

EIA STATEMENT

(SUPPLEMENTED*)

INVESTMENT PROJECT PROPOSAL FOR ‘MINING AND PROCESSING OF POLYMETAL ORES FROM THE ROZINO DEPOSIT, TINTYAVA PLA, SITUATED IN THE LANDS OF THE ROZINO VILLAGE AND GUGUTKA VILLAGE, IVAYLOVGRAD MUNICIPALITY, HASKOVO DISTRICT.’.



Customer: Tintyava Exploration AD

December 2025

- * **Note:** This EIA Statement was supplemented in accordance with the written instructions of:
1. The Ministry of Environment and Water, Ref. No. OBOC-68-65/20.10.2025
 2. The Ministry of Healthcare, Ref. No. 04-09 -119/10.09.2025
 - 3 . The Eastern Aegean Basin Directorate, Plovdiv, Ref. No. ПЙ-010-808(2) dated September 26, 2025.

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List of abbreviations:

Abbreviation	Meaning
AMS	Automatic Monitoring Station
AMB	Archaeological Map of Bulgaria
BAS	Bulgarian Academy of Science
BGS	Bulgarian Geodesy System
WABD	West-Aegean Basin Directorate
EABD	East-Aegean Basin Directorate
BSS	Bulgarian State Standard
BEQ	Biological elements of quality
NM	Biological oxygen demand
EM	Explosive materials
LRT	Water Body
GDCRAS	General Directorate ‘Civil Registration and Administrative Services’
SG	State Gazette
ICE	Internal Combustion Engines
EIAS	Environmental Impact Assessment Statement
EEA	European Environmental Agency
UIC	Uniform Identification Code
EU	European Council
AOI	Water Act
PIAA	Public Information Access Act
PZ	Protected zone
EPA	Environment Protection Act
Mineral Resources Act	Mineral Resources Act
WMA	Waste Management Act
SPA	Spatial Planning Act
EEA	Executive Environmental Agency
IP	Investment Proposal
AAQ	Ambient Air Quality
CGHC	Control of Generally Hazardous Chemicals
IPPC	Integrated Pollution Prevention Control
MI	Ministry of Interior
MH	Ministry of Healthcare
MAF	Ministry of Agriculture and Foods
MOEW	Ministry of Environment and Water
vehicles	Motor Vehicle
The Council of Ministers	Weather Station
NASEM	National Automated System for Environmental Monitoring
NEN	National ecological network
NIICH	National Institute of Immovable Cultural Heritage
Non-methane volatile organic compounds	Non-Methane Volatile Organic Compounds

RRP	Regulation on Radiation Protection
NSI	National Statistical Institute
NCPHA	National Centre for Public Health and Analyses
EIA	Environmental Impact Assessment
TDR	Compliance Assessment
Concentrator	Processing plant
HCM	Hazardous chemicals and mixes
BSC	Blasting Safety Code
DBA	Drilling and Blasting Activities
Drill & Blast	Drilling and Blasting Works
GWB	Groundwater Body
TLV	Threshold Limiting Value
NCS	Pumping Station
RBMP	River Basin Management Plan
FRMP	Flood Risk Management Plan
RHI	Regional Health Inspectorate
RIEW	Regional Inspectorate of Environment and Water
RWMA	Regional Waste Management Association
AAL	Average Annual Limit
ADL	Average Daily Limit
NW-SE	Northwest - Southeast
EQS	Environmental Quality Standards
AAV	Average Annual Value
MWF	Mine Waste Facility
CO	Carbon Dioxide
SPZ	Sanitary protection zone
PW	Pipe well
CSP	Crushing and sorting plant
ABW	Airblast wave
PM ₁₀	Particulate Matter below 10 microns
PM _{2.5}	Particulate Matter below 2.5 microns
PCQE	Physical and chemical quality elements
HMQE	Hydromorphological quality elements
CS	Chemical Status
CDD	Complete Detailed Design
EMEP	European Monitoring and Evaluation Programme
MIBC	Methyl isobutyl carbinol
NO _x	Nitric oxides
PAX	Potassium amyl xanthate
SO ₂	Sulphur dioxide

I. INTRODUCTION GENERAL INFORMATION

Project Investor Details:

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General Information about the investment proposal and the EIA procedure:

This Statement concerns the investment proposal (IP) for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.’.

By way of Permit No. 467/28.02.2017 issued by the Minister of Energy (**Textual Attachment No 2**) Gorubso – Kurdzhali AD from the town of Kardjali is allowed to carry out prospecting and exploration for metalliferous ores and minerals in the Tintyava PLA situated in the lands of the Ivaylovgrad Municipality, Haskovo District, and the Krumovgrad Municipality, Kardjali District.

The rights and obligations set forth in the Agreement dated 02.05.2017 for prospecting and exploration for metalliferous ores and minerals - subsurface resources in the meaning of Article 2, paragraph 1, item 1 of the Mineral Resources Act in the Tintyava PLA, concluded between Gorubso – Kurdzhali AD and the Minister of Energy pursuant to Permit No. 467/28.02.2017 of the ME were transferred to Tintyava Exploration AD by means of an Additional Agreement No. 1 to the Contract, pursuant to Article 25, paragraph 1 of the MRA and Article 61, paragraph 1, item 12 of the Contract. This Contract became effective on July 17, 2017 and was followed by a Decision No. 09-OC/2017 of the Minister of Environment and Waters concerning the assessment of the negative environmental impact assessment. On 31.08.2020, an Additional Agreement No. 2 extending the period of the Contract by 2 years was signed between Tintyava Exploration AD and the Minister of Energy.

After a 2-year overall report for the performed activities and a reasoned proposal for the first extension of the Contract were submitted, and pursuant to Article 31, paragraph 3 of the ЗП, in connection with Article 2, paragraph 2 and paragraph 7 of the Contract dated 02.05.2017 г., on 23.01.2023, Tintyava Exploration AD and the Minister of Energy signed Additional Agreement No 3 (**Textual Attachment No 3**) extending the Contract for 2 more years. By way of Letter Ref. 017/08.05.2019 (**Textual attachment 4**) the Company has filed an application to register a commercial discovery, which can be granted after a positive EIA decision, indicated in a letter from the Ministry of Energy Ref. No. E-26-T-364/15.05.2020 (**Textual attachment 4**).

At the time of writing of this report, there is no executed agreement granting a concession for the deposit. As required by Article 37, paragraph 1 of the Mineral Resources Act (MRA), the concession area includes the area of the deposit or its separate parts, and all areas necessary for the

performance of the concession-related non-mining activities. The following should be taken into consideration when defining the concession area:

- the bedding of the mineral resource;
- the technical conditions for its utilization to the full;
- the necessary additional areas for placing of stockpiles, storage facilities and technical infrastructure;
- the requirements of the MRA for optimal extraction of the natural resource, the overall and annual mining designs will provide for additional exploration to ensure the most complete possible extraction of natural reserves and resources during the mining of the deposit, by applying suitable and environmentally sound technologies.

The distances between the mining areas and urban boundaries and areas have been taken into consideration with a view to securing buffer zones around the technical infrastructure and to protect the environment and human health.

Therefore, the comments here will extend to the boundaries and size of the design concession area required for the mining of the deposit and processing of the ore as this area will be proposed for alignment with the concerned government authorities during the concession granting procedure.

The Contracting Company intends to carry out mining and processing of polymetal (gold-silver) ores from the Rozino Deposit, Tintyava License, with a future concession area of **275 ha, of which 118 ha will be disturbed**. The main activities considered herein are:

- open pit mining of polymetal ores;
- flotation of the ore to concentrate;
- construction and operation of the necessary attendant infrastructure – roads, water supply, power supply, material stores, mine waste facility, etc.;
- staged rehabilitation of the disturbed areas.

The concession period is set as 35 years.

The purpose of the IP is open pit mining and processing of polymetal gold and silver ore from the Rozino Deposit in the Tintyava PLA. The open pit mining process will involve liberation of the natural resource from overburden, mining by drilling and blasting, and crushing of the mined material. Ore processing will comprise flotation to produce concentrate as the final product from the plant. No ingot metal will be produced. The mining waste will be disposed of in mining waste storage facilities.

The IP does not consider maintenance and construction of an explosives storage facility. Blasting will be based on a written agreement with a specialized company possessing all the necessary permits and agreements and carrying out the storage and delivery of the explosives and blasting of the ore mass.

The investor had informed the Haskovo RIEW, the concerned municipalities, mayor's offices and communities at the earliest stage. The investment proposal (IP) lies within the scope of item 19 - Open mining of raw materials in quarries and pits in the case of surface area exceeding 25 ha, or peat extraction in the case of surface area exceeding 150 ha.' of Annex 1 to the Environmental Protection Act (EPA) and is subject to mandatory Environmental Impact Assessment (EIA).

At this stage, open mining and flotation processing of natural raw materials is outside the scope of Annex 4 of the Environment Protection Act and, therefore, the IP does not require an integrated permit in the meaning of Chapter Seven, Section Two of the Environment Protection Act. Thus, there is no need for an assessment of the applicability of BATs for the proposed technologies.

No storage of hazardous chemical substances and mixes in quantities exceeding those laid down in Annex 3 of the Environment Protection Act is envisaged in the IP and, therefore, it is not subject to Article 103 of the EIA. Explosives will be supplied by a licensed company whose storage facilities are equipped and operated in accordance with the legal requirements for use of hazardous substances.

The future license area does not intrude on protected areas in the meaning of the Protected Areas Act, but affects two protected areas (PA) of the country’s Natural 2000 ecological network:

- ‘*Rhodopi - East*’, code BG0001032, for protection of natural habitats and wild flora and fauna;

- ‘*Byala reka*’, code BG0002019, for protection of wild birds.

In line with the instructions given, the Investor has taken steps to prepare the necessary EIA documents and a report on the assessment of IP compliance with the protected area conservation goals and object of protection (CA report).

With reference to the letter of the Ministry of Environment ref. 99-00-587/27.05.2024 and pursuant to Article 98, paragraph 1 of the Environment Protection Act, a notification to a potentially affected party - the Republic of Greece has been sent concerning the EIA procedure and in line with the provisions of the Convention on Environmental Impact Assessment in a Transboundary Context. This notification is consistent with Decision I/4 of the First meeting of the Parties to the Convention.

Letter Ref. OBOC – 68/23.10.2024 of the MOEW contains the response of the Greek state confirming its wish to participate in the EIA procedure as a concerned party. This makes the Minister of Environment and Water the competent authority for conducting of the EIA procedure. The assessment considers in detail the aspects of transboundary impact with particular focus on ‘water’. The letters concerning the transboundary procedure are presented in **Textual attachment 5**.

The project site is within the area of responsibility of the East Aegean Catchment Directorate based in the city of Plovdiv. The EABD Director has expressed a statement in Letter Ref. No. IIY-01-183 (5)/26.05.2023 (**Textual Attachment 6**) that the IP is admissible provided that the following conditions are met (we attach some of them):

- No pollution of surface and ground water by operations in the IP is allowed;
- No activities that may impair the status of the BG3MA100R270 water body are allowed.
- No direct and indirect disposal of hazardous and harmful substances in ground water is allowed during the IP implementation;
- No felling of natural riparian vegetation is allowed;
- Abstraction from surface or ground water must be carried out following a permit issued in accordance with Article 44, paragraph 1 of the Waters Act;
- Construction of new facilities in a water body must be carried out following a permit issued in accordance with Article 46, paragraph 1 of the Waters Act;
- The quality and quantity status of drinking water sources in the IP area is protected;

- Construction of drainage ditches peripheral to the mine field and to the open pit must be provided for in order to collect precipitation and snow-melt run-off from higher levels to prevent entry of surface water into the pit;
- Adequate measures for reusing of precipitation, waste and drainwater into a closed return cycle in order to reduce the planned water abstraction and efficient use of water.

All those requirements have been taken into account in the basic design and the relevant analyses will be made in this EIA Statement.

It should be noted that the Water Act does not provide any bans and restrictions as regards the IP presented above.

To ensure comprehensive analysis and assessment of the ‘ground water’ component, the Principal has commissioned drawing up of a ‘Report on hydrogeological conditions in the Rozino Deposit IP area’. This report was made by competent persons and was presented to the MOEW with the Principal’s letter Ref. No. 4-2/28.04.2024. Two statements, one by EABD Ref.No. ПЙ-10-182(8)/12.05.2024, and one by an expert in hydrogeology, were returned concerning this report. All documents are presented in **Textual attachment 16**.

The scoping terms of reference for the EIA statement was prepared in accordance with Article 10, paragraph 3 of the EIA Regulation in October 2024 and was submitted for consultation. The written results from the consultations are presented in **Textual attachment 7**.

The EIA Statement was prepared on the grounds of Article 96, paragraph 1 of the Environment Protection Act, in line with the consultations with the concerned parties and the community, additional studies during the EIA procedure, including letters of the MOEW with Ref. No. OBOC-68-17/18.11.2024 and Ref No. OBOC-68-28/14.02.2025, and was filed for quality evaluation by the MOEW in August 2025. A first negative quality assessment of the EIA Statement and of the CA was provided with letter Ref. No. OBOC-68-65/20.10.2025 (**Textual attachment 7A**), with certain omissions being pointed out and the statement being returned for supplementing. It is notable that most statements, and the statement by the competent authority, do not use the criteria for quality assessment of the EIA Statement laid down in Article 14, paragraph 1 of the EIA Regulation.

This supplemented EIA Report reflects the remarks made and we draw attention to the following response to the remark in item 1.5 of MOEW’s letter: “No evaluation has been made as to whether individual IP sections are not within future sanitary protection zones around potable water abstraction facilities without sanitary protection belt areas, less than 1,000 m. from the boundaries of the future concession area for which no sanitary protection belt areas have been established”, written in detail and reasoned in the report submitted in August 2025 and repeated herein.

All existing sources of water around the future concession area have been investigated. Facilities of the Haskovo Water Supply and Sewerage Company are situated 800 m to the east and 1,800 m to the south of the IP boundaries - the Rozino Pumping Station (in the Arpa Dere River floodplain) and the Gugutka Village Pumping Station (in the Byala Reka River floodplain) (Figure IV.2.2-1, Table IV.2.2-11, and Table IV.2.2-12. Information was requested of the EABD in accordance with the Public Information Access Act. Decision for provision of access to public information No. 3ДОИ-01-9/31.01.2025 by the EABD Director (**Textual attachment No 15**) states

explicitly that **‘At the present time we have no information about any future IInd and IIIrd belts of Sanitary Protection Zones for near-by potable water supply sources’.** Therefore, such an assessment would not be possible and this expert statement remains;

Perhaps this answer has been read by the EABD and the matter is not raised again in their statement with Ref. No. IIY-010-808(2) dated September 26, 2025.

As regards the remarks in the same letter from the EABD, namely:

“The ‘Rozino’ head reservoir used for drinking water supply and owned by a state forestry enterprise is situated in the lands of the Pastrook village, Ivaylovgrad Municipality, around 620 m. east of point 6 of the future concession outline. This water-abstraction facility is not provided with a sanitary protection belt as required by Regulation 3 of October 10, 2000.

Attachment 7.2.1. under Section 7 of the updated Aegean River Basin Management Plan of the East-Aegean Basin Directorate, adopted with Decision 920/31.12.2024 of the Council of Ministers, provides for a measure with code DW_1 and name: Prohibitions and restrictions for activities in the potable water protection zones and in the sanitary protection belt areas and buffer zones around water abstraction facilities/systems, and implementation action for measure: DW_1_35 Prohibition for mining of underground mineral resources, including aggregate and construction materials, within a buffer zone with a radius of 1,000 m. from groundwater abstraction facilities for potable water supply.

In view of the circumstances described above, some of the design concession area, which is the subject of the IP, falls within the scope of the measure provided in the 2022-2027 Aegean River Basin Management Plan of the East-Aegean Basin Directorate, and the 1,000 m radius buffer zone around the groundwater abstraction for potable water supply (the Rozino head reservoir in the village of Pastrok in the Ivaylovgrad Municipality) should be excluded from the concession area in the Rozino Deposit.” we are making the following point of clarification:

The Rozino head reservoir is 2,300 m. away from the pit outline in which mining will be carried out and 1,300 m. from the buffer zone boundary, with a 1,000 m radius from the water intake facility. As can be seen on Figure II.1.2-1, the catchment is near point 6 of the future concession area, and this point is downstream of the non-contact water reservoir. As is visible on the maps, **no mining is possible in the 1,000 m buffer zone (without a sanitary protection belt) and, therefore, no drilling and blasting, because there will be a man-made water intake, a non-contact water reservoir, required for the IP.**

We are pointing out once again that the mining will be 1,300 m. away from the 1,000 m radius buffer zone (without a sanitary protection belt) and 2,300 m from the head reservoir and, therefore, we see no reason to exclude the buffer zone area around the Rozino head reservoir from the future concession area. Excluding this area will deprive us of the possibility to build a non-contact water reservoir which is needed for the IP. The figure below is a visual presentation of these distances.

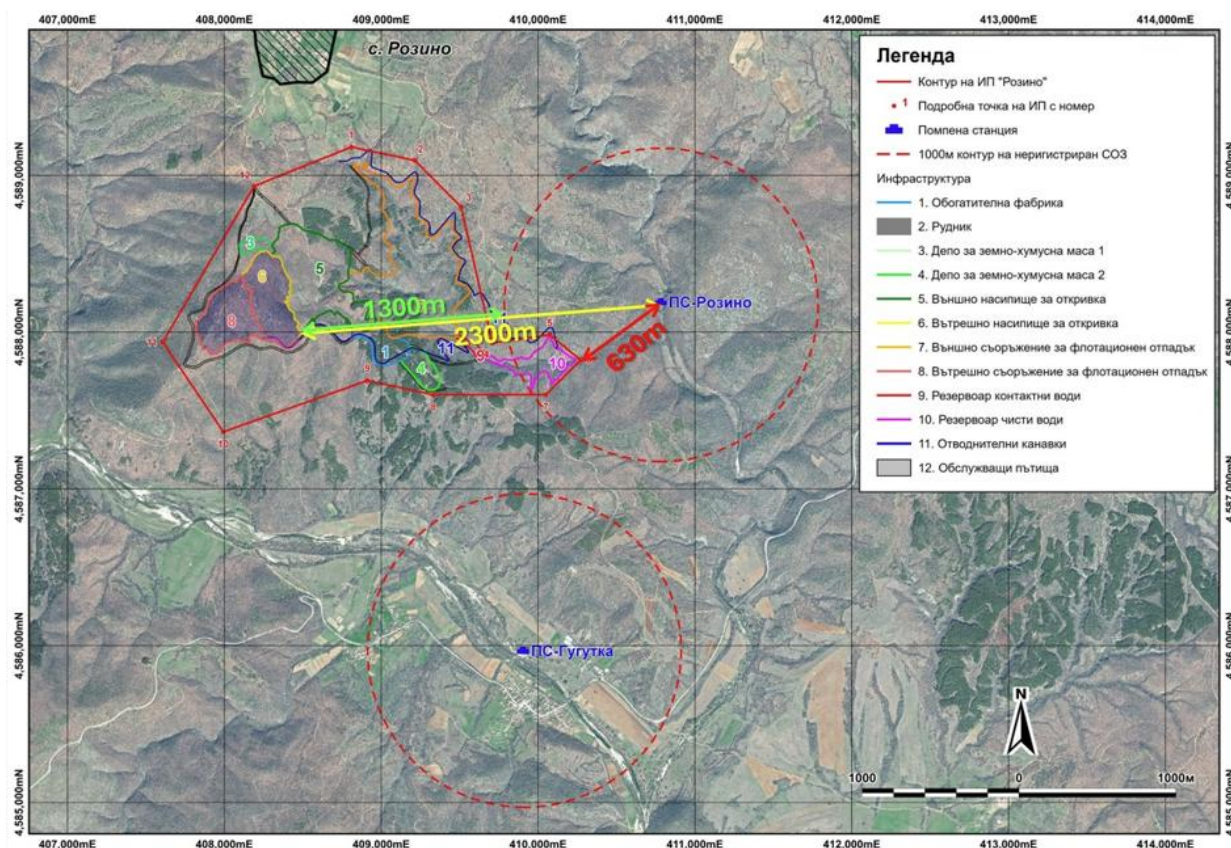


Figure II.1.2-1. Location of the Rozino Head Reservoir relative to the pit outline and the IP outline

In addition, we point out that Figure V.2-1 (page 167) indicates the IP watershed areas during the operation and shows clearly that no mining operations will be carried out in the watershed areas of the Rozino head reservoir.

The subject of description and analysis in this Statement is the *territory* that will be affected by the entire IP with its additional or auxiliary facilities and activities in relation to the space and time dimensions, the frequency and the duration of significant impacts which the IP is likely to have. The impacts caused by the IP during *its implementation stages – construction, operation, closure and rehabilitation*, have been identified and the extent of development/detail of the draft document and the information provided by the Investor have been taken into account.

Also, the possible cumulative impacts have been evaluated based on available information about any other existing or envisaged activities and projects carried out in the IP area.

The expected impacts have been evaluated and general and specific conclusions are made in respect of the expected potential impacts and their extent. These conclusions underpin the proposed recommendations and measures to reduce the impacts, resolve potential future environmental issues and concerning the safe operations on site, ensuring human-health and the environment protection and sustainable development of the region.

The list of experts according to Article 83, paragraph 1 of the Environment Protection Act and the leader of the team writing this EIA statement is presented in **Textual attachment No 1**. Copies of the higher-education diplomas of all experts are attached and written declarations, personally signed by the experts, as required by Article 11, paragraph 4 of the EIA Regulation are attached and consistent with: Regulation (EU) 2016/679 of the European Parliament and of the

Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC; the Law on Electronic Documents and Electronic Certification Services and with Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC. **According to the current legislation, qualified electronic signatures are equal to the signatures affixed by hand.**

II. A DETAILED CHARACTERISATION OF THE IP WITH INFORMATION ABOUT THE SIZE, IMPACTED AREA, PARAMETERS, SCOPE, VOLUME, THROUGHPUT, SCOPE, AND FORMATTING OF THE COMPLETE IP

1 . Description of the project location. Land Requirement Mode of operation. Throughput.

1.1. Physical features of the region

The Rozino deposit in the Tintyava PLA is situated in the lands of the villages of Rozino, Gugutka, Ivaylovgrad Municipality, Haskovo district, and is 1.2 km. to the south of the Rozino village. The border with Greece is to the east and south, and the municipalities of Lyubimets, Majarovo and Krumovgrad are situated to the north and west. The Rozino Project is located approximately 350km (by road) east-southeast of the city of Sofia.

The Rozino Deposit region is encircled to the south by the steep rocks of the Tashlaka locality and is divided by the Byala River and its tributaries which flow into the regional watershed area of the Arda river. The average altitude in the deposit area is approximately 470 m. (in the north) and 300 m. (in the south).

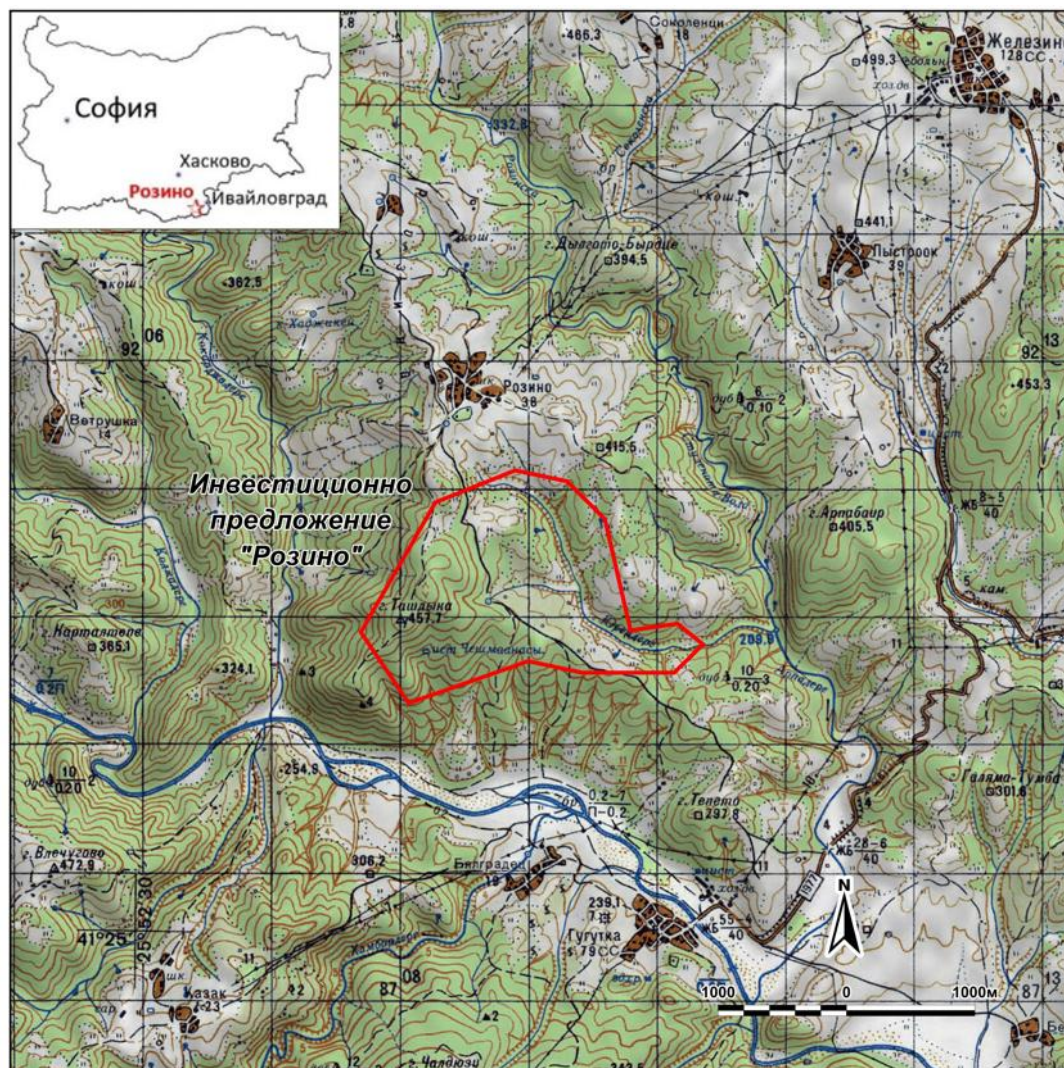


Figure II.1.1-1. Location of the Rozino Deposit, Tintyava Property

The topography in the area is low-mountainous and hilly, with level hills being prevalent. Low ridges and valleys are well pronounced. The Maglenik height is home to Kodjaele, the highest peak in the area, of 1,267 m. The elevation above sea level varies between 70 and 700 m., averaging at 320 m. The topography at the level of the Tashlaka peak is highly indented by the Byala reka river and its tributaries - Dermen dere, Kokarja dere, Arpa dere, Hambar dere, Yuruklerska, etc. Tectonically controlled river valleys dominate the river basins, whose rivers, flowing from different directions, enter the main regional river - Arda.

The area belongs entirely to the Gyumyurdjin-Maglenishka geographic sub-area.

North-westerly winds prevail and are active along the valleys and the mountain ridges. Foehn is also present. The annual average precipitation varies widely between 800 and 1,200 mm. Its high is during the autumn and winter, in November and December. Often storms reach 100 mm. over 24 hours. This is one of the reasons for sheet erosion. Snow stays on the ground for 5 to 10 days per year. The surface run-off rate is 5 to 25 l/sec./1m².

1.2 Areas required for the IP and road links. Design depth of mining.

The overall intended concession area amounts to **275 ha**, of which **118 ha** will be disturbed. The buffer area covers 157 ha. Some facilities will be developed in areas already processed/disturbed without taking over new areas, with the ‘overlap’ being 261,9 ha. The individual infrastructure is distributed as follows:

No.	Sites	Areas, ha x 10
1	Process plant	51.4
2	Open pit	261.9
3	External topsoil stockpile 1	14.5
4	External topsoil stockpile 2	37.0
5	External waste rock stockpile (overburden)	247.0
6	Internal overburden stockpile (backfill).	133.2
7	External process tailings storage facility.	438.4
8	Internal (backfill) process tailings storage facility.	128.7
9	Contact water reservoir. Includes: an external processing waste storage facility, a mine, a processing plant and collection ditches. Comprises a supernatant water body and retaining dam).	9.1
10	Clean water reservoir and collection ditches (lake and retaining wall)	62.4
11	Service roads (external to the above infrastructure)	57.3
12	Overlapped areas - backfilling-internal stockpile and internal process tailings storage facility (this area is deducted from the total area!).	-261.9
Total required area:		1179.0

No mining will be carried out in the buffer zone. The buffer zone will provide protection for the facilities and plants and will restrict accidental access by people and animals. It will ensure compliance with the obligations arising from the Mineral Resources Act for further exploration with a view to optimal extraction of reserves and resources from the subsurface.

A visual presentation of the IP elements, which are at the concept phase, is made with the layout plan presented on Figure II.1.2-1. As the project advances with transition toward detailed design, the outlines of individual sub-sites may change insubstantially, within the evaluated terrain, without changes to the impact analysis.

In keeping with the requirements set forth in letter IIY-02-231/1/18.12.2024 of the West Aegean Region Basin Directorate, provisions should be made for construction of drainage ditches peripheral to the mine field and to the open pit must be provided for in order to collect precipitation and snow-melt run-off from higher levels to prevent entry of surface water into the pit. It should be noted that they are visualised in the layout plan hypothetically, given the current topography of the terrain. Their exact locations will be determined following engineering calculations and development of specific technical designs to ensure maximum efficiency in respect of the technical parameters of the future overall design. This is the reason for occasional deviations of the contours of hypothetical ditches outside the proposed concession area. These deviations will be corrected during the technical design phase and will be aligned with and constructed within the submitted concession area.

The coordinates along the outline of the future license are presented in the table below.

Table 1.2.1. Registry of boundary point coordinates of the design license area (БГС 2005 system and Geographic coordinates)

No.	East, m	North, m	Longitude, degrees	Latitude, degrees
1	408811	4589180	25.908290	41.449019
2	409216	4589094	25.913149	41.448299
3	409510	4588798	25.916717	41.445662
4	409710	4587930	25.919241	41.437868
5	410076	4587982	25.923614	41.438381
6	410274	4587821	25.926004	41.436948
7	410050	4587600	25.923359	41.434934
8	409332	4587600	25.914766	41.434853
9	408913	4587690	25.909739	41.435616
10	407994	4587363	25.898795	41.432568
11	407609	4587935	25.894091	41.437674
12	408190	4588930	25.900899	41.446702

The register of impacted propertis is presented in **Textual attachment No 8.**

The IP layout plan is presented on the next figure.

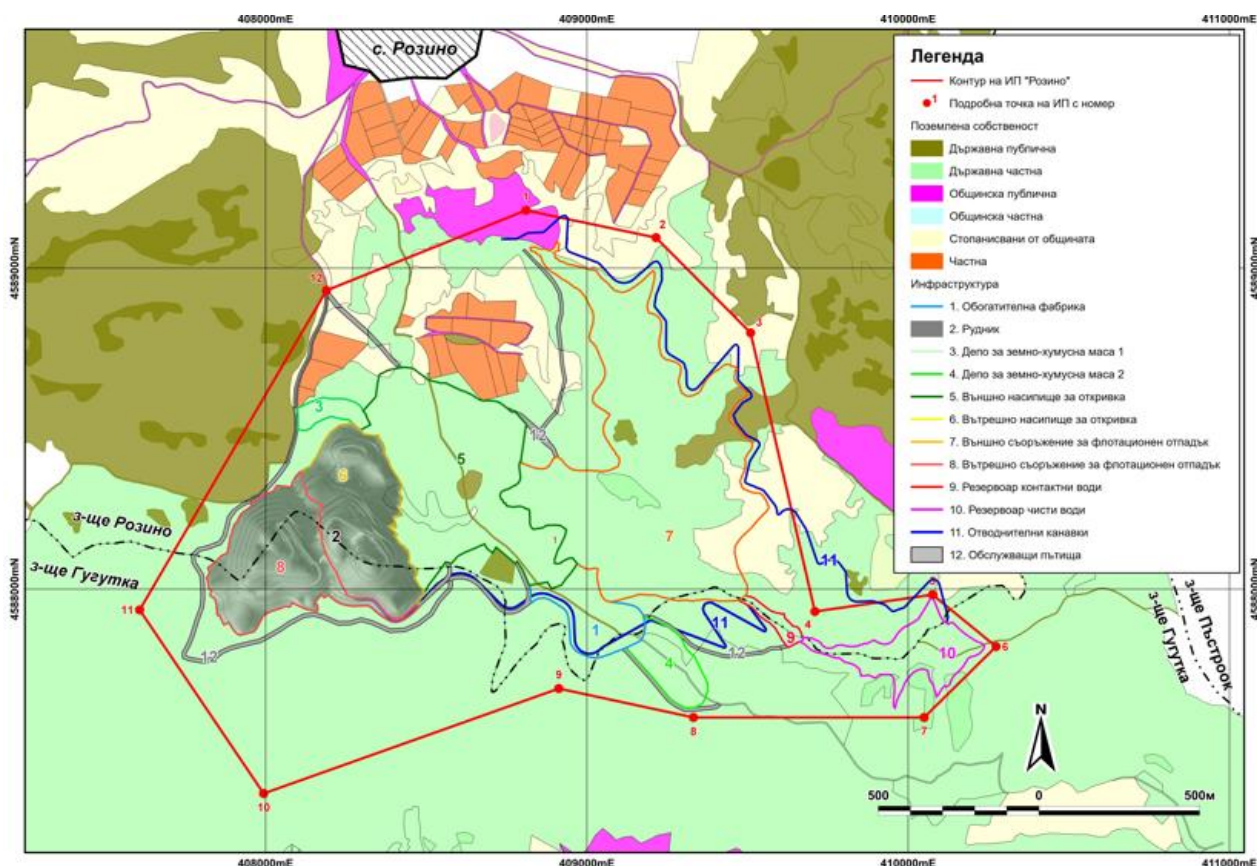


Figure II.1.2-1. IP layout plan

Realizing the investment proposal requires construction of on-site roads and access roads. The Rozino mine will be connected to the road system along the existing unsurfaced road running across the Rozino and the Konnitsi villages and linking them to the towns of Ivaylovgrad and Krumovgrad via the II 59 road.

It is assumed at this time that two options are present for transport access to and from the concession area, including hauling of final produce:

- *option 1:* Via a new 3,725 m. long private road from the concession area to a Category III National Road;
- *option 2:* Via a new 2,810 m. long private road from the concession area to a municipal road. The municipal road is 12,210 m. long.

These options are visualised on **Figure II.1.2-2**.

The expected weekly number of produce hauling trucks totals at 30, with 25 t of net weight hauled per truck, in three business days per week.

An approximate forecast is that hazardous chemicals and materials will be delivered once per quarter but it is unclear where the suppliers will be from as no suppliers have been selected and cannot be selected before a mining concession is obtained and the processing plant is constructed.

The principal intends to use **electric trucks** because no harmful substances are emitted and no internal combustion engine noise is generated. The economic incentives and regulations of the EU, such as the Euro 7 requirement, make way for an increasing number of electric heavy vehicles in the coming years. It is the EU policy to remove gradually heavy diesel-powered vehicles to the benefit of zero-emission vehicles. The IP proponent also aspires to this policy. 5,279 new electric trucks have been registered in the EC in 2023 alone.

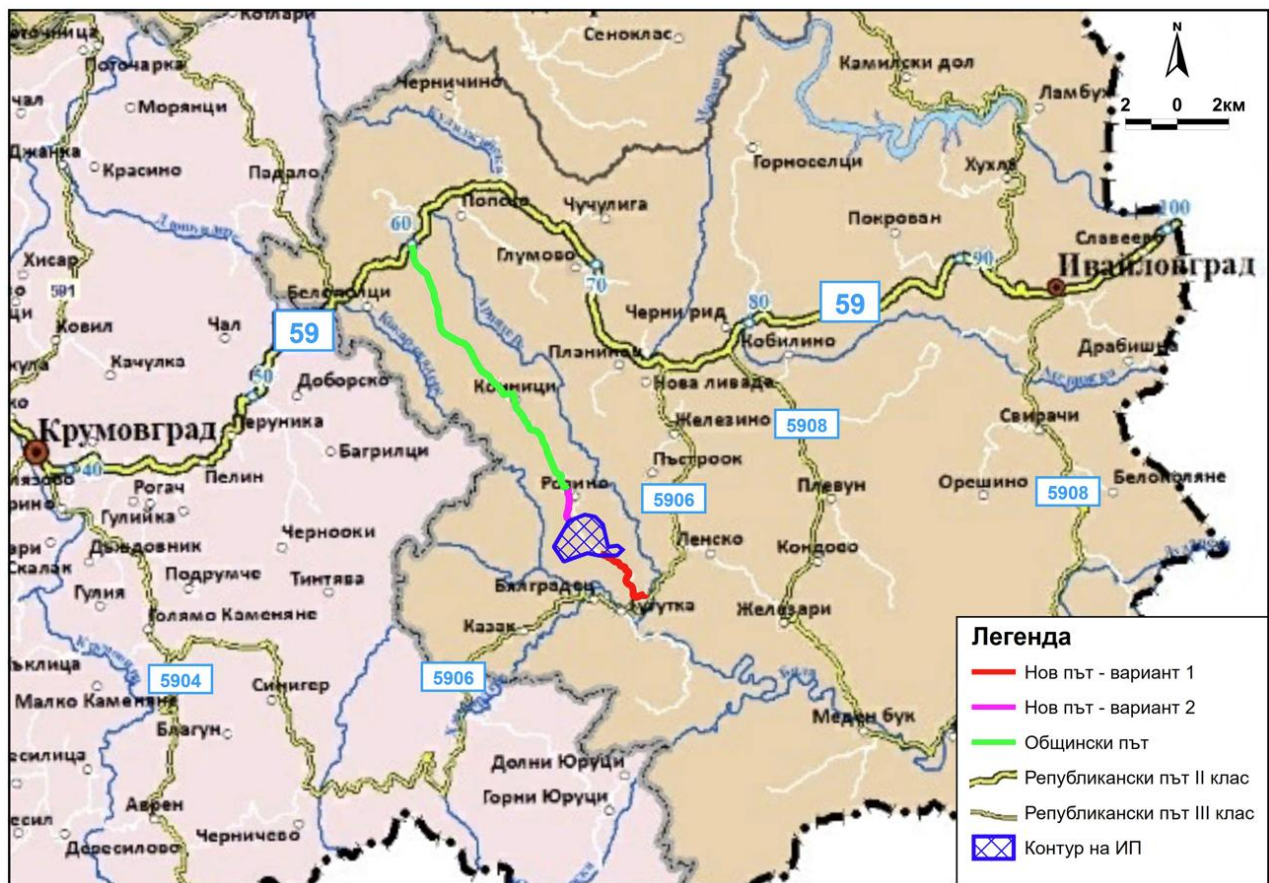


Figure II.1.2-2. Final produce hauling option assumptions

The measured reserves and resources continue to an approximate depth of 195 m., with around 95% of them lying at less than 120 m., with approximately 1% being below 140 m. **The planned maximum depth of the pit is approximately 140 m from the terrain surface.**

Figure 1.2-2. presents a cross section of the pit with designated elevations.

RL 315 is the elevation of the fresh water reservoir and RL 325 is the elevation of the mixed water reservoir.

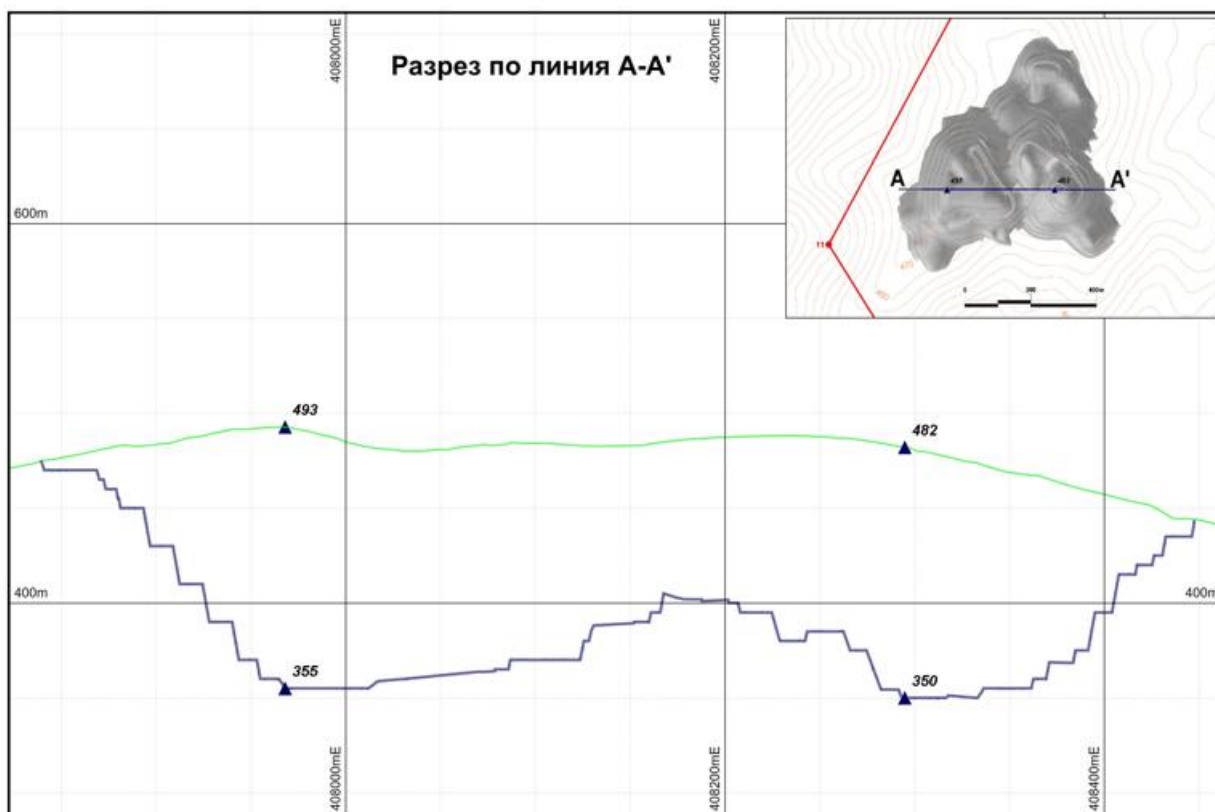


Figure II.1.2-3. Cross section of the pit with elevations

1.3. Throughput. Mode of operation. Personnel.

The reserves in the Rozino Deposit amount to 11.3 Mt of ore grading at 1.33g/t gold and 26.6 Mt of overburden, as described in the Supplement to the Final Report on Reserves’ Given the time required for mine construction, construction of the necessary infrastructure, land-acquisition procedures, investment risks, mining and geology risks, the period of existence of the site will be 35 years for an average annual rate of production of 0.87 Mt of

The planned maximum annual throughput rate is as follows:

- Ore – 1.77 Mt/a or 0.72 Mm³/a;
- Overburden – 3.3 Mt/a or 1.3 Mm³/a;

The planned average annual throughput rate is as follows:

- Ore – 0.87 Mt/a or 0.36 Mm³/a;
- Overburden – 1.65 Mt/a or 0.681 Mm³/a;

Processing of these quantities of ore requires a processing plant with a design annual throughput of 1.7 Mt of Tons This design maximum output of the plant will ensure available processing capacity if the planned maximum annual throughput rate of the mine is achieved.

The following table presents the regimen of operation of the mine and the processing plant.

Table 1.3-1. Mine and Processing Operation Regimen

No.	Parameters	Unit	Qty
1.	Work days per year		
	- Total number of days in the year	No./Year	365
	- Number of holidays per year	No./Year	0
	- Number of bank holidays per year	No./Year	14
	Total number of work days per year	No./Year	351
2.	Work days per week	No./Week	7
3.	Work shifts per 24 hours	no/day	
3.1.	For the pit	no/day	2
3.2.	For the plant	no/day	3
4.	Shift duration	hour	8

The number of persons operating on site was determined by the types of activities during the operation, with the expected **total personnel being 120 persons**, but may get as high as 300 if needed. According the present information, 50 persons will be required for the mining operation and 70 for the Processing Plant.

2. Description of the physical characteristics of the complete IP and, where applies, of any required demolition operations, of the water and subsurface use requirements – during the construction and operation phases. Rehabilitation.

Geological engineering, hydrogeological, geological and other field testing and laboratory testing have been carried out while studying the mining and processing conditions for operation of the deposit. Open pit mining will be employed, given the dip, situation and depth of the natural resource.

The intended IP parameters are as follows:

- ✓ No mining operations have been carried out in the Rozino deposit, Tintyava PLA;
- ✓ No processing plant has been constructed;
- ✓ Access by transport to the deposit will be along existing roads, with partial construction of new roads;
- ✓ There are no electricity and water supplies to the mine.
- ✓ Drilling and blasting will be employed during the mining.
- ✓ The deposit will be operated in accordance with duly approved overall operation and closure design/plan.

Deposit stripping and pit construction are fundamental for the open pit mining. The efficient and safe operation of the Tintyava PLA is contingent on the correct and coherent implementation of these activities.

The open pit mining of polymetal ores from the Tintyava PLA will include drilling and blasting, crushing, hauling and processing of the mined material in the processing plant, hauling of overburden (waste rock) to a stockpile, and transporting of the flotation waste to a MWF.

Mine Construction

The capital mine construction works will be as follows:

➤ **Year 1:**

- Rehabilitation of existing road links and building of new roads to the pit, to the processing plant, to stockpiles, to the water reservoirs;
- Stripping works to prepare 2 stockpiles for topsoil collected selectively where possible and also stored selectively, a mine waste facility, and a temporary low-grade ore stockpile Approximately 45% of the project area will be stripped;
- Mine plant maintenance pad is set up;
- Construction of a power supply line is started;
- The plant site is cleared and construction of the processing plant is started;
- Mobile ISOBOX containers for the administration and changeroom facilities are delivered;
- A diesel generator set is delivered and installed for use during mine construction and, subsequently, as a stand-by power source for cases of main-supply failure;
- Delivery and installation of a mobile crusher for the MWF retaining walls (dams) and for road construction and maintenance;
- Grubbing of terrains intended for the clean water pond and starting the dam construction;
- Grubbing of terrains intended for the contact water pond and starting the dam construction;
- Grubbing of MWF footprint areas;
- Grubbing of the contact water reservoir dam area at the base of the MWF;
- Setting up of the first mine levels, mainly for overburden removal, in order to uncover and prepare ore reserves;
- Delivery of mobile chemical toilets for the workers.

➤ **Year 2:**

- Continued selective topsoil removal, with further 45% of the area, or 90% in total being stripped, and continued selective topsoil disposal for subsequent use in rehabilitation;
- Continuing works on the MWF and the low-grade ore stockpile;
- All road links between individual facilities are completed;
- The MWF contact water reservoir dam is completed as are the pit and the processing plant will be completed;
- The low-grade ore stockpile contact water reservoir dam will be completed;
- The clean-water reservoir dam will be completed, as will be the contact-water pond and the non-contact water reservoir.
- The entire system for management of the water flowing to the contact-water and non-contact water reservoirs is completed;
- The adjoining infrastructure is completed and operations can begin;
- Construction of the processing facility will be completed by the end of Year 2.

Table II.2-1 shows the overburden and ore volumes utilized during the first two years.

Table II.2-1. Volumes utilized during the mine construction phase

Production year	One		Two	
Section 1	Overburden, t	Ore, t	Overburden, t	Ore, t
Total:	8,621	3,837	708,689	178,947
Stockpiled ore		3,837		178,947

Completion of all of the above activities completes the mine construction phase and initiates the proper mining.

Operation

Proper operations will begin immediately after mining construction is completed and after the plant begins normal operations.

The main processes during the operation will be:

- Overburden removal
- Mining operations
- Ore Processing

Ore mining

Topsoil overburden (mass) work

The topsoil (soil) overburden will be collected separately from the rock overburden. Selective topsoil stockpiling is envisaged and the topsoil will be used for disturbed-area rehabilitation after operations end.

The main soil-mass collection activities will be:

- removal from the envisaged areas of tree and brush vegetation (grubbing);
- heaping of the soil mass by bulldozer, although it should be noted that no topsoil is present in some areas or is shallower than 0.25 cm. and, therefore, cannot be collected. The topsoil from all other areas will be collected in heaps and loaded by front end loader or excavator onto trucks for hauling to the two top-soil stockpiles;

These stockpiles will be developed during the mine construction and will be closed after rehabilitation is completed.

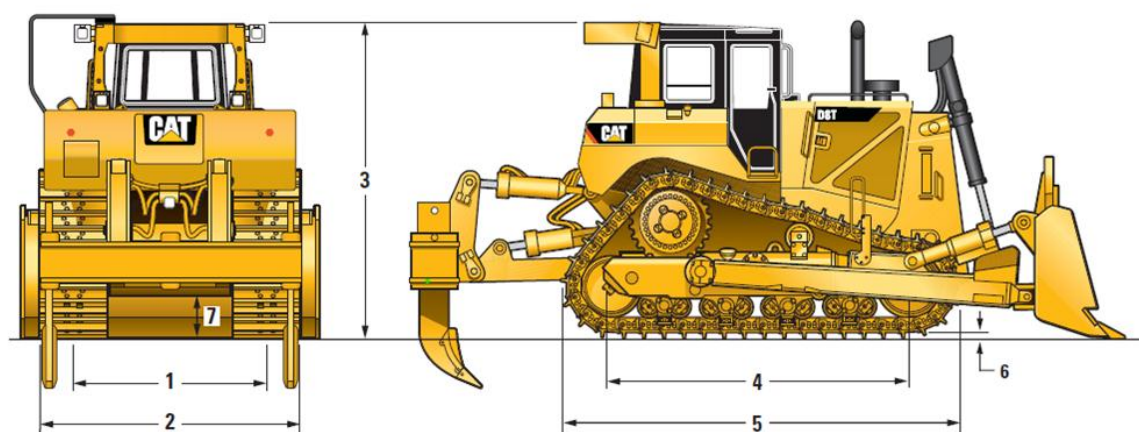


Figure II.2-1 CAT D8t bulldozer.

Overburden (waste rock) work

The following overburden removal and ore-mining parameters have been set for the Rozino Deposit:

- Working bench height - 5 to 10 m.;
- Non-working bench height - 20 m. (the 5 m. high benches in the final non-mined contour are combined in groups of 4 or two 10 meter high benches joined as 2);
- Working bench angle - 85 to 90°;
- Non-working bench angle - 70°;
- Minimal width between two non-working bench groups - 12 m.;
- Minimal work-area width - 60 m.;
- Overall non-mined face angle $36\div 48^\circ$.

Because of the hardness of the overburden, it is accepted that both the ore and the waste rock will be detached by drilling with subsequent millisecond delay initiation and blasting using the NONEL system.

As it does not contain any payable components but envelops or is hosted in the ore-bearing rocks, the rock overburden in the Rozino Deposit should be selectively removed and stockpiled.

Most generally, the processes for selective removal of waste rock are: drilling and millisecond delay blasting to detach the waste rock from the massif, loading by back-hoe shovel to trucks and hauling to a waste-rock stockpile.

Currently, the NONEL (non-electric) blast field ignition and blasting system has for the past 30 years been most widely used in Bulgaria and in the EU because of its advantages over electric or cap-and-fuse ignition which were used in the past in almost all open pits and quarries in Bulgaria. The NONEL system has the following advantages:

- It is the safest transport, handling and initiation system;
- Its broad range of arming delay devices allows for controlled reduction of the blast impact to a minimum level and blasting of separate series of boreholes in the same blast field;
- Lower sound impact.
- Better fragmentation.

