



Rialtas na hÉireann
Government of Ireland

Historic Mines Services 2026 RFT

Appendix 2: Specification for Lot 2 Critical Failure Assessment

30 July 2026

Version 1

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1 Introduction

The Department of Climate Energy and the Environment (the Department) seeks service providers for Historic Mines Services. **This specification document relates to Lot 2 Critical Failure Assessment only.** Please refer to separate specification documents for Lots 1 and 3.

The Department seeks under Lot 2 Critical Failure Assessment (CFA) a service provider to provide the following services: Development of potential dam failure scenarios, modelling, receptor mapping and consequences for the hinterland of Gortmore and Shelton Abbey Tailings Management Facilities (TMFs). **Time is of the essence for these services in relation to Gortmore.** It is anticipated that a contract will be awarded for this work during October 2026 and CFA for Gortmore TMF is required to be completed on an urgent basis within 4 months. Deliverables to include:

- Interim early warning system for embankment failure for Gortmore TMF only;
- Critical Failure Assessment including :
 - Risk Assessment and Modelling including credible failure scenarios and dam breach analysis;
 - Downstream Receptor Mapping and consequence classification;
 - A definitive, expert-reviewed final report synthesising all findings methodologies, and engineering conclusions
 - Recommendations for key mitigation actions to reduce risks;
- Development of an Emergency Preparedness and Response Plan (EPRP) for dam failure to include trigger action response plan, notification protocol and recommendations for an effective early warning system for alerting residents in the immediate vicinity;
- Review of CFA and EPRP after three years, or after substantive changes to the condition of the site (incidental or due to remediation works).

There is an option to extend the contract by one year in order to continue the services if required. Full details of the requirements are outlined in this document.

2 Background information

2.1 Historic mines in Ireland

The Department currently undertakes management of abandoned mine sites, primarily where the minerals are State-owned and sites are identified as high risk. Management and planning for future rehabilitation is undertaken by the Historic Mines Rehabilitation Programme, a joint programme of the Geoscience Policy Section and Geological Survey Ireland.

The Historic Mine Sites – Inventory and Risk Classification Volume I study carried out by DCEE (then DCENR) and the Environmental Protection Agency (Stanley *et al.*, 2009) identified Avoca, Silvermines and Tynagh as Class I (the highest priority) historic mining sites in the country, in terms of their potential to affect human or animal health or to have an impact on the environment. Accordingly, responsibility for Avoca and Silvermines was taken by the government in 2005.

2.2 Avoca and Silvermines

A rehabilitation options assessment was carried out by SRK for Silvermines in 2002 (SRK, 2002) to identify a range of potential options to address human health and environmental impacts at the Silvermines sites. A feasibility study for the management and remediation of Avoca was completed for the Department in 2008 (CDM, 2008). Due to the financial downturn at the time, the Department was not in a position to fully implement the feasibility options.

Following a number of pollution incidents at Gortmore Tailings Management Facility in Silvermines, it was partially remediated between 2008 and 2010. The steepest banks were re-graded and buttressed. About 50% of the area was capped and a drainage system installed.

At Avoca, a programme of priority safety works was undertaken by the Department over the period 2014-2021. The completed priority safety works included:

- Stabilisation works to the railway embankment and rehabilitation works at the Deep Adit (undertaken in 2014).
- Capping works at open shafts and stopes (undertaken in 2014 – 2017).
- Rehabilitation and stabilisation works at the Tigroney Spoils Area (undertaken 2016 – 2017). The works involved regrading and capping/vegetation works with drainage

diverted to the north east and west of the site. Heritage structures including the 850 ore bins were conserved.

- Rehabilitation works to stabilise the 850 Adit (undertaken 2016 – 2017, 2019 – 2020).

Since 2012, monitoring and limited remedial works have been carried out at the sites.

Environmental and geotechnical monitoring has been carried out by consultants on behalf of the Department since 2012 to present, with the latest monitoring rounds carried out in spring 2026 (with a hiatus 2021-2023). Monitoring reports are available at the following link:

<https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/historic-mines-rehabilitation/>.

Pending the renewal by DCEE of the feasibility studies and rehabilitation plans, the Historic Mines Rehabilitation Programme will continue to monitor the condition of the sites and to quantify and mitigate risk at the sites. To fulfil these objectives, the procurement of these services is now being undertaken.

