however that the recorded chloride concentrations are within the threshold of 187.5mg/l as set for this parameter in European Union Environmental Objectives (Groundwater) Regulations 2010, as amended. Notwithstanding the above, the concentration recorded in 2019 at MW2 (94mg/l) is 3.2 times higher than the concentration recorded at MW1 at a level of 29.2mg/l; • The monitoring results further show exceedances of IGV for ammonia of 0.15mg/l and the standard of 0.175mg/l set out for this parameter in European Union Environmental Objectives (Groundwater) Regulations 2010, as amended, at both monitoring locations in 2017 and 2019. In 2017, the recorded concentration of ammonia at MW1 was 7.88mg/l and 5.67mg/l at MW2. In 2019, the recorded concentration of this parameter at MW1 was 7.44mg/l and 21.17mg/l at MW2, which is 2.8 times higher than the upgradient concentration. Although, the risk assessment states that ammonia may originate from the extensive peaty soil environment, the higher concentration at MW2 indicates that the groundwater quality at this location is impacted by the landfill; • The monitoring results further show exceedances of IGV for manganese of 50µg/l at both monitoring locations in 2017 and 2019. In 2017, the recorded concentration of this parameter at MW1 was 241µg/l and 96µg/l at MW2. In 2019, the recorded concentration of this parameter at MW1 was 310µg/l and 220µg/l at MW2; • Additionally, coliforms were detected during both monitoring events. In 2017, the recorded concentration of total coliforms at MW1 was 40cfu/100ml and 27cfu/100ml at MW2. In 2019, the recorded concentration at MW1 was 3cfu/100ml and 10cfu/100ml at MW2. Faecal coliforms were not detected in 2019 but in 2017 the recorded concentrations at both monitoring locations was 2cfu/100ml. The monitoring results show that the closed landfill impacts on groundwater quality. It is noted that the exceedances of parameters at the upgradient location indicate that groundwater quality is impacted by other factors than the landfill however, the observed increase in the parameter concentrations at the downgradient location indicated that the closed landfill is also impacting on groundwater quality. The risk assessment further states that leachate sampling at well L1, as shown in Figure 3, shows that the landfill leachate is impacting on the surface water quality in the drains surrounding the site and the Harristown Stream.

	Condition 3.8(e) requires monitoring on a quarterly basis of groundwater from at least three groundwater monitoring boreholes, one of which shall be upgradient of the waste body and two of which shall be downgradient of the waste body. Additionally, Condition 3.8(b) requires quarterly monitoring for leachate.
Landfill gas:	There is a risk of landfill gas migration to nearby houses. The most likely pathway for the migration of the landfill gas is through the underlying bedrock and existing landfill cap. Landfill gas is migrating through the waste toward the surface water drains surrounding the landfill. The nearest domestic dwelling is located 280m north of the closed landfill. Gas monitoring was undertaken on the 1st December 2017, 8th August 2019 and 24th March 2020. The monitoring included the measurement of methane (CH_4), carbon dioxide (CO_2), oxygen, atmospheric pressure and gas flow rate. The 2017 gas monitoring was carried out at three monitoring locations MW1, M2 and L1, as shown in Figure 3. The monitoring results show that methane concentrations varied from 3.7 %v/v in MW1 and 0.5 %v/v in MW2 to 76 %v/v at L1. In 2019, no methane was recorded at MW1 and the concentration of methane at MW2 was recorded at 1.8 %v/v and no monitoring was carried out at L1. The monitoring results from March 2020 show that methane was recorded at 75.6 %v/v at L1, 0.1 %v/v at MW1 and 0.9 %v/v at MW2. 'Landfill gas addendum' to the risk assessment states it is possible that the methane could originate from the peat subsoil locally. Considering however a very high methane generation at the monitoring location within the middle of the waste body and relatively low methane concentrations at MW1 and MW2, Condition 3.4 requires investigation of the source of such high methane levels. Furthermore, Condition 3.1(g) requires a gas pumping trial, while Condition 3.1(h) requires a report on the trial to be submitted to the Agency and agreement sought regarding any recommendations arising from the trial and their implementation. Additionally, Condition 3.1(b) requires a landfill cap, to include a 1mm thick low permeability geomembrane, and Condition 3.1(c) requires gas vent pipes to be installed. Furthermore, Condition 3.8(c) requires monitoring to detect the presence and concentration of landfill gas on a quarterly basis.
Conceptual site model:	The overall risk rating of the site is High Risk (class A) due to leachate migration to the surface waters. The conceptual site model is shown in Figure 4.

