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## **SECTION 8**

### **ENVIRONMENTAL COMMITMENTS**

## 8.0 ENVIRONMENTAL COMMITMENTS

### 8.1 Environmental Design Principles

The Environment Design Principles are the basis for the project to comply with the Environmental commitments and regulations. The design principles are described in detail in TSD # 10 of this study.

### 8.2 Pre-construction – Environmental Requirements

#### Geoenvironmental Investigations

The surveys performed during the pre-construction phase show the existing environmental conditions. The results of the preliminary geo-environmental investigations are presented, analyzed and discussed in TSD # 8. This work is continuing at the present time and a final report will be completed in mid-August. TSD # 8 will be amended to reflect the completion of the investigations, and to identify recommendations for handling, processing, or disposal of contaminated superficial soils that require grading or excavation to facilitate the construction of foundations or utility services.

#### Site Demolition Staging Plan

Based on the defined demolition requirements, RTB Bor will prepare a staging strategy that account for any specialized environmental or safety training of staff or contractors.

### 8.3 Permit Requirements – Construction, Commissioning, and Operations

The following permit requirements are required to facilitate project construction, commissioning, or operation:

- **Building Permit for Smelter, Acid and Waste Treatment Plants** – a single building permit is required from the Town of Bor, and before starting the operation RTB Bor must obtain the appropriate water and usage permit;
- **Transportation Permits - for delivering large equipment and heavy loads to site:**
- For the transportation of large equipment or heavy loads to the construction site, SNC-Lavalin will hire a licensed specialized company. This company will

obtain all necessary licenses from Ministry of Internal Affairs for defined route

and will provide the required transportation escort to site

- **Commissioning or Operations Permits:**

After finishing of building phase Ministry of Environment and Spatial Planning forms a Technical Commission. The main task of this Commission is undertake a technical review of the project. After this review RTB could submit a request for trial operation, for a maximum period of one year. Within this 1 year period all necessary monitoring is performed in order to submit a request for an integrated operations permit.

- **Occupational Health and Safety Certifications;**

Occupational health and safety certification is a usual activity after starting operations, and also with RTB Bor.

Companies performing work must have on file an occupational risk assessment. All equipment and machinery must have appropriate certification certificates and instruction manuals.

Prior to site commissioning -- building regulations are issued regarding of regulations of the building site, listing all certificates, occupational risk assessments, methods of work, level of personnel training, special certificates for workers who work on heights and similar. This regulation is approved by work and building inspector.

- **Training Certifications for Workers**

For employees, employer is obligated to have certificates on their training to work on heights, with fork lifter, for welding, etc. Quality of finished work is proved with adequate certifications provided by the appropriate Institutes, Faculties or other licensed institutions.

## **8.4 Air Quality Management – Existing Operating Practice**

### **8.4.1 Existing Air Quality Protocols**

Due to the fact that the gas phase is one of the products during the process of copper production at the Smelter in Bor it is necessary to purify the gasses in electrostatic filters and, only after that, only gasses directing from the reactor and the converter are forward for further processing in the Sulfuric acid plant.

The excess of the gas emissions must be strictly monitored. This is achieved in the Bor Copper Smelter by monitoring air pollution in the city and connecting with the Technical preparation of the Smelter.

The shift technician in the Technical preparation alerts technologists about pollution when measured concentration of SO<sub>2</sub> is above 500 µg/m<sup>3</sup> at measuring station "Park" and "Brezonik". When the concentration values exceed 1000 µg/m<sup>3</sup>, measures to reduce the concentration of sulfur dioxide are taken. The perpetrators have obligations and responsibilities to take the following measures:

- The Shift technologist of Smelter contacts the shifts technologist of Sulfuric acid plant on the possibility of withdrawing the maximum amount of gas
- The shift manager of Sulfuric acid plant takes measures to withdraw the maximum amount of gas
- The shift technologist of Smelter reduces production by reducing the capacity of the reactor
- The shift technologist of the Smelter stops the converting process, which allows full use of high-concentrated reactor gases in Sulfuric acid plant
- The shifts technologist does not continue the converting process until sulfur dioxide concentration at any measure point drops below 500 µg/m<sup>3</sup>
- He undertakes other measures to reduce air pollution (reduction of furnace firing)
- The shifts technologist of Smelter, in the case of the technology - technical needs, reports to the administrator or technical manager of Smelter and the shift manager of Sulfuric acid plant before the reactor and converter stopping
- The shift manager of Sulfuric acid plant notifies the administrator and technical manager of the Factory right after stopping the plant
- If an unplanned delay in Sulfuric acid plant is needed, the shift manager of this factory informs the shift technologist of Smelter for preventive production reduction
- Sulfuric acid plant pulls smelter gas after reactor stopping after turning on the zones in LC filters in Smelter
- In the case of Sulfuric acid plant work stopping, it is necessary to perform the following: stop the reactor operation, reduce the furnace heating by 50%, and strictly control the converter work process. If delay in the work of Sulfuric acid

plant lasts more than 36 hours, it is necessary to access to the Smelter working stopping. In such cases, it is required to notify the national inspectors of environmental protection

- Responsible for the implementation of these points are managers and technical executives and Smelter and Sulfuric acid plant

If all the above measures do not provide the desired effect, it is accessed to the complete stopping of the total production process and the competent executives are notified at the same time.

Stopping the parts of the process, and if necessary, the total production, can cause adverse effects in terms of stability of aggregates. After normalization of the air pollution indicators, shifts technologist gives permission for the reactivation of the stopped manufacturing process.

