ADRIATIC METALS PLC

VARES PROJECT

SURFACE MINERAL WASTE DISPOSAL PLAN

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Contents

Adriatic Metals
Bosnia & Herzegovina

SURFACE MINERAL WASTE DISPOSAL PLAN

This document has been developed/revised as indicated below and described in the revision record on the following page. Please destroy all previous revisions.

Version	Date	Authors	Reviewed	Pages
1.0	29/07/21	Joseph Crummy Danira Zanović	Vildana Mahmutović	9
2.0	21/07/23	Joseph Crummy	Danira Zanović	4
3.0	13/08/24	Angel Vega	Danira Zanović	11

ISSUED FOR: ☐ Design ☒ Construction ☒ Operations ☐ Other __________

1. INTRODUCTION

The company Adriatic Metals BH is the holder of concessions for the exploration and exploitation of polymetallic ore in Vareš (BiH). Based on the conducted research, the company developed a project for the exploitation and processing of polymetallic ore in Vareš (Vareš Project), which includes 3 spatial and technological units:

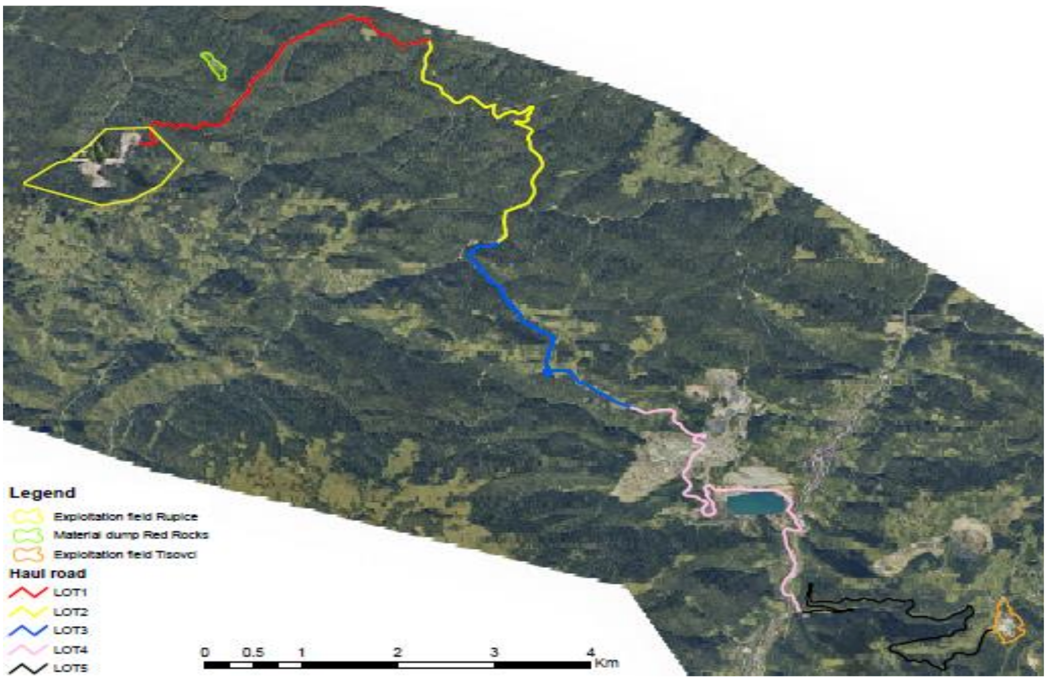
- Rupice mine, the footprint of the Rupice mine project is 103.92 ha;

- Tisovci ore processing plant, the footprint of the Tisovci plant project is 107.68 ha;

- Transport road Rupice - Tisovci (length 24.5 km);

The area of Vareš is historically known for the exploitation and processing of ore and the Vareš project represents the continuation of the traditional exploitation and processing of ore based on good industrial practices and the best available techniques. Preparatory works began in November 2021, and the construction of the underground mine, ore processing plant and transport road began in the summer of 2022 and continued during 2023.