2.3 Silvermines

2.3.1 Site description

The Silvermines area of north County Tipperary has been mined intermittently for over one thousand years for a range of commodities. Lead, zinc, copper, silver, barite and sulphur were exploited from a number of different sites, covering an area of approximately 2,300ha. The mining sites include Ballygown, Garryard, Gorteenadiha, Magcobar and Shallee South/East (Figure 1). The last working mine, a barite operation at Magcobar, closed in 1993. Just over a decade previously, the final base metal mine shut down, following the cessation of underground operations by Mogul Mines Ltd. (Mogul) at Garryard. The latter operation resulted in the generation of significant volumes of fine to coarse grained sand particles referred to as 'tailings.' Mine tailings (post-processing fine rock particles) were deposited in a specially constructed tailings management facility (TMF) at Gortmore (Figure 2). The TMF is a c. 7m to 8m high flat-topped mound comprising 5Mm³ of tailings from the Mogul Mines processing plant at Garryard, 2km to the east. The perimeter is some 2.9km long, and the area some 58ha. Rehabilitation works have been completed at various localities in the Silvermines area, including Gortmore TMF, with the site work administered by then North Tipperary County Council on behalf of the Department. To date this rehabilitation work has included partial capping and vegetating of the surface, drainage

improvement, remedial works to wetlands at the TMF; fencing/capping of mine shafts and adits; and the filling of a pit at Ballygown.



Figure 1 Silvermines aerial overview (from MKO, 2026a).



Figure 2 Gortmore TMF aerial overview (MKO, 2026, unpublished).

2.3.2 Environmental monitoring

The most recent environmental monitoring report for Silvermines, in respect of monitoring round undertaken in February 2026 (MKO, 2026a), showed that the overall impact to the aquatic environment from the former mining area is considerable and ongoing.

The main concerns are dissolved metals in surface and groundwater, especially zinc, nickel, lead and cadmium. Three discharges (Shallee and two from Garryard) have a significant negative impact on the water quality of the Kilmastulla River due to high concentrations of dissolved metals. Dissolved metal concentrations exceed ecological and human health criteria for all metals except zinc at all Gortmore Seep locations.

The report recommends urgent attention is given to the seepages at Gortmore and that investigations should be undertaken to allow a plan to be developed to manage this and wider issues to minimize impacts to the aquatic environment. The report made a key recommendation of relevance to the request for these services:

- Investigations at Gortmore TMF, e.g. to include water pressures and gradients, seepage rates, depth, soil strength and pore pressure of tailings material, and a range of geotechnical laboratory testing are recommended to address seeps and ensure stability, proper drainage, run-off, and discharge management.

2.3.3 Geotechnical monitoring

The most recent geotechnical reports from 2026 (GWP Consultants, 2026a, 2026b) identified the main physical hazards at Silvermines sites to be the stability of Gortmore TMF, the stability of embankments at Garryard tailings lagoon, high rock faces and open mine workings at Shallee, along with collapsed mine workings, shafts, adits, buildings, and asbestos at Ballygown. Tenderers are referred to the detailed list and map of features contained in the most recent monitoring report GWP (2026a) (Table 1-3 and maps *Ballygown South/Garryard/Shallee Area Features dated 28.04.2026*). These are not provided here owing to their large size. The report is available directly at:

https://assets.gov.ie/static/documents/f89b1391/Silvermines_Geotechnical_Report_After_March_2026_Inspection.pdf

Some 47 observations were made on the physical condition of Gortmore TMF in the report following the inspection in March 2026 (GWP, 2026b). Tenderers are referred to the detailed list and map of features contained in that report (Table 1 and map *Gortmore TMF Area Features AVSILMON2604G dated 30.04.2026*). These are not provided here owing to their large size. The report is available directly at:

https://assets.gov.ie/static/documents/71e30d83/Gortmore_TMF_Geotechnical_Report_After_March_2026_Inspection.pdf

The report classifies Gortmore TMF as a Significant Hazard on the basis that:

- The Gortmore TMF is a liquid tip. It was originally deposited in a liquid form and recent flight auger holes undertaken by the Department indicate the water table is within 0.5m of the top surface and the contents remain saturated below this level.
- The liquid contents are well over 10,000m³ in volume.
- The level of the liquid content is over 4m above the surrounding ground.