4. SPR linkages and remedial actions

SPR linkage scenarios (applicable ones only):	**Leachate and gas migration scores**: High scores: • Migration of the landfill leachate, via surface water drainage/run-off, to surface waters (SPR 8). Moderate scores: Three pathways for leachate migration were identified as Moderate Risk: • migration of leachate, via groundwater that recharges surface water drainage/run-off, to surface water body (SPR 1); • migration of leachate to the underlying aquifer (SPR 5); and • migration of leachate, via groundwater, to surface water body (SPR 7). Low scores: Three pathways for leachate migration and one pathway for gas migration were identified as Low Risk: • migration of leachate to private wells (SPR 3); • migration of leachate to public water supplies (SPR 6); and • lateral migration of landfill gas to nearby houses (SPR 10). **Summary:** Upon the review of the monitoring data; • remedial action is warranted to address the risk of leachate migrating from the site into surface and groundwater; and • remedial action is warranted to address the risk of off-site migration of landfill gas.
Proposed remedial actions:	The applicant considered the following remedial actions as the feasible options: 1. Landfill cap The applicant proposes to install a 1m thick cap. The risk assessment states that there may be sufficient capping material on site to cover both areas with a 1m cap once the material in the A2 area is redistributed. The risk assessment further states that the capping layer should be integrated into a perimeter retaining berm and graded to achieve a fall from a central ridge running north to south to the sides of the capped site with a fall of 1:40. The risk assessment further states that it is likely that some clay will be required to be imported to create this berm.

	2. Perimeter berm The risk assessment recommends installation of a compacted, low permeability clay perimeter berm around the waste body, as shown in Figure 5. 3. Gas ventilation wells The risk assessment recommends that four gas ventilation wells, as shown in Figure 5, are installed to allow passive ventilation of landfill gas. The risk assessment further states that the well pipes should be 100mm slotted uPVC pipes and should extend 150mm above the top soil layer. Condition 3.1(g) requires carrying out a gas pumping trial within six months. Additionally, having regard to the high methane concentrations recorded in monitoring well L1, Condition 3.4 requires investigation of the source of such high methane readings. Having regard to the monitoring results submitted in support of the application for certificate of authorisation, the age of the closed landfill, the location of the nearest drinking water borehole (600m to the west-south-west of the site) and the fact that the nearby dwellings are serviced by public supply water mains, the following remedial measures are considered appropriate and recommended in Condition 3.1: (a) Minimise the disturbance of deposited waste to the extent possible; (b) Install a low permeability landfill cap, minimum 1m, with 1mm thick low permeability geomembrane having a hydraulic conductivity of less than or equal to $1x10^{-9}$m/s; (c) Install four gas vent pipes within the waste body. The gas venting pipes shall meet the following requirements: (i) There shall be a fan on each gas venting pipe; (ii) The gas vent pipes shall not be perforated above the ground level. (d) Install at least three gas monitoring boreholes outside the waste body, of which one shall be upgradient of the waste body and two of which shall be downgradient of the waste body; (e) Install at least three groundwater monitoring boreholes, of which one shall be upgradient of the waste body and two of which shall be downgradient of the waste body; (f) Reseed grass within the site; (g) The local authority shall, within six months of the date of grant of this Certificate of Authorisation, carry out a gas pumping trial. Details of the proposed gas pumping trial shall be submitted for agreement by the Agency;

	(h) Within one month of the completion of the gas pumping trial, as required under Condition 3.1(g), the local authority shall submit a report on the trial to the Agency and seek agreement of the Agency regarding any recommendations arising from the trial and their implementation. The proposed remedial actions are intended to break the SPR linkages by preventing: • migration of leachate into the surface waters and the aquifer; and • migration of landfill gas to off-site locations. The recommended certificate of authorisation allows for the importation and use of soil and stone to complete the works.
Proposed aftercare monitoring and assessment:	Monitoring as specified in Condition 3.8 of the recommended certificate of authorisation. Validation report to be submitted within 30 months.
Adequacy of risk assessment:	Regulation 7(7) of the Regulations states that the EPA must be satisfied with the risk assessment before proposing to grant a certificate of authorisation. The risk assessment is adequate for the following reasons: • It has identified, assessed and adequately addressed the associated risks inherent with the landfill site. • An Appropriate Assessment was also completed to evaluate the potential risk to the European sites associated with the adjoining surface waters. It concluded that the remedial measures will not impact on the protected sites at River Suck Callows SPA (Site Code: 004097), Corliskea/Trien/Cloonfelliv Bog SAC (Site Code: 002110), Bellanagare Bog SAC (Site Code: 000592), Bellanagare Bog SPA (Site Code: 004105), Cloonchambers Bog SAC (Site Code: 000600) and Drumalough Bog SAC (Site Code: 002338).