The construction of project contents is in the final phase. During the development of the project and the constructive phase, changes were made to individual project solutions in order to apply better technical solutions, spatial positions of project parts, avoiding priority habitats and habitats of species of conservation importance. All changes in relation to the base project, as well as changes in the impact on the environment and society from them, have been communicated to the relevant interested parties.



Picture 1. Layout of the Vares Project

This Surface Mineral Waste Disposal Plan (SMWDP) is developed to provide further details on the measures to be implemented during the operational phase of the Vareš project to ensure that the actual environmental impacts are consistent with those evaluated in the Environmental and Social Impact Assessment (ESIA). This plan also provides the mechanism to adapt new measures throughout the ongoing construction and operation to improve the management and identification of waste rock characteristics.

The SMWDP represent one component of the overall Environmental Social Management Strategy (ESMS). The ESMS includes a number of commitments and component management plans which together form the basis for the ongoing operation of Adriatic Metals.

The current version of the Plan is aligned with national legislation, requirements of international financing institutions (e.g. IFC, EBRD) and mining sector best practices (e.g. ICMM, GISTM). As a living document, this plan sets responsibilities, procedures and compliance actions to be updated during the LOM as appropriate.

2.0. LEGAL FRAMEWORK AND STANDARDS

ADT is highly committed to implement practices in accordance with international practices in addition to local legislation, with due respect of guiding principles and policies of the European Bank for Reconstruction and Development (EBRD) and International Finance Corporation (IFC).

2.1. National Legislation

- Environmental Protection Law ("Official Gazette of the Federation of BiH", No. 15/21)
- Law on Waste Management ("Official Gazette of the Federation of BiH", No. 33/03, 72/09 and 92/17)
- Mining law ("Official Gazette of the Federation of BiH", No. 26/10)

2.2. International Requirements

- European Bank for Reconstruction and Development (EBRD)
  - Performance Requirement 1: Assessment and Management of Environmental and Social Risks and Impacts

- Performance Requirement 3: Resource Efficiency and Pollution Prevention and Control
- Performance Requirement 4: Health, Safety and Security
- Sourcebook on EU Environmental Law

* World Bank - International Finance Corporation (WB-IFC)
  - Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Performance Standard 3: Resource Efficiency and Pollution Prevention
  - Performance Standard 4: Community Health, Safety, and Security
  - Environmental, Health and Safety Guidelines for Mining
* International Council of Mines and Metals (ICMM)
  - Global Industry Standard on Tailings Management (GISTM)
  - Tailings management Good Practice Guide

3.0. ROLES AND RESPONSIBILITIES

Principal roles and responsibilities for the implementation of this plan are outlined below.

Roles	Responsibilities
COO-Managing Director	• Ensure adequate resources are provided for implementation of this plan (SMWDP).
Head of Mining	• Management over Waste Rock Dump facilities • Ensure the plan is endorsed and fully implemented by peer and sub-units (e.g. projects, geology), contractors and sub-contractors.
Head of Processing	• Management over Tailings Storage Facilities • Ensure the plan is endorsed and fully implemented by peer and sub-units (e.g. projects, geology), contractors and sub-contractors.

Head of Sustainability/Environmental Manager	• Review and update the Plan through the different stages during the life of mine.
	• Ensure technical support is provided to contractors for the implementation of this plan, including.
	  ◦ Training
	  ◦ Third-party reviews
	  ◦ Guidelines
	  ◦ Field inspections
	• Environmental and social monitoring

Environmental Compliance Specialist	• Inspection and Monitoring • Raising environmental non-compliances in system
Ecologist Restauration and Reclamation Specialist	• Implement progressive Reclamation and Closure activities

4.0. SURFACE MINERAL WASTE DISPOSAL PLAN

Mining waste comes from extracting and processing mineral resources. It includes materials such as topsoil overburden, clay and sediments collected to gain access in operational areas and waste rock and tailings (after the extraction of the valuable mineral).

4.1. Waste rock

Metals mining typically generates waste rock that needs to be disposed of and normally is stored on surface, where it remains permanently, as waste rock dumps, under atmospheric conditions. One characteristic of waste rocks is its reactivity under atmospheric conditions which can lead to generation of acid drainage and sulphate/metals leaching, and release of contaminated waters to the surrounding environment, if disposal is not arranged to minimize reaction between the waste rocks and atmospheric oxygen and moisture. Mine development needs to take this into account, and the science of acid rock drainage (ARD) is used to predict and understand the reactivity of the waste rock masses, with a view to arranging permanent storage in a manner that minimizes future environmental impacts.