The Gortmore study concluded that “the site is in an unsatisfactory geotechnical condition. Should it fail, then a very serious pollution incident could occur and there may be fatal consequences with nearby houses being inundated with sludge”. It noted a lack of supporting information to assess the actual stability of the structure, and that “there are indications that the western end of the southern bank may be close to failure”.

It made the following recommendations:

- Updated UAV survey following vegetation removal.
- Remedial works including capping, buttressing and repair of piping erosion.
- Site investigation to determine the geometry and construction of the berms; installation of new piezometers to monitor the hydrological conditions; cone penetration testing, sampling for shear strength.
- Stability analysis to determine the stability risks posed by the TMF.
- Treatment of contaminated water draining into the Kilamstulla River.
- Erection of hazard signage.

2.4 Avoca

2.4.1 Site description

The Avoca mining area is in the Wicklow Mountains, approximately 55 km south of Dublin. The site comprises the East and West Avoca mines and Shelton Abbey tailings management facility (TMF), which is situated 5 km downstream of the former mining area (Figure 3). The Avoca Mine site was worked intermittently for approximately 250 years with the extraction of 16Mt of copper and pyrite ore and on-site processing of concentrates. The mine closed in 1982. Mineral extraction has left an environmental legacy that comprises three open pits, over 70 shafts and adits, numerous spoil piles and 25 mine buildings/structures. The mine area was subdivided into a number of properties in the 18th and 19th centuries, each named after the townlands in which they were located. From northeast to southwest these were Connary, Cronebane, Tigroney on the eastern side of the

river, and Ballygahan and Ballymurtagh on the western side (Figure 3). The site also includes a Tailings Management Facility (TMF) at Shelton Abbey which is in the ownership of Wicklow County Council. It is located approximately 8 km south on the bank of the Avoca River. The site is about 1,000m long by 450m wide, covering an area of c. 45ha, containing some 7,500,000m³ of tailings material (see Figure 4).

The most hazardous features have been fenced off, or in the case of some of the shafts and adits, blocked off. The fences are breached regularly leading to unauthorized access to open pits, underground workings, etc. Spoil piles and Shelton Abbey TMF have elevated metal levels and are physically unstable with the potential to collapse. In addition, there is unstable ground which has the potential for subsidence. The water discharges from the mine and TMF are acidic and metal laden. This has impacted on the water quality of the Avoca River.

Further detail on recent environmental monitoring carried out in the Avoca and Shelton Abbey areas is available in MKO reports (2026b).

