This Report has been cleared for submission to the Director by Marie O'Connor, Programme Manager

Signed: **Dated:** 24th January 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:	24th January 2020
RE:	Application by **Cavan County Council** for a Certificate of Authorisation for a closed landfill at **Cootehill Landfill, Pottleboy, Cootehill, County Cavan**. Certificate of Authorisation Register Number **H0020-01**.

1. Application details

Type of facility:	Closed landfill as defined in the Regulations[1]
Original site ownership	Cavan County Council
Current site ownership	Cavan County Council
Operator of closed landfill	Cavan County Council operated this site since 1967.
Proposed use post remedial works	Amenity for the local community or businesses.
Risk category of closed landfill:	Following carrying out remediation measures at the closed landfill, the risk category was reduced from moderate (Class B) to a low risk (Class C).
Section 22 register number:	S22-02579
Grid Reference	260672 E and 313544 N
Application received:	17th July 2015

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

AA screening determination:	20th August 2019
Regulation 7(4) notice:	12th September 2019
Additional information received:	Regulation 7(4) Reply was received on 7th November 2019. Unsolicited information was received on 20th August 2019 and 6th September 2019.
Name of Qualified Person:	Tim Moynihan Credentials provided by Institute of Geologists Ireland.
EPA site inspection:	No inspection was required.

2. Information on the closed landfill

Location of facility	The closed landfill is located 0.8km south of the centre of Cootehill town, in the townland of Pottleboy adjacent to the L-6088-0 road as shown in Figure 1. Bordering the site to the east is land which is in a private ownership. The waste extends slightly into this private land as shown in Figure 2. Note: the waste has been removed from the site and the site has already been remediated. This is discussed further throughout this Inspector's Report.
Period of landfilling	1967 to 1975
Surrounding area	There are domestic dwellings to the north and the south of the closed landfill. There is also Cootehill Community Resource House to the north and a creche to the north-west of the site. To the south-east of the closed landfill there is a forested area and agricultural spread lands to the west and east of the site.
Area of the closed landfill	The County Council's site covers an area of 0.18ha. The waste body footprint within the private land covers an area of 0.10ha.
Quantity of waste at the facility	The quantity of deposited waste was originally estimated by the applicant to be 3,740 tonnes. However, upon excavation of the entire waste body (discussed further below), the quantity was determined to be approximately 6,003 tonnes.
Characterisation of waste deposited	The deposited waste consisted of municipal solid waste (MSW) and construction and demolition (C&D) waste. The waste included plastic, paper, glass, metal and textiles. Excavation works commenced in August 2015 and were completed in September of the same year. In total 6,003.23 tonnes of waste were excavated from the site, including the area extending into the adjacent private land. The excavated waste was categorised into the following types: • soil and stones (LoW code: 17 05 04) – 5,821 tonnes; • mixed municipal waste (LoW code 20 03 01) – 92 tonnes; and, • metals (LoW code: 20 01 40) – 90 tonnes.

	Additionally, trace amounts (1 to 2 fibres) of hazardous waste in the form of Chrysotile (white asbestos) were found in trial hole TH10.

3. Site investigations

Current condition and appearance of closed landfill:	The landfill site is now grassed and fenced off as shown in Figure 3. There is a small stream, referred to in the application as Pottleboy stream, flowing along the northern and western site boundary as shown in Figure 4.
Site investigations	The site investigations established the following facts: • the extent of the waste body is 1,700 m^2; • waste was found in 19 of the 25 trial holes excavated as shown in Figure 6; • waste material was intermixed with clay; • the landfill is not lined; • the landfill gas was being generated; however, the recorded gas levels were low; and • in some areas of the site the bed rock was reached at a depth of 0.6m.
Monitoring and analysis of samples (water, gas, waste):	The following site investigations were carried out as part of Tier 2 and Tier 3 investigations: • topographical survey (carried out in October 2014); • ecological survey (carried out in November 2014); • trial hole survey, including waste classification (carried out in October 2014); • gas monitoring (was carried out on 15 occasions over a six week period from October 2014 to November 2014. Also, extended gas monitoring was carried out in November 2014); • soil sampling (carried out in October 2015); and • sampling of water quality in the stream (carried out in 2014).
Hydrology	The Pottleboy Stream flows in a south-western direction and discharges to the Drumman River (Waterbody code: IE_NW_36A020600) 0.9km downstream of the closed landfill. Drumman River discharges to Annalee River (Waterbody code: IE_NW_36A020600) 1.3km downstream of the closed landfill. The status of the Drumman River and Annalee River is good. Approximately 25km downstream of the landfill site the Annalee River forms a part of Lough Oughter and Associated Loughs SAC [Site Code: 000007]. A section of the stream that borders with the landfill site is piped as shown in Figure 5. Sampling of water quality in the stream was carried out at locations upstream and downstream of the landfill in October 2014 (see Figure 5 for sampling locations). The analysed parameters included pH, electrical conductivity, dissolved organic carbon, fluoride, chloride, sulphate, volatile organic compounds

