An Taisce
The National Trust for Ireland
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Dublin 2, Ireland
D02 V0P9

An Coimisiún Pleanála
64 Marlborough Street
Dublin 1

16th November 2026

Ref: 26/60493
App: Wonderlight Ltd
For: for a new MRO Hangar Building (for the Maintenance, Repair and Overhaul of aircraft), with associated staff accommodation and site works, at Lindbergh Avenue and Earhart Avenue, Shannon Airport, Co. Clare. The development will consist of the construction of; (1) A new building up to two stories, with an overall height of 17.5m, with the ground floor to accommodate a 4 no. bay aircraft MRO hangar, together with ancillary floorspace to include for training facility, storage, toilets, switch, comms and plant rooms. The first floor will provide for staff accommodation, to include for office, canteen, toilets, conference rooms and locker space, with mezzanine space for the airplane bays. The building will include for back-lit corporate branding and signage and roof mounted solar panels. (2) A new vehicular and pedestrian access onto Lindbergh avenue to the east of the site, to provide for pedestrian connection to the existing bus stop on Airport Avenue further to the east, internal circulation areas, 2 no. double gates to a proposed relocated airside boundary, 4 no. taxi apron zones with access to existing airplane taxiway to the west. (3) Demolition / removal of existing outbuilding, tanks, concrete yard and associated hard surface areas. (4) Provision of hangar yard and tug paths, and surface car park to include for provision of accessible parking, electric vehicle charging spaces, sheltered bicycle parking and pedestrian links. (5) A stand-alone single storey chemical & refuse storage building. (6) A stand-alone single storey ESB sub-station/switchroom building, 2 no. generator structures, a Gas Skid installation and 2 no. under-ground static storage water tanks. (7) A proposed foul pumping station and rising main connection to the existing foul sewer network along Earhart Avenue to the east. (8) Revised on-site surface water drainage arrangements including part diversion and replacement of the existing on-site storm sewer, new on-site attenuation and connection to the existing storm sewer. (9) Proposed connection to existing mains water supply infrastructure along Lindbergh Avenue. (10) Excavation of contaminated soil from main site to be relocated to a designated on-site containment berm to the south-east of the site, (11) Infilling and levelling of main site to facilitate construction of proposed development, (12) New boundary treatments including a 2.7m high security mesh fencing around the perimeter, together with all associated site works and services. A Natura Impact Statement will be submitted to the Planning Authority with this application
Site: Lindbergh Avenue and Earhart Avenue,, Shannon Airport,, Co. Clare

A Chara,

In accordance with s. 37(4) of the Planning and Development Act 2000 (as amended), An Taisce wishes to appeal the decision by Clare County Council on 20th October 2026 to grant permission for the above planning application (Ref. P26/60493).

A. Entitlement to Appeal

We make this appeal on the basis that we were not notified of the application by Clare County Council, as we were entitled to be per Article 28 of the Planning and Development Regulations 2001 (as amended). Article 28(1)(n) of the Planning and Development Regulations 2001 requires notice to An Taisce "*where it appears to the authority that the development might have significant effects in relation to nature conservation*". Article 28(1)(c)(iii)(I) requires the same where the development "*might affect or be unduly close to … a cave, site, feature or other object of archaeological, geological, scientific, ecological or historical interest*".

The subject application was accompanied by a Natura Impact Statement (NIS). The first Planner's Report records that "*indirect impacts on these European sites cannot be ruled out during the construction and operational phases in the absence of mitigation*". The Environmental Assessment Officer described the European sites as "*hydrologically linked and directly adjacent to the site of the proposed works*", and the Further Information request recorded that "*groundwater has been identified as a potential pathway to European Sites*".

We therefore submit that because there were clearly significant potential effects in relation to nature conservation and an object(s) of ecological interest, and because we were not notified as required by Article 28, we are entitled to appeal under section 37(4). Our grounds of appeal are as follows.

B. Grounds of Appeal

An Taisce does not object in principle to the development of aircraft maintenance facilities at Shannon Airport. This appeal is related to one element of the project: the permanent retention of soil from a former AFFF fire-training ground, contaminated with per- and polyfluoroalkyl substances (PFAS), in an engineered berm on the lowest part of a site in Flood Zone A, approximately 309 m from the Lower River Shannon SAC (site code: 002165) and the River Shannon and River Fergus Estuaries SPA (site code: 004077), to which the site drains.

We note that Clare County Council's grant of permission states that the development: "*would not seriously injure the amenities of the area or of property in the vicinity, would be acceptable in terms of traffic safety and convenience, and would be in accordance with the proper planning and sustainable development of the area*". It says nothing about flood risk, contaminated land, waste, the berm or the Flood Guidelines, although these were the principal planning issues raised by the application and by the Council's own Further Information request.

1. Contaminated Land, Waste and the Alternatives

TOBIN's Risk Assessment and Soil Classification Report, prepared for Shannon Airport Authority and lodged with the application, states that "*Part of the site is an old fire training ground, where firefighting simulations were conducted using firefighting foams and repellents*" (page 3), and that PFAS was tested for "*due to the site's former use as a fire training ground" and "detected in eighteen*

samples" of 53 (page 5). It identified PFAS above the EPA's proposed interim concentrations[1] (see Appendix 1) at TP9 and TP17 (Table 6-2, page 16). TOBIN's Further Information response (October 2026) shows the old Fire Training Ground on an aerial plan of the site (Figure 1, page 5), records that it was not used for fire training since 2009 (page 4), extends the PFAS exceedances to TP9, TP17, TP201, TP202, TP208 (page 11), and states that 2,550 m³ of this soil ("*11% of the main dig*") will be "*placed in a fully encapsuled engineered berm*" (page 7), with a further 19,280 m³ of "*PFAS containing material below EPA Ambient Interim Concentrations*" placed in the same berm (page 8). The applicant's Planning Statement says the same (page 8).

About 2,550 m³ of soil, from the five locations identified in the Further Information Response, exceeds the Interim Ambient Concentrations proposed by the EPA for deciding whether soil can be used as a by-product (PFOS 4.4 µg/kg, PFOA 2.6 µg/kg), and about 19,280 m³ of PFAS-bearing soil below them is to be placed, unlined, in the same berm. The EPA Position Paper[2] (Appendix 1) relied on by the applicant as Interim Guidance is a consultation document "*to inform development of Draft Guidance*". It classes Fire Training Areas and Fire Fighting Incidents as very high risk (Table 4), recommends that such material "*not be used as by-product and that instead it is treated as a waste*", and directs material above the urban and industrial values to "Soil & stone considered to be waste" (Figure 2 of the EPA document). Nothing in it treats encapsulation as a route to reuse. While the paper is not policy, it is the view of the State's environmental regulator on the question at issue. No waste licence or other EPA authorisation has been sought for the berm.

We would highlight that the Construction and Demolition Waste Management Plan lodged as Further Information describes the soil as "*expected to be inert soil and subsoils*" and does not mention PFAS, the berm or encapsulation. Condition 2(a) of the grant requires that plan to be "*implemented in full".*

1.1 Relevant Development Plan Objectives

Objective CDP15.11 states:

> *"It is an objective of Clare County Council:*
> *a) To ensure that, prior to the redevelopment of a site previously known to include an operation with the potential for high environmental impact such as petrol stations, gasworks, landfills or coal yards, due diligence is carried out on the site to:*
> - *Consider the ecological aspects of soil and groundwater contamination;*
> - *Prepare a site risk assessment and where deemed necessary a waste plan and a site aftercare and remedial action plan; and,*

> *b) Ensure that contaminated soil is disposed of in accordance with the Waste Management Regulations (S.I.821 of 2007)."*

A former AFFF fire-training ground qualified as a site of the type described in 15.11(a) above. The objective treats contaminated soil as material for disposal under waste law, not as fill to be retained.