Overall, 26.6 Mt or around 10.8 Mm^3 of waste rock will be removed from the deposit by design. Or the expected maximum annual volume is 3.3 Mt ($1.3 \text{ Mm}^3/\text{a}$)

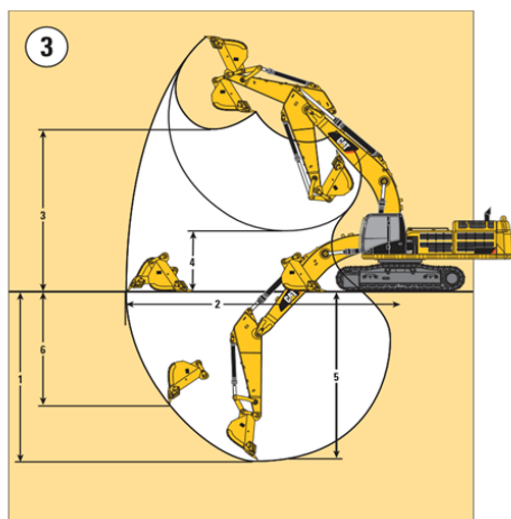
These volumes of waste rock are intended for stockpiling in the WRF to the east of the mine pit.

Backfilling of mined-out spaces will begin after Year 4 (once the reserves in Section 1 are exhausted).

The overburden removal bench heights will be 5 to 10 m.

The waste rock and the ore will be loaded by a 6 m^3 backhoe hydraulic excavator, positioned after the blasting and airing of the pit next to the blast field and beginning the loading of the blasted heap.

Figure II2-2. presents an overall view of a CAT 930D excavator and its basic technical parameters.



Дължина на стрелата	7.25 m
Рамо	3.4 m
Кофа	6.0 m ³
1 Максимална дълбочина на гребане, мм	7650
2 Максимална дължина на загребване на нивото на земята, мм	12 690
3 Максимална височина на товарене, мм	8200
4 Минимална височина на товарене, мм	3200
5 Максимална дълбочина на гребане със събрана кофа, мм	7520
6 Максимална дълбочина при вертикално гребане, мм	5100

Figure 2-2. The CAT 390D excavator and its basic technical parameters

Overburden hauling will be by dumper trucks with a total carrying capacity of approximately 55 t (33 m³) and a 10x4 axle configuration, a 7 m. loading length, a 2.6 m. loading width, and a 1.96 m. unloading height. The trucks will be equipped with modern engines meeting the EURO 6 emission standard.

Twelve machines will be used in overburden removal.

Table II.2-2. Overburden (topsoil and waste rock) work equipment types

No.	Equipment type	Required units
1.	Dozer	1
2.	Excavator	1
3.	Dumper trucks	7
4.	Water Truck	1
	Total overburden:	10

The conceptual design and a maximum annual output of overburden of 3.3 Mt and 1.7 Mt of ore underlie the tentative parameters for drilling and blasting for overburden and ore. The main drilling and blasting parameters are provided in Table II.2-3.

Table II.2-3. The main parameters of the ore blasting work

No.	Parameters	Unit	Overburden and ore - average parameters
1	Bench height	m	5 to 10
2	Hole Diameter	mm	76.2 to 110
3	Explosive type	-	ANFO/E3000
4	Relative explosive consumption	kg/m ³	0.36

5	Volume of rock blasted from 1 blast field / blasting for overburden	m ³	Approximately 30,000
6	Volume of rock blasted from 1 blast field / blasting for ore	m ³	Approximately 15,000
7	Frequency of blasting for overburden per week	qty	1 time per week
8	Frequency of blasting for ore per week	qty	1 time per week

The total number of blasts will be 88. The intent of the drilling and blasting works is to secure productive and efficiency of the excavation and hauling equipment and, also, of the primary crushing by suitable optimal crushing of the material and ensuring a minimal quantity of oversize pieces.

No explosives will be stored on site. The IP is not covered by the assumptions of Article 99b of the Environment Protection Act.

A contractor will carry out the drilling and blasting works and will deliver the required explosives immediately prior to their use, which excludes the likelihood of explosives being present on site. The determined mass of the charge will be mandatory for the drafting of each drilling and blasting pattern.

Ammonium nitrate - fuel oil (ANFO) and/or site-mixed emulsion are intended for use as the main explosives. The drilling and blasting parameters have been defined for three different zones on account of the rock mass type and condition, as follows: Oxide, transitive and fresh rocks, for both ore and barren rock, respectively.

Special blasting works means that the blasted material will slide in place without any flyrock. However, as regards the safety of blasting near urban areas, any probability of flyrock will be precluded through the use of protective covers. These protective covers could be heavy rubber blasting mats or geotextile or light covers made of wide and smaller mesh nets used together with discarded post-use conveyor belts. Properly positioned over the blast field, the protective covers restrict flyrock. Blasting mats reduce the generated noise and dust raised during blasting. The individual protective covers will be positioned in a manner that enables blasting fumes to escape. This reduces blasting fume pressure and allows for a debris and dust suppression by the mats. Another substantial advantage is that the covers can be used multiple times.

In this regard and in line with the good open-pit development practices, the first 5 to 6 blasts will be intended to adjust and fine-tune the drilling and blasting parameters. Well-blasted/fragmented material saves further energy for fragmenting of oversize pieces and generally improves the efficiency of the mining and processing machinery.

In line with the Rules on Labour Safety in Open Pits and Quarries, the drilling and blasting contractor will hold a license for operation with explosives and must receive a permit from the Regional Labour Inspectorate for the performance of drilling and blasting for each year and must draft a drilling and blasting pattern for each individual blasting and present it for approval by the Control Over Hazardous Materials Authority of the Ministry of the Interior's regional office. The determined safe mass of the charge will be mandatory for the drafting of each drilling and blasting pattern.

The investor may not carry out any blasting inconsistent with the safe explosive charge determined with respect of the seismic impact in the area of the quarry. The legislator has provided for a strict control mechanism intended to ensure work safety, environmental safety and local community life and health safety.

Experimental blasts have been carried out during the pre-feasibility studies in the Rozino deposit, with control measurements and registration of their environmental impacts, their results are presented in ‘*Evaluation of the Side Impact of Blasting on the Environment, Rozino Site. Final Report (2020.)*’

Ore related work

The following operational parameters have been adopted for both overburden and ore related work:

- Working bench height - 5 to 10 m.;
- Non-working bench height - 20 m. (the 5 m. high benches in the final non-mined contour are combined in groups of 4 or two 10 meter high benches joined as 2);
- Working bench angle - 85 to 90°;
- Non-working bench angle - 70°;
- Minimal width between two non-working bench groups - 12 m.;
- Minimal work-area width - 60 m.;
- Overall non-mined face angle $36\div 48^\circ$.

Ore will be detached by drilling with subsequent millisecond delay initiation and blasting using the NONEL system.

The NONEL system has the following advantages:

- It is the safest transport, handling and initiation system;
- Its broad range of arming delay devices allows for controlled reduction of the blast impact to a minimum level and blasting of separate series of boreholes in the same blast field;
- Lower sound impact.
- Better fragmentation.

The following mining sequence will be applied:

- prepared reserves from a level will be percussion-bored by a rig equipped with a dust extraction system;
- once bored, the field will be charged with primed explosives and blasted.
- Once the working face is aired, the ore will be loaded by a 6 m³ backhoe excavator onto dumper trucks and will be hauled to the concentrator plant.

The expected maximum annual ore volume is 1.75 Mt, or 0.72 Mm³. In total, 6 machines will be employed in ore mining.

Table II.2-4. Type of ore equipment, pcs.

No.	Equipment type	Required units
1.	Excavator	1
2.	Dump trucks	4
3.	Water Truck	1
	Total Ore:	6

The blasting parameters are provided in **Table II. 2-3.**

Securing the quality of ore feed to the plant requires work in two stages in the Rozino deposit. This will ensure availability of ore with the required quantity and quality over the entire period of operation.

Stage 1 Development of Section 1

All operation will be focused only in Section 1 during this stage.

Once stripping in Section 1 is completed, all the plant will be moved and used in the stripping and preparation of Section 2. Only mining will continue in Section 1 until the scheduled geological reserves are exhausted.

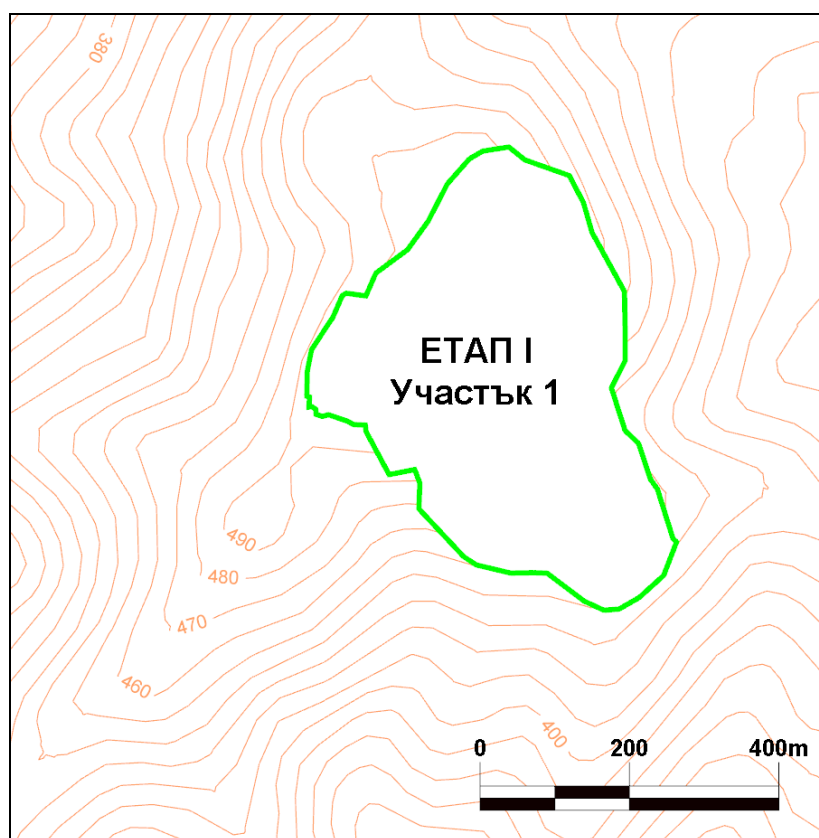


Figure II.2-3. Stage 1, Section 1 of the deposit

Once the bottom of reserves in Section 1 is reached, waste overburden and mine waste rock can be used as backfill in the pit in this section (the mine waste facility will change from external to internal).

Stage 2: Section 1+2

Stage 2 will begin by pre-stripping in Section 2. Mining in Section 1 will not yet have been completed.

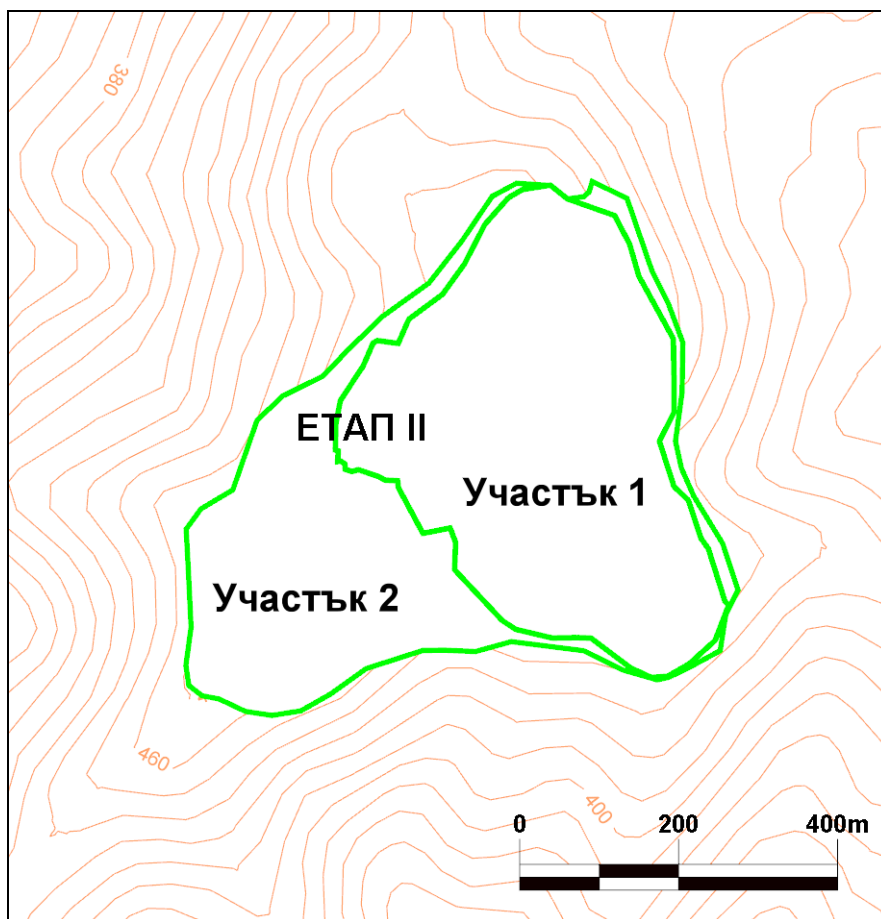


Figure II.2-4. Stage 2, Section 1 and Section 2 of the deposit

Section 2 will be completed after:

- full exhaustion of reserves in Section 2;
- backfilling of Section 1 using overburden rock and processing waste.

Stockpiling works

Stockpiling will involve selective stacking by bulldozer and trucking.

Selective/separate stockpiling of:

- Earthfill and topsoil;
- Waste rock (overburden);
- Flotation tailings (processing waste)

This selective stockpiling conforms to the best international practices for management and conservation of topsoil which will be used to remediate disturbed areas at the beginning of the rehabilitation phase.

Stockpiling of topsoil

Two earth-fill and topsoil stockpiles will be developed for the deposit, as follows:

- To the north-east with one horizon at RL 495 m;
- To the south-west with two horizons at RL 377 and 382 m.

These stockpiles are expected to evolve during the mine construction and will be closed after rehabilitation is completed. It should be noted that the a staged rehabilitation system can be selected during the drafting of the overall design for operation and closure of disturbed lands.

Stockpiling of waste rock (overburden)

As regards the rock overburden stockpile, it will be bulldozer operated. The waste rock hauled by trucks will be delivered to the stockpile and dumped. Subsequently, a bulldozer will shape the stockpile.

An external stockpile will be developed and in-pit stacking will begin after Year 4.

The boundary between the outer and the in-pit stockpiles is conditional and follows the outline of Section 1 in the pit.

Table II.2-5. Type of stockpiling equipment, pcs.

No.	Equipment type	Required units
1.	Dozer	2
	Total stockpiling works	2

Disposal of flotation tailings

The processing waste will be disposed of in a thickened state of 70 – 75% solids. This method is preferable to the conventional tailings for the following reasons:

- Higher recovery of return water;
- Lower use of ‘fresh’ water;
- Smaller disposal area;
- Significant increase in the stability coefficient of disposal facilities containing thickened flotation tailings;
- Significantly reduced risk of compromising of supporting facilities;
- Significantly higher potential for staged rehabilitation.

Disposing of flotation tailings (processing waste) with a 25%/75% water to solids ratio will reduce the footprint and, thus, the volume of the facility by approximately 1÷1.5 ha as compared to conventional disposal where the water to solids ratio is 45%/55%, i.e. there is an approximate 20 to 25% reduction of return water.

The water content of the flotation tailings will be reduced and a thickener will be installed in the processing plant to store the water from the dewatered flotation tailings.

Following exhaustion of the reserves in Section 1 and as the mining works in Section 2 advance, backfilling of the mined out spaces will begin and, again, will be consistent with the best open mining practices. Backfilling is expected to begin during Year 4 or 5 of the operations.

Backfilling has the following positive effects:

- Substantial reduction of the area required to (store overburden) and processing tailings (should the quality of such a process be proven);
- Substantial reduction of the time during which external stacking will be required, allowing for much faster rehabilitation of the possible external stockpile and the external process tailings storage facility.

Ore Processing

Process Flow Diagram and Description of the Ore Processing Plant

According to the pre-feasibility studies, the mined-ore processing sequence includes the following main and auxiliary activities:

- crushing and hauling;
- Storage of crushed ore in a covered intermediate storage facility - a reinforced concrete area covered by a canopy and with a feeder underneath;
- milling (ball mill);
- flotation;
- flotation tailings thickening and disposal in a WRF;
- concentrate thickening and filter-press dewatering;
- auxiliary activities - provision of: water, air and reagents.

The general concentrator-plant process flow diagram is presented on Figure 1.2-5.

Ore Dressing

Crushing

The choice of ore preparation circuit is underpinned by the low fragmentation index (4,7-8,92 kWh/t) and the moderate Bond-mill work index (11,2-12,5 kWh / t) for the different ore types which favours the use of a staged crushing circuit and ball milling. A belt feeder is the primary feeding device and is capable of sustaining impact by large pieces of ore entering the ROM bin. A static grizzly will separate all oversize pieces from the jaw-crusher feeder. Secondary dust from unloading trucks and from the crushing process will be prevented by a sprinkler system installed throughout this plant.

The comminution circuit is designed to produce P80 -12 mm. crushed ore. It will involve three stages of crushing: Primary jaw crusher followed by secondary and tertiary cone crushers. The ore will be fed directly from the pit or by a loader from the ROM pad to the ROM bin. A protective 700 x 700 mm screen will prevent entry of large pieces into the jaw crusher. A static 15kW hydraulic hammer will crush oversize pieces to the required size. A belt feeder (1300 x 6400 mm, 22kW) will feed the primary jaw crusher (160 kW). The crushed ore will be fed to a conveyor through a sieve. Any steel scrap will be removed by a magnet in the metal scrap bin.

Air quality in each crusher building will be maintained by a system of sprinklers. A 5 t maintenance hoist is provided for in the primary crusher building. The primary crushed material will be screened in a two-deck screen. The underside will report to the stockpiled ground ore and the oversize will report to the secondary and tertiary cone crushers. The secondary and tertiary crushers will operate in a closed circuit with the two-deck screen until all material is fed as through

the lower screen deck to the stockpiled crushed ore. Two weightometers are provided for. There is one secondary crusher and two tertiary crushers. Assuming 16 hour work in two shifts with a 75% plant availability on average, the crushing plant throughput will be 5,000 t/day. The total installed capacity of the crushing plant will be approximately 1,600 kW.

Covered crushed-ore intermediate storage

A 15,000 t. of buffer volume is provided for downstream of the crusher. This volume will be sufficient to supply the milling circuit for three days.

The crushed ore will be kept in a temporary stockpile comprising a reinforced concrete pad with a feeding bin and will be covered by a metal canopy to prevent fugitive emissions of dust.

Ore grinding.

The ore will be ground in a ball mill. The mill feeding belt will be provided with the necessary ore-feed speed controls and capacity counters. A crosscut conveyor belt sampler will be provided for metallurgical accounting purposes.

The milling circuit comprises a ball mill operating in a closed cycle with a battery of cyclone classifiers. This milling circuit is designed to produce particles P80 -75 μm . The ball mill is 4.88 m in diameter, 7.62 m long with a 3500 kW motor. The ball mill comprises a trunnion and gearbox lubrication system, a cooling system and a control system. The ball mill discharges into a sump feeding the hydrocyclone battery by means of a duty/stand-by feeding pump. The cyclone battery comprises 14 cyclones of which 12 only are operational at any time. The cyclone underflow reports to the flotation circuit while the sand recirculates back to the ball mill.

Any spillage from the grinding circuit will be contained within a sump beneath the ball mill. The sump will be equipped with a vertical slime pump to direct spillage back into the mill feed box.

The installed capacity in the milling circuit is approximately 3,700 kW.

Ore dressing (flotation)

High-volume flotation cells were chosen for the flotation circuit as they are more cost-effective than staged flotation reactors (SFR) from the CAPEX and OPEX perspective. The cells were sized and selected based on resulting laboratory flotation times, with a 2.5 industrial-scale ratio and an aeration ratio of 0.85.

The flotation circuit will comprise a standard collective rougher-scavenger and cleaner sections to produce gold-pyrite containing concentrate.

Prior to reporting to the flotation circuit, the ground ore from the hydrocyclone battery underflow will be passed through a 0,85 mm. mesh size cleaning vibrating screen for removing of all non-typical impurities in the ore, such as wood, plastics, metals and larger ore pebbles.

The cleaning screen underflow will be fed to the two agitation cells, each of 50 m³ in volume. Sequentially connected, they will provide the required slurry and reagent agitation time of 2 x 5 minutes.

A feeding pump downstream of the agitation circuit will feed the slurry to the rougher-scavenger cell circuit comprising 6 high-volume flotation cells in a configuration of 4 gold bearing rougher cells and 2 scavenger cells. Each cell has an effective volume of 60 m³, the total being 360 m³, which ensures the required flotation time of 34 minutes. All flotation cells electrical motors are 90kW each.

The flotation cells are supplied with air mass flow control to enable each bank of cells to be controlled.

The scavenger product is the final flotation barren waste and will report to the deep cone thickener for dewatering prior to reporting to the WRF.

The rougher concentrate will be pumped to the cleaner bank. Before reporting to the flotation cells, the slurry will be conditioned in a 10 m³ agitation cell allowing for a 5 minute-long slurry agitation with reagents. The cleaner circuit comprises two cells with installed capacity of 15kW and effective volume of 8 m³ each, or 16 m³ in total, ensuring the required 8.6 minutes of flotation time.

Water sprays are provided in the flotation cell launders to assist froth breakdown and concentrate flow.

A sampler on the discharge side of the scavenger tailings (final tailings) provides a current

analysis sample.

The cleaner concentrate is final and reports to a sump feeding a gold bearing concentrate sump. The target gold concentration in the final concentrate is 22 to 30 g/t depending on the grades in the ore feed.

The gold bearing concentrate pump is a fixed-speed cellular pump.

Reagent metering is controlled automatically to operator-set flow rates. Dedicated pumps and metering devices feed frother (Methyl Isobutyl Carbinol - MIBC) and collector (Potassium Amyl Xanthate - PAX) in various points along the flotation process.

Any spill along the circuit is collected by sump pumps mounted on the flotation circuit floor and is fed to the respective points along the flotation circuit.

The installed capacity in the flotation circuit is approximately 1000 kW.

Concentrate thickening and filtration.

The concentrate thickener has been sized using the available static-settling test results. No dewatering tests have been carried out to size and select the concentrate filter unit. Data about similar concentrate types and particle sizes were used instead. The design moisture content in the concentrate is 10 to 12% density by volume. The concentrate thickening and dewatering circuit comprises a 16 m. diameter concentrate thickener and a dewatering filter press. 11.3 t/h of concentrate will report to the thickener, with 23% solids in the feed. The thickener overflow will be recirculated back to the process water reservoir for reuse in the grinding and flotation circuits. Two 50 mm by 40 mm duty/stand-by thickened tailings pumps will pump the thickened product (50 to 55% solids) to the filter press.

The filter feed reservoir will be agitated to prevent settling of solid particles. Two 75 mm by 50 mm duty/stand-by thickened tailings pumps will pump the concentrate from the filter-press feed reservoir to the concentrate filter-press. The concentrate filter press will be a vertical filter-plate press designed to operate at 75% availability and to produce 11.3 t. of concentrate per day with 10 to 12% moisture content. The filter-press is equipped with a dedicated compressor and air intake.

The concentrate will report to a bin for storage before being loaded for processing by an end-user.

Required plant

The following will be required for the concentrator plant:

- A front-end loader to feed the crusher plant;
- A bulldozer to maintain the crushed ore buffer storage;

Table II.2-6. Type and numbers of the machines used in the Processing Plant

No.	Equipment type	Required units
1.	Front end loader	1
2.	Dozer	1
Total for processing plant:		2

Flotation Tailings Management

The following specifics were considered for the choice of the tailings thickening and dewatering process:

- Physical and chemical parameters of the flotation tailings will - the current data show no acid generation potential.
- The yield strength limit or yield stress - the property corresponding to the yield strength limit at which plastic deformation of the material occurs;
- Negative water balance;
- Best practices for dewatering of processed mining waste;
- Best practices for management of mining and processing waste.

The above practices and the basic design for the Rozino Deposit have lead to the selection of a technology for disposal of flotation tailings (processing waste) thickened to 70-75%.

Tailings disposal will be preceded by removal of water (thickening). The thickener operates in the following manner: radial flow of slurry to the centre of the thickener, into a feeding tank. As the solids settle, a rake reaching the outer end of the thickener rotates slowly and moves the settled material to the central outlet. At the same time, as solid particles deposit over the thickener base, the supernatant water or solution clarifies and as its level increases with the introduction of more slurry, it flows over a perimeter launder to return to the process. The particles settling into the centre of the thickener and the matter raked toward it exit through the central exit pipe at the thickener base, containing significantly less water than the slurry in which they had entered the thickener. High-pressure slurry pumps can transfer the thickened processing waste to the storage facility.

The advantage of this method is its efficiency as regards water and the more favourable operating conditions as compared to the conventional method of disposal of processing waste with high content of water. A second advantage over the other options is the minimal potential for liquefaction (slumping or flowing) of the disposed waste or a dam failure. Usually, high-output cone thickeners increase the solids concentration to around 70 -75%.

Cone thickeners ensure the highest yield strength values and guarantee high stability of the stored waste.

The water to solids ratio in the resulting waste is 25/75.

Higher thickening allows for:

- significant increase of the use of return water;
- significant reduction of the use of 'fresh' water.

Being denser, the waste is easier to handle and shape the stockpile it is disposed of in.

Reduced water content shortens significantly the time for evaporation of residual water and improves the stability of the stockpile body, thus allowing for its staged upgrading with guaranteed stability.

Thickening of waste prior to disposal bears a reflection on the overall consumption of water in the processing plant and provides a substantial improvement of the overall water balance.

Also, thickened waste disposal conforms to the natural geographic, geological, geotechnical and geochemical conditions of the site. As the waste is disposed of from the highest toward the lowest stockpile points, it should be noted this disposal enables staged rehabilitation of completed slopes.

Closure and rehabilitation

If the maximum output is achieved - mining and processing of 1.7 Mt of ore per year, closing and rehabilitation of worked out spaces may begin as early as Year 6 after mining begins.

Post-closure rehabilitation (technical and biological) will ensure a stable and maintenance-free status of the site. The proposed overall site-rehabilitation strategy is:

- Technical rehabilitation;
- Biological rehabilitation.

In practice, technical rehabilitation will start during mine construction, when topsoil will be collected and stockpiled selectively.

The technical rehabilitation activities will involve:

- Forming of ledges and securing of all non-working benches;
- Cleaning of all mine levels of residual rock pieces;
- Loading, delivery and spreading of topsoil along the terrains intended for rehabilitation;
- Preparing of terrains intended for forestation;
- Preparing of terrains intended for recovery for agriculture;
- Ensuring normal surface run-off;
- All areas remediated during the Concentrator Plant closure will be ploughed up (to increase water infiltration and reduce the potential for surface erosion and instability), levelled and covered by a 0.15 m deep top-soil layer (except for the concrete structures).
- The concrete slabs will remain in place and will be covered by approximately 0.40 m. deep layer of topsoil from the stockpiles.

The technical rehabilitation will be followed by biological one. It will comprise:

- Forestation of the areas intended for returning to the forestry fund by creation of a nursery of saplings of local tree species (oak and Austrian pine) which will be required for rehabilitation;
- Sowing of grass in the areas intended for restoration as agricultural land, by purchasing of seed mixes, sowing and growing.

3 . Description of the main characteristics during the operation of the IP (all processes and activities), such as power demand and power use, the nature and quantity of materials and natural resources used (including water, soils and biodiversity).

3.1. Description of the Main Parameters of the Production Process

The purpose of the IP is open pit mining and processing of polymetal gold and silver ore from the Rozino Deposit in the Tintyava PLA. The open pit mining process will involve liberation of the natural resource from overburden, mining by drilling and blasting, and crushing of the mined material. Ore processing will comprise flotation to produce concentrate as the final product from the plant. No ingot metal will be produced. The mining waste will be disposed of in mining waste storage facilities.

The IP does not consider maintenance and construction of an explosives storage facility. Blasting will be based on a written agreement with a specialized company possessing all the necessary permits and agreements and carrying out the storage and delivery of the explosives and blasting of the ore mass

For detailed information see the preceding item.

3.2. Required raw and other materials, utilized natural resources, power demands and power used

The IP is for mining of polymetal gold and silver ore, which means that **the natural resources will be impacted directly.**

The reserves in the Rozino Deposit amount to 11.3 Mt of ore grading at 1.33g/t gold and 26.6 Mt of overburden, as described in the Supplement to the Final Report on Reserves’

Mineral Composition of the Ore

The following were observed in the analysed ore samples:

- Primary materials: pyrite, chalcopryrite, sphalerite, magnetite.
- veined materials: quartz, calcite
- supergenetic materials: haematite/limonite, bornite.

Pyrite is the most frequent primary mineral. The remaining minerals occur as single grains. Pyrite precipitates as idiomorphic and hypidiomorphic grains and aggregates most common separately, rarely with chalcopryrite and sphalerite. Most frequently, the supergenetic minerals affect pyrite which is completely replaced by haematite/limonite in certain places.

No native gold has been found in the ore.

The only vein minerals observed are only quartz and calcite.

Haematite is the most widespread supergenetic mineral, attended by limonite in many places. Several bornite grains have been identified and may be the result of chalcopryrite alteration.

Fuel and hazardous chemical substances and mixes

Fuel, lubricants and other hazardous chemicals and materials (HCM) will be used and stored in the mine site as part of the ore concentration process.

The required equipment will be as follows:

Table II.3.2-1. Total required plant and machinery

No .	Equipment type	Overburden work	Ore related work	Stockpiling works	Flotation Plant	Required number, total
1.	Excavator	1	1	-	-	2
2.	Dump trucks	7	4	-	-	11
3.	Water Truck	1	1	-	-	2
4.	Front end loader	-	-	-	1	1
5.	Dozer	1	-	2	1	4
		Total 10	Total 6	Total 2	Total 2	20

Diesel fuel will be used for loaders and haul trucks and for ancillary self-propelled mining equipment. It will be kept in steel tanks with a total volume of 42.5 t. (with an average density of 0.85) - 50,000 l or 55 m³. The number of the tanks and their sizes will be in accordance with a Design for construction of a filling station consistent with the Zoning Act.

Diesel fuel will be delivered by tank trucks and at most 42.5 t will be present on site.

Fuels and lubricants will be used by the service machinery during the construction and operation of the mine.

The required lubricating, hydraulic and cooling oils and grease will be delivered packaged and the packaging will be returned to the vendors in a full-empty scenario.

Present on site, in a storage facility, will be:

- Prista® M10 De motor oil in 2 drums, each of 110 kg. capacity, totalling at 0.22 t. and
- Prista® AN 68 motor oil in 2 drums, each of 110 kg. capacity, totalling at 0.22 t.

Ammonium nitrate - fuel oil (ANFO) and/or site-mixed emulsion are intended for use as ***the main explosives***. The total number of blasts will be 88. A contractor will carry out the drilling and blasting works and will deliver the required explosives immediately prior to their use, which excludes the likelihood of explosives being present on site. ***A specialized explosives manufacturer will supply the blasting materials which will not be stored on-site.***

No ***chemical substances and mixes*** will be used during the mining process. Such materials will be used in the concentration process. The following reagents will be stored and prepared in the reagent supply area:

Frother: Methyl isobutyl carbinol (MIBC). The MIBC preparation system comprises an agitated storage tank with two duty/stand-by distribution pumps feeding MIBC to the flotation circuit. The maximum amount available on site will be 6.6 t., present in: a storage facility and a solution tank with a total capacity of 480 kg – 500 l – 0.6 m³, and a solution feeding tank with a total capacity of 60 kg – 64 l – 0.06 m³ with a solution metering system.

Collector: Potassium Amyl Xanthate (PAX). The maximum amount available on site will be 18.7 t., present in: a storage facility and a solution tank with a total capacity of 1,440 kg – 9,600 l – 10 m³, and a solution feeding tank with a total capacity of 480 kg – 3,200 l – 3.5 m³ with a solution metering system. Two duty/stand-by circulating pumps will feed the solution with PAX to the flotation circuit;

Activator: Copper sulphate (CuSO₄·5H₂O). The maximum amount available on site will be 45 t., present in: a storage facility and a solution tank with a total capacity of 3,000 kg – 20,000 l – 20 m³, and a solution feeding tank with a total capacity of 1500 kg – 10,000 l – 10 m³ with a solution metering system.

Sulphidizing agent: Sodium hydrogen sulphide (NaHS). The maximum amount available on site will be 48 t., present in: a storage facility and a solution tank with a total capacity of 3600 kg – 23,980 l – 25 m³, and a solution feeding tank with a total capacity of 1200 kg – 8,000 l – 8 m³ with a solution metering system.

Collector: Aerofloat 404 (A404). The maximum amount available on site will be 3.6 t, present in: a storage facility and a solution tank with a total capacity of 360 kg – 2,400 l – 2.5 m³, and a solution feeding tank with a total capacity of 60 kg – 400 l – 0.4 m³ with a solution metering system.

Flocculant (mixture): The maximum amount available on site will be 2.2 t., present in an automatic polymer-solution dosage machine. The flocculant distribution system comprises a flocculant dust bin, a feeding auger, an agitated mixing an agitated storage tank and two metering pumps. Polymer solution doses will be prepared in advance in a Tomal PolyRex automatic machine. This will allow for proper solution preparation and aging of flocculants. Both metering pumps will feed the mixed flocculant to the concentrate thickener and to the processing waste

thickener. Each line will be equipped with a mixer for further flocculant dilution to 0.02% density upstream of the thickeners.

The delivery, transport, preparation, use, disposal and treatment of solutions and packaging are in line with the regulatory requirements.

The IP is not covered by the assumptions of Article 99b of the Environment Protection Act.

Electrical power - Powering the concentrator plant and open pit machines, facilities and installations requires construction of a power line. At this stage, the design scheme involves construction of one branch line from the existing 10 kV power line (designated by a black line in the figure below) and comprises a switch yard in the Rozino Village. The route (designated by a red line in the figure below) to the Processing Plant is expected to be 2.4 km long is expected to be 2.4 km. long. The switch yard is 583 m. away from the concession boundary.

The power line coordinates in the BGS-2005 system are:

Site	East, m	North, m
Rozino switchyard	408680.31	4589732.34
Intermediate point	408691.70	4589375.40
Point of entry into the concession area	408764.60	4589160.97

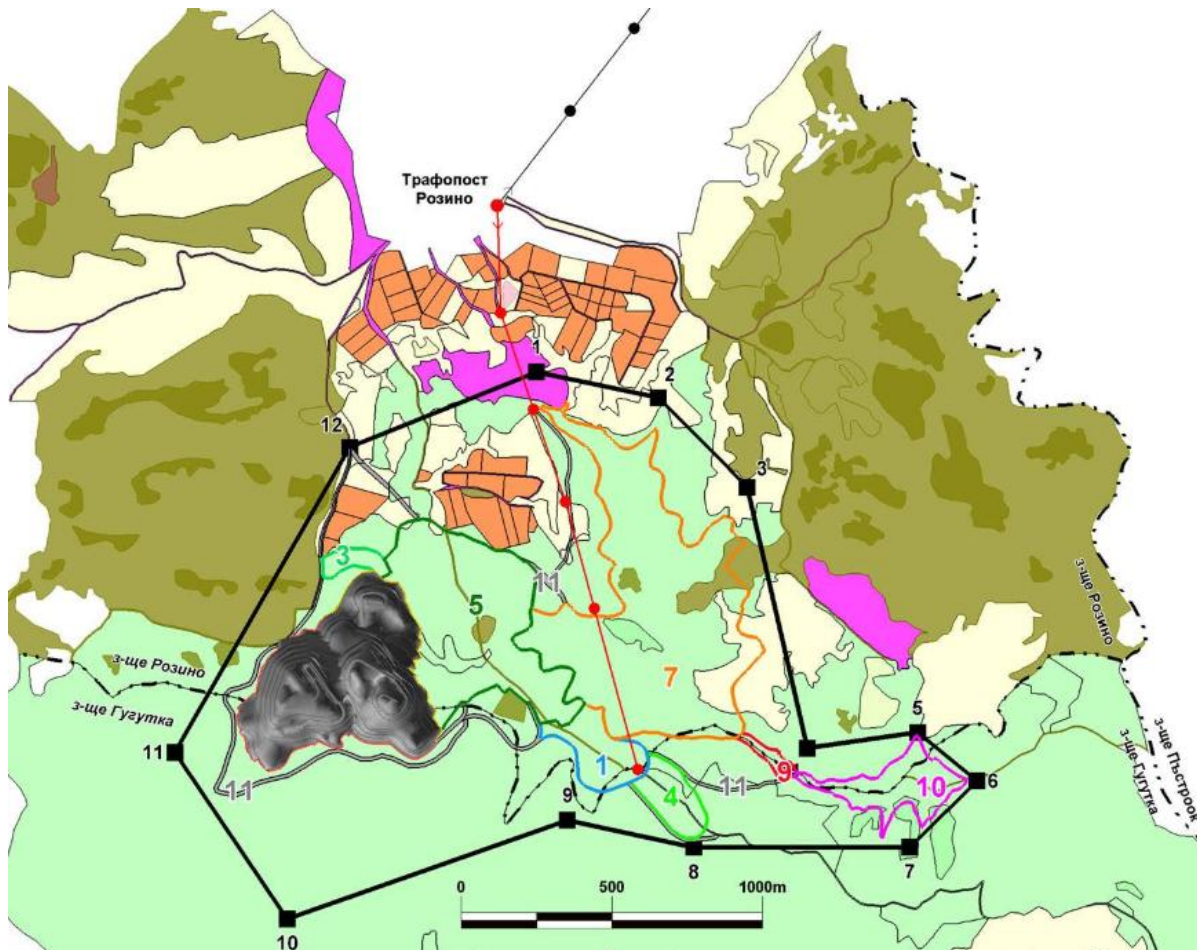


Figure II.3.2-1. Projected power-supply line route.

Water Supply

The IP will require processing water (for the processing plant and for dust control, and potable water for the personnel.

The hydrology report on the hydrology study of existing surface water bodies **shows that** water can be used from Arpa valley between January and May, when its river flow is sufficient, to supply via the Rozino Pumping Station a water flow of at least 50 l/s (for an expected overall volume of 648,000 m³) which is equal to 10% of the average-multiannual water quantity, **and to guarantee the ecological minimum for the river.** An open non-contact water reservoir will be filled during this period by constant pumping.

One possible water-abstraction option is to build a pumping station near the existing Rosino Pumping Station used for supplying of potable water to the village of Rozino. The higher water flow in February, March and April allows for using higher flow rates, at around 100 l/s during these months, to fill the non-contact water during higher precipitation-related inflows.

As the pit develops during the years, the Rozino mine watershed area will accumulate precipitation water. This water will report to an open contact-water reservoir and will be used in the process.

The hydrogeological study in the deposit area showed insignificant groundwater flow-rates and that groundwater abstraction would be utterly insufficient for the process.

Where possible, the water will be returned to ensure optimal water consumption, and an open contact-water basin will be constructed for this purpose.

Bottled water will be provided for drinking purposes.

A contract will be entered into with the Water Supply and Sewerage company for delivery of water from a reservoir which is owned by this company and will be situated 800 m. from the personnel service premises in the processing plant area. There is such an infrastructure and its connection to the future project is technically possible. The exact routes will be determined during the detailed engineering design phase.

No **soils and bio-diversity** will be used as a natural resource but will be impacted by the IP implementation. Their current state and projected impacts are characterised and described in the relevant sections of this statement.

4. Assessment by type and quantity of the expected residual substances and emissions (such as pollution of water, air, soil and subsurface layers, noise, vibrations) and quantities and types of waste generated during the construction and operation phases.

The IP will be implemented in three stages, from construction, operation, closure and through to rehabilitation. As required by the scope of this item, the main emissions by pollutant during the construction and operation stages are presented here, and all other sections consider all three phases in detail. It should be noted that there are no typical construction works but uncovering of the natural resource and, therefore, the construction stage should be understood as uncovering of the natural resource.

Ambient air

During construction

The construction works involve uncovering of the natural resource, which includes topsoil removal (if any) and overburden stripping. This stage involves dust emissions from excavation and handling operations and construction machinery exhaust. Dust emissions will depend largely on the weather - wind speed, temperature, as well as the fractional composition and relative weight of the fine particulate matter. Insignificant quantities of NO_x, PM₁₀, NMVOC, CO, and SO₂ will be emitted by internal combustion engines of the construction machines and transport vehicles.

The air-quality impact of pollutants during the construction works may be considered insignificant, of short duration, reversible, of small territorial extent, and with no cumulative effect.

During operation

No fugitive emissions are to be discharged into the ambient air during the IP implementation.

The operation will involve generation of dust during mining and crushing of the polymetal ore. There will be local pollution over short distances of up to 50 m. from its various sources and should not have any effect on pollution in the region.

Other harmful emissions which causing environmental and workplace pollution will be exhaust from machinery. Gaseous CO_x, NO_x, SO_x, incompletely combusted hydrocarbons, dust (soot) etc. emitted from the diesel plant and transport vehicles will be local in nature and will not have any substantial impact on pollution in the region.

The following measures to reduce air pollution in the deposit are provided for in the IP:

- spraying of on-site roads, especially in dry weather;

- using new equipment in good repair with daily inspection prior to beginning of work and timely repairs of faulty machinery;
- sprinkling during ore handling and processing in the crushing and ball-milling circuits;
- indoor concentration of ore in the processing plant to prevent fugitive emissions of dust.

Also, harmful substances will be emitted in the ambient air during drilling and blasting, but these are short-term, temporary and completely reversible.

The processing operation will not emit ambient air pollutants.

For detailed information about emissions during mining, processing (mainly crushing) and hauling see Section V of the report. A mathematical model was used to determine the impacts by the emissions released during the mining and transporting operations, and the calculations were made using solidified European methods and methods approved by the Minister of Environment and Water.

During Closure and Rehabilitation

The emissions are identical to the emissions during construction.

Water

During construction

No waste water will be generated during the construction period. Chemical toilets and mobile washing facilities for the workers are envisaged.

During operation

The IP expectations are that no use/emissions of harmful or hazardous substances will be emitted and that no impact on ground and surface water in the region will be caused.

Generation of the following waste water is expected for the site: process-related and generated from the flotation and concentrate dewatering process, and ablution effluent from the mine-site workers. All this water will be recycled, using the contact-water reservoir as a buffer storage.

No discharging of process-related waste water into water bodies or into the sewerage systems of urban centers is envisaged.

A local ablution-effluent treatment facility (utilizing microbiological sludge) will be constructed with the treated water being fed to the contact water reservoir.

No discharging of ablution effluent into water bodies or into the sewerage systems of urban centers is envisaged.

Surface precipitation water and mine run-off will be diverted to the contact-water reservoir. Such waste water will be generated throughout the mine life.

As a general rule, no discharges to water bodies are envisaged by the Project.

During Closure and Rehabilitation

Water management will be the same as during the construction.

Soils

During construction

The deposit stripping process will involve removal of topsoil where it is present on the terrains, overburden removal and beginning of mining proper. Top soil will be removed also within the footprint of any auxiliary facilities intended for construction. These operations will generate emissions of: particulate matter from the operations in the concession area; internal-combustion engine exhaust (carbon oxide, nitrogen oxides, sulphuric dioxide, soot etc.) from the mining machines and transport vehicles (dump trucks).

During operation

The operations in the deposit will have an indirect impact on the soils from dust emissions in the ASL and subsequent dust deposition on vegetation and soils near-by. Any potential pollution of lands and soils adjacent to the pit areas may be caused by:

- dust – when hauling and crushing of the mined material in dry and windy weather;
- oil products – improper maintenance and operation of the equipment and incidental spilling of fuel and lubricants;
- gas-borne or airborne pollution during blasting.

Section V of this statement considers the possible impacts on soils by the mining and processing (crushing) works and proposes specific and relevant mitigation or prevention measures.

During Closure and Rehabilitation

The soil impacts are the same as the impacts during construction, with the exception of any soil removed for use during the technical and biological rehabilitation.

Risk Energy Sources (Noise and Vibration)

During construction

Noise impacts in the region will be caused by the machines used during the ore mining preparations - stripping and disposal of soil layers (where present), overburden stripping and removal, construction of new in-pit roads and work areas, and deposit development pre-start operations.

The following sections of this EIA Statement present the noise levels of various machines and facilities and determine the expected equivalent construction-site noise levels in proximity to operating machinery.

During operation

Any **noise impacts** in the region will be caused by the equipment used in ore mining, drilling and blasting, crushing and concentration of the mined material, and by transport vehicles. Furthermore, there will be noise caused by machines loading overburden. The noise caused by blasting, by hauling trucks and by other facilities, as well as by the crusher and ball mill will be daily and will be around 85 *dB(A)* for the workers using those machines, while it will be significantly lower for the region. Ear protection will be provided for the workers and is mandatory for excavator and bulldozer operators and for the other workers.

Machinery generated noise will be localised in points and will affect the machine operators and those working within the pit, but not the surrounding villages and the environment. No disturbance of the noise comfort in surrounding urban areas is expected to be caused by the plant used within the IP, but is, nevertheless, analysed in detail in Section V of this EIA Statement.

The potential sources of excessive general transport-related **vibrations** are the cabins of many bulldozers and excavators, with localized vibrations caused by the handles of control levers. Also, vibrations may occur around the crushers.

During Closure and Rehabilitation

The harmful physical factors impacts will be the same as during the construction stage.

No sources of light, heat or radioactive **radiation** exist in the activities provided for in the IP.

Waste

The following types of waste are expected during the operation of the investment proposal and may be divided into two main groups:

- wastes falling within the subject matter of the Wastes Management Act, and
- mining waste falling within the subject matter of the Mineral Resources Act.

These wastes must be classified in accordance with Regulation No. 223/06/2014 on the Classification of Wastes (SG, issue. 66/2014, most recently amended and supplemented).

Generated Waste within the scope of the Wastes Management Act

During construction

To a large extent, the construction stage comprises deposit development preparations and *mineral reserve uncovering works in preparation for mining*.

Some typical construction works will be carried out during the construction of the processing plant and of the other necessary facilities. Construction permitting for any particular site will be followed by construction waste management planning in accordance with the *Regulation on Construction Waste Management and Incorporation of Recovered Construction Materials*.

The expected construction waste types are:

- 15 01 01 Paper and cardboard packaging;
- 15 01 02 Plastic packaging;
- 15 01 03 Wooden packaging;
- 17 01 01 Concrete;
- 17 02 03 Plastics;
- 17 04 05 Iron and steel;
- 17 05 04 Soil and stones other than those mentioned in 17 05 03
- 20 03 01 Mixed municipal waste.

All waste will be handed over on the basis of written contracts with persons holding the relevant permits or registration documents issued pursuant to the Waste Management Act.

The local municipal waste transporting company serving the Ivaylovgrad Municipality will be contracted to haul periodically the household waste which will be collected in containers.

During the operation:

The investment proposal generates wastes by the mining, processing and transport operations, and household wastes by the personnel.

Table II.4-1. Classification of waste included in the Waste Management Act

Type of Waste	Name	Regulation 2/2014 Code
Non Hazardous	Ferrous metals	16 01 17
	End-of-life tyres	16 01 03
	Obsolete equipment other than the equipment specified in codes 16 02 09 through 16 02 13* - lamps used in the lighting systems across the site	16 02 14
	Waste from sand traps	19 08 02
	Conveyor belt waste (incl. conveyor mats) (plastic and rubber)	19 12 04
Hazardous	Mineral-based non-chlorinated hydraulic oils	13 01 10*
	Synthetic hydraulic oils	13 01 11*
	Synthetic engine, gear and lubricating oils	13 02 06*
	Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances	15 02 02*
	Packaging containing hazardous substance residues or polluted with hazardous substances	15 01 10*
	Lead batteries	16 06 01*
Household waste	Mixed household waste	20 03 01

The generated wastes will be collected separately and in a timely manner, and handed over for subsequent treatment under contract with companies holding registration or permit documents issued in line with the Wastes Management Act. **No hazardous waste will be stored in the IP area**

Only modern mining and transport equipment consistent with the Euro 6 standard will be used during the operations in the plant. Current repair and maintenance of the transport vehicles and mine plant will be carried out in the repair workshop. A site equipped with the necessary spill-containment and removal materials will be designated for collection of the waste from these activities. Also, any spills of fuel and/or oil occurring during emergencies will be collected using absorbent materials (wood shavings, sawdust) which will then be handed over as hazardous waste (code 150202*).

Expected generation of waste during reclamation

Waste that will be generated during closure and rehabilitation of the deposit will be the same as the waste generated during the operation, with the exception of mining waste.

Generated Waste according to the Mineral Resources Act

The following waste will form during the mining and processing of metal-bearing ores:

- Code 01 01 01 - wastes from mineral metalliferous excavation, which will be disposed of on a waste rock stockpile;

- Code 01 03 06 - tailings other than those mentioned in 01 03 04 and 01 03 05, that will be disposed of as paste.

The acid rock drainage study of the rocks in the deposit shows that **no** acid will be **generated** from the overburden rocks and no leaching of metals is expected. Both the ore and the waste rock are low in sulphides (~1% and below 0.5% pyrite) and relatively high in neutralizing potential ratio of more than 2. The metal leaching test results showed that the properties of ore, waste rock and flotation tailings seepage would not be hazardous.

Article 22r, paragraph 4 of the Mineral Resources Act requires that the IP prepares a mine waste management proposal as part of the EIA documents and this proposal is presented in **Textual attachment No 9**.

No other mining waste is expected to form.

The IP does not envisage waste treatment activities other than disposal of mine waste.

III. DESCRIPTION OF REASONABLE ALTERNATIVES (FOR INSTANCE, AS REGARDS THE ACTIVITIES, TECHNOLOGY, LOCATION, SIZE AND EXTENT) STUDIED BY THE CUSTOMER AND RELEVANT TO THE IP AND TO ITS SPECIFIC CHARACTERISTICS, AND INDICATION OF THE REASONS FOR THE SELECTED OPTION IN CONSIDERATION OF THE ENVIRONMENTAL CONSEQUENCES OF THE IP IMPACTS

According to Article 96, paragraph 1, item 2 of the Environment Protection Act, the EIA Statement must contain: ‘Description of reasonable alternatives (for instance, as regards the activities, technology, location, size and extent) studied by the Customer and relevant to the IP and to its specific characteristics, and indication of the reasons for the selected option in consideration of the environmental consequences of the IP impacts’.

With these legal requirements in mind, the alternatives are considered below and are structured in 5 sub-items. Additionally, the ‘no action’ alternative, or the non-implementation of the proposed investment proposal, is considered as well. The following limitations when considering alternative implementation options exist:

The particular location of the natural resource in the subsurface does not allow for consideration of any IP siting alternatives. This is stated in item III.1. of the EIA Statement.

Relocating the IP elements is the only possible alternative (item III.2) inside the future concession area, but is subject to other restrictions such as: the topography, the technological sequencing of the processes, and securing of stability and safety of the facilities.

The technology and mining sequence alternative is presented in item III.3 of the EIA Statement, but this also is subject to a number of restrictions, such as: the natural resource bedding depth, its location underground, the geological and mining-engineering conditions during the operation.

The ore processing alternatives are considered in item III.4 of the EIA Statement, with environment protection in all of its aspects being the decisive factor in choosing the alternative.