Those ordes for the possible stopping and restarting of the production process are directly forwarded to shift managers in individual technological units and to shift manager of Sulfuric acid plant by the shift technologist.

After the start of Smelter plant, Sulfuric acid plant also starts and this way the technological relationship between plants of Smelter and Sulfuric acid plant is achieved and there is no risk of increased emissions from the production process into the atmosphere. In order to provide efficient synchronization of technological processes with the aim of reducing the air pollution in working and living environment and increased productivity of copper production, a complex LAN was established.

### **Air Quality Monitoring**

Copper Smelter and Refinery performs regular control of gas flows and emissions from the Smelter and Sulfuric acid plant. Control is performed by an authorized, independent, professional institution - the Institute of Mining and Metallurgy.

Monitoring of immision is performed by Department of Public Health 'Timok' Zajecar. The concentration of sulfur dioxide emissions are controlled at three measuring stations, which are selected in accordance with national and international recommendations and criteria, as follows:

- 1) In a city park - in the old city center - measuring position is selected to be located near the emitter and at the direction of the eastern wind,
- 2) Near the Jugopetrol storage - at the direction of the dominant, northern wind
- 3) In Brezonik – the nearest suburban area

At these measuring stations the average daily concentrations of sulfur dioxide are measured by the "British method". These measurements are submitted to the municipal administration and the TIR and they are available only after the monitoring team meeting (the earliest after the fifteenth day of the month for the previous month).

Agency for the Environment of the Ministry of Environmental Protection and Spatial Planning has been very active in expanding and improving the monitoring of air quality in Bor in recent years. Previous activities of the Agency (chronologically) are:

- 1) Designing a measurement point of BOR-Institute in the public network for automatic monitoring of air quality (funds - donations EU),
- 2) Supply, installation and activation of automatic measuring stations for monitoring of air quality at the site BOR-Brezonik, Measurement results - hour value to every 10 minutes available on the website of the Agency, [www.sepa.gov.rs](http://www.sepa.gov.rs) (funds - Fund for Environmental Protection RS)
- 3) Help for the Department of Environmental Protection of the Bor Municipality in the performance of automatic measurement of SO<sub>2</sub>,
- 4) Design, implementation of tender procedures, procurement, establishment and activation of a new automated stations AMSKV BOR-Gradski Park. Equipment of newly formed AMSKV is one of the most reliable in the world. Measurement results - hour value to every 10 minutes available on the website of the Agency, [www.sepa.gov.rs](http://www.sepa.gov.rs) (funds - Ministry of Environment and Spatial Planning, Fund for Environmental Protection RS)
- 5) To promote knowledge about the possible impact on the environment and creating better conditions for the management of technological processes in the Smelter, the Agency has designed and implemented a special web site (access is possible only with a password) with the most detailed results of the automatic monitoring for the needs of TIR, time of averaging – from 3 minutes to 1 hour.
- 6) The experts of the Agency, by invitation, participate in the work of the monitoring team
- 7) The Agency has set up and activated AMSKV BOR-Institut (EU donation). The testing of installed equipment is in progress. Measurement results of AMSKV will be shown on the site of the Agency when all equipment of the state network AMSKV is delivered and activated (current estimation – middle of the March 2010.)

Further increase in the number of automatic devices for air quality monitoring is necessary. With the proper maintenance of existing equipment, improvement of monitoring should be directed to the application of meteorological numerical models to generate the distribution of pollutants and air pollution forecasts.

Meteorological parameters are monitored by automatic measuring devices at places 'Brezonik', 'Gradski Park' and 'Institut'. On Site Institute, Institute of Mining and Metallurgy performs a classic meteorological measurements and observations, (a continuation of activities initiated 1986). There is expressed need for support from the Republic Hydrometeorological Institute. That support would consist of: meteorological forecast for the planning of activities and delays during adverse weather conditions and support to the continuation of classical meteorological station work.

### **Communication with the Public**

In order to establish cooperation with stakeholders (local communities, civic associations, trade and non-governmental organizations and individuals) a permanent telephone line was opened, where people can report increased air pollution, provide comments and suggestions. On this line is always a professional person on duty, who can give precise answers at any time (Telephone: 427-485 and 064 / 81-78 - 578).

In addition to the results obtained by monitoring system reading, shifts technologist is required to respond to the citizens alerting following a stablished procedure.

### **Communication with Local Government and State Bodies**

Copper Smelter and Refinery has provided technical, personnel and technical assistance in the formation of the Department of Environmental Protection in Municipal Administration. A Member of monitoring team from the TIR participates in the preparation of weekly and monthly reports.

#### **8.4.2 Refinement of Air Quality Dispersion Modeling**

TSD # 9 presents the preliminary air quality modeling assessment evaluating the proposed emissions from the proposed smelter and acid plant to historical and existing operational conditions. This preliminary assessment needs to be reviewed by design staff at SNC-Lavalin and Outotec, and operations staff at RTB Bor.

Further refinement of the dispersion modeling assessment should be undertaken as the smelter design proceeds.

### **Upgrade of the air quality monitoring network**

The existing air quality monitoring stations should be validated and a network of air quality monitoring stations should be deployed in the region of the RTB complex. The sites of each monitoring stations should be selected in order to have representativeness of:

- Areas directly affected by the RTB complex (downwind of RTB based on predominant winds)
- Areas not affected by RTB (upwind reference point)
- Areas potentially affected by RTB due to specific operating (such as fugitives or upsets) and/or meteorological conditions
- Point of maximum modeled concentrations (impingement point identified by modeling)

The final choice of the location of the stations must also consider local sources or obstacles, equipment and personnel safety as well as equipment-specific requirements.

