



Annual Environmental Report (AER) 2023

Company Name: **Boliden Tara Mines DAC**

Licence Number: **P0516-04**

Address: **Knockumber, Navan, Co. Meath**

Class of Activity¹: **Class 1.3; 11.1 and 11.5**

¹ See Appendix I

Purpose of this Report

One of the functions of the Environmental Protection Agency (EPA) is to licence and regulate the activities² of large scale industrial (e.g. chemical, food processors, power plants) and waste facilities. Submitting an Annual Environmental Report (AER) is a requirement of all EPA licences.

An AER is a public document. To this end, this format has been developed for industrial and waste licence holders (other than the intensive agriculture sector) to use as a template. This is to assist any member of the public to interpret and understand the environmental performance of the licensed facility.

The AER is a **summary** of environmental information for a given year. It includes:

- Details of the licence holder's environmental goals achieved, goals to maintain compliance and/or improve their environmental performance;
- Answers to questions regarding their facility's activities;
- Tables of results from monitoring emissions such as air, water, noise, and odour; and
- Details of waste generated, accepted and treated.

An AER does **not** provide detailed technical data. Such information is available in three ways:

- 1) Contacting the licence holder directly. The Contact Us section of this template enables the licence holder to provide details of where a member of the public can obtain further information on topics reported in this document.

² See Appendix I

- 2) Some documents³ are available on the EPA website via the licence details page for each individual licence. This can be found by browsing either the <http://www.epa.ie/licensing/> or <http://www.epa.ie/enforcement/> pages of the EPA website.
- 3) All formal enforcement correspondence exchanged between the EPA and a licence holder during the regulatory process is available for public viewing by appointment at any EPA Office.

If you have a question or query about an AER or an individual EPA licensed facility see the EPA's website or contact the relevant EPA office. See <http://www.epa.ie/about/contactus/> for contact details.

³ This includes EPA site inspection and compliance monitoring reports, licence holders' self-monitoring reports, AERs and special reports

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Glossary

Abatement Equipment	Technology used to reduce pollution
AER	Annual Environmental Report.
Beyond Compliance	Beyond compliance is concept to help deliver greater organisational performance and long-term value for the environment, society and the economy.
CRAMP	Closure, Restoration and Aftercare Management Plan.
ELRA	Environmental Liability Risk Assessment.
Emission Limit Value	Limits set for specified emissions, typically outlined in Schedule B of an EPA licence.
EMS	Environmental Management System.
Environmental Goal	An objective or target set by a licensee as part of an environmental management system (EMS).
Environmental Pollutant	Substance or material that due to its quantity and/or nature has a negative impact on the environment.
Facility	Any site or premises that holds an EPA industrial or waste licence.
FP	Financial Provision.
GJ	Giga joules, an international unit of energy measurement.

Groundwater	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Incident	As defined by an EPA industrial or waste licence.
Inert Waste	Is waste that will not undergo physical, chemical or biological change thereby, is unlikely to cause environmental pollution or harm human health.
List of Wastes (LoW)	A list of wastes drawn up by the European Commission and published as Commission Decision 2014/955/EU.
Noise Sensitive Location	Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.
Non-Renewable Resource	A resource of economic value that cannot be replaced at the same rate it is being consumed e.g. coal, peat, oil and natural gas.
Oil Separator	Separator system for light liquids (e.g. oil and petrol).
PRTR	Pollutant Release and Transfer Register.
Renewable Resource	Wind, solar, aerothermal, geothermal, hydrothermal and ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases.
Sanitary Waste	Waste water from toilet, washroom and canteen facilities.

Storm Water	Rain water run-off from roof and non-process areas.
Surface Water	Lakes, rivers, streams, estuaries and coastal waters.
Trigger Level	A value set for a specific parameter, the achievement or exceedance of which requires certain actions to be taken by the licence holder.
Volatile Organic Compounds	Gases produced from solids or liquids that evaporate readily in ambient conditions.
Waste	Any substance or object which the holder discards or intends or is required to discard.

Disclaimer

These are **not** legal definitions. Legal definitions can be found in the corresponding legislation.

Declaration

I, Ailish Mc Cabe, Environmental Engineer at Boliden Tara Mines, confirm that by ticking the box below, all information in this report is truthful and accurate to the best of my knowledge and belief.

In addition, I confirm that all monitoring and performance reporting required by our EPA licence and summarised herein is available for inspection by the EPA.

Tick here

1) Introduction

See below a brief description of our facility and a summary of our environmental performance this year.

Boliden Tara Mines (BTM) is the largest zinc mine in Europe. Its activities include exploration, mining, processing, shipping of concentrates and the storage of related 'tailings' waste.

In 2023, 1.06 million tonnes of ore were mined yielding 101,685 tonnes of zinc concentrate, 12,845 tonnes of lead concentrate and 0.978 million tonnes of tailings waste.