Particular attention is given to flotation tailings management alternatives (item III. 5), with consideration of the conventional option with a tailings management facility and of the more benign thickened-tailings disposal option.

2.1. IP Location Alternatives

As regards the location of the Rozino Deposit in the Tintyava PLA there are no other alternatives since the ores and minerals have been established in this area and the mineable reserve limits have been defined. The boundaries of the future concession area have been proposed accordingly.

2.2. Siting options for the project facilities

Pit location, size and layout are dictated by geology of the ore body and the determined for mining reserves as topographic and geographic constraints combine to reduce opportunity for locating the associated ore processing plant and auxiliary infrastructure and facilities.

Several options with a larger footprint taken by the auxiliary plant and infrastructure have been considered and rejected by the Investor with the view to maximum protection of the natural features.

The following major project design components have been considered in respect of options for design and location:

- the ore mining method and the siting of the respective attendant facilities;
- minimal encroaching upon the soil surface;
- requirements for environmentally sound management of mine wastes.
- minimal impact on areas of the Rhodopes Eastern protected area with code BG0001032 and the Byala reka protected area with code BG0002019.

The practical perspective and all these circumstances show that there is no better alternative for siting the mine, the facilities and the infrastructure.

Difference in impacted areas from the notification sent with letter No. ПД-279/14.02.2023 to the Haskovo RIEW.

The concession area with the above notification amounts to 304.47 ha of which 118.98 ha are disturbed and 185.49 ha are a buffer zone. In order to optimise the location of facilities and reduce the directly impacted areas, the total footprint of the concession area considered in this assessment is 275 ha with 118 ha being disturbed and with 157 ha allocated as a buffer zone.

2.3. Mining Method Alternatives

The open pit mining is applied at deposits with ore bodies which are close to the surface and have substantial low-grade mineral resources. The main disadvantage of this mining method is the formation of a new negative form in the landscape (open pit or borrow), which is a challenge to the rehabilitation of the environment after shut-down of operations. Additionally, another large landscape form may be created – a waste rock stockpile.

Underground mining is used to mine higher grade deposits located at greater depths in the earth's crust. This method requires backfilling of the mined stopes. Underground backfilling is required for the more efficient extraction of the reserves and for prevention of surface caving above the ore bodies. The underground mining option facilitates the management of mine wastes as it involves partial reclaim and reuse of waste products as fill materials in the underground backfilling process. In the case of close-to-surface low-grade deposits, this option is economically infeasible because it involves higher mine construction and operational costs.

Shaft mining is not an option for the conditions in the “Rozino deposit for the following reasons:

- the small bedding depth of the ore body – 15-20 m;
- the small strip ratio – 2.5, making shaft mining systems environmentally unsound;
- the morphological type of the mineralization – veinlet-disseminated, requires exact identification of balance ores and proper and regular extraction, which is difficult in shaft mining. Shaft mining would require setting aside of Appendix areas for temporary stockpiling of different ore types and their subsequent blending prior to feeding to the processing plant.

No such other alternatives could be considered because the mining technology considers the location of the natural resource in the subsurface, and the geological mining conditions. The open mining of polymetal ores is a method widely applied in similar deposits. It is also justified as the only economically viable method, given the expenses for mining, processing and hauling relative to the market price of the produce.

2.4. Raw material processing alternatives

There are three possible alternatives for mined-ore processing:

- *Alternative 1:* Ore mining and crushing within the license and selling to processing facility owners;

- *Alternative 2:* Processing the ore to gold bearing concentrate as the final product within the concession area. This option includes mandatory construction and operation of a concentrator plant which requires increasing of the potential concession area in order to provide sufficient space for the auxiliary facilities such as: water and chemical solution reservoirs, flotation tailings storage facility, storage facility for the finished product, etc. This option would require additional water management - provision of sufficient amounts of fresh water and sufficient volumes of return water.

- *Alternative 3:* Processing of ore to end metal as the final product within the concession area, which would require: mining, a processing plant, cyaniding and end-metal production facility. Given the proven mineral reserves, this option is economically and financially non-viable and excludes the need for another hazardous chemical substance - cyanide.

The preliminary technical and economic assessment of all three options with a +/-30% accuracy show that *Alternative 2* as unambiguously advantageous.

Alternative 1 is inapplicable for the following reasons:

- remoteness from any existing processing facilities. Apart from being economically unsound, hauling of enormous quantities of ore at such a distance means significant presence of heavy-duty trucks on the road network and, therefore, higher emissions of harmful substances in the ambient air, above-standard noise levels, lasting disturbance of animal species and significant discomfort for the people who use these roads;

- the existing plant is limited to processing of ore from specific deposits with specific throughputs and ore composition. In fact, there is no available production capacity to take additional quantities of ore from the Rozino deposit;

- limited volumes of the respective processing plant waste facilities, designed with specific needs, conditions and capacities in mind.

Alternative 2 which is preferred by the Customer allows for a final product – gold-bearing concentrate of significantly smaller volume as compared to the ore mass, can be transported easily for further processing with lesser impact on the road network and on the environment adjacent to the transport routes.

2.5. Flotation tailings management alternatives

- *Alternative 1*: Conventional spigotting into a TMF whereby water carries the waste slurry to the TMF, which is, by nature, a water-engineering facility.

- *Alternative 2*: Disposal of thickened waste; Additional dewatering of the processing waste produces 70-75% solid waste which is transported to the waste storage facility by means of a pipeline.

Considering the advantages of thickened waste disposal, the Customer intends to use *Alternative 2*.

The advantages of this technology over the disposal of high water content waste are as follows:

- Reduced use of ‘fresh’ water by 20÷25%, leading to reduced volume and area of the ‘fresh’ water reservoir by up to 5%;
- Increased recovery of return water by 20÷25%, leading to reduced volume and footprint of the ‘contact’ water reservoir by up to 5%.
- Reduced footprint of the tailings disposal facility by 10 to 15% through reduced volume of disposed waste;
- Low water content in the disposed waste by up to 5%.
- Accelerated waste drying and solidifying - 1-2 days in dry seasons.
- Increased overall stability coefficient of the stockpile and retaining wall bodies because of lower or zero water content in the waste;
- Reduced risks related to the disposal of high water content waste;
- Possibility for staged rehabilitation of areas once the design disposal levels are reached.

2.6. No-action alternative

The ‘no-action alternative’ is non-implementation of the investment proposal. In this case the polymetal resources situated and proven in the Rozino Deposit, Tintyava PLA will not be mined and utilized. This would deprive the state and the Ivaylovgrad Municipality of revenues from fees related to direct and indirect taxes and fees, and the local community from jobs on site and in other service providing companies.

IV. DESCRIPTION OF THE RELEVANT ASPECTS OF THE CURRENT STATE OF THE ENVIRONMENT (BASELINE SCENARIO) AND BRIEF PRESENTATION OF THEIR LIKELY EVOLUTION IF IP IS NOT IMPLEMENTED, INsofar AS THE NATURAL CHANGES CAUSED BY THE BASELINE SCENARIO CAN BE ASSESSED FROM THE AVAILABLE ENVIRONMENTAL INFORMATION AND SCIENTIFIC KNOWLEDGE

1 . Atmospheric air and climate factors

1.1. Weather characteristics and regional meteorology

Being in the Eastern Rhodopes, the IP climate belongs to the transitional-Mediterranean climatic region and is characterised as moderate-continental to Mediterranean. The region is under predominant Mediterranean climatic influence, especially so with regard to the Mediterranean cyclons. Apart from that, owing to its wider openness toward the north, cold continental air masses rushing in from the north is felt strongly. Cyclone activeness during the winter term is the reason both for relatively high temperatures and increased and mainly frontal precipitation. Temperatures in January average between 1 and 2°C. Occasional heavy rains fall with up to 88 mm of precipitation per 24 hours. This intense winter and autumn precipitation makes for relatively high average annual levels between 650 and 750 mm. In most cases the precipitation is rain, with snow falling mainly during the second half of December, and in January and February. The snow cover remains for 5-6 days on rare occasions. Usually, the snow-melt is rather quick and causes the rivers to swell and, in some cases, become violent.

Despite relatively mild winters, springtime thaws are slow in coming. Spring-time chills and white ground frosts occur until mid-April, with spring-time thermal conditions being more favourable further south and the harmful chills and ground frost terminating earlier than those above. According to Bulgaria’s Geographic Atlas (2010), the average precipitation total during the spring varied between 150 and 200 mm in the period between 1976 and 2005.

Precipitation is more scarce in the summers, with rather high extreme temperatures, the averages for July being 23 to 25°C, with many sunny days. Hot tropical air masses rush in and cause periods of drought. Precipitation totals in the summer (June, July, August) between 1976 and 2005 varied between 150 and 200 mm same as during the spring.

The nearest weather station registering long-term weather data is situated in Krumovgrad, a town situated approximately 20 km west of the deposit boundaries.

Precipitation:

Precipitation is a main weather factor aiding in the natural removal of pollutants from the ambient air.

The average annual precipitation is 761 mm.

Precipitation is highest during the winter, at 251 mm, which is favourable for the restricting of fugitive dust emissions.

Table IV.1-1. Average Monthly Precipitation in mm (MCKrumovgrad)

I	II	III	IV	V	VI	VII	VIII.	IX	X	XI	XII	Year
83	67	64	60	66	64	37	24	38	73	84	101	761

Table IV.1-2. Average monthly and annual number of days with precipitation (Krumovgrad Weather Station)

mm	I	II	III	IV	V	VI	VII	VIII.	IX	X	XI	XII	Year
≥0.1	10.6	9.1	8.7	9	9.9	8.5	5.4	4.2	4.3	6.7	8.5	10.3	95.1
≥1	8.7	7.1	6.9	7.2	8.3	5.9	4.1	3.1	3.6	5.5	7.1	8.9	76.4

Wind:

The winds in the investment proposal area are the main factor determining the direction in which stripping and mining pollutants will scatter. Wind is an important factor for natural self-

purification of air and has a direct effect on the distance over which pollutants will scatter during the various IP implementation phases.

Table IV.1-3. Average wind speed by month and direction, m/s (Krumovgrad Weather Station)

Directions	I	II	III	IV	V	VI	VII	VIII.	IX	X	XI	XII
N	4	3.8	3.6	3.4	3.3	3.3	3.6	3.5	3.4	3.6	3.5	3.8
NE	3.4	3	3.4	3.1	3.1	2.7	3	3.2	2.9	3	3.1	3
E	3.1	2.9	2.7	2.6	2.6	2.5	2.6	2.6	2.8	2.5	2.8	2.7
SE	3	3.3	3.1	3	2.9	2.9	2.7	2.6	3	3.1	3.2	3.1
S	3.3	4.9	4.3	4.4	3.3	3.2	3.2	3.2	3.2	4	4.3	4.7
SW	2.7	4.2	3.2	3.7	3.3	3.1	2.8	2.6	2.8	3.2	2.8	4.2
W	1.6	2	2.2	2.6	1.9	2.1	2	2.1	2	1.6	1.9	1.6
NW	3	2.6	2.7	2.7	3.5	2.6	3.1	2.8	2.8	2.5	2.6	2.7

Table IV.1-4. Average annual wind frequency by direction, calm weather (%) and wind speed (m/s) (Krumovgrad Weather Station)

Directions	Frequency %	Speed m/s
N	34.1	3.6
NE	14.2	3.1
E	8.3	2.7
SE	12.7	3
S	9.5	3.8
SW	5.5	3.2
W	2.6	2
NW	13.1	2.8
Calm	49.9	-

Northern winds predominate year-round (34.1%), followed by north-eastern, north-western and south-eastern winds (*40% in total*). The frequency of the remaining winds is less than 10%. The predominant wind direction, from north to south, determines the main direction of scatter of potential pollution from the site.

The average wind speed in the region is 1.8 m/s.

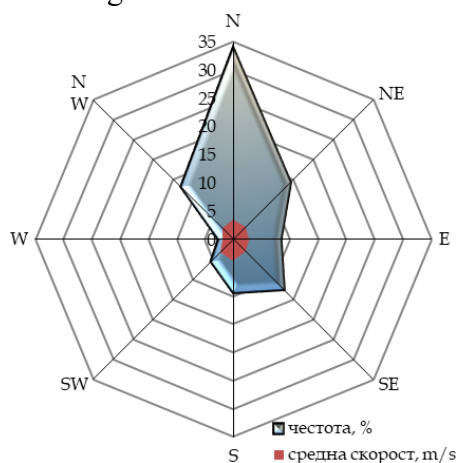


Figure IV.1.1-1 .Annual wind pattern by frequency and speed and by speed and direction - Krumovgrad Weather Station

Conclusions:

North-westerly winds prevail and are active along the valleys and the mountain ridges. Foehn is also present. The annual average precipitation varies widely between 800 and 1,200 mm. Its high is during the autumn and winter, in November and December. Often storms reach 100 mm. over 24 hours. This precipitation aids in limiting of fugitive emissions of dust.

In general, the climate in the region allows for year-round mining operations.

1.2. Atmospheric Air Quality in the Region

Directive 2008/50/EC concerning the atmospheric air quality and cleaner air for Europe creates a framework for evaluation of EC level air quality. *Regulation No. 12 of July 15, 2010 on the Air Emission Limits for Sulphur Dioxide, Nitrogen Dioxide, Fine Dust Particles, Lead, Benzene, Carbon Monoxide and Ozone* transposes this directive into the Bulgarian legislation.

The following tables present a systematic arrangement of the atmospheric air quality standards from the directive and from the national legislation by the parameters that concern the IP implementation.

Table IV.1-5. Human health protection standards

Pollutant	concentration	Size	Period of averaging	Permitted number of exceedances
PM ₁₀	50	µg/m ³	24 hours	35
	40	µg/m ³	1 year	-
PM _{2.5}	20	µg/m ³	1 year	-

Atmospheric air quality in the territory under consideration is controlled by the Haskovo Regional Inspectorate of Environment and Waters. The atmospheric air status in the Ivaylovgrad Municipality, situated within the Rozino deposit boundaries, is good.

A system of monitoring points observes the atmospheric air quality. According to the atmospheric air quality assessment and management zoning (*Article 30, paragraph 1 of Regulation 7 on Air Quality Assessment and Management*), the Ivaylovgrad Municipality belongs to ‘regions’ in which the levels of one or several pollutants are between their respective upper and lower assessment threshold levels. The Ivaylovgrad Municipality is not part of the national eco-monitoring system. The nearest point is the Studen Kladenets Automatic Station - Automated urban background measuring point, situated in the built-up part of the town of Kardjali and accounting for the effects of industrial and household emissions. This monitoring point is more than 40 km away on a straight line to the north-west of the IP boundaries and, therefore, its monitoring data are not applicable to the region under consideration.

In line with the *Environment Protection Program of the Ivaylovgrad Municipality, 2023 - 2028*, no excessive quantities of harmful emissions into the atmosphere have been registered. No large industries and environmental polluters are present there.

There are no significant sources of pollution in the IP area. There are no roads with intensive vehicle traffic, no developed industry, no large urban centers and, therefore, household heating does not have a substantial effect on atmospheric air quality.

In total, there are no other pollution sources in the region and it is possible to conclude that the ambient air quality is within the admissible limits.

Conclusion:

The analyses so far allow for the conclusion that background pollution levels in the air, which are related to the IP implementation, are within the admissible human-health protection limit values.

The maximum possible average annual concentrations of PM₁₀ and PM_{2.5} are several times lower than the admissible limit values.

The maximum dust levels in the deposit area are within the admissible limit values for chemical agents in workplace air, specified in Attachment 1 to *Regulation 13 of December 30, 2003 on Employee Protection against Risks of Exposure to Chemical Reagents at Work*.

2 . Surface and Ground Water

The Investment proposal for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit’ in the Tintyava PLA falls under the jurisdiction of the East Aegean Region Basin Directorate in Plovdiv, the river basin of the Byala Reka River, a water body (WB) with code BG3MA100R270 - Byala Reka River and its Tributaries.

Determining the impact on waters is underpinned mainly by the *2022 - 2027 River Basin Management Plan of the East Aegean region* (RBMP of EAR), and the *2022 – 2027 Flood Risk Management Plan of the East Aegean region* (FRMP of EAR), which are the main tools for integral water management and are up-to-date at the time of preparation of this statement.

The baseline status of the water bodies which are likely to be affected by the investment proposal is determined by available data from the monitoring of their ecological, chemical and quantitative status. Also, very important during the IP implementation process are the various economic uses of these waters such as water supply, irrigation etc., and the water body protection zones, which are mainly intended for protection of potable water, protected areas and Natura 2000 areas.

The Waters Act (WA) defines such water protection zones as:

Article 119a.(1) The water protection zones are:

- 1. the surface water catchment area and the earth’s surface upstream of groundwater bodies as per Article 119, paragraph 1, items 1 and 2;*
- 2. the water bodies defined as waters for recreation and water sports, including the zones with bathing waters, as per the provision of Article 135, paragraph 1, item 7;*
- 3. the zones in which the waters are sensitive to nutrients, inclusive of:*
 - a) vulnerable zones;*
 - b) Sensitive zones;*
- 4. the zones for protection of economically valuable fish species and other aquatic organisms;*
- 5. the protected territories and areas nominated or designated for protection of habitats and biological species whose conservation requires maintaining or improving of the water status.*

Table 2-1. shows the existence or not of water protection zones in the Rozino deposit, according to Article 119a.(1) of the Waters Act.

Table IV.2-1. Water protection zones in the Rozino Deposit, according to Article 119a.(1) of the Waters Act.

Water protection zones	Zone type	IP outside/inside (name, code) of protection zone

Article 119a, par.1, item 1 of the Waters Act	Zone for protection of potable water from surface water bodies	Outside.
	Zone for protection of potable water from ground water bodies	Inside. WPZ Code: BG3DGW000PtPg049, Ground water body BG3G000PtPg049 Fissure - Eastern Rhodopes Complex
Article 119a, par.1, item 2 of the Waters Act	Zone for recreation and water sports	Outside
Article 119a, par.1, item 3 of the Waters Act	Sensitive zone	Outside
	Vulnerable zone	Inside. Ground water body BG3G000PtPg049 - Fissure – Eastern Rhodopes Complex, determined as water polluted or endangered by pollution with nitrates from farming sources, according to Attachment 1 to Order ПД-900/21.10.2024.
Article 119a, par.1, item 4 of the Waters Act	Economically valuable fish species area	Outside.
Article 119a, par.1, item 5 of the Waters Act	Protected Areas	Outside.
	Habitats area*	Inside. Protected area with code BG0001032 Rhodopes - Eastern
	Bird area	Inside. Protected area with code BG0002019 Byala Reka

The IP area **does not encroach on** potable water facilities or the sanitary protection belts established around them.

The investment proposal for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district’ involves use of quantities of water for the processing needs (in the concentrator plant), for dust suppression and for drinking and domestic uses of the staff. This industrial-use water will be taken from surface water sources - a possibility to use water from the Arpa Dere river in the Rozino Pumping Station area. As the pit develops during the years, the Rozino mine watershed area will accumulate precipitation water. This water will report to an open contact-water reservoir and will be used in the process. Where possible, the water will be returned to ensure optimal water consumption, and an open contact-water basin will be constructed for this purpose.

Textual attachment No. 10 presents a Hydrology Evaluation of the Byala Reka River and its tributary, the Arpa Dere River, near the Gugutka village, Ivaylovgrad Municipality, Haskovo District.

Bottled drinking water will be provided. A contract will be entered into with the Water Supply and Sewerage company for delivery of water from a reservoir which is owned by this company and will be situated 800 m. from the personnel service premises in the processing plant area. There is such an infrastructure and its connection to the future project is technically possible. The exact routes will be determined during the detailed engineering design phase.

Section 5 of the third RBMP of EAR concerning BG3MA100R270 Byala Reka River and its Tributaries defines as the ecological status goal ‘protection of the good status and prevention of deterioration’, and no specific measures are provided for in Section 7 regarding this water body. Therefore, the investment proposal does not contain activities that contradict the program of measures set forth in the third RBMP of EAR or which cannot be abided by during the IP implementation. This applies also to the measures set forth in the third FRMP of EAR insofar as the IP does not affect any regions with potential flood risks.

2.1. Surface water

The Investment proposal for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA’ is situated within the Byala Reka river basin.

The watershed area of the Byala Reka River together with the watershed area of the Luda River is, up to the state border with the Republic of Greece, 636 km². The Byala Reka River springs near Chernichino village in the Krumovgrad Municipality, and flows from west to east in the southern part of the Eastern Rhodopes. It is 72.3 km long to the border. The Luda River is 17.5 km. long between its springs and the state border. There are 13 more substantial tributaries to the Byala Reka River, situated symmetrically relative to the main river. Of those, the largest are the Kokardja Dere River, the Arpa Dere River, the Hambar Dere River, and the Yuruklerska River. Near the border with the Republic of Greece, the Byala Reka River flows into the Luda River whose name in the Greek territory is Eritropotamos (the Red river).

The site of the Investment Proposal is situated in the Ivaylovgrad Municipality, Haskovo District, Southern Bulgaria, and immediately to the south of the Rozino village. The Byala Reka River, the Luda River and their tributaries are the main water sources in the region, and the site is situated between two tributaries to the Byala Reka River (the Kokardja Dere River and the Arpa Dere River). The Byala Reka River drains the Maglenik, Irintepe and Sirta ridges of the Eastern Rhodopes, with a total watershed area of 549 km². Approximately 7.53 m³/s are discharged by the river near the Dolno Lukovo village, and the river is recharged mainly by precipitation. Many surface water bodies are ephemeral, without flows during the dry season (dry valleys).

The surface water bodies closest to the Rozino Deposit boundaries are the Byala Reka River 650 m to the south, the Kokardja Dere River 550 m to the west, and the Arpa Dere River 560 m to the east.

The problems in the river basin are related to the regional weather features. The Byala Reka River and the Luda River are torrential. Rapidly increasing flows between 5 and 90 m³/sec in few hours have been observed in winter. The Byala Reka River becomes a large, stormy and high-flow river with wide meanders in times of highest discharge rates (February). Its high water floods the adjacent flood plains. This river is a significant contributor to high water levels in the Maritsa River on the territory of Turkey, and to flooding in Greece and Turkey. At the same time, the rivers in this basin are almost dry.

The entire territory of the Rozino Deposit is situated within the extent of the surface water body with code **BG3MA100R270** named ***Byala Reka River and its Tributaries***. The water course is defined as natural, with a catchment area of 618.5 km² and with a river network length of 69.9 km (Table IV.2.1-1).

The Byala Reka River and its tributaries exhibit features of the type R14 Sub-Mediterranean rivers in EcoRegion 7 (Figure IV.2.1-1.). In Bulgaria, the river can be ascribed to two of the R14 sub-types, namely:

- the R14a sub-type - SubMediterranean small and semi-mountainous seasonal rivers and streams in EcoRegion 7 – the stretch between the springs and Meden buk village/Dolno Lukovo village. The river runoff varies substantially during the seasons, but the rivers do not dry up completely. These are a specific storm-flow type rivers.
- the R14c sub-type - R14c SubMediterranean ephemeral (intermittent) small and medium sized rivers and streams – the stretch between Meden buk village/Dolno Lukovo village and the state border. The river runoff of this Mediterranean river sub-type features periods of complete drying up with varying occurrence frequencies during the years. These are a specific storm-flow type rivers.

The third RBMB of EAR (Section 4) defines Water Body BG3MA100R270 as in ‘good’ ecological status (Table IV. 2.1-2) for biology (BQE), physico-chemical (PHQE) and hydromorphological (HMQE) quality elements with average evaluation reliability (Table IV. 2.1-3, Table IV. 2.1-4 and Table IV. 2.1-5). The hydromorphological conditions are close to the reference conditions for this river type, with weak impact on the river-side zone. The chemical status of this water body is evaluated as ‘good’ (Table IV. 2.1-6). The water body status indicates a stable trend, preserving the ‘good’ ecological and chemical status reported during the second RBMP of EAR.

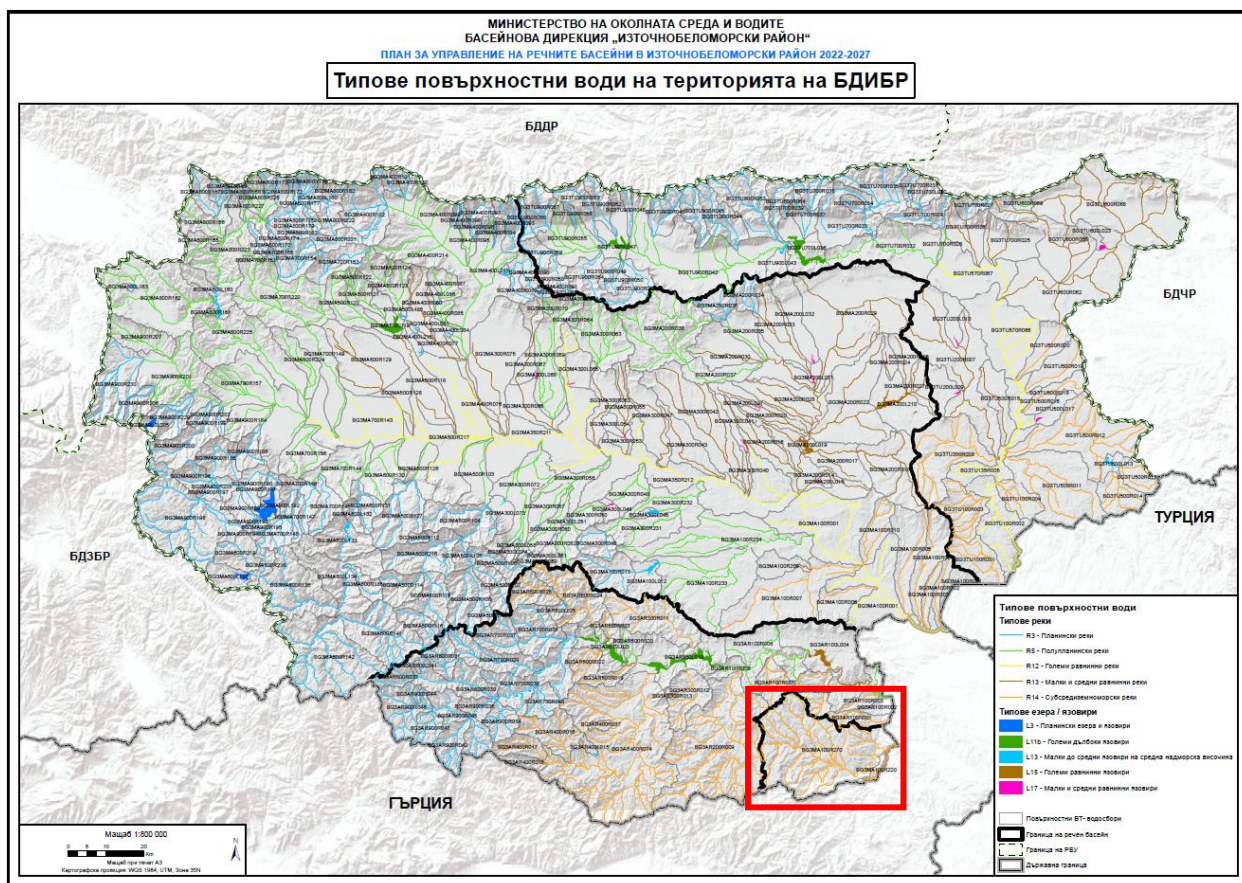


Figure IV.2.1-1. Distribution of the R14 type of Sub-Mediterranean rivers in EcoRegion 7 and in the Byala Reka River basin (marked in red).

According to the information published in the Annual Bulletin of Waters in the East Aegean region for 2022 and 2023, the ecological and chemical status of Water body BG3MA100R270 Byala Reka River and its Tributaries is ‘good’ (Table IV. 2.1-7).

The status was assessed on the basis of results derived from monitoring of biological quality elements, physical and chemical indicators, specific pollutants and priority substances in the surface waters between 2016 and 2021. The monitoring data have been processed, analysed and compared using the type-specific classification systems in Regulation No. H-4 of 14.09.2012 on the Characterization of Surface Water (in respect of parameters involved in determining the ecological status) and the 2021 Regulation on Environmental quality standard for priority substances (in respect of priority substances determining the chemical status of surface waters).

An updated Approach for Grouping of Surface Water Bodies for Monitoring and Assisting in the Ecological and Chemical Status Evaluation has been used to draw up the assessment of the ecological status/potential. The national approach develops further the approaches applied in Bulgaria for grouping of surface water bodies during the second RBMP cycle, 2016-2021 (these approaches providing monitoring data for the assessment in the 2022-2027 RBMP). This grouping is intended to optimise the planning of the surface water monitoring and of surface water body assessment, and, also, provision of good representativeness of the results for all of the grouped surface water bodies. This approach allows for use of data collected from one water body for the assessment of another water body, in consideration of the following criteria:

- The surface water bodies must be of the same type;
- The water bodies should be subject to similar pressures which do not pose a risk of non-achieving of a good surface water body status.
- The adopted good ecological status limit values and standards for all quality elements must not be exceeded.

The updated grouping approach introduces possibilities to group water bodies by individual quality elements (including priority substances and specific pollutants). The water body BG3MA100R270 Byala Reka River and its Tributaries was grouped during the ecological and chemical status assessment, with it being monitored for the ecological status and grouped with water body BG3AR100R002 for the chemical status.

The Review of the significant types of pressure and impact from human activities on the status of surface and ground waters (Section 2, Attachment 2.2.1.4 of the third RBMP of EAR) states that *no significant pressure is identified* in respect of water body BG3MA100R270 Byala Reka River and its Tributaries. The assessed ecological and chemical status and the absence of significant pressures was the basis to determine the water body as in no risk for achieving of the goals (Table IV. 2.1-8).

It can be seen in Table IV.2-1 that the surface water body where the IP area is situated does not lie in water protection zones defined as zones for protection of potable water from surface water bodies, for recreation and for water sports, for economically valuable fish species or as a sensitive zone.

This water body is a water protection area according to Article 119 a, paragraph 1, item 5 of the Waters Act, related to the protected areas determined or designated for protection of habitats

and biological species in which the maintenance or improvement of water status is an important factor for the conservation of these species and habitats:

- Natura 2000 water protection zone according to Directive 92/43/EIC on the Conservation of Natural Habitats of Wild Fauna and Flora in which the maintenance or improvement of water status is an important factor for the conservation of the flora and fauna - Protected area with code BG0001032 Rhodopes - Eastern;
- Natura 2000 water protection zone according to Directive 2009/147/EIC for the Conservation of Wild Birds in which the maintenance or improvement of water status is an important factor for the conservation of the flora and fauna - Protected area with code BG0002019 Byala Reka River.

These areas are re-designated/updated in the third RBMP of EAR, according to the areas included in the National ecological network (NEN) established in line with the provisions of the Biodiversity Act (BA). The boundaries of the water protection areas referred to in Article 119a, paragraph 1, item 5 of the Waters Act overlap with boundaries of the Natura 2000 protected areas and with the boundaries of the protected areas in which surface water bodies in the Eastern Aegean Region are situated.

A program of measures has been developed to fulfil the environment protection goals (Table IV. 2.1-9 and Table IV. 2.1-10) in Section 7 of the third RBMP of EAR (2022-2027). No specific measures are provided for the surface water body with code BG3MA100R270 Byala Reka River and its Tributaries which is situated in the IP area, because its ecological and chemical status is determined as ‘good’.

The list of additional measures (Table IV. 2.1-11) includes general measures applicable at the basin-management region level. It can be seen from the listed additional measures that only measure *PM_4 EIA in the cases of abstraction of water from surface water bodies* (Key-type measure (KTM) 99 Other preventive measures) is of relevance to the implementation of the Investment Proposal under consideration. The absence of processes providing for discharging of waste water into surface water means that measures IP_1 Implementation of the procedure for reviewing of issued waste-water discharge permits, PI_1 Amendment or termination of waste-water discharge permits as a result of their reviewing, and PI_3 Ensuring of collection, discharging and treatment of production waste water discharged into water bodies.

According to the third RBMP of EAR (2022 – 2027) adopted with Decision 937/28.12.2023 of the Council of Ministers, the IP region is not situated in a region with high potential flood risk.

Table IV.2.1-1. Information about surface water bodies in the IP area

Water Body Code	Water Body Name	Category of the Surface Water Body	Hydro-morphological category	Type Code	Type Description	River length, km	Catchment area, km ²
BG3MA100R270	Byala Reka River and its tributaries	River	Natural	R14	Sub-Mediterranean rivers in EcoRegion 7 <u>Subtypes:</u> - R14a SubMediterranean small and semi-mountainous seasonal rivers and streams in EcoRegion 7 - R14c SubMediterranean ephemeral (intermittent) small and medium sized rivers and streams	69.9	618.5

Table IV.2.1-2 Information about the ecological status of the BG3MA100R270 surface water body.

Water Body Code	Water Body Name	Water Body Type	Type Description	Overall evaluation of EcoStatus by BQE	Overall evaluation of EcoStatus by PHQE	Overall evaluation of EcoStatus by HMQE	Overall ES evaluation	Parameters with deviations from the Good EcoStatus
BG3MA100R270	Byala Reka River and its tributaries	R14	Sub-Mediterranean rivers in EcoRegion 7	Good	Good	Good	Good	no

Table IV.2.1-3 Information about the ecological status of the BG3MA100R270 surface water body using biological quality elements.

Water Body Code	WB Name	Overall ES evaluation by macrophytes	Overall ES evaluation by phytobenthos	Overall ES evaluation by macrozoobenthos	Overall ES evaluation by fish	Overall ES evaluation by biological quality elements	BQE with deviations from the Good EcoStatus	Evaluation data
BG3MA100R270	Byala Reka River and its tributaries	Good	Good	Good	Good	Good	no	Monitoring

Table IV.2.1-4 Information about the ecological status of the BG3MA100R270 surface water body using physico-chemical quality elements.

Water Body Code	WB Name	EcoStatus evaluation for pH	EcoStatus evaluation for BOD ₅ (rivers)	EcoStatus evaluation for total nitrogen	EcoStatus evaluation for total phosphorus	EcoStatus evaluation for dissolved oxygen	Overall evaluation of EcoStatus by PHQE	PHQE with deviations from the Good EcoStatus	Evaluation data
BG3MA100R270	Byala Reka River and its tributaries	Good	Excellent	Excellent	Excellent	Excellent	Good	no	Monitoring

Table IV.2.1-5 Information about the ecological status of the BG3MA100R270 surface water body using hydrobiological quality elements.

Water Body Code	WB Name	Hydrology	Continuity	Morphology	EcoStatus for HMQE	Notes
BG3MA100R270	Byala Reka River and its tributaries	Excellent	Good	Good	Good	The hydromorphological conditions are close to the reference conditions for this river type, with weak impact on the river-side zone.

Table IV.2.1-6 Information about the chemical status of the BG3MA100R270 surface water body.

Water Body Code Water Body Name		Chemical Status of surface water bodies in the 2022-2027 RBMP						
		Chemical Status Evaluation for Substances up to No. 33 with Included Pervasive Pollutants (incl. uPBTs)			Chemical Status Evaluation for Substances up to No. 33 with Excluded Pervasive Pollutants (except for uPBTs)			Exceeded - chemical status 33 (WATER/BIOTA)
		Chemical Status in the ‘water’ matrix	Chemical Status in the ‘biota’ matrix	Total chemical status in the ‘water’ and ‘biota’ matrices	Chemical Status in the ‘water’ matrix	Chemical Status in the ‘biota’ matrix	Total chemical status in the ‘water’ and ‘biota’ matrices	
BG3MA100R270	Byala Reka River and its tributaries	Good	Unknown	Good	Good	Unknown	Good	no

Table IV.2.1-7 Information about the ecological and the chemical status of the BG3MA100R270 surface water body.

Surface Water Body Code (WB)	Water Body Name	Annual bulletin about water status in the East Aegean region for 2022		Annual bulletin about water status in the East Aegean region for 2023	
		Ecological status	Chemical Status	Ecological status	Chemical Status
BG3MA100R270	Byala Reka River and its tributaries	Good	Good in the 'water' matrix and the 'biota' matrix	Good	Good in the 'water' matrix and the 'biota' matrix

Table IV.2.1-8. Evaluation of the ecological and chemical status risks of the BG3MA100R270 surface water body.

Water Body Code	Water Body Name	Overall evaluation of EcoStatus by BQE	Risk assessment for BQE	Overall evaluation of EcoStatus by PHQE	Risk assessment for PHQE	Overall ES evaluation	Total ecological evaluation of risk	Total chemical status in the 'water' and 'biota' matrices	Chemical Risk Assessment
BG3MA100R270	Byala Reka River and its tributaries	Good	not at risk	Good	not at risk	Good	not at risk	Good	not at risk

Table IV.2.1-9 Information about the ecological status of the BG3MA100R270 surface water body.

Water Body Code	Water Body Name	Environmental status/potential in the third RBMP	Indicator with a deviation in the third RBMP	Ecological status goal in the third RBMP	Exception for achieving of good ecological status in the third RBMP
BG3MA100R270	Byala Reka River and its tributaries	Good	None	Preservation of the good ecological status and prevention of its deterioration.	not applicable

Table IV.2.1-10. Objective concerning the chemical status of the BG3MA100R270 surface water body.

Water Body Code	Water Body Name	Chemical status evaluation in the third RBMP	Excess - 33 (water/biota)	Chemical status GOAL in the third RBMP	Exception for achieving of good chemical status the third RBMP
BG3MA100R270	Byala Reka River and its tributaries	Good	no	Preservation of a good chemical status and prevention of its deterioration.	not applicable

Table IV.2.1-11. List of Additional Measures to Achieve the Environmental Goals

Measure code	Key-type measure (KTM) code	KTM	Measure type	Measure name	Enforcing authority
DP_12	2	Reduction of pollution with nutrients from agriculture	Diffuse pollution	Biological methods to restrict eutrophication	Basin Directorate / Ministry of Agriculture and Foodstuffs
DP_13	3	Reduction of pollution with pesticides from agriculture	Diffuse pollution	Protection of water against pollution with plant protection preparations	MOEW/BD
DP_2	16	Upgrading or improvements of industrial (incl. farming) wastewater treatment plants	Diffuse pollution	Reduction of diffuse pollution from industrial activities	Facility owner or operator
DP_4	16	Upgrading or improvements of industrial (incl. farming) wastewater treatment plants	Diffuse pollution	Reduction of pollution from mining activities	Facility owner or operator
DW_4	13	Potable water protection measures (such as designation of protective zones, buffer areas etc.)	Protection of water extraction	Protection of surface waters intended for domestic water supply	MOEW/BD
GO_3	14	Scientific research, improvements based on knowledge to reduce uncertainty	Improvement of management	Improvement of water management in water protection zones	MOEW/ EEPA/ BD
HY_2	6	Improvement of the hydromorphological conditions of water bodies (such as restoration of rivers, improvement of riparian areas, removal of solid embankment fills, restoration of the connection between rivers and floodplains, improvement of the hydromorphological status of transitional and coastal waters etc.)	Hydromorphology	Restoration of the natural condition of lake bottoms downstream of barricades.	Facility owner or operator

Measure code	Key-type measure (KTM) code	KTM	Measure type	Measure name	Enforcing authority
HY_7	6	Improvement of the hydromorphological conditions of water bodies (such as restoration of rivers, improvement of riparian areas, removal of solid embankment fills, restoration of the connection between rivers and floodplains, improvement of the hydromorphological status of transitional and coastal waters etc.)	Hydromorphology	Improvement of the morphological status of rivers.	Facility owner or operator / MOEW, BD
HY_8	6	Improvement of the hydromorphological conditions of water bodies (such as restoration of rivers, improvement of riparian areas, removal of solid embankment fills, restoration of the connection between rivers and floodplains, improvement of the hydromorphological status of transitional and coastal waters etc.)	Hydromorphology	Application of EIA to investment proposals/projects concerned with new changes of the physical features of surface water bodies	MOEW/BD
IP_1	16	Upgrading or improvements of industrial (incl. farming) wastewater treatment plants	IPPC	Implementation of the procedure for reviewing of issued wastewater discharge permits	MOEW/EEPA
IP_2	14	Scientific research, improvements based on knowledge to reduce uncertainty	IPPC	Observation of results from the local monitoring network of tailings management facilities	MOEW/BD/EEPA
OS_2	23	Measures for natural retention of water	Other significant unfavourable impacts	Improvement of the natural retention of water	MOEW/Municipalities/Districts/Facility owner or operator
PI_1	2,3,16	For more than one KTM	Point discharging of waste water	Amendment or termination of wastewater discharge permits as a result of reviewing	MOEW/BD
PI_2	16	Upgrading or improvements of industrial (incl. farming) wastewater treatment plants	Point discharging of waste water	Ensuring adequate treatment of industrial wastewater	Facility owner or operator
PI_3	1	Construction or upgrading of waste water treatment plants	Point discharging of waste water	Ensuring collection, discharging and treatment of industrial wastewater discharged into water bodies	Facility owner or operator
UW_1	1	Construction or upgrading of waste water treatment plants	Municipal waste water	Use of natural wastewater treatment methods	Facility owner or operator / MOEW, BD

Measure code	Key-type measure (KTM) code	KTM	Measure type	Measure name	Enforcing authority
OS_3	14	Scientific research, improvements based on knowledge to reduce uncertainty	Other significant unfavourable impacts	Examination to ascertain pollution of surface and ground waters	MOEW/BD
OS_4	23	Measures for natural retention of water	Other significant unfavourable impacts	Wetland drainage	Municipalities/Districts/MOEW
PM_2	99	Other preventive measures	Other preventive measures	Protection of the status of groundwater against pollution and deterioration	MOEW/BD
PM_3	99	Other preventive measures	Other preventive measures	Application of EIA to abstraction of water from ground water bodies	MOEW
PM_4	99	Other preventive measures	Other preventive measures	Application of EIA to abstraction of water from surface water bodies	MOEW

2.2. Groundwater

The IP area surface is situated within ground water body (GWB) with code BG3G000PtPg049 Fissure water - Eastern Rhodopean Complex, in a region which is part of the Eastern Rhodopean block comprising Pre-Cambrian, Palaeogene and Quaternary rock formations. This GWB is next to the state border which predominantly follows along watershed crests.

According to Bulgaria's hydrogeological zoning, the area under consideration belongs to the Eastern Rhodopean region of the Rila-Rhodopes district and is part of the Arda River valley. The waters of highest practical significance in the territory under consideration, which is part of the Arda River catchment area, are waters circulating in the alluvial sediments of the Byala Reka River and its tributaries and the Arpa Dere River, the Hambar Dere River, the Yuruklerska River etc. The paleogenic sediments form laminar aquifer complex with mainly low flow rate. This aquifer is broad, significantly deep, featuring uneven horizontal and vertical changes of various rock types which, together with the uneven jointing, have caused filtration anisotropy of the ore-hosting rocks. Fissure type waters have formed in the studied region of this complex. These water have formed in sediment-tuff materials, with main water-bearing materials such as sandstone, conglomerates and, to a lesser extent, tuffs and tuff-breccia. The ground water is connected to the areas of regional jointing. Sandstone and conglomerate are frequently silicified which reduces their water-collection properties and available water. The fissure water is recharged by precipitation but recharging is difficult because in most cases the water permeable rocks are covered by non-impermeable layers. On the other hand, the severely disjointed terrain aids in the faster draining of the crossing gorges which also reduces the volumes of water accumulating there. Water abstraction testing in the Ivaylovgrad area has shown that the relative flow-rates are low, frequently falling below 0.1 l/s.

In summary, lithology types of a rather diverse type and age are included in this generalized geological and lithological section of GWB BG3G000PtPg049. The geological formations in the studied region are represented by a metamorphous base (migmatites, serpentinites, amphibolites, marbles, gneiss and granite) and by a Palaeogene sediment complex (breccias and conglomerates, polymictic coarse-grained to aleuritic sandstones, marls and coal schists).

The ground water circulates exclusively along mechanical disturbances such as fissures and tectonic discontinuities in those virtually water-tight lithological types. The non-uniform water-bearing capacity of these rock formations is determined by rock geology and lithology and, most of all, by irregular jointing and faulting.

The level of groundwater flowing through GWB IIBT BG3G000PtPg049 were measured on a regular basis in 8 boreholes in 2019-2022 (and are still being monitored). The measurement results and the overall study results allow characterizing the GWB BG3G000PtPg049 in the studied Rozino IP area. Groundwater table during the period in question was measured as 4.82 to 31.33 m. below the surface and generally follows the landscape line. The water levels vary between 259.27 and 467.03 m. Borehole RDD-056 is an exception - the ground water there drain freely at elevation 368.75 m. The ground water is type-classified as fissure water.

The permeability of the water saturation rocks is very low, the filtration ratio varying between 2.11×10^{-7} and 2.13×10^{-9} m/sec, and the conductivity ranging between 0.02 and 0.069 m²/24 h.

The water flowing into GWB BG3G000PtPg049 is fresh, with mineralization of <1 g/l, and are neutral (pH 7.02 – 7.65). The chemical analyses show lower concentrations of the studied

parameters as compared to the quality standard set forth in Regulation 1 of October 10, 2007. This shows a good chemical status of the ground water and the values measured in the different boreholes are very similar and reflect a comparatively constant chemical composition of the ground water that is not altered by human activity.

The water accumulated in the Palaeogene sediments in the studied area recharges mainly via fractures and tectonic discontinuities from adjacent horizons and via the metamorphous rocks of their basement. Combined with very low rock filtration ratios, the highly rugged terrain allows for very little recharging through surface water seepage.

The Report on hydrogeological conditions in the Rozino Deposit IP area, prepared by Tintyava Exploration AD In here as an attachment, details the geological and hydrogeological characteristics of the groundwater bodies and in the Rozino IP. The report is presented in **Textual attachment 16**.

The main data and parameters (geological, hydrogeological, soil) of groundwater body BG3G000PtPg049 - Fissure – Eastern Rhodopes Complex are presented in Table IV.2.2-1, Table IV.2.2-2, Table IV.2.2-3, and Table IV.2.2-4 (source: Section 1 of the third RBMP of EAR).

Section 4, items 4.2.2 and 4.2.3, Attachment 4.2.2.2.1 of the third RBMP of EAR define the chemical status of groundwater body BG3G000PtPg049 as ‘good’ in accordance with Regulation 1 of October 10, 2007 on Groundwater Exploration, Use and Protection (SG, issue 87 of 2007, amended in SG issue 28 of 2013) and its quality status for certain threshold values is ‘good’ (Table IV.2.2 -5) This GWB was evaluated as ‘at risk’ in the second RBMP of EAR, while its risk assessment in the third RBMP of EAR is: ‘not at risk’ (Table IV.2.2-6.)

The up-to-date information about the status of the waterbody is based on the 2022 Annual bulletin about the state of surface and ground water bodies in the West Aegean River Basin Management Region (published on May 05, 2023). The chemical status of the groundwater bodies in the West Aegean River Basin Management Region is evaluated on the basis of measured pollutant concentrations and pollution levels in the monitoring points, determining and comparing the respective 5-year averages with the respective quality limit values as per Attachment 1 of Regulation 1 of October 10, 2007 on Exploration, Use and Protection of Ground Water, and comparison of the respective pollutants/pollution parameters with the relevant limit values for each groundwater body included in the RBMP of EAR (2016-2021).

The total available resource of GWB BG3G000PtPg049 is 10,753 l/sec, with consumption of 253 l/sec, which equates to an exploitation index of 2.35%. The main water uses are (Table IV. 2.2-7):

- public domestic water supply to the population – 168.6 l/sec.;
- industrial water supply – 3.0 l/sec.;
- agricultural water supply (irrigation, stock breeding and aquacultures) – 9.0 l/sec.;
- satisfying personal needs of the residents (households) – 51.4 l/sec.;
- other purposes – 18.9 l/sec.

No ecosystems dependent on the quantitative pressure over groundwater are established within the EAR.

This groundwater body is identified as a water protection zone in accordance with Article 119a, paragraph 1, item 1 of the Waters Act – water abstraction for human consumption, with water protection zone code of BG3DGW000PtPg049.

The investment proposal territory is situated in a zone vulnerable to nitrates, according to Section 3, item 3.3.1 of the third RBMP of EAR and Attachment 1 to Order ПД-900/21.10.2024 of the Minister of Environment and Waters. Areas vulnerable to nitrates are protected by Order ПД-237/17.03.2020 of the Minister of the Ministry of Environment and Waters, and Order ПД-09-222/27.02.2020 of the Minister of the Ministry of Agriculture, Foodstuffs and Waters has approved a Program of measures for limitation and prevention of pollution with nitrates from agricultural sources in vulnerable areas, in keeping with Regulation 2/13.09.2007 on the Protection of Waters against Pollution with Nitrates from Agricultural Sources.

A program of measures has been developed to fulfil the environment protection goals (Table IV.2.2-8) in Section 7 of the third RBMP of EAR (2022-2027). No specific measures are provided for Ground water body BG3G000PtPg049 - Fissure – Eastern Rhodopes Complex in which the IP area is situated, because this GWB has been defined as stable and in ‘good’ quality and chemical status.

Since no significant pressure has been identified, the risk assessment of GWT BG3G000PtPg049 for chemical (based on monitoring data and diffusive pressure) and quantity status is that it is not at risk’ (Table IV. 2.2-9).

Attachment 1.3.3.4 of Section 1 of the third RBMP of EAR presents a review of the aquatic or terrestrial ecosystems connected to the ground-water bodies. Such a connection has been identified between GWB BG3G000PtPg049 and WB BG3MA100R270 and it concerns habitats 6510 Lowland hay meadows over an area of 0.02 km² in the BG0001032 Rhodopes - Eastern protected area. The ecosystem status is favourable (Table IV.2.2-10).

In principle, this connection defines the structure, composition and functioning of ecosystems, especially where water is a limiting factor. Habitat 6510 ‘Lowland hay meadows’ is presented in the protected zone mainly along valleys and river beds, on flood plains and in lower-elevation pan-valley areas in the Eastern Rhodopes. This habitat is typical of periodically inundated areas or areas with long-term soil humidity and traditionally it is maintained by hay mowing and non-intensive pasture use. Geographically, these meadows are present in BG0001032 in batches, not forming large discontinuous massifs but, rather, local areas along the Arda river and its tributaries, along rivers and in valleys, and in the lower river stretches near low-lands. This batch structure is typical of the 6510 habitat in loosely tilled and semi-cultivated landscapes.

According to the report on ‘Distribution and assessment of the Nature Conservation Status of the 6510 ‘Lowland hay meadows’ habitat (*Alopecurus pratensis*, *Sanguisorba officinalis*) in Protected area BG0001032 ‘Rhodopes - Eastern’, Attachment 8.2. Map of Final Distribution of the 6510 Nature Habitat in the protected area BG0001032 ‘Rhodopes - Eastern’, the nearest sites with 6510 natural habitat are near the Gugutka village (in an area of around 0.06 ha), approximately 3.5 km to the south-east, the Planinets village (0.75 ha) approximately 7 km. to the north, in the Tintyava village (0.9 ha) 8 km to the southeast, and near the Kondovo village (approximately 1 ha) around 9.5 km east of the concession area (<https://natura2000.egov.bg/EsriBg.Natura.Public.Web.App/Home/ProtectedSite?code=BG0001032&siteType=HabitatDirective>). These are small local sections with a total area of around 2.7 ha.