	(VOCs) and heavy metals such as arsenic, antimony, barium, cadmium, chromium, copper, mercury, molybdenum, nickel, lead, selenium and zinc. Although, the recorded concentrations were below their respective environmental quality standards (EQSs) in *European Communities Environmental Objectives (Surface Water) Regulations 2009, as amended*, or method detection limits, the concentration for a few parameters at downstream location was slightly higher than their concentration at the upstream location. This indicates that waste was impacting water quality in the stream; however, because the measured concentrations were within EQSs, this impact was not significant.
Hydrogeology	The site overlies Cavan Groundwater Body (Code: IE_NW_G_061). The status of this groundwater body is good. The bedrock beneath the site is a poorly productive bedrock. Groundwater vulnerability in the vicinity of the site is extreme. There is also rock at or near the surface. Tier 2 Report states that no groundwater was encountered at the landfill site during trial hole investigation, therefore no groundwater sampling was carried out. Five soil samples were taken from trial holes TH2, TH10, TH23 and TH25, and TH20 (an area of the neighbouring site where no waste disposal took place) and were analysed for organics, inorganics, metals, mineral oil/oils & greases, polyaromatic hydrocarbons (PAHs), phenols, volatile organic compounds (VOCs) and asbestos. The sampling results show that no significant concentrations of PAHs were detected. It was noted that mineral oil and conductivity were significantly lower in TH10 than the other four trial holes. Trace amounts in the form of 1 to 2 fibres of asbestos (Chrysotile – white asbestos) were found in TH10. Also, out of these five samples, the samples at locations TH10, TH23 and TH25 contained trace amounts of construction and demolition waste. The nearest public water abstraction is Cootehill Public Water Supply (Abstraction code: 0200PUB1011_1). This water abstraction is located 2.4km north-east from the closed landfill. The groundwater flow in the vicinity of the closed landfill is from north-east to south-west, towards the Drumman River (Waterbody code: IE_NW_36A020600) hence, there is no hydrological connection between the site and this abstraction. Accordingly, there will be no impact from the closed landfill on the quality of the water which is being abstracted. There are also seven private wells within 2km of the site. Five of these wells are located north-west of the closed landfill with the nearest well located 750m of the site. The remaining two wells are located south-east of the closed landfill with the nearest well located 1.4km of the closed landfill. Due to the direction of groundwater flow, there will be no impact of the closed landfill on these private wells.

Leachate and water quality:	Tier 2 Report states that no leachate was encountered at the closed landfill site during trial hole investigation, therefore no leachate sampling was carried out. As outlined above, there are wells in the vicinity of the closed landfill; however, due to the fact that groundwater flow is from the north-east to south-west, no impact is expected from the closed landfill on these wells.
Landfill gas:	Gas monitoring was carried out at on-site and off-site locations as shown in Figures 7 and 8. Low levels of landfill gas were detected in gas well GW8, with negligible levels of landfill gas detected in gas well GW3, GW7, and GW 9. The results of the gas monitoring indicate that outside the waste body (GW1) the detected levels of methane were below the trigger levels recommended in the Landfill Monitoring Manual (Trigger level - Methane 1% v/v). The results of the landfill gas survey showed that elevated levels of landfill gases are primarily recorded at GW 8. Although landfill gas flow rate measurements were variable in some of the monitoring locations, the results were consistent with gas flows associated with a landfill of this age. The Validation Report dated December 2016 that submitted in support of the application states that following the completion of the waste excavation works a full site walkover was carried out on 19th November 2015 and 14th December 2015 and that no methane readings above 100ppm were detected. As a precautionary measure, Condition 3.3 requires installation of four gas monitoring wells within the footprint of the previously deposited waste. Condition 3.7(c) requires gas monitoring at these gas monitoring wells at a quarterly basis.
Conceptual site model:	Tier 2 Assessment resulted in the risk rating for the closed landfill remaining the same as assumed at Tier 1 Assessment, which was Moderate Risk (class B). This risk rating was due to one linkage identified as moderate risk: 1. human health exposure pathway of off-site migration of landfill gas and emission into nearby houses (SPR 10). Four other linkages were identified as low risk: 2. migration of leachate to surface waters (SPR 1); 3. migration of leachate to private and public wells (SPR 3); 4. migration of leachate to the underlying aquifer (SPR 5); and, 5. migration of leachate to surface water dependent ecosystems (SPR 7). The applicant carried out the remediation works in 2015. The works began in August 2015 and were completed in September 2015. All waste has been removed from the landfill site and from the area extending into adjacent private land. This resulted in reducing the

	risk category from moderate (class B) to a low risk (class C). The applicant claims that the removal of waste resulted in breaking all above linkages. It is noted however, that gas was detected on-site following the removal of waste and, as stated above, Condition 3.7(c) requires gas monitoring on a quarterly basis.