During 2023 there was one incident with environmental impact (INC1026192); one associated open Compliance Investigation (CI002064); 25 external complaints received and three non-compliances of license conditions (NC026438, NC027575 and NC027576).

The following site visits were carried out by the Agency: 1 planned site visit as part of the OEE annual programme (SV27039); 1 site visit to assess progress on CI002064 and 'care and maintenance' status of the operation; and 1 site visit (SV28227) following INC1026192.

BTM operations were suspended and placed on a 'care and maintenance' position from July 14th, 2023. A care and maintenance (C&M) team consisting of 107 employees (working part-time) cover 24 hours 7 days a week ensuring operational controls at the mine site and tailings storage facility are maintained. Compliance with IEL requirements and conditions during cessation of mining activities were maintained throughout 2023.

Contact Us

If you have any questions or would like further information on any aspect of our licensed activity, please contact us directly.

See below details:

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2) How we Manage our Facility

Environmental Management System

Explanation

To ensure our facility's activities do not cause environmental pollution we are required to have detailed documentation systems in place to help us manage and track our environmental performance. These systems are referred to as Environmental Management Systems (EMS). We review our EMS every year and set up-to-date **environmental goals** to continually improve our environmental performance.

The information below sets out the environmental goals for our facility to help us prevent environmental pollution and reduce our impact on the environment. Target dates for completing each goal and progress towards achieving the goal are outlined in Table 1.

Table 1 Environmental Goals

Environmental Goal	Target Date	Progress
Protection of groundwater – Replacement of tailings and reclaim water pipelines	Throughout 2024	Phase 1 of project involving the replacement of 2100 meters of both tailings and reclaim water pipelines is complete. Replacement of an additional 350 meters of each pipeline will be complete Q1 2024. Feasibility studies to cross the River Blackwater are ongoing.
Protection of surface water – treatment plant to increase treatment capacity for suspended solids and antimony	2024	Application to construct a water treatment plant to treat suspended solids and antimony (3 x 1,000m ³ /h treatment capacity expansions) within the mine site complex is awaiting approval from An Bord Pleanála.
Passive treatment trials at Tailings Storage Facility (TSF -)to treat run-off and mine influenced water	Ongoing	Trials ongoing focusing on chemicals of potential concern (COPC) sulphate and magnesium.

Protect groundwater - Upgrade groundwater model at TSF	2024	Remediation action Plan (RAP) ongoing. Monthly monitoring and reporting in place.
Waste Reduction - alternative use for surplus mine rock	Throughout 2024	Seek EPA approval to use mine rock as a construction material in proposed reinforcement buttress application at TSF.
Biodiversity – Develop a biodiversity management plan for all Company owned lands.	Throughout 2024	Ongoing. Continue with existing programmes – bees, forestry management.
Generate electricity from renewable sources: large scale solar PV	2004	Application for 18 MW solar PV farm to generate renewable electricity for use within the Tara Mines site submitted February 2024.
Generate electricity from renewable sources to used onsite - Pumps as Turbines (PAT) project	Ongoing	Investigate possibilities to extend PAT installations in mine.
Mine compressed air optimisation	Throughout 2024	Ongoing. SEAI EXEED funded project in progress.
Mine ventilation on demand	Throughout 2024	Ongoing. SEAI EXEED funded project in progress.
Optimise mine water pumping	Throughout 2024	Ongoing. SEAI EXEED funded project in progress.

Comment

Environmental Management has always been at the core of operations since the development of the mine in 1973. Today the EMS ensures the company achieves best practice in all areas of environmental management and compliance and makes the necessary resources available to include human resources, specialised skills, organisational infrastructure, technology and financial resources.

In 2017, the National Standards Authority of Ireland (NSAI) certified the Company to ISO 14001:2015 EMS. Consistent with Environmental Policy environmental objectives and associated targets are set annually to continuously improve the Company's environmental performance. Progress towards achieving targets is reviewed periodically.

The Company is always looking at new ways to improve environmental management and environmental practices and reduce its impacts on the environment. These practices are often not identified as an actual environmental objective for the year but can lead to fewer complaints, increased compliance with IEL conditions and improved environmental management practices.

Beyond Compliance

Explanation

We are legally required to comply with our environmental licence. However, the EPA realise that some sites go further than just complying with their environmental licence requirements. Some projects carried out at facilities can have long term positive impacts on the environment and local communities.

The EPA's beyond compliance initiative is encouraging us to identify and report on these environmental and sustainability projects. For example, the project could involve renewable energy, biodiversity, water conservation or exemplar community engagement.

Did any project completed on your site in the reporting year go beyond your licence requirements?

Yes

No

If yes, provide details of one case study in Appendix III that demonstrates how the project went beyond compliance of your licence.

3) Energy & Water

Energy

Explanation

Fossil fuels such as coal, gas and oil are non-renewable resources. As a result, our EPA licence requires that we measure our energy use and set targets to improve the energy efficiency of our activities and reduce our overall use, where possible. Where we have the means and technology on-site to generate energy, this is also captured in this report.