CDP15.30(h) requires projects "*to be fully informed by ecological and environmental constraints at the earliest stage of project planning*".

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[1] EPA, Position Paper Regulation 27 Consultation to inform development of Draft Guidance for brownfield soil and stone by-product material, incorporating a PFAS screening tool: https://www.epa.ie/publications/corporate/consultations/-consultations/position-paper-regulation-27-consultation-to-inform-development-of-draft-guidance-for-brownfield-soil-and-stone-by-product-material-incorporating-a-pfas-screen.php

[2] Ibid

Ultimately, it is submitted that retaining waste from a very-high-risk PFAS source on site, as a permanent store, where the Plan requires contaminated soil to be disposed of under waste law and requires the least-impact reasonable alternative to be chosen, is contrary to the proper planning and sustainable development of the area.

1.2 Alternatives for Dealing with Contaminated Soil

The applicant's Soil Risk Assessment identifies off-site high-temperature thermal treatment as "*the only proven destruction method*". In the MetroLink Railway Order proceedings, Transport Infrastructure Ireland adopted the opposite approach to what is proposed in this development for Dublin Airport soil, exporting all excavated material above the limit of detection for treatment, and found an engineered containment cell "*impractical within Ireland due to the lack of available suitable landfill sites and local treatment facilities with the necessary permissions from the EPA*" (relevant sections attached as Appendix 2).[3] The transport justification here (avoiding "circa 2,300 truck loads") relates to the whole 23,000 m³ excavation; the material actually at issue is about 11% of it. The Council itself raised the long-term sterilisation of airport lands as a concern.

2. Flood Risk

The Applicant's Flood Risk Assessment (TOBIN, Revision E, 24 July 2026) states that, on Map I11 of the Clare County Development Plan 2023–2029, "*the subject site is seen to be located in Flood Zone A*" (section 2.3). The NIS, the updated Appropriate Assessment (AA) Screening Report and the first Planner's Report (in its AA section) describe the site as Flood Zone B. The first Planner's Report, in its flood-risk section, describes it as Flood Zone C and concludes that the development "*would not give rise to significant flood risk concerns*". That reflects the defended mapping in the 2012 Local Area Plan, not the flood-zone mapping. The Council therefore assessed flood risk on the wrong flood zone.

Ground levels on the site are 1.15–2.5 mOD (Flood Risk Assessment). The undefended 1-in-200-year coastal level is 4.04 mOD today and 4.54 mOD in the mid-range future scenario; the mid-range 1-in-1,000-year level is 4.76 mOD (Table 3-1). The Shannon embankments protect to 4.71 mOD. Map I11, as varied in June 2026, also shows an OPW Flooding layer for the 1-in-1,000-year flood under the high-end future scenario over the airport lands, which the applicant's extract of the map (Figure 2-2) does not show.

2.1 Location and Assessment of the Berm

The berm is on the lowest part of the site. On the Further Information drawings, existing ground along the berm is approximately 0.65–1.4 mOD and the finished top approximately 2.52–2.70 mOD (12230-2028). The top of the berm is therefore approximately 1.3–1.5 m below the current undefended 1-in-200-year level, and the PFAS cell is moved from the higher northern part of the site (approx. 2.0–2.3 mOD, PFAS Location Plan 12230-2029) onto the lowest ground, nearest the estuary and the shallow water table.

The Flood Risk Assessment considers only the hangar, as "less vulnerable" development. It does not mention the berm. Its own fluvial model shows the site "*liable to fluvial flooding in a 1 in 1000-year event, particularly on the southeast of the site and an area to the southwest*" in the mid-range future scenario (section 4.6, Figure 4-8). It discounts this because "*The area which is particularly susceptible to fluvial flooding in the MRFS event is also open space, which is appropriate in any flood zone*"

[3] TII Response re. MetroLink: https://downloads.metrolink.ie/oh/Response%20to%20WID%20Sub_Final.pdf

(section 5.1). That area is where the berm is to be built. The only assessment on file treats the location of a permanent contaminant store as open space.

2.2 Clare County Development Plan

Objective CDP 2.6 requires the Council *"(a) To ensure development proposals have regard to the requirements of the SFRA and Flood Risk Management Guidelines …*" and *"(b) To ensure that flood risk assessments include consideration of potential impacts of flooding arising from climate change including sea level rise and coastal erosion*". The Flood Risk Assessment assesses only the mid-range future scenario.

The Strategic Flood Risk Assessment (Volume 10(c) of the Plan) classifies the Airport zoning as "Highly vulnerable", with the commentary "*JT* [justification test] *required for all development within Flood Zone A and B*" (Table 5-1). It lists the Shannon Estuary Embankments as "*Not to specific design standard*" (Table 3-2). It treats a site as defended only "*if the standard of protection is 1% AEP (fluvial) or 0.5% AEP (tidal), within which a freeboard of at least 300mm is included*" (section 3.2). On the applicant's own figures the freeboard against the mid-range 1-in-200-year level is 0.17 m. The SFRA also states that "*it is not appropriate to consider the benefits of schemes which have not been constructed*" (section 4.4.3), yet the Flood Risk Assessment relies on the site's future benefit from the Shannon Town and Environs Flood Relief Scheme, which is at options stage. It requires the high-end scenario to be "*quantified / mapped for coastal settlements*" (section 7.3). It records that "*No further assessment of flood risks in Shannon has been included in this SFRA*" (Table 9-1).

No Justification Test was required by the Council and none was passed. A grant of permission for development in Flood Zone A on airport-zoned land, without the Justification Test that the Plan says is "*required for all development",* and on a flood risk assessment that does not consider the high-end scenario that CDP 2.6(b) and the SFRA require, would be contrary to the Development Plan.

2.3 The Flood Guidelines

The Guidelines require that "*the presence of flood protection structures should be ignored in determining flood zones*", because defended areas "*still carry a residual risk of flooding from overtopping or breach of defences*" and *"there may be no guarantee that the defences will be maintained in perpetuity*" (paragraph 2.25). "*The sequential approach and the Justification Test apply to such defended locations*" (paragraph 3.4). In Flood Zone A, development "*should be avoided and/or only considered in exceptional circumstances*" (paragraph 3.5).

The Guidelines' vulnerability classes do not list a permanent store of contaminated soil. Table 3.1 says that "*uses not listed here should be considered on their own merits*". It classes "potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding" as highly vulnerable, and excludes landfill and hazardous waste from the less vulnerable waste-treatment category. A permanent cell of a persistent, bioaccumulative pollutant, beside an estuary SAC, is on its merits a potential significant source of pollution in the event of flooding. The Guidelines expressly identify "*impacts on water quality, habitats and flora and fauna caused by ... pollutants carried by flood water*" as consequences of flooding (paragraph 2.12).

Part 1 of the Justification Test requires that "*the subject lands have been zoned or otherwise designated for the particular use or form of development in an operative development plan, which has been adopted or varied taking account of these Guidelines*" (Box 5.1). No plan zones this land for the permanent storage of contaminated soil, and the 2023 SFRA did not assess Shannon. Part 2 requires a site-specific assessment showing that the risk can be managed; the only assessment on file does not address the berm. It is therefore unclear how the justification test can be passed.