5. Appropriate assessment

There are six European Sites within the vicinity of the facility. These are listed in Appendix 1.

A screening for Appropriate Assessment was undertaken to assess, in view of best scientific knowledge and the conservation objectives of the site, if the activity, individually or in combination with other plans or projects is likely to have a significant effect on any European Site. In this context, particular attention was paid to the European Sites at River Suck Callows SPA (Site Code: 004097), Corliskea/Trien/Cloonfelliv Bog SAC (Site Code: 002110), Bellanagare Bog SAC (Site Code: 000592), Bellanagare Bog SPA (Site Code: 004105), Cloonchambers Bog SAC (Site Code: 000600) and Drumalough Bog SAC (Site Code: 002338).

The activity is not directly connected with or necessary to the management of any European Site and the Agency considered, for the reasons set out below, that it cannot be excluded, on the basis of objective information, that the activity, individually or in combination with

other plans or projects, will have a significant effect on any European Site and accordingly determined that an Appropriate Assessment of the activity was required.

The reason for this determination is as follows:

- The closed landfill borders with land drains which discharge into the Harristown Stream. This stream discharges into the Suck River which ultimately forms a part of the River Suck Callows SPA (Site Code: 004097) therefore, there is hydrogeological connectivity between the landfill site and the River Suck Callows SPA (Site Code: 004097).

- The risk assessment submitted as part of the application states that impacts from the landfill leachate are present in the said drains and may impact on the Harristown Stream in low flow conditions.

An Inspector's Appropriate Assessment has been completed and has determined, based on best scientific knowledge in the field and in accordance with the European Communities (Birds and Natural Habitats) Regulations 2011 as amended, pursuant to Article 6(3) of the Habitats Directive, that the activity, individually or in combination with other plans or projects, will not adversely affect the integrity of any European Site, in particular River Suck Callows SPA (Site Code: 004097), Corliskea/Trien/Cloonfelliv Bog SAC (Site Code: 002110), Bellanagare Bog SAC (Site Code: 000592), Bellanagare Bog SPA (Site Code: 004105), Cloonchambers Bog SAC (Site Code: 000600) and Drumalough Bog SAC (Site Code: 002338), having regard to their conservation objectives and will not affect the preservation of these sites at favourable conservation status if carried out in accordance with the application, risk assessment and recommended certificate of authorisation and the Conditions attached hereto for the following reasons:

- Specifically, the remedial works will be undertaken to minimise the potential for water pollution in River Suck Callows SPA (Site Code: 004097) and will ensure that there will be no significant impact on this European Site;
- The project alone, which consists of the remediation of the closed landfill, or in-combination with other projects, will not adversely affect the integrity, and conservation status of any of the qualifying interests of River Suck Callows SPA (Site Code: 004097);
- There are no significant emissions to air from the landfill which could affect the bird species that the River Suck Callows SPA (Site Code: 004097) is designated for; and
- There is no hydrogeological connectivity between the closed landfill and Corliskea/Trien/Cloonfelliv Bog SAC (Site Code: 002110), Bellanagare Bog SAC (Site Code: 000592), Bellanagare Bog SPA (Site Code: 004105), Cloonchambers Bog SAC (Site Code: 000600) and Drumalough Bog SAC (Site Code: 002338).

In light of the foregoing reasons, no reasonable scientific doubt remains as to the absence of adverse effects on the integrity of those European Sites: River Suck Callows SPA (Site Code: 004097), Corliskea/Trien/Cloonfelliv Bog SAC (Site Code: 002110), Bellanagare Bog SAC (Site Code: 000592), Bellanagare Bog SPA (Site Code: 004105), Cloonchambers Bog SAC (Site Code: 000600) and Drumalough Bog SAC (Site Code: 002338).

6. Recommendation

I recommend granting the certificate of authorisation as proposed.

Signed

Date 22nd September 2020

Ewa Babiarczyk

Procedural Note

Any representations received by the Agency within 30 days of the draft certificate of authorisation being made available will be considered by the Agency.