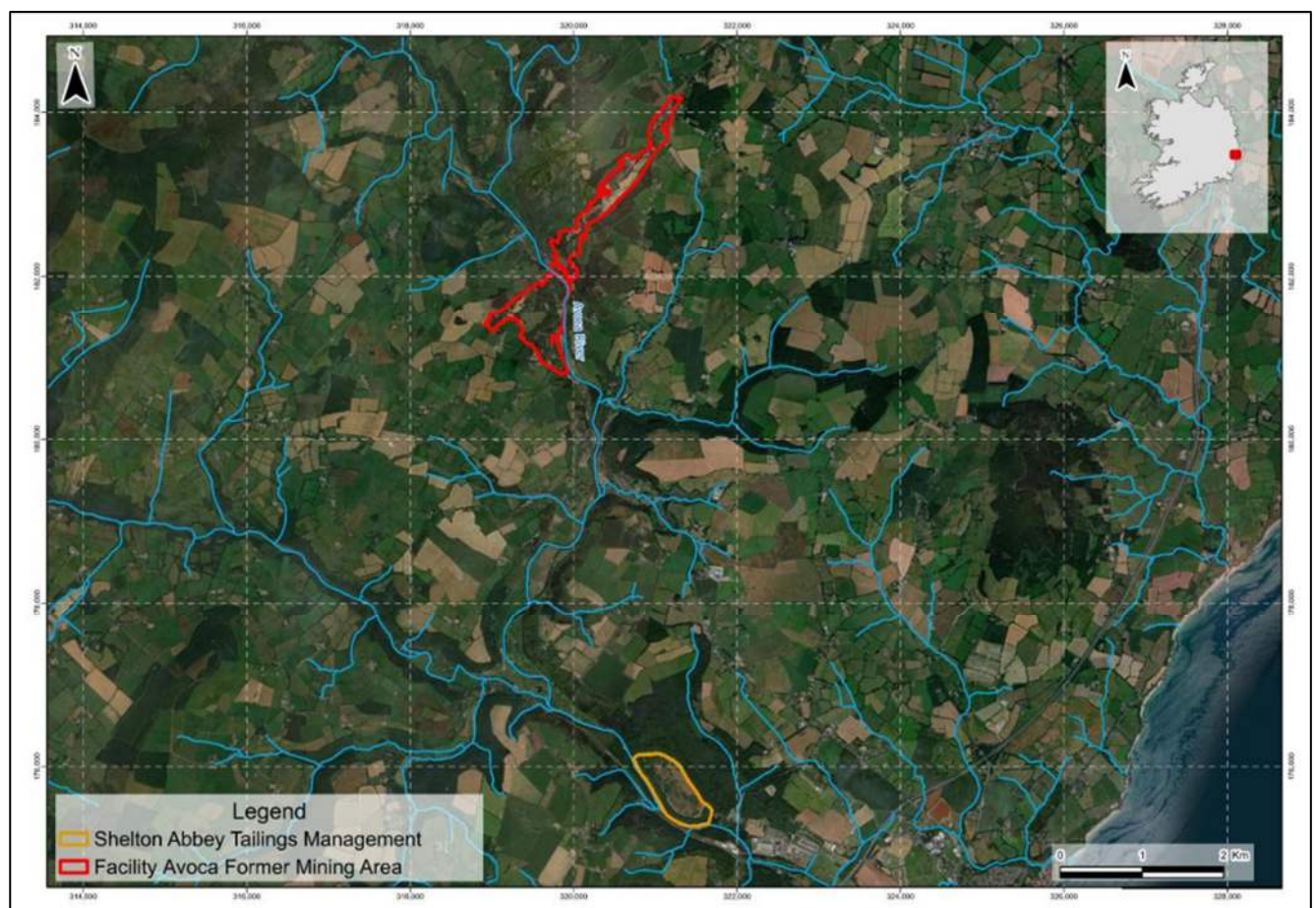


Figure 3 Avoca aerial overview (from MKO, 2026b)



Figure 4 Shelton Abbey aerial overview (MKO, 2026, unpublished)

2.4.2 Environmental monitoring

The monitoring programme in relation to the Avoca area was designed in 2017 and has not significantly changed since then. There are currently 8 groundwater well and 21 surface water and adit discharge monitoring locations. Some monitoring points have become unsafe to sample or obsolete for scientific or technical reasons since the commencement of the programme.

The most recent environmental monitoring round was completed for Avoca in February 2026 as described in the monitoring report (MKO, 2026b). For the February 2026 monitoring event 29 locations were sampled: eight groundwater monitoring wells, 13 surface water and eight adit discharge/drainage locations. Flow rate was measured at one location on the Avoca River, and the flow rate was projected and estimated for the other 12 locations. Flow was also measured at seven adit discharge/drainage locations and projected and estimated at one.

The findings in relation to monitoring on the Avoca River in the vicinity of Shelton Abbey TMF show that metal loadings increase slightly downstream of Shelton Abbey, suggesting impacts from the TMF. Further detail is available in MKO (2026b).

2.4.3 Geotechnical Monitoring

The geotechnical report from 2026 (GWP Consultants Ltd, 2026c) identified the main physical hazards at Avoca sites to be high rock faces and shafts; along with collapsed mine workings, adits, buildings, tips and lagoons, some of which pose a severe safety risk. GWP prepared a separate report on the geotechnical condition of Shelton Abbey (GWP Consultants Ltd, 2026d). The scope of the inspection was five areas in the main site (Conary, Cronebane and Mount Platt, East Avoca, Tigroney and West Avoca), the TMF at Shelton Abbey and an underground inspection of the 850 adit. Tenderers are referred to the detailed lists and maps of features contained in the most recent monitoring report GWP (2026c) (Table 1-7 and accompanying maps documenting observations on shafts, adits, structures, fences, rockfaces, tips, lagoons at Avoca. These are not provided here owing to their large size. The report is available directly at:

https://assets.gov.ie/static/documents/fe499ecd/Avoca_Geotechnical_Report_After_March_2026_Inspection.pdf.