3. European Sites

The NIS at Section 5 clearly identifies a risk on foot of the contaminated soil contained within the berm:

> *"Indirect impacts cannot be ruled out during the operational phase with regards to the berm as a northern section is proposed to contain low levels of PFAS-impacted material. Therefore, maintenance measures are required during the operational phase to ensure no contaminated material indirectly impact on this Natura 2000 site and that this contained berm does not indirectly impact on the surrounding environment during the operational phase".*

With the mitigation provided relying heavily on ongoing monitoring and maintenance by Shannon Airport Authority, as outlined in Section 6.10 of the NIS. We note that the applicant provides the following by way of reissuance: *"The geomembrane liner for the Berm will have a design life exceeding the operational life of the development".*

However, we would observe that PFAS chemicals are anecdotally referred to as 'forever chemicals' and for good reason. As such, while the membrane is undoubtedly robust, it will ultimately fail at some point in the future, as no man-made structure such as this has the capacity to maintain its integrity infinitely, and this ultimate failure would very likely be accelerated on foot of unprecedented climate events, such as flooding and extreme rainfall, which would undoubtedly weaken the berm. It is our view that the mitigation provided does not provide the necessary reassurance that berm failure will not ultimately result in adverse impact on the nearby SAC.

Furthermore, the applicant is Wonderlight Ltd, but the Further Information response states that the berm will remain on lands "*owned and controlled by Shannon Airport Authority*", which "*will retain responsibility for long-term management, inspection and monitoring*". A condition binding the applicant to manage the berm in perpetuity would depend on a third party and may not be enforceable.

While the updated Construction and Environmental Management Plan (CEMP) provides some maintenance measures for the construction phase, from our review of the documentation, no specific details are given on how the third party will monitor or maintain the berm during the operational, and post operational phase. This could be considered post consent conditionality. The detail of this monitoring/mitigation plan does not appear to have been provided, nor its adequacy critiqued for the purposes of complying with EU legal requirements for certainty of lack of impact under Article 6(3) of the Habitats Directive, or indeed for Article 4 of the Water Framework Directive. Given that the ongoing mitigation and monitoring is the key mitigation relied upon to prevent the berm giving rise to PFAS contamination into the Shannon SAC, this is crucial missing information, which the decision maker should be relying upon. This introduces uncertainty into the process. In order to conclude that this will have no impact on the QI communities, the decision maker must know, ahead of time, beyond reasonable scientific doubt, that there will be no adverse impact on the integrity of the SAC. The requirement for certainty when carrying out an Appropriate Assessment has been clearly fleshed out in case law. It is now very well established that approval can only be granted for plans and projects when it has been established beyond all reasonable scientific doubt that the subject proposal will not adversely impact any Natura 2000 sites. In Case C 258/11, Sweetman & Others v An Bord Pleanála & Others, the CJEU held that:

> *"authorisation for a plan or project ....may therefore be given only on condition that the competent authorities ....are certain that the plan or project will not have lasting adverse*

effects on the integrity of the site. That is so where no reasonable scientific doubt remains as to the absence of such effects".

Regarding the Clare County Development Plan, Objective CDP12.1 requires that "*All proposed developments shall incorporate the Mitigation Measures as contained in the SIFP* [Strategic Integrated Framework Plan for the Shannon Estuary] *(Volume 9 of this plan) for ensuring the integrity of the Natura 2000 Network*". SIFP objective AV1.5 supports airport development "*ensuring that all such developments shall not significantly affect species and habitats designated by the Habitats and Birds Directive, Water Framework Directive, and all other relevant EU Directives*". Mitigation measure BFF MM39 requires such development to "*ensure the protection of the structure and function of the Shannon Airport Coastal Lagoon as detailed and required by the conservation objectives for the Lower Shannon SAC qualifying interest feature 1150*". CDP15.4 requires Appropriate Assessment for projects "*likely to impact on European sites (SACs and SPAs), whether directly or indirectly or in combination*". These are mandatory objectives of the Plan.

The NPWS conservation objectives (Version 1.0, 2012) set the objective to restore the favourable conservation condition of coastal lagoons, otter, Atlantic salmon and sea lamprey. They warn that "*Assessments cannot consider an attribute in isolation from the others listed for that habitat or species*". The updated NIS does not address the Shannon Airport Lagoon, about 72% of the SAC's lagoon habitat, beyond listing it.

The berm's perimeter French drain is "*to be constructed around berm and discharge to existing airport drainage network*" (12230-2024; 12230-2028), routed to manhole S8 and the airfield drainage "flowing south to the unnamed airport canal" (12230-2026), which drains via the Canal Pump House to the estuary. The EPA/AECOM[4] sample at the Canal Pump House recorded PFOS at 0.0105 µg/L, above the annual-average environmental quality standard for transitional and coastal waters (0.00013 µg/L) (see Table 3 and Table 3 – Water Results). The applicant's own dilution calculation, correctly computed from its own inputs, gives estuary concentrations of 0.0002–0.0008 µg/L, also above that standard.

Adding a permanent PFAS source to a drainage system that already discharges PFAS above the environmental standard to an SAC whose objectives are to restore its habitats and species is not consistent with CDP12.1, AV1.5, BFF MM39 or CDP15.4, and is contrary to the proper planning and sustainable development of the area.

4. Environmental Impact Assessment

On 23 September 2026 the first Planner's Report treated the proposal as sub-threshold development and concluded that a screening determination was not required because there was "*no real likelihood of significant effects on the environment*" (page 15). The same report found that "*indirect impacts on these European sites cannot be ruled out*" (page 22), and the Further Information request issued the same day recorded "*serious concerns*" about the berm, including its proximity to the Shannon Estuary (page 2). The Further Information then disclosed the groundwater pathway, 23,000 m³ of excavation and 2,550 m³ of soil above the EPA's interim concentrations, but the EIA question was not revisited; the second Planner's Report states only a conclusion (page 15). An Taisce asks An Coimisiún to make its own determination on the full information, having regard to the Schedule 7 criteria.

[4] EPA/AECOM (2021) Procurement and Processing of Environmental Samples for PFAS and BFR Analysis at Select Sites: https://www.epa.ie/publications/monitoring--assessment/waste/ACM_RP_ENV_002_1.pdf

5. Conclusion and Recommendations

We reiterate that An Taisce is not, in principle, opposed to the development of aircraft maintenance facilities at Shannon Airport. The issue that must be resolved is the proposed permanent retention of PFAS-contaminated soil in Flood Zone A. While a request for revised particulars could potentially resolve some of the issues, the scale and material nature of the changes An Taisce considers to be needed may necessitate refusal and the submission of a new, revised application.

The permanent on-site retention of PFAS-contaminated soil from a former fire-training ground, where off-site treatment is available, would create an unnecessary and permanent source of pollution within the catchment of European sites. It would be contrary to objectives CDP15.10(a), CDP15.11, CDP12.1 and CDP15.4 and to SIFP objective AV1.5 and mitigation measure BFF MM39 of the Development Plan, and to the proper planning and sustainable development of the area.

The site is in Flood Zone A per the Clare County Development Plan 2023–2029 and depends on embankments the Plan records as "not to specific design standard". The permanent PFAS containment berm, on the lowest part of the site and below the undefended 1-in-200-year coastal flood level, is a potential significant source of pollution in the event of flooding and, on its merits, highly vulnerable development, which in Flood Zone A should be avoided. No Justification Test has been passed and the flood risk assessment does not assess the berm or the high-end future scenario. The development would be contrary to objective CDP 2.6 and the Strategic Flood Risk Assessment of the Development Plan, to the Planning System and Flood Risk Management Guidelines (2009), and to the proper planning and sustainable development of the area.