The information below summarises the energy used this year compared to the previous year and includes renewable and non-renewable energy types.

Table 3 Energy Used

Energy Used	Quantity (GJ)	% Increase/ decrease on previous year
Electricity	463,203	- 52.47%
Heavy Fuel Oil	-	-
Light Fuel Oil	62,048	- 82.18%
Natural Gas	-	-
Coal / Solid Fuel	-	-
Peat	-	-
Renewable Biomass	-	-
Renewable Energy Generated On-site	41	+42.5%
Total Energy Used	525,292	-

Comment

BTM has established an energy efficiency and CO₂ emissions reduction strategy and programme based on ISO 50001:2018 certified Energy Management System.

During 2023 the following energy efficient improvement projects that are part funded by the SEAI EXEED scheme will continue to be implemented:

- mine ventilation on demand
- mine water pumping optimisation
- compressed air optimisation

Once fully implemented, the above projects are estimated to provide energy savings of approximately 5.2 GWh/yr.

The information below summarises the energy we generated on our site this year with specific focus on renewable energy generation.

Table 4 Energy Generated

Energy Generated	Quantity (GJ)	% Increase/ decrease on previous year
Renewable Energy	41	-
Total Energy Generated	41	-

Comment

BTM continues to develop a renewable energy strategy.

The following pilot scale renewable energy projects were ongoing throughout 2023.

- The Canteen building roof solar PV system generated 11,390 kWh/y (41 GJ) of renewable energy in 2022 for direct site use.
- Ongoing discussions are with EirGrid to connect the Pump as Turbine (PAT) pilot project to the internal electricity network. Once connected, it is expected that the PAT will generate c. 277,000 kWh/y (997.2 GJ) of renewable energy for direct site use.
- A planning application was prepared (submitted February 2024) for a solar PV farm to generate renewable electricity for use within the Tara mine site providing for an electrical capacity of 18-megawatts (MW).

Water

Explanation

Water is a natural resource and we are required by our EPA licence to identify ways to reduce our use where possible. Water used in industry can be extracted from groundwater, rivers and lakes (surface water), taken from public water supplies (Irish Water), recycled from the facility's processes or harvested from rainwater.

The information below summarises and compares the quantity of water used this year compared to the previous year.

Table 5 Water Used

Source of Water Used	Quantity (m ³ /year)	% Increase/ decrease on previous year
Groundwater	6,347,991	+ 3.4%
Surface Water	10,943	-226.4%
Public Supply	32,594	-62.6%
Recycled Water		
Rainwater		
Total Water Used	6,391,528	

Comment

The onsite 'water management system' supplies both the Processing and Mining operations and also manages the intakes of groundwater from the underground workings.

Process water (waste water from the processing plant) is pumped to the Tailings Storage Facility (TSF) which operates as a large sedimentation/aeration pond where solids settle, and clear water is drawn off for recirculation and is re-used in the underground mining and surface milling processes.

Potable water from the Navan town urban supply network is used for canteens and other utilities. Flow meters are installed at various outputs to identify and monitor usage.

Surface rainwater from the mine site and tailings storage facility is collected and becomes part of the overall onsite water management system.

There are a number of projects ongoing in the underground mine looking at reducing the quantity of service water brought from surface. This involves building holding reservoirs that required water can be extracted from. This will also result in an energy saving from not pumping this water from surface.

Because of the recirculation system, an excess of water ($> 600 \text{ m}^3/\text{h}$) is accumulated which is carefully managed. This excess water is discharged to the River Boyne, at Emission Point Reference SW1, under IEL conditions.

In addition, clean groundwater, derived from an area of the mine that has minimal or no contact with the orebody, is collected in a dedicated reservoir and pumped directly to surface for discharge to the River Blackwater at Emission Point Reference SW2.

All discharged water flow and quality is continuously monitored and controlled to satisfy the conditions specified in IEL P0516-04.

4) Environmental Complaints

Explanation

Our EPA licence requires that activities do not cause environmental nuisance such as odour, dust or noise. Our licence also requires that we have procedures in place to record, investigate and respond to environmental complaints if or when they arise.

We have an environmental complaints procedure in place where you can contact us⁴ directly. You can also contact the EPA⁵ if you wish to make an environmental complaint, confidentially or not.

See the information below for a summary of **all** the environmental complaints relating to our activities made directly to us and to the EPA this year.

Table 6 Summary of All Environmental Complaints Received in

Type of Complaint	Number of Complaints	Number Closed
Odour / Smells		
Noise	1	1
Dust		
Water Quality		
Air Quality		
Waste		
Litter		
Vermin/Flies/Birds		
Soil Contamination		
Vibration	21	21
Other	3	3

⁴ See Section 1, Introduction – Contact Us

⁵ If you wish to contact the EPA to make an environmental complaint about an EPA licenced facility, please go to <https://lema.epa.ie/complaints>

Comment

During 2023 a total of 25 external complaints of an environmental nature were received:

- 21 in relation to ground vibration from underground blasting;
- 3 in relation to domestic well water levels ; and
- 1 in relation to noise associated with site activity.