The stations should be equipped with analysers and instruments to continuously monitor all of the pollutants subject to an air quality standard. For suspended particles, a specific continuous analyzer should monitor the concentrations of the PM10 particles and regular samplings should be done to determine the size distribution of the particles as well as metal content regarding the metals subject to an air quality standard by the Serbian government and international standards.

The stations should be autonomous and be able to communicate with a central data-processing center.

### **Installation of an on-site meteorological station**

A meteorological station, equipped with dispersion-grade instrumentation, is required to make site specific modeling as well as real-time modeling of the emissions. The EPA has established and detailed the minimum and preferred performance characteristics required from a meteorological sensor to be able to use its results in air dispersion modeling. The EPA also established specific guidelines for the location of a meteorological station to guaranty representativeness of the region without interference from localized elements. The meteorological station should be integrated into the air quality monitoring network and the real-time dispersion model for industrial production adjustments based on dispersion potential.

***Installation of a Continuously Emissions Monitoring System (CEMS) to monitor the emissions of the main contaminants (particulate matter and SO<sub>2</sub>) at the main stacks of the complex.***

The use of CEMS in the main emitting stacks of RTB will allow the verification of the conformity of the emissions of the sources and permit real-time modeling of the dispersion of the emissions.

**Development of a real-time air dispersion modeling system**

Using data coming from the meteorological stations, air quality monitoring stations and the various CEMS, a real-time air dispersion model should be used to indicate if the meteorological conditions of the moment provide adequate dispersion potential compared with the type and intensity of production. The production activities at RTB can therefore be controlled to avoid air quality problems in the surroundings.

**Capture of dust and SO<sub>2</sub> fugitive emissions**

The industrial process used at RTB generates substantial fugitive emissions of SO<sub>2</sub> and particulates matter. Since these emission sources are typically at ground level or building-roof heights, the dispersion potential of the emitted pollutants is low. In the case of the RTB complex, the low height release situation is amplified by the local topography and the fact that the majority of the specific sensitive receptors are very close to the site and on higher grounds. Captured emissions should be rerouted to a stack so that they can be released at a higher elevation.

**8.4.3 Modification of Air Quality Management System and Protocols**

The existing air quality management system will be examined during the design phase and modifications will be recommended to address:

- the transitional operations during construction; and
- the commissioning and operation of the new smelter/acid plant facilities.

**8.5 Construction Site Environmental Management Plan**

The Construction Site Environmental Management Plan has been prepared taking into consideration the potential effects that the implementation of the project may have on the environment as identified in Section 7 of this report.

The potential effects on the physical, natural, and socio-economic environments, identified during the analysis presented in this document, allowed to develop different Management Plans to prevent, minimize and/or mitigate these effects.

The analysis of potential environment interaction showed that during the site preparation the physical and natural environment may be affected by the following activities:

- Geotechnical and Environmental Site Investigations
- Site demolition – buildings, structures, equipment
- Site excavations
- Waste characterization and waste disposal
- Foundations
- Site grading
- Installation of site services (water and waste connections)

During the Construction Phase, the activities that may affect the physical and natural environment are the following:

- Surveying
- Borrow materials (sand & granular materials)
- Grading and Fill Placement
- Foundation Works
- Site Drainage
- Erosion and Sediment Control
- Materials and Equipment Delivery
- Construction Site Maintenance
- Construction Site Restoration/Rehabilitation
- Accidents & Malfunctions
  - Vehicular/equipment collisions
  - Material/Product Spills
  - Fires /explosions
- Commissioning

- Acid Plant start-up
- Smelter start-up

Most of these activities will affect the soils, the water quality and quantity and other activities will affect the air quality or may increase the level of noise. The Occupational Health and Safety and Human Health may be affected during the preparation and construction phases. Also, the Hazardous materials and hazardous wastes as well as the general waste may produce effects on the environment.

Since this project will be developed in an existing industrial property, it is not expected to find any significant direct effect on the natural biological system or on the archaeological features.

The following Environmental Management Plans have been identified and considered for development in order to address the potential effects of the demolition and construction phase identified in the analysis:

- **Erosion and Sediment Control Management Plan**

The project will be developed in an industrial property, located in a topographic flat area, with no slopes. There are no creeks or water courses in the project area. It has been considered that soils will not suffer erosion and the sediments that may be affected, as per any standard infrastructure building, are inside the property. For these reasons, it has been concluded that there is no need to implement an Erosion and Sediment control Management Plan.

- **Demolition Waste Management Plan/Strategy**

The infrastructure to be demolished in the area includes existing buildings on the site C.M. Bor II CP 4400/24 and CP 4400/48. Different material will be generated as a result of the demolition activities. Some material will be recycled and part of the material will be considered waste. A demolition Waste Management Plan is required for the project area in order to comply with environmental national and international regulation. Information pertinent to the development of a preliminary Demolition Waste Management Plan for the project is presented in the next section of this document. The Demolition Waste Management Plan will also be based on the results of the Geo-environmental investigations that are reported in Volume 2 - TSD # 8. This plan will also be developed in consideration of the occupational health and safety considerations for workers involved in the various demolition activities and the risks associated with the removal, movement, or disposal of waste materials.