The development would add a permanent source of a persistent, bioaccumulative pollutant to a drainage system that discharges to the Lower River Shannon SAC and the River Shannon and River Fergus Estuaries SPA, whose conservation objectives include restoring coastal lagoons, otter, Atlantic salmon and sea lamprey. It would be contrary to objectives CDP12.1 and CDP15.4, SIFP objective AV1.5 and mitigation measure BFF MM39 of the Development Plan, and to the proper planning and sustainable development of the area. The applicant also appears to have failed to provide the requisite detail on the ongoing monitoring and maintenance of the berm for the operational and post operational phase of the development.

None of the seven conditions imposed by Clare County Council deal with the berm. There is no condition on long-term management, aftercare, monitoring locations or trigger levels, restriction of future development, financial security or the body responsible, although the Council's own Further Information request required "*a long-term management and aftercare plan for the containment berm*", including "*Protocols and procedures for dealing with failure of the containment berm".* Section 34(4)(i) of the Planning and Development Act expressly allows conditions "*for the maintenance or management of the proposed development (including … the appointment of a person or body of persons to carry out such maintenance or management)*". None were imposed. Condition 2(b) instead leaves a finalised Construction and Environmental Management Plan and Method Statement to be agreed after permission, and Condition 3 regulates only "*All waste generated and transported off site*".

The Office of the Planning Regulator's Practice Note PN03, Planning Conditions (October 2022)[5], states:

[5] Office of the Planning Regulator, Practice Note PN03, Planning Conditions, October 2022: https://publications.opr.ie/view-planning-practice-file/Njk=

- "*Planning permission should be refused if a significant part of the proposed development is fundamentally unacceptable*", and "*conditions substantially altering the nature of the proposal should not be imposed*" (section 1.2);
- for details left to later agreement, "*the detail to be agreed must not be a fundamental part or determining issue in the case*", and where information is needed "*there is a strong argument for obtaining this information prior to the granting of planning permission*" (section 3.9);
- "*it is inappropriate to impose a condition in a planning permission requiring the later submission*" of information needed for Appropriate Assessment, and the authority must be "*certain that the development consent granted establishes conditions that are strict enough*" (section 3.14); and
- conditions that depend on action outside the developer's control "*cannot be complied with by the developer and so are not enforceable*" (section 3.8).

The management of the berm for the life of the source is the determining issue in this case, not a point of detail. It cannot properly be left to a plan agreed post-consent.

The applicant is Wonderlight Ltd, but the Further Information response states that the berm will remain on lands "*owned and controlled by Shannon Airport Authority*", which "*will retain responsibility for long-term management, inspection and monitoring*". A condition binding the applicant to manage the berm in perpetuity would depend on a third party and may not be enforceable.

A condition omitting the berm and requiring off-site removal would likely substantially alter the nature of the proposal, which OPR PN03 says should not be done by condition (section 1.2). It would also change the excavation, haulage and waste arrangements on which the application was assessed. It is likely that a project designed around off-site removal should come forward as a new application, on which the public can comment from the start.

However, if An Coimisiún is minded to grant permission, An Taisce requests that it first invite revised particulars omitting the berm and providing for off-site treatment of all PFAS-affected soil, with updated assessments (including an updated Appropriate Assessment) and public notice. Any grant of permission should not leave the management of PFAS-contaminated soil to post-consent agreement.

Please acknowledge this appeal and advise us of any decision made.

Is muidne le meas,

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Senior Planning and Environmental Policy Officer
An Taisce – The National Trust for Ireland

Dr. Elaine McGoff
Head of Advocacy
An Taisce – The National Trust for Ireland

APPENDIX 1:
EPA Position Paper Regulation 27 Consultation to inform development of Draft Guidance for brownfield soil and stone by-product material, incorporating a PFAS screening tool

CIRCULAR ECONOMY PROGRAMME

The Driving Force for Ireland's Move to a Circular Economy

Environmental Protection Agency

An Ghníomhaireacht um Chaomhnú Comhshaoil

Position Paper

Regulation 27

Consultation to inform development of Draft Guidance for brownfield soil and stone by-product material, incorporating a PFAS screening tool

This position paper has been developed by the Environmental Protection Agency (EPA) providing a rationale for the development of draft guidance for brownfield soil and stone by-product material and consultation submissions are invited from stakeholders.

Foreword

The current National Development Plan identifies brownfield sites in urban areas for increased development of housing, commercial and infrastructure. Brownfield areas are those which have been previously developed; this may include any previous use of the site which may have resulted in contamination of the soil. This includes road, buildings, previous earthworks, industrial activity, etc. The number of brownfield soil and stone by-product notifications received by the Agency has been increasing and it is expected that the number will continue to increase in line with economic activity. Responding to this, the Agency is developing guidance to assist notifiers in a manner that will improve the quality of notifications received and streamline the assessment of such notifications. Such guidance will bring more certainty and clarity to industry and regulators around the beneficial use of excess soil and stone from brownfield developments sites.

Legislative Framework

By-products are substances/objects which *meet* the conditions of Regulation 27 of the European Union (Waste Directive) Regulations 2011-2020[1]. These conditions are set out in Regulation 27(1) as follows:

"27. (1) the Agency shall take appropriate measures to ensure that a substance or object resulting from a production process the primary aim of which is not the production of that substance or object is considered not to be waste, but to be a by-product if the following conditions are met:

a) *further use of the substance or object is certain;*
b) *the substance or object can be used directly without any further processing other than normal industrial practice;*
c) *the substance or object is produced as an integral part of a production process;*
d) *further use is lawful in that the substance or object fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts."*

Regulation 27(2)(a) requires the holder of a by-product to *notify* the Agency and *seek a determination* on the matter from the Agency.

[1] S.I. No. 323/2020 - European Union (Waste Directive) Regulations 2020

Current Process

While national by-product criteria are in place for *greenfield* soil and stone which supports circularity of that material, brownfield soil and stone notifications are notified and assessed on a case-by-case basis. The notifier is required to submit evidence that the soil and stone is uncontaminated and equivalent to virgin soil or that it is geochemically appropriate for deposit at the use location for the specified use. To demonstrate this, notifiers provide solid soil laboratory testing results which the Agency assess against maximum concentrations and/ or trigger levels set out in Table 3.3 of the EPA, 2020 *Guidance on waste acceptance criteria at authorised soil recovery facilities* (the SFR guidance)[2]. Within the guidance, the country is divided into six different geochemical domains with different limits set for each domain. The limits against which to compare the laboratory results are chosen based on the domain within which the use location lies.

The current assessment process adopts a zero-tolerance approach in relation to several parameters. That is, no total organic carbon (TOC), mineral oil, total polychlorinated biphenyls (PCBs), total polycyclic aromatic hydrocarbons (PAHs) or asbestos result should exceed the respective maximum concentration and/ or trigger level stated in the SRF guidance. However, in relation to metals, the guidance states that the results for up to three parameters in any particular sample may exceed the respective maximum concentration and/ or trigger level. However, no individual result should exceed 1.5 times the respective maximum concentration and/ or trigger level.

Where exceedances do occur, notifiers often submit environmental and human health risk assessments to demonstrate that the use of the material will not lead to adverse human health or environmental impacts, which is assessed by the Agency prior to making a determination.

There is considerable variation in the risk methodologies used by notifiers, a varying quality of data and often a large volume of data submitted. As a result, the assessment of brownfield notifications can be highly complex, protracted and resource intensive.