All complaints were responded to in an appropriate manner. A record of the response made to each complaint is maintained.

5) Environmental Incidents

Explanation

It is our responsibility as an EPA licensed facility to ensure we have systems in place to prevent incidents that have the potential to cause environmental pollution. If an incident occurs, we are required to report it to the EPA, investigate the cause and fix the problem.

The EPA classify environmental incidents into 5 categories based on the potential impact on the environment:

- Minor
- Limited
- Serious
- Very Serious
- Catastrophic

See Table 6 for the number of the environmental incidents we reported to the EPA this year.

Table 7 Number of Environmental Incidents

Incident Category	Minor	Limited	Serious	Very Serious	Catastrophic
Abatement Equipment Offline					
Breach of Ambient ELV					
Breach of Emission Limit					
Explosion					
Fire					
Monitoring Equipment Failure					
Odour					
Spillage					
Breach of trigger Level					
Uncontrolled Release		1			
Other					

Comment

There were one incident with environmental impact during 2023, INCI026192 and managed under compliance investigation CI20064.

In September 2023 there was an uncontrolled release from the reclaim water pipeline approx. 415 m north of the River Blackwater. The root cause was pipeline failure at a welded joint. The section of pipeline where leak occurred was excavated and replaced.

2.1 km of reclaim pipeline from the TSF was replaced and commissioned in 2022 (following integrity testing) and the replacement of an additional 350m of pipeline will be commissioned in Q1 2024.

An Operational Review of both the reclaim and tailings systems by an independent third party was carried out.

6) Our Environmental Emissions

Explanation

We are required to ensure the emissions from our activities do not cause environmental pollution.

We are required to monitor any of the following emissions that we make:

- Storm water
- Waste water
- Air
- Groundwater
- Noise

We regularly test any such emissions for specific pollutants and materials to ensure they do not contain levels of pollution that exceed emission limit values (ELVs) or cause environmental pollution. If monitoring of an emission indicates an ELV is exceeded, we are required to report this to the EPA⁶.

The next sub-sections of this report summarise our compliance with any ELVs set in our EPA licence. Some emissions monitored do not have specific ELVs, but we still carry out monitoring and report all incidents that may give rise to environmental pollution.

⁶ See section 5, Incidents

Storm Water

Explanation

Storm water is rain water run-off from roof and non-process areas of a facility, e.g. carparks, and generally shall not contain any pollution.

Storm water is usually released into a local water body after a basic form of treatment. Our EPA licence requires that we manage storm water to ensure no polluting substances or materials are released into the environment.

The information below summarises how the storm water from our facility is treated, where it is released and the results of monitoring this year.

1. Storm water from our facility is managed prior to release by;

All rainwater and surface run-off are collected and becomes part of the onsite water management system. All sources of water undergo three stages of treatment / clarification before eventual discharge to the River Boyne at Emission Reference Point SW1 under IEL conditions.

The discharged water flow and quality is continuously monitored and controlled to satisfy the conditions specified in IEL.

2. Storm water from our facility is released into the following water bodies:

Treated water is discharged to the River Boyne at Emission Point Reference SW1.

Table 8 Summary of Storm Water Monitoring

Parameter measured	No. of Samples	% Compliant⁷	Comment

Add rows as necessary

Comment

100 word limit

⁷ % compliant = [(number of samples compliant) / (number of samples taken)] x 100. Compliance could refer to emission limit values or trigger levels. The EPA commonly use trigger levels on stormwater discharges.

Waste Water

Explanation

There are two types of waste water that can be produced:

- Process waste water produced from the activities and;
- Sanitary waste water from toilets, washrooms and canteens.

Our EPA licence requires us to manage our waste water on or off-site and ensure that it does not cause environmental pollution when discharged into the environment.

The information below summarises how we treat the waste water produced from our activities, where it is released and the results of monitoring this year.

1. Waste water produced by our activities is treated as follows before discharge to a receiving waterbody;

There are three sources of water that are considered process water:

- Water ingress to the mine that is pumped out to maintain a suitable dry working environment in the underground mine
- Surface run-off
- Water from processing plant

Water from these three sources is collected, pumped and treated prior to discharge to the River Boyne at Emission Point Reference SW1.

All water from the process plant is pumped to the tailings storage facility for treatment and subsequently returned to the reclaim pond on site. Mine water and surface run-off, representing a low-risk effluent are treated in the onsite water treatment system.

The water treatment system comprises three stages of clarification in sediment-aeration ponds prior to discharge to the River Boyne.

At present, mine water is pumped and collected at a central underground pumping station. The water enters a large settling sump where suspended solids settle out and is subsequently pumped to surface to a mine water pond, acting as a primary settlement pond. Overflow from this mine water pond decants by controlled overflow to a secondary stage of

settlement/clarification in the Reclaim Water Ponds. Water from the Reclaim Water Pond decants, via a controlled overflow, to a Clear Water Pond (discharge pond).