4. SPR linkages and remedial actions

SPR linkage scenarios (applicable ones only):	As outlined above, the removal of waste recommended as the remediation measure in Tier 3 Report resulted in the identified SPR linkages being broken with exception of the landfill gas migration.
Proposed remediation measures:	Remedial works were considered as part of Tier 2 and Tier 3 Reports and included removal of waste and were carried out by the applicant in 2015. All waste has been removed from the landfill site and from the area extending into adjacent private land. The total quantity of material removed was 6003.23 tonnes. The removed waste comprised of soil and stones (LoW code: 17 05 04), mixed municipal waste (LoW code: 20 03 01) and mixed metals (LoW code: 20 01 40). Following the removal of waste the applicant infilled the site with 350 tonnes of subsoil, 450 tonnes of topsoil and, to facilitate drainage, approximately 150 tonnes of stones. The applicant stated that this soil was imported to the site as clean inert soil and was locally sourced, and that it was analysed and deemed suitable. No waste authorisation was in place and no by-product notification was made in relation to the soil and stones imported to the site. The applicant stated that these remedial actions broke the SPR linkages by preventing: - potential migration of leachate to groundwater, surface waters and protected area; and - migration of landfill gas to off-site locations. Condition 3.7(e) of the recommended certificate of authorisation requires monitoring of groundwater from at least three groundwater monitoring boreholes, two of which shall be downgradient of the site.
Proposed aftercare monitoring and assessment:	Monitoring as specified in Condition 3.7 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. Notwithstanding the fact that the boundary of the application is smaller than the area of waste that was originally deposited, the risk assessment is adequate for the following reasons:

	• the site investigations extended to the adjacent private land; • the risk assessment has identified, assessed and adequately addressed the associated risks inherent with the landfill site, including the waste body within the private land; and • an Appropriate Assessment screening was also completed to evaluate the potential risk to the European sites associated with the nearby surface waterbodies. It concluded that the remedial measures did not impact the protected sites.

5. Appropriate assessment

There are two 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 Lough Oughter and Associated Loughs SAC [Site Code: 000007] and Lough Oughter SPA [Site Code: 004049].

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:

- There is hydrological connectivity between the landfill site and surface waters which ultimately discharge into the above European Sites.

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 Lough Oughter and Associated Loughs SAC [Site Code: 000007] and Lough Oughter SPA [Site Code: 004049], 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:

- Condition 3.2 on management of the closed landfill aims for prevention of the potential for water pollution and any significant impact on Lough Oughter and Associated Loughs SAC [Site Code: 000007] or Lough Oughter SPA [Site Code: 004049] and will result in positive impacts to current water quality conditions;
- the project, alone or in-combination with other projects, will not adversely affect the integrity, and conservation status of any of the qualifying interests of Lough Oughter and Associated Loughs SAC [Site Code: 000007] or Lough Oughter SPA [Site Code: 004049];

- also, there are no significant emissions to air from the landfill which could affect the bird species that Lough Oughter SPA [Site Code: 004049] is designated for; and
- Condition 3.7 requires ongoing environmental assessment and monitoring.

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: Lough Oughter and Associated Loughs SAC [Site Code: 000007] and Lough Oughter SPA [Site Code: 004049].

6. Recommendation

I recommend granting the certificate of authorisation as proposed.

Signed

Date 24th January 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.