[2] Guidance on waste acceptance criteria at authorised soil recovery facilities

Proposed Approach

The proposed approach is not unfamiliar and involves comparison of laboratory analysis results against a set of pollutant limit values (PLVs), rather than the limits set in the SRF guidance. Assistance was procured from Geosyntec Consultants to develop PLVs and a PFAS screening tool.

The proposed PLVs are screening criteria against which leachate data and total solid soil analysis from brownfield soil and stone material can be compared and are based on broad land use scenarios and the vulnerability of the use location, as described further below. The PLVs have been developed for commonly assessed determinands including metals, inorganic parameters (e.g. chloride, sulphate) and selected organic parameters (dissolved organic carbon, phenol, Mineral Oil, Total BTEX, Total PAH, Total PCBs, benzene, naphthalene, dibenzo(ah)anthracene, benzo(b)fluoranthene and benzo(a)pyrene).

Land Use Scenarios and Solid Soil Analysis

Where possible, PLVs have been derived from existing generic assessment criteria (GAC). Three land use scenarios are considered, each covering a broad end use type.

The three scenarios are:

- **Residential Development Areas** – Covers all areas within a proposed or existing residential development including but not limited to residential buildings, open space, landscaping, play areas and roadways.
- **Commercial and Industrial Development or Parkland** – Covers all industrial and commercial development site and open areas within the land. Parkland areas include public parks with pitches, dedicated sports grounds and nature reserves.
- **Agriculture** – Covers all areas of agriculture, including allotments. Where a house is present or proposed on farmland the “Residential Development” PLV will apply to the footprint of the house and any adjoining garden or drive areas.

When notifying brownfield soil and stone material, the notifier will be expected to identify the appropriate land use scenario based on the proposed end use of the

material and apply the relevant PLVs. The proposed solid PLVs can be seen in *Table 1 of Appendix 1*. As seen in the table, the limits are generally tightest for material intended for use in agricultural settings in comparison to residential and commercial and industrial settings or parkland. PLVs for residential development areas and commercial and industrial development or parkland are the same for many of the parameters but are tighter for residential development areas where they do differ.

As the proposed PLVs have been derived taking into consideration potential risk to human health and the environment to create robust conservative limits, it is considered that any exceedance identified may pose a risk of adverse environmental or human health impact. As such, exceedances of the solid PLVs will not be tolerated and, where notified, will result in a waste determination rather than a by-product determination.

Use Location Vulnerability and Leachate Analysis

PLVs have been developed for two different vulnerability scenarios:

- **Scenario A (PLV-A criteria)** assumes the soil and stone by-product is exposed and present over high permeability subsoil.
- **Scenario B (PLV-B criteria)** assumes the soil and stone is present above a low permeability subsoil. Due to the presence of low permeability subsoil, there is a reduced potential for leachate to reach the groundwater aquifer compared to Scenario A.

It is anticipated that notifiers will select the appropriate scenario based on the use of the material they have notified and will apply the relevant PLVs i.e. based on the vulnerability of the use location. Vulnerability of the use location can be determined using Geological Survey Ireland's Groundwater Data Viewer[3]. The proposed PLVs can be seen in *Table 2 of Appendix 1*. Exceedances of the leachate PLVs will not be tolerated and, where notified, will result in a waste determination rather than a by-product determination.

A decision flow for applying the proposed PLVs is included in *Figure 1* of *Appendix I*.

[3] IE GSI Groundwater Data Ireland ITM Viewer

If all parameters tested are below the proposed solid soil and leachate PLVs, the by-product material is deemed to not pose adverse risk to the environment and human health and can therefore be determined as by-product, assuming all other conditions of Regulation 27(1) have been demonstrated to be met. If exceedances of solid and/or leachate PLVs are identified the soil and stone material will be deemed to pose a risk of adverse environmental or human health impact and will be determined as waste.

PFAS Screening

In Ireland there is currently no limit for PFAS concentration in soil. Given the emerging and developing challenge of PFAS contamination, there is a need to provide some certainty to industry to support circularity where appropriate in the context of developing urban spaces.

In relation to including PFAS in the guidance, specific PFAS compounds were selected as indicator substances for PFAS use in Ireland. Nine PFAS were identified which have a high potential to be present in Irish soils: PFOS, PFOA, PFNA, PFBA, PFDA, PFHpA, PFHxA, 6:2 FTS and 8:2 FTS. However, due to uncertainty and insufficient data available based on current studies, interim ambient concentrations (IAC) for PFOS and PFOA only are proposed to determine whether soil and stone can be used as by-product. These are the PFAS with the greatest amount of relevant data in literature and expected concentrations in soils are higher than for other PFAS. The relevant IACs for PFOS and PFOA can be seen in *Table 3 of Appendix 1*.

The IACs for PFOS and PFOA are split into two ambient zones, rural, and urban and industrial. It is the Agency's intention to develop a map of Ireland to accompany these IACs. The map will identify rural areas of Ireland versus urban and industrial areas. The map will aid notifiers in identifying the correct set of IACs to use. The application of the correct IACs based on ambient zones is to not worsen the current situation i.e. not add any contamination above existing ambient concentrations.

When applying the IACs it will be necessary for the notifier to identify the risk level of PFAS being present in soil and stone at the source (See *Table 4 of Appendix 1*).

Different scenarios apply depending on the level of risk identified by the notifier. For example, it is recommended that soil and stone material derived from very high-risk source sites not be used as by-product and that instead it is treated as a waste. Soil and stone material originating from low-risk sites (i.e. greenfield sites), may be used as by-product with no soil analysis for PFAS needed. For medium and high-risk sites, it is recommended that notifiers test for PFAS and apply the IACs proposed for PFOS and PFOA. A decision flow for applying the proposed PLVs based on the risk level identified is included in *Figure 2* of *Appendix I*.

Submission of your observations/ suggestions

In order to get the most out of your feedback it would be helpful for your feedback to be submitted under specific categories as set out below:

Category No.	Submission Category Description	
1.	Notified material	Brownfield soil and stone.
2.	Solid soil PLVs	Three proposed land use scenarios and the proposed PLVs derived for each.
3.	Leachate PLVs	Scenario A and Scenario B based on groundwater vulnerability at the use location and the proposed PLVs for each.
4.	Decision flow	Decision flow diagram for applying solid soil and leachate PLVs.
5.	PFAS risk table	Various site types identified under different risk categories; very high, high and medium
6.	Decision flow	Decision flow diagram for applying PFAS PLVs based on the level of risk identified.
7.	Other	

Please email your observations/ suggestions which will contribute to the development of guidance for brownfield soil and stone by-product material that will aid in the safe reuse of brownfield soil and stone material whilst demonstrating compliance with Regulation 27(1)(a)-(d).

Email: byproduct@epa.ie

Email Title: *Guidance for brownfield soil and stone by-product material, incorporating a PFAS screening tool*

Feedback: Break your feedback into categories 1-7 above.

