ADRIATIC METALS PLC

VARES PROJECT

SURFACE MINERAL WASTE DISPOSAL PLAN

JULY 2023

Contents

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

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

1.0 Surface Mineral Waste Disposal Plan

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. In open-cast mining these waste rock dumps can be substantial in size, in underground mining scenarios they are typically much smaller in volume. These waste rocks can be reactive under atmospheric conditions and can lead to the generation of acidic 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.

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

1.1 Disposal of Waste-Rock Materials

In addition to the ores to be excavated from underground at Rupice, a significant quantity of non ore-bearing material, referred to as waste rock, will be excavated to provide access to the ores. This waste rock will be stored permanently on-surface, on-site within the Rupice Exploitation Field. There will be two types of waste-rock, distinguished as PAG (potentially acid generative) and non-PAG (sterile and unreactive). These two types have been characterized in terms of their reactivity characteristics under atmospheric conditions via a series of detailed field experiments that were run on-site at Rupice during 2020 and 2021. The PAG materials need to be stored in a manner that prevents acidification and metals/sulphate leaching over the short, medium and long time-frames. The non-PAG materials have been demonstrated experimentally to be benign when exposed to atmospheric conditions.

Experimentation shows that the PAG material has the potential to react under atmospheric conditions and that acid generation and metals/sulphate leaching could occur if the disposal is not arranged properly. Here it will be explained how the disposal of these materials will be performed to prevent acidification and metals/sulphate leaching.

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. The PAG waste rock

materials will be sent to the dedicated PAG waste rock dump and the non -PAG (sterile, unreactive) materials will be either disposed on a dedicated dump or used for constructional purposes related to the mining operation.

There are two principle means of preventing acidification and leaching of the PAG materials;

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.

Both these approaches are to be adopted 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 time-frames.

The limestone/PAG proportions necessary to prevent acidification and metals/sulphate leaching are be 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 time-frames.

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 Eastern Mining and at the Tuzla Geotechnical laboratory to guarantee that the dump is designed and constructed with this specifically in mind. The necessary testing is underway to ensure that the PAG dump is constructed in a geotechnically stable configuration.

The option exists for the placement of a clay liner on the base of the PAG waste-rock dump. However, it is expected that the testwork currently being performed on the waste-rock/limestone/clay mix will demonstrate that careful mixing and compaction will render this material adequately impermeable, to the point that a dedicated liner is not necessary. The option also exists for placing of a basal limestone layer on the dump; this option will be considered as the dump design work proceeds.

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 re-used by the mining operation or discharged to the environment. Any slimes generated will be added to the clay/limestone mix and placed within the PAG waste rock dump. At the end of mine-life this active water treatment plant will be replaced by a passive treatment system to be built downstream of the PAG waste rock dump.

On mine closure a soil layer will be placed on the PAG waste rock dump and recultivation will be performed using suitable native species.

The benefits of this PAG waste rock dump design are:

1. Prevention of acidification and metals/sulphate leaching of the PAG waste rock materials over the short, medium and long time-frames
2. Disposal and use of the clays generated during underground mine-development
3. Compaction will lower the volume of the waste-rock dump and help ensure that adequate space is available for all anticipated PAG waste-rock
4. Making the waste rock dump an actual engineered facility will ensure long-term geotechnical stability.

<u>Permanent Disposal of Non-PAG (Sterile) Waste Rock Materials</u>

The non-reactive waste rock materials generated by underground mining activities will be stored permanently on-surface. The materials will be classified as non-PAG on a truckload by truckload basis and dumped in a pre-determined location. Truck traffic over the dump after

material placement will be used to implement compaction, to lessen water flow through the materials and to reduce the dump volume. During mine-life, run-off from the dump will be captured and sent to the water treatment plant where it will be treated to the relevant discharge standards and either re-used by the mining operation or discharged to the environment. On mine closure a soil layer will be placed on the final dump surface and re-vegetated using native species.

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 subjected to any necessary geotechnical testwork to prove suitability before being used for such purposes.

1.2Disposal of Clay Materials

Underground mine development activities are currently generating significant quantities of clay, and it can be expected that these materials will be generated throughout the mine-life. 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. The test-work necessary to optimize the mix and the compaction is underway, with a view to installing this liner before the stockpile platform is put to use. This will have the dual benefit of disposing of the clay generated during early underground development and providing an 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.

2.0 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.