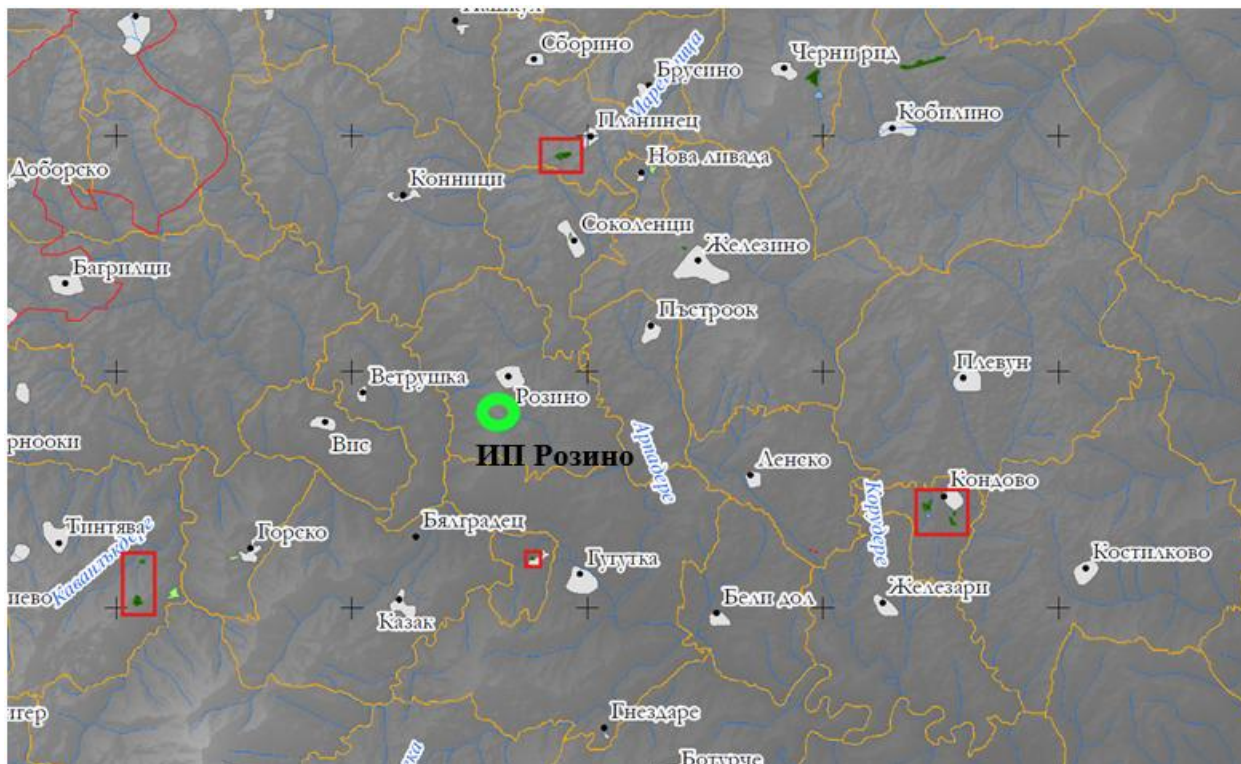


Figure IV.2.2-1. Sections with identified habitat 6510 Lowland hay meadows - marked in red (source: NATURA 2000).

On the other hand, the total available resource of GWB BG3G000PtPg049 is 10.753 l/sec., and the total consumption is 253 l/sec. - the operating index is 2.35%. The operating index would increase by only 0.5% if the design water abstraction of 50 l/sec. is implemented.

Accordingly, it can be concluded that the impact on natural habitat 6510 ‘Lowland hay meadows’ will be insignificant because:

- the sections in which habitat 6510 are territorially distant relative to the concession area;
- habitat 6510 has been localised in river-side sections without direct hydraulic connection to the concession area;
- the design quantity of abstracted water is insignificant relative to the available resources of the GWB.

It could be pointed out in summary that the groundwater resources in the region are of limited availability but of a stable and good chemical status, low industrial pressure and no significant anthropogenic change. If the protected-area applicable restrictions for water-use for human consumption, the requirements in respect of nitrate-vulnerable zone and the envisaged management and monitoring measures are applied, no substantial negative impact on the groundwater and related ecosystems is to be expected.

Water will be pumped directly from the Arpa Dere River during the wet months of the year (January through May). Water from Arpa dere will be abstracted near the point of its confluence with the Yuren dere river adjacent to the Rozino village pumping station. This pumping station has been designed to pump water from a spring flowing into river pool. The flow-rate of this spring

varies between 6 and 11 l/s during the entire year and is season dependent. It is calculated that a flow-rate of around 0.34 l/s will be required to supply Rozino village. Any excess water from the spring could, with the relevant justification, be drawn year-round for the industrial needs of the site. The plan is to abstract water from a natural pool without damming or other river blocking construction works.

The higher water flow in February, March and April allows for drawing at around 100 l/s during these months, to fill the non-contact water during higher precipitation-related inflows. This option is defined as a possibility and not as the main option because the hydrogeological study in the deposit area showed groundwater resources of limited availability and that groundwater abstraction will be utterly insufficient for the process.

One possible option during the IP implementation is abstraction of water from the Arpa Dere River floodplain (GWB BG3G000PtPg049) by constructing a pumping station. This would require the Investor to follow a permitting procedure for abstraction of water from ground waters pursuant to Article 52, paragraph 1, item 4 and Article 44, paragraph 1, in connection with Article 50, paragraph 7 and paragraph 8, and Article 60 of the Waters Act and with Regulation 1 on Exploration, Use and Protection of Groundwater

The Rozino head reservoir is 2,300 m. away from the pit outline in which mining will be carried out and 1,300 m. from the buffer zone boundary, with a 1,000 m radius (without a sanitary protection area) from the water intake facility (Figure IV.2.2-2). As can be seen on Figure II.1.2-1, the catchment is situated near point 6 of the future concession area, and this point is downstream of the non-contact water reservoir. As is visible on the maps, no mining will be carried out in the 1,000 m buffer zone and, therefore, no drilling and blasting, because there will be a man-made water intake, a non-contact water reservoir, required for the IP.

In this respect, the activity is not in contradiction with Section 7 of the third RBMP of EAR, measure *DW_1* named: *'Prohibitions and restrictions for activities in the potable water protection zones and in the sanitary protection belt areas and buffer zones around water abstraction facilities/systems'*, with a certain implementation action for measure: *DW_1_35* *'Prohibition for mining of underground mineral resources, including aggregate and construction materials, within a buffer zone with a radius of 1,000 m. from groundwater abstraction facilities for potable water supply'*.

No subsurface mineral resources and drilling and blasting are envisaged in the 1,000 radius buffer zone by the IP, whereby the action for compliance with measure *DW_1_35* is met.

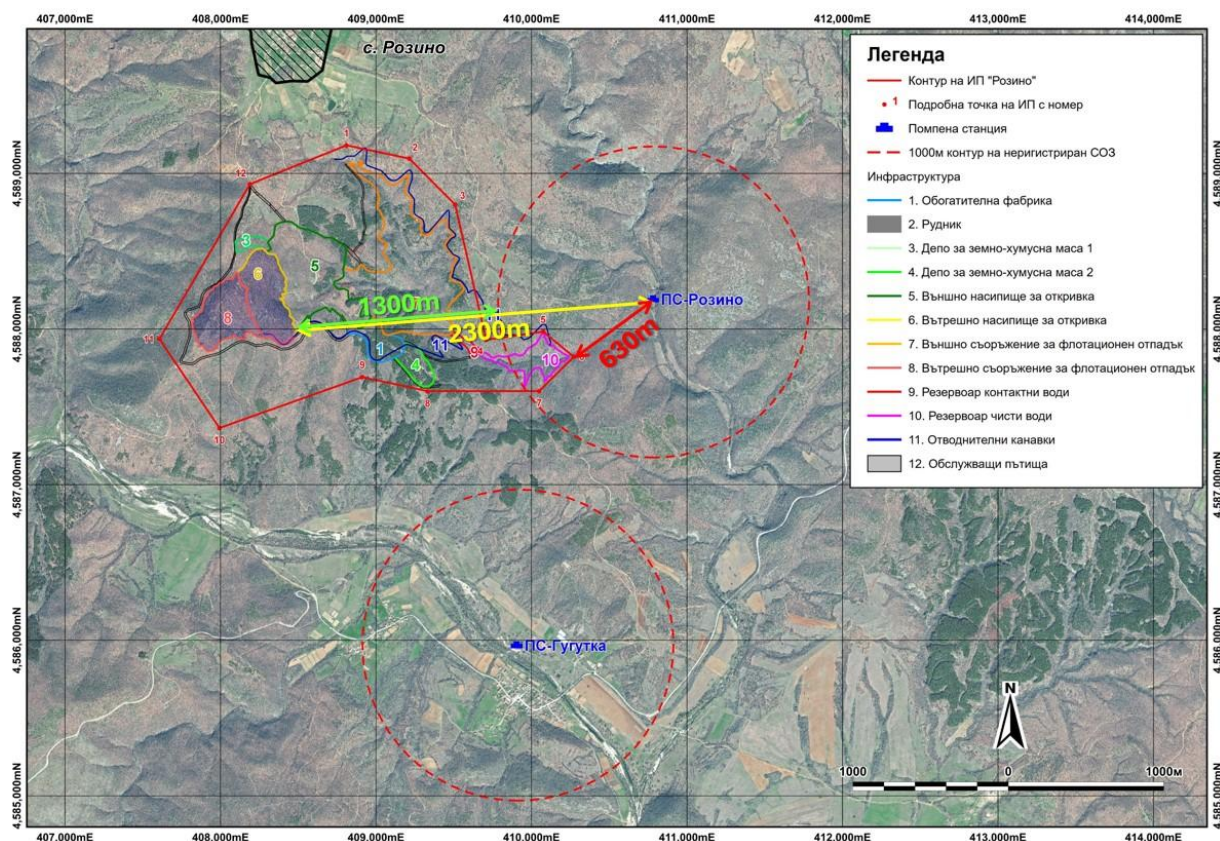


Figure IV.2.2-2. Layout of the Rozino head reservoir relative to the pit outline

Given the low exploitation pressure of this GWB (2.35%) with water extraction for personal needs, no impact on the chemical and qualitative status of the ground water is expected.

The investment proposal does not concern domestic water supply facilities and their sanitary protection belt areas. Only a dry well (R-19) near Rozino Village, along the road to Gugutka Village, and the Anasa fountain (G-1) (not in use) near Gugutka Village are situated within the future Rozino Concession Area.

Other water sources have been identified in the wider area around the IP site, used for watering of livestock and irrigation, and water sources which are not used or have dried up. Facilities without permits are situated 800 m to the east and 1,800 m to the south of the future ‘Rozino’ concession - the Rozino Pumping Station of the Haskovo Water Supply and Sewerage Company (in the Arpa Dere River floodplain, Water body BG3G000PtPg049) and the Gugutka Village Pumping Station (in the Byala Reka River floodplain, Water body BG3MA100R270) (Figure IV.2.2-3 and Table IV.2.2-11).

According to the conclusions of the hydrology evaluation presented in **Textual attachment 10**, water abstraction for the IP will be carried out mainly during the winter and spring period (January–May) from the Arpa Dere River near the Rozino Village pumping station (a section upstream of the confluence with the Yuren Dere River), and the water will be abstracted from a naturally formed pool without damming of the river. The following values have been determined for the Arpa Dere River in the section under consideration: flow rate $Q_{avg} = 0.983 \text{ m}^3/\text{s}$, ecological minimum $Q_{ec} = 0.098 \text{ m}^3/\text{s}$ and actual minimal water quantity with 90% availability $Q_{90} = 0.003 \text{ m}^3/\text{s}$. The analysis of water extraction possibilities shows that the full

abstraction capacity (approx. $104 \text{ m}^3/\text{s} \approx 104 \text{ l/s}$, i.e. 10% of the limit value/ecological minimum) applies only in times of sufficient water level; restrictions are possible during the dry period (June–November) because the monthly water quantities may fall below the ecological minimum (10% of the limit value). The conclusions indicate that limited water use and priority guaranteeing of utility and domestic water supply (for Rozino village) means that water abstraction for the Rozino mine is not expected to affect the water supply and, also, abstraction from surface water will not alter the water quality because the process water will be managed as non-contact/isolated in reservoirs and will be prevented from contacting groundwater or from uncontrolled returning to a receiving water body.

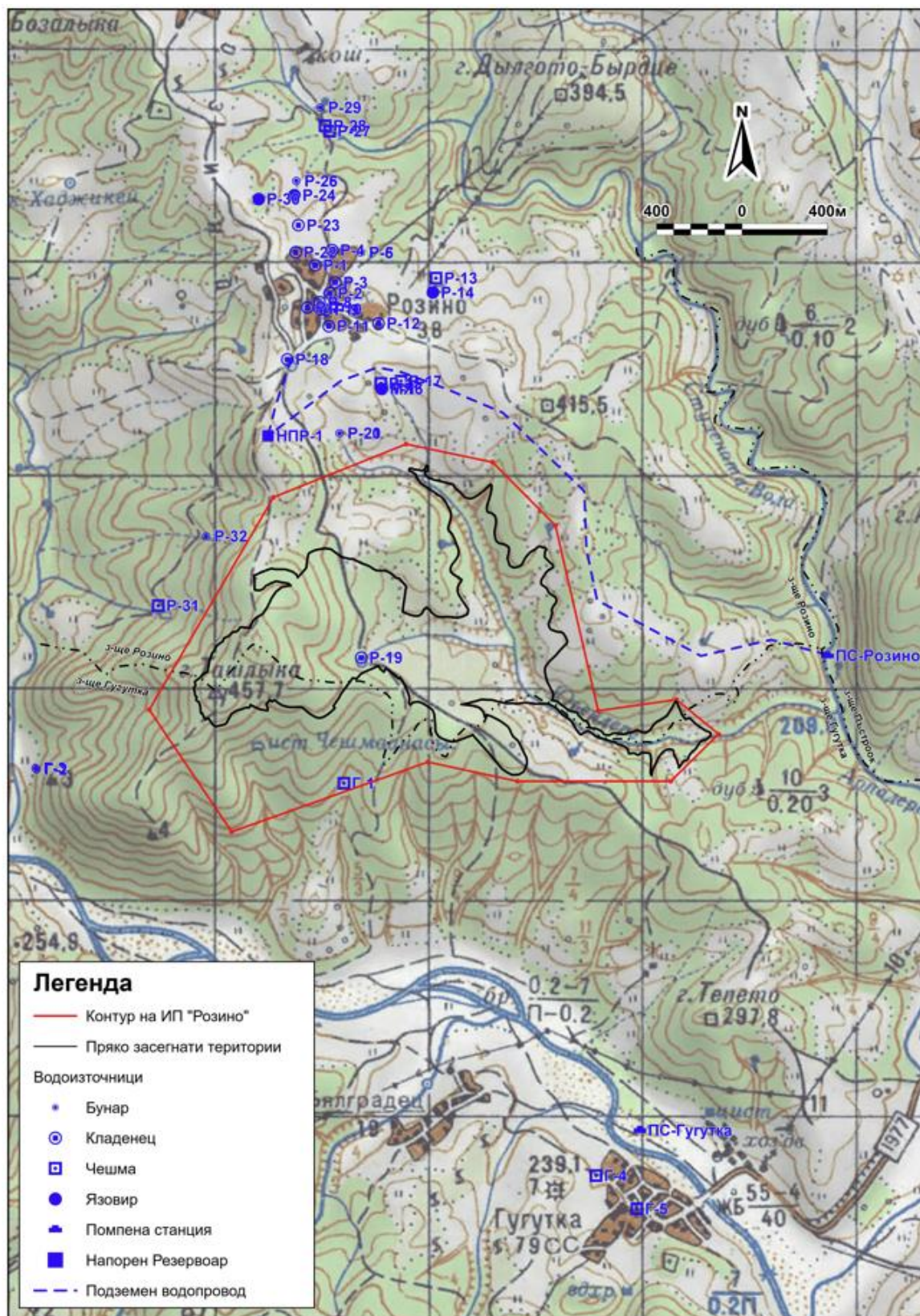


Figure IV.2.2-3. Location of the water sources relative to the boundaries of the future Rozino concession area.

Table IV. 2.2-12. provides information about water abstraction facilities in the IP area, provided from the EAR Basin Directorate and from the Haskovo Water Supply and Sewerage Company.

Table IV.2.2-1. Information about the groundwater body in the IP area.

GWB name	GWB code	GWB type according to the hydraulic conditions of its roof strata	Characteristics of the geological layer flows	GWB area km ²	Uncovered area km ²	Characteristics of the GWB roof strata in the recharge zone	GWB on which aquatic and/or terrestrial ecosystems depend directly
Fissure water - Eastern Rhodopean Complex	BG3G000PtPg049	Unconfined	Not layered The waters flow through the weathered rock areas from higher to lower ground.	6593.09	6489.96	Various brown and cinnamon forest soil types. Diverse volcanic, volcano-sediment, metamorphous and magmatic rocks weathered in various degrees.	BG0001032 Rhodopes - Eastern, BG0002106 Ivaylovgrad dam BG0002071 Bridge Arda BG0002012 Krumovitsa BG0002013 Studen kladenets BG0002014 Madjarovo

Table IV.2.2-2 Geological parameters of ground-water body BG3G000PtPg049.

GWB name	GWB code	Geological Setting		
		Geological Formation	Lythological structure of the GWB	Tectonics
Fissure water - Eastern Rhodopean Complex	BG3G000PtPg049	Pre-Rhodopean supergroup, Rhodopean supergroup, Metavolcanite complex, Phanerozoic granitoids, Palaeogene volcanogenic, sediment-effusive complexes	Rhyolites, andesites, pyroclastic rhyodacites, tuffs, tuffites, tuffaceous sandstones and siltstones, limestones - cavernous, chalky sandstones, marls, conglomerates, sandstones, clays. Gneiss schists, granitized gneisses, granite-gneisses, gneisses, migmatites, schists, amphibolites, marbles, calcoschists.	Rhodopean massif - the Central-Rhodopean and Eastern-Rhodopean block

Table IV.2.2-3 Characteristics of sediments and soils covering ground-water body BG3G000PtPg049.

GWB name	GWB code	Characteristics of sediments and soils covering the ground-water body			
		Depth of sediments and soils covering the ground-water body, m	Porosity %	Permeability coefficient, m/day	Absorbing properties
Fissure water - Eastern Rhodopean Complex	BG3G000PtPg049	From 1 to several scores of meters depending on the degree of weathering.	1-55	0.5-2.2	no data

Table IV.2.2-4 Hydrogeological parameters of ground-water body BG3G000PtPg049.

GWB name	GWB code	Aquifer type	Hydrogeological parameters of the ground-water body					
			GWB Depth, m	Permeability coefficient m/day	Transmissivity, m ² /day	GWB Type	Porosity %	% Seepage
Fissure water - Eastern Rhodopean Complex	BG3G000PtPg049	Fissure, low availability	several meters to scores of meters	0.0001-1	ND	Fissure flow GWB	1-2	8

Table IV.2.2-5 Evaluation of the chemical status of the BG3G000PtPg049 ground-water body.

GWB code	Name	Test: Overall assessment by chemical status of the GWB	Test: Intrusion of salty or polluted water (NA/good/bad)	Test: Substantial deterioration of the ecological or chemical status of surface water bodies caused by transfer of pollutants from GWB (NA/good/bad);	Test: Substantial deterioration of the status of terrestrial ecosystems dependent on ground waters caused by transfer of pollutants from GWB (NA/good/bad)	Test: Deterioration of quality of ground waters intended for domestic water supply (NA/good/bad)	Upward trend present (yes/no)	Overall assessment of GWB chemical status	Substances or indicators of pollution
BG3G000PtPg049	Fissure water - Eastern Rhodopean Complex	good	good	good	good	good	no	good	no

Table IV.2.2-6 Evaluation of the chemical-status risk of the BG3G000PtPg049 ground-water body.

GWB code	Name	Risk assessment by chemical status of SWB in RBMP 2 (2016 - 2021)	Overall assessment by chemical status of SWB in RBMP 2 (2016 - 2021).	Risk assessment by chemical status of SWB in RBMP 3 (2016 - 2027).	Overall assessment by chemical status of SWB in RBMP 3 (2016 - 2027).
BG3G000PtPg049	Fissure water - Eastern Rhodopean Complex	at risk	good	not at risk	good

Table IV.2.2-7 Use of water from ground-water body BG3G000PtPg049.

Ground Water Body Code	Ground Water Body Name	Annually abstracted water quantities, l/sec								Available GWB resources, l/sec	Exploitation index
		Purpose of water extraction							Total		
		For pubic drinking water supply for the population	For agriculture (irrigation, livestock)	For industrial purposes	Other	For aquacultures	For satisfying of personal needs of the residents (households)	Tourism and recreation			
BG3G000PTPg049	Fissure water - Eastern Rhodopean Complex	168.55	9	3.0	18.9	0.00	51.38	2	253	10753	2.4%

Table IV.2.2-8. Goals for achieving of good chemical status of the BG3G000PtPg049 ground-water body.

Ground Water Body Code	GWB name	Overall assessment of WB chemical status in the third RBMP	Indicators with a deviation in the third RBMP	Goal - chemical status in the third RBMP	Exceptions from achieving of good status in the third RBMP
BG3G000PtPg049	Fissure water - Eastern Rhodopean Complex	good	no	Preservation of the good chemical status and prevention of its deterioration	not applicable

Table IV.2.2-9. Evaluation of the risk for the BG3G000PtPg049 ground-water body.

GWB code	GWB name	Category of pressure		Risk assessment by chemical status of SWB based on monitoring results	Risk assessment by chemical status of SWB (monitoring + diffusive pressure)	Risk assessment by quality of the SWB
		Point	Diffusive			
		Potential impact % of exposed GWB area	Potential impact % of exposed GWB area			
BG3G000PtPg049	Fissure water - Eastern Rhodopean Complex	7.87% <u>Sources:</u> Landfills, pesticide warehouses, soil lagoon, deposits of: industrial minerals; rock-lining materials; construction materials; urban areas with partial sewerage	57.15% <u>Sources:</u> Urban areas without sewerage and from agricultural diffusion - likely by organic nitrogen and phosphorus fertilizers, tailings management facilities, metal deposits, deposits of: uranium; rock-lining materials; construction materials; industrial minerals	not at risk	not at risk	not at risk

Table IV.2.2-10. Connection of terrestrial ecosystems to the BG3G000PtPg049 ground-water body.

Groundwater Body	Surface Water Body	Terrestrial ecosystems	Terrestrial ecosystems - surface area, km ²	Protected zone	Ecosystem status
BG3G000PtPg049 Fracture water - Ivaylovgrad Massif	BG3MA100R270 Byala Reka River and its tributaries	6510 Lowland hay meadows	0.02	BG0001032 Rhodopes - Eastern	Favourable

Table IV.2.2-11. Water sources in the territorial range of the IP site or in its wider surroundings

ID	Town/village	Location	Type of facility		Geographic coordinates		БГС2005 UTM		Use
				Facility code	Latitude	Longitude	North 35N	East 35N	
P-1	Rozino village	Rozino Village, Myumyun	Well	Well	41.456513	25.903067	4590017	408385	Dry
P-2	Rozino village	Rozino Village, the mosque	Well	Well	41.455341	25.903913	4589886	408454	not in use
P-3	Rozino village	Rozino Village, downstream of the mosque	Well	Well	41.455803	25.904204	4589937	408479	not in use
P-4	Rozino village	Rozino Village, Kadir Gyulista	Well	Well	41.457162	25.904014	4590088	408465	irrigation
P-5	Rozino village	Rozino village	Draw well	Draw well	41.457069	25.905632	4590076	408600	watering place
P-6	Rozino village	Rozino village	Draw well	Draw well	41.457069	25.905632	4590076	408600	watering place
P-7	Rozino village	Rozino Village, next to Orhan’s mother	Well	Well	41.454726	25.902666	4589819	408349	Dry
P-8	Rozino village	Rozino Village, next to Orhan	Well	Well	41.454957	25.903345	4589844	408406	not in use
P-9	Rozino village	Rozino Village, next to Myumyun’s sheep pen	Well	Well	41.454637	25.903733	4589808	408438	Dry
P-10	Rozino village	Rozino Village, sheep pen	Well	Well	41.454661	25.903397	4589811	408410	not in use
P-11	Rozino village	Rozino Village, Mayor’s office	Well	Well	41.453954	25.903876	4589732	408449	not in use
P-12	Rozino village	Rozino Village, switchyard	Well	Well	41.454097	25.906663	4589745	408682	Dry
P-13	Rozino village	Rozino Village, downstream of the dam lake	Tap water	Tap water	41.456037	25.909852	4589957	408951	watering place
P-14	Rozino village	Rozino village	Water storage dam	Water Reservoir	41.455432	25.909682	4589890	408936	watering place
P-15	Rozino village	Rozino Village, next to the water dam	Tap water, Mehmed Daud	Tap water	41.451568	25.906838	4589464	408693	watering place
P-16	Rozino village	Rozino village	Water Reservoir	Water Reservoir	41.451334	25.906889	4589438	408697	watering place
P-17	Rozino village	Rozino village	Tap water	Tap water	41.451669	25.907961	4589474	408787	watering place
P-18	Rozino village	Rozino Village, next to the graveyard	Well	Well	41.452527	25.901578	4589576	408255	not in use
P-19	Rozino village	Rozino Village, the road to Gugutka village	Well	Well	41.439985	25.905931	4588179	408601	Dry
P-20	Rozino village	Rozino village	Draw well	Draw well	41.449438	25.904551	4589230	408499	watering place
P-21	Rozino village	Rozino village	Draw well	Draw well	41.449438	25.904551	4589230	408499	watering place
P-22	Rozino village	Rozino Village, next to the first house	Well	Well	41.457052	25.901968	4590078	408294	for irrigation

ID	Town/village	Location	Type of facility		Geographic coordinates		БГC2005 UTM		Use
				Facility code	Latitude	Longitude	North 35N	East 35N	
P-23	Rozino village	Rozino village	Well	Well	41.458197	25.902105	4590205	408307	for irrigation
P-24	Rozino village	Rozino Village, next to the Mayor	Water Reservoir	Water Reservoir	41.459456	25.901856	4590345	408288	watering place
P-25	Rozino village	Rozino village	Draw well	Draw well	41.460060	25.901953	4590412	408297	watering place
P-26	Rozino village	Rozino village	Draw well	Draw well	41.460060	25.901953	4590412	408297	watering place
P-27	Rozino village	Rozino village	Tap water, Mehmed Gyulistan	Tap water	41.462176	25.903786	4590645	408453	watering place
P-28	Rozino village	Rozino village	Tap water	Tap water	41.462408	25.903530	4590671	408432	dry
P-29	Rozino village	Rozino village	Draw well	Draw well	41.463171	25.903230	4590756	408408	Dry
P-30	Rozino village	Rozino village	Water Reservoir	Water Reservoir	41.459275	25.899859	4590327	408121	watering place
P-31	Rozino village	Rozino village	Kyoryumer's water tap	Tap water	41.442074	25.894524	4588423	407651	not in use
P-32	Rozino village	Rozino village	Draw well	Draw well	41.445026	25.897155	4588748	407875	Dry
G-1	Gugutka village	Gugutka village	Tap water, Anasa	Tap water	41.434680	25.905050	4587591	408520	not in use
G-2	Gugutka village	Kokardja Dere	Draw well	Draw well	41.435091	25.887820	4587655	407081	watering place
G-3	Gugutka village	Kokardja Dere	Draw well	Draw well	41.435154	25.887759	4587662	407076	watering place
G-4	Gugutka village	Along the road to Gugutka village	Tap water	Tap water	41.418261	25.919446	4585753	409700	dry
G-5	Gugutka village	Gugutka village, next to the church	Tap water	Tap water	41.416877	25.921755	4585597	409891	Flowing
B-1	Byal Gradets village	Along the road to the Byala Reka river	Draw well	Draw well	41.426241	25.899436	4586660	408039	watering place
K-1	Kazak village	Kazak village	Draw well	Draw well	41.426434	25.893269	4586688	407524	Dry
Gugutka PS	Water Supply and Sewerage - Haskovo	In the Byala Reka River floodplain, Water body BG3MA100R270	Pumping Station	Pumping Station	41.420195	25.921879	4585965	409906	Water Supply and Sewerage - Haskovo
Rozino PS	Water Supply and Sewerage - Haskovo	In the Arpa Dere River floodplain, Water body BG3G000PtPg049	Pumping Station	Pumping Station	41.440319	25.932045	4588189	410783	Water Supply and Sewerage - Haskovo
Small dam	Tintyava Exploration AD	Rozino dam	Water storage dam	Water Reservoir	41.451334	25.906889	4589438	408697	Tintyava Exploration AD

Table No. IV.2.2-12. Information about water abstraction facilities in the IP area provided from the EAR Basin Directorate and from the Haskovo Water Supply and Sewerage Company.

No.	Operator	Permit	БГC2005 UTM34N		Geographic coordinates		RL	Water Body Code	Note
			North	East	North	East			
1	Water Supply and Sewerage - Haskovo	No permit	4585965.17	409905.94	41°25'12.7"	25°55'18.76"	222	BG3MA100R270	Gugutka PS, for water supply
2	Water Supply and Sewerage - Haskovo	No permit	4588188.83	410783.07	41°26'25.15"	25°55'55.36"	255	BG3G000PtPg049	Rozino PS, for water supply
3	Tintyava Exploration AD	No. 1/08.01.2019	4589438	408697	Rozino dam		296	Water storage dam	For drilling operations

3 . Soils

According to Bulgaria’s soil-geographic zoning (N. Ninov, Geography of Bulgaria, 1997), the IP area is situated in a Balkan-Mediterranean soil sub-area, in the Eastern Rhodopes - Sakar province.



Figure IV.3-1 Map of Bulgaria’s soil-geographic zoning and location of the IP

This province is dominated by shallow soils (Leptosols, LP) – umbric leptosols with lithosols, umbric liptosols with cinnamon luvisols (chromicq LVx) soils and development of erosion. The soils in the province belong mainly to Class IV of soil capability – poor.

They are formed over the weathering zone of Paleogene limestones (Pg23). Up to 90% of these soils are defined as cinnamon leached, sandy-clayey, rocky, rather shallow, poor, dry, and not suitable for forests. These soils are poorly fertile, weak and with up to 2% of total nitrogen. Their pH is mainly slightly acidic and neutral. The high ion-exchange and buffer capacity of these soils, which are differentiated in texture, are also highly stable against pollution and belong to resistance class III. The sub-Mediterranean part of the climate in the region where cinnamon forest soils occur contributes to a longer and more intense intra-soil weathering processes. The soils are cinnamon to cinnamon-brown in colour and more clayey in composition.

Crumbly, shallow and predominantly dry leached cinnamon forest soils of clayey-sandy composition prevail in the Ivaylovgrad Municipality. In general, cinnamon forest soils occur mainly in low-mountain regions and occupy the relatively more disjointed terrain forms in pan valleys. This soil type contains mineral chemical elements. As the physical properties are concerns, the profile is highly compacted irrespective of the differences in mechanical composition. Furthermore, usually the upper layer is highly pulverised but the subsoil structure

is good, in comparison. The soil structure deteriorates abruptly at depth. Increased erosion is observed in the areas where these soils occur. In general, relatively high vertical disjointing of the terrain and significant deforestation are the main erosion-conductive processes.

It is important to note that soil erosion is among the main problems faced by farmers and impacts agricultural development to a high degree. Many studies show that sustainable organic farming and regular forestation can improve the condition of the soils and reduce the erosion processes.

Cinnamon forest soils are suitable for vineyards, tobacco, fruit crops and cereals.

The other soil types in the Ivaylovgrad area are slowly weathering and erodible leached and weakly leached chernozem vertisols occurring in river valleys and in shallow soils over hard rocks.



Figure IV.3-2. The contour of the future concession area, Google Earth

The regional laboratory of the Executive Environmental Agency in Haskovo monitors the Earth and Soils monitoring and control subsystem of the National Automated System for Environmental Monitoring (NASEM). The soil-sampling points have been defined by the Executive Environmental Agency in Sofia. They are situated over the entire jurisdiction of the RIEW and are related to the sources of pollution. The monitoring points are appropriate for the soil types, the permanent uses and the crops. Geographic coordinates in a 16x16 km network have been laid down for those monitoring points. Sampling in the Ivaylovgrad Municipality is carried out in the following points:

- Pashkul village;
- Svirachi village.

According to the Regional Environmental Status Report drawn up by the Haskovo RIEW,

the samples taken in 2021 were analysed in 2022 for heavy metals and level I metalloids following an annual soil monitoring program approved by EEA’s Executive Director. Samples taken from both points in the Ivaylovgrad Municipality had been analysed for the following parameters: heavy metals and metalloids, total nitrogen (Keldahl), phosphorus, organic carbon, soil pH, electrical conductivity, total carbon and persistent organic pollutants - 16 PAH, 6 PCB, 15-chlor-organic pollutants, bulk density. The analysis results show compliance for all parameters with the limit values set forth in Regulation 3/2008 on the Limit Values for Harmful Substances in Soils and in Annex 2 under Article 4 – Safe Concentrations, Maximum Admissible Concentrations, Intervention Concentrations for Persistent Organic Pollutants and Oil Products in Soils.

No soil sampling and soil acidity testing in the Ivaylovgrad region have been carried out in 2022.

Storage facilities (BB cubes) for obsolete plant protection products which have become unusable or have been banned are present in the municipality and have been repaired.

The soil samples taken from the points in the Pashkul and the Svirachi villages have been analysed in 2022 for pesticide pollution. No pesticide pollution was shown in the test results.

No sampling and testing of soil samples for acidity from the Ivaylovgrad region have been carried out.

No pollution with oil products was found on the territory of the Haskovo RIEW in 2022.

No soils from the points in the Pashkul and Svirachi villages have been taken and tested in 2023 and 2024.

The storage facilities (B-B cubes) for old, unsuitable and banned plant protection products, unchanged since 2023.

A planned inspection of the B-B cubes was carried out in 2024 in the Plevun village in the Ivaylovgrad Municipality, and prescriptions were issued to remedy any established irregularities, such as repairing a ruptured warehouse roof, repairing the warehouse walls, clearing the area of grass. A subsequent inspection found that all the prescriptions were complied with.

Polluted Lands

No pollution with harmful substances and waste has been established on the site and on its adjacent lands.

Degradation Processes

No and landslide processes are observed in the project site area.

Land Use Patterns

The register of impacted properties is presented in **Textual attachment No 8**.

4. Subsurface Environment and Mineral Diversity

The Regional Geology

The Eastern Rhodopes is regarded as part of the so-called Eastern-Rhodopean anticlinorium comprising a series of anticlinal and synclinal folds (Kozuharov, 1971) such as the Kesebair upheaval, the Avren graben-synclinatorium, the Tintyava upheaval, and the Rozen synclinatorium.

The Tintyava PLA is located in the Eastern Rhodope fall, east of the Belorechki cupola. It is positioned in a Palaeogene graben, typical of the Eastern Rhodopes and filled mainly by coarse clastic material and by less rudaceous sediments. The graben has formed by collision development of the region during the Upper Cretaceous and the Oligocene. This has resulted to the accumulation of thick terrigenous and volcanogenic-sediments of diverse composition during the Palaeogene. Hypoabyssal and mainly acidic subvolcanic intrusives have become embedded by the end of the Oligocene in this heavily disintegrated earth crust and have enabled the creation and long existence of hydrothermal systems. The intrusions have acted as thermal motors driving large volumes of hydrothermal solutions. These solutions have leached gold from the hosting rocks and have transported it as chloride complexes across the permeable faulting and thrusting zones. Their mixing with meteoric water has resulted in lower temperature and deposition of the more mineralization. Several highly metamorphous complexes, mesozoic schists and aplitic granites (Rozino type), which are superimposed between one another, are delineated in the western and north-western parts of the Palaeogene sediment basin. Two suites - a breccia-conglomerate and a coal-bearing sandy suite of Preabonian age have been proven by fauna indicators in the PLA. These suites are 800 - 1,000 m. deep and 100 to 800 m. deep, respectively. Their lithology is highly diverse. The breccia conglomerate suite comprises pieces of the metamorphous foundation, granite blocks, ultrabazites, and diaphorites with sandy and coal-sandy bindings. The coal-sandy suite comprises polymictic sandstones with limestone-clayey binding, gravel conglomerates, aleurolitic sandstones, marls, coal schists and coal.

The main ore deposition is hosted in the sediments of the Byala River graben near the western boundary of the basin. Several highly metamorphous complexes, mesozoic schists and aplitic granites (Rozino type), which are superimposed between one another, are delineated in within the Palaeogene sediment basin.

The sediments outcropping to the surface are part of the Krumograd group (undefined), the breccia-conglomerate suite (Podrumchenska suite), the coal-bearing sandy formation (conglomerate-sandstone suite).

The Alpine ore deposits in the Eastern-Rhodopes Ore Basin are united in five mineralization types:

- pre-Palaeogene: chalcopryrite-pyrite with gold type;
- Palaeogene quartz-pyrolusite, quartz-gold-polymetal, quartz-gold-adular (low-sulphide) types;
- Neogene: quartz-antimony with gold type.

Quartz-gold-polymetal and quartz-gold-adularia mineralizations are predominant in the PLA.

The quartz-gold-polymetal mineralization is closely linked to montsonite hypoabyssal intrusive rocks, post-plutonic dykes and rhyolite-andesite depressions (Kolkovski, 1994). The ore bodies comprise quartz-sulphide veins, vein-like zones or linear stockwerks. Five mineral types are present in the formation:

- quartz-pyrite-chalcopryrite with bismuth sulphosalts - Madjarovo, Popsko;
- quartz-hematite-chlorite with gold - Madjarovo, Spahievo;
- quartz-polymetal with chalcopryrite - Madjarovo, Popsko, Zvezdel-Pcheloyad;
- quartz-barite-sulphosalt with gold - Zvezdel-Pcheloyad, Madjarovo, Popsko.

The quartz-gold-adularia mineralization which is poor in sulphides in the Eastern-Rhodope Ore Region is increasingly important. It is characterised by a genetic connection to sub-volcanic bodies, mainly basalt-latite sills. It is controlled by sub-meridional faults. Four mineral types have been identified:

- quartz-pyrite - Sarnak;
- gold-adularia with haematite - Sarnak, Sedefcje, Chala;
- gold-quartz-pyrite - Rozino;
- gold-quartz-adularia - Madjarovo, Krumovgrad.

The regional geological position of the Rozino Deposit is interpreted as a sequence of small Palaeogene syn-tectonic extensional sediment basins in the Byala Reka metamorphous core basin. The tectonic situation in this complex is extensional and complicated, with a main north-western direction and right-slip fault kinematics of the main structures. One of the main fault disturbances is the so-called Byala Reka shear zone followed along more than 15 km. in the region. Multiple north-eastern fault disturbances limiting the northwestern part of the sediment basin have been established and drilling data have established the Tashlak fault on which the telethermal alteration zone is found.

The main lithological units containing the gold mineralization in the deposit are breccia-conglomerates/sandstone sediments and, partially, olistostrome blocks, metagranites and ultrabazite rocks of the upper multicolored complex. The breccia-conglomerate suite is the main host of the mineralization and lies transgressively or along a low-angle fault separating it from the up to 200 m. deep foundation. This unit comprises alternating coarse and often non-layered and non-stratified conglomerates of polymictic breccia, sandstone, siltstone and clayey bands. A large 800 m. long, 350 m. long and 170 m. deep olistostrome body that had most likely slipped along the fault surface of a listric fault during sedimentation has been defined in the basin. It consists of black-gray low metamorphous and highly folded schists and phyllites abundant in organic materials.

The strip-intergrown type of gold-silver (polymetal) mineralization is closely linked to the sedimentary Palaeogene complex comprising unsorted breccia-conglomerates, sandstones and gravelites, as well as olistostrome schists which are genetically linked to sediments and have formed under similar sedimentation conditions. No other significant mineralizations have been found within the sediment basin other than singular quartz, and less frequently, amethyst veins and veinlets with pyrite, but without, or with insignificant, gold and or silver grades of no economic interest.

The polymetal sulphides (chalcopyrite, sphalerite and galena) are locally evolved in the sediments of the foundation contact zone. This zone is made of uncompressed tectonic clay, mainly chlorite, ankerite, adularia and muscovite, with chaotically injected sulphides. The distribution of this mineralization is exceptionally irregular.

No increase of heavy metal concentrations and radionuclides above the legislated reference/maximum allowable levels has been found during the geochemical analyses of samples of soils, boreholes and natural outcrops in mineralized and hosting lithologies. Therefore, no unfavourable geochemical processes such as acid drainage and/or secondary mobilisation of metals is expected at the present time.

Morphology of the Orebodies

The industrially most important morphogenetic type in the Rozino Deposit is the strip-intergrown type of mineralization evolved in the Palaeogene sediments. The orebody morphology is complex and they may be divided conditionally into steep and sub-horizontal. The steep bodies are evolved near the contact of the sediments with the underlying rocks in the north-northeastern fault sheaf. Frequently the sub-horizontal ore bodies are separate and without clear links to fault structures. The main ore controls in this case are the permeability and the geochemical features of the hosting rocks. Some rare veiny ore bodies are hosted among the rocks of the metamorphous substrate. The bodies are sub-horizontal to slightly inclined, concordant with the foliation and always linked to the mineralizing structure.

Three morpho-genetic types of mineralization can be identified in the Rozino deposit: strip-intergrown type, streaks and veins (gold-silver-polymetal veins);

The steep bodies are evolved near the contact of the sediments with the underlying rocks in the north-northeastern fault sheaf - the Tashlaka fault which confines the sediment palaeogene basin on the north-east. A Bonanza type mineralization is evolved along the fault contact zone where chalcopyrite, sphalerite and galena are deposited alongside gold. The gold mineralization in this shear zone traced for 300 m. is highly irregular both laterally and vertically.

Cross-cutting shape-forming ore bodies are observed both in the steep and inclined ore bodies described above and separately, in the veinlet and veiny morphogenetic mineralization types. They are best represented in the north-northeastern contact-side flank of the sediment basin where they form 130-150° trending and up to 80m wide strip. Veins, veinlets and sheaves of veins are observed on the surface and in boreholes.

Spatial binding with a tectonic direction of 130-150 degrees is observed around the veins (and particularly those with fracture brecciation and silicification). Many veins with voids and open spaces seem to occupy steep sections of extension near the shears, while others are subparallel to the shears. Studies of the veins have shown the following:

- Usually, the quartz-(carbonate)-pyrite-marcazite and quartz-(carbonate)-adularia veins include hollows and substantial open spaces. Crustiform, chalcedonic and mossy textures are present.
- Pyrite, +/- quartz, veinlets are oriented similarly to the quartz veins and mostly dip moderately to WSW and SSW;
- The carbonate veins seem to be paragenetically late and dip moderately to steeply to the SW, subparallel to the NW-SE trending late faults.

Total mineral and chemical composition of the ores

Almost all samples contain a chaotic mix of differently sized clasts varying between 4-62.5 µm grains (represented by angular coarse particles) to several centimetre large clasts forming over-saturated conglomerates and breccias. The clasts comprise an allochthonous mix mainly of quartzites, milotized quartzites, feldspar quartzites, mica schists (often containing graphite), phyllitized schists and grainy muscovite-containing fragments. The matrix is almost always made of a finer-grained mix of the same minerals building the clasts - mainly quartz, muscovite and feldspar. Finely injected haematite/limonite and/or ferroxide pigmentation are observed in many of the samples. All samples contain injected allotriomorphic rutile grains present in the clasts and, also, in the matrix. Garnet grains are present in some cases.

The type of mineralization in the Rozino Deposit is low-sulphide epithermal gold-silver system distributed among a Palaeogene sediment complex of breccia-conglomerates, sandstones and gravelites. Pyrite is the main ore mineral, occurring in veinlets and injected in the quartz-carbonaceous gangue/non-mineral mass. Chalcopyrite, sphalerite and galena have been established in more limited quantities, but their grades are low and of no economic importance.

Gold occurs mainly along the boundaries of pyrite grains and in micro-cracks, and, very rarely, as freely visible grains. Silver is present in trace amounts, especially when bound to pyrite and as silver inclusions in sulphide minerals (such as galena) and in gold (electrum).

The gangue minerals are predominantly quartz, iron carbonates (ankerite) and, rarely, adularia, with participating chlorite and muscovite. The zone of hydrothermal alteration features a quartz-carbonaceous and chlorite-adularia association typical of low-temperature epithermal systems.

According to the laboratory test results, the waste rock is classified as environmentally harmless, non-acid generating and non-hazardous according to the mining waste classification criteria.

Data from chemical analyses on the master composite ore sample characterize it as gold-containing (1.28 g/t Au), with minimal content of Ag of 2g and of other payable components (Ag – 2 g/t; Cu – 48 g/t; Pb – 28 g/t; Zn – 74 g/t). The potential penalty elements in the ore (As – 125 g/t; Cr – 54 g/t; Cd <1 g/t) are negligible and are not expected to affect the quality of the final products.

Only silver recovery has been evaluated but due to the low Ag grades in the input composite sample and the low value of this metal, analyses have been made only of final products and they show that the recovery is less than 50%, which is economically insignificant relative to the gold.

The Rozino Deposit. Contains a gold-silver mineralisation with secondary presence of polymetal sulphides and, therefore, the combined term 'polymetal (gold-silver)' is used in various parts of the documentation. This term reflects the mineralogy but does not suggest an integrated recovery of metals other than gold and, partially, silver.

Pyrite dominates with small quantities of chalcopyrite, sphalerite and galena. These minerals occur locally and their concentrations are low and economically insignificant.

Data from chemical analyses on the master composite ore sample characterize it as gold(~containing (1.28 g/t Au); with minimal content of Ag of 2g) and of other payable components (Ag – 2 g/t; Cu – 48 g/t; Pb – 28 g/t; Zn – 74 g/t). The potential penalty elements (As – 125 g/t; Cr – 54 g/t; Cd <1 g/t) are negligible and are not expected to affect the quality of the final Product.

Only silver recovery has been evaluated but has been considered only in the final products due to its low content in the input composite sample. Less than 50% recovery of silver was achieved - economically insignificant relative to the gold.

Therefore, the term 'polymetal' is used only in a descriptive geological sense to reflect the presence of various sulphide minerals, but the deposit is classified as 'gold-silver' because only these two elements are of economic significance for the planned processing technology.

The Rozino Deposit is classified as gold-silver, but silver is of secondary and non-economic nature and has, therefore, not been included in the reserve and resource estimates

presented in the geology report submitted to the Ministry of Energy and approved by the Specialised Committee of Experts. In response to note 4.3.3 concerning the description of ore, presence of silver, control over the flotation process and the potential environmental risks, we are presenting the following clarification:

The Rozino Deposit is classified as gold-silver, but silver is of secondary and non-economic nature and has, therefore, not been included in the reserve and resource estimates presented in the geology report submitted to the Ministry of Energy and approved by the Specialised Committee of Experts.

Data from chemical analyses on the master composite ore sample characterize it as gold-containing (1.28 g/t Au); with minimal content of Ag of 2g) and of other payable components (Ag – 2 g/t; Cu – 48 g/t; Pb – 28 g/t; Zn – 74 g/t). The potential penalty elements (As – 125 g/t; Cr – 54 g/t; Cd <1 g/t) are negligible and are not expected to affect the quality of the final Product.

Silver is far too low to be assessed as an economic indicator, especially since laboratory testing shows very low recoveries (<50%) and irregular distribution in the ore. Its presence has no effect on the economic parameters of the reserve and resource estimate. It is possible that silver may be regarded as an additional positive component during the subsequent processing of concentrate (production of gold-silver containing Dore gold), but is not economically significant at the present time.

The project provides for production only of gold-bearing flotation concentrate, with gold as the main economic component. The target gold concentration in the final concentrate is 22 to - 30 g/t depending on the grades in the ore feed and on the flotation parameters. The process will be controlled by regular laboratory analyses of the ore, and of the intermediate and final products, by means of atomic-absorption or ICP methods to determine the content of precious metals.

As regards the environmental risk related to pyrite in waste, the ARD (Acid Rock Drainage) analyses show a non-acid generation potential of the flotation tailings whose pyrite content is negligible. According to the geochemical test results, the waste is classified as harmless, non-acid generating and non-hazardous. Accordingly, no unfavourable geochemical processes are expected and no environmental risk is present during the planned management of waste.

The form in which gold is present in the ore and its connection to the chosen processing technology:

The form in which gold is present

Ores in the Rozino Deposit are a low-sulphide epithermal gold-silver system in which the gold is predominantly bound to sulphides, mainly pyrite (along the boundary of grains and in micro-cracks). unbound (native or electrum) is a rarity and is observed (during previous scientific works) occasionally in isolated samples.

There is no contradiction between the expressions ‘no native gold has been found’ and ‘native gold established in singular samples’ because these expressions reflect the varying degrees of analysis sensitivity and representativeness of the methods used. Often, ore petrography and mineralogical observations do not detect sub-micron/fine unbound gold while local findings in specialized analyses may register isolated grains. In summary: Most of the gold is ‘bound to sulphides’ and is not unbound.

Processing by flotation, connection to mineralogy

Being the main gold bearing mineral, pyrite is the target of the process. Therefore, the final processing product is gold-enriched pyrite flotation concentrate.

This determines the expected product characteristics - a gold-bearing pyrite concentrate with target content of approximately 22-30 g/t Au, where gold is ‘concentrated’ jointly with pyrite separated by flotation. Silver and non-ferrous metals are present in low and irregular concentrations and do not define the process flow diagram

Proving and controlling the form in which gold is present the final product:

• *Analytical laboratory methods (carried out/intended):*

- o Phase analysis (stepped cyanide/thiocyanide/thyosulphate tests) to distinguish between unbound gold, gold aggregated with other minerals and gold locked in sulphides.
- o QEMSCAN/MLA (Mineral Liberation Analysis) for quantitative evaluation of gold bearing minerals (pyrite, electrum), the degree of releasing and associations of gold.
- o Flotation tests (open and closed cycles) to assess the extraction/losses and stability of parameters for optimal recovery of gold and silver.

• *Operational control and reporting:*

- o Routine fire assays of ore, intermediate products, concentrate and tailings, with keeping of a daily/weekly processing balance.
- o Monitoring of sulphur (total and sulphide sulphur), pyrite Estim content (estimated and/or via MLA), Eh/pH, reagents regimen (collector/depressant), flotation duration and grain-size distribution.
- o Confirmation of the stability at a target concentration level (22–30 g/t Au) by recurring reference sampling and cross-analyses (AAS/ICP vs. fire assay analysis).

Loss of metals and the environmental aspect

The test results indicate high Au recoveries ($\geq \sim 85\%$) and low/non-economic recovery of Ag ($< \sim 50\%$), which is consistent with the low average grade and irregular distribution of silver in the ore.

Since the Au bearing mineral (pyrite) is taken into the concentrate, there is very little residual pyrite in the flotation tailings, which is key for reducing the risk of acid drainage (ARD). ARD (static-kinetic) testing classifies the tailings as non-hazardous and non-acid generating, meaning that no unfavourable processes such as acid flows or mobilisation of metals is expected during the intended regimen of processing and waste management.

Summary

The predominant form in which gold is present in the Rozino deposit is ‘gold bound to sulphides’ (pyrite) with rare occurrences of unbound gold (incl. electrum). Therefore, the selected pyrite-aimed flotation process is justifiable and produces gold-bearing (sulphide) concentrate as the final product. Economically significant recoveries of Au and low environmental vulnerability of the tailings will be confirmed by process monitoring and by the available results.

Veined Mineralization

Veins are a frequent occurrence in the examined intervals. Mainly ankerite with some quartz are the minerals present in the veins. Seen under the microscope, many veins are trimmed

by a selvage of idiomorphic quartz and, in some case, adularia, while ankerite generally occupies the central part of the vein. Sometimes the vein quartz forms dog-tooth shaped crystals, typical of low-pressure growth in a pull-apart shear fracture. While most fractures are narrow and completely sealed by quartz and ankerite, others are wider and more porous, which is an indication of filling up of hollows and caverns.