Deadline: 5 p.m. Friday 22nd May 2026

Appendix I

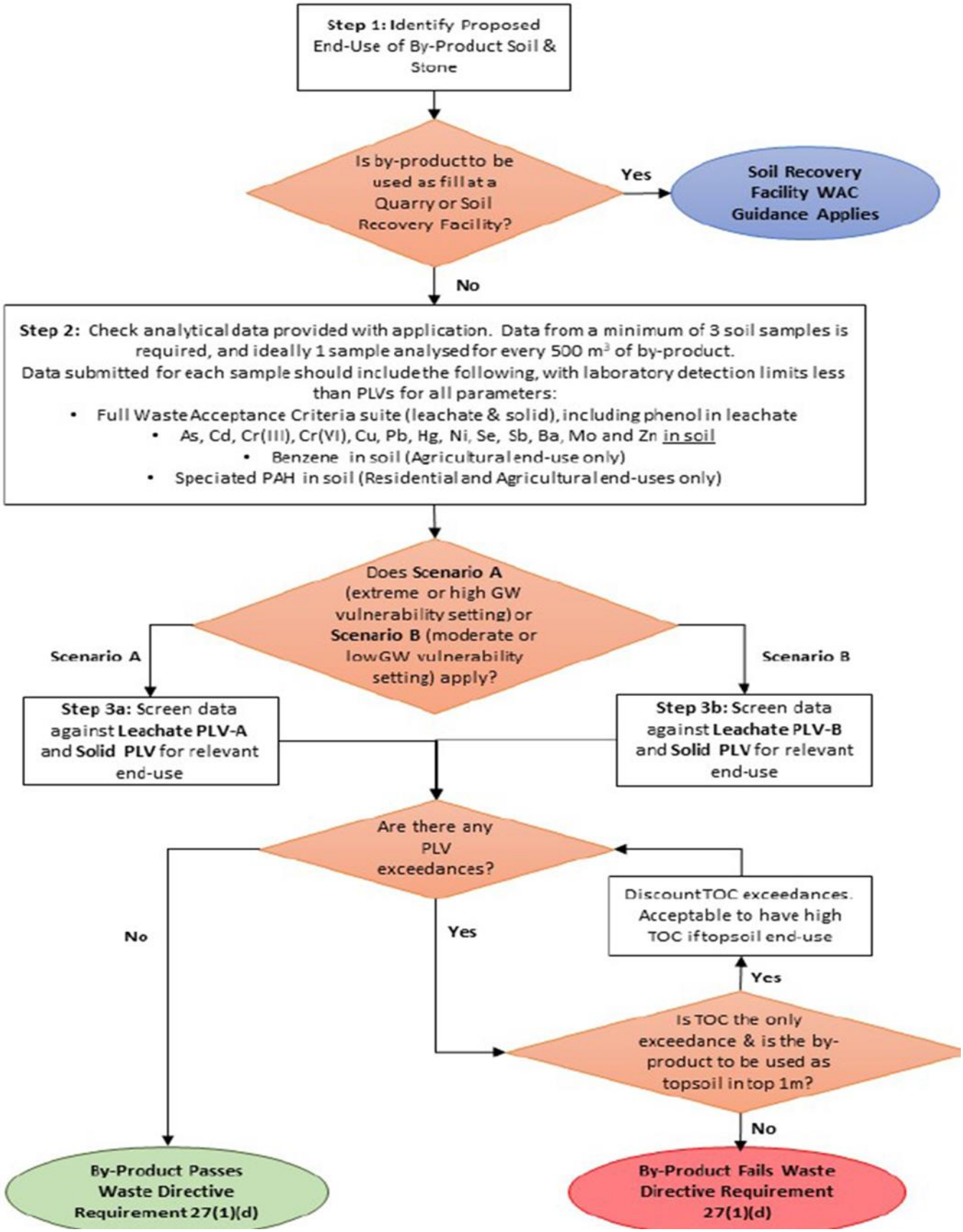


Figure 1: Proposed outline for use of PLV.

Note:

As seen in *Step 1 of Figure 1*, the use of the soil and stone material as fill at a quarry or soil recovery facility is outside of the scope of the three land use scenarios and as such, the proposed PLVs will not apply. Instead, the maximum concentrations and/ or trigger levels set out in Table 3.3 of the SRF guidance will continue to apply to material destined for use at quarries and SRFs.

Table 1: Proposed Total (Solid) Concentration Targets (S-PLVs)

Land Use	Residential Development Areas	Agricultural	Commercial and Parkland
Determinand			
Metals & Metalloids			
Arsenic, Inorganic (As)	37	43	86
Barium (Ba)***	1300	-	5000
Cadmium (Cd)	3.3	1.9	3.3
Chromium, Trivalent (Cr III)	74	74	74
Chromium, Hexavalent (Cr VI)	6	1.8	NR
Copper (Cu)	80	63	80
Mercury, Inorganic (Hg)**	0.5	0.5	0.5
Molybdenum (Mo)	21	19	21
Nickel (Ni)	66	53	66
Lead (Pb)	109	80	109
Antimony (Sb)	5.3	5.3	5.3
Selenium (Se)	17	17	17
Zinc (Zn)	240	170	240
Hydrocarbons			
Benzene	NR	0.0082	NR
Total BTEX	0.025		
PCBs (7 congeners)	0.035		
Mineral Oil C10-C40	50		
Benzo[a]pyrene	NR	0.36	NR
Benzo[b]fluoranthene	NR	0.37	NR
Dibenzo[a,h]anthracene	NR	0.054	NR
Naphthalene	0.9	NR	NR
Total PAH (17 including Coronene)	1		
Other			
TOC	2.4%*		
Asbestos	No asbestos fibres present		

All values are mg/kg unless otherwise specified, NR = not required

* Total Organic Carbon is a measure of all carbon with a sample including, but not limited to, plant and animal matter, wood, coal or ash and hydrocarbons. If it can be verified that the soil & stone by-product is to be used as a topsoil growth medium within the top 1 m of the surface then this value does not apply.

** PLV applicable to inorganic forms of arsenic and mercury only. Non inorganic forms of arsenic and mercury are considered to potentially relate to former industrial land use.

***Barium is not considered likely to be a risk driver parameter in consideration of brownfield soil and stone. S-PLVs calculated to be protective of human health. No background concentration data for barium in Ireland is available. No suitable plant uptake values have been published for barium therefore an S-PLV protective of agriculture could not be calculated.

***Table 2**:* Proposed Leachate PLVs (as 10:1 L/S Ratio Leachate (mg/kg))

Compound	Target Levels, all values in mg/kg	
	Proposed PLV-A	**Proposed PLV-B**
As	0.05	0.05
Ba	4.4	9.4
Cd	0.006	0.006
Cr Total	0.23	0.5
Cu	6.7	14
Hg	0.005	0.005
Mo	0.25	0.5
Ni	0.06	0.13
Pb	<0.05	0.06
Sb	0.13	0.29
Se	0.1	0.22
Zn	0.29	0.62
Chloride	400	850
Fluoride	<3	6.1
Sulphate	920	2,000
Phenol	<0.1	<0.1
Dissolved Organic Carbon	180	400

Table 3: Interim Ambient Concentrations.

Ambient Zone	PFOS (µg/kg)	PFOA (µg/kg)
Rural	0.6	1.1
Urban and Industrial	4.4	2.6

Table 4: Risk Level Table for Risk Screening for the Presence of PFAS.

Risk Level	Site Type (Past or present use)
Very High	AFFF* Production Sites (None in Ireland)
	Fire Training Areas, Fire Fighting Incidents
	Military Sites
High	In proximity of Fire Training Area (2)
	In proximity of Fire Incident with known AFFF use (2)
	Airport excluding fire training and incident areas
Medium	In proximity of Military Sites (2)
	Landfills/ Waste Management (2)
	Industrial Use with air emissions, or in proximity (2)
	Industrial Use no air emissions
	Previously developed land, not within other categories
Low[4]	Agriculture (1)
	Forestry Land
	Pristine Countryside

*AFFF = aqueous film-forming foam

[4] If the risk level is identified as low, the soil and stone material is considered to be greenfield and as such, testing for PFAS is not a requirement. As seen in Figure 2 of Appendix 1, low risk material may be considered suitable for re-use as by-product anywhere above the water table.