As soon as practicable after the expiry of the 30-day period the Agency will determine the certificate of authorisation, which may vary from the draft certificate, and shall issue an appropriately validated certificate of authorisation in accordance with the Waste Management (Certificate of Historic Unlicensed Waste Disposal and Recovery Activity) Regulations 2008.

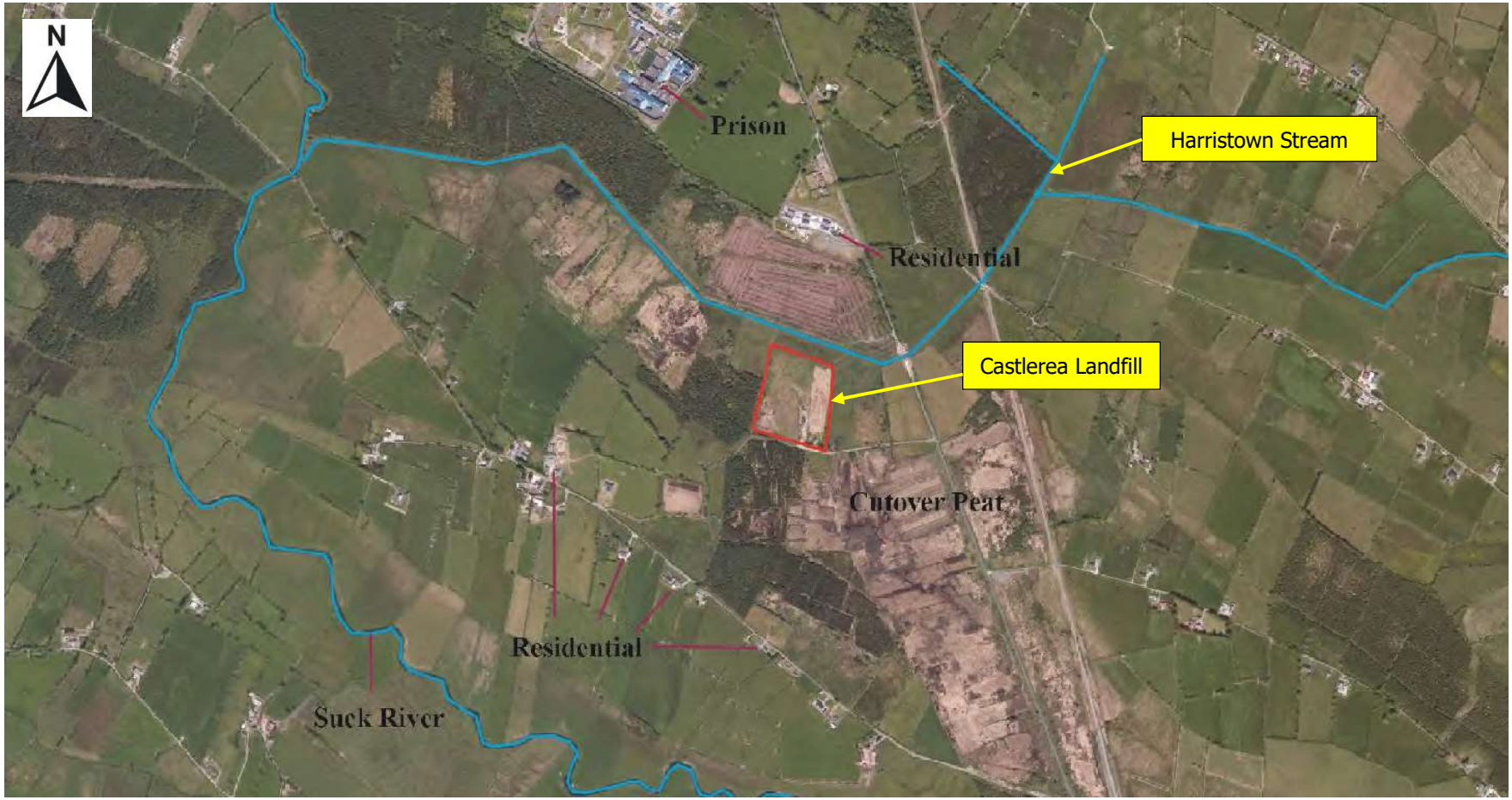

Figure 1: Location and surroundings of Castlerea Landfill

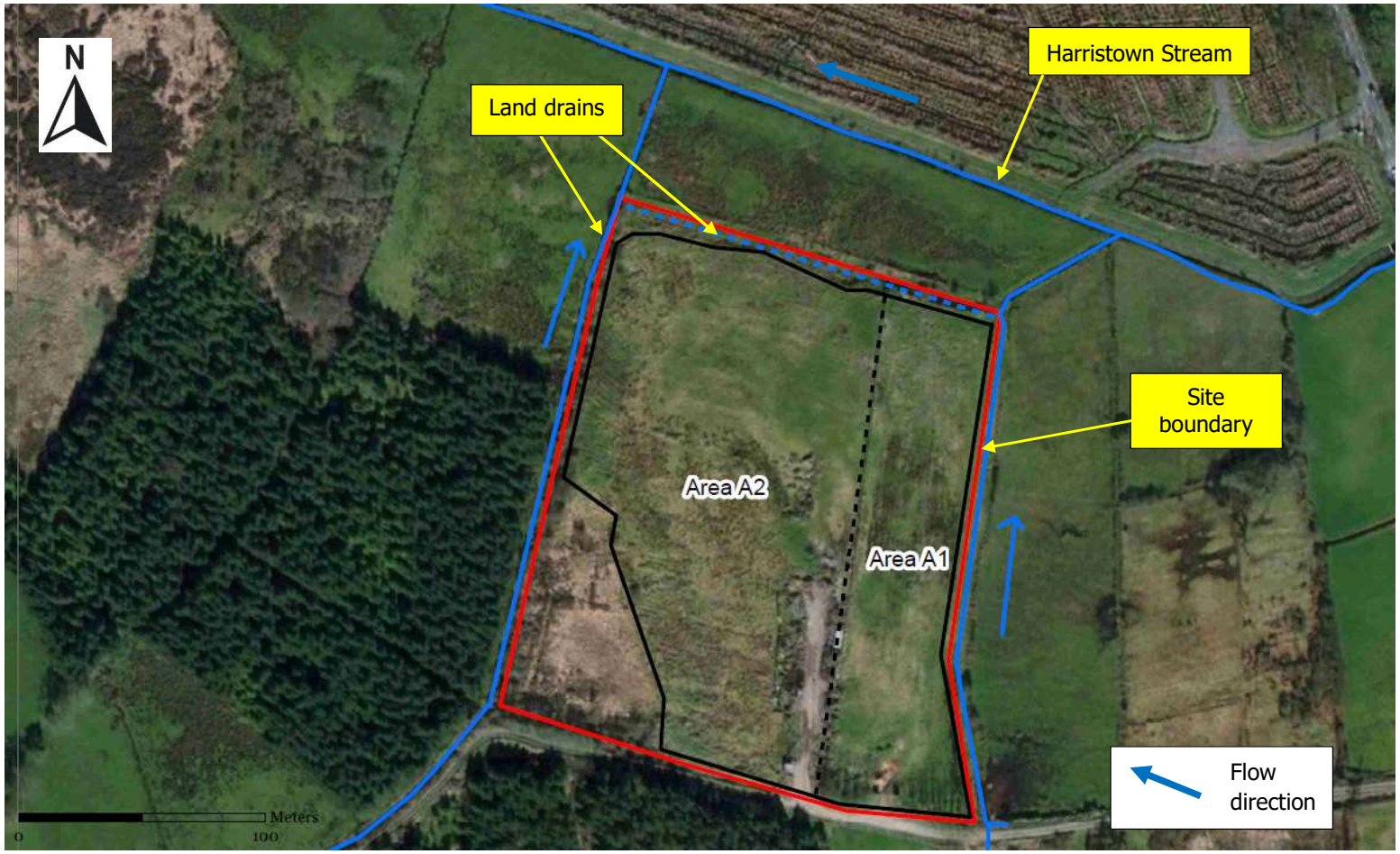

Figure 2: Immediate waterbody network