- **Hazardous Waste and Hazardous Material Management Plan**

During the Demolition phase several infrastructures will be destroyed and different type of material will be generated in the project site. Some material will be considered general waste, other material will be treated as hazardous waste and part of the material will be recycled. The geo-environmental investigations that are presented in Volume 2 – TSD # 8, have indicated that that heavy metal contamination of the superficial soils is found throughout the area designated for redevelopment. This material indicates that the contamination occurs in within 1-3 metres of the surface that will be disturbed through site grading, and the installation of foundations and services. The Hazardous Materials and Hazardous Waste Management Plan is presented in the following section.

- **Water Management Plan, including drainage and liquid effluents**

Fresh Water for the process is obtained from the Lake Bor or Industrial water from the flotation tailings is recycled and reused. Water effluent from the modernized smelter and new acid plant will be treated through the construction of a new water treatment plant. Effluent from the treatment plant will be discharged to the tailings or polishing pond and not directly to a natural watercourse.

During detailed design, details on the location of the polishing pond will be developed by RTB Bor so that the water management is coordinated and integrated with other activities associated with the Local Environmental Action Plan which is presented in Volume 2, TSD # 10.

It should be noted that RTB Bor's long term planning objective is to recycle as much water to minimize the amount of effluent discharge to the environment. This effort involves the development of a broader water management plan for integrating the Bor complex with the Krevelj Mine and processing complex. This initiative is beyond the scope of this EIA.

The construction of the modernized smelter and new acid plant will not disturb normal plant operations and water use during the construction period. Overall, the installation of the water treatment plant will contribute to the improvement in water quality since there is no treatment of waste water from the existing smelter at present.

- **Air Quality and Dust Management Plan**

The demolition and construction activities will generate high volumes of dust and particulates in the air affecting the natural environment. The Air Quality Management Plan for demolition and construction prepared for the project, focus

on the abatement and control of material particulates and dust generated in these phases. The Monitoring of the chemicals and particulates present in the air will be performed as described in the Monitoring section.

### **Occupational Health and Safety Plan (OHSP)**

An Occupational Health and Safety Plan (OHSP) had been prepared for the project and will be implemented during the demolition and construction phase. The OHSP is presented in the following section.

- **Emergency Preparedness and Response Plan (EPRP)**

RTB Bor together with the Municipality of Bor have established emergency preparedness and response plans in the event accidents or other environmental incidents occur at the RTB Complex and nearby mine facilities.

The existing plans and procedures provide an adequate level of protection for all activities related to the site demolition and construction phases of the smelter modernization and construction of the new acid plant.

The existing plans and procedures will be reviewed periodically with the Town of Bor and the Ministry of Environment and Spatial Planning as the demolition and construction process proceeds.

#### **8.5.1 Demolition Waste Management Plan**

- The Demolition Waste Management Plan should be implemented together with the Hazardous Materials and Waste and Management Plan (when applicable). It will take into account the following:.

**Table 8.1.1 Demolition Waste Management Plan**

Table 8.1.1 Demolition Waste Management Plan	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To manage wastes generated during the demolition and construction phase of the project in such a way that any potential impacts on the environment are minimized or avoided.</li> </ul>
<b>Performance Requirements</b>	<ul style="list-style-type: none"> <li>• Prevent adverse environmental impacts from wastes during demolition and construction activities.</li> <li>• Adhere to good waste management practices by:                             <ul style="list-style-type: none"> <li>• Minimising waste generation.</li> <li>• Maximising water and materials reuse and recycling; and,</li> <li>• Safely treating and disposing of all non-reusable and non-recyclable materials.</li> </ul> </li> </ul>
<b>Implementation and Mitigation Strategy</b>	<ul style="list-style-type: none"> <li>• RTB Bor shall collect separately and re-use or recycle all recyclable building wastes, such as:                             <ul style="list-style-type: none"> <li>○ Timber from concrete form work can be recovered and reused.</li> <li>○ Scrap steel and off cuts can be recycled; and</li> <li>○ Used oils can be collected and recycled.</li> </ul> </li> <li>• RTB Bor shall make available to local population any wastes that cannot be re-used or recycled by the project for re-use or recycling (ex: wood, bricks, etc.). However, the RTB Bor shall ensure that any such wastes made available to the population are neither dangerous nor toxic.</li> <li>• RTB Bor shall segregate and characterise waste streams to facilitate waste reduction and recycling.</li> <li>• RTB Bor shall sort waste at the demolition site. To achieve waste separation at source, bins for re-usable and recyclable materials shall be provided. For large quantities of waste, an on-site area shall be allocated for the collection of materials.</li> <li>• RTB Bor shall design for domestic waste to be placed into appropriate waste containers for disposal in an engineered sanitary landfill.</li> <li>• RTB Bor shall develop secure, engineered waste storage areas to prevent leaching of materials into the soil, surface water, or groundwater.</li> <li>• RTB Bor shall develop good housekeeping procedures and workforce awareness.</li> </ul>

**Table 8.1.2 Demolition Waste Management Plan – Place of Disposal or Reuse**

BUILDING	AREA	TYPE AND AMOUNT OF MATERIAL (t)						PLACE OF DISPOSAL OR REUSE
		Steel	Concrete	Brick façade – clay blocks	Refractory and Acid resistance brick and concrete	Magnetite	Clay (Charged)	
<b>FS Reactor 2</b> Bridges between L-1 and L-2 Object reactor Plant reactor Cyclone Reactor-pipeline Feeder with gear Bunker for concentrate Conveyors Charging system for reverb furnace 2 AB elements Firebrick	18	2650	38		114			Steel can be recycled – temporary location of CP 4400/44 Bor CM 2.  Firebrick from reverb Bath (480 tons) and magnetite (2029 t) are stored on CP 4400/24 nearby object No. 17 and will be recycled.  The remaining material (concrete, masonry bricks, clay blocks, refractory, acid resistant bricks and clay) are disposed in the old open pit.
<b>Reverb furnace No. 2</b> The construction of the AB reverb furnace foundation, roof and lining Off gas channel to boilers 3 & 4 Boilers with accompanying equipment Off gas duct line of reverb furnace Supporting construction of boilers	19	6565	657		1170	2029	1404	As Above