The discharge from the Clear Water Pond to the River Boyne is via a weir structure, which measures and controls the discharge. The rate of discharge from the Clear Water Pond is dictated by the flow in the River Boyne, as a minimum dilution rate of >100:1 as required under licence conditions.

An automatic hydrometric gauging station installed on the River Boyne provides a real time record of water levels and flow in the river. Discharge from the site is controlled based on River Boyne flows.

2. Treated waste water from our facility is released into the following water bodies:

Treated water is discharged to the River Boyne at Emission Point Reference SW1.

Table 9 Summary of Waste Water Monitoring

Parameter measured	No. of Samples	% Compliant	Comment
Flow	Continuous	100%	SW1 - 24hr composite sample
pH	Continuous	100%	SW1 - 24hr composite sample
Temperature	Continuous	100%	SW1 - 24hr composite sample
DO	Continuous	100%	SW1 - 24hr composite sample
Suspended Solids	Daily	100%	SW1 - 24hr composite sample
Zinc (as Zn)	Daily	100%	SW1 - 24hr composite sample
Lead (as Pb)	Daily	100%	SW1 - 24hr composite sample
Copper (as Cu)	Daily	100%	SW1 - 24hr composite sample
Iron	Daily	100%	SW1 - 24hr composite sample
Cadmium (as Cd)	Daily	100%	SW1 - 24hr composite sample
Arsenic (as As)	Daily	100%	SW1 - 24hr composite sample
Antimony (as Sb)	Daily	100%	SW1 - 24hr composite sample
Sulphate	Daily	100%	SW1 - 24hr composite sample
Cyanides (as Cn)	Weekly	100%	SW1 - 24hr composite sample
Chromium (as Cr)	Weekly	100%	SW1 - 24hr composite sample
Mercury (as Hg)	Weekly	100%	SW1 - 24hr composite sample
Orthophosphate (as PO4)	Weekly	100%	SW1 - 24hr composite sample
Total phosphorous	Weekly	100%	SW1 - 24hr composite sample
Ammonia (as N)	Weekly	100%	SW1 - 24hr composite sample
Nitrate (as No)	Weekly	100%	SW1 - 24hr composite sample
Nitrite (as N)	Weekly	100%	SW1 - 24hr composite sample
Kjeldahl nitrogen	Weekly	100%	SW1 - 24hr composite sample
Total phosphorous	Weekly	100%	SW1 - 24hr composite sample
BOD	Weekly	100%	SW1 - 24hr composite sample
COD	Weekly	100%	SW1 - 24hr composite sample

Add rows as necessary

Comment

BTM has two 'point source emissions' to surface water:

- Emission Point Reference **SW1** of process effluent to the River Boyne
- Emission Point Reference **SW2** of groundwater to the River Blackwater

Discharge at SW1 includes treated wastewater from the process plant, drainage water from the mine and surface drainage water that is captured in the site water management system.

This excess treated water is discharged to the River Boyne at a flow dilution ratio of >100:1 and is recorded and controlled from the Processing Departments automated ABB system.

Discharge at SW2 is clean groundwater, derived from the 'Nevinstown' mine area that has minimal or no contact with the orebody. This groundwater, collected in a dedicated reservoir, is pumped directly to surface for discharge to the River Blackwater. Discharge is recorded and controlled from the Processing Departments automated ABB system.

In accordance with IEL P0516-04 conditions control and monitoring of process effluent emissions to water is carried as per Schedules C.2.1 and C.2.2.

Emissions to water during 2023 are in full compliance with emission limit values set out in IEL Schedule B.2.

Air

Explanation

Generally, three types of air emissions are monitored from industry in Ireland: gases, dust (particulates) and odour. Our EPA licence requires us to ensure that any air emissions from our activities do not cause air pollution or create an odour nuisance.

The information below details the number of air emission points we monitor, the results from testing the air emissions and any odour assessments carried out by us and the EPA this year.

1. We monitor air emissions from the following number of emission points at our facility.

Control and monitoring of emissions to atmosphere are carried out as per Schedules C.1.1 and C.1.2 at emissions reference points: A2-4, A2-6, A2-7, A2-8, A2-9, A2-10 and A2-11.

Emissions from the processing plant are from a single remaining point source ventilation stack on the concentrate storage building (A2-4).

The remaining air emission sources are from mine return airshafts that serve to ventilate the underground workings in the mine.