Notes:

If different land use type exists within a large site, then zoning of the site may be appropriate. For example: if there was a past fire-fighting incident in an industrial development, everywhere potentially impacted by the incident would be considered a “Very High” risk zone. Outside of this these areas would be a “Medium” risk zone.

(1) Biosolids from waste water treatment plants are sometimes applied to agricultural land as a fertiliser. At present there is no biosolid register in Ireland and it is not clear what lands biosolids have been applied to. There is potential for PFAS to be present in biosolids and as such, there is increased potential for PFAS to be present in soil where biosolids have been applied, particularly in topsoil. Caution is recommended where topsoil from agricultural land is used as a by-product, particularly at sites with a sensitive land use (i.e. residential development or parkland) and testing should be considered.

(2) Research by Moghadasi et al (2023) using mainland Europe soil data and regression analysis has suggested elevated PFAS soil concentrations may be present in the vicinity of firefighting sites, waste management sites and industrial sites. Off-site migration of PFAS may relate to windblown spreading of dust and AFFF, industrial air emissions, migration in surface water and groundwater flow. If the site which by-product is to be sourced from is situated within:

- 2 km of a fire training area,
- 500 m of the site of a fire incident where AFFF was used, or
- 10 km of a military site, landfills/waste management site or industrial site with air emissions that could contain PFAS,

consideration should be given to whether such off-site sources could impact the source site. If there is potential for impact then the site the by-product is sourced from should be considered “Medium Risk”.

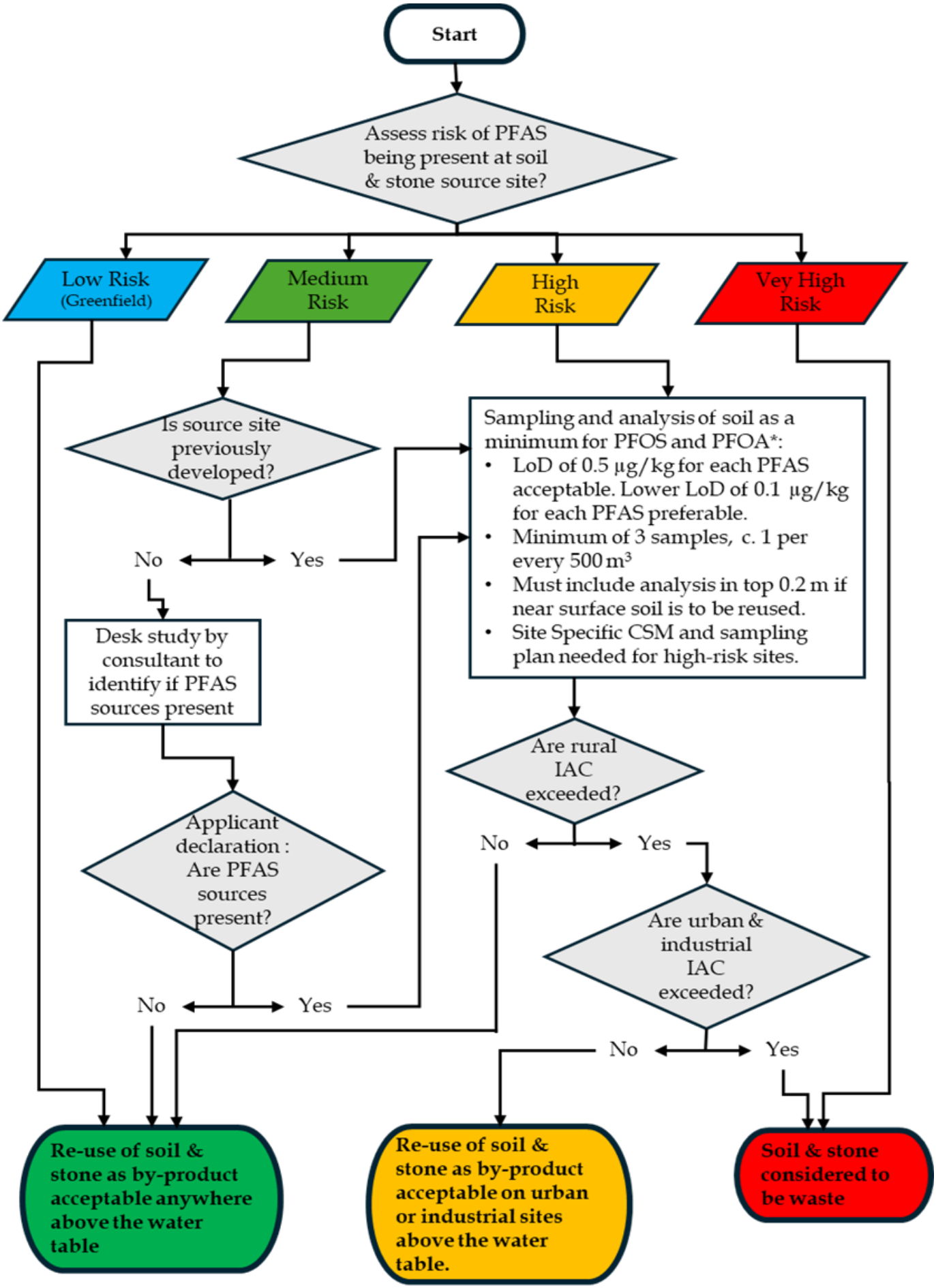


Figure 2: Recommended Use of IAC as PLVs for Assessing Suitability of Re-Use of Soil and Stone.

Note: IAC = Interim Ambient Concentrations. *It is preferred that sampling analysis takes place for 9 PFAS which have a high potential to be present in Irish soils: PFOS, PFOA, PFNA, PFBA, PFDA, PFHpA, PFHxA, 6:2 FTS, 8:2 FTS. Analysis for these 9 PFAS at a LOD of 0.1 µg/kg would help support future refinement of ambient PFAS concentrations. CSM = Conceptual Site Model. **For re-use of Soil & Stone as by-product to be acceptable all sub clauses of Clause 27(1) of European Union (Waste Directive) Regulations 2011-2020 (the Regulations) must be met.**

APPENDIX 2:
Extracts from MetroLink Railway Order, TII Reply to An Bord Pleanála Request for a Response to Wild Ireland Defence CLG & Sabrina Joyce-Kemper Submission; Appendix C: MetroLink PFAS Management Strategy for Dublin Airport Report

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Appendix C. MetroLink PFAS Management Strategy for Dublin Airport Report

1. Introduction

The purpose of this Report is to address the concerns raised by the Wild Ireland Defence/Sabrina Joyce Kemper submission and outline to An Bord Pleanála (ABP) how the MetroLink project (hereafter referred to as the proposed Project) will manage per- and polyfluoroalkyl substances (hereafter referred to as PFAS) contamination if encountered during the proposed Project construction works at Dublin Airport.

This Report also presents an updated assessment of the potential environmental effects of the proposed Project works at Dublin Airport and the manner in which any adverse environmental impacts arising from the presence of PFAS will be mitigated. This updated assessment has been prepared in light of information contained in the Dublin Airport 2021-2023 Environmental Monitoring Report, daa 2024 (Fehily Timoney, 2024, hereafter referred to as the daa Report), which was released into the public domain following the conclusion of the Oral Hearing and on Transport Infrastructure Ireland's (TII's) subsequent sampling and testing at Dublin Airport in September/October 2024. This assessment has been conducted by relevant subject matter experts, who authored the Environmental Impact Assessment Report (EIAR), along with PFAS specialists, and updates the assessment in the EIAR in light of the additional information now available.