A small number of narrow veins comprises only quartz. Thin fine-grain orthoclase (adularia) occur rarely in the series.

Narrow micro-veinlets with adularia increase appreciably in the sections where the host rock is sufficiently compacted. Several generations of veins have been noted.

Pyrite-containing solutions have penetrated the foundation ultramafic rocks displacing partially the outer peripheral parts of magnetite grains and filling the narrow fractures in the host rocks. Generally, the central parts of the magnetite grains are unaffected. This seems to show that the pyrite mineralization is at least partially owed to penetration of iron rich sulphides in the rock. No pyrite veins are observed in the rocks above the contact with the foundation.

Sulphide mineralization

Pyrite occurs in the entire series, mostly as single idiomorphic to sub-idiomorphic grains or groups of few grains scattered throughout the host-rock matrix. It also occurs as recrystallized grains attached to the outer peripheral parts of the clasts. A very small number of pyrite grains is included among the clasts. Many of the pyrite grains have entrained in their central parts multiple fine or small lamellar grains of mica and contain fewer inclusions in their outer peripheries, which seems to represent a later pyrite overgrowth of the grains. Pyrite associates with veins rarely but in the sections where quartz-ankerite veins intersect pyrite grains the latter are remobilized and recrystallized as nests in or near the vein. It is noted that in rare instances grains of gold form inclusions in the remobilized and/or recrystallized pyrite. It seems that most of the pyrite has formed during diagenesis and has changed partially during the late recrystallization and overgrowing during the hydrothermal activity. Many pyrite grains have become corroded by the altered material of the matrix.

The foundation below the contact zone has been affected by low-temperature pyritization that has replaced magnetite partially and has filled small joints in the rock. The pyrite is melnikovite-pyrite formed at low temperatures.

The polymetal sulphides are locally evolved in the sediments of the foundation contact zone. This zone comprises non-compacted tectonic clay (mainly chlorite, ankerite, adularia and muscovite) with chaotic injections of sulphides - in other words, they are not present as veins or in fractures but may have been such before the faulting. These are represented by usually closely linked and mostly intergrown chalcopyrite, sphalerite and galena. Any association with pyrite seems to be accidental, rather than by a causal link. Only a small number of polymetal sulphide grains are linked to pyrite and seem to be genetically linked. In those cases the pyrite is usually anhedral and intergrown with sphalerite and chalcopyrite, rather than idiomorphic-to-subidiomorphic. In the cases where the polymetal sulphides are linked to the more frequent idiomorphic pyrite, chalcopyrite, sphalerite and galena are generally attached to the outer periphery of pyrite grains and are not intergrown. It seems that the polymetal sulphides which have formed at a later stage have assimilated the existing grains of pyrite. Frequently gold is associated with chalcopyrite, sphalerite and galena, and forms small, rounded or egg-shaped inclusions and

concretions in these minerals, but very rarely it associates with pyrite. Rare chalcopyrite injections are observed along the entire series. No change of chalcopyrite into covellite, digenite or chalcocite is observed.

Gold Mineralisation

Although gold grades in the series are anomalous to some extent, gold visible under microscope have been established only in singular samples. Most of the gold-behaviour related data are outlier-grade samples where gold is associated with chalcopyrite, sphalerite and galena in the form of small concretions and rounded inclusions into the minerals and onto grain peripheries. Some rare gold grains are present as ‘free’ gold along the contacts between silica and/or carbonaceous grains forming the matrix of the rocks, while a small number of grains occurs as inclusions in the pyrite.

5. Landscape

According to the European Landscape Convention, it has an important role in the cultural, ecological, and social sphere of the public interest and, being conducive to the economic activity, is a resource whose protection, management, and planning can contribute toward sustainable development of the community and quality of life improvements.

Defined as a ‘territory; the specific aspect and elements have emerged as a result of actions and interactions between natural and/or human factors’.

According to the definitions accepted in Bulgaria, ‘landscape is a territorial system comprising interacting natural and anthropogenic components and complexes’ and represents a system containing and recreating resources, preserving the genetic fund and is a source of aesthetic impact.

Landscape sustainability is a category which reflects the persistence or rigidity of landscape in time. It is regarded as sustainability relative to the magnitude of the impact affecting the landscape structure and its capacity for prolonged unidirectional development while preserving its natural or acquired properties over a defined forecast period.

The landscape in the IP area has not been affected by anthropogenic factors. There are no asphalt roads, industrial enterprises, storage facilities etc. It belongs to the Eastern Rhodopean - Sakar district according to the Regional Differentiation of Landscapes in Bulgaria (Velchev, Todorov, Penin, 2002).

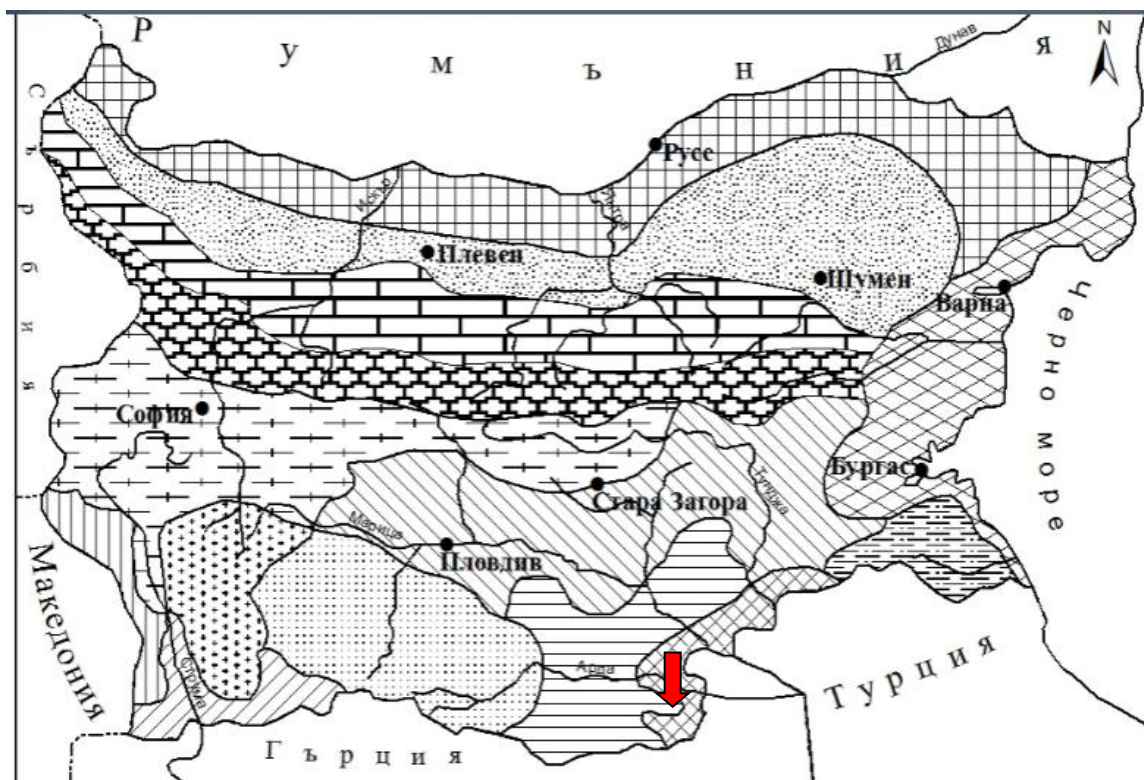


Figure IV.5-1. Location of the IP and Regional Differentiation of Landscapes in Bulgaria (Velchev, Todorov, Penin, 2002).

The more important characteristics are the following:

- The Eastern Rhodopes, Sakar and the lower stretches of the Maritsa, Tundja and Arda rivers are included;
- The Mediterranean influence is strong;
- Increased anthropogenic influence exists in some places;
- The terrain is low-mountainous, rolling.

6 . Flora and Fauna. National ecological network

6.1. Flora and Fauna

Flora

Bulgaria's geobotanical zoning (Bondev 2002) places the studied region into the Krumovgrad Region of the Eastern-Rhodopean district of the Macedonian-Thracian province which includes the country's warmest regions. The Eastern-Rhodopean district occupies the Eastern Rhodopes and part of the Thracian pan valley - the area between Asenovgrad, Parvomai, Haskovo and Dimitrovgrad. Generally, its vegetation is predominantly xerothermal, comprising formations of Italian oak, pubescent oak and common oak. Moesian beech formations and Moesian beech, Durmast oak, Oriental Durmast oak and occasionally, hornbeam, occur in the southernmost and southwestern parts of this district. There are beech groves in the western part of the Yellow sector. Many of the forests are exhausted and penetrated by more resilient species, forming secondary forests of Oriental hornbeam and shrub formations of Christ's thorn, red juniper or grass formations dominated by scented grass, yellow bluestem and terophytes. This district is rich in floral elements. Macedonia-Thracian (27) species are most numerous, comprising 27 Balkan

species and 10 Bulgarian endemic species. The Mediterranean species (11) are comparatively numerous as well, while the Illyrian species (3), steppe (3) and Euxinian (2) floral elements are less well represented. The Macedonia-Thracian Bulgarian endemic species are: *Quercus thracica*, *Saponaria stranjensis*, *Medicago rhodopaea*, *Valerianella pontica*, *Verbascum adrianopolitanum*, *V. humile ssp. rhodopaeum*, *Onosma thracica*, *Tulipa rhodopaea*, *Muscari vandasii*. The Balkan endemic species of the Macedonia-Thracian floral elements are: *Minuartia garckeana*, *Moenchia graeca*, *Silene frivaldskyana*, *S. scorpiilli*, *Hypericum thasium*, *Genista rumelica*, *Linum thracicum*, *Stachys milanii*, *Campanula scutellata*, *Nonea atra*, *Verbascum ovalifolium*, *Celsia roripifolia*, *C. rupestris*, *Malabaila aurea*, *Stachys balcanica*, *S. alpina ssp. bulgarica*, *Tymus atticus*, *Salvia ringens*, *Verbascum humile*, *Knautia ambigua*, *Anthemis tenuiloba*, *Haberlea rhodopaensis*, *Senecio macedonicus*, *Fritillaria pontica*, *F. stribrnyi* and *Crocus olivieri*. Some of the steppe species are *Paliurus spina-christi*, *Phlomis herba-ventis ssp. pungens*, *Tamarix ramosissima*, the Euxinian elements are *Lathyrus aureus* и *Quercus erucifolia*, and the Mediterranean are *Stipa pontica*, *Asparagus acutifolia*, *Quercus coccifera*, *Silene cretica*, *Platanus orientalis*, *Eriolobus trilobata*, *Trifolium tenuifolium*, *Cnicus benedictus*, *Achnatherum bromoides*, *Arbutus unedo*, *A. andrachne*, *Medicago bondevii*. Vegetation in the Krumovgrad region is highly diversified, with xerothermal Italian oak and Italian-Cerris oak forests, and xeromesophytic Durmast oak and mixed Durmast-hornbeam oak forests, with some Oriental Durmast oak forests. Forests of Moesian oak are dispersed further south in the region, with occasional oriental beech single trees or groups. Common holly - the evergreen relict shrub and small tree, occurs throughout the beech forests. Habitats of the rare species Thracian oak (*Q. thracica*) and *Verbascum humile ssp. Juruk*, are found only in this region. This is the only location where the species *Eriolobus trilobata*, *Arbutus unedo* and *A. andrachnae* have been found so far.

Southern exposures or exposures with a southern component prevail in the exploration region. The forest communities comprise xerothermal species such as Italian oak, cerris oak and pubescent oak. Various oak communities of have formed during the years of intensive logging. Scrub communities – mainly oriental hornbeam (*Carpinus orientalis*), juniper (*Juniperus oxycedrus*) and Christ's thorn (*Paliurus spina-christi*), are also present in some places. Grass vegetation has formed predominantly in former tobacco meadows abandoned during the years for various reasons. Depending on the time at which they had been abandoned, parts of these former tobacco lands are being overtaken by scrub. Austrian pine and Scots pine plantations in poor condition are a frequent occurrence, many of the trees are attacked by parasites and many (almost 40%) have withered completely or partially.

11 habitats classified according to EUNIS (Davies et al. 2004) were established during the field studies in the studied area (SA) – a 700 m. buffer from the boundaries of both pits, plus 110 m. from the borders of all IP elements (for details see item VII) were established with 5 listed in Attachment 1 of the Biodiversity Act and being the subject of protection in the Rhodopes - Eastern Protected Zone (Table IV.6.1-1, Attachment V.1.1-1 of the Protected Area Impact Report).

Table IV.6.1-1. Types of habitats in the studied area (SA) and within the boundaries of direct impact (IP). EUNIS – EUNIS Code; Attachment 1 – Attachment 1 of the EPA Code (* - priority habitat).

No.	EUNIS	Habitat	Attachment 1	Studied Area / ha	IP area / ha
1	C2.31	Upper currents of permanent, slow-flowing rivers and streams		0.9369	0.2380
2	E1.22	Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (*important orchid sites)	6210	15.9168	1.5202
3	E5.2	Meadows		4.6917	0.8978
4	F5.13	Arborescent matorral with <i>Juniperus</i> spp.	5210	0.9151	0.9115
5	F5.31	Helleno-Balkan pseudomaquis		3.3069	0.0000
6	G1.737	Eastern white oak woods	91AA	148.1712	17.3182
7	G1.76	Pannonian-Balkan turkey oak –sessile oak forests	91M0	400.0661	95.1278
8	G3.F1	Coniferous crops		74.0565	28.7337
9	G5.81	Recently cut down places, former deciduous forests		14.0200	0.8712
10	H3.6	Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii	8230	0.2619	0.0000
11	H5.61	Unsurfaced pathways		2.1820	0.9593

C2.31. Upper currents of permanent, slow-flowing rivers and streams

We have included in this habitat the middle stretch of Yuren dere, which dries up during the hot summer months. This fact and the stony bottom explain the complete absence of macrophytic vegetation. No conservation value.

E1.22. = 6210() Semi-natural dry grasslands and scrubland facies on calcareous substrates (FestucoBrometalia) (*important orchid sites).*

These communities are rich in flora, the main grass-stand comprising representatives of the orders *Festuca* and *Bromus*, as well as *Chrysopogon gryllus*. Species such as *Dorycnium herbaceum*, *Teucrium chamaedrys*, *Sanguisorba minor*, *Eryngium campestre*, *Dactylis glomerata*, *Poa bulbosa*, *Convolvulus cantabrica*, *Cistus incanus* and many others occur. Individual *Juniperus oxycedrus*, *Rosa canina*, and *Paliurus spina-christi* shrubs occur but do not cover more than 2 - 5% of the property. This habitat is included in Attachment 1 of the Biodiversity Act and is the subject of protection in the Rhodopes - Eastern Protected Zone.

E5.2. Meadows.

This habitat occupies 8 polygons of grass habitats over an area of less than 1.5 ha (larger polygons are classified as E1.22), mainly in the northern part of the studied area. In reality, these are forest meadows (Figure IV.6.1-1) with floral composition similar to habitat E1.22 but lesser in floral diversity, with better presented nemoral component – for example *Geranium pyrenaicum*, *Verbascum blattaria*, *Ranunculus velutinus*, *Luzula* sp., *Lappula squarrosa*, *Stellaria media*, *Melica uniflora*, *Galium pumilum* etc. Individual bushes and trees are more frequent as well. This habitat has conservation value.



Figure IV.6.1-1: Habitat E5.2.

F5.13. = 5210 Arborescent matorral with Juniperus spp.

This habitat occupies 1 polygon in the northern part of the studied area. These are juniper groupings dominated by *Juniperus oxycedrus* (Fig. V.1.1-3) and occupying terrains mainly along oak communities and frequently are in a stage of succession between grass and forest habitats. They prefer shallower and skeletal soils forming along the periphery of forest communities. Where the groups are dense, nothing else is present among the juniper individuals, while grass complexes of the same composition typical of the surrounding areas of the 91AA natural habitat type occur among 'looser' groups. The following plant species were established there: *Chrysopogon gryllus*, *Dactylis glomerata*, *Rosa sp.*, *Gypsophila muralis*, *Tragopogon sp.*, *Sanguisorba minor*, *Quercus sp.*, *Carpinus orientalis*, *Pyrus amygdaliformis*, *Hypericum olympicum*, *Eryngium campestre*, *Anthemis sp.*, *Paliurus spina-christi*, *Cistus incanus*, *Rubus sp.*, *Ranunculus sp.*, *Muscari sp.*, *Petrorhagia velutina*, *Rumex sp.*, *Convolvulus cantabrica*, *Alium sp.*, *Galium aparine*, *Calamintha nepeta*, *Lolium perenne*, *Achillea millefolium*, *Achillea clypeolata*, *Trifolium arvense*, *Dorycnium herbaceum*, *Vicia sp.* This habitat is included in Attachment 1 of the Biodiversity Act and is the subject of protection in the Rhodopes - Eastern Protected Zone.

F5.31. Helleno-Balkan pseudomaquis

This habitat occupies 1 polygon in the southwestern part of the studied area. These are thicket groups (Figure IV.6.1-2) on a limited area of skeletal and scattered soil around weathered rock and outcrop habitats (H3.6 habitat). These groups are polydominant, comprising *Juniperus oxycedrus*, *Paliurus spina-christi*, *Osyris alba*, *Pistacia terebinthus*, *Phillyrea latifolia*, *Carpinus orientalis*, *Jasminus fruticans*, *Rubus sp.* Some single trees are also present - *Fraxinus ornus*, *Quercus pubescens*, *Acer monspessulanum*, *Juglans regia*. The following plant species were

established in the grass stand: *Trifolium campestre*, *Crupina crupinastrum*, *Cyanus triumfettii*, *Campanula sparsa*, *Euphorbia* sp., *Briza maxima*, *Petrorhagia velutina*, *Sedum* sp., *Thymus* sp., *Asparagus acutifolius*, *Cynosurus echinatus*, *Chrysopogon gryllus*, *Stipa* sp., *Muscari* sp., *Tragopogon* sp., *Genista* sp., *Orlaya grandiflora*, *Melica uniflora*, *Cheilanthes marantae*, *Lolium perenne*, *Anthemis* sp., *Cruciata pedemontana*, *Gypsophila muralis*, *Cistus incanus*, *Poa bulbosa*, *Sanguisorba minor*. This habitat is listed in Bulgaria's Red Data Book as 'nearly threatened' (Biserkov 2011). It will not be affected by the IP.



Figure IV.6.1-2: Habitat F5.31.

G1.737. = 91AA Eastern forests of pubescent oak.*

It comprises separate oak forests on skeletal shallow soils. Rock blocks of varying sizes outcrop frequently. The weather and the anthropogenic impacts (grazing and various felling types) are the cause for their fragmentation and sometimes they are dominated by thicket. The tree stand is approximately 4 - 5 m. high, with an average diameter at chest height of 25 - 28 cm. The forest canopy is around 4 - 5. This tree stand comprises various oak species dominated by white oak (*Quercus pubescens*). Hungarian oak (*Quercus frainetto*) and Cerris oak (*Quercus cerris*) are also present, with Durmast oak (*Quercus dalechampii*) in the higher parts. The brush storey comprises prickly juniper (*Juniperus oxycedrus*), bladder-senna (*Colutea arborescens*), dogwood (*Cornus sanguinea*), European smoke tree (*Cotinus coggygria*) etc. The composition of species at the ground-level storey is relatively rich. This habitat is included in Attachment 1 of the Biodiversity Act and is the subject of protection in the Rhodopes - Eastern Protected Zone.

G1.76. = 91M0 Pannonian-Balkan Turkey Oak and Sessile Oak Forests.

This is the predominant habitat type in the studied area, occupying a little more of 60% of its area. These forests are of composition that is very similar to the previous habitat, but are more

mesophytic in nature which affects both the tree storey and the grass storey. The dominant species are cerris oak (*Quercus cerris*) and/or Italian oak (*Quercus frainetto*). Other participants are white oak (*Quercus pubescens*) and eastern hornbeam (*Carpinus orientalis*), with Durmast oak (*Quercus dalechampii*) and European hornbeam (*Carpinus betulus*) in the higher parts. Same as in the previous habitat, these are comparatively young coppice woods but with a larger canopy. No brush storey is present, with some individuals or small groups of dogwood (*Crataegus sanguinea*), hawthorn (*Crataegus monogyna*) and others. The composition of the ground storey species is relatively varied, but with a low foliage projective cover of around 20 - 25%. Many oak trees are infected with summer mistletoe (*Loranthus europaeus*). The communities along the right-hand slope of the lower stretch of the Yuren Dere river are an exception. Their habitat, physiological and plant-health status is very good. The tree stand horizontal structure is irregular, caused by felling carried out in the past. It comprises mainly cerris oak (*Quercus cerris*) and Italian oak (*Quercus frainetto*), with frequent occurrence of individual pubescent oaks (*Quercus pubescens*). Also, small trees of Balkan maple (*Acer hyrcanum*), flowering ash (*Fraxinus ornus*), as well as cornel tree (*Cornus mas*), mountain ash (*Sorbus aucuparia*), walnut (*Juglans regia*) and Montpellier maple (*Acer monspessulanum*) occur. The breast-height diameter of the oak trees varies between 60 cm and 110-120 cm., with tree heights reaching 16-18 m. The dominant trees develop large crowns which results in high tree-stand canopy at 9 - 10 m. The soil cover is covered solidly by fallen leaves, which when combined with the high forest canopy, leads to poor development of the grass synusium. The overall projective cover of the grass species does not exceed 10-15%, with small patches of grass vegetation forming in open areas. The proximity of the river increases air humidity below the tree canopy which causes more abundant development of climbing vegetation - lianas: traveller's joy (*Clematis vitalba*) and ivy (*Hedera helix*). Also, this is also the reason for development of small clumps of Sweet broom (*Ruscus aculeatus*). This habitat is included in Attachment 1 of the Biodiversity Act and is the subject of protection in the Rhodopes - Eastern Protected Zone.

G3.F1. Coniferous crops

It comprises plantations of Scots pine (*Pinus sylvestris*) and/or Austrian pine (*Pinus nigra*) of around 55 – 60 years of age. The health status of the visited plantations, most of which were withering, is rather poor. The vertical structure is simple – a tree storey (around 8 -10 m. high with stem diameters of around 35 – 40 cm) with ground-layer grass storey comprising single individuals of *Dactylis glomerata*, *Rosa canina*, *Rubus caesius*, *Crataegus monogyna* etc. (Figure IV.6.1-3). This habitat has conservation value.



Figure IV.6.1-3: Habitat G3.F1.

G5.81. Recently cut down places, former deciduous forests

This habitat covers 4 polygons in the western part of the studied area. All cutting areas are in oak forests - habitats 91AA and 91M0. The first stages of succession were abundant coppice tufts of the tree species in the felled area (*Quercus pubescens*, *Quercus cerris*, *Quercus frainetto*) and some pioneer brush species such as *Juniperus oxycedrus*, *Rosa sp.*, *Rubus sp.* etc. No conservation value.

H3.6. = 8230 Siliceous rock with pioneer vegetation of the Sedo-Scleranthion or of the Sedo albi-Veronicion dillenii

These are 4 very small polygons situated in the southwestern corner of the studied area. They comprise siliceous rocks, almost completely deprived of vegetation, which occurs only in rock fractures or over limited levelled sections. Lichens domineer. The composition of species is relatively large (given the limited surface area and nature of the substrate) – with *Cistus incanus*, *Umbilicus rupestris*, *Scleranthus annuus*, *Satureja sp.*, *Sedum sp.*, *Alyssum sp.*, *Briza maxima*, *Sesleria sp.*, *Cerinthe minor*, *Festuca sp.*, *Allium sp.*, *Cardamine graeca*, *Geranium sp.* This habitat is included in Attachment 1 of the Biodiversity Act and is the subject of protection in the Rhodopes - Eastern Protected Zone. This habitat will not be directly affected.

H5.61. Unsurfaced pathways

Wider forest roads were mapped as unsurfaced pathways, with one crossing the studied area in a south-south-eastern direction, and another road is running in an north-west direction as

far as the centre and the western part of the property. Narrower / more overgrown forest roads form a dense network in the area but have not been mapped as such. No conservation value.

Plant species with higher conservation value

According to available data (Asyov et al. 2012, Peev 2011, Petrova 2004) and our field studies also in other parts of the Eastern Rhodopes, and considering the biology of the respective species, the following plants with higher conservation value can be found in the IP area (included in Attachments 2 and/or 3 of the Biodiversity Act or in Bulgaria's Red Data Book):

Pontic fritillary (Fritillaria pontica)

Disseminated in the Northeastern and Middle Bulgaria, the middle and eastern Stara Planina mountain, Sredna gora, Slavyanka, the Struma valley, the Rhodopes, and Southeastern Bulgaria. It grows in deciduous forests, including rarefied deciduous forests, and in shrubland, at elevations up to 1,500 m. a.s.l. (Asyov et al. 2012, Stoyanov et al. 1966, personal observations). This is a species occurring frequently in the Eastern Rhodopes with many and stable populations (Petrova 2004). It was found outside the studied area during the field studies, and in other locations in the Eastern Rhodopes. Its presence in the studied area and in the IP boundaries cannot be ruled out. This species is listed in Attachment 3 of the Biodiversity Act.

Lizard orchid (Himantoglossum caprinum)

Occurs throughout the country, although in limited numbers and up to 1,100 m. a.s.l. It is relatively more abundant in the karst regions of the northern Balkan area, the Stara Planina mountain, the Znepolski region, and the Eastern Rhodopes. Occurs in open, sunny locations, frequently on calcareous stony soils, in lightly used pastures, among shrubs and in forest meadows in light deciduous forests, including among roadside strips of trees, on scree and on Christ's thorn overgrown dunes (Peev 2011, personal observations). The species was found in the southern part of the studied area, in a rarefied section of habitat 91M0, more than 600 m. away from the IP boundaries. It is listed in Bulgaria's Red Data Book as 'Vulnerable', and in Attachments 2 and 3 of the Biodiversity Act. It is subject to protection in the Rhodopes - Eastern Protected Zone. The impacts to which it will be subject will be considered in the Protected Area Impact Report.

Violet limodore (Limodorum abortivum)

Occurs rarely throughout the country, up to 900 m. a.s.l., but we have found it in the Western Rhodopes at 1,300 m. a.s.l. (Asyov et al. 2012, personal observations). We have discovered it in rarefied forests or in forest edges and meadows under forest canopy, in shrubs with well presented tree vegetation and, less often, in pastures overrun by shrubs, mainly in the oak and beech belts, and in spruce and spruce-Scots pine forests in the Western Rhodopes. This species was found during the field studies in the eastern part of the studied area, outside the IP boundaries. This species is listed in Attachment 3 of the Biodiversity Act.

Pink butterfly orchid (Orchis papilionacea)

Occurs rarely almost everywhere in Bulgaria (except for the Danube Plain and the higher mountains), at up to 1,000 m. a.s.l. (Asyov et al. 2012, Stoyanov et al. 1966). It grows on meadows, shrubland, on mesophile to xerophile grasslands, whether trampled and stony. This species was

found during the field studies in 8 locations in the western part of the studied area, with one location with 2 individuals being present in the IP boundaries. A numerous population was found outside the studied area, west of Rozino village. This species is listed in Attachment 3 of the Biodiversity Act.

Autumn lady's-tresses (Spiranthes spiralis)

Occurs rarely and almost throughout the country (except for Northeastern Bulgaria and has not been found in the Struma and Mesta River valleys), at up to 1,000 m. a.s.l. (Asyov et al. 2012, Stoyanov et al. 1966). It grows on dry grasslands, most often in trampled lands (pastures), including stony pastures (personal observations). We have found it in urban lawns. This species was found in the southwestern part of the studied area during the field studies, outside the IP elements. This species is listed in Attachment 3 of the Biodiversity Act.

Poppy anemone (Anemone pavonina)

Occurs in Southern Bulgaria (except the higher parts) and in the northern Black Sea coastline, up to 400 m. a.s.l. (Asyov et al. 2012). Grows in rarefied forests and shrubland, most frequently in associations of oriental beech (*Fagus orientalis*), oaks (*Quercus pubescens*, *Q. cerris*), Christ's thorn (*Paliurus spina-christi*), and juniper (*Juniperus oxycedrus*) (Йорданов 1970). It was not found during the field studies in the studied area (we have found it multiple times elsewhere in the Eastern Rhodopes), but given the presence of suitable habitats, its presence in the IP elements is possible. This species is listed in Attachment 3 of the Biodiversity Act.

Verbascum rupestre

Grows in rock crevices in vertical sections and, very rarely, on rocky lands over silica (Peev 2011). It was found in one of the polygons with habitat 8320 outside the IP elements. It is listed in Attachment 3 of the Biodiversity Act and in Bulgaria's Red Data Book as ‘Threatened’.

Caesar's amanita (Amanita caesarea).

Occurs in light and warm oak and mixed deciduous forests (oak, beech, horse chestnut), on well drained soils. It is disseminated along the Black Sea coastline, the northern Balkan area, the Stara Planina mountain, the Znepole and Vitosha areas, in Sredna gora, the Rhodopes, the Thracian pan valley, and in Strandja (Peev 2011). This species was found in the easternmost part of the studied area, in an oak forest (habitat 91M0), outside the IP elements. This species is listed in Bulgaria's Red Data Book as ‘Vulnerable’.

Fauna

Invertebrates

So far more than 29,000 invertebrate animal species have been announced in Bulgaria (of approximately 29,850 animal species in total), of which the large majority comprises insects with more than 20,500 species.

Typical of the Eastern Rhodopes is the exceptional diversity of fauna complexes, created by the combination of physico-geographic, climatic and habitat specifics. Unique communities of millipedes, arachnids and various insects have been found (Beron & Popov 2004). There are exceptionally varied and well studied fauna of species such as the dragonfly (Marinov 2004),

orthopterans (Popov & Chobanov 2004), ground beetles (Guéorguiev 2004, Teofilova & Kodzhabashev 2020) and butterflies (Beshkov & Langourov 2004), most of which are with a high nature protection status.

According to the standard form for the Rhodopes - Eastern Protected Zone (according to the Habitats Directive), there are 15 invertebrate species included in Attachment 2 of the Biodiversity Act, and are subject to protection in the zone – thick shelled river mussel (*Unio crassus*), stone crayfish (*Austropotamobius torrentium*), the *Coenagrion ornatum* dragonfly, and the *Paracaloptenus caloptenoides* grasshopper, the following butterflies: *Lycaena* (*Lycaena dispar*), *Euphydryas aurinia*, eastern eggars (*Erigaster catax*), *Euplagia quadripunctaria*, *Dioszeghyana schmidtii*, and the following beetles: stag beetle (*Lucanus cervus*), Alpine longhorn beetle (*Rosalia alpina*), great capricorn beetle (*Cerambyx cerdo*), long-horned beetle (*Morimus funereus*), *Osmoderma eremita* and *Probaticus subrugosus*. These species are considered in detail in the Protected Area Impact Report.

The following invertebrate animals were found in the IP area during the field study:

Gastropoda:	Limacidae:	<i>Limax maximus</i> Linnaeus, 1758
Decapoda:	Potamidae:	<i>Potamon ibericum</i> Bieberstein, 1808
Scorpiones:	Euscorpiidae:	<i>Euscorpius</i> sp.
Araneae:	Araneidae:	<i>Araneus diadematus</i> Clerck, 1758
Myriapoda:	Scolopendridae:	<i>Scolopendra cingulata</i> Latreille, 1829
	Glomeridae:	<i>Glomeris balcanica</i> Verhoeff, 1906
Odonata:	Calopterygidae:	<i>Calopteryx virgo</i> Linnaeus, 1758
	Aeshnidae:	<i>Aeshna cyanea</i> Müller, 1764
	Libellulidae:	<i>Crocothemis erythraea</i> Brullé, 1832
		<i>Libellula depressa</i> Linnaeus, 1758
Plecoptera:	Perlodidae:	<i>Perlodes intricatus</i> Pictet, 1841
Mantodea:	Mantidae:	<i>Mantis religiosa</i> Linnaeus, 1758
	Empusidae:	<i>Empusa fasciata</i> Brulle, 1832
Isoptera:	Heterotermitidae:	<i>Reticulitermes lucifugus</i> Rossi, 1792
	Cleridae:	<i>Trichodes</i> sp.
Coleoptera:	Carabidae:	<i>Bembidion stephensii stephensii</i> Crotch, 1866
		<i>Bembidion deletum deletum</i> Audinet-Serville, 1821
		<i>Carabus coriaceus</i> Linnaeus, 1758
		<i>Carabus intricatus</i> Linnaeus, 1761
		<i>Carabus scabrosus</i> Olivier, 1795
		<i>Cicindela sylvicola</i> Dejean, 1822
	Buprestidae:	<i>Acmaeodera degener</i> Scopoli, 1763
		<i>Capnodis tenebrionis</i> Linnaeus, 1761
		<i>Coroebus rubi</i> Linnaeus, 1767
	Lampyridae:	<i>Lampyris noctiluca</i> Linnaeus, 1767
	Cerambycidae:	<i>Cerambyx cerdo</i> Linnaeus, 1758
		<i>Rutpela maculata</i> Poda, 1761
		<i>Stenurella melanura</i> Linnaeus, 1758
	Coccinellidae:	<i>Coccinella septempunctata</i> Linnaeus, 1758
	Tenebrionidae:	<i>Gnaptor spinimanus</i> Pallas, 1781

	Lucanidae:	<i>Lucanus cervus</i> Linnaeus, 1758
	Scarabaeidae:	<i>Cetonia aurata</i> Linnaeus, 1758 <i>Copris lunaris</i> Linnaeus, 1758 <i>Oxythyrea cinctella</i> Schaum, 1841 <i>Scarabaeus</i> sp.
	Lycidae:	<i>Lygistopterus sanguineus</i> Linnaeus, 1758
Hymenoptera:	Crabronidae:	<i>Vespa crabro</i> Linnaeus, 1758
	Scoliidae:	<i>Megascolia maculata</i> Drury, 1773
	Apidae:	<i>Apis mellifera</i> Linnaeus, 1758
	Formicidae:	<i>Cataglyphis nodus</i> Brullé, 1833
Neuroptera:	Ascalaphidae:	<i>Libelloides macaronius</i> Scopoli, 1763
Lepidoptera:	Notodontidae:	<i>Thaumetopoea pityocampa</i> Denis & Schifferrmüller, 1775
	Lasiocampidae:	<i>Eriogaster lanestris</i> Linnaeus, 1758
	Erebidae:	<i>Amata phegea</i> Linnaeus, 1758 <i>Euplagia quadripunctaria</i> Poda, 1761
	Nymphalidae:	<i>Aglais urticae</i> Linnaeus, 1758 <i>Argynnis paphia</i> Linnaeus, 1758 <i>Hipparchia circe</i> Fabricius, 1775 <i>Inachis io</i> Linnaeus, 1758 <i>Maniola jurtina</i> Linnaeus, 1758 <i>Melanargia galathea</i> Linnaeus, 1758 <i>Melitaea cinxia</i> Linnaeus, 1758 <i>Nymphalis polychloros</i> Linnaeus, 1758 <i>Pyronia tithonus</i> Linnaeus, 1758 <i>Vanessa atalanta</i> Linnaeus, 1758 <i>Vanessa cardui</i> Linnaeus, 1758
	Sphingidae:	<i>Macroglossum stellatarum</i> Linnaeus, 1758

Vertebrate animals

The studied region belongs to the transitional-Mediterranean climate area with temperate-continental to Mediterranean climate. The terrain is rolling and varied, with zones of different microclimate. The summers are hot and dry, especially the second half. The winters are relatively mild with more precipitation but also with brief periods of low temperature which restrict the penetration of thermophilic species from the south. The soil cover is thin, the rock foundation is monolithic, without deep and wide screes. The forests are predominantly low-stemmed, coppice, or young pine-tree plantations. No standing water impoundments are present. The streams (Yuren Dere) are torrential and often dry up after July. These conditions contribute to a relatively rich composition of vertebrate species. During our field studies and from work on other projects in this part of the Eastern Rhodopes we have found or inferred from the available habitats that 139 vertebrate animal species can be observed in the IP area (Table IV.6.1-1).

Table IV.6.1-1: Vertebrate animal species seen or potentially present in the IP area, and their national nature conservation status. BA – Number of Attachment to the Biodiversity Act;

BRDB – Category according to Bulgaria's Red Data Book (Golemanski 2011).

No.	Species	BA	Bulgaria's Red Data Book	No.	Species	BA	Bulgaria's Red Data Book
<u>Amphibians</u>				70	<i>Pica pica</i>	-	-
1	<i>Salamandra salamandra</i>	3	-	71	<i>Lanius collurio</i>	2, 3	-
2	<i>Lissotriton vulgaris</i>	3	-	72	<i>Lanius minor</i>	2, 3	-
3	<i>Triturus karelinii</i>	2, 3	-	73	<i>Lanius senator</i>	3	-
4	<i>Bombina variegata</i>	2, 3	-	74	<i>Oriolus oriolus</i>	3	-
5	<i>Bufo bufo</i>	3	-	75	<i>Alauda arvensis</i>	3	-
6	<i>Bufo viridis</i>	3	-	76	<i>Galerida cristata</i>	3	-
7	<i>Hyla arborea</i>	3	-	77	<i>Lullula arborea</i>	2, 3	-
8	<i>Pelophylax ridibundus</i>	-	-	78	<i>Delichon urbicum</i>	3	-
9	<i>Rana dalmatina</i>	-	-	79	<i>Hirundo daurica</i>	3	-
10	<i>Rana graeca</i>	3	-	80	<i>Hirundo rustica</i>	3	-
<u>Reptiles</u>				81	<i>Riparia rupestris</i>	3	-
11	<i>Testudo graeca</i>	2, 3	EN	82	<i>Phylloscopus sp.</i>	3	-
12	<i>Testudo hermanni</i>	2, 3	EN	83	<i>Aegithalos caudatus</i>	3	-
13	<i>Gymnodactylus kotschy</i>	3	-	84	<i>Parus caeruleus</i>	3	-
14	<i>Darevskia praticola</i>	-	-	85	<i>Parus lugubris</i>	3	-
15	<i>Lacerta trilineata</i>	3	-	86	<i>Parus major</i>	3	-
16	<i>Lacerta viridis</i>	3	-	87	<i>Parus palustris</i>	3	-
17	<i>Podarcis erhardii</i>	3	-	88	<i>Erithacus rubecula</i>	3	-
18	<i>Podarcis muralis</i>	3	-	89	<i>Ficedula parva</i>	2, 3	VU
19	<i>Podarcis taurica</i>	3	-	90	<i>Luscinia megarhynchos</i>	3	-
20	<i>Ablepharus kitaibelii</i>	3	-	91	<i>Muscicapa striata</i>	3	-
21	<i>Anguis colchicus</i>	3	-	92	<i>Oenanthe hispanica</i>	3	-
22	<i>Ophisaurus apodus</i>	3	VU	93	<i>Oenanthe oenanthe</i>	3	-
23	<i>Malpolon insignitus</i>	3	-	94	<i>Phoenicurus ochruros</i>	3	-
24	<i>Natrix natrix</i>	-	-	95	<i>Turdus merula</i>	3	-
25	<i>Natrix tessellata</i>	3	-	96	<i>Turdus philomelos</i>	3	-
26	<i>Dolichophis caspius</i>	3	-	97	<i>Turdus viscivorus</i>	3	-
27	<i>Elaphe sauromates</i>	2, 3	EN	98	<i>Sturnus vulgaris</i>	-	-
28	<i>Platycephalus najadum</i>	3	-	99	<i>Cinclus cinclus</i>	3	-
29	<i>Zamenis longissimus</i>	3	-	100	<i>Troglodytes troglodytes</i>	3	-
30	<i>Vipera ammodytes</i>	3	-	101	<i>Sitta europaea</i>	3	-
<u>Birds</u>				102	<i>Motacilla alba</i>	3	-
31	<i>Columba palumbus</i>	-	-	103	<i>Motacilla cinerea</i>	3	-
32	<i>Streptopelia decaocto</i>	-	-	104	<i>Acanthis cannabina</i>	3	-
33	<i>Streptopelia turtur</i>	-	-	105	<i>Carduelis carduelis</i>	3	-
34	<i>Cuculus canorus</i>	3	-	106	<i>Carduelis chloris</i>	3	-
35	<i>Caprimulgus europaeus</i>	2, 3	-	107	<i>Coccothraustes coccothraustes</i>	3	-
36	<i>Apus apus</i>	3	-	108	<i>Fringilla coelebs</i>	3	-

No.	Species	BA	Bulgaria's Red Data Book	No.	Species	BA	Bulgaria's Red Data Book
37	<i>Ciconia ciconia</i>	2, 3	VU	109	<i>Passer domesticus</i>	-	-
38	<i>Ciconia nigra</i>	2, 3	VU	110	<i>Passer hispaniolensis</i>	3	-
39	<i>Accipiter gentilis</i>	3	EN	111	<i>Emberiza calandra</i>	3	-
40	<i>Accipiter nisus</i>	3	EN	112	<i>Emberiza cia</i>	3	-
41	<i>Aquila chrysaetos</i>	2, 3	VU	113	<i>Emberiza cirrus</i>	3	-
42	<i>Aquila pomarina</i>	2, 3	VU		Mammals		
43	<i>Buteo buteo</i>	3	-	114	<i>Erinaceus roumanicus</i>	3	-
44	<i>Buteo rufinus</i>	2, 3	VU	115	<i>Talpa europaea</i>	-	-
45	<i>Circaetus gallicus</i>	2, 3	VU	116	<i>Rhinolophus mehelyi</i> / <i>Rh. euryale</i> *	2, 3	VU
46	<i>Gyps fulvus</i>	2, 3	EN	117	<i>Hypsugo savii</i>	3	-
47	<i>Hieraaetus pennatus</i>	2, 3	VU	118	<i>Myotis myotis</i> / <i>M. blythii</i> *	2, 3	-
48	<i>Milvus migrans</i>	2, 3	VU	119	<i>Nyctalus noctula</i>	3	-
49	<i>Neophron percnopterus</i>	2, 3	EN	120	<i>Pipistrellus nathusii</i>	3	-
50	<i>Pernis apivorus</i>	2, 3	VU	121	<i>Pipistrellus pipistrellus</i>	3	-
51	<i>Falco subbuteo</i>	3	VU	122	<i>Apodemus agrarius</i>	-	-
52	<i>Falco tinnunculus</i>	3	-	123	<i>Mus musculus</i>	-	-
53	<i>Athene noctua</i>	3	-	124	<i>Rattus norvegicus</i>	-	-
54	<i>Otus scops</i>	3	-	125	<i>Sylviaemus sp.</i>	-	-
55	<i>Strix aluco</i>	3	-	126	<i>Glis glis</i>	-	-
56	<i>Upupa epops</i>	3	-	127	<i>Sciurus vulgaris</i>	-	NT
57	<i>Coracias garrulus</i>	2, 3	VU	128	<i>Lepus europaeus</i>	-	NT
58	<i>Merops apiaster</i>	-	-	129	<i>Capreolus capreolus</i>	-	-
59	<i>Dendrocopos major</i>	3	-	130	<i>Cervus elaphus</i>	-	-
60	<i>Dendrocopos medius</i>	2, 3	-	131	<i>Dama dama</i>	-	-
61	<i>Dendrocopos minor</i>	3	-	132	<i>Sus scrofa</i>	-	-
62	<i>Dendrocopos syriacus</i>	2, 3	-	133	<i>Felis silvestris</i>	3	EN
63	<i>Dryocopus martius</i>	2, 3	VU	134	<i>Canis aureus</i>	-	-
64	<i>Picus canus</i>	2, 3	EN	135	<i>Canis lupus</i>	2	VU
65	<i>Picus viridis</i>	3	-	136	<i>Vulpes vulpes</i>	-	-
66	<i>Corvus corax</i>	3	NT	137	<i>Martes foina</i>	-	-
67	<i>Corvus cornix</i>	-	-	138	<i>Meles meles</i>	-	-
68	<i>Corvus monedula</i>	-	-	139	<i>Mustela nivalis</i>	3	-
69	<i>Garrulus glandarius</i>	-	-				

* - by way of echolocation; the method does not allow for distinction between the two species.

Some amphibians and reptiles, the stork, the raptors, the nightjar, the European roller, some woodpeckers (grey, black, middle spotted woodpecker), songbirds and the wolf are given higher conservation status. All they are subject to protection in the two protected zones in which the IP is situated – the Rhodopes - Eastern Protected Zone (under the Habitats Directive) and the Byala Reka River Protected Zone (under the Birds Directive). The exceptions are the European legless lizard (*Ophisaurus apodus*), the goshawk (*Accipiter gentilis*), the red-breasted flycatcher (*Ficedula parva*) and the wild cat (*Felis silvestris*). The remaining species, although included in Attachment

3 of the Biodiversity Act (and some also in Attachment 2), are widespread and with comparatively numerous populations both in the Eastern Rhodopes and in Bulgaria in general.

6.2. National ecological network

Protected zones

The IP area is situated in two protected areas (PA) of the National Environmental Network Natura Figure 2000 (Figure IV.6.2-1):

- ‘Rhodopi - Eastern’, code BG0001032, for protection of natural habitats and wild flora and fauna;
- ‘Byala reka’, code BG0002019, for protection of wild birds.

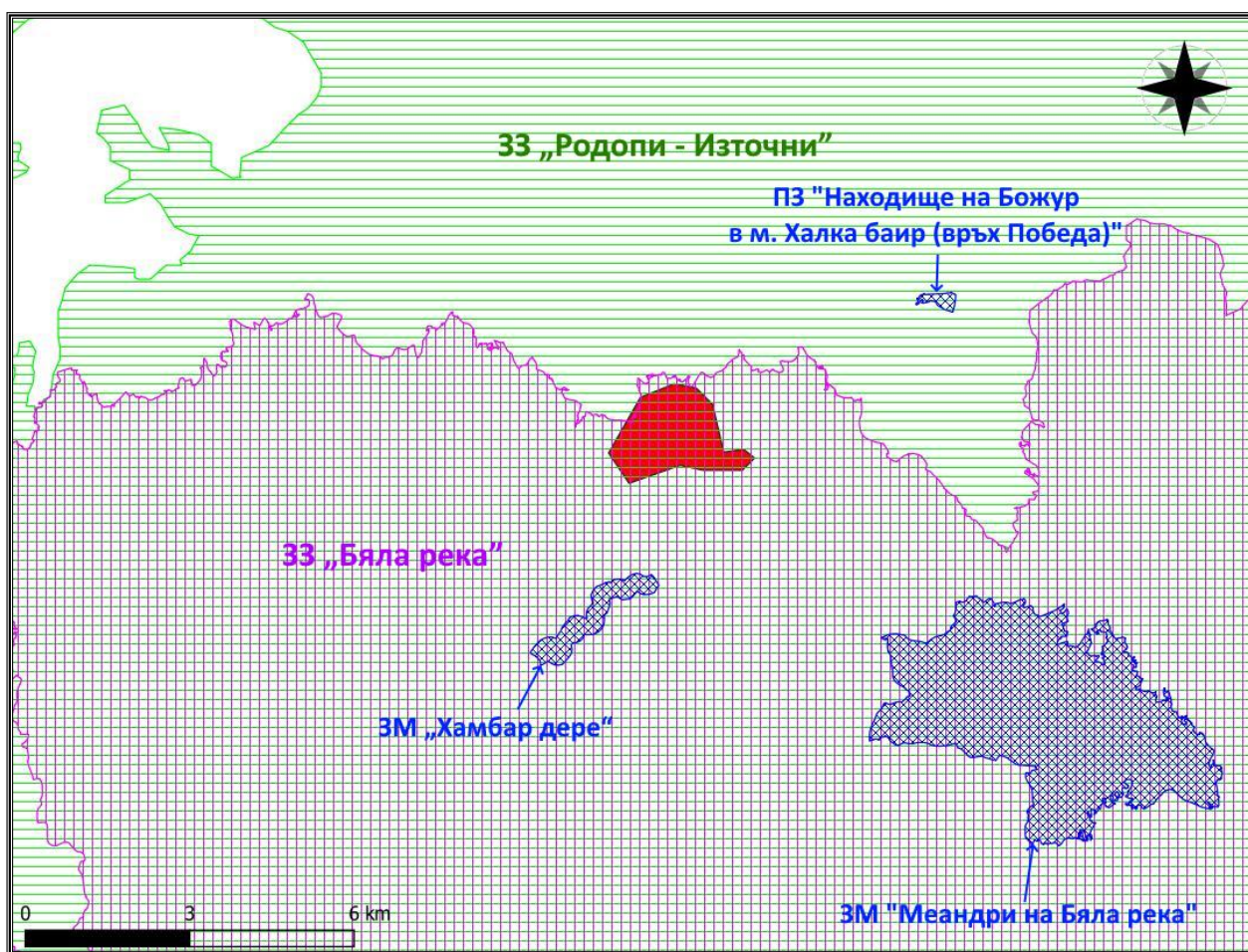


Figure IV.6.2-1: IP location relative to the protected zone and to the protected area. Red polygon – concession area; green horizontal line – Protected Area under the Habitats Directive; pink vertical line – Protected Area under the Birds Directive; blue diagonal line – protected areas under the Protected Areas Act.

Protected Areas

The IP area does not impact any protected areas in the meaning of the Protected Areas Act. The nearest such area is the Hambar Dere Protected Locality (PL) (Figure IV.6.2-1) situated approximately 1.6 km. from the concession area (distance between the nearest concession and PL boundary points).

7 . Cultural and Historical Heritage

This part of the EIA Statement was made in order to establish the extent to which known sites of cultural heritage could be impacted by the implementation of the investment proposal for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.’. This analysis was carried out by gathering and processing of data about known cultural values. The existence, location and current status of cultural heritage object were determined using various information sources – the Bulgaria’s Archaeological Map computer system, the registers of the National Institute of Immovable Cultural Heritage, reports from site exploration along the railway line and along other infrastructure in the region, specialised publications concerning former archaeological studies, and analysis of topographic maps and ortho-photo maps.

The nature of the investment initiative assumes that its implementation may endanger or compromise mainly archaeological cultural values. According to Article 146 of the Cultural Heritage Act, archaeological sites are all movable and immovable material traces of human activity from past epochs, situated or found in the earth layers, on the earth’s surface, on dry land and under water, whose main information sources are terrain studies. Immovable and movable archaeological objects are cultural values by status, categorised as being of national significance or comprising natural wealth. The diversity of human activities and the enormous chronological section during which they have been created and existed explain the substantial diversity of this type of objects.

Known cultural values near the investment proposal were established during the analysis and measures for their protection defined in the specialised regulatory framework are specified. All objects whose protection could be affected positively or negatively by all activities of the project for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA’ are presented.

The region in which the investment proposal is situated is poorly studied and the number of known archaeological objects is comparatively small. A total of ten archaeological sites have been registered in the lands of the Rozino and Gugutka villages so far. Of those four are near, but outside, the Tintyava PLA. It is possible that there may be unregistered archaeological objects in the region and that they may be endangered by future exploration or mining.

Registered archaeological objects near the concession area boundaries:

1 . Bulgaria’s archaeology map No. 1590350. A medieval castle in the Kaleto locality, situated 2.5 km. south-southwest of the Rozino Village and 0.25 km from the southwestern boundary of the concession area. GPS coordinates: 41.43391667 25.89338333.

2 . Bulgaria’s archaeology map No. 1590322. An early iron age settlement situated 0.5 km. south-west of the Rozino Village and 0.3 km from the northern boundary of the concession area. GPS coordinates: 41.45247 25.9094.