Table 10 Summary of Air Emissions Monitoring

Parameter measured	No. of Samples	% Compliant	Comment
Total Particulate	28	100%	A2-4 Monthly; A2-6, A2-7, A2-8, A2-9, A2-10, A2-11 Quarterly
Zn	7	100%	A2-4 Monthly
Pb	7	100%	A2-4 Monthly
As	7	100%	A2-4 Monthly

Cd	7	100%	A2-4 Monthly
Hydrogen Sulphide	22	100%	A2-6, A2-7, A2-8, A2-9, A2-10, A2-11 Quarterly
NOx (as NO2)	22	100%	A2-6, A2-7, A2-8, A2-9, A2-10, A2-11 Quarterly
Ammonia	22	100%	A2-6, A2-7, A2-8, A2-9, A2-10, A2-11 Quarterly

Add rows as necessary

Comment

BTM uses an INAB accredited contractor, Odour Monitoring Ireland, to carry out compliance monitoring at air Emission Points that meets with ISO 17025:2005 requirements and the EPA Air Emissions Monitoring guidance (AG2).

From July 2023, during 'care and maintenance', A2-6 was not operated and all other ventilation shafts were operated at 25% of their normal running capacity.

All emissions to atmosphere during 2023 are in full compliance with emission limit values set out in IEL Schedule B.1.1.

Table 11 Summary of Odour Assessments Carried Out

Assessment Conducted By	No. of Odour Assessments	% Compliant⁸	Comment
Licence Holder			
EPA			

Add rows where necessary

Comment

100 word limit

⁸ A compliant odour assessment is based on EPA Odour Impact Assessment Guidance available at [Air Enforcement | Environmental Protection Agency \(epa.ie\)](https://www.epa.ie/enforcement/)

Fugitive Solvent Emissions

Are you required to monitor fugitive solvent air emissions from your facility?

Yes

No

Explanation

The use of solvents is regulated under Irish and European Union (EU) Regulations⁹. Solvents are chemicals that, by their nature, are volatile (evaporate readily under ambient conditions). Solvents can be found in many inks, glues and cleaning agents. Due to the volatility of solvents some emissions may be released into the atmosphere during our activities before being captured in our air treatment system. This type of emission is called a **fugitive solvent emission**.

The information below summarises the quantity of solvents used this year, the percentage of fugitive solvent emissions (% of total quantity used) and whether the percentage complied with the targets set in the EU Regulations.

Table 12 Summary of Fugitive Solvent Emissions

Quantity of Solvents Used (Kg)	% Fugitive Solvent Emissions	Compliant

Comment

100 word limit

⁹ See Annex VII of the Industrial Emissions Directive

<https://ec.europa.eu/environment/industry/stationary/ied/legislation.htm>

Groundwater

Explanation

Groundwater is an important and sensitive resource in Ireland. Our EPA licence requires that we monitor groundwater to ensure our activities do not cause groundwater pollution.

Understanding how groundwater flows through soil and rock layers and eventually into surface and coastal waters is a complex science. Sometimes groundwater pollution that occurred in the past can take years and even decades to disappear. Therefore, it is important that experts help us monitor and interpret results from groundwater monitoring and testing.

The information below is a basic summary of the condition of the groundwater this year.

1. Do you have a groundwater monitoring programme in place?

Yes

No

2. Have the groundwater monitoring results over the last 5 years indicated the presence of groundwater pollution?

Yes

No

Table 13 List of Groundwater Pollutants Identified

Pollutants

Chemicals of Potential Concern (COPCs) in close proximity to the TSF are sulphate and magnesium.

The existing groundwater monitoring network in the vicinity of the TSF involves monthly sampling at 39 locations in superficial deposits/overburden (OB) and bedrock (BR) boreholes and quarterly sampling from 13 domestic wells. All groundwater quality data is reviewed in line with relevant water quality standards, EC Environmental Objectives (Groundwater) Regulations SI No. 9 of 2010 and amendments.

In compliance with IEL Condition 6.21, an independent annual review and assessment of all hydrogeological, hydrological and water quality data collected is undertaken by AECOM.

Sulphate is the main substance associated with COPC's from the TSF and is used as the key parameter for evaluating water quality trends. The extent of the groundwater plume at the TMF is actively being monitored and tracked by way of monthly sampling of groundwater and surface water.

Annual environmental reporting (IEL Condition 6.21) includes the contouring of sulphate concentrations in both shallow and deep groundwater and trend analysis of sulphate concentrations. This reporting also includes trend analysis of sulphate concentrations, which provides an early warning of any trends towards exceedance, and an opportunity to mitigate.

Since April 2023 the frequency of trend analysis, contouring and comparison of sulphate concentrations to trigger and intervention values has been increased from annually to monthly as part of the Remediation Action Plan for the TSF.

3. Give details of the investigations and subsequent actions taken, where applicable, to manage the groundwater pollution.

In 2015, a remedial strategy was developed to address known impacts on groundwater in the vicinity of the TMF, in AECOM's *Risk Screening and Technical Assessment Report*.

The Strategy included setting of compliance points, trigger values and intervention values for the Chemicals of Potential Concern (COPCs) at the TMF (sulphate and magnesium). The tailings water is known to be naturally high in sulphate, and to a lesser extent magnesium, and elevated concentrations of these chemicals have been recorded in groundwater in the immediate vicinity of the TMF and documented for many years.