4.1.1. Waste rock characterization

Waste rocks to be produced by the Rupice mining operation have been comprehensively investigated in terms of reactivity under atmospheric conditions and associated potential for acid generation and sulphate/metals leaching.

There will be two types of waste-rock, distinguished as:

- PAG (potentially acid generative) and
- Non-PAG (sterile and unreactive)

The investigation was carried out using rigorous scientific methodology and industry-standard test-work. The work was performed on-site at Rupice using a combination of geological and chemical expertise. The waste rock package and how it would behave under long-term storage under atmospheric conditions has been understood[1].

First it is necessary to be able to distinguish PAG from non-PAG materials as they are extracted from underground, so that the PAG materials can be separated and dealt with appropriately. A detailed geological investigation has been performed with this in mind, and every waste-rock batch that comes to surface will be classified as PAG or non-PAG.

4.1.2. PAG waste rock management

PAG waste rock will be stored in a manner that prevents acidification and metals/sulphate leaching over the production, closure and post-closure stages.

In order to prevent acidification and leaching of the PAG waste rock, the following principles are identified:

1. Add alkalinity in the form of limestone to counteract the acidifying tendencies of the pyrite within the potentially reactive rock.
2. Restrict access of atmospheric oxygen and moisture to the potentially reactive material.

[1] J. Crummy PhD (2020-2021). *Site Field investigation and characterization*

Both above principles will be implemented during placement of the PAG material on the waste rock dump as follows:

Addition of Alkalinity

The project geology includes Jurassic limestone, a very good source of clean, pure calcium carbonate. This material constitutes a very effective source of alkalinity that can be added to the PAG waste rock to prevent acidification. It is available in unlimited quantities from the immediate project geology. It is the intention to co-dispose PAG waste rock with this limestone top this effect. The limestone will be broken to a gravel/sand granulometry and will be mixed 25%/75%* with PAG waste rock.

Restriction of Atmospheric Oxygen and Moisture

Experience has shown that underground development generates significant quantities of clay, from underground blasting and mucking activities and during on-surface excavation and construction works. This clay, if mixed with the PAG rock/limestone mixture, followed by compaction using truck traffic, will form a mass that is highly impermeable to atmospheric oxygen and moisture.

The combination of the addition of limestone, the addition of clay, and compaction during placement on the PAG dump will restrict the access of atmospheric oxygen and moisture to the potentially reactive materials and will add alkalinity to counteract the acidifying potential of the pyrite. This will prevent acid generation and sulphate/metals leaching over the short, medium and long timeframes.

The limestone/PAG proportions necessary to prevent acidification and metals/sulphate leaching are set initially at 25% limestone to 75% waste rock. Field experimentation on a project in a neighbouring country demonstrates that this proportion of limestone will be adequate for this purpose. Lower proportions of limestone may be adequate, but before reducing the proportions experimental verification will be needed. This will involve the mixing and testing of different limestone/PAG waste rock proportions (10/90, 15/85, 20/80, 25/75 ratios) under field conditions, over a full two-year time term, to determine with certainty what proportion is adequate to keep the materials chemically stable over the short, medium and long timeframes.

4.1.2.1. Construction

This PAG dump will constitute an engineered facility. This will require that the mixing of the materials be done in the correct proportions and that the placement and compaction be performed in a manner that guarantees geotechnical stability of the waste rock dump. The relevant engineering expertise is available in-house within the company and at the Tuzla Geotechnical laboratory to guarantee that the dump is designed and constructed with this specifically in mind.

The dump’s profile (e.g. height and slope angles) should be designed to ensure the final structure is safe, stable and not prone to significant erosion. Factors that should be considered in the construction are material types, proposed vegetation cover, natural topography and climate. In general, more dispersive material, poorer topsoil and high dumps will require flatter outer slopes. Only the best conditions and stable materials would justify slopes approaching 20 degrees.