3 . Bulgaria’s archaeology map No. 10003863. Burial mound situated 2 km. northwest of the Gugutka village and 0.4 km from the southern boundary of the concession area. GPS coordinates: 41.42944 25.90336.

4 . A site without a Bulgaria’s archaeology map number Antique building situated 2.6 km. south of the Rozino Village and 0.2 km from the southwestern boundary of the concession area. GPS coordinates: 41.431842 25.896716.

If the investment proposal is not realised, the condition of the known archaeological sites will not change.

8. Wastes

No unregulated dump sites or other waste pollution with negative environmental impact is present on the territory which will be affected by the investment proposal.

The territorial extent of the investment proposal covers the lands of the Rozino and Gugutka villages in Ivaylovgrad Municipality, Haskovo District.

Mining waste will be treated in the mine waste facility and in a temporary low-grade ore stockpile. A mining waste management proposal has been developed (**Narrative attachment 9**).

According to Article 22r, paragraph 4 of the Mineral Resources Act (MRA), provided that the investment proposal for activities engendering mining waste is subject to a procedure pursuant to Chapter Six of the Environment Protection Act, the investment proposal must include the mining waste management proposal.

The mining waste management proposal was prepared in accordance with these provisions and is consistent, to the relevant level of detail, with the provisions concerning the development of mining waste management plans. Its content follows the structure laid down in the *Mine Waste Management Regulation* (promulgated in the SG, issue 5 of January 19, 2016, amended), and with Directive 2006/21/EC on the management of waste from extractive industries.

The mining waste management plan will be intended to prevent, reduce or limit the harmful impacts of waste onto the environment and will be **drawn up after an EIA decision to approve the investment proposal for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.’ is made.**

This is also the provision of Article 22r, paragraph 7 of the Mineral Resources Act which orders the Operator to present, together with the Mine Waste Management Plan, to the Minister of Energy an enacted EIA Decision issued in accordance with Chapter Six of the Environment Protection Act and containing a reasoned explanation that the mining waste management is not contradictory to the waste management plans and programs required by the Wastes Management Act. Such plans are approved by the Minister of Energy.

Other generated waste will be handed over for treatment by the Regional Waste Management Association (RWMA) for the Kardjali region named ‘Non-Profit Association For Clean Rhodopes’ and to persons holding the relevant document referred to in Article 35 of the Wastes Management Act, following the waste management hierarchy in order to prevent, reduce or limit the harmful impact on human health and on the environment.

9. Hazardous substances

No industrial zones and hazardous substance and pesticide storage facilities are present on the territory which will be affected by the investment proposal. No industrial enterprises using hazardous substances are established near-by.

No enterprises and/or facilities classified in accordance with Chapter Seven of the Environment Protection Act are established near the area which will be affected by the investment

proposal area. According to the register of enterprises and/or facilities classified in accordance with Chapter Seven of the Environment Protection Act, the nearest enterprises/facilities with 'low and high risk potential' are more than 45 km away.

10. Risk Energy Sources - Noise, Vibrations and Radiation

10.1. Noise and vibrations

Noise is one of the main negative impacts on the population, present as an unwanted or harmful external sound caused by human activities and emitted by automotive, railway or air transport, by industrial installations and facilities and by local sources, etc. Environmental noise indicators are physical values determined with account of the extent and limits of discomfort for citizens exposed to noise. Second to air pollution, noise is a fundamental human health factor.

Noise in the natural and living environment indicators are physical values determined with account for the limits and level of discomfort for citizens exposed to noise, depending on the nature of the noise, the time of the day, the intended purpose of the living premises, the nature of the territories and of the zones in and outside the urbanised areas.

The effect of the noise factor is most distinct in the urban areas with population in excess of 100,000. Their noise loading depends on both noise intensity and the duration of its impact.

The main sources of environmental noise are:

- automotive and railway transport flows;
- air transport;
- local sources – industrial enterprises, commercial facilities, places of entertainment, service facilities, etc., situated in a territory defined as urban according to the Spatial Development Act.

Regional Health Inspectorates - part of the National System for Monitoring of Noise in Urban Areas, participate in annual inspections, analysis, evaluation and control of transport noise loading. The nearest noise monitoring points are situated in Kardjali, more than 40 km along a straight line from the IP boundaries and, therefore, its monitoring data are unsuitable for the region under consideration.

Presently, no mining and primary processing of natural resources are carried out on, or in a close proximity to, the Rozino Deposit. No activities that could emit noise and vibrations into the environment are carried out in the deposit area.

No intensive automotive traffic exists in the IP area and it may be concluded that automotive traffic is not a significant source of noise in the region.

Any background noise in the near-by residential areas is created by the residents' everyday activities.

10.2. Radiation

The area in which the IP will be situated is not a source of environmentally harmful radiation.

The geological base is not a source of harmful radiation based on gamma-spectrometry measurements of one flotation tailings sample and of sixteen drill core sample composites of crushed rocks taken from various depths in the RTD-015 borehole within the IP site. This analysis was carried out by the DIAL OOD accredited Central Scientific Research Laboratory, and the results are submitted in records 2025/4989 (the sample is identified as O 019) dated 06.11.2020,

No. 2025/4990 (the sample is identified as M365) dated 07.11.2025, No. 2025/4991 (the sample is identified as M366) dated 07.11.2025, No. 2025/4992 (the sample is identified as M367) dated 07.11.2025, No. 2025/4993 (the sample is identified as M368) dated 10.11.2025, No. 2025/4994 (the sample is identified as M369) dated 10.11.2025, No. 2025/4995 (the sample is identified as M370) dated 10.11.2025, No. 2025/4996 (the sample is identified as M371) dated 10.11.2025, No. 2025/4997 (the sample is identified as M372) dated 11.11.2025, No. 2025/4998 (the sample is identified as M373) dated 11.11.2025, No. 2025/4999 (the sample is identified as M374) dated 11.11.2025, No. 2025/5000 (the sample is identified as M375) dated 11.11.2025, No. 2025/5001 (the sample is identified as M376) dated 11.11.2025, No. 2025/5002 (the sample is identified as M377) dated 11.11.2025, No. 2025/5003 (the sample is identified as M378) dated 13.11.2025, No. 2025/5004 (the sample is identified as M379) dated 13.11.2025, No. 2025/5005 (the sample is identified as M380) dated 13.11.2025, **Textual attachment 17.**

The laboratory analyses for determining the specific gamma-radionuclide activeness were carried out using a gamma-spectrometry system made by Canberra Packard and comprising a DSA-LX digital multi-channel analytical device with a GENIE2000 software package intended for gamma-spectre measurement and processing. The detector is made of high-purity germanium (HPGe) in a lead protective shield allowing for low-background measurements. Measurements were made of the Potassium-40, Lead-210, Lead-214, Bismuth-214, Radium-223, Radium-226, Thorium-230, Thorium-232, Uranium-238 and Uranium-235 nuclides, in accordance with the rules on studying of natural radioactivity.

The maximum admissible levels of specific activeness of natural radionuclides were determined in accordance with Attachment 3, Table 3 of the Regulation on Radiation Protection, in order to deregulate large quantities of materials (more than 1 t) as follows:

- Specific mineral activeness for each single natural radionuclide of the Uranium-238 and Thorium-232 families – 1 Bq/g.
- Specific mineral activeness of the material for a single radionuclide, Potassium-40 – 10 Bq/g.

Gamma logging was carried out to study the specific radioactivity in a 166 m layer of the RTD-015 borehole. The radioactivity was sufficiently low and will not cause pollution and distribution of radioactive isotopes in the remaining environmental media.

According to the gamma-spectrometry analyses of samples from various depths in the RTD-015 borehole, there is no immediate environmental hazard and hazard for the workers during the construction phase and, therefore, there is no need for radiation safety measures and activities.

The following tables present the specific activeness of the samples from various depths.

Table IV.10.2-1 Specific activeness of samples from various depths

Test results (value, uncertainty) Au									
Name	O019	M 365	M 366	M 367	M 368	M 369	M 370	M 371	M 372
Parameter	Flotation waste	Core sample composites							
		0.50±10.8 m	10.8±21.0 m	21.0±31.0 m	31.0±41.0 m	41.1±51.7 m	51.7±61.7 m	61.7±71.7m	71.7±81.7 m
Potassium-40	0.933 ± 0.023	1.000 ± 0.021	0.968 ± 0.033	0.560 ± 0.020	0.598 ± 0.013	0.637 ± 0.022	0.964 ± 0.021	1.231 ± 0.042	0.815 ± 0.027
Lead-210	0.021 ± 0.009	0.017 ± 0.007	0.031 ± 0.012	0.024 ± 0.005	0.109 ± 0.008	0.017 ± 0.005	< 0.014	< 0.023	0.020 ± 0.005

Lead-214	0.018 ± 0.001	0.022 ± 0.001	0.029 ± 0.001	0.017 ± 0.001	0.015 ± 0.001	0.018 ± 0.001	0.020 ± 0.001	0.026 ± 0.001	0.021 ± 0.001
Bismuth-214	0.018 ± 0.002	0.021 ± 0.001	0.028 ± 0.001	< 0.003	0.014 ± 0.001	0.009 ± 0.001	0.019 ± 0.001	0.026 ± 0.001	< 0.002
Radium-223	< 0.005	< 0.005	< 0.005	< 0.002	< 0.007	< 0.003	< 0.007	< 0.005	< 0.003
Radium-226	< 0.017	< 0.010	0.032 ± 0.012	< 0.006	< 0.031	< 0.006	0.023 ± 0.006	0.026 ± 0.007	0.028 ± 0.007
Thorium-232	0.029 ± 0.001	0.041 ± 0.001	0.039 ± 0.001	< 0.002	< 0.072	0.064 ± 0.021	< 0.072	< 0.001	< 0.065
Uranium-238	0.022 ± 0.006	0.034 ± 0.006	0.029 ± 0.005	0.032 ± 0.003	0.024 ± 0.001	< 0.002	0.037 ± 0.001	0.045 ± 0.001	< 0.002
Uranium-235	0.0019 ± 0.0006	0.0029 ± 0.0003	< 0.001	< 0.0003	0.017 ± 0.004	0.039 ± 0.003	0.022 ± 0.006	0.030 ± 0.006	0.030 ± 0.003

Table IV.10.2-2 Specific activeness of samples from various depths

Test results (value, uncertainty) Au								
Name	M 373	M 374	M 375	M 376	M 377	M 378	M 379	M 380
Parameter	Core sample composites							
	71.7÷91.8 m	91.80÷102.2 m	102.2÷112.3 m	112.3÷122.8 m	122.8÷132.9 m	132.9÷143.3 m	143.3÷153.3 m	153.3÷166.2 m
Potassium-40	0.986 ± 0.034	0.686 ± 0.014	0.917 ± 0.032	0.647 ± 0.014	0.717 ± 0.025	0.716 ± 0.024	1.087 ± 0.037	0.990 ± 0.021
Lead-210	< 0.019	0.021 ± 0.006	< 0.024	0.014 ± 0.006	0.023 ± 0.006	0.028 ± 0.005	< 0.025	0.018 ± 0.007
Lead-214	0.023 ± 0.001	0.018 ± 0.001	0.025 ± 0.001	0.015 ± 0.001	0.023 ± 0.001	0.031 ± 0.001	0.032 ± 0.001	0.022 ± 0.001
Bismuth-214	0.022 ± 0.001	0.019 ± 0.001	0.024 ± 0.001	0.015 ± 0.001	< 0.003	0.016 ± 0.001	0.032 ± 0.001	0.021 ± 0.001
Radium-223	< 0.004	< 0.004	< 0.005	< 0.006	0.0046 ± 0.0016	< 0.004	< 0.006	< 0.006
Radium-226	0.026 ± 0.007	< 0.011	0.028 ± 0.006	< 0.027	0.045 ± 0.004	0.035 ± 0.010	0.047 ± 0.013	0.028 ± 0.006
Thorium-232	< 0.052	< 0.050	< 0.089	< 0.056	< 0.056	< 0.056	< 0.094	< 0.067
Uranium-238	0.033 ± 0.001	0.031 ± 0.001	0.038 ± 0.001	0.027 ± 0.001	< 0.003	< 0.003	0.048 ± 0.001	0.990 ± 0.021
Uranium-235	0.021 ± 0.005	0.023 ± 0.004	0.917 ± 0.032	0.020 ± 0.005	0.029 ± 0.003	0.033 ± 0.003	0.030 ± 0.007	0.023 ± 0.005

The resulting values allow the conclusion that the samples from the controlled areas conform to the requirements for specific activeness of natural radionuclides, laid down in Attachment 3, table 3 of the Regulation on Radiation Safety, in order to deregulate large quantities of materials. *Accordingly, no hazard is present to the environment, the on-site workers and the population and, therefore, no particular measures and activities are needed to ensure radiation safety.*

The gamma-spectrometry analysis results compared to the standards in the current legislation show that the materials removed from the site do not pose a threat to the environment and would not cause changes to the natural radiation background of the site. The radioactivity measured in the studied layers is sufficiently low to prevent pollution and distribution of radioactive isotopes into the remaining environment media.

11. Health and Hygiene Aspects

The Rozino Deposit concession in the Tintyava PLA, which is the subject of this IP, is situated in the lands of two villages - Rozino and Gugutka, in the Ivaylovgrad Municipality, Haskovo District. The entire concession is **outside the zoning boundaries of any urban area**.

The extent of the analyses and the evaluation is determined by the **IP parameters** and by **the location of the nearest objects in need of health protection** in the meaning of item 3 of §1 of the Additional Provisions of the *Regulation on the Terms and Procedures for Conducting Environmental Impact Assessments*.

The IP parameters, including the type and quantity of expected residual substances and emissions, and quantities and types of waste generated during the various implementation stages show that the IP impact is local in scope – mainly within the extent of the directly impacted terrains (*the pit, the process plant, the earth and topsoil stockpiles (HD1 and HD2) and the waste-rock stockpiles, as well as the mine waste (flotation tailings) facility, the contact water reservoir, the non-contact water reservoir and collection ditches, and the service roads*) in the concession area.

The total surface area of the concession is 275,3 ha, and the surface area of the terrains directly impacted/disturbed is 118 ha. The remaining 157,3 ha is defined as a buffer zone where no mining will be carried out - it will provide protection for the facilities and plants and will restrict accidental access by people and animals.

The distances from the concession area and from the directly impacted terrains inside it to the zoning boundaries of the nearest settlements are described in **Table IV.11-1** and are shown on **Figure IV.11-1** (distances from the concession area boundaries to the zoning boundaries of the nearest settlements), **Figure IV.11-2** (distances from the directly impacted terrains in the concession area and the zoning boundaries of the settlements) and **Table IV.11-2** and **Figures IV.11-3, 4 and 5** (distances between the pit and the directly impacted other terrains in the concession area to the nearest sites in need of health protection).

Table IV.11-1. Distances between the concession boundaries and settlements and sites in need of health protection

Distances between the concession area and the zoning boundaries of the nearest settlements, in meters (m) Figure IV.11-1		Distances from the nearest directly impacted areas in the concession area and the zoning boundaries of settlements, in meters (m) Figure IV.11-2	
Rozino village	466	Rozino village	600
Byal Gradets village	1,366	Byal Gradets village	1,405
Gugutka village	1,721	Gugutka village	1,855

* The zoning boundaries in digital format from the Cadastre Map of the Republic of Bulgaria, over a Google Earth base

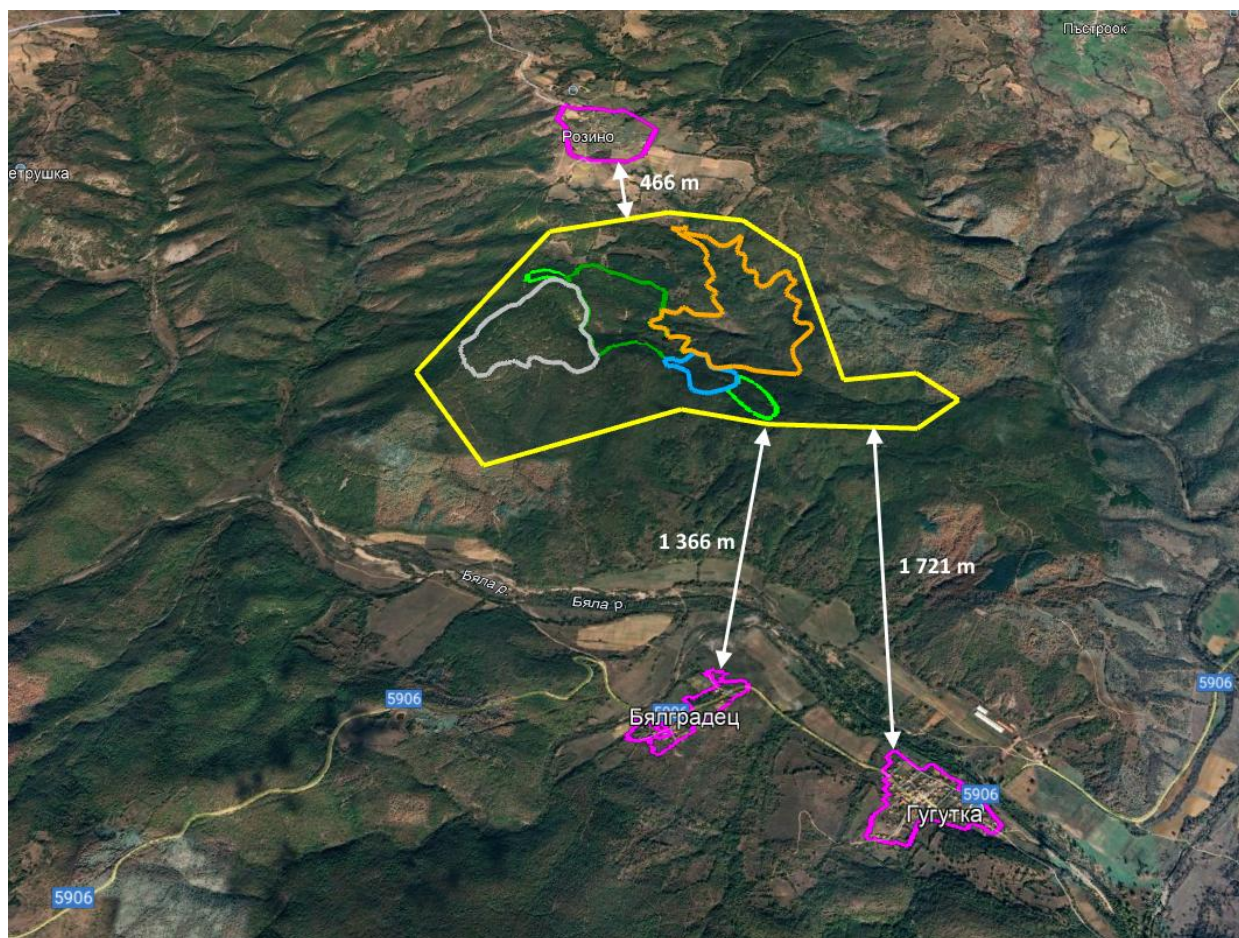


Figure IV.11-1. Distances between the concession area and the zoning boundaries of the nearest settlements

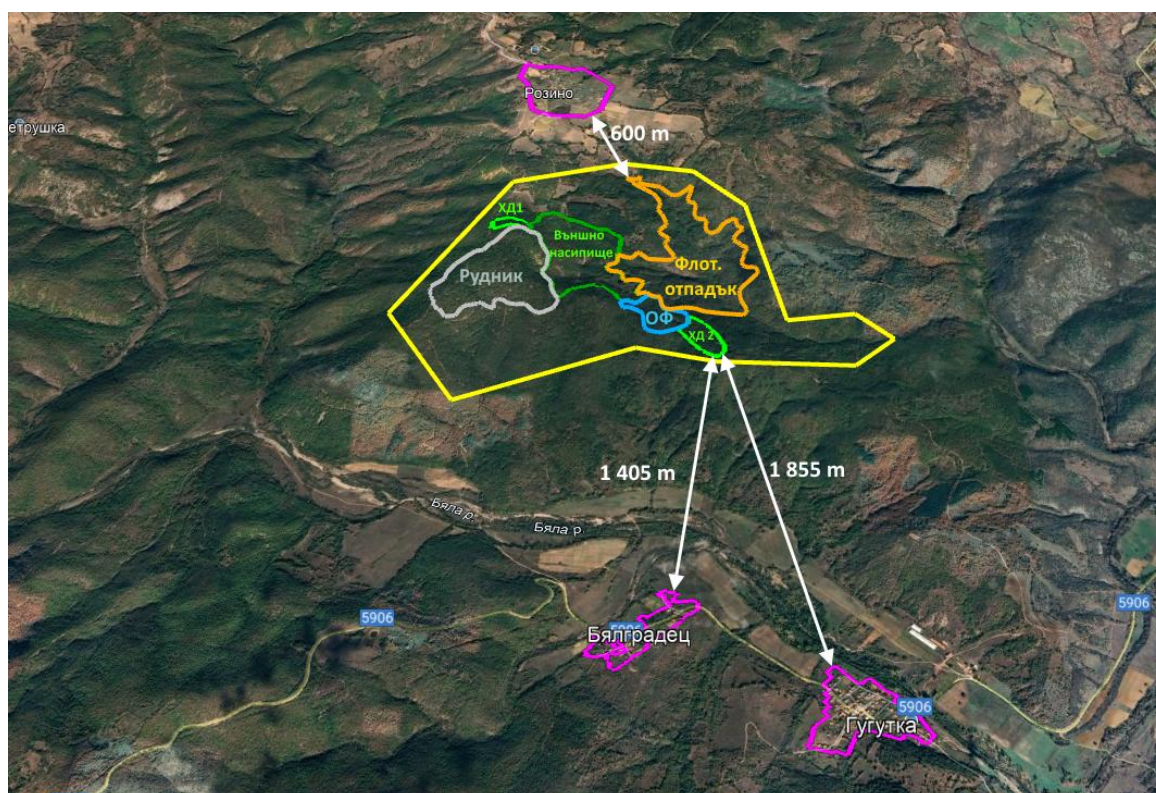


Figure IV.11-2. Distances between the nearest directly impacted terrains in the concession area and the zoning boundaries of the nearest settlements

Table IV.11-2. Distances between the impacted terrains/sites in the concession area and the nearest sites in need of health protection

Site in the concession area	Nearest object in need of health protection, distance in meters (m)
Mine	Residential building in the Rozino village – 1,200 m
	Residential building in the Byal Gradets village – 1,793 m
	Residential building in the Gugutka village – 2,483 m
Process plant	Residential building in the Rozino village – 1,677 m
	Residential building in the Byal Gradets village – 1,548 m
	Residential building in the Gugutka village – 2,104 m
Topsoil stockpile 1	Residential building in the Rozino village – 1,137 m
	Residential building in the Byal Gradets village – 2,390 m
	Residential building in the Gugutka village – 3,070 m
Topsoil stockpile 2	Residential building in the Rozino village – 1,911 m
	Residential building in the Byal Gradets village – 1,422 m
	Residential building in the Gugutka village – 1,872 m
External stockpile	Residential building in the Rozino village – 1,002 m
	Residential building in the Byal Gradets village – 1,781 m
	Residential building in the Gugutka village – 2,370 m
Flotation tailings facility	Residential building in the Rozino village – 693 m
	Residential building in the Byal Gradets village – 1,733 m
	Residential building in the Gugutka village – 2,167 m

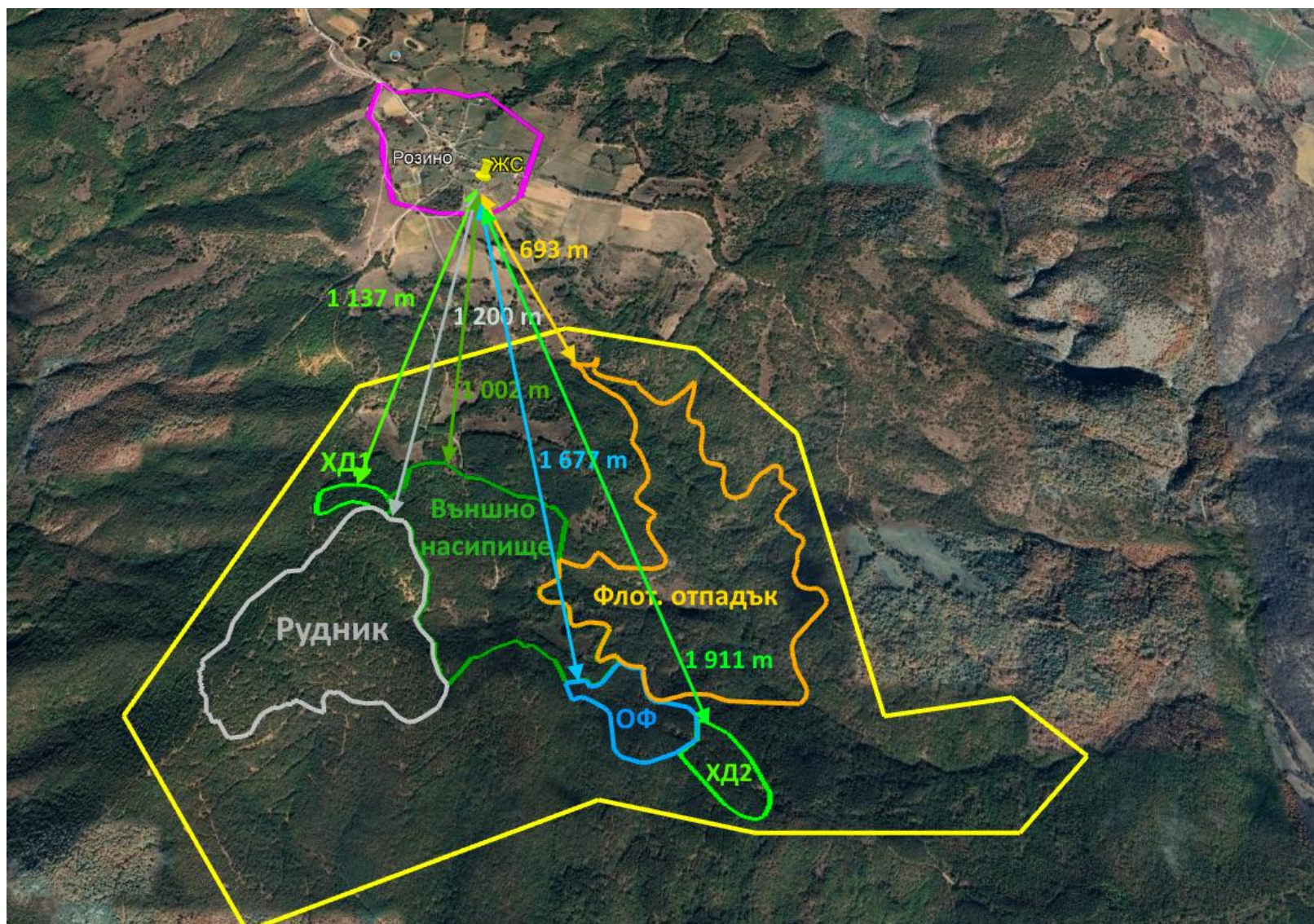


Figure IV.11-3. Distances between the main IP sites and facilities and the nearest site in need of health protection - a residential building in the Rozino village

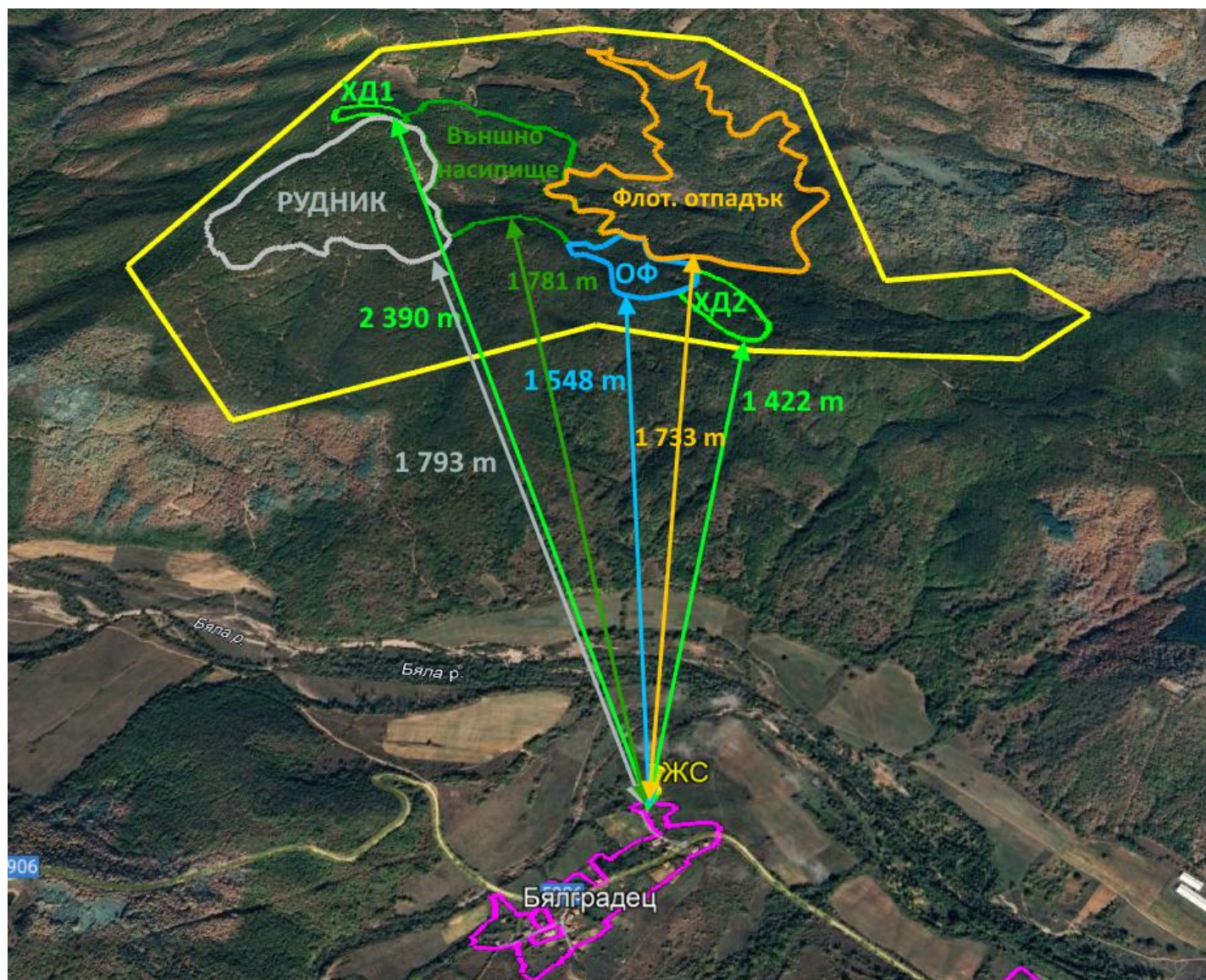


Figure IV.11-4. Distances between the main IP sites and facilities and the nearest site in need of health protection - a residential building in the Byal Gradets village

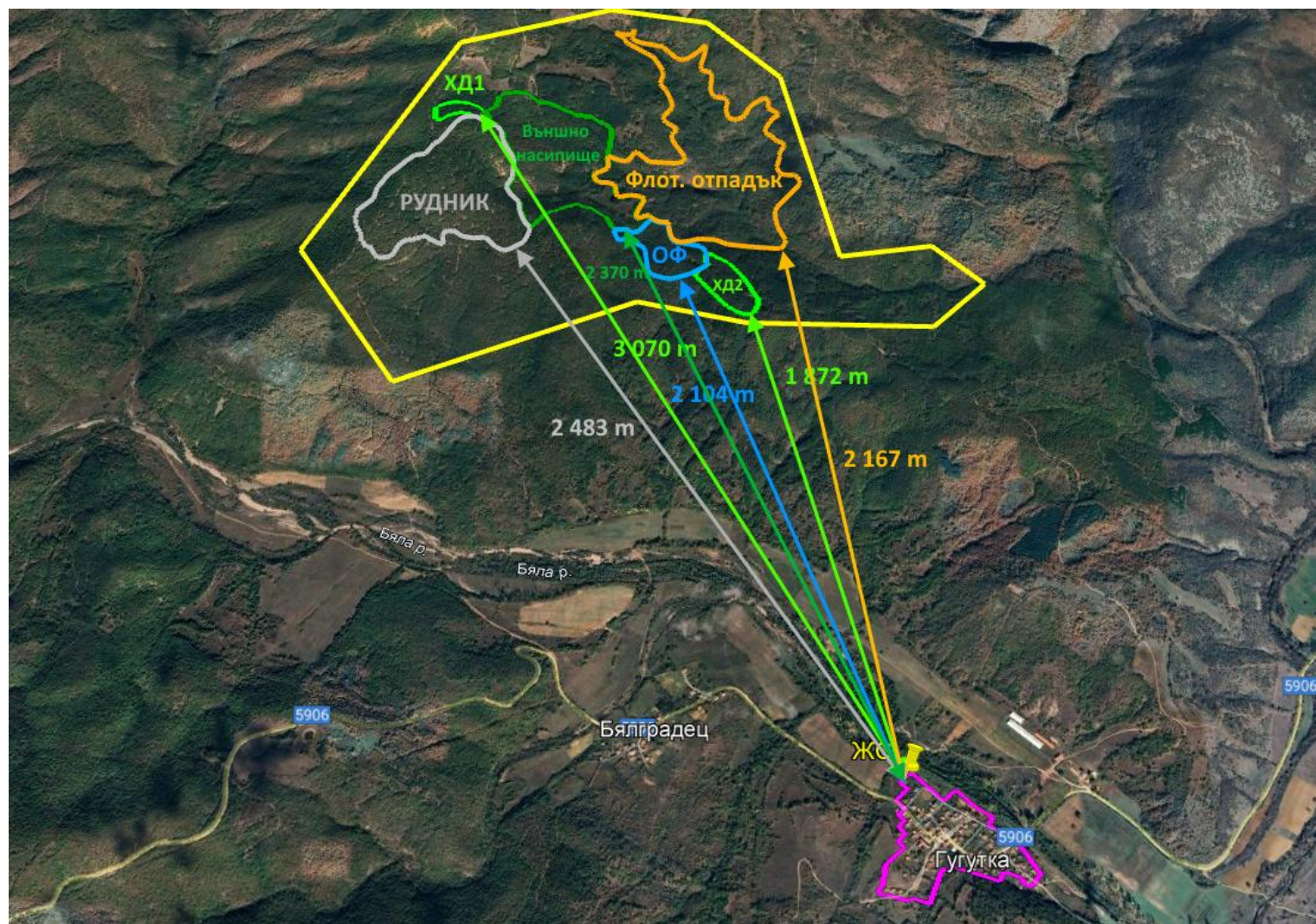


Figure IV.11-5. Distances between the main IP sites and facilities and the nearest site in need of health protection - a residential building in the Gugutka village

Given the mainly local impact of the deposit-development activities and the distance from the nearest sites in need of health protection, including the nearest zoning boundaries of the nearest settlements, the extent of the study of the IP impact on the environmental aspects of health and hygiene and human health included the population of the villages of Rozino, Byal Gradets and Gugutka in the Haskovo District.

11.1. Health status of the population

An assessment of the potentially impacted population was made for the evaluation of the human health impact of the IP.

Data covering a 5 year period (2019-2023) were used in the analysis in order to ensure a time interval sufficient to establish the health and demographic trends for the population in the IP area (in respect of statistical/administrative units for which official data are available), as follows:

- official statistics from the National Statistical Institute (NSI) for the 2019-2023 period;
- tables with information about persons with permanent and current address registration in the 2019-2023 period in Rozino, Byal Gradets and Gugutka villages, Ivaylovgrad Municipality, Haskovo District, published on the web page of the General Directorate ‘Civil Registration and Administrative Services’ (GD CRAS);
- information, provided in accordance with the Public Information Access Act (PIAA) by the Haskovo Regional Health Inspectorate (with letters ref. no. 93-11/10.10.2023 and with Decision No. 14/2024);
- information, provided in accordance with PIAA by the Ivaylovgrad Municipality, with letters ref. no. 30-00-528/1/16.10.2023 and ref. no. 30-00-563/1/04.12.2024;
- *Healthcare. Brief statistic reference books with annual data for 2019-2023*, published on the web-page of the National Centre for Public Health and Analyses (NCPHA).

Population Numbers

The population numbers in the IP area is as follows:

Table IV.11.1-1 Persons registered under permanent and current addresses (numbers), in the Civil Registration and Administrative Services General Directorate (in respect of urban areas, the municipality and the district), in the National Statistical Institute (in respect of the country)

Administrative unit	Registered address	2019	2020	2021	2022	2023
Rozino village	permanent	154	150	150	149	139
	current	58	56	54	48	50
Byal Gradets village	permanent	133	135	137	137	142
	current	53	57	61	61	65
Gugutka village	permanent	154	154	154	154	141
	current	98	93	97	101	104
Ivaylovgrad Municipality	permanent	7,893	7,792	7,652	7,573	7,487
	current	6,131	5,983	5,801	5,632	5,675
Haskovo District	permanent	293,571	291,314	288,400	285,747	235,416
	current	247,571	245,212	241,856	237,412	195,161
Average for Bulgaria		6,951,482	6,916,548	6,838,937	6,447,710	6,445,481

Table IV.11.1-1 allows deriving of the following trends for the population in the IP region:

- The population numbers in all three settlements in the IP area are very low, at less than 200 persons during the entire period under consideration. The changes in numbers during the 5 years under consideration are the following:
 - The population with permanent address in the Rozino Village has decreased by 9.7%, and the population with current address has decreased by 13.8% during the period.
 - The population with permanent address in the Byal Gradets Village has decreased by 6.8% (9 persons), and the population with current address has increased by 22.6% (12 persons) during the period;
 - The population with permanent address in the Gugutka Village has decreased by 8.4%, and the population with current address has decreased by 6.1% during the period;
- The numbers of the population of the Ivaylovgrad Municipality are also low, at less than 10,000 persons, having decreased during the period under consideration by 5.1% for those with permanent address and by 7.4% for those with current address. The population in the Haskovo District is also decreasing, but at much higher rates, the decrease during the period under consideration being 19.8% for the population with permanent address and 21.2% for the population with current address;
- For comparison, the country’s average decrease during this period was 5.1%, which is consistent with the decrease of the population with permanent address in the Ivaylovgrad Municipality and is much more favourable than the population decrease in the district. In the settlements, the population is decreasing at faster rates than the country’s rates, but slower than the district rates, the Byal Gradets village being the exception.
- In 2023, the population of all three settlements situated closest to the IP area comprised only 5.6% of the population in the Ivaylovgrad Municipality with permanent address and 3.9% of those with current address. Relative to the district, the population of the three settlements is 0.2% of the population with permanent and 0.1% of the population with current addresses.
- These data are indicative of a substantial irregularity of population distribution between the towns and villages (71.5% of the Haskovo District population resided in towns in 2023), which is typical of the entire country and is unfavourable in respect of the provision of health services, impacting mainly the smaller and isolated settlements such as the three settlements in the IP area.

Age Structure of the Population

Data about the age structure of the population are available for the municipality, district and country levels and are presented in **Table IV.11.1-2:**

Table IV.11.1-2. Age structure of the population in 2019-2023
(recalculated as %), NSI

Year	Administrative unit	Below working capacity age	In working capacity age	Above working capacity age
2019	Ivaylovgrad Municipality	12.5	56.0	31.5
	Haskovo District	15.5	57.9	26.6
	Bulgaria	15.3	59.8	24.9
2020	Ivaylovgrad Municipality	12.7	55.4	31.9
	Haskovo District	15.5	57.9	26.6
	Bulgaria	15.4	59.8	24.8
2021	Ivaylovgrad	12.4	55.3	32.3

Year	Administrative unit	Below working capacity age	In working capacity age	Above working capacity age
	Municipality			
	Haskovo District	15.5	58.1	26.4
	Bulgaria	15.5	60.0	24.5
2022	Ivaylovgrad Municipality	11.4	54.0	34.6
	Haskovo District	15.2	56.3	28.5
	Bulgaria	15.2	58.5	26.3
2023	Ivaylovgrad Municipality	11.5	54.1	34.4
	Haskovo District	15.1	56.3	28.6
	Bulgaria	15.2	58.5	26.3

It can be seen from the table above that the age structure in all administrative units is of the ageing type (the number of population of higher than working capacity age exceeds substantially the number of population below working capacity age), and the problem has been increasing during the period under consideration at all three administrative levels. The chart below presents a comparison of age structures in 2023.

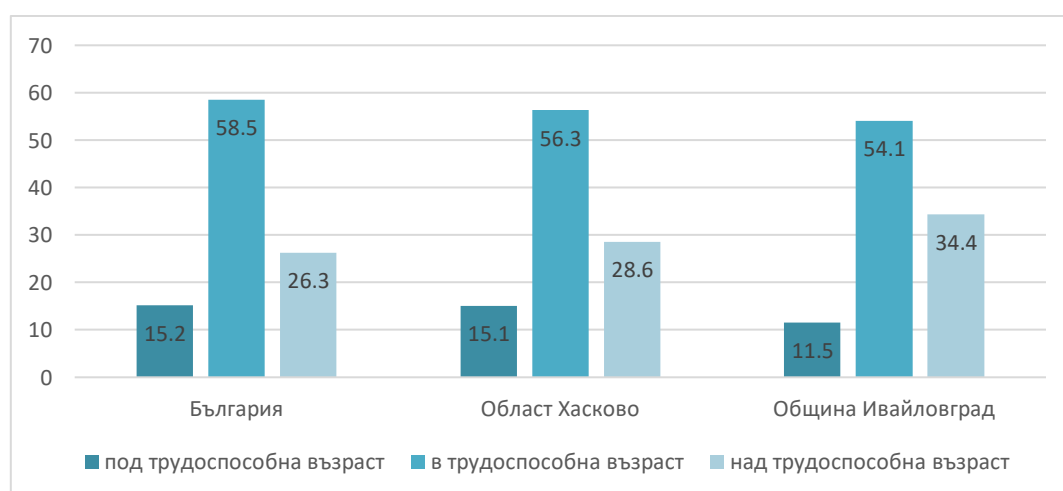


Figure IV.11.1-1. Population below, at and above working capacity age in 2023, *National Statistical Institute (data presented as %)*

It can be seen from **Figure IV.11.1-2** that the age structure is less favourable than the country's average both in the Ivaylovgrad Municipality and in the Haskovo District. This situation is most unfavourable in the municipality where the percentage of young population and population at working capacity age is the lowest and the percentage of population over the active age is the highest, being 1/3rd of the total population.

Birth rate, general and child mortality rate, natural growth

Data about live-born and general mortality (pcs.) for all three urban areas are presented in **Table IV.11.1-3:**

Table IV.11.1-3. Birth-rates (BR) and Total Death Rate (TDR) in Rozino village, Byal Gradets village and Gugutka village, National Statistical Institute, Ivaylovgrad Municipality

Town/village	2019		2020		2021		2022		2023	
	P	TDR	P	TDR	P	TDR	P	TDR	P	TDR
Rozino village	1	0	0	1	1	0	1	0	2	0
Byal Gradets village	0	NA	0	NA	2	NA	0	NA	0	NA
Gugutka village	0	0	0	0	0	0	1	2	0	0

This table presents singular birth-rate and mortality cases.

Data about birth rates, death rates, child mortality and natural growth in the municipality, the district and the country, are presented in **Table IV.11.1-4:**

Table IV.11.1-4. Birth rate, general and child mortality rate, natural growth, National Statistical Institute, Haskovo Regional Health Inspectorate

Statistical Region	Year	Liveborn - birth rate per 1,000 people, ‰	Dead - total death rate per 1,000 people, ‰	Children death rate per 1000 liveborn - ‰	Natural growth per 1,000 people, ‰
Ivaylovgrad Municipality	2019	7.6	20.0	NA	-12.4
	2020	6.1	22.9	NA	-16.8
	2021	5.9	31.9	NA	-26.0
	2022	5.8	26.8	NA	-21.0
	2023	6.6	23.0	ND	-16.4
Haskovo District	2019	8.0	16.7	8.2	-8.7
	2020	7.4	19.7	8.4	-12.3
	2021	7.6	23.1	4.8	-12.1
	2022	7.8	20.3	4.9	-12.5
	2023	7.8	16.8	8.0	-9.0
Nationwide	2019	8.8	15.5	5.6	-6.7
	2020	8.6	18.0	5.1	-9.4
	2021	8.5	21.7	5.6	-13.2
	2022	8.8	18.4	4.8	-9.6
	2023	8.9	15.7	4.9	-6.8

Note: The birth rates and general death rates in the Ivaylovgrad Municipality are calculated as parts per thousand as a ratio of live-born and, respectively, diseased, relative to the average annual population for the respective year.

The data in **Table IV.11.1-4** show the following:

- As regards **birth rates**, the values and the trends are least favourable in the municipality, followed by the district, and are, in both administrative levels, less favourable than the country's averages. Birth rates in both the municipality and the district are decreasing unlike the country, having increased, albeit insignificantly, during the period;
- As regards the **total mortality rate**, the values are analogous to the birth-rate values, the most unfavourable/highest mortality rate being that of the municipality, followed by the district. A negative upward trend is observed at all three levels during the period;
- **Child mortality** is a medical care quality indicator but is affected also by the standard of living and by the health literacy of the population. It is higher in the district where the values vary during the period as compared to the country's values. One positive trend is the decrease in child mortality during the period both in the district and nationwide;

- **The natural growth** in all three levels is negative during the period and its trend is unfavourable and downward. The values are the least favourable in the municipality, followed by the district.
- In general, **both the municipality and the district show less favourable values** for the analysed parameters, mainly because of the deteriorated age structure of the population and migration of young people toward larger urban areas.

Deaths by cause

The following figures show ***deaths by cause*** for the Haskovo District and for Bulgaria in the 2019-2023 period, presented by *disease class according to the International Disease Classification (ICD-10)*:

<i>Class I Certain infectious and parasitic diseases</i>
<i>Class II Neoplasms</i>
<i>Class III Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism</i>
<i>Class IV Endocrine, nutritional and metabolic diseases</i>
<i>Class V Mental and behavioural disorders</i>
<i>Class VI Diseases of the nervous system</i>
<i>Class VII Diseases of the eye and adnexa</i>
<i>Class VIII Diseases of the ear and mastoid process</i>
<i>Class IX Diseases of the circulatory system</i>
<i>Class X Diseases of the respiratory system</i>
<i>Class XI Diseases of the digestive system</i>
<i>Class XII Diseases of the skin and subcutaneous tissue</i>
<i>Class XIII Diseases of the musculoskeletal system and connective tissue</i>
<i>Class XIV Diseases of the genitourinary system</i>
<i>Class XV Pregnancy, childbirth and the puerperium</i>
<i>Class XVI Certain conditions originating in the perinatal period</i>
<i>Class XVII Congenital malformations, deformations and chromosomal abnormalities</i>
<i>Class XVIII Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified</i>
<i>Class XIX Injury, poisoning and certain other consequences of external causes</i>
<i>Class XX External causes of morbidity and mortality</i>
<i>Class XXII Codes for special purposes, incl. COVID-19</i>

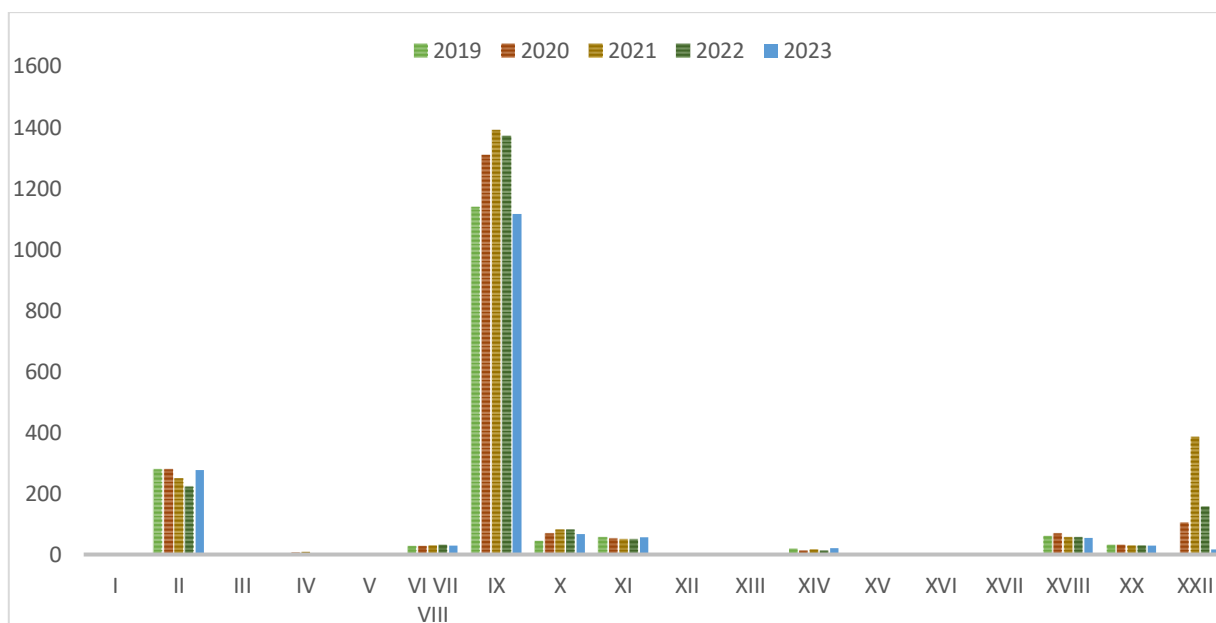


Figure IV.11.1-2. Deaths by cause distributed by disease class for the Haskovo District in 2019-2023 (per 100,000 persons), NSI

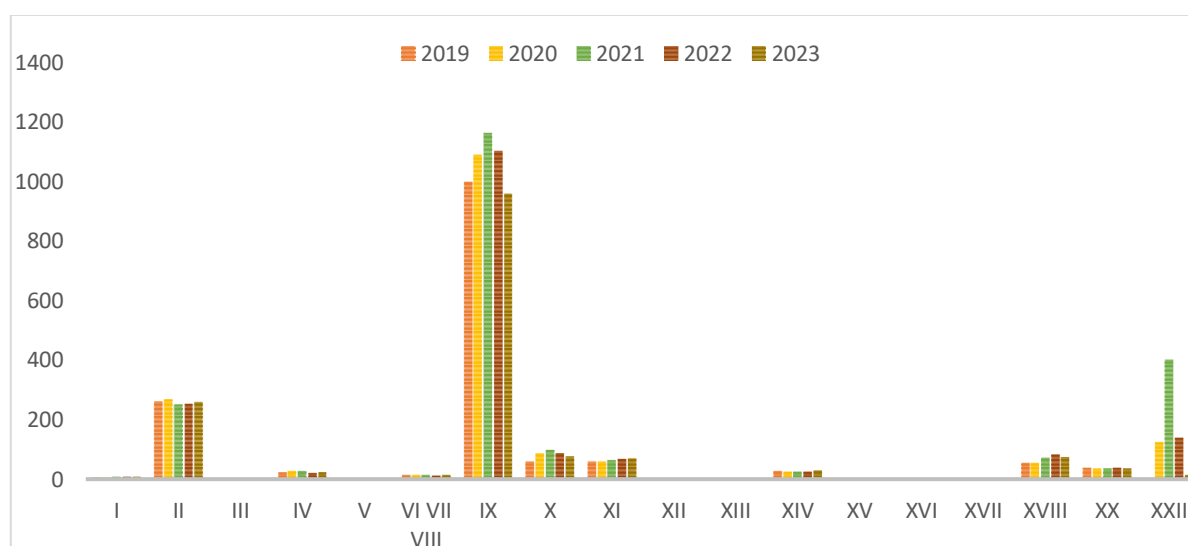


Figure IV.11.1-3. Deaths by cause distributed by disease class for Bulgaria in 2019-2023 (per 100,000 persons), NSI

Comparing the data, including the trends and values for the Haskovo District and for Bulgaria for 2019-2023 shows the following:

- **A leading cause** for death among the population over the entire period for both the district and the country are the diseases of Class *IX Diseases of the circulatory system*. The district values are higher/less favourable than the country's, with a positive downward trend being observed for both the district and the country;
- **The second cause** for death, also in the district and the country's average, are the diseases of *Class II Neoplasms*. The district values are higher/less favourable than the country's averages, with a positive downward trend during the period both for the district and for the country;

- **The third cause for the district** at the beginning of the period are diseases from Class *XVIII Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified*, which are decreasing during the period and are, at the period end, displaced by Class *X Diseases of the respiratory system* (increasing after 2019 and, subsequently, decreasing, but are higher at the end of the period than at the beginning).