In 2019 this remedial strategy was reviewed, and a Remediation Action Plan (RAP) developed that provides other potential remedial actions that could be taken in the long-term. It is a live document and the remedial strategy, as well as a conceptual model is reviewed and updated on an annual basis.

Arising from the annual site visit (SV21941) in 2021 the Remediation Action Plan for the TMF was further reviewed to provide a remedial options assessment of corrective actions available. A Corrective Action and Feasibility Design report (CAFD) was submitted in 2022 (LR065459).

Since April 2023 the frequency of trend analysis, contouring and comparison of sulphate concentrations to trigger and intervention values is conducted and reported monthly.

Comment

Groundwater monitoring is carried out in accordance with Schedule C.7 of Tara's IEL.

All groundwater quality data is reviewed in line with relevant water quality standards. The EC Environmental Objectives (Groundwater) Regulations SI No. 9 of 2010 and amendments.

In compliance with IEL Condition 6.21, an annual independent review and assessment of all hydrogeological, hydrological and water quality data collected is undertaken and reported upon by *AECOM*.

Noise

Explanation

Our EPA licence requires that we monitor noise emissions from our facility. Noise monitoring can be conducted at the boundary of our facility and/or at locations beyond the boundary referred to as “noise sensitive locations”. Noise monitoring requires the use of special noise monitoring equipment. Our EPA licence requires that noise produced by our facility shall not exceed the noise limit values and/or give rise to nuisance.

The information below gives a summary of when and where we conducted noise monitoring this year and if results complied with our EPA licence limits.

1. We conducted noise monitoring on the following dates this year:

Continuous noise monitoring is carried out at two fixed stations around the Knockumber mine site and at one fixed station at the TSF.

2. Where was the noise monitoring carried out?

- i. the boundary of our facility;
- ii. noise sensitive locations off-site; or
- iii. both.

Continuous noise monitoring is carried out at noise sensitive locations off-site in the environs of the mine site and one at the boundary of the TSF.

3. Were measured noise levels compliant with your EPA licence limits?

Yes

No

If No, we took the following actions to address the noise level exceedances?

150 word limit

Comment

Noise monitoring is carried out as per ISO 1996 Part 1.

Noise emissions from the mine site plant are continuous and the same for daytime and night-time due to the continuous nature of the operation. The noise environment around the mine site is dominated by anthropogenic sources most notably road traffic from the busy road network.

The TMF lies in a rural setting and existing noise levels are typical of such an environment. Normal operations at the facility do not generate any discernible noise.

All site operations are at a level significantly below noise level limits set out in IEL Schedule B.4.

7) Waste

Waste Generated

Explanation

Our EPA licence requires us to manage the waste we generate in a manner that does not cause environmental pollution.

We manage, store and record hazardous, non-hazardous and inert waste we generate in accordance with our licence. We ensure that this waste is subsequently treated or disposed of in accordance with the relevant waste Regulations.

The information in Table 14 is a summary of waste we generated this year and the percentage increase or decrease on the previous year. The percentage recovery is the amount of total waste generated that was reused, recycled or recovered.

Table 14 Waste Generated

Type	Quantity (Tonnes)	% Increase/ decrease on previous year	% Recovery
Hazardous	79	- 135.4 %	100%
Non-Hazardous	978,423	- 98.6 %	100%
Inert	802	- 99.6 %	90%
Total Tonnes	979,304		

Comment

Treatment and transfer of waste generated onsite, and treatment of waste accepted is in accordance with IEL conditions and with National and European legislation and protocols.

Details of all waste generated onsite during 2023 have been reported in the *Environmental Performance Report (LRD0038360)*.

There were no rejected consignments of waste in 2023.

Hazardous waste consists of waste generated from general site operations (waste oil, oil filters, oil hoses, grease, contaminated plastic drums, chemical packaging waste).

Inert waste consists of waste generated from general site operations (general mixed waste, dry recyclables, paper and cardboard, iron and steel, wooden packaging, end-of-life tyres).

Non-hazardous waste generated is Extractive Waste of which:

418,826 tonnes of tailings pumped to underground mine as backfill (EWC 01 03 06)

559,297 tonnes of tailings pumped to the TSF (EWC 01 03 06)

Waste Accepted

Did you accept waste onto your facility for storage, treatment, recovery or disposal this year?

Yes

No

Explanation

Our EPA licence requires us to manage the waste we accept in a manner that does not cause environmental pollution.

We manage, store and record all incoming and outgoing hazardous, non-hazardous and inert waste. The waste we accept may be treated, recovered, disposed or stored at our facility depending on our licence requirements.

The information in Table 15 provides a summary of waste we accepted this year and the percentage increase or decrease on the previous year. The percentage recovery is the amount of total waste accepted that was reused, recycled or recovered.

Table 15 Waste Accepted

Type	Quantity (Tonnes)	% Increase/ decrease on previous year	% Recovery
Hazardous			
Non-Hazardous			
Inert	164,158	-105%	100%
Total Tonnes	164,158		

Comment

The Randalstown Tailings storage Facility (TSF) accepts recovered material, greenfield Soil and Stone (EWC 17 05 04), that is used at the facility for purpose agreed by the Agency under IEL conditions 8.13.23 to 8.13.28 and Schedule A.