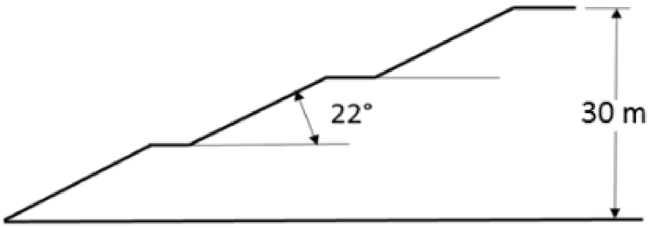


Figure 2. Schematic of slope design for waste rock dump

During mine-life, run-off from the PAG waste rock dump will be directed to a storage lagoon and hence to the water treatment plant where it will be treated to the relevant discharge standards. The treated water will either be re-used by the mining operation or discharged to the environment.

4.1.2.2. Inspection and Monitoring

- Waste rock dumps will be monitored to verify construction in accordance with geotechnical design criteria.
- Waste rock dumps will be inspected quarterly (at a minimum) to detect any abnormal conditions such as subsidence, and to verify the integrity of existing controls. Records of these inspections shall be retained.
- Waste rock disposal facilities shall be inspected following periods of heavy rainfall. Inspection processes shall document any observed surface ponding, slumping on slopes, discoloration, or seepage from the toe, inclusive of the determination of pH and EC.
- All drainage diversion and sediment control structures shall also be periodically inspected to verify they remain fully operational.
- Surface water and groundwater environmental samples will be periodically monitored in accordance with a formal schedule.

4.1.2.3. Progressive Reclamation and Closure

- Stabilization and/or progressive reclamation activities will be scheduled and completed as soon as practical after designated areas of the waste dump become available.
- Waste rock construction and operation will carry out both trial and progressive reclamation.
- Waste rock dumps will be constructed, reclaimed and closed to ensure geotechnical stability and geochemical stability, to minimize erosion and to leave landforms that are aesthetically acceptable to external stakeholders and can be used by wildlife.
- Waste rock facilities shall be closed in accordance with defined reclamation objectives and agreed closure criteria.

- Concurrently, all volumes of topsoil removed and stocked in the operational areas will be spread over all surfaces at a thickness of about 5 to 20 cm (depending on the nature of the underlying waste rock). The surfaces should then be deep ripped (minimum 1 m) on contour at appropriate spacings. It is essential that rip lines on outer slopes are survey controlled to ensure they are horizontal for their entire length. Direct seeding of local species at the optimal time for the region will maximise the benefit of annual rainfall events.

4.1.3. Non-PAG waste rock management

The non-reactive waste rock materials generated by underground mining activities will be stored permanently on-surface. The non-PAG waste-rock materials will be made available during mine-life for any constructional uses that may arise on the mine-site. The materials will be classified as non-PAG on a truckload-by-truckload basis and dumped in a predetermined location in accordance with:

- Permits and licenses granted by authorities
- Mine planning
- Deployment of constructional projects on the mine site (e.g. roads, premises, ancillaries)
- Environmental stewardship and enhancement

The non-PAG materials will be subjected to any necessary geotechnical testwork to prove suitability before being used for such purposes.

4.1.3.1. Surface Disposed Tailings Materials

Tailings is a common by-product of the metals and minerals recovery process, consisting of the processed left over from the separation of recoverable metals and minerals from mined ore, together with the water and reagents used in the recovery process.

4.1.3.2. Tailings characterization

At Vareš project, tailings are filtered (~10% moisture) and reported to a dry-stack Tailings Storage Facility (TSF). As a result of the grinding and re-grinding stages, tailings produced by the flotation process for lead-silver and zinc can reach about 80% below 38µm (microns) and a maximum dry density of 2.46t/m^3.

VPP tailings were tested and reported as reactive and acid generative, and prone to the metals and sulphate leaching under atmospheric conditions.

Figure 3. Image showing the consistency of filtered tailings at VPP

4.1.3.3. Tailings management

Should not be managed in a safe, responsible manner, tailings can pose risks to the environment, human health and infrastructure and therefore engineered facilities (i.e. Tailings Storage Facility) are of critical importance.