The main physical hazards of the Shelton Abbey site relate to the physical integrity of the lagoon banks. Like Gortmore TMF, Shelton Abbey TMF has not been properly capped, which is allowing water to percolate through the tailings, seep out into the adjacent

watercourses and cause stability concerns. Although there is a better understanding of the construction and hydrology of Shelton Abbey due to the availability of construction records, the reports recommend carrying out further studies to establish the full depth of the TMF and the nature of the underlying materials and to undertake a stability analysis. The report (GWP Consultants Ltd, 2026d) points out that “should the TMF slopes fail, then there could be many thousands of cubic meters of toxic tailings deposited in the Avoca River. There is a risk that such an event could occur due to either elevated water pressures, or erosion of the riverbank”.

2.5 Recently collected data at Gortmore and Shelton Abbey TMF sites

Historic design, construction, and operational data for both TMF facilities are highly limited. On a short-term basis, in order to address this information gap and because of recently reported deterioration in conditions as outlined above, particularly at the Gortmore TMF and pending a full rehabilitation plan, a site investigation was required to assess subsurface conditions.

This site investigation was initiated in May 2026 involving

1. Aerial survey:
 - a. LIDAR to ascertain current ground levels combined with Visual RGB photogrammetry to produce 2D maps and 3D models
 - b. Thermal photogrammetry to help detect seepages from the TMF.
2. Geophysical survey:
 - a. Electromagnetic (EM) surveys to measure ground conductivity (contribution from high conductivity water in saturated soil regarding detection of seepage migration).
 - i. Across the entire TMF profile, including the berms, with intent to produce an output showing ground conductivity contours.
 - ii. Outside the perimeter of the TMF, including one continuous line along the toe of the berms and one line halfway to the streams, to try and detect shallow migration of leachate in the subsurface.
 - b. Electrical Resistivity Tomography (ERT):
 - i. Along two profiles across the TMF extending to the nearby streams to identify the thickness of the tailings, the likely nature of geological materials beneath the TMF and changes in the materials within the TMF.

- ii. Two other profiles, N/S, across the berm to the south, with greater vertical resolution in the data and analysis, but smaller penetration depth.
 - c. Seismic Refraction surveys where the emphasis is on multichannel analysis of surface waves (MASW), principally to help determine potential changes in ground stiffness and areas of low shear strength. Survey lines were run on top of the TMF berms. The TMF perimeter is approximately 3 km long.
3. Intrusive ground investigation trial pitting, drilling, sampling and installation of new monitoring points in order to
- a. Characterise:
 - i. the tailings.
 - ii. the berms
 - iii. the geological materials beneath the tailings
 - b. Conduct geotechnical and laboratory assay testing of tailings and other geological materials including:
 - i. Particle Size Distribution
 - ii. Moisture Content
 - iii. Density and Specific Gravity
 - iv. Shear Strength
 - v. Atterberg Limits
 - vi. Vertical Hydraulic Conductivity
 - vii. Chemical Assay
 - c. Install monitoring wells (piezometers) to determine water quality and water level elevations
 - d. Conduct slug tests on existing and new monitoring wells (piezometers)
 - e. Estimate potential recharge capacity or rates across the TMF
 - f. Conduct downhole camera surveys of all existing monitoring wells
 - g. Characterise the subsurface materials downgradient of the berms in the seepage areas

Overall, the GI was designed to determine piezometric and geochemical conditions within and behind the TMF embankment, determine groundwater flow directions, gradients and estimate velocities, determine variation in material types impounded within TMF, and confirm the condition/shear strength of the berms and foundation materials.

This information will provide data for input into the CFA. The contractor must review all available data provided by the client. No further intrusive field investigations are planned; the contractor must work with the existing data package. The data will be provided to the contractor on commencement of the contract.

3 Requirements

The objective of this contract is to assess the structural integrity, model potential failure scenarios, and develop Emergency Preparedness and Response Plans (EPRPs) for two abandoned Tailings Management Facilities (TMFs): Gortmore in County Tipperary and Shelton Abbey in County Wicklow, Ireland.

The successful tenderer will be required to provide two Critical Failure Assessments and an expert report with stakeholder briefing reports for Gortmore and Shelton Abbey TMFs. The successful tenderers may also be asked to provide engineering advice and recommendations on issues arising from the findings which are within the remit of the Minister.