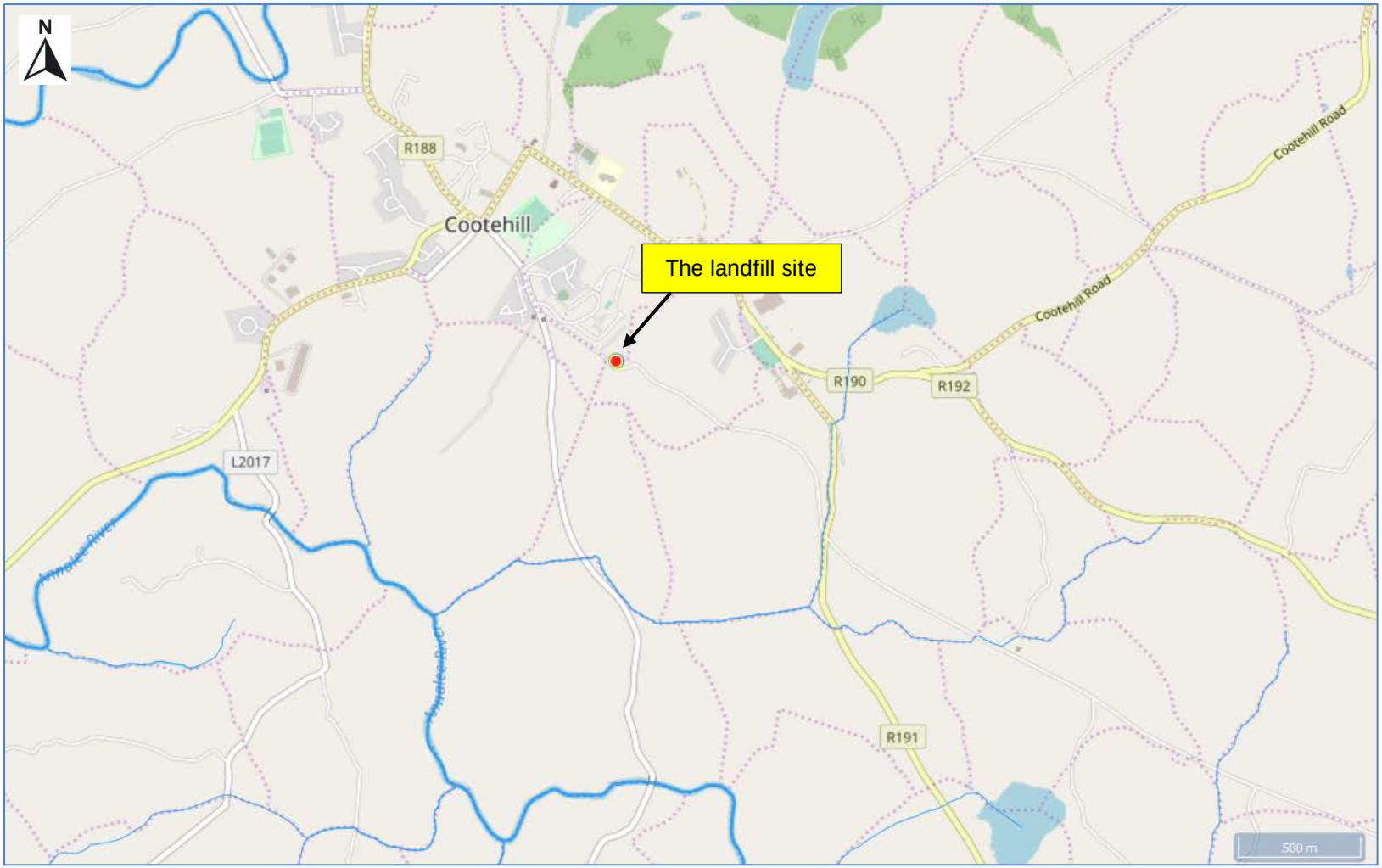

Figure 1: Location of Cootehill Landfill

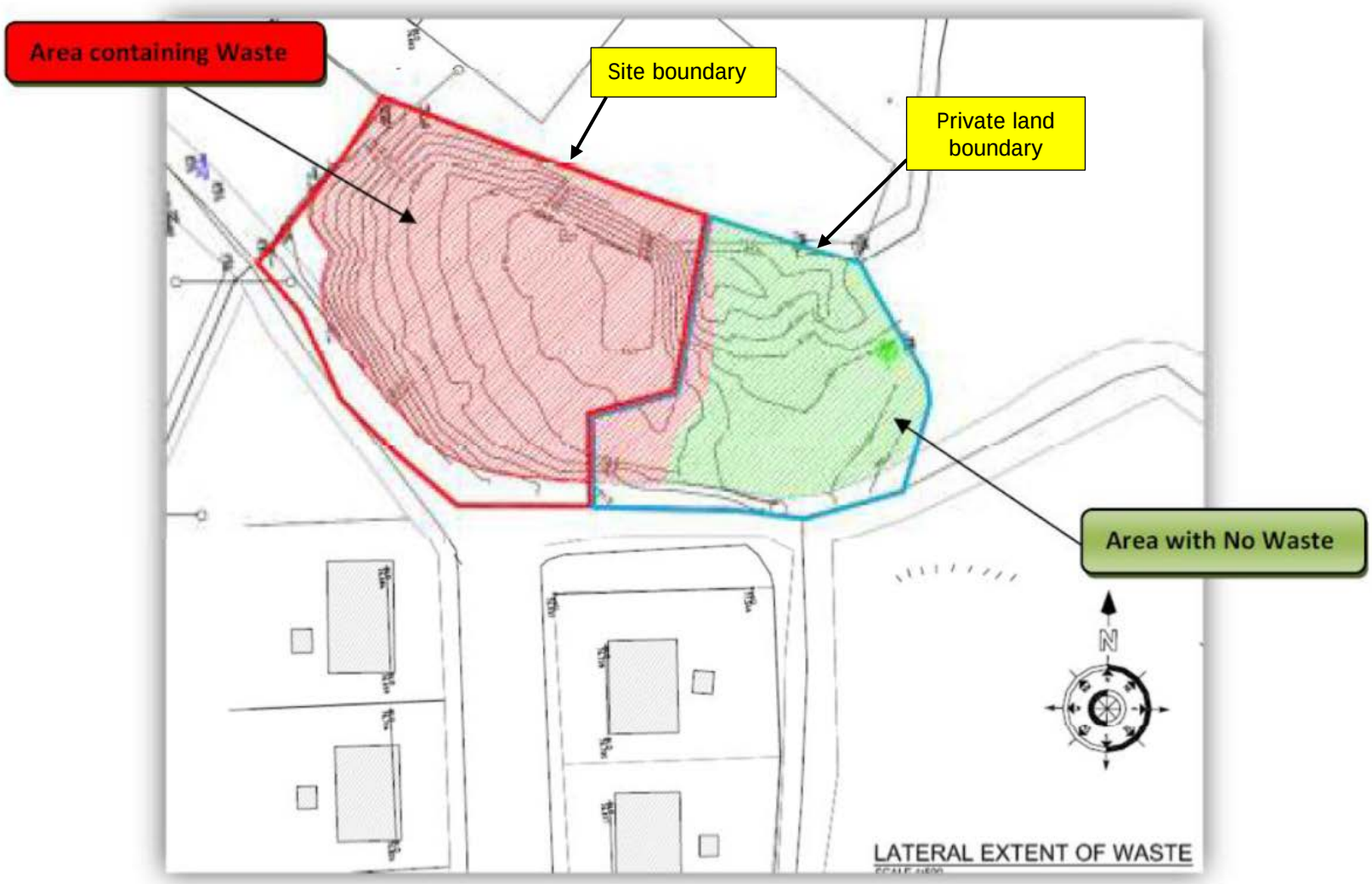