<b>Electrostatic filters and LC-3 LC-4</b> Spray tower with a conveyor supporting structure Electrostatic filters with related equipment, with AB foundations Input and output gas from the supporting structure Main reactor-pipeline with lining and supporting structure AB columns and beams Facade brick	21	274	27	67			Steel can be recycled – temporary location of CP 4400/44 Bor KO 2.  Firebrick from reverb Bath (480 tons) and magnetite (2029 t) are stored on CP 4400/24 nearby object No. 17 and will be recycled. The remaining material (concrete, masonry bricks, clay blocks, refractory, acid resistant bricks and clay) are disposed in the old open pit.
<b>Fans for exhausting reactors gases</b> Fans – Input and output gas from the supporting structure Foundation Firebrick	22	5.00	167	11			The remaining material (concrete, Masonry, Bricks, Clay blocks, refractory, acid resistant brick and clay) are disposed in the old open pit.
<b>Daily fuel tank for heavy oil</b> Tube installation AB-Foundation with firewall	22a	5:00	36				
<b>Pumping stations for water and heavy oil</b> Tube installation AB columns and beams Facade brick	22b	1:00	22	14			
<b>Locksmith's workshop with bathroom</b> The walls of the brick facade AB foundations, serklage, plates	23		86	38			
<b>Daily warehouse</b> The walls of the brick façade AB foundation walls, beams, plates	24		80	50			
<b>Offices</b> The walls of clay bricks AB plates, foundation walls	49		68	42			

**Table 8.1.3 Demolition Waste Management Plan - Monitoring**

<b>Monitoring</b>	<ul style="list-style-type: none"> <li>• Quantities of waste being sent for reuse, recycling and disposal shall be monitored on a monthly basis. During construction, both waste and reusable and recyclable materials storage areas shall be monitored to ensure that they are maintained properly.</li> </ul>
<b>Reporting and Deliverables</b>	<ul style="list-style-type: none"> <li>• RTB Bor shall develop a Demolition and Construction Waste Management Plan that shall include the following elements:                             <ul style="list-style-type: none"> <li>○ The scope and objectives of the plan;</li> <li>○ Environmental values to be protected;</li> <li>○ Opportunities and actions to be taken to implement the waste management hierarchy;</li> <li>○ Quantitative estimates of the expected waste streams;</li> <li>○ Emergency response procedures;</li> <li>○ Training and management;</li> <li>○ A monitoring and reporting program; and</li> </ul> </li> <li>• RTB Bor shall be responsible for waste collection and waste management issues</li> </ul>
<b>Identification of Incident or Failure to Comply</b>	<ul style="list-style-type: none"> <li>• The following constitute incidences or failures to comply in relation to waste management policies:                             <ul style="list-style-type: none"> <li>○ Uncontrolled waste disposal; and</li> <li>○ Other non-compliance with the waste management plan, or other environmental protocols.</li> </ul> </li> </ul>
<b>Corrective Action</b>	<ul style="list-style-type: none"> <li>• Should an incident or failure to comply occur, RTB Bor shall take the necessary actions to identify the causes of non-conformance with the waste management plan and implement any actions necessary to ensure future compliance?</li> </ul>
	<ul style="list-style-type: none"> <li>•</li> </ul>

## 8.5.2 Hazardous Materials and Waste Management Plan

The Hazardous Materials and Waste Management Plan should be implemented together with the Demolition Waste Management Plan (when applicable).

**Table 8.1.4 Hazardous Materials/Waste Management Plan**

**Table 8.1.4 Hazardous Materials /Waste Management Plan**

### 1.0 Introduction

The Hazardous Materials/Waste Management Plan (HMWMP) covers the construction phase of the Project and creates a framework for handling and disposal of hazardous wastes in a safe and environmentally responsible manner. The objective of this preliminary HMWMP is to outline the main components of a detailed HWHMMP. Following process plant commissioning and before start of plant operations the Project Owner will tailor/update the final operations HWHMMP.

In addition to the HMWMP defines mandatory procedures for the handling of hazardous materials (hazmats) during the construction phase of the Project.

### General Strategies

General strategies that will be adopted for a proper management of hazardous waste include:

**Proactive Procurement Policy:** Tender/Bid documents will notify prospective bidders of the environmental sensitivity of the site and solicit the use of environmentally suitable materials, equipment and products to minimize waste generation, where practical. During all Project phases the possibility of material substitution with more environmentally friendly alternatives will be reviewed for all materials that are hazardous to handle, generate hazardous wastes or otherwise have the potential to create environmental problems.

**Waste segregation:** RTB Bor site personnel will be required to attend an orientation session which, among other things, outlines waste management responsibilities and then implement category-wise segregation of waste in support of 3Rs (Reduce, Reuse and Recycle) practices.

**Waste minimization:** Processes and materials used will be evaluated on the basis of possible reduction in raw material usage, during the design, construction and operation stages of the Project.

**Recovery/reuse initiatives:** Recovery of usable materials and opportunities for on-site or off-site reuse will be assessed during Project

**Table 8.1.4 Hazardous Materials /Waste Management Plan**

design, and amended (where appropriate) during construction and operations activities.