The basic requirement of a TSF is to provide safe, stable, non-polluting and economical storage of tailings, presenting negligible public health and safety risks, and acceptably low social and environmental impacts during its operation and after mine closure.

The dry stack TSF will expose its contents to atmospheric conditions during mine-life, but in a compacted form to minimize water infiltration. Periodic encapsulation with non-reactive, non-acid-generative rock materials will be practiced during mine-life, and the tailings materials will thus be isolated from direct rainfall impact before acid generative and leaching reactions start in earnest. The combination of compaction and periodic encapsulation will minimize the opportunity for atmospheric influence in the form of air and water infiltration to the reactive materials and can be expected to prevent acidification during mine-life. Any run-off from the tailings stack will be captured at the toe of the facility and fed into the process plant water supply system and will be treated before being recycled as process water.

4.1.3.4. Inspection and Monitoring

Key TSF project management roles include the design engineer, responsible engineer (for the construction project), supervision and quality assurance technician.

TSF construction depends heavily on the construction quality of all aspects of the TSF, including:

- Comprehensive design drawings

- Strict adherence and implementation of the design
- Proper care and use of construction materials as per specifications
- QA/QC (Quality Assurance/Quality Control) to identify construction inadequacies

Operationally, the TSF will have a specific Manual of Operations and important aspects for inspection includes:

- All TSF and associated pumping and pipeline systems to be inspected on a shift basis. Observations will be recorded in the VPP logbook and any extraordinary observations or maintenance requirements must be documented and appropriate action taken, including reporting to regulators and the community.
- Assessments of:
    - the position and size of the decant pond and observations relating to freeboard requirements
    - damp patches
    - seepage and erosion, by visual and operating checks
    - status of leak detection systems
    - status of automatic flow measurement and fault alarms
    - impacts on birds, wildlife or livestock, particularly birds that may be affected by tailings water consumption.

Monitoring activities include:

- piezometers to monitor the phreatic surface against agreed trigger levels to maintain embankment stability
- piezometers and bores to monitor groundwater mounding and outward movement beneath and surrounding the facility
- surface water and groundwater quality sampling both upstream and downstream of the facility to check against agreed trigger levels
- dust control
- rehabilitation trials and monitoring of closure strategies, including slope treatments and covers, and revegetation performance.

4.1.3.5. Progressive Reclamation and Closure

On closure, the dry stack facility will be finally encapsulated in non-reactive, non-acid generative rock material, an erosion resistant rock layer, and finally stockpiled topsoil, before being recultivated with locally derived flora.

The periodic encapsulation, final encapsulation and application of an erosion resistant layer will require suitable non-reactive, non-acid-generative rock materials. Appropriate materials have been identified within the geology of the immediate project area and are available from currently commercially quarried sources or from the existing Veovaca pit wall. The exact materials to be finally used will be decided as the project advances into production.

4.1.3.6. Clay materials

Throughout the mine life, it is expected that clay material be removed by the underground mine development activities. This material requires disposal either on-site or off-site.

During constructional activities it is the intention to use this clay to produce a liner for the ore stockpile platform. The ore stockpile platform is being constructed via cut and fill of outcropping Jurassic limestone. The mixing of the clay and the limestone followed by compaction will be capable of generating a highly impermeable and acid-resistant liner to the ore stockpile platform.

On completion of construction activities, the intention is to place the clay materials in the PAG waste rock dump in the manner described above and for this practice to be adopted throughout mine-life. This has the dual benefit of providing a disposal route for the clays and preventing atmospheric oxygen and moisture contact with the reactive waste rock materials.

5. TRAINING

Required number of training programs will be provided for the project personnel working with waste rocks, as well as the environmental team, and relevant subcontractors.

Regular internal inspections will be made to ensure that the mitigation measures indicated in this Plan are applied during project.

6. REVIEW AND UPDATE

The results of monitoring will be reported to responsible parties to ensure that the project activities comply with the national legislation and international standards.

Depending on the monitoring results, Surface Mineral Waste Disposal Plan will be reviewed and updated when necessary.