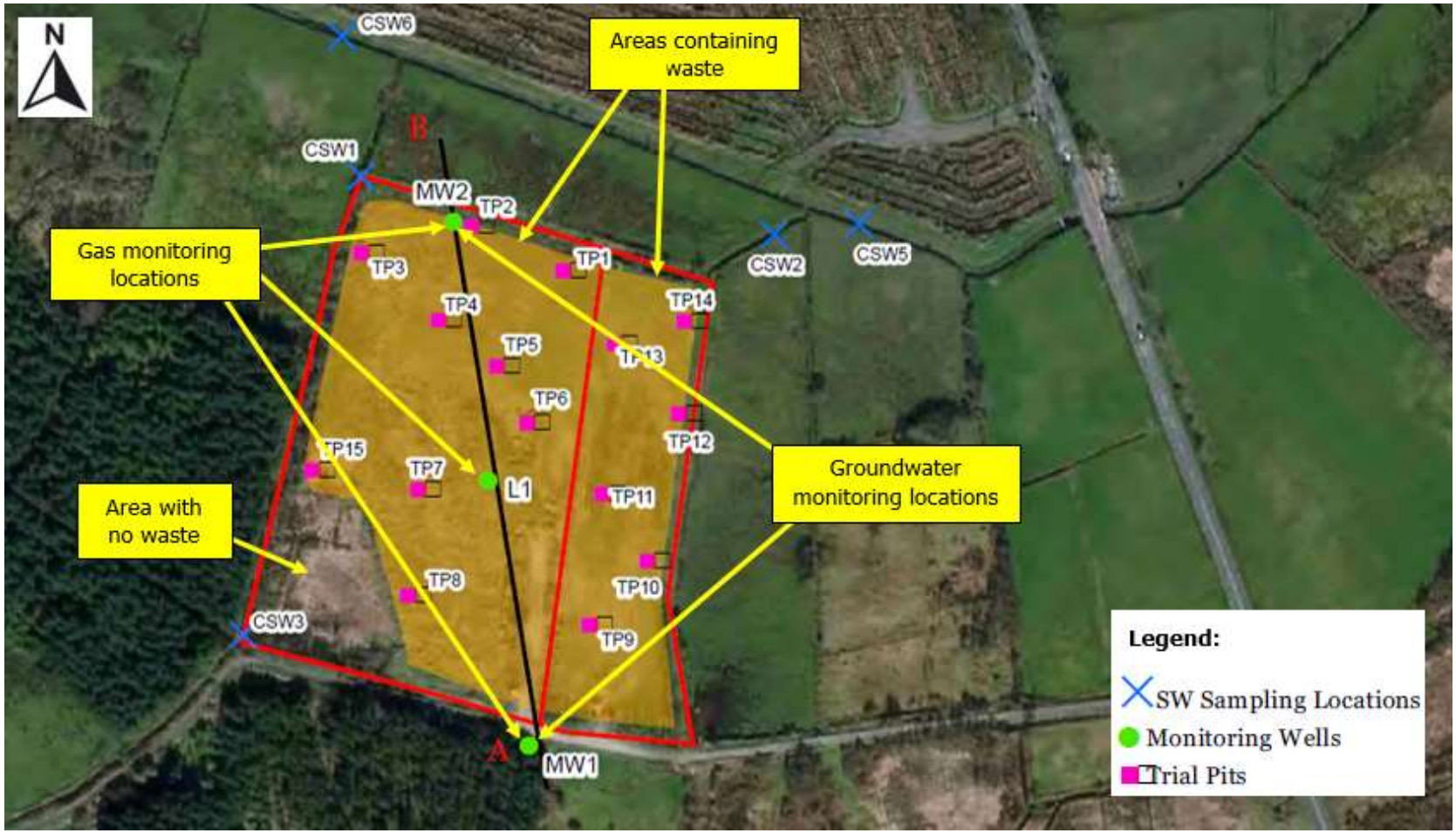

Figure 3: Approximate extent of deposited waste and monitoring locations

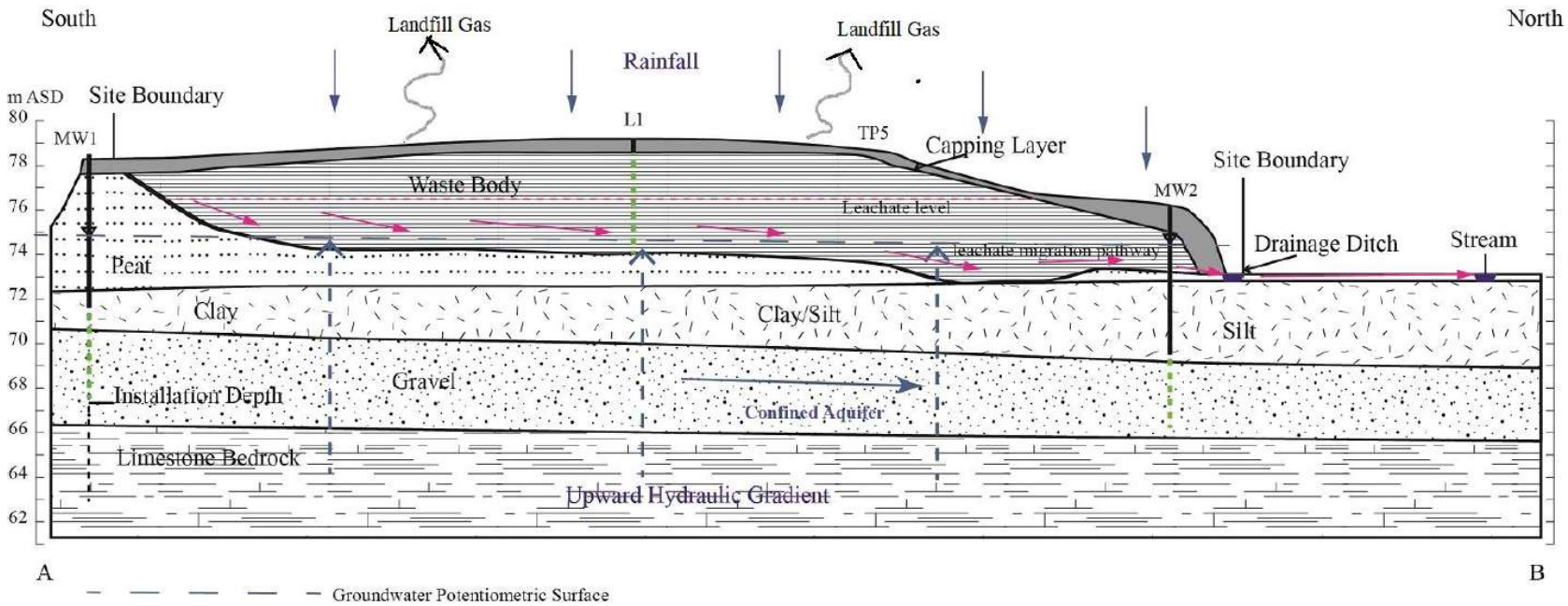

Figure 4: Conceptual site model for Castlerea Landfill – cross section from South to North of the site