Recycling initiatives: Segregation of target recyclable materials will be conducted during all phases of the Project.

**Treatment and Processing:** Off-site treatment or processing of hazardous wastes will be applied to minimize health and environmental issues or concerns.

**Incineration of some hazardous wastes** to reduce the quantity of wastes requiring landfill disposal or shipment to off-site facilities.

## 2.0 Regulatory Framework

All hazardous waste management operations and facilities must meet the Serbian regulations, and, where appropriate, take into account other established international guidelines such as those set by the World Bank (WB), the World Health Organization (WHO) and the United Nations Environmental Program (UNEP), in addition to guidelines from international conventions to which Serbia is a signatory.

## 3.0 Roles and Responsibilities

Roles and responsibilities among RTB Bor and its Contractors/sub-contractor(s) will be defined during the contract phase. However, it can be anticipated that the Owner will be ultimately responsible for ensuring any amendments made to the plan reflect the modifications that are made to any waste management facility, operational procedures, and contracted waste management services over the life of the Project. Similarly, RTB Bor will be responsible for managing the hazardous waste management services Contractor(s) that will be retained during the construction period.

RTB Bor will be responsible for the day to day activities related to the collection of hazardous waste and operation and maintenance of the on-site hazardous waste management facilities, as well as the monitoring and reporting of such operations. If extremely hazardous waste will be handled and disposed of this waste management Contractor must be approved and licensed in hazardous waste management. Any Construction Contractors/Sub-Contractors will be responsible for following the guidelines, procedures and measures included in the final HMWMP.

## 4.0 Definition and Identification of Hazardous Wastes

Hazardous wastes can be generally classified accordingly to the hazardous materials that originated them, such as: explosives, compressed gasses, flammable liquids, flammable solids, oxidisers, poisonous and infectious wastes, radioactive wastes, and corrosive wastes. Universal waste is a type of hazardous wastes that poses a lower risk to the human health and the environment.

During the demolition and construction phase it is expected that hazardous wastes may include:

**Table 8.1.4 Hazardous Materials /Waste Management Plan**

- waste oils, lubricants, fluids, filters and greases used in vehicle/machines maintenance;
- batteries (dry and wet type including lead-acid),
- used fluorescent tubes;
- chemicals/fuels empty containers;
- used paints and paint containers;
- chemically contaminated soils and absorbent pads and rags;
- empty pressurized vessels.

Properly trained personnel will determine whether a waste is hazardous, as it requires ample experience in identification of waste constituents and origin and its physical-chemical characteristics, as well as training in applicable health, safety and environmental matters and regulations.

#### **5.0 Materials Reuse And Recycling**

Where possible, suppliers and vendors will be required to take back unused hazardous materials or wastes and/or package that comes with them. Examples of these materials include:

- empty compressed gas containers
  - waste oils/lubricants
  - wet acid batteries
- unused explosives and chemicals/reagents  
waste electronic and electric equipment

#### **6.-0 Storage**

Safe and organised storage of hazardous wastes/materials is critical to minimise or eliminate the potential for spills, accidents, incidents or hazards. Hazardous wastes will be stored in closed containers inside engineered facilities with appropriate secondary containments, fire extinguishers, spill kits, eye wash, first aid kits and telephone or other communication system to allow for adequate emergency notification. All barrels and drums containing hazardous wastes will be stored upright on pallets unless otherwise noted. Hazardous wastes/materials will be removed from the project site within 180 days from the accumulation date.

The storage areas will be properly ventilated, clearly identified, clear of obstructions and accessible only to trained and authorized

**Table 8.1.4 Hazardous Materials /Waste Management Plan**

personnel. Contact between incompatible wastes will be prevented and there will be sufficient separation between waste containers in order to monitor potential leaks.

### **7.0 Labeling**

All waste storage areas or containers will be properly labelled with the words “HAZARDOUS WASTE”/ “HAZARDOUS MATERIAL”; and relevant information on the content of the vessel and the date when the waste began accumulating in it. Label will also include information on the intended disposition of the container. Containers must remain labelled until emptied and thoroughly cleaned or the contents neutralised, cured or chemically deactivated.

### **8.0 Packaging**

Hazardous materials/wastes will be properly packaged in order to ensure safe handling and use. Selection of appropriate containers depends on physical-chemical characteristics of hazardous material/wastel as well as its rate of generation, mode of transportation and disposal method.

### **9.0 Waste Management And Disposal**

The table below provides an overview of the anticipated types of hazardous materials and wastes to be generated over the course of the Project’s construction phase and options for their handling and disposal. It should be noted that references to off-site facilities refer to licensed in-country installations.

Table: Hazardous Wastes/Materials Categories and Handling and Disposal Options

### **10.0 Training**

Prior to working on site, all personnel who may be required to handle, store, label, transport, monitor, etc. hazardous wastes shall receive appropriate training, including information on labelling, hazard symbols and MSDS in order to ensure it is done safely. Refreshing courses and emergency response drills will be carried out periodically.

Training shall include applicable Serbia legislation and international best practices and guidelines, like Canada’s WHMIS (Workplace Hazardous Materials Information System) and Transportation of Dangerous Goods (TDG). All training shall be documented.

**Table 8.1.4 Hazardous Materials /Waste Management Plan****11.0 HMWMP Monitoring**

Periodic audits will be conducted on the HWMP to determine the efficiency of the system and priorities for future action. Audit information will be collected through worker interviews; and interviews with site management, hazardous wastes handlers, and health and safety personnel..