Figure 2: Extent of deposited waste

Figure 3: Current condition of the landfill site

Figure 4: Local river network

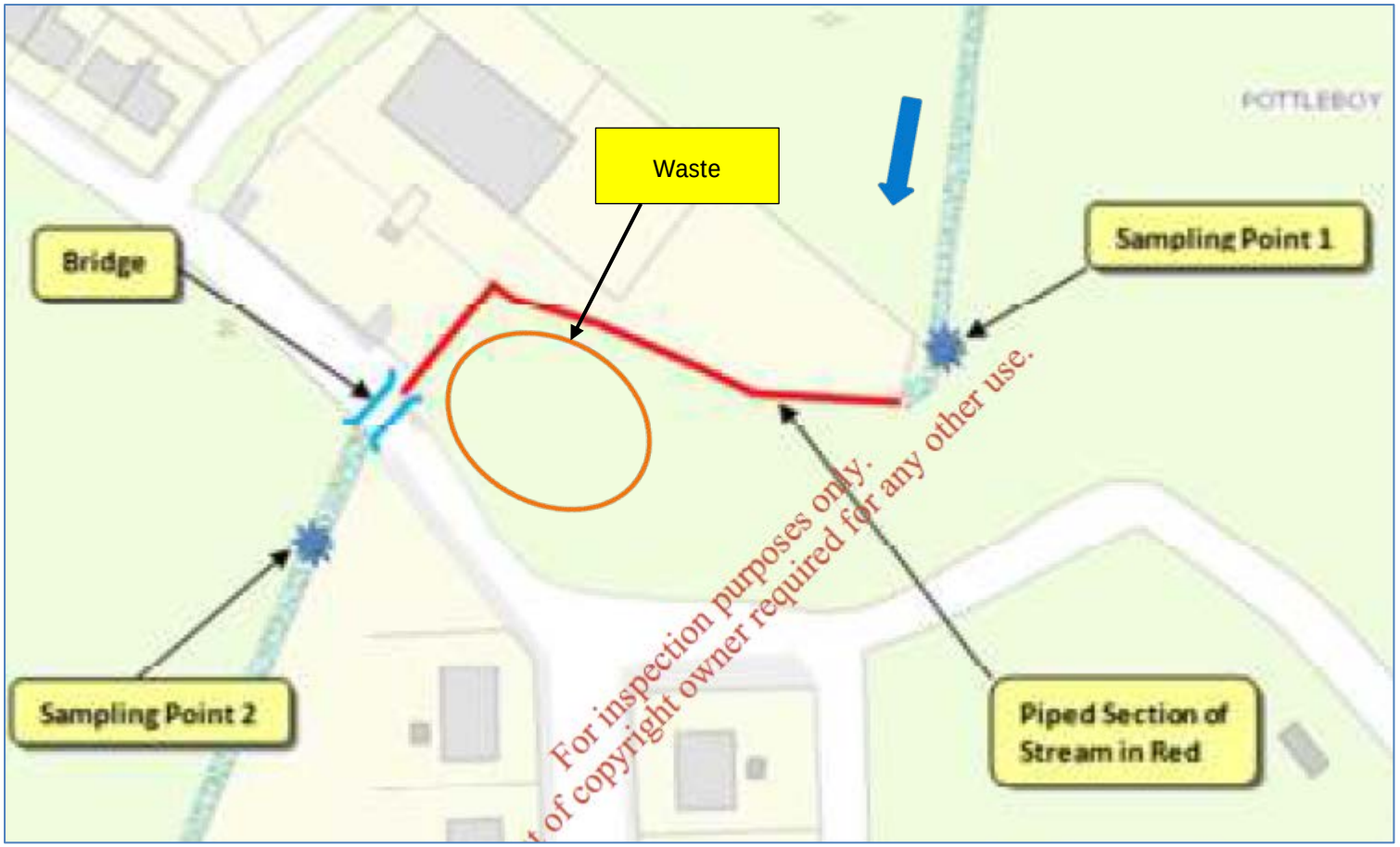