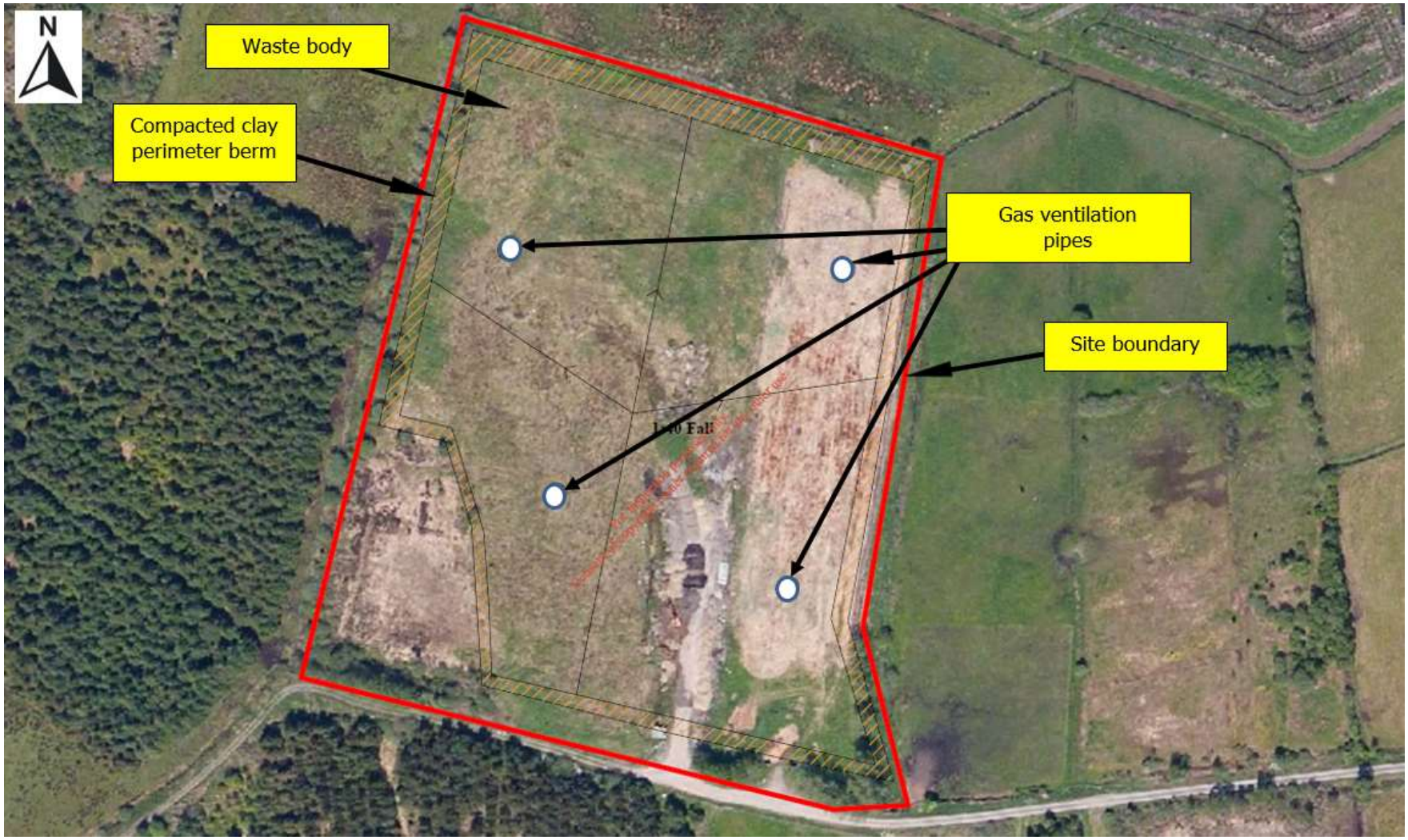

Figure 5: Remediation infrastructure

Appendix 1: Assessment of the effects of activity on European sites and proposed mitigation measures.

European Site	Distance from the facility (km)	Qualifying Interests (* denotes priority habitat)	Conservation Objectives	Assessment
River Suck Callows SPA (Site Code: 004097)	31km south of the closed landfill	A038 Whooper Swan *Cygnus cygnus* A050 Wigeon *Anas penelope* A140 Golden Plover *Pluvialis apricaria* A142 Lapwing *Vanellus vanellus* A395 Greenland White-fronted Goose *Anser albifrons flavirostris*	NPWS (2018) Conservation objectives for River Suck Callows SPA [004097]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht [dated 21/02/2018].	<u>Emissions to Water</u> There will be no emissions from the landfill site to surface water. <u>Conclusion:</u> Condition 3.1 of the certificate of authorisation outlines the remedial actions required at the site. Condition 3.8 requires monitoring, sampling, analysis and characterisation of leachate. It also requires sampling, analysis and characterisation of groundwater. The controls in the recommended certificate of authorisation ensure the qualifying interests of this European site are protected. <u>Emissions to Air</u> Recommended certificate of authorisation requires installation of a landfill cap and gas vent pipes. <u>Conclusion:</u> The controls in the recommended certificate of authorisation ensure the qualifying interests of this European site

				are protected.
Corliskea/Trien/Cloonfelliv Bog SAC (Site Code: 002110)	2.6km south-west of the closed landfill	7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion 91D0 Bog woodland	NPWS (2016) Conservation Objectives: Corliskea/Trien/Cloonfelliv Bog SAC [002110]. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht [dated 17 Feb 2016].	There is no hydrogeological connectivity between the closed landfill and this SAC.