The CFA and expert report for both Gortmore and Shelton Abbey TMFs must account for the unique and permanent profile of each site. Given that the large volume of elevated sandy tailings at each location (8M tonnes at Gortmore and 7.5M tonnes at Shelton Abbey) contain heavy metals (lead, zinc mainly) and sit in poorly drained floodplains, any breach poses a potential risk of a cascade failure reaching the Kilmastulla/Shannon and Avoca River catchments respectively.

Critical Urgency Note

- **Gortmore TMF:** This facility shows signs of active deterioration and sits in close proximity to a number of residences. All deliverables including design for an early warning system for Gortmore must be fast-tracked and fully completed within 4 months of contract award.
- **Shelton Abbey TMF:** This facility follows a standard project timeline, to be executed sequentially or in parallel without compromising the Gortmore deadline.

3.1 Service 1: Project Management

The tenderer should propose their methodology for project management to oversee the tasks and specifications contained within this RFT. **This will be scored in Award Criterion**

1 in the RFT document. The methodology for project management should specifically address the following requirements.

3.1.1 Project team

The project team should be identified in the tender in the form of an organisational chart. Key personnel such as the project manager are critical, and the Department expects that those identified persons will be involved and fill the role outlined in the organisational chart for the duration of the project. However, unexpected circumstances can arise and we therefore request alternatives to be identified in the tender submission.

The submission should provide the following information:

- The name of the person who will be the Project Manager for the contract. Please provide an up-to-date CV for the Project Manager.
- The names of the persons who will be working on the project and their specific role in the project. Please provide the names of alternates in the event that the first named persons are not available. Provide CV for both the first named and alternate persons. For each person, please also provide a statement of their current areas of responsibility and expertise.
- An estimate of the number of person days that each named person will spend on the project.

3.1.2 Project Meetings

An initial meeting will take place between the Department and the successful tenderer, ahead of fieldwork commencing. Thereafter, project meetings will be held twice yearly, unless specific issues arise which require additional meetings with the Department or other relevant bodies. These meetings will be primarily so that the consultant can report on progress and highlight any problematic issues. The project meeting schedule is to be specified in a project Gantt chart.

3.1.3 Health and Safety plan

The Contractor is responsible for assessing and mitigating all risks associated with fieldwork and associated activities for its personnel. Ensuring the health and safety of personnel working on this project is of great importance, given that there are physical and chemical risks at the sites. The Client requires comprehensive risk assessments with mitigation measures and risk matrices, plus statements and policies written on the safe system of working in relation to each of the activities described in this RFT, **to be produced in draft**

as part of the project plan. Such assessments must make very specific reference to the components of the work. If there is a failure to complete this, then the Client will not permit the Contractor to begin fieldwork and the contract may be suspended. The Client requires that the Contractor report all accidents and near-misses including, but not limited to, any matter where the emergency services are respondents to any of its personnel, vehicles, or field accommodations for any reason. Notification must be with 4 hours of the incident and to be followed by a formal report within 24 hours in writing. The Client will agree a reporting format with the Contractor ahead of fieldwork commencing. Any significant health and safety risk identified by the consultant in the course of the contract at either Avoca or Silvermines should be communicated to the Department immediately.

3.1.4 Green Procurement

Tenderers are required to provide evidence of commitment to environmentally friendly practices that reduce emissions, resource use and waste (as they relate to specific proposals in the tender response), in support of Government Green Procurement objectives. The tenderer should include in their proposal metrics for demonstrating green commitments over the lifetime of the contract.

3.1.5 Deliverables, reporting and timelines

The deliverables for each service are summarised in Table 1 Services and deliverables for Lot 2

Deliverable	Content	Timing
Service 1 Project Management		
1. Project plan	Project plan including: (i) Methodology (ii) Draft Health & Safety plan (iii) Timelines for deliverables and billing	2 weeks post contract award
Service 2 Gortmore Interim Early Warning System		
2. Gortmore EWS	Interim engineering design, procurement and commissioning of the EWS	6 weeks post contract award
Service 3 Critical Failure Assessment		
3. CFA for Gortmore and Shelton Abbey TMFs	Delivery of final report to include: (i) Geotechnical Data Review (ii) Risk Assessment and Modelling; (iii) Receptor Mapping and classification;	4 months post contract award for Gortmore. 11 months post contract for Shelton Abbey

	(iv) Final Report and Presentation To be re-run after three years or sooner following substantial changes to the site.	Re-run in year 3.
Service 4 Emergency Preparedness and Response Plan		
4. EPRP for Gortmore and Shelton Abbey TMFs	Delivery of EPRP to include: (i) Recommendations in response to CFA (ii) Trigger Action Response Plan (iii) Notification and Communication Protocols (iv) Evacuation logistics Update on foot of re-run of CFA.	6 months post contract award for Gortmore. 14 months post contract award for Shelton Abbey. Update in year 3.