In line with Condition 11.12 a computer-based record for each load of material arriving at the facility is maintained. This includes details of source of material, dates and times of acceptance, quantity of material accepted, list of waste code and haulier details.

Records are also maintained of each source site which includes a 'Letter of Suitability' by a competent person which includes the following information:

- Confirmation that the material is greenfield soil/stone with a LoW of 17 05 04.
- A description of the source and nature of the soils.
- The location of the source of the soil (including a photograph of the site on the day of the visit and a map showing the source site boundary)
- The suitability of the material for its intended use.
- Confirmation that the material will not cause environmental pollution at the facility
- A further letter of suitability for each subsequent 5,000 tonnes of waste material obtained from that source
- A statement regarding the presence of invasive plant species at the source site

Although not a requirement for greenfield soil and stone, any site investigation/sampling results for the source site is provided and records maintained.

8) Financial Provision

Explanation

Our EPA licence requires us to assess the risk our activities pose to the environment if we cease our activities or if an incident occurred. If we are identified as a high risk facility¹⁰ by the EPA, we are required to put provision in place such as a financial bond or insurance to cover the cost of restoring our site to a satisfactory condition. This financial provision can then be used to cover the cost of managing the restoration or clean up should such an event occur.

1. Are you required to have an agreed financial provision in place?

Yes

No

2. What year was your Closure, Restoration and Aftercare Management Plan (CRAMP) last agreed by the Agency?

The CRAMP was last agreed in 2016.

An updated CRAMP was submitted in 2020.

Financial instrument (Bond) based on the EPA template for Financial Provision was agreed (2024).

3. What year was your Environmental Liability Assessment Report (ELRA) agreed by the Agency?

BTM is obligated in accordance with IEL conditions to undertake a comprehensive and fully costed Environmental Liabilities Risk Assessment (ELRA) to addresses the liabilities from past and present activities.

¹⁰ See Appendix II

The original ELRA was carried out in 2002 with subsequent reviews conducted in 2013 and 2018 after license reviews. A further review was undertaken in 2020 to update the costings of the plausible worst-case environmental liability scenario (TSF dam wall breach).

A further revision was submitted in April 2021 (LR034778) and agreed by the Agency.

4. Has there been any significant changes on your site since the last agreements?

Yes

No

If yes, have you submitted details to the EPA?

Yes

No

N/A

Appendix I

Class of Activity

Industrial and waste facilities are classed into different sectors depending on the nature of their activity and its potential impact on the environment. The EPA Act 1992 as amended, outlines these as follows:

Class 1	Minerals and other materials
Class 2	Energy
Class 3	Metals
Class 4	Mineral fibres and glass
Class 5	Chemicals
Class 6	Intensive Agriculture ¹¹
Class 7	Food and drink
Class 8	Wood, paper, textiles and leather
Class 9	Fossil fuels
Class 10	Cement, lime and magnesium oxide
Class 11	Waste
Class 12	Surface Coatings
Class 13	Other Activities

¹¹ This reporting template is not applicable to the **intensive agriculture sector**. Their annual environmental reporting structure is different and can be found at [Compliance & Enforcement: Licensees: Reporting Publications | Environmental Protection Agency \(epa.ie\)](#)

Appendix II

High Environmental Risk Categories

If an industrial or waste licence falls into one of these categories it is deemed, by the EPA, as a high environmental risk. As a result, the licence holder is required to have financial provision in place. See section 8, Financial Provision.

1. Landfills
2. Non-Hazardous Waste Transfer Station
3. Incineration and Co-Incineration Waste Facilities
4. Category A – Extractive Waste Facilities
5. Upper and Lower Tier Seveso Facilities
6. Hazardous Waste Transfer Stations
7. High Risk Contaminated Land
8. Exceptional Circumstances

NOTE:

This list is subject to change.

See the link below for further information.

[Compliance & Enforcement: Financial Provisions Publications | Environmental Protection Agency \(epa.ie\)](#)

Appendix III

Beyond Compliance

The case study below shows how we went beyond the requirements of our licence in the reporting year.

Community Engagement and Social License to Operate

In 2023 as part of BTM's Social License to Operate (SLO) and working with relevant stakeholders a tool for stakeholder management, Borealis, was implemented where all relevant communications with stakeholders (internal and external) are recorded and maintained.

In addition, an external 'Stakeholder Feedback Portal' was launched with the aim of improving performance with stakeholder engagement. This 'Stakeholder Feedback Portal' is a direct channel for members of the public or any external stakeholder to report concerns, requests for information, suggestions or grievances related to operations. This provides for better interactions with external stakeholders.

Social license to operate is a central part of the work with the Global Industry Standard on Tailings management (GISTM), ICMM and Water Stewardship.