**12.0 EMERGENCY RESPONSE**

All the workers involved in handling of hazardous wastes will be trained in emergency responses at the site and there will be equipment available continuously for emergency response for hazardous wastes incidents, including Personal Protection Equipment (PPE). Details of emergency response and spill control measures will be included in the Project's Emergency Response Plan (ERP) for construction phase.

**13.0 REPORTING**

During the Site Demolition and Construction periods the records will be maintained to identify and types of waste generated through particular facilities or activities;

- quantities of materials that are reused or recycled; and
- quantities of hazardous materials disposed of on-site or re-processed.

**Table 8.1.5 Hazardous Materials/Waste Management Plan Key Considerations/Operations**

Waste/Materials Stream	Description	Main Source	Handling & Disposal Options	Key Considerations / Observations
Welding residues	Welding rods/grinding or cutting wheels	Demolition, Construction or maintenance activities	Recycle / Pack in drums and landfill	
Aerosol cans	Pressurized containers (deodorants, spray paint, shaving creams, etc.)	Construction area	Recycle / Landfill	Crush empty cans and send to landfill
Paint containers	Empty cans (any size, empty, dry)	Construction area	Reuse / Landfill	Crush empty cans and send to landfill
Paints and Coatings	Residues of paint, waterproofing, epoxy coatings and resins	Construction area	Reuse / Incinerate / Landfill (secure cell)	Store for maintenance purposes to minimize amount requiring disposal. Stabilize waste and landfill or dispose with slag.
Compressed Gas Cylinders	Empty compressed gas cylinders	Construction activities	Reuse / Recycle / Landfill	Reuse/Recycle through gas suppliers. Landfill only those that can not be recycled (based on expired refill dates)
Used oils	Used lube oil, hydraulic oil, brake fluids, etc	Equipment and vehicle maintenance	Reuse / Recycle /	Evaluate possibility of reuse it in ANFO preparation for use in mine. Examine potential for off-site recycling by fuel/oil supplier.
Oil filters	Oil filters	Equipment and vehicle maintenance	Recycle / Landfill	Preferably return to supplier or dispose of off-site. Otherwise, drain and crush filter before landfilling

Waste/Materials Stream	Description	Main Source	Handling & Disposal Options	Key Considerations / Observations
Oily fabrics	Oily fabrics (rags, gloves, clothing etc)	Truck and mechanical repair shops	Incinerate	Treated as a hazardous material
Solvents / Degreasers	Paint thinner, acetone, varsol	Construction activities	Recycle / Incinerate	Use degreasers which have been developed to reduce adverse environmental impacts, where practicable. Investigate opportunities for recycling and/or disposal through in-country waste processing services.
Hydrocarbon Contaminated Soils	Contaminated soil	Hydrocarbon fuel spills	Treat through on-site bioremediation facility	Store in appropriate containers for on-site treatment and disposal or shipped to an off-site licensed facility.
Fluorescent tubes	Fluorescent tubes	Offices	Landfill (glass); recycle (mercury)	Crush fluorescent tubes in an appropriately designed fluorescent tube crusher and mercury recovery unit. The crushed glass can be landfilled and the recovered mercury can be recycled. Otherwise, dispose of off-site.
Used batteries	Dry-cell batteries	Domestic electronic equipment from camps, offices, and monitoring equipment	Recycle / Landfill (secure cell)	Return batteries to supplier
	Lead-acid batteries	Equipment and vehicle maintenance	Recycle / Landfill	Return batteries to supplier. Drain and neutralize acid and dispose inert battery on landfill

Waste/Materials Stream	Description	Main Source	Handling & Disposal Options	Key Considerations / Observations
Health Care Wastes	First aid kits, bandages, etc.	First aid stations	Landfill	
Asbestos	Friable and non-friable	Insulation and tiles	Seal in bags and landfill	Follow special handling procedures and use properly trained personnel

### 8.5.3 Air Quality and Dust Management Plan For Site Decommissioning and Construction Activities

The below table shows the Air Quality Management Plan.

**Table 8.1.6 Air Quality Management Plan**

Table 8.1.6 Air Quality Management Plan	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>To minimise the release of fugitive emissions and dust in areas where demolition and construction activities are occurring.</li> </ul>
<b>Performance Requirements</b>	<ul style="list-style-type: none"> <li>Fugitive emissions, including odours, dust, smoke and fumes, are either prevented or controlled so that they do not cause an environmental nuisance.</li> <li>Workers are not exposed to dust or other health risks identified by Serbian and international workplace standards;</li> <li>Dust does not cause health or safety issues on site or beyond the boundaries of the site.</li> </ul>
<b>Implementation and Mitigation Strategy</b>	<ul style="list-style-type: none"> <li>Site Personnel will be supplied with protective masks or breathing apparatus when working in dusting conditions where they may be exposed to health risks attributed to heavy metal contamination of dust materials;</li> <li>RTB Bor and its Contractors/subcontractors shall apply appropriate dust control measures, subject to vehicle and machinery movements at a frequency and rate that shall minimise dust generation;</li> <li>Include fugitive air emissions and air quality management strategies in environmental awareness training of site workers.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>RTB Bor shall conduct regular visual inspections for evidence of excessive dust generation during demolition and construction phase.</li> </ul>
<b>Corrective Action</b>	<ul style="list-style-type: none"> <li>The site operations will be assessed to determine the source of the emissions and identify any significant modifications to activities that can be made to rectify problems identified during the demolition and construction phases.</li> </ul>