Bellanagare Bog SAC (Site Code: 000592)	6.6km north-north-east of the closed landfill	7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion	NPWS (2015) Conservation Objectives: Bellanagare Bog SAC [000592]. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht [dated 27 Nov 2015].	There is no hydrogeological connectivity between the closed landfill and this SAC.
Bellanagare Bog SPA (Site Code: 004105)	6.6km north-north-east of the closed landfill	A395 Greenland White-fronted Goose *Anser albifrons flavirostris*	NPWS (2018) Conservation objectives for Bellanagare Bog SPA [004105]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht [dated 21/02/2018].	There is no hydrogeological connectivity between the closed landfill and this SPA.
Cloonchambers Bog SAC (Site Code: 000600)	4.2km north-west of the closed landfill	7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion	NPWS (2016) Conservation Objectives: Cloonchambers Bog SAC 000600. Version 1. National Parks and Wildlife Service, Department of Arts,	There is no hydrogeological connectivity between the closed landfill and this SAC.

			Heritage and the Gaeltacht [dated 18 Jan 2018].	
Drumalough Bog SAC (Site Code: 002338)	6.6km north-west of the closed landfill	7110 Active raised bogs* 7120 Degraded raised bogs still capable of natural regeneration 7150 Depressions on peat substrates of the Rhynchosporion	NPWS (2016) Conservation Objectives: Drumalough Bog SAC 002338. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs [dated 3 Aug 2016].	There is no hydrogeological connectivity between the closed landfill and this SAC.