Table 1 Services and deliverables for Lot 2

The tenderer should propose a draft payment schedule based on the services and deliverables in Table 1.

All rights and interest in the data shall vest in the Department. All data collected by the successful tenderer should be treated as confidential and shall not be disclosed to any other party without written permission from the Department.

3.2 Service 2: Interim Early Warning System for Gortmore TMF

Based on the above review of the available geotechnical data and until the final report of the CFA and recommendations are delivered, the Gortmore TMF requires the consideration of rapid deployment of an **interim** robust early warning system for failure (EWS). The tenderer is required to propose a suitable system and approach to deliver this service. **This will be scored in Award Criterion 2 in the RFT document.**

The system must be capable of detecting surface and subsurface earth movements to alert residents and authorities before significant structural failures occur. Due to the remote location, the solution must feature independent power infrastructure and strict quality controls.

The system architecture and engineering design of the EWS must therefore include the following considerations:

- Continuous monitoring of slope stability, displacement, and ground acceleration.
- Suitable sensor technology e.g. tiltmeters.
- Automated, multi-channel notification protocols for local residents and authorities.

- Complete hardware, software, and communication network specifications.
- Appropriate data integrity and clear thresholds within a QA/QC framework to eliminate false positives from wildlife, livestock or weather.
- Systems for remote health-checking and sensor calibration verification.
- Off-grid power supply and redundancy design suitable for a remote, exposed site (e.g. solar/wind paired with industrial battery storage).
- Ease of deployment for an interim or modular solution which may be augmented or modified when the CFA report recommendations are delivered.
- The comprehensive design, procurement of hardware, and final deployment of the operational Early Warning System must be fully realised within a budget of region €25,000 (excluding VAT).

Time is of the essence for this service. The entire scope must be completed rapidly and delivered for consideration within the first 6 weeks of the contract commencement.

3.3 Service 3: Critical Failure Assessment

The tenderer is required to propose a suitable approach to deliver Critical Failure Assessment Services for Gortmore and Shelton Abbey TMFs. **This will be scored in Award Criterion 3 in the RFT document.**

3.3.1 Geotechnical Data Review

The contractor must review all available input data provided by the client, primarily that generated by the ground investigation fieldwork in 2026. This data will be provided to the contractor on commencement of the contract.

No further intrusive field investigations are planned at this time; the contractor must work with the existing data package.

The contractor will also be required to consult any other sources it deems relevant to the task, e.g., those listed in Table 2.

Source	Description	Availability
Geotechnical monitoring reports	For Gortmore and Shelton Abbey TMFs	GWP Consultants (2026b) Gortmore TMF report on March 2026 geotechnical inspection. Available at: https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/historic-mines-rehabilitation/ GWP Consultants (2026d) Shelton Abbey TMF report on March 2026 geotechnical inspection. Available at: https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/historic-mines-rehabilitation/

		and-the-environment/publications/historic-mines-rehabilitation/
Feasibility assessments for rehabilitation	For Avoca and Silvermines including examination of Gortdrum and Shelton Abbey TMFs	SRK (2002) Management and Rehabilitation of the Silvermines Area. Summary Report. Available at: https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/historic-mines-rehabilitation/ CDM (2008) Feasibility Study for Management and Remediation of the Avoca Mining Site. Feasibility Study. Available at: https://www.gov.ie/en/department-of-climate-energy-and-the-environment/publications/historic-mines-rehabilitation/

Table 2 Sources of information for geotechnical review.

The contractor will develop a unified baseline conceptual site model (CSM) for each TMF characterising, inter alia, the tailings properties, phreatic surface, foundation conditions, and containment dam geometry.

The contractor should identify data uncertainties and document how these uncertainties impact the confidence level of the engineering models.