**8.5.4 Occupational Health and Safety Plan (OHSP)**
**Table 8.1.7 Occupational Health and Safety Plan (OHSP)**

Table 8.1.7 Occupational Health and Safety Plan (OHSP)	
<b>Objectives</b>	<ul style="list-style-type: none"> <li>• To ensure that the project does not adversely affect the health of the employees, contractors or the general public.</li> <li>• Zero reportable injuries and work-related illnesses.</li> </ul>
<b>Performance Requirements</b>	<ul style="list-style-type: none"> <li>• RTB Bor shall prepare and implement a Health, Safety, and Environment and Community (“HSEC”) system that will meet best practice standards for construction works.</li> </ul>
<b>Implementation and Mitigation Strategy</b>	<ul style="list-style-type: none"> <li>• RTB Bor and its Contractor(s) shall provide all employees with suitable personal protection equipment (safety shoes, masks, ear protection, protective clothing and safety glasses in appropriate areas), emergency eyewash and shower stations where required, ventilation systems, and sanitary facilities.</li> <li>• RTB Bor and its Contractor(s) shall place signs in each area of the construction site to indicate what type of safety equipment must be used.</li> <li>• RTB Bor and its Contractor(s) shall make certain that all employees wear an identification badge (with photo) which shows their employer, department, position and employee number.</li> <li>• RTB Bor shall make certain that all visitors are identified by a visitor identification badge and that they are carefully monitored. Visitors shall also follow a detailed security procedure.</li> <li>• The modernized smelter and new acid plant shall be equipped with properly designed elevated platforms, walkways, stairways, and ramps with handrails, toe-boards, and non-slip surfaces.</li> <li>• RTB Bor and its Construction Contractor(s)/Sub-Contractors shall ensure that electrical equipment is grounded, well-insulated and conforms to applicable codes.</li> </ul>
<b>Monitoring</b>	<ul style="list-style-type: none"> <li>• RTB Bor and its Construction Contractor(s)/Sub-Contractors shall keep records of all accidents, occupational illnesses, chemical spills, fires and other emergencies.</li> <li>•</li> </ul>
<b>Reporting and Deliverables</b>	<ul style="list-style-type: none"> <li>• RTB Bor’s Health Safety and Environmental (HES) Manager shall be responsible for enforcing all occupational and public health directives and keeping all related records.</li> </ul>
<b>Identification of Incident or Failure to Comply</b>	<ul style="list-style-type: none"> <li>• The following constitute incidents or failure to comply with occupational and public health policies:                             <ul style="list-style-type: none"> <li>○ Directives and procedures contained in the site HSE System are not being followed;</li> <li>○ Directives and procedures contained in the site HSE System are not being enforced;</li> <li>○ Site HSE System does not encompass all required topics and situations; and</li> <li>○ High rate of work-related injury and illness.</li> </ul> </li> </ul>

**Table 8.1.7 Occupational Health and Safety Plan (OHSP)**

<b>Corrective Action</b>	<ul style="list-style-type: none"> <li>• In the event of an incident or failure to comply, a selection of the following actions will be undertaken as appropriate:             <ul style="list-style-type: none"> <li>○ Contractor shall investigate why incident occurred and investigate and implement mitigating measures;</li> <li>○ Contractor shall ensure HSE information provided is adequate and up-to-date and revise regularly as appropriate;</li> <li>○ Contractor shall ensure that employees, contractors and visitors to the site are familiar with the procedures and policies relevant to their positions;</li> <li>○ Contractor shall ensure HSE directives and procedures are enforced; and</li> <li>○ Contractor shall ensure HSE documents are readily available to everyone on the site.</li> </ul> </li> </ul>
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### 8.6 Environmental Monitoring – Transitional Phase

Environmental monitoring (air quality) during the transitional period -- when the existing smelter continues to operate and construction on the new smelter and acid plant proceeds, will follow the procedures and protocols that have been established for the current operations.

Smelter operations, however, may require additional production adjustments to adapt to changing production capabilities as the demolition, construction, and modernization activities proceed.

### 8.7 Environmental Monitoring – Commissioning Operations Phase

Environmental monitoring of the new smelter will involve the adaptation of the existing monitoring system, and modification of the operational procedures to suit the new smelter and acid plant operations. During the initial commissioning, the air quality monitoring system will be integrated with the dispersion modeling to more effectively management plant production and operations.

### 8.8 Environmental Audit – RTB Bor Facility Operations

As part of the broader Local Environmental Action Plan, RTB Bor will prepare annual internal reports to evaluate progress in implementing the Company's environmental management plans, monitor environmental and social performance and assess compliance with relevant Serbian standards and World Bank guidelines. Where actions are found to be inadequate or not achieving the desired results alternative measures will be considered and management plans amended accordingly. Thus, annual reporting will result in continued environmental and social improvement.

In addition to annual reporting, quarterly reports will be compiled for the following:

- Surface Water and Groundwater Management;
- Air Quality Management;
- Waste Management;
- Health and Safety Performance Statistics;
- Community and Social Impact Issues/Concerns.

### **8.9 On-going Document Control – Serbian Authorities**

As part of RTB Bor normal operations -- RTB provides the Serbian Authorities with information on various aspects of their facility operations in accordance with prescribed documentation filing requirements. For example, documentation is provided with respect to:

- Chemical water treatment plant details (water treatment plant);
- Emissions from the power and heating plants, and smelter;
- Quantities of waste generated and disposed of;
- Inventories of hazardous wastes stored on site; and
- Monthly - Environmental monitoring reports (LEAP – air quality)

Once the new smelter and acid plant become operational, quarterly and annual environmental status reports should be prepared for filing with regulatory authorities, and integrated with their other documentation filing requirements.