Figure 5: Location of the piped section of the stream

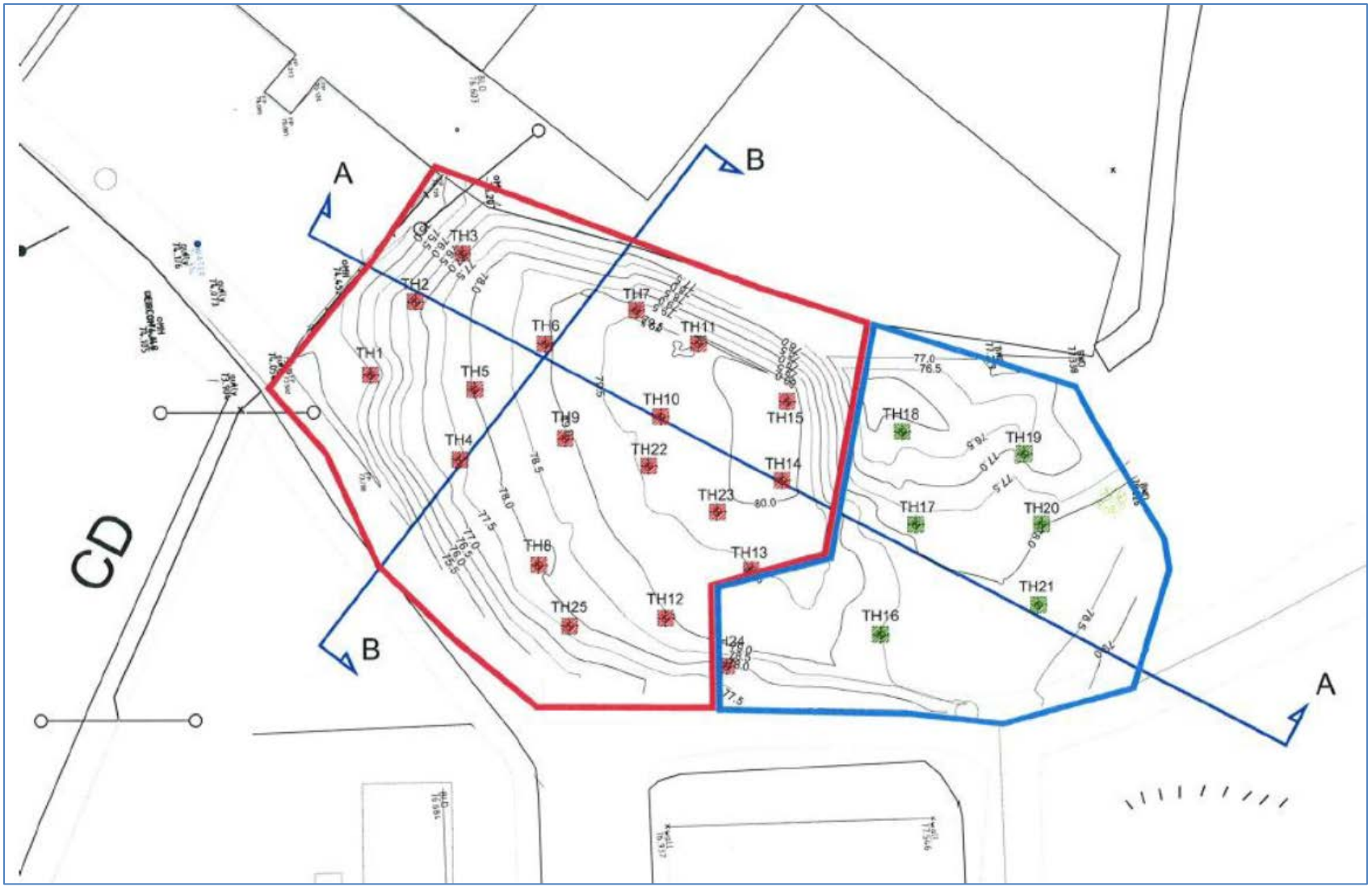

Figure 6: Trial hole locations.