3.3.2. Risk Assessment and Modelling

Drawing from the above data review the contractor will be required to develop a failure risk assessment. The risk assessment will take into account the two TMFs' characteristics e.g. tailings contents, embankments, caps, ponds and drainage networks as sources and vectors for failure.

The contractor will utilise the reviewed and synthesised site characterisation data to perform robust engineering analyses simulating critical failure modes specifically tailoring the choice of software to the characteristics of the TMFs.

Failure Modes and Effects Analysis Register:

A register will be developed identifying and ranking site-specific (or TMF zone specific) failure trigger mechanisms, including consideration of:

- Slope Instability of the perimeter embankments.
- Internal Erosion / Piping
- Capping Degradation
- Overtopping, and
- Face degradation.

Dam Breach Modelling:

Development of TMF dam breach simulations to model tailings run-out distances, inundation zones, flow velocities, and downstream impacts.

Production of validated, multi-scenario electronic files utilising appropriate software packages dependent on expected tailings behaviour, solids content and mobility (e.g. HEC-RAS, FLO-2D, MPM, MADflow with mud/debris extensions) simulating the progression of the tailings slurry across each respective local floodplain or outwash area.

3.3.3 Downstream Receptor Mapping and Consequence Classification

Quantify the impacts on human receptors, critical infrastructure, water courses, and environment.

- **High-Resolution Inundation Maps:**
 - GIS-ready, scannable map packages detailing slurry depths, velocities, and exact arrival times across the affected zones.
- **Emergency Zoning Vector Layers:** Shapefiles delineating critical operational zones for example:
 - Self-Evacuation Zone: Areas where slurry arrival occurs under 30 minutes.
 - High-Hazard Zone: Areas with dangerous depth-velocity combinations.
 - Environmental Exclusion Zone: Areas requiring immediate long-term agricultural and veterinary quarantine due to acute heavy metal toxicity risks.
- **GISTM Consequence Classification Assessment:** Formal hazard ranking of the facility in accordance with the Global Industry Standard on Tailings Management (GISTM) and Canadian Dam Association (CDA) guidelines or with reference to other equivalent international guidelines and/or legislation (e.g. ANCOLD, EU Directive 2006/21/EC classification of waste facilities).
- **Environmental Exposure Assessment:** Spatial overlay analysis mapping the intersection of the slurry path with local environmental and built assets (houses, farm buildings, roads). This must explicitly model heavy metal transport (specifically lead and zinc) and outline agricultural contamination vectors for nearby farmlands.

3.3.4 Final Expert Report and Presentations

The contractor shall deliver a definitive expert-reviewed final report synthesising all findings, methodologies and engineering conclusions.

The report shall detail any required short-term engineering recommendations for emergency stabilisation measures and reduction of risks (e.g., reinforcement butressing, drainage intervention, surface water diversion, modification to the above Early Warning System), focusing heavily on the Gortmore TMF.

It must be signed and sealed by a Chartered or Professional Engineer (CEng/P.Eng), Professional Geologist or international equivalent, acting as the specialised reviewer.

The contractor shall make provision for a stakeholder briefing pack consisting of a non-technical presentation slide deck and executive summary optimized for briefing Department Senior Management, County Councils, community groups, local landowners, and national environmental agencies.

3.4. Service 4: Emergency Preparedness and Response Plan

The tenderer is required to propose a suitable approach to deliver Emergency Preparedness and Response Plan for Gortmore and Shelton Abbey TMFs. **This will be scored in Award Criterion 4 in the RFT document.**

Develop actionable, site-specific Emergency Preparedness and Response Plans (EPRPs) for the two TMFs based on the failure modelling results. Practical emergency recommendations shall be designed to integrate directly with County Council and Environmental Protection Agency (EPA) incident and emergency response and management protocols.

- **Trigger Levels:** Establish a Trigger Action Response Plan (TARP) with clear, tiered monitoring benchmarks (Green, Amber, Red) based on visual indicators, piezometer, tiltmeters or other installed monitors with recommendations for an effective early warning system for alerting residents in the immediate vicinity.
- **Notification Matrix and Protocols:** Map a communication protocol, roles, and responsibilities for site caretakers, local authorities, emergency services,

stakeholders and downstream communities. There will need to be a separation of protocols to be tailored for communication to households.

- **Evacuation & Logistics:** Define safe access/egress routes, muster points, and immediate containment actions if required.

5 References

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