Third in the country's average during the entire period are diseases of Class *X Diseases of the respiratory system*, with similar value movement during the period, increasing in the district after 2019 and decreasing during the last two years. Still, they are higher at the period end relative to 2019. The values in the district are lower than the country's average - a positive difference for the district.

Increasing disease IX and X values after 2019 both nationwide and in the district can be explained by the COVID-10 pandemic¹. In the case of this disease, people with cardio-vascular diseases are some of the most impacted groups (given that cardiac diseases such as ischaemic heart disease and survived microcardiac infraction reduce the organisms capabilities to handle the stress of the infectious process, and that COVID-19 is associated with multiple mechanisms affecting the cardio-vascular system and causing damage). Cardio-vascular complications caused by COVID-19 are linked to increased mortality rates and harder course of the condition, as the data about the period under consideration confirm. There is a similar explanation of the trends for respiratory system diseases - COVID-19 affects the respiratory system.

Neoplasms are of multi-factor genesis, the main causes being lifestyle (standard of living, harmful habits, unhealthy feeding habits) and infections, with the occupational environment, environmental pollution and other factors also being involved.

Infant mortality by cause

The two figures below present data about mortality of children below 1 year of age by cause both in the district and in the country (per 1,000 liveborn);

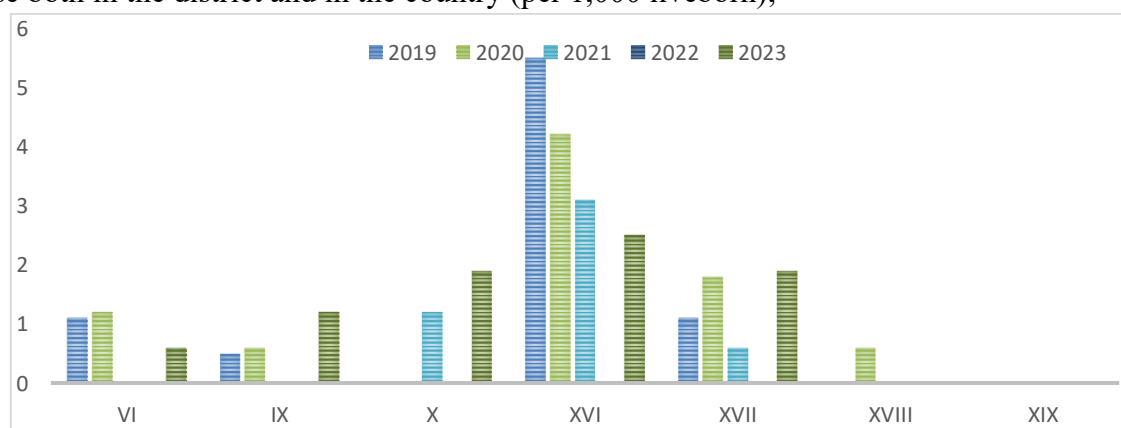


Figure IV.11.1-4 Child mortality by cause distributed by disease class for the Haskovo District in 2019-2023 (per 1,000 persons), *Haskovo Regional Health Inspectorate* (*according to information presented by the Haskovo RHI, no data are available for 2021)

¹ Cardio-vascular system and Covid-19, Damyan Boichev, Naidenka Zlatareva, Ivo Petrov, *Bulgarian Cardiology* 27(3): 16-23, DOI: 10.3897/bgcardio.27.e67571

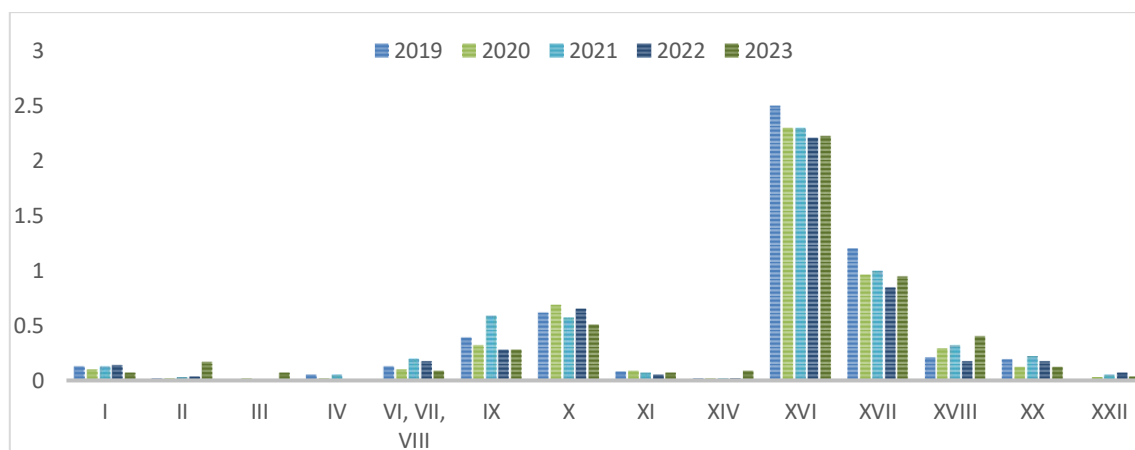


Figure IV.11.1-5. Child mortality by cause distributed by disease class for Bulgaria in 2017-2021 (per 1,000 persons), NSI

As can be seen from the charts on **Figures IV.11.1-4 and 5**, the leading mortality causes for children below 1 year of age nationwide and in the district are classes *XVI Certain conditions originating in the perinatal period* and *XVII Congenital malformations, deformations and chromosomal abnormalities* (i.e. the typical disease classes linked to child mortality). Compared to the country, the district values of the two leading causes are higher/less favourable. One positive trend for the district is that there are no deaths for a large part of the disease classes, and the classes causing deaths (except for the two leading classes) are singular cases, without any formed trends. The child mortality does not indicate the presence of heightened health risks in the IP region.

Population Disease Prevalence and Morbidity Rates

Information about disease prevalence and morbidity rates is available only for the Haskovo District (no country averages are available).

Population *disease prevalence* data are shown on **Figure IV.11.1-6**:

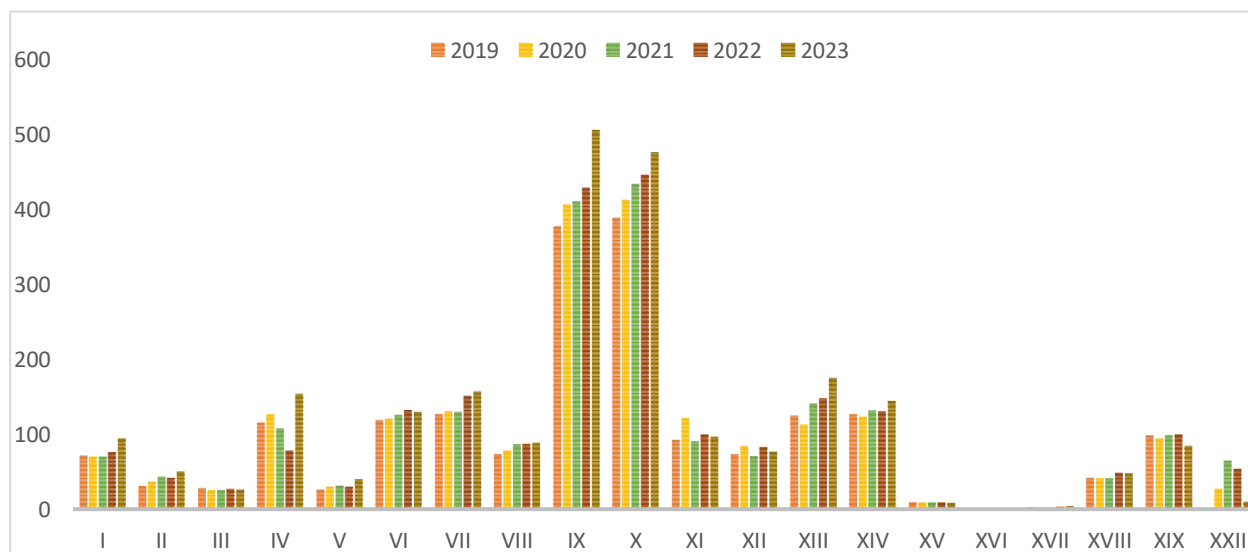


Figure IV.11.1-6. Population disease prevalence for the Haskovo District 2019-2023 (per 1,000 persons), Haskovo Regional Health Inspectorate

According to the prevalence data for the period under consideration, respiratory system diseases are in the lead, followed by circulatory system diseases, with the values/instances

increasing during the period and circulatory system diseases becoming first at the end of the period with respiratory diseases being second.

Third at the period start are the diseases of class *VII Diseases of the eye and adnexa*, which also increase during the period, but at the end of the period are displaced by the diseases of class *XIII Diseases of the musculoskeletal system and connective tissue* which increased at a higher rate.

Population **disease prevalence** data about the Haskovo District in 2019-2023 are presented in **Figure IV.11.1-7**:

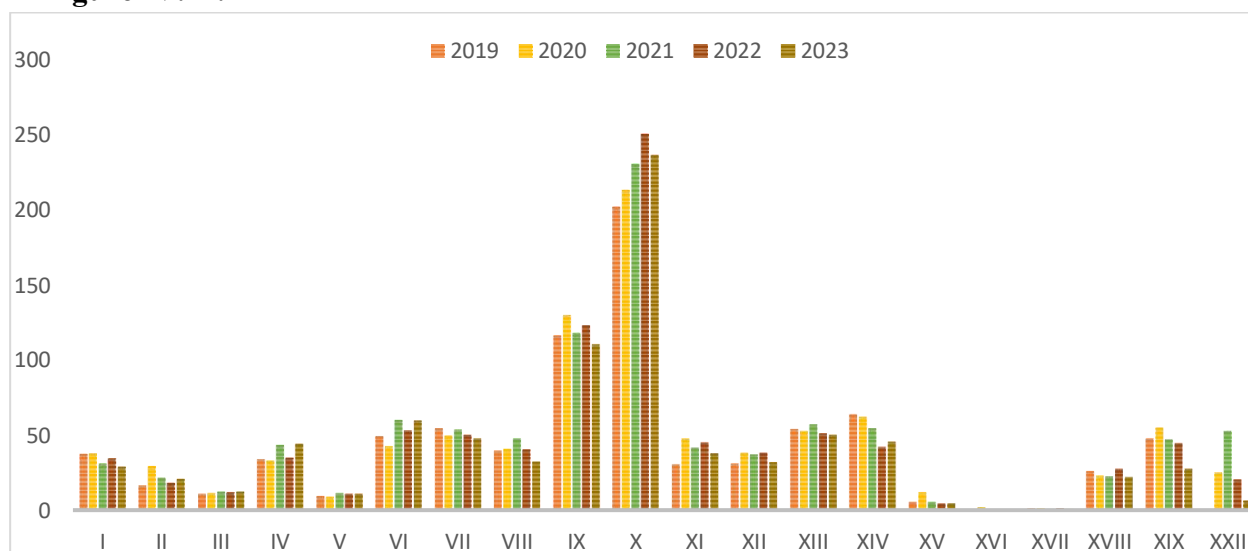


Figure IV.11.1-7. Population morbidity for the Haskovo District 2019-2023 (per 1,000 persons), *Haskovo Regional Health Inspectorate*

As regards prevalence, the first two leading causes in the district during the period under consideration are respiratory system diseases followed by circulatory system diseases, the former being on the increase during the period, but with a positive downward trend in the final year and the circulatory system diseases decreasing during the entire period. Third in the beginning of the period are the class *XIV Diseases of the genitourinary system*, and at the end - class *VI Diseases of the nervous system*.

Hospitalized prevalence

The **hospitalized prevalence** data for the district and for the country are presented on the two figures below:

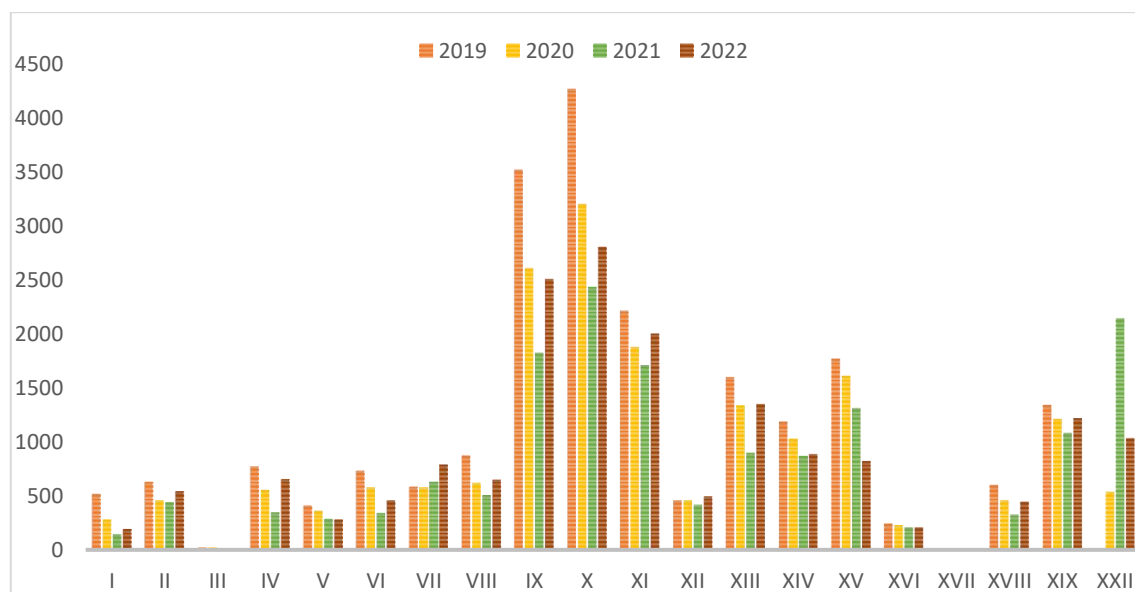


Figure IV.11.1-8. Hospitalized prevalence among the population of the Haskovo District in 2019-2022 (per 100,000 persons), *Haskovo Regional Health Inspectorate* (no data are available for 2023)

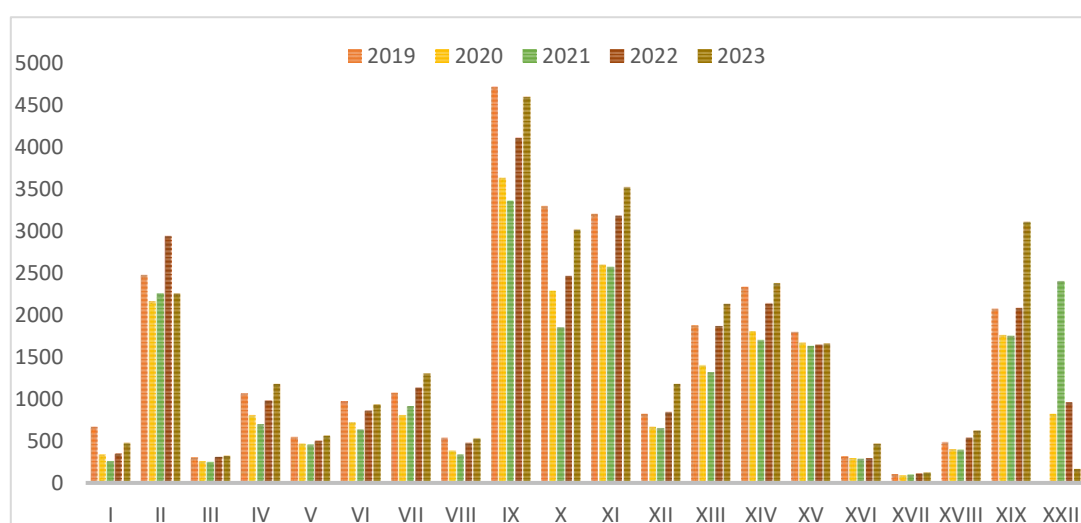


Figure IV.11.1-9. Hospitalized prevalence by disease class for Bulgaria 2019-2023 (per 100,000 persons), *NCPHA*

The following trends and general conclusions can be derived from the data in **Figures IV.11.1-8 and 9**:

- The leading hospitalization causes *at the national level* are the diseases of class IX (diseases of the circulatory system), X (diseases of the respiratory system) and XI (diseases of the digestive system) in the beginning of the period under consideration, first at the end of the period are still the diseases of the circulatory system, (class IX), with diseases of the digestive system (class XI) being second, COVID-19 being third, and neoplasms (class II) being forth. There is a favourable downward trend for the two leading causes of hospitalization - the class IX and X diseases;

- The class X, IX and XI are also the leading causes of hospitalization in *the Haskovo District* during the period. Hospitalization for all three leading causes declines during the period, which is positive;
- When compared, the values for hospitalization by leading class show that only hospitalization for class X diseases is higher for the district, while hospitalization for classes IX and X are lower and, therefore, more favourable.

11.2. Risk factors related to the population and to human health

The risk factors for the population and for human health can be analysed conditionally into three groups (according to the manner in which they are considered in the *Annual Reports of the Minister of Healthcare on Citizen Health Status* – the latest such report was published in December 2024 and concerns 2023²) – risk factors related to socio-economic environment (social health determinants), *lifestyle-related risk factors and environmental and occupational risk factors*. Their analysis showed the following:

Socio-economic risk factors

According to the *Regional Profile of the Haskovo District in 2023*³. – **Figure IV.11.2-1**, the economic development for the district is defined as average and the social development is defined as unsatisfactory.



Figure IV.11.2-1. Regional profile for the Haskovo District, 2023.

As regards the **economic development factors**, the district is among Bulgaria’s three lowest gross domestic product, lowest salary and lowest monthly pension districts. Poverty is relatively high, with 26% of the population living below the national poverty line, the country’s level being 20.6%.

The population of working age is below the country’s average, with employment declining and unemployment rising. The challenge for the local labour market remains unchanged - the

² <https://www.mh.government.bg/bg/politiki/godishen-doklad-za-zdraveto/>

³ https://www.regionalprofiles.bg/var/docs/2024_BG/26-Haskovo-2024-BG.pdf

educational structure of the workforce, with the share of those with higher education being 19% while the country's average is 31%. Investment in the region is low.

The infrastructure level is good, above the country's average, and the local taxes are lower than the country's average.

The social development indicators show that the natural growth in the district is below the country's average, as is also the population density. The same applies to the share of children in kindergartens and the extent of the school education system. The share of university undergraduates relative to the population is decreasing.

Healthcare suffers from shortages of medical doctors and hospital beds, the indicators also being lower than the country's average. Life expectancy for the local population is increasing and remains relatively high, at 73.4 years of age in a country's average of 73.5. Health insurance is on the increase, but is slightly lower than the country's average.

Household waste generation is on the increase, but its quantities are lower than the country's average, and there is a very high percentage of the waste handed over for recycling - 97% with the country's average being 76%. There are significantly fewer disturbed areas than the average for Bulgaria – 0.1% in the district and 0.4% on average for Bulgaria.

Lifestyle risk factors

The main risk factors in this group are smoking, unhealthy nutrition, low physical activeness, and use and abuse of alcohol.

Smoking is the main behavioural risk factor for chronic non-contagious diseases. More than 80% of the smokers are from the low and average income population group, and a study by the NSI during the 2013-2022 period shows increased use of cigarettes on average per household member.

Also, expenses for alcoholic drinks increase, with Bulgaria being among the first in alcohol consumption. Narcotic drug use is also a problem.

Low physical activeness is among the main causes of chronic and non-contagious diseases which combined with other factors increase the morbidity and mortality caused by ischemic heart disease, cerebrovascular disease, diabetes, hypertonia, malignant neoplasms, etc. The mortality risk is 20-30% higher for physically inactive persons. According to a nationwide National Study of Health Risk Factors in 2020, more than 60% of the respondents older than 20 years of age are insufficiently active physically, the main problem being among children.

Occupational risk factors

Farming is the main economic activity in the Ivaylovgrad Municipality, but the municipality itself is poorly developed and is one of the underdeveloped rural regions in the South-central region. Being a long-standing sector, farming features well-established and good risk-management practices, climate changes and psycho-social workplace risks being on the increase recently.

Environmental health determining factors - the current status

The potential impact of the IP on the health and demographic status of the population requires an analysis of the environmental factors with effect on human health (the so-called environmental health determinants)

Atmospheric air, potable water, bathing water, soils, waste, noise, non-ionizing radiation, ionizing radiation, hazardous chemical substances and, recently, climate change are generally recognized environmental risk factors.

The analysis of the environmental media components and factors in the IP, made in the remaining sub-items of **item IV** of the EIA Statement allow the following conclusions about the environmental health-risk factors:

Ambient Air Quality – According to the analyses referred to in item **IV.1.2** of the EIA Statement, there are no significant sources of pollution in the IP area. There are no roads with intensive vehicle traffic, no developed industry, no large urban centers and, therefore, household heating does not have a substantial effect on atmospheric air quality. The maximum possible average annual concentrations of PM₁₀ and PM_{2.5} are several times lower than the admissible limit values.

Potable water – The IP area does not encroach on potable water facilities or the sanitary protection belts established around them.

The Rozino head reservoir is 2,300 m. away from the pit outline in which mining will be carried out and 1,300 m. from the buffer zone, with a 1,000 m radius from the water intake facility. As can be seen on Figure II.1.2-1, the catchment is near point 6 of the future concession area, and this point is downstream of the non-contact water reservoir. As is visible on the maps, no mining is possible in the 1,000 m buffer zone and, therefore, no drilling and blasting, because there will be a man-made water intake, a non-contact water reservoir, required for the IP.

Only a dry well (R-19) near the Rozino village, along the road to Gugutka Village, and the Anasa fountain (not in use) near Gugutka Village are situated within the Rozinovo deposit. The deposit, including the concession area, is situated within ground water body BG3G000PtPg049 - Fissure – Eastern Rhodopes Complex defined as a zone for protection of potable water from ground water bodies with code BG3DGW000PtPg049. The chemical status of this water body is good and its exploitation index is low (not at risk in respect of its quantity status).

According to the most recent published *Report with Analysis and Evaluation of Potable Water Quality in the Haskovo District in 2024 by the Haskovo Regional Health Inspectorate*⁴, there is no indication of water-quality deviation in the three nearest settlements in the IP area for the Group A chemical parameters plus additional parameters, and for Group A microbiological parameters, and for Group B parameters including radiological indicators.

Bathing water – the concession area is not within the range or near bathing/recreation and water sports areas in the meaning of the Water Act.

Soils – The analyses of soil samples from the IP area (according the Regional Annual Reports of the Haskovo RIEW) show that the ecological status of the soils is good as regards the nutrient reserves, the content of heavy metals and metalloids, and of persistent organic pollutants.

Wastes – presently, no waste is generated in the concession area and unregulated waste disposal has been established.

Noise – Presently, no mining and primary processing of natural resources are carried out on, or in a close proximity to, the Rozino Deposit. No activities that could emit noise, vibrations

4

<https://www.old.rzi-haskovo.org/wp-content/uploads/2013/11/%D0%93%D0%BE%D0%B4%D0%B8%D1%88%D0%B5%D0%BD-%D0%B4%D0%BE%D0%BA%D0%BB%D0%B0%D0%B4-%D0%92%D0%B8%D0%9A-2024%D0%B3-%D0%95%D0%9F.pdf>

and harmful radiation into the environment are carried out in the deposit area. No intensive automotive traffic exists in the IP area and it may be concluded that automotive traffic is not a significant source of noise in the region. Any background noise in the near-by residential areas is created by the residents’ everyday activities. The noise levels at present do not place the population of areas nearest to the deposit at risk.

Non-ionising radiation – According to the *Annual Report on Monitoring of Sources of Non-Ionising Radiation in Haskovo District during 2024 of the Haskovo RIEW*⁵, the power-density values do not exceed the urban-area limit values ($10\mu\text{W}/\text{cm}^2$) stipulated in Regulation 9/1991 on the Maximum Allowable Electromagnetic Levels in Residential Areas and Estimation of the Protective Distances to Radiation Sources (SG, issue 35/1991, amended and supplemented in the SG, issue 8/2002).

Ionising radiation – No radiation background in excess of the limit values has been established in the area of the municipality.

Hazardous chemical substances – No activities involving storage and use of hazardous chemical substances are carried out in the concession area *at the present time*. The nearest enterprise with a potential risk for a large-scale incident involving hazardous substances is 45 km. away.

Climate change - Climate change involves primary and secondary effects on the population and on human health. The primary impacts affect human health directly, for example through heat and cold waves, and floods. The secondary impacts affect human health indirectly by means of other climate-affected factors such as pollens, vector-borne diseases, fires, polluted food, water and air, and damaged crops. The primary and secondary health effects of climate change can be differentiated in the following groups: heat-related morbidity and mortality; extreme weather related morbidity and mortality; cardio-vascular diseases including insult, asthma, respiratory allergies and diseases of the respiratory system; diseases caused by food and nutrition factors; water-related diseases; mental health and stress-related disorders, neurological diseases and disturbances. The key future vulnerabilities are as follows:

- Health effects of temperature and humidity - these include expected increase of: the number of deaths caused by cardio-vascular diseases and insults in large cities during the summer attributable to hot waves and to the urban heat-island effect; vector-borne diseases; campylobacter infections, respiratory diseases attributable to the effects of particulate matter in warmer air; and allergic diseases attributable to earlier blossoming and increased levels of pollen, spores and other weather-related health effects. These include expected increase of: mortality rates as a result of extreme weather events and fires, such increases being higher among the vulnerable groups; water and food related morbidity attributable to damaged infrastructure; and post-traumatic disorder;
- Change in precipitation-related health effects - this includes the expected increase of: occurrence of cryptosporidiosis and campylobacteriosis through the combination of more frequent precipitation and higher average annual temperatures; and infections caused by non-vibrio cholera (enteritis not exhibiting vibrio cholera) attributed to heavier rainfalls and higher humidity levels.

⁵ <https://www.old.rzi-haskovo.org/wp-content/uploads/2022/08/%D0%94%D0%BE%D0%BA%D0%BB%D0%B0%D0%B4-%D0%95%D0%9C%D0%9F-%D0%A5%D0%B0%D1%81%D0%BA%D0%BE%D0%B2%D0%BE-2024.pdf>

These vulnerabilities are globally significant and should be considered for the future IP implementation.

In summary, the analysis of the health and demographic status of the population in the IP area shows that:

- *As regards the **population numbers**, the three settlements closest to the IP area are extremely sparsely populated and comprise an insignificant percentage of the population in the municipality and in the district. The population trends in the settlements in the IP area and in the Ivaylovgrad Municipality are more favourable than the district average and less favourable than the country’s average;*
- *The process of demographic ageing continues, with the **age structure** in the Ivaylovgrad Municipality being less favourable than the country’s average as a result of depopulation of the three settlements and the high share of population above working capacity age, at more than 1/3 for the municipality. This problem is defined as extremely significant because it determines the reproduction of the population and of the work-force in the future⁶;*
- ***Birth rates, total death rates and natural growth** are the most unfavourable values for the municipality, mainly because of the degraded age structure of the population and migration of young people to larger urban centres and abroad. **Child mortality** decreases during the period, which is a positive trend attributable in the district to the same causes as the country’s average;*
- *As regards the **causes of deaths**, first for both the district and the country are the diseases of the circulatory system followed by neoplasms – higher/less favourable in the district but with a positive downward trend at the end of the period at both administrative levels. The values are higher in the district. Third in the country and in the district (at the period end in the district) are the diseases of the respiratory system, declining during the recent years and being lower in the district than the country’s average. The leading causes for **hospitalization** (hospitalization morbidity) are the diseases of the circulatory, respiratory and digestive systems, all with positive downward trends. The values for hospitalization by leading class show that only hospitalization for class X diseases is higher for the district, while hospitalization for classes IX and X are lower and, therefore, more favourable. The higher values for the district by cause of death and hospitalized morbidity are also attributed to the deteriorating age structure of the population.*
- *The environmental health determinant status in the IP area is not indicative of problems or deteriorating indicators, including obstacles for IP implementation. In general, the population status data do not show determining factors attributable to environmental health determining factors in the region, the observed trends being mainly of socio-economic nature.*

⁶ According to the Annual Report on the Health Status of the Citizens of the Republic of Bulgaria in 2023, <https://www.mh.government.bg/bg/politiki/godishen-doklad-za-zdraveto>

DESCRIPTION OF THE ELEMENTS REFERRED TO IN ARTICLE 95, PARAGRAPH 4, WHICH ARE LIKELY TO BE AFFECTED SIGNIFICANTLY BY THE IP: THE COMMUNITY, HUMAN HEALTH, BIODIVERSITY (E.G. FAUNA AND FLORA), SOILS (E.G. ORGANIC MATTER, EROSION, COMPACTION, SEALING), WATER (E.G. HYDROMORPHOLOGICAL CHANGES, QUANTITY AND QUALITY), AIR, CLIMATE (E.G. GREENHOUSE GAS EMISSIONS, IMPACTS RELATED TO ADAPTATION), MATERIAL ASSETS, CULTURAL HERITAGE, INCLUDING ASPECTS OF ARCHITECTURE AND ARCHAEOLOGY, AND LANDSCAPE (DESCRIPTION OF THE LIKELY SIGNIFICANT CONSEQUENCES FOR THE ELEMENTS REFERRED TO IN ARTICLE 95, PARAGRAPH 4 OF THE DIRECT CONSEQUENCES AND OF ALL INDIRECT, SECONDARY, CUMULATIVE, TRANSBOUNDARY, SHORT-TERM, MID-TERM AND LONG-TERM, LASTING AND TEMPORARY, POSITIVE AND NEGATIVE CONSEQUENCES OF THE IP, AND CONSIDERATION OF THE ENVIRONMENTAL PROTECTION GOALS OF SIGNIFICANCE FOR THE IP)

1 . Atmospheric air and climate factors

Mining and processing of polymetal ores from the Rozino Deposit does not assume releasing of greenhouse gas emissions into the atmospheric air in quantities that could affect the climate changes in the region, i.e. cumulative.

Climate change is manifested as long-term changes in precipitation quality and annual distribution, temperature, humidity, wind direction, distribution of atmospheric pressure and other weather factors. The regimen of precipitation is changing and extreme weather events are more frequent and cause disasters such as floods and dry spells.

It is important to point out again that the IP implementation will not contribute to climate change. See item 6.6 for more detailed information.

1.1. Air Pollution Sources Associated with the Implementation of the Investment Project – Construction, Operation, Closure and Rehabilitation

The company’s investment proposal includes staged development of the two sections of the Rozino Deposit. Once stripping in Section 1 is completed, all the plant will be moved and used in the stripping and preparation of Section 2. Only mining will continue in Section 1 until the scheduled geological reserves are exhausted, i.e. activities will be carried out simultaneously in both sections.

This report considers the period of IP implementation during which maximum ambient-air pollution is expected. These are the first four years of the IP implementation when mining will be carried out concurrently with stripping of the deposit and dumping of overburden on an external stockpile. In-pit stockpiling of overburden will become after the fourth year, which will allow for far less fugitive dust emission in the ambient air as compared to hauling and out-of-pit stockpiling.

Activities causing dust and gas emissions to be released into the ambient air will be carried out during the development, operation and closure of the Rozino Deposit. The emissions from the sources will be **fugitive**.

Based on their source type, the fugitive emissions can be regarded as areal (*from drilling and blasting, overburden and ore removal and stockpiling, handling of mined materials, crushing*

of the mined materials, engine exhaust from construction machinery, etc.) and linear (dust and exhaust from transport vehicle engines moving along roads in and around the pit).

No operation of a source of controlled emissions into the ambient air is intended for the IP implementation.

FUGITIVE EMISSION SOURCES:

Construction, stripping and mining works are sequential processes which do not need to be considered separately here for the purpose of analysis. All activities generating fugitive dust into the ambient air can be carried during a year.

Air pollution in the Rozino Deposit area will be caused mainly by dust emissions from:

- rock blasting works;
- overburden handling;
- ore handling;
- processing of mined ore using a crusher;
- the overburden stockpiling area;
- operation of internal combustion engines of mining (processing) machinery used to mine and handle the mined material;
- operation of the internal combustion engines of the heavy-duty mine trucks;
- moving mining machinery along the in-pit roads.

The industrial machines required for mine construction, mining, processing and in-pit hauling is: a blast-hole drilling rig; a mining excavator; a bulldozer; a front end loader; a crushing and sorting plant; a water tank truck; in-pit hauling trucks (55 t carrying capacity); etc.

The following methods are used to determine and calculate the emissions of harmful substances:

- AP-42 8.19.2 Crushed stone processing, 1994 - this document presents emission factors for rock drilling and blasting are presented;
- The methodology of the European Environmental Agency (EEA) developed under the European Monitoring and Evaluation Program (EMEP) of the Convention on Long-Range Transboundary Air Pollution, with latest update in 2023.

The calculated emissions of harmful substances are presented below by emission source and by activities causing fugitive emissions into the ambient air.

The emissions of harmful substances are presented by sources with the highest ambient air quality impact in the region, and these sources are:

- mining (processing) equipment for mining and handling of the mined material;
- heavy duty in-pit hauling equipment;
- mined material handling operations;
- processing of mined construction material in a mobile crusher;
- overburden stockpile.

Emissions from industrial plant operations:

Diesel fuel will be used for the operation of industrial plant and transport machinery (drilling rig, excavator, dozer, front end loader).

The internal combustion engines of the industrial plant will, during operation, emit into the ambient air the following harmful gases, described most generally: carbon oxides, nitrogen oxides,

sulphuric oxides, soot, non-combusted hydrocarbons, etc. The harmful gas quantities can be calculated using the latest methodology of the European Environmental Agency.

Table V.1-1 presents the emission factors of the main pollutants emitted from off-road machinery used for industrial purposes (*NFR sector - 1.A.2.g.vii Mobile Combustion in manufacturing industries and construction – Table 3.1*).

Table V.1-1 . Emissions from the industrial machinery in the Rozino Deposit

Pollutant	Emission factor g/t fuel
Soot/carbon	1306
CH ₄	83
CO	10774
CO ₂	3160
N ₂ O	135
NH ₃	8
NMVOC	3377
NO _x	32629
PM ₁₀ /PM _{2.5}	2104
Cadmium	0.01
Mercury	1.7
Chromium	0.05
Nickel	0.07
Selenium	0.01
Zinc	1.00
Greenhouse gas emissions	
CO ₂	3160
N ₂ O	135
CH ₄	83

Presently, industrial equipment emissions are not standardized by the current legislation.

Internal combustion engine emissions are typical of such activities and are unavoidable, and will be released mainly within the deposit area. The expected concentrations of pollutants into the ground-level atmosphere are below the threshold limit values for gasses in the occupational environment air. Internal combustion exhaust is released into the atmosphere at high temperature and, therefore, quickly scatter upward. Pollution in the ground air layer settles over short distances (as far as 200 m) and over a large area, thus guaranteeing compliance with the occupational air quality standards.

Calculation of greenhouse gas emissions from plant operations:

Greenhouse gas emissions can be calculated from the relative fuel consumption for ore stripping/mining. A relative fuel consumption for 3.75 *dm³/t* of raw material/overburden allows the calculation that the maximum total consumption of fuel by the plant in the Rozino Deposit will be as high as 16,256 *t/y*. The maximum greenhouse gas are estimated as:

- 51.4 *t/y* of CO₂ emissions;

- 2.2 t/y of N₂O emissions or 654 t/y CO₂equivalent.⁷;
- 1.3 t/y of CH₄ emissions or 34 t/y CO₂equivalent.

Mined mass mining/blasting emissions:

According to AP-42 8.19.2 Crushed stone processing, 1994, the emission factor during rock drilling and blasting is 0.00004 kg/t (*kg PM₁₀ per ton of blasted rock*). The planned annual throughput rate is 5,070,000 t of mined material (*ore + waste rock*), with two blasts planned per week.

The blasting and drilling dust emissions released into the atmosphere will be 203 kg/year PM₁₀ and PM_{2.5} or 0,0064 g/s.

Depending on the explosives used, toxic gases will also be released into the air and these can be equated to the so-called conditional carbon oxide. The conditional carbon oxide is a combination of the following toxic gases:

CO+6.5NO_x+2.5(SO₂+H₂S), [l/kg], where

6.5 and 2.5 are the respective coefficients for higher toxicity of nitrous and sulphuric gasses relative to CO toxicity.

In this particular case, ore mining will involve use of roughly dispersed ammonium nitrate explosive mixtures (*Emulite 100, ANFO or RIOGEL*), selected for their practice-proven qualities.

The quantities of toxic gasses formed during the blasting depends directly onto the oxygen balance of the particular explosive used. In the case of explosives with positive oxygen balance, the quantity of nitrous oxides increases and the carbon oxide decreases. In the case of explosives with negative balance, carbon oxide increases and nitrogen oxides decrease.

The amounts of toxic gases emitted into the atmosphere will be calculated below on the basis of the available information about the explosives.

Oxygen balance based calculations of the explosives:

Calculations of the toxic gasses based on the oxygen balance of the explosive will be made first, since data about this balance are available. The oxygen balance of one of the chosen explosives (*Emulite – 100*) is ‘-5’, and the toxic gas quality can be determined in theory using the following figure:

⁷ https://www.moew.government.bg/static/media/ups/tiny/2017/07/Metodika_final.pdf

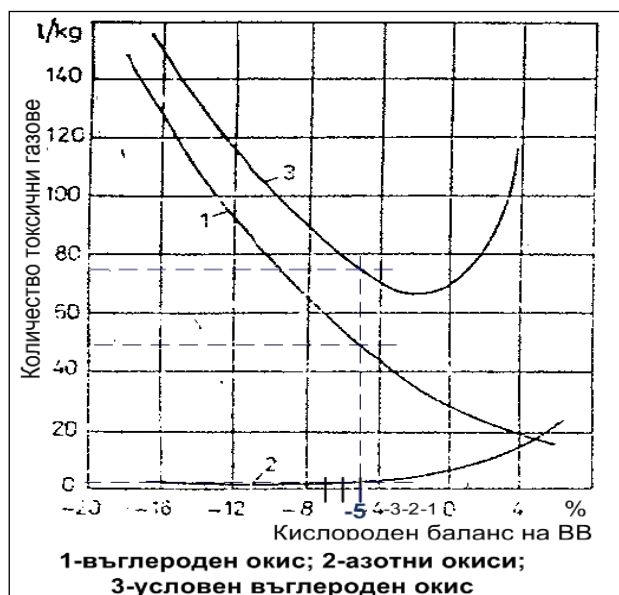


Figure V.1.1-1 Influence of the oxygen balance of the explosive on the amount of toxic gas release

According to the figure above (*Blasting operations textbook – Tehnika State Publishing House – Sofia, 1988*), blasting of this explosive will release into the atmosphere 75 l/kg toxic gasses expressed as conditional carbon oxide.

According to manufacturer data, up to 933 l/kg of gasses will be released when blasting. It can be assumed conditionally that blasting of 1 t of explosives will release around 933,000 l of gaseous products. According to data from the use of ANFO explosives with 94.5% porous ammonium nitrate and 5.5% diesel fuel (Safety Ratio +0.14%), the gas emissions per 1 kg of explosive are as follows: 142 l/kg CO₂; 22,24 l/kg NO_x; 159 l/kg conditional CO. The tests followed the Bulgarian State Standard CEN 13631 – 16 in a 142 m³ pressure chamber in an existing testing facility. According to another source⁸, the use of ammonia nitrate/naphta explosive (ANFO), **~176 kg CO₂ is released for each detonated ton of explosive.**

Blast gaseous products, including toxic gases, are distributed as follows:

- some gases enter into the atmosphere;
- some gases are absorbed by the blasted rock and by the finely dispersed dust;
- some gasses fill host rock cracks and pores where they can remain for very long and are released very slowly.

Except for dust, which is emitted over relatively short distances from its source, gaseous pollutants will mainly flow upwards and will scatter over large distances from the IP site. One or two blasts per week cannot cause violation of the established ambient air quality standards.

Calculation of greenhouse gas emissions from blasting of mined material:

⁸ <https://www.agg-net.com/resources/articles/drilling-blasting/air-decking-and-the-environment#:~:text=Explosives%20work%20by%20producing%20large,176kg%20of%20CO2%20is%20p,roduced>

Greenhouse gas emissions can be calculated from the relative CO₂ emission value for 1 t of explosives – 176 kg/t CO₂. Annual use of as much as 727,200 kg will generate up to 128 t/y of CO₂ emissions.

Emissions from loading of mined material and overburden and unloading of overburden:

Consistent with section ‘Industrial Processes and Use of Products’ – ‘Quarrying and mining of minerals other than coal’ (NFR Category 2.A.5.a) the dust emissions can be calculated using the following formulas:

$$E_{PM10} = k_{pms-PM10} \times k_{mat.hand} \times \frac{\left(\frac{U}{k_U}\right)^{1.3}}{\left(\frac{M}{k_M}\right)^{1.4}} \times Q_{mat.handled}$$

$$E_{PM2.5} = k_{pms-PM2.5} \times k_{mat.hand} \times \frac{\left(\frac{U}{k_U}\right)^{1.3}}{\left(\frac{M}{k_M}\right)^{1.4}} \times Q_{mat.handled}$$

Where:

- $E_{PM10/PM2.5}$ – emission of PM₁₀ or PM_{2.5}, in kg/year;
- U – average annual wind speed, m/s (1.8 m/s);
- M – moisture content, % (6.6 %);
- $Q_{mat.handled}$ – quantity of handled materials, t/y;

$Q_{mat.handled} = 5070000, t/yr.$, when loading of overburden from the pit area to be hauled to the outdoor stockpile and of ore to be hauled to the coarse ore bin in the Processing Plant (Area source 1);

$Q_{mat.handled} = 3540000, t/yr.$, when unloading of ore in the ROM pad for the coarse ore bin in the Processing Plant (Area source 2);

$Q_{mat.handled} = 3300000, t/yr.$, when unloading of overburden over the outdoor stockpile (Area source 3);

- Ku – 2.2 s/m;
- K_M – 2;
- $k_{mat.hand}$ – 0.0016 kg/t;
- $k_{pms-PM10}$ – 0.35;
- $k_{pms-PM2.5}$ – 0.053.

The calculation results are as follows:

➤ 411.13 kg/year (0.013037 g/s) PM₁₀ and 62.26 kg/year (0.001974 g/s) PM_{2.5} from handling operations in the mine area (Area source 1);

➤ 287.06 kg/year (0.009103 g/s) PM₁₀ and 43.47 kg/year (0.001378 g/s) PM_{2.5} from unloading and scooping of ore from the ROM pad to the coarse ore bin in the Concentrator Plant (Area source 2);

➤ 267.6 kg/year (0.008486 g/s) PM₁₀ and 40.52 kg/year (0.001285 g/s) PM_{2.5} from unloading of overburden on the stockpile (Area source 3).

Emissions from ore processing in the Processing Plant (Area source 2):

A crushing plant will be used to crush the mined ore.

Fugitive dust emissions are released during filling of the crushing and sorting plant feed bin.

According to Table 3.2 in Section ‘Industrial Processes and Use of Products’ – ‘Quarrying and mining of minerals other than coal’ (NFR Category 2.A.5.a), the handling emission factor is 0.00055 kg/t (*kg PM₁₀ per t of ore*) and 0.00014 kg/t for PM_{2.5}.

Up to 1,770,000 t of ore will be fed to the crushing and sorting plant feed bin, during which fugitive emissions are possible such as:

- 973.5 kg/year (0.0309 g/s) PM₁₀;
- and 247.8 kg/year (0.0079 g/s) PM_{2.5}.

Three crushing stages will follow: Primary jaw crusher followed by secondary and tertiary cone crushers, ore screening, unloading in a crushed-ore intermediate storage and transferring through a Crushed ore silo onto a conveyor belt feeding a ball mill.

The following NFR Category 2.A.5.a formula can be used to calculate the emissions:

$$E_{PM10_{PM2.5}} = P \times \left(EF_{PM10_{PM2.5}^{cru}} \times Flow_{cru} \times (1 - ER_{cru}) + EF_{PM10_{PM2.5}^{sc}} \times Flow_{sc} \times (1 - ER_{sc}) + EF_{PM10_{PM2.5}^{TP}} \times Flow_{TP} \times (1 - ER_{TP}) \right)$$

Where:

- $E_{PM10_{PM2.5}}$ (kg/year) – emission of PM₁₀ or PM_{2.5};
- $EF_{PM10_{PM2.5}}$ (kg/t) – emission factor for crushing processes (cru), screening (sc) and transferring (TR);
- $Flow_{cru/sc/TP}$ (% of the production process) - the quantity of ore passed through the crushing (cru), screening (sc) and transferring (TP) processes;
- $ER_{cru/sc/TP}$ – coefficient for reduction (%), depending on the applied emission-reduction technology in the crushing (cru), screening (sc) and transferring (TP) processes
- P (t/year) – annual productions.

The reduction coefficients can be calculated using the following equation:

$$1 - ER = ((1 - Eff) \times Use + (1 - Use))$$

Where:

- ER – coefficient of reduction (%);
- Eff (%) – efficiency of the envisaged technology (*determined according to Table 3-3 NFR Category 2.A.5.a*). In the case of spraying, the Eff coefficient of the respective process is: 50% during crushing; 75% during screening.

It is important to clarify that spraying in the ore crushing process is provided for. In this case, the ore is considered dry (*moisture content below 1.3%*) during its initial discharging into the crusher receiving bin, the coarse screening and the coarse crushing. Downstream of these processes the ore is considered wet (*moisture content above 1.3%*). According to table 3.2 of NFR Category 2.A.5.a, the emission factors for the various ore processing stages are as follows:

Process	EF for dry ore kg/t		EF for wet ore kg/t	
	PM ₁₀	PM _{2.5}	PM ₁₀	PM _{2.5}
Crushing - primary	0.0012	0.0006	0.00027	0.00005
Crushing – secondary	0.0012	0.0006	0.00027	0.00005
Crushing – tertiary	0.0012	0.0006	0.00027	0.00005
Screening	0.0043	0.00028	0.00037	0.000025
Handling	0.00055	0.000014	0.000023	0.0000065

The emissions from the ore crushing, screening and transferring processes can be calculated as follows:

$$E_{PM10} = 1770000 \times (0.0012_{cru\ 1} \times 1 \times 0.5 + 0.00027_{cru\ 2} + 0.00027_{cru\ 3} + 0.0043_{sc1} \times 1 \times 0.25 + 0.00037_{sc2} \times 1 + 0.000023_{TP} \times 3)$$

$$E_{PM2.5} = 1770000 \times (0.0006_{cru\ 1} \times 1 \times 0.5 + 0.00005_{cru\ 2} + 0.00005_{cru\ 3} + 0.00028_{sc1} \times 1 \times 0.25 + 0.000025_{sc2} \times 1 + 0.0000065_{TP} \times 3)$$

Ore processing will generate the following dust emissions:

- 4697.58 kg/year (0.149 g/s) PM₁₀;
- and 910.665 kg/year (0.0289 g/s) PM_{2.5}.

Subsequent ore processing in the ball milling (operating in a closed circuit with a group of hydrocyclone classifiers) and ore dressing will not cause emissions into the atmospheric air.

Wind erosion from the waste rock (overburden) stockpile:

Emissions caused by wind erosion in stockpiles can also be calculated using the EMEP-developed method used by the EEA.

Item 3.3.5 of Section ‘Industrial Processes and Product Use’ – ‘Quarrying and mining of minerals other than coal.’ (*NFR Category 2.A.5.a*) presents the emissions caused by wind erosion.

The following formulas are used for the calculation:

$$E_{PM10} = k_{wind.erosion} \times AD_{PM10} \times \left(\frac{s}{k_s}\right) \times \left(\frac{(1-p)}{k_{working.days}}\right) \times \left(\frac{I}{k_I}\right) \times A \times (1-ER)$$

$$E_{PM2.5} = k_{wind.erosion} \times AD_{PM2.5} \times \left(\frac{s}{k_s}\right) \times \left(\frac{(1-p)}{k_{working.days}}\right) \times \left(\frac{I}{k_I}\right) \times A \times (1-ER)$$

Where:

- $E_{PM10/PM2.5}$ – emission of PM₁₀ or PM_{2.5}, in kg/year;
- p (%) – average percentage of the days during the year with atmospheric precipitation above 0.254 mm (86 days per year⁹ on average)– p=0.23;
- s (%) – average silt content on the stockpile surface – s=0.5%;

⁹ Climate reference book, Precipitation in Bulgaria, BAS, 1990

- I – percentage of the time with wind speed $>19.3 \text{ km/h}$ (5.36 m/s)¹⁰. $I=3.7333$;
- $A(\text{m}^2)$ – stockpile surface exposed to erosion;
- AD – Aerodynamic factor (0.5 for PM_{10} and 0.2 for $\text{PM}_{2.5}$);
- $k_{\text{wind.erosion}} (\text{kg/m}^2) - 1.12 \times 10^{-4} \times 1.7 \times 365$;
- $k_s - 1.5$;
- $k_{\text{working.days}} (\%) - 235 \times 365 \times 10^{-1}$;
- $k_I - 15$;
- ER (%) – emission reduction factor – the worst option is assumed, with 0 as the ER value;

$$A = nb_{\text{stockpile}} \times r^2 \times \sqrt{(1 + \tan(\theta)^2)}$$

$$r = \sqrt[3]{\left(\frac{\frac{w}{\rho} \times 3}{\pi \times \tan(\theta)} \right)}$$

Where

- $A (\text{m}^2)$ – stockpile surface exposed to erosion. The calculated surface is $32,590 \text{ m}^2$;
- $nb_{\text{stockpile}}$ – number of stockpiles;
- $r (\text{m})$ – pile radius. The calculated radius is 168 m ;
- $w (\text{t})$ – weight of the stockpiled material. $w=7317310 \text{ t}$;
- $\rho (\text{t/m}^3)$ – material density. The assumed value is 2.54 t/m^3 ;
- $\theta (^\circ)$ - angle of repose. The assumed angle is 30° .

The calculated wind erosion from the waste rock stockpile surface is as follows:

- 767 kg/year (0.0243 g/s) PM_{10} ;
- 307 kg/year (0.00973 g/s) $\text{PM}_{2.5}$.

Emissions during transport:

A mine truck will be used to haul ore and overburden.

The overburden will be trucked to the external stockpile during the first 4 years, followed by in-pit stockpiling. The worse option of hauling from the pit to the external stockpile along the following in-pit road will be considered:

- in-pit unpaved road (*the grey line on Figure V.1.1-2*) with the longest hauling distance of 4 km ;

The ore will be trucked to the indoor storage of the coarse ore bin in the Processing plant. The following in-pit road will be used:

- in-pit unpaved road (*the orange line on Figure V.1.1-2*) with the longest hauling distance of $1,550 \text{ m}$;

The final concentrate will be hauled for processing by an end user, in accordance with the options presented on **Figure II.1.2-2**.