TII has prepared a comprehensive management strategy to address the potential risks associated with PFAS at the airport to achieve the following:

- **Prevention of PFAS mobilisation and transfer:** Measures will be implemented to prevent the mobilisation or transfer of PFAS to the receiving environment during the construction and operational phase of MetroLink, should PFAS be encountered; and
- **Avoidance of Preferential Pathways:** The proposed Project will ensure that no preferential pathways are created that could facilitate the transfer or migration of PFAS.

To achieve this, TII will employ a combination of treatment strategies, onsite management practices, and design solutions. These measures will be aligned with international best practices for managing PFAS, ensuring the highest standards of environmental protection and safety.

The proposed Project has adopted an approach to management of PFAS-containing material encountered during the construction phase that is entirely consistent with the precautionary principle. In order to ensure that the environmental assessments carried out in relation to impacts of any such PFAS-containing material encountered are based on conservative assumptions, the project has assumed a worst-case scenario where all excavated material at Dublin Airport has the potential to contain detectable PFAS. This conservative assumption is made to ensure that the magnitude of the impacts is not underestimated.

The precautionary principle, as adopted by TII, pertains to the management, containment and treatment of PFAS-containing material and relates to limits of detection, protection measures and export as a means for dealing with PFAS containing material. TII has adopted this principle as a management strategy to take protective measures to prevent harm, especially given the current uncertainty about the full extent of the PFAS contamination at Dublin Airport and the risk it poses to the wider environment.

The worst case scenario is an assessment methodology used to evaluate the potential impacts of a project under the most adverse conditions. In this case, it involves assuming that all excavated material at Dublin Airport is contaminated with PFAS. This approach ensures that the environmental assessment does not underestimate the potential impacts, allowing for a more comprehensive evaluation of the risks and necessary mitigation measures.

By ensuring that PFAS management approaches are centred around the precautionary principle and combining the worst case scenario with the precautionary principle in its approach to environmental assessments, the project ensures that all potential risks are addressed comprehensively and proactively.

Based on the current availability of treatment options, the project has identified methods to effectively manage PFAS.

Excavated soils that are not impacted by PFAS will be reused subject to meeting the requirements under Article 27 of the European Communities (Waste Directive) Regulations 2011-2020[1]. Due to the lack of a coherent regulatory framework for the management, treatment or re-use of PFAS contaminated material, any excavated material encountered with levels of PFAS above the Limit of Detection will be exported for treatment and/or disposal.

The limit of detection for excavated materials is assumed to be 1µg/kg for most individual PFAS (noting that some PFAS, have a higher limit of detection). A limit of detection of 1µg/kg is considered to be the lowest reliable limit currently offered by analytical laboratories because this represents the threshold at which analytical laboratories can consistently and accurately detect and quantify the presence of PFAS in excavated materials without significant interference or error.

However, if specific limits and/or legislative changes are introduced in Ireland that specify procedures or binding thresholds for the re-use and disposal of PFAS, these requirements will be adhered to.

1.1 Expert Input from PFAS Specialists

Recognising the complexity and importance of managing PFAS contamination, a team of international PFAS specialists were engaged to review information and data on PFAS and contribute to this report with their insights and recommendations. This team of experts provided strategic advice and insights from their extensive experience in working on projects in which PFAS have been found to be present. The specialists involved include:

- Dr Jane Thrasher: Director in Land Quality and Jacobs UK PFAS lead. With 30 years' experience, she provided expert guidance on PFAS characterisation and analysis for MetroLink while overseeing the drafting of this report;
- Dr Karl Bowles: Senior Principal Environmental Scientist with Jacobs and Adjunct Associate Professor at the University of Queensland. With over 30 years of experience, he developed and assessed treatment options for soil and water for MetroLink;
- Brad Simmons: Jacobs' Technical Director for Contaminated Land for Asia Pacific. With 30 years experience, he provided strategic advice on treatment and management of PFAS-contaminated materials during construction; and
- Dr Dora Chiang: Global Principal for PFAS and Contaminants of Emerging Concern (CECs) at Jacobs. With over 25 years experience, she reviewed the report and provided specialist advice to the MetroLink project team.

[1] A Notification was made to the EPA under Article 27 (now referred to as Regulation 27) of the Waste Management Act (as amended) in November 2021. This notification was made to propose the reuse between 2.1 and 2-7million m3 of suitable excavated soil and rock arising from the MetroLink project on another site. A revised notification was submitted to the EPA in December 2024 where this volume was reduced to between 1.8 and 2.5million m3 to account for potentially PFAS contaminated material and a specified limit for PAH.

5. Management Strategy for Soil

An evaluation was undertaken to identify effective treatment options for managing soils/rock contaminated with PFAS, specifically for the proposed Project works at Dublin Airport. The evaluation began with a longlist of potential technologies, which were then narrowed down based on their effectiveness, availability and suitability for this specific site. The process was informed by the experiences and practices from other jurisdictions. The longlist of treatment options considered and the final shortlist of treatment options are provided in Annex D.

A range of *in-situ* remedial options are widely used to manage PFAS contamination globally. They are however unsuitable for this project as the material to be managed is excavated soil and rock from tunnelling. A range of *ex-situ* remedial options effective at managing PFAS contamination have been identified and considered. *Ex-situ* destructive methods including high temperature incineration are unlikely to be a practicable solution for large volumes of soil and rock with low concentrations of PFAS contamination and are not available in Ireland.

Ex-situ Immobilisation, involving treating the soil to immobilise PFAS contamination within the soil matrix prior to disposal in a landfill or engineered containment cell, was identified as a potential option. These methods do not destroy the PFAS, but are effective at reducing the risk by locking the PFAS in and preventing migration. However, this option was deemed impractical within Ireland due to the lack of available suitable landfill sites and local treatment facilities with the necessary permissions from the EPA.

Ex-situ soil treatment has also been considered. However there is just one such facility in Ireland licenced to receive any material containing PFAS (operated by Enva, https://enva.com/news-pr/soil-treatment-and-site-decontamination-services) and its capacity is understood to be limited.

The evaluation concluded that the only workable strategy is to export the contaminated materials for treatment overseas. This strategy involves transporting the contaminated soil/rock/fill overseas for either treatment, destruction, or landfill. This approach is necessary due to the absence of local facilities within Ireland capable of handling such PFAS materials at volume. This ensures that the contaminated materials are handled in a manner that mitigates environmental and health risks, given the current limitations of local treatment options.

This approach has been adopted by daa for the remediation of stockpiles of PFAS contaminated soil associated with the Apron 5H redevelopment at Dublin Airport. It is understood that over 150,000 tonnes of PFAS impacted soil was removed and treated in overseas facilities, including in Belgium and Norway (See https://www.dublinairport.com/docs/default-source/sustainability-reports/daa-PFAS-FAQ.pdf).

Another example of this approach is the remediation of a former airport at Svea in Svalbard, Arctic Norway (https://perpetuum.no/en/about-pfas/disposal-of-afff-foam-from-airport/). A total amount of 50,000 tonnes of PFAS contaminated soil was transported from Svalbard by ship to a landfill in northern Norway.

There are a number of licenced facilities in other European countries where there is capacity for treatment of PFAS contaminated soils including an Indaver site in Belgium where incineration and encapsulation solutions at large scale are offered.