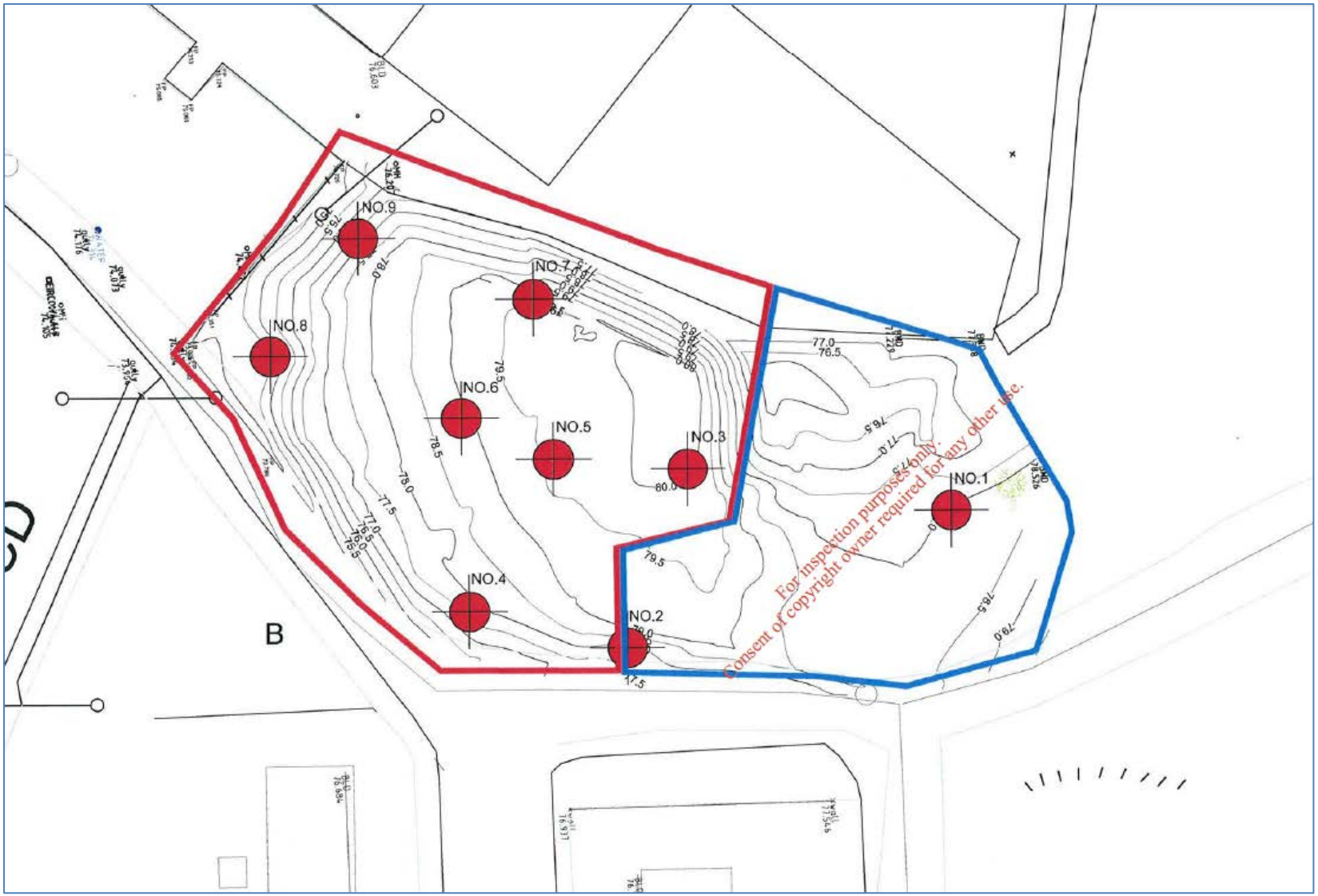

Figure 7: On-site gas monitoring locations

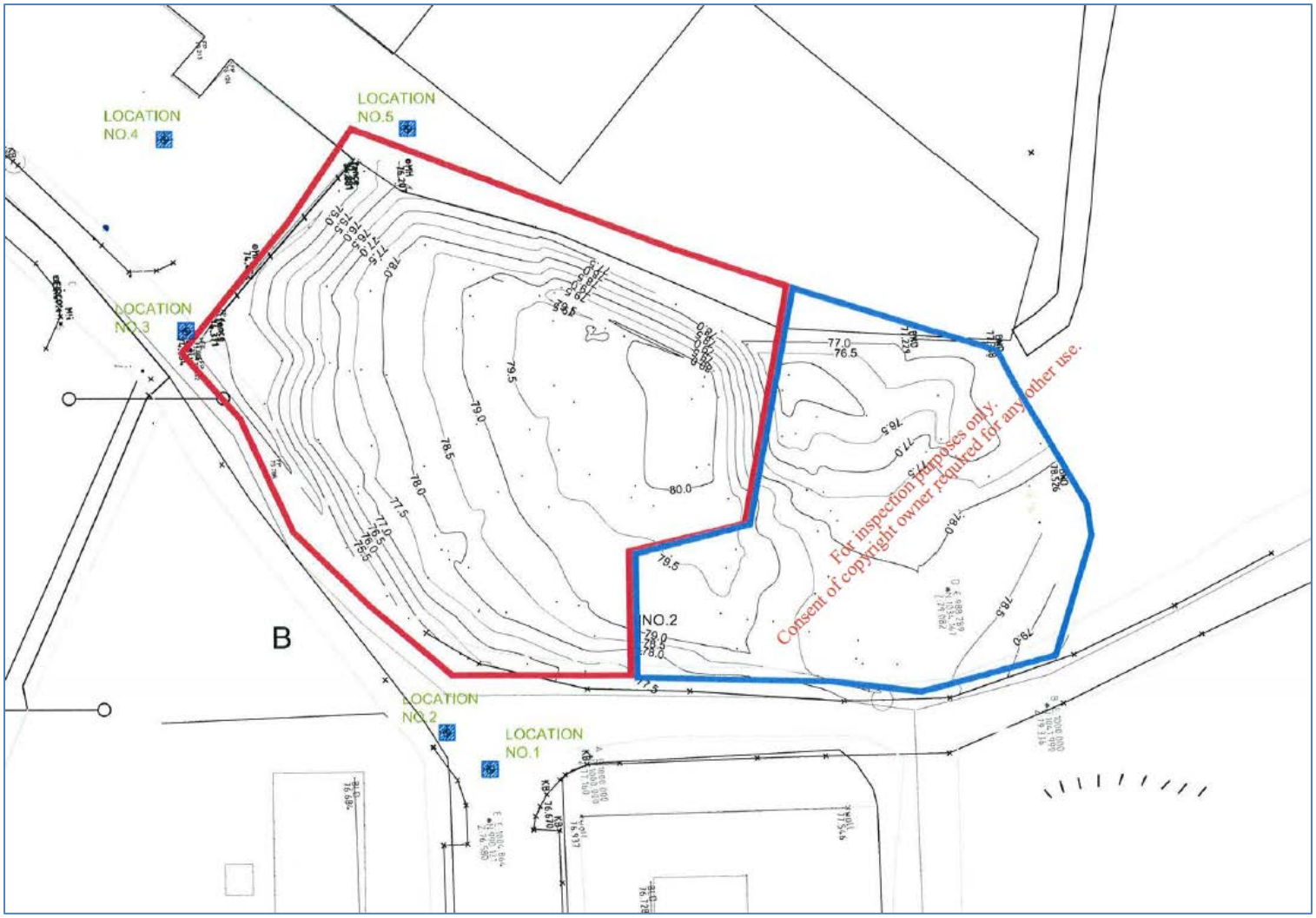

Figure 8: Off-site gas monitoring locations

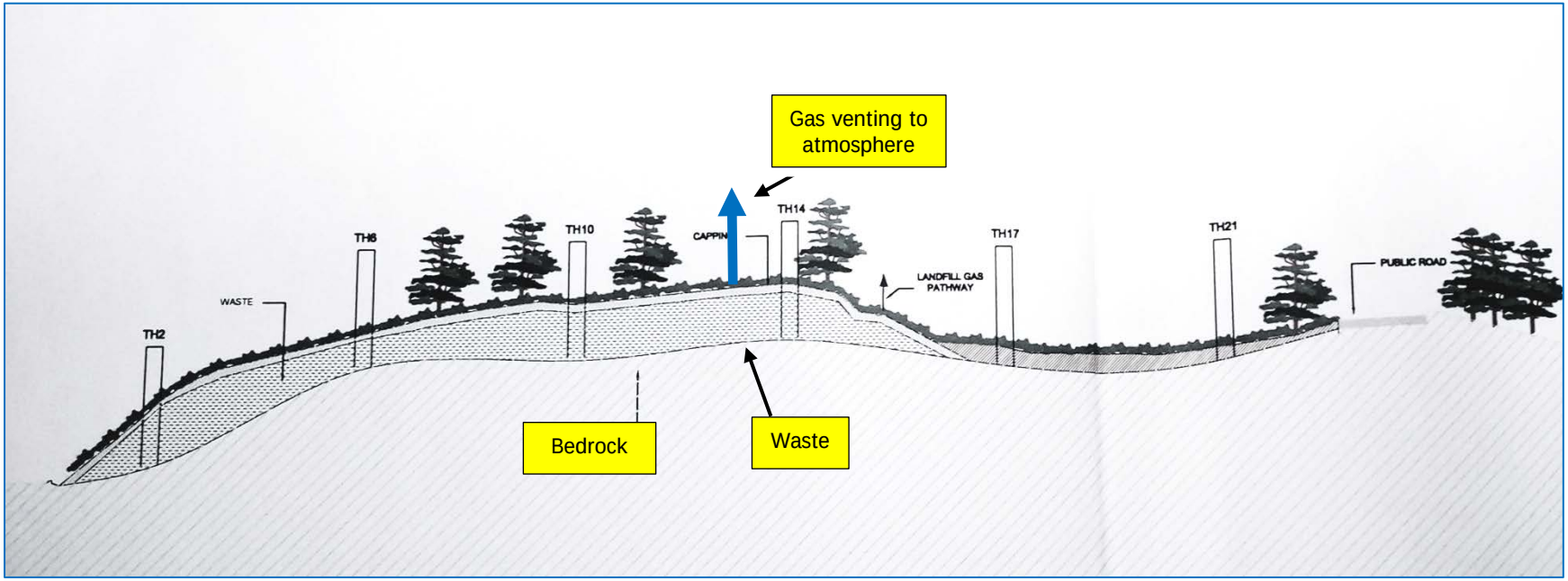

Figure 9: Conceptual site model for Cootehill Landfill site

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
Lough Oughter and Associated Loughs SAC [Site Code: 000007]	16 km west of the closed landfill	**Species** 1355 Otter *Lutra lutra* **Habitats** 3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation 91D0 Bog woodland*	NPWS (2018) Conservation objectives for Lough Oughter and Associated Loughs SAC [000007]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht (dated 21/02/2018).	Municipal solid waste and construction and demolition waste have been removed from the site and there will be no emissions to water or air from the closed landfill. The controls in the recommended certificate of authorisation ensure the qualifying interests of the European sites are protected.
Lough Oughter Complex SPA [Site Code: 004049]	21 km west of the closed landfill	**Birds** A005 Great Crested Grebe *Podiceps cristatus* A038 Whooper Swan *Cygnus cygnus* A050 Wigeon *Anas penelope*	NPWS (2018) Conservation objectives for Lough Oughter Complex SPA [004049]. Generic Version 6.0. Department of Culture, Heritage and the Gaeltacht (dated 21/02/2018).	Municipal solid waste and construction and demolition waste have been removed from the site and there will be no emissions to air from the closed landfill. The controls in the recommended certificate of authorisation ensure the qualifying interests of the European sites are protected.