¹⁰ Climate reference book, Volume 4 - Wind, BAS, 1990

The expected weekly number of produce hauling trucks totals at 30, with 25 t of net weight hauled per truck, in three business days per week. The principal intends to use **electric trucks** because no harmful substances are emitted and no internal combustion engine noise is generated.

The quarry roads are designated with grey and orange lines on the next figure.

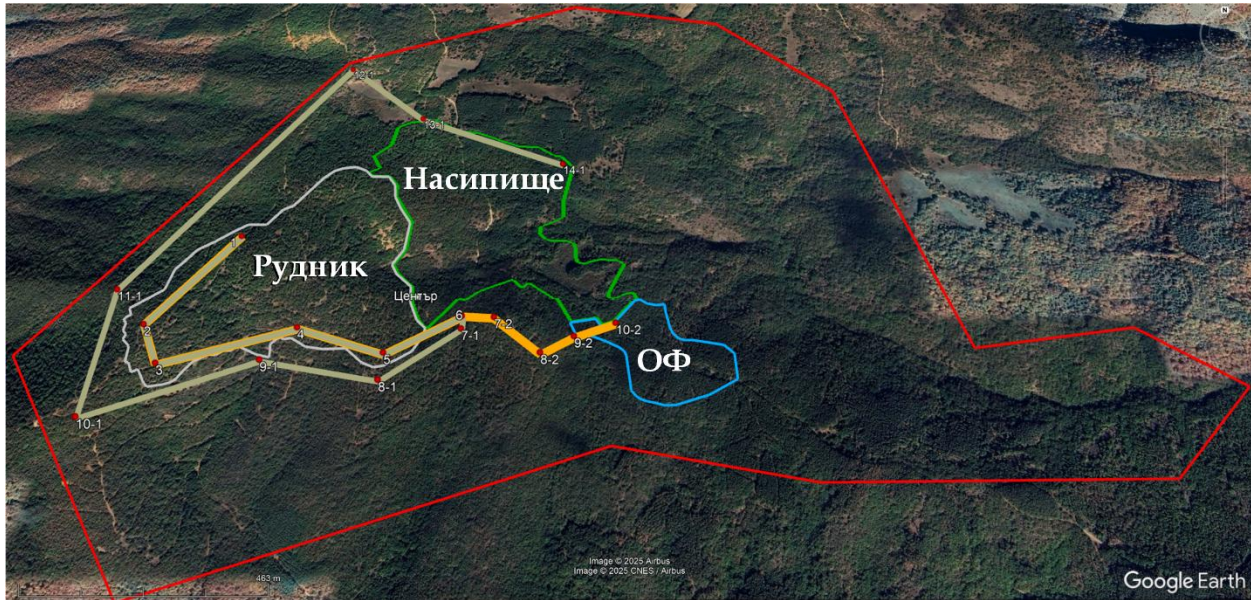


Figure V.1.1-2 .In-pit roads

The transport-related emissions can be calculated using the latest methodology of the European Environmental Agency (EEA) developed by the European Monitoring and Evaluation Program (EMEP) of the Convention on Long-Range Transboundary Air Pollution. This methodology was developed to facilitate the parties to the Convention in the preparation of their annual emission reports and, also, as regards the EU Directive on National Emission Ceilings (NEC Directive). The edition updated in 2023 was used.

Item 3.3.5 of Section ‘Industrial Processes and Product Use’ – ‘Quarrying and mining of minerals other than coal.’ (*NFR Category 2.A.5.a*) considers the various pollution sources.

Hauling along unpaved quarry roads:

The unpaved quarry roads are situated within the pit and the external overburden stockpile limits.

The following formula for calculating the emissions during unpaved quarry-road hauling is used:

$$E_{PM10} = k_{PM10} \times \left(\frac{s}{k_s}\right)^{0.9} \times \left(\frac{W_{dumper}}{k_w}\right)^{0.45} \times d_{unpaved} \times \left(1 - \frac{p}{k_{day}}\right) \times (1 - ER)$$

$$E_{PM2.5} = k_{PM2.5} \times \left(\frac{s}{k_s}\right)^{0.9} \times \left(\frac{W_{dumper}}{k_w}\right)^{0.45} \times d_{unpaved} \times \left(1 - \frac{p}{k_{day}}\right) \times (1 - ER),$$

Where:

- $E_{PM10/PM2.5}$ – emission of PM₁₀ or PM_{2.5}, in kg/year;
- s – content of silt on the road surface (%) – 9.15 average value for quarry roads made of crushed rock;

- W_{dumper} – dumper weight – 55 t during in-pit hauling;
- d_{unpaved} – annual hauling distance over unpaved quarry roads;
- ER – emission reduction factor – the worst option is assumed with 0 as the value;
- p – number of days in the year with atmospheric precipitation exceeding 0.254 mm – 86 days¹¹. The quarry roads will be sprayed in dry weather to an equivalent minimum precipitation of 0.254 mm. The value of p is 186;
- k_{PM10} – 0.422 kg/km;
- $k_{\text{PM2.5}}$ – 0.042 kg/km;
- k_w – 2.72 t;
- k_s – 12;
- k_{day} – 365.

The results for transport-related emissions are as follows:

- 0.004860889 g/(m.s) PM₁₀ and 0.000483796 g/(m.s) PM_{2.5} during overburden hauling along in-pit roads (*Linear source 1*);
- 0.002607211 g/(m.s) PM₁₀ and 0.000259481 g/(m.s) PM_{2.5} during ore hauling along in-pit roads to the Processing plant (*Linear source 2*).

Hauling along paved quarry roads:

The paved quarry roads are those outside the pit and the external overburden stockpile limits.

The following formula for calculating the emissions during unpaved quarry-road hauling is used:

$$E_{\text{PM10}} = k_{\text{PM10}} \times (sL \times k_{sL})^{0.91} \times (W_{\text{dumper}} \times k_w)^{1.02} \times d_{\text{paved}} \times \left(1 - \frac{p}{k_{\text{day}}}\right)$$

$$E_{\text{PM2.5}} = k_{\text{PM2.5}} \times (sL \times k_{sL})^{0.91} \times (W_{\text{dumper}} \times k_w)^{1.02} \times d_{\text{paved}} \times \left(1 - \frac{p}{k_{\text{day}}}\right)$$

Where:

- $E_{\text{PM10/PM2.5}}$ – emission of PM₁₀ or PM_{2.5}, in kg/year;
- sL – silt content on the road surface (g/m²) – 8.3 g/m² average value;
- W_{dumper} – truck weight – 55 t;
- d_{unpaved} – annual hauling distance over paved quarry roads;
- p – number of days in the year with atmospheric precipitation exceeding 0.254 mm – 86 days¹². The quarry roads will be sprayed in dry weather (*at least 100 days per year*) to an equivalent minimum precipitation of 0.254 mm. The value of p is 186;
- k_{PM10} – 0.62E-03 kg/km;
- $k_{\text{PM2.5}}$ – 0.15E-03 kg/km;
- k_{sL} – 1 (m²/g);
- k_w – 1.1 t¹;
- k_{day} – 4x365.

The results for transport-related emissions are as follows:

¹¹ Climate reference book, Precipitation in Bulgaria, BAS, 1990

¹² Climate reference book, Precipitation in Bulgaria, BAS, 1990

- 0.000694358 g/(m.s) PM₁₀ and 0.000184805 g/(m.s) PM_{2.5} during overburden hauling along in-pit roads (*Linear source 1*);
- 0.000372446 g/(m.s) PM₁₀ and 9.91248E-05 g/(m.s) PM_{2.5} during ore hauling along in-pit roads to the Processing plant (*Linear source 29.91248E -05*)

Calculation of greenhouse gas emissions from transport operations:

The greenhouse gas emissions can be calculated using the following emission factors

- in respect of CO₂ - 3,181.89 g/kg (*tables 3-12 and 3-13 of NFR Category 1.A.3.b, 2024*);
- in respect of N₂O - 0.07 g/kg (*table 3-7 of NFR Category 1.A.3.b, 2024*);
- in respect of CH₄ - 0.21 g/kg (*table A1-0-4 of NFR Category 1.A.3.b, 2024*);

The following greenhouse gas emission values result from fuel consumption of 216.8 g/km (*table 3-15 of NFR Category 1.A.3.b, 2024*) and maximal run of up to 480,000 km/y between the pit and the stockpile (*road length ≈ 4.0 km*) and 96,546 km/y between the pit and the process plant (*road length ≈ 1.5 km*):

- 398 t/y of CO₂ emissions;
- 0.07 t/y of N₂O emissions or 2.6 t/y CO₂equivalent.¹³;
- 0.21 t/y of CH₄ emissions or 0.7 t/y CO₂equivalent.

TOTAL ROZINO DEPOSIT DEVELOPMENT EMISSIONS

Dust will be the main pollutant emitted during the entire deposit development period. Information about emissions of 10 and 2.5 μm grain-size dust is presented below. The sources are separated by type (*area and linear*).

Table V.1.1-2 Area source emissions

Activity	PM ₁₀	PM _{2.5}
	g/s	g/s
Mine operation emissions - area source 1		
Drilling and blasting	0.0064	0.0064
Loading of mined material and overburden on dump trucks	0.013037	0.001974
Total emissions from area source 1	0.019437	0.008374
Stockpile emissions - area source 2		
Unloading of overburden	0.008486	0.001285
Wind erosion from the external stockpile	0.0382	0.01528
Total emissions from area source 2	0.046686	0.016565
Processing plant emissions - area source 3		
Unloading of ore in storage for the coarse-ore bin	0.009103	0.001378
Scooping of ore by excavator to feed the Crusher plant		
Dumping of ore on the Crusher plant	0.0309	0.0079
Crushing in the Crusher plant (<i>primary, secondary and tertiary</i>)	0.064	0.0225
Sieving in the Crusher plant	0.0811	0.0053
Unloading from the Crusher in indoor crushed-ore intermediate storage	0.0013	0.0004
Transferring through a crushed ore silo and to the ball mill belt conveyor	0.0026	0.0007
Total emissions from area source 3	0.189003	0.0368

¹³ https://www.moew.government.bg/static/media/ups/tiny/2017/07/Metodika_final.pdf

Table V.1.1-3 Linear source emissions

Linear source No.	PM ₁₀	PM _{2.5}
	g/(m.s)	g/(m.s)
Linear source No. 1 Emissions from in-pit transport, from the pit to the stockpile	0.000694358÷ 0.002433758	0.000184805÷ 0.000242231
Linear source No. 2 Emissions from in-pit transport, from the pit to the processing plant	0.000372446÷ 0.001305397	9.91248E-05÷ 0.000129915

1.2. Air and Climate Factor Impact Assessment According to the National Standards and Legal Requirements

a) during the construction and operation of the site

The analyses in item V.1.1 allow the conclusion that the activities in the IP site will be a source predominantly of dust in the atmospheric air.

The following human health limit values have been established in accordance with Regulation No. 12 of July 15, 2010 on the Air Emission Limits for Sulphur Dioxide, Nitrogen Dioxide, Fine Dust Particles, Lead, Benzene, Carbon Monoxide and Ozone:

- 50 µg/m³ average daily value (ADV) for PM₁₀;
- 40 µg/m³ average annual value (AAV) for PM₁₀;
- 20 µg/m³ AAV for PM_{2.5}

Pollutant scatter will be modelled in this item depending on the sources of their generation and on the time of operation. The worst case scenario is assumed in this case - the IP implementation period during which maximum pollution of the atmospheric air is expected, or these are the first four years of the IP implementation when mining will be carried out concurrently with stripping of the deposit and dumping of overburden on an external stockpile. The calculated concentrations will be compared to the applicable human-health protection standards.

The activities which will be carried out on the IP site will form three area and two linear sources (*in-pit transport with 55 t trucks between the Pit and the Processing Plant*) of pollution.

Assessing the effect of IP implementation on atmospheric air quality involved calculations of pollutant scatter (*PM₁₀ and PM_{2.5}*) in the ground air layer. These calculations followed the MOEW approved 'Method for estimation of the source height, dispersion and expected ground-level concentrations of harmful substances' using the Traffic Oracle software. This software consists of two main modules: EMISSIONS and DIFFUSION.

The EMISSIONS module calculates the emissions of specific harmful substances in the exhaust gasses from internal combustion engines used in motor vehicles, defined on the basis of the Joint EMEP/CORINAIR Atmospheric Emission Inventory Guidebook. This module was not employed in this case since the emissions were calculated using the latest EEA method developed by European Monitoring and Evaluation Program (EMEP) of the Convention on Long-Range Transboundary Air Pollution (*see sub-item V.1.1*).

The emissions calculated according to the preceding sub-item were used as input for the DIFFUSION module used to calculate the concentration of area and linear source pollutants into the ground air layer. According to the input weather information, the module produces the

maximum possible one-time pollution under the worst weather conditions or the average annual pollutant concentrations, depending on the wind pattern.

The studied air space dimensions are: - length (*east to west*) – 4,000 m; - width (*north to south*) – 4,000 m (see *Figure V.1.2-2*).

The data about each source fed into the software are presented below:

Area source 1 – Rozino pit, with approximate surface area of 261,900 m² – the pit boundary is reduced to a regular figure (*the black rectangles on Figure V.1.2-1*) because of limitations of the Traffic Oracle software.

X1	Y1	X2	Y2	H	Int.	PM ₁₀	PM _{2.5}
m	m	m	m	m		g/s	g/s
1413	1843	585	448	5	1	0.019437	0.00837

Area source 2 – *External overburden stockpile with approximate surface area of 247000 m²* – the stockpile boundary is reduced to a regular figure (*the black rectangles on Figure V.1.2-1*) because of limitations of the Traffic Oracle software.

X1	Y1	X2	Y2	H	Int.	PM ₁₀	PM _{2.5}
m	m	m	m	m		g/s	g/s
2005	1943	395	625	5	1	0.046686	0.016565

Area source 3 (see *Figure V.1.2-1*) – *Processing plant with approximate surface area of 51,300 m²* – the stockpile boundary is reduced to a regular figure:

X1	Y1	X2	Y2	H	Int.	PM ₁₀	PM _{2.5}
m	m	m	m	m		g/s	g/s
2447	1735	225	228	5	1	0.189003	0.0368



Figure V.1.2-1 Area sources within the Rozino Deposit area.

Linear source 1 – In-pit 55 t truck hauling of overburden from the Rozino mine to the external overburden stockpile:

Section from point-point	X1 m	Y1 m	X2 m	Y2 m	Width m	PM ₁₀ g/(m.s)	PM _{2.5} g/(m.s)
1-2	1558	2192	1397	1928	6	0.002433758	0.000242231
2-3	1397	1928	1451	1821	6	0.002433758	0.000242231
3-4	1451	1821	1740	1915	6	0.002433758	0.000242231
4-5	1740	1915	1940	1843	6	0.002433758	0.000242231
5-6	1940	1843	2103	1943	6	0.002433758	0.000242231
6-7.1	2103	1943	2104	1907	6	0.000694358	0.000184805
7.1-8.1	2104	1907	1938	1771	6	0.000694358	0.000184805
8.1-9.1	1938	1771	1674	1827	6	0.000694358	0.000184805
9.1-10.1	1674	1827	1321	1685	6	0.000694358	0.000184805
10.1-11.1	1321	1685	1309	2030	6	0.000694358	0.000184805
11.1-12.1	1309	2030	1731	2810	6	0.000694358	0.000184805
12.1-13.1	1731	2810	1945	2605	6	0.000694358	0.000184805
13.1-14.1	1945	2605	2316	2430	6	0.002433758	0.000242231

Linear source 2 – In-pit 55 t truck hauling of ore from the Rozino mine to the Processing Plant:

Section from point-point	X1 m	Y1 m	X2 m	Y2 m	Width m	PM ₁₀ g/(m.s)	PM _{2.5} g/(m.s)
1-2	1558	2192	1397	1928	6	0.001305397	0.000129915
2-3	1397	1928	1451	1821	6	0.001305397	0.000129915
3-4	1451	1821	1740	1915	6	0.001305397	0.000129915
4-5	1740	1915	1940	1843	6	0.001305397	0.000129915
5-6	1940	1843	2103	1943	6	0.001305397	0.000129915

Section	X1	Y1	X2	Y2	Width	PM ₁₀	PM _{2.5}
from point-point	m	m	m	m	m	g/(m.s)	g/(m.s)
6-7.2	2103	1943	2175	1939	6	0.000372446	9.91248E-05
7.2-8.2	2175	1939	2282	1839	6	0.000372446	9.91248E-05
8.2-9.2	2282	1839	2355	1883	6	0.000372446	9.91248E-05
9.2-10.2	2355	1883	2447	1919	6	0.000372446	9.91248E-05

The variety of pollution sources and the use of various Traffic Oracle modules require introduction of discrete receptors – in the houses closest to the Rozino Deposit. These discrete receptors have the following coordinates:

- Rozino Village with coordinates (UTM) 408523.23 m E, 4589687.88 m N, which correlate to the following conditional coordinates: Along the X axis – 2047 and along the Y axis – 3606;
- Byal Gradets Village with coordinates (UTM) 409072.2 m E, 4586233.58 m N, which correlate to the following conditional coordinates: Along the X axis – 2596 and along the Y axis – 152.

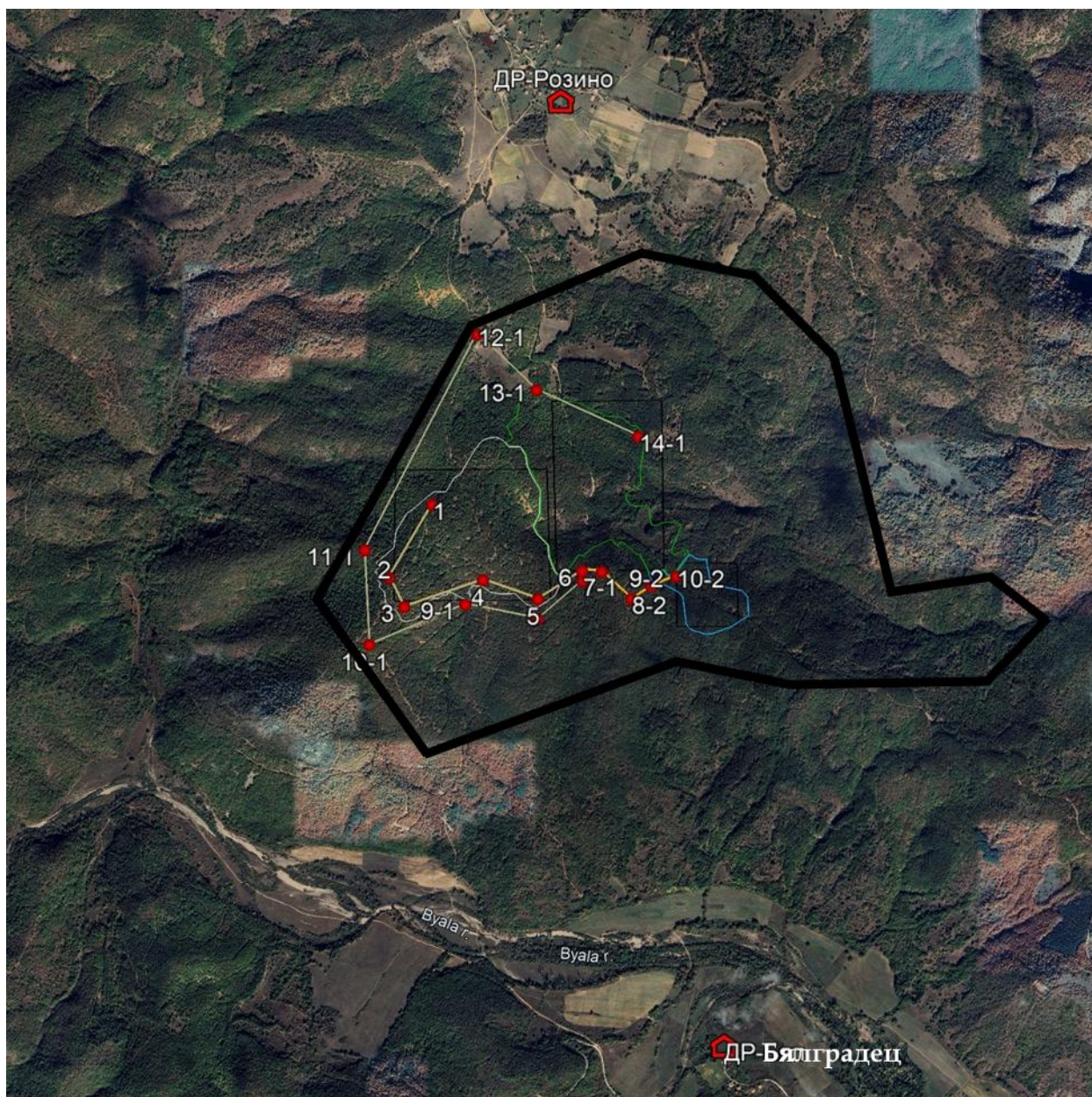


Figure V.1.2-2 The studied air-space area with indicated sources of pollution and discrete receptors

The used methodology allows calculation of one-time maximum and average annual concentrations in area and linear source emissions. In this case the main atmospheric air pollutant will be dust with average daily and average annual values determined in the $10\ \mu m$ particle-size and the average annual values in the $2.5\ \mu m$ particle-size fraction. The average annual concentrations of pollutants in the atmospheric air calculated with the software will be presented below. This software is not applicable to calculating average daily concentrations.

Certain limitations of the software required a twofold consecutive modelling of linear sources – Linear source 1 was modelled first, followed by Linear source 2. This is followed by a separate area-source model. The linear source results recorded in the text (DAT) files are summed up using the SUPERPOSITION module of the Traffic ORACLE package in order to comply with the principle of superposition. This is followed by aggregating the common linear source file with

the area source file. The total average annual value (AAV) results expressed with isolines are superimposed over a satellite image of the region, using the Surfer software.

The average annual PM₁₀ concentration results for linear sources are presented in an attachment – the software files. The maximum calculated AAV for PM₁₀ within the nearest urban areas are as follows:

- Rozino Village – 10.9 $\mu\text{g}/\text{m}^3$;
- Byal Gradets Village – 10.9 $\mu\text{g}/\text{m}^3$.

The average annual PM_{2.5} concentration results for linear sources are presented in an attachment – the software files. The maximum calculated AAV for PM_{2.5} within the nearest urban areas are as follows:

- Rozino Village – 1.34 $\mu\text{g}/\text{m}^3$;
- Byal Gradets Village – 0.08 $\mu\text{g}/\text{m}^3$.

The average annual PM₁₀ concentration results for area sources are presented in an attachment – the software files. The maximum calculated AAV for PM₁₀ is 9.12 $\mu\text{g}/\text{m}^3$ (*within the concession area*) while the annual average limit value is 40 $\mu\text{g}/\text{m}^3$. The maximum AAV in the nearest urban areas are the following:

- Rozino Village – 1.34 $\mu\text{g}/\text{m}^3$;
- Byalgradets Village – 1.34 $\mu\text{g}/\text{m}^3$.

The average annual PM_{2.5} concentration results for area sources are presented in an attachment – the software files. The maximum calculated AAV for PM_{2.5} is 6.2 $\mu\text{g}/\text{m}^3$ (*within the concession area*) while the annual average limit value is 20 $\mu\text{g}/\text{m}^3$. The maximum AAV in the nearest urban areas are the following:

- Rozino Village – 0.01 $\mu\text{g}/\text{m}^3$;
- Byalgradets Village – 0.13 $\mu\text{g}/\text{m}^3$.

The results of the aggregation of all pollution sources in the Rozino Deposit. Using the SUPERPOSITION module of the Traffic ORACLE software package are recorded in a text (DAT) file (*attached*).

The maximum calculated AAV for PM₁₀ following the aggregation of the work files for linear and area sources in the nearest urban areas (*in the discrete receptors*) is as follows:

- Rozino Village – 10.96 $\mu\text{g}/\text{m}^3$;
- Byalgradets Village – 1.07 $\mu\text{g}/\text{m}^3$.

the average annual human health level being 40 $\mu\text{g}/\text{m}^3$.

The maximum calculated AAV for PM_{2.5} following the aggregation of the work files for linear and area sources in the nearest urban areas (*in the discrete receptors*) is as follows:

- Rozino Village – 1.32 $\mu\text{g}/\text{m}^3$;
- Byalgradets Village – 0.22 $\mu\text{g}/\text{m}^3$.

the average annual human health level being 20 $\mu\text{g}/\text{m}^3$.

The two figures below present the isolines of the summed-up concentrations of pollutants from the operation of the Rozino Deposit, contoured using the Surface software.

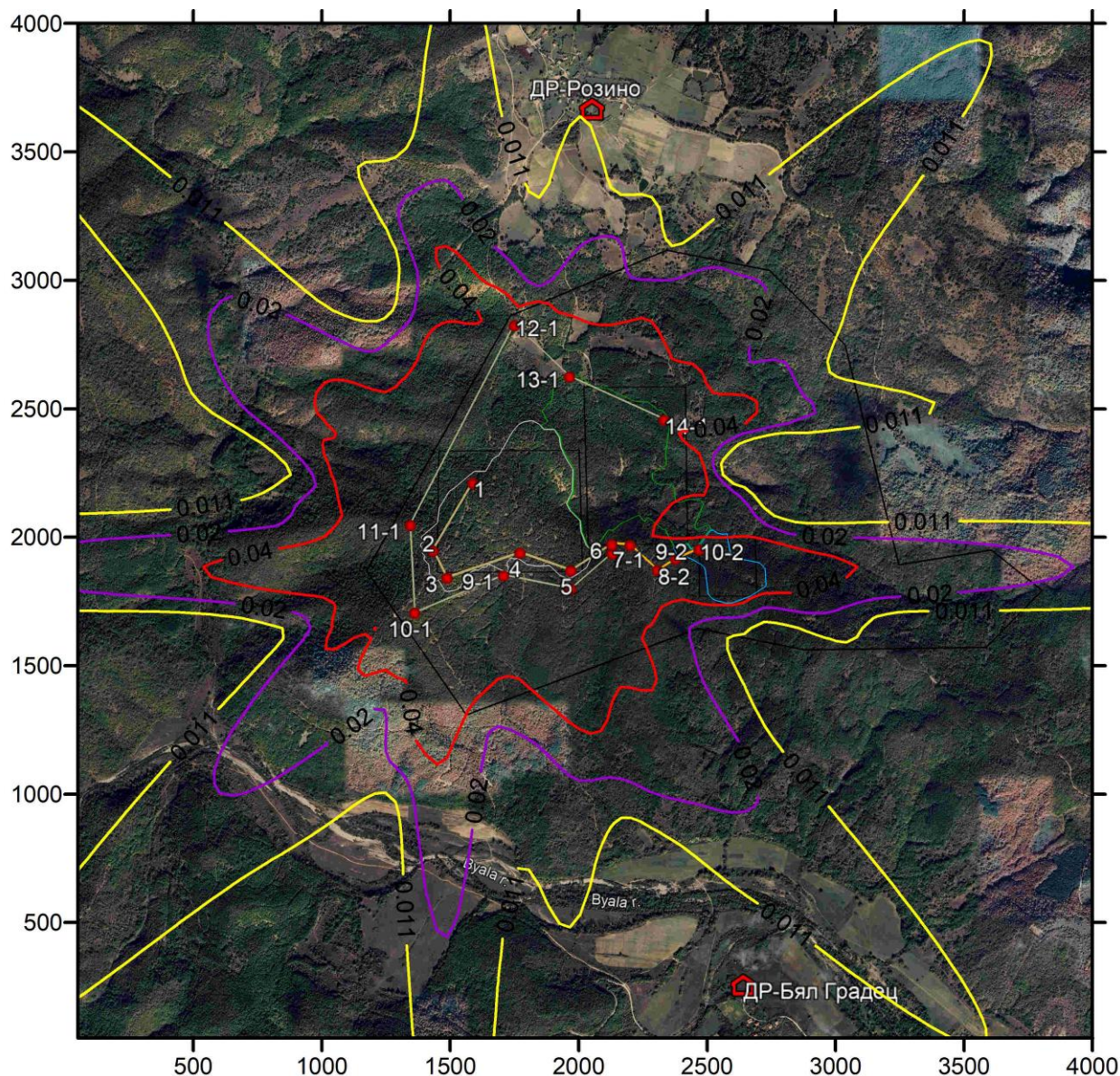


Figure V.1.2-3 AAV of PM₁₀ resulting from the Rozino Deposit operations, mg/m^3

The figure above presents the PM₁₀ distribution lines resulting from operations in the Rozino Deposit. The zone where the average annual human-health limit value of $40 \mu g/m^3$ is likely to be exceeded is surrounded by a red line. It can be seen in the figure that most of this zone is situated inside the concession area. The maximum levels of pollution in the nearest urban zones fall below $11 \mu g/m^3$ (the yellow isoline in the figure).

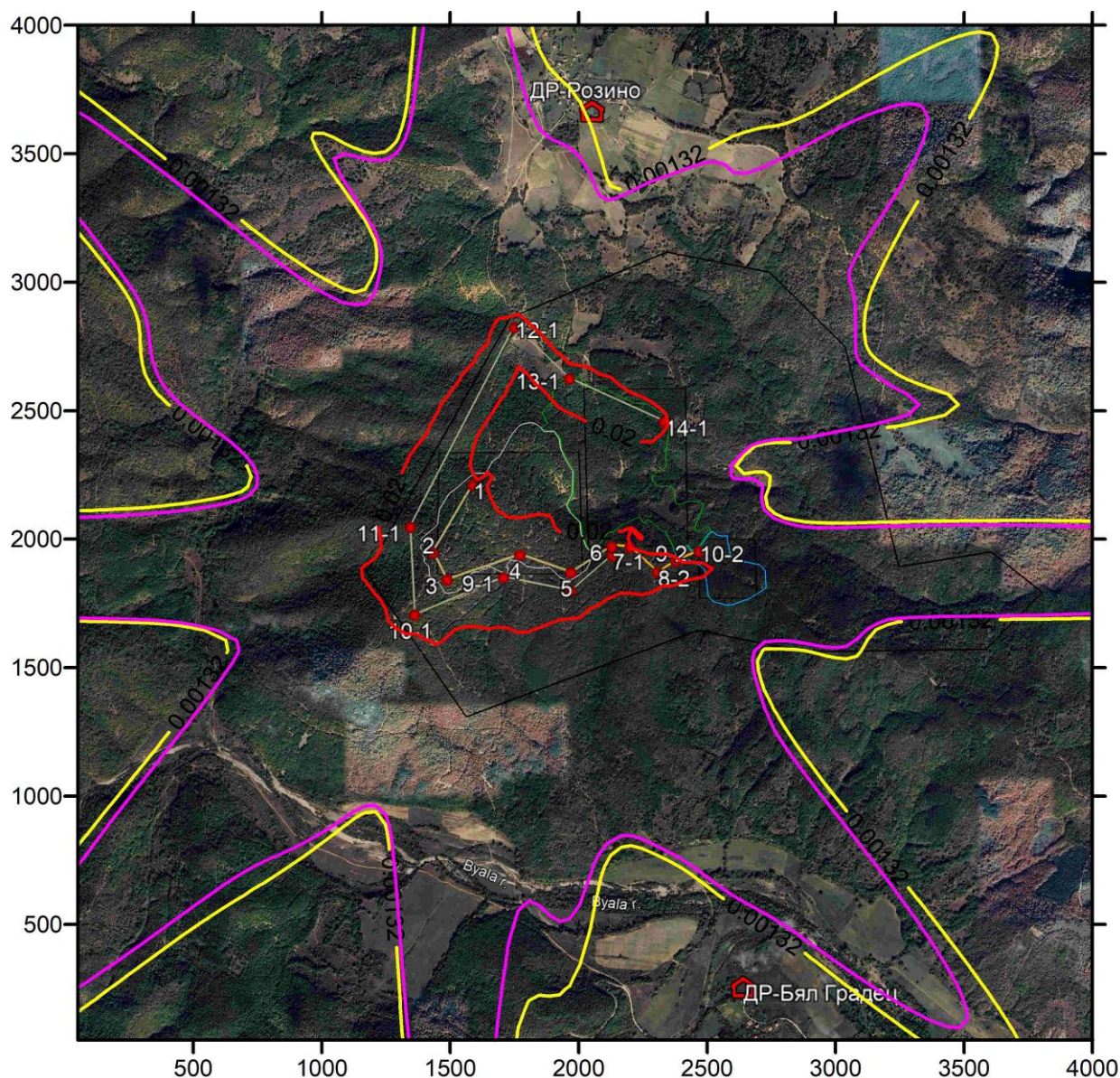


Figure V.1.2-4 AAV of PM_{2.5} resulting from the Rozino Deposit operations, mg/m³

The red line in the above figure surrounds the zone where the average annual human-health limit value of 20 µg/m³ for PM_{2.5} is likely to be exceeded. This zone is almost entirely situated within the concession area. The maximum levels of this pollutant in the nearest urban zones fall below 1.5 - 1.34 µg/m³ (the pink isoline in the figure).

In general, the stripping and mining works in the Rozino Deposit concession area will not have a significant impact on the ambient air quality in the nearest urban areas. The maximum calculated AAVs for PM₁₀ and PM_{2.5} are significantly lower than the human-health protection limit values.

In connection with MOEW letter Ref No. OBOC-68-65/20.10.2025, additional analysis was made of the scatter of dust pollution in the atmospheric air during drilling and blasting on the IP site. As we stated above, the modelling program used and affirmed in Bulgaria can be used to calculate average daily concentrations, but allows calculation of maximum single concentrations as well. To ensure completeness of the analysis, single pollution of the atmospheric air with PM₁₀

will be modelled, i.e. the maximum average hourly concentrations of this pollutant will be calculated. The maximum concentration not exceeding the average daily human-health protection limit value would be proof that blasting works on site cannot affect the atmospheric air quality.

With a total of 88 blasts per year (*or 2 times per week*), the maximum PM₁₀ emission would be 0.0267 g/s. It is important to note that the most conservative approach was adopted in this case, it being maximum removal of overburden and maximum mining of ore, to a total of 5,070,000 t/y. **It is not possible that the maximum annual ore mined should coincide in time with the maximum amount of removed overburden.** The calculated total PM₁₀ emissions during blasting of 57,613.6 t/d and an emission factor of 0.00004 kg_{PM10}/t_{blasted material} is, as we specified above, 0.0267 g/s.

The following sources of pollution will not be functional during the days of blasting: loading of mined material and overburden on dump trucks; unloading of ore in storage for the coarse-ore bin; and unloading of overburden; movement of heavy-duty equipment. It is assumed that the processing plant will operate during the days of blasting and that there will be wind erosion of the stockpile, as it is not affected by the on-site production process.

The data about each source fed into the software are presented below:

Area source 1 – the Rozino Mine

X1	Y1	X2	Y2	H	Int.	PM ₁₀
m	m	m	m	m		g/s
1413	1843	585	448	5	1	0.02667298

Area source 2 – External overburden stockpile:

X1	Y1	X2	Y2	H	Int.	PM ₁₀
m	m	m	m	m		g/s
2005	1943	395	625	5	1	0.0382* ¹

*¹ Includes wind erosion from the stockpile

Area source 3 – the Processing Plant:

X1	Y1	X2	Y2	H	Int.	PM ₁₀
m	m	m	m	m		g/s
2447	1735	225	228	5	1	0.189003

Using the third module of the Traffic Oracle software – ‘Maximum possible single pollution’, the worst weather conditions have been estimated for use in the calculation of the maximum concentrations of the pollutant in question. The results from this software are as follows: wind speed 2.5 m/s, *direction from the west (315°)* and atmospheric stability class E.

Consecutive modelling have been made for each of the eight wind directions (0; 45; 90; 135; 180; 225; 270; 315 deg) in order to ensure completeness of the analysis and calculation of the maximum possible average hourly concentrations in the entire studied area. Then a common DAT file was made using the Excel software, and the maximum ground-level concentrations from the eight DAT files were included in this common file. The common file is used for placing of the isolines of average hourly concentrations of this pollutant on the map of the region.

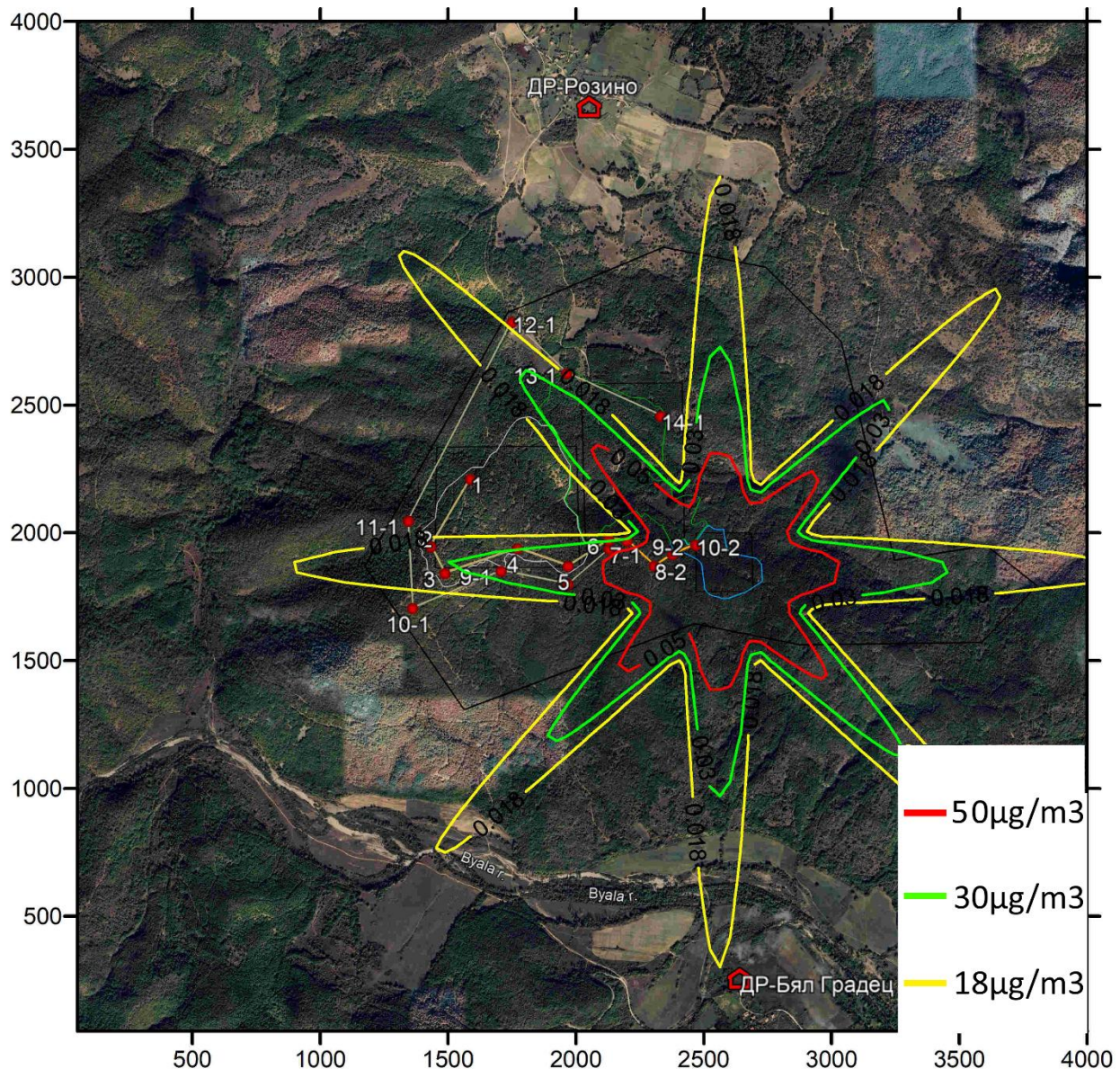


Figure V.1.2-5 PM_{10} one-time maximums during blasting works, mg/m^3

The PM_{10} one-time maximum concentration results are presented in an attachment – the software files. The maximum calculated PM_{10} concentration in the nearest urban areas (*the Rozino and Byalgradets villages*) are lower than $18 \mu g/m^3$ (*the yellow isoline on the figure*).

The calculations show that the maximum PM_{10} one-time maximum that would result over a short period of time (*under the respective wind speed and direction, and atmospheric stability class*) will be even lower than the average-daily human-health protection limit value of $50 \mu g/m^3$.

The conclusion is possible that together with the other sources of pollution in the IP area, blasting activities there cannot exceed the established average daily human health protection limit value for PM_{10} .

Conclusion:

The modelling exercises allow for the conclusion that operations in the Rozino Deposit will not cause atmospheric air pollution in excess of the admissible limit values. Dust concentrations in the urban areas will be within the human-health protection limit values.

b) During Closure and Rehabilitation

Rehabilitation activities (*technical and biological*) will have significantly lower impact on the atmospheric air. Once again, fugitive dust and exhaust emissions will be generated by the excavator, bulldozer and dump trucks. No mining equipment and processing equipment will be operated during this phase.

The significantly smaller volume of work as compared to the construction works and deposit operations allow the conclusion that the impact of closure and rehabilitation on the atmospheric air quality within the IP area will be insignificant.

Summary of ambient-air impact conclusions

By type of impact: insignificant, with constant frequency during the mining period;

By territorial impact: local, mainly within the concession area;

Occurrence of impact: permanent, daily, until closure of operations and rehabilitation of disturbed terrain.

Impact duration: continuous, during the deposit operation period, recoverable to some extent by well performed rehabilitation;

Cumulative and combined environmental impacts: The IP will have no substantial impact on air quality in the region.

2 . Surface and Ground Water

• *Surface water*

Mining and processing involve open pit, conventional crusher, milling and flotation to produce gold-bearing concentrate.

Water management on site is carefully planned and designed, with a complete strategy based on the principle of sustainability and minimisation of mining impacts on the ground and surface waters. Conservation of the country’s water resources is also an important part of the strategy. The project intends to close fully the cycle of mine-contacted water for internal use during normal operating conditions.

An integrated approach for water quality management within the industrial site has been developed. The integrated and sustainable water management report is presented in **Textual attachment 11**. It is based on the division of surface water into two flows:

- Water in contact with the mining operations - processing cycle return water, TMF return water, ore stockpile return water and pit return water;
- Water not in contact with the production operations - surface, precipitation and slope run-off, and run-off from undisturbed forest areas.

This functionality allows for sustainable water management by minimising the quantity of recycled contact water at any time of the operation. The main operational challenge will be to find the balance between excess and shortage of water, especially given the fact that the annual evaporation rate exceeds the annual precipitation rate.

The water management strategy considers the experience of previous projects, the prescriptions of the control authorities and the Investor’s requirement for continuous improvements. The integrated approach adopts the principles of waste-water minimisation, for

which purpose a fresh-water use minimisation strategy and water recycling back into production on site has been developed.

Also, it is important to understand and evaluate the risk because of the impossibility to prevent extreme rainfall events. Most generally, the contact water basins are likely to overtop during extreme precipitation or, rather, a combination or sequence of precipitation. Therefore, the results from the particular scenarios considered and described in detail in the *Integrated and Sustainable Water Management Report* show that the design maximum water level (maximum flood level) in the settling pond of the TMF, equal to a 0.1% precipitation event (once in 1,000 years) as required by the Bulgarian legislation, will remain below the dam crest RL. The freeboard will vary during the period of operation between 0.37 m in the beginning and 0.54 m at the end of operations. No water overflow will be expected, therefore.

In addition, measures to control seepage underneath the facilities have been considered in order to return contact seepage to the process, with a grout curtain separating contact and non-contact ground water, thus preventing mixing both flows and spreading of contact water seeping downstream along the Yuren Dere River.

The integrated water management approach employed during the development of the water management strategy for the *Mining and Primary Processing of Auriferous Ores from the Rozino Deposit* project is sustainable and uses the best water-management mining practices. The adopted approach of *zero discharge* of surface and ground water is required for approval of the project by the Competent authority.

The main principles of the surface water management strategy/plan are as follows:

- Development of a non-contact collection system to divert non-contact water from surrounding slopes for storage and returning to the fresh-water reservoir.
- Collection of contact water flows from the ore stockpile and from the open pit and diverting them to the TMF settling pond or to the contact-water storage lake and avoiding discharging of contact water into the environment.
- Protection of unlined channels against erosion by way of adequate hydraulic design limiting flow speeds to the maximum admissible levels;
- Provision of spillways for the non-contact water facilities sized for the maximum theoretical rainfall event in order to prevent uncontrolled flowing over the dam body;
- Ensuring the required freeboard in the non-contact water reservoirs so that the maximum flood levels remain below the overflow edges of the non-contact water facilities.
- Provision of a closure strategy for all three water storage facilities upon completion of the mining operations.

Water balance modelling shows that the required active volume in the fresh-water dam will be approximately 300,000 m³ and, therefore, the dam was designed for a total permitted volume of 365,000 m³. This will guarantee that no water shortages will be experienced the processing plant (PP) The modelling shows that an input of 50 l/s of water during 5 months of the year is sufficient to supply the project based on this water volume.

The water balance analysis shows that an active volume of approximately 14,000 m³ will be required for the contact water reservoir, which is designed for a total volume of 25,000 m³

which is equal to approximately 7 days’ worth of storage at maximum output of the pumps in this reservoir.

The predicted peak volume of water entering the TMF settling pond is approximately equal to 50,000 m³ for the dry-year scenario, 115,000 m³ for the average-year scenario, and 220,000 m³ in a wet year. The TMF was sized to contain this water and to ensure its reliable inclusion into the processing plant return cycle. The most important and most significant water-modelling result, apart from the strategic water management, is that the design maximum water level in the water storage reservoir remains lower than the spill weir during the entire period of deposit operations. This means that no water will overtop the reservoir, even during extraordinary water events.

The water balance of the entire project is presented below in a conceptual inflow and outflow diagram.

Inflows:

- Incidental general precipitation over open pit areas, the TMF settling pond, and the contact-water and fresh-water reservoirs;
- Run-off from the watershed area from external and internal zones (flows from natural upstream watershed areas will be diverted to the fresh water reservoir;
- Fresh-water at a rate of 50 l/s from the Arpa Dere River near the Rozino Pumping Station between January and May (5 months of the year);
- Inflow of ground water from the open pit and other seepage;

Run-off is assumed to be precipitation-related at this stage. Snow melt contributions are less than 10% of the annual precipitation and are not expected to Alteration the water balance dynamics to a significant extent.

Outflows:

- Evaporation from the water surfaces in the open pit, the TMF settling tank and the contact-water and fresh-water reservoirs;
- Water entrained into the tailings and/or seepage flows from the TMF;
- Water for ablutions, at 50 l per person per day for a personnel of up to 300 persons (75% of which will, following treatment, be returned via the TMF for use in the processing plant); and
- Spraying water varying between 140 m³ (in February) and 10,510 m³ (in August) and drawn from the TMF.
- Forced evaporation through a vaporiser plant controlling the contact-water reservoir level;

No surface water pollution with worker ablution effluent is expected. As described above, such effluent will be treated and returned to the processing plant via the TMF.

Impact Assessment

a) During the construction phase

TMF dam construction will be carried out from the beginning of on-site construction works and until the end of year two. There will be no production and the water will be classified as construction water during this phase. The surface water will be managed by way of permanent and temporary channels. The watershed areas are presented in Figure V.2-1.

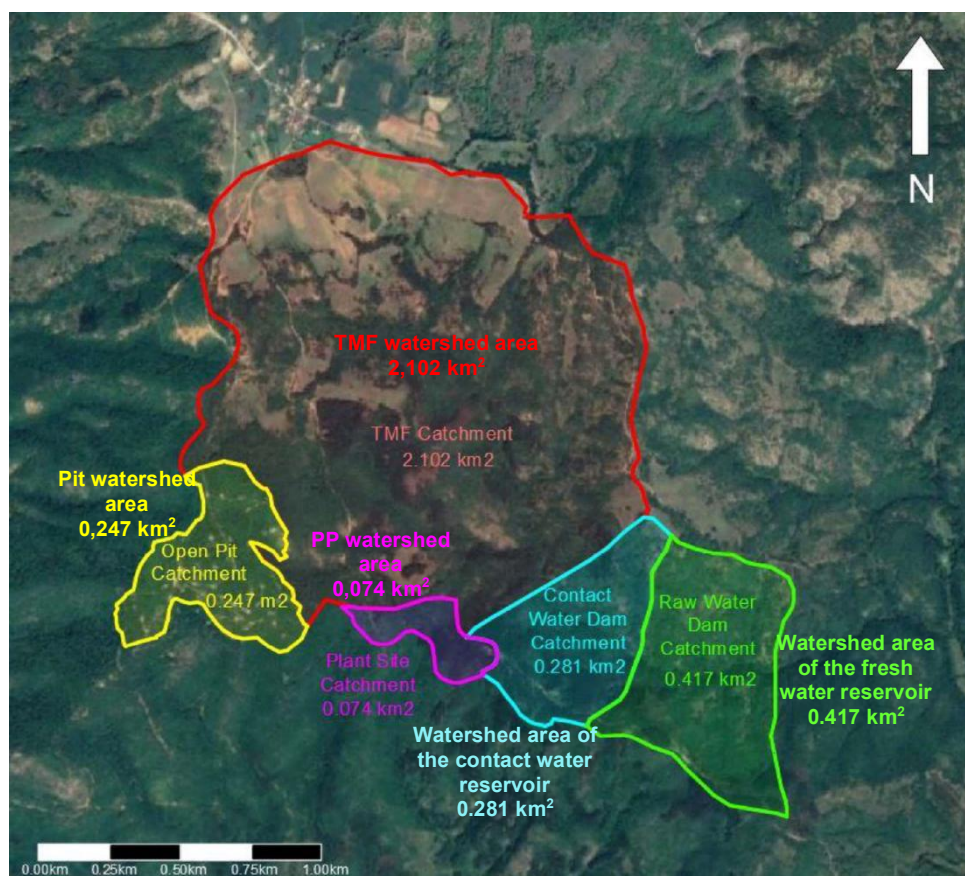


Figure V.2-1 Catchment areas during the construction
(until Year Two)

Temporary settling ponds will be made during the construction period along the water flow in order to catch any sediment run-off and decant clarified water into the Yuren Dere valley.

No negative impacts on surface water is expected during the construction phase since no objective reasons for such impacts will be present.

b) During the operation phase

Two channels will manage flows from upstream of the facilities during the operation phase - a northern diversion channel along the northeastern side, and a southern diversion channel to the south of the site. These channels will discharge into the fresh-water reservoir and, respectively, to the contact-water reservoir. The northern diversion channel will operate along the northeastern end of the TMF from the beginning of year three, and will reach the fresh-water reservoir area north of the site. This configuration will remain unchanged until the end of mining works, prior to closure.

The watershed areas formed during the operation period are presented on Figure 5, and the watershed area parameters are presented in Table V.2-1 and in Figure V.2-2.

Table V.2-1 Watershed area parameters during mine operation

Catchment area	Surface area (km ²)	Length of flow, (m)	Average terrain gradient, (%)	Arrival time, (min)
Tailings management facility	0.858	911	26.69	12.09
Contact Water Reservoir	0.233	374	24.52	7.03

Fresh water reservoir	1.632	3482	22.67	48.27
Process plant	0.118	899	19.75	14.89
Open pit	0.239	not applicable	not applicable	not applicable

The projected pit-bottom elevation is 435 m. No groundwater has been reached during the drilling and no additional pit inflows are expected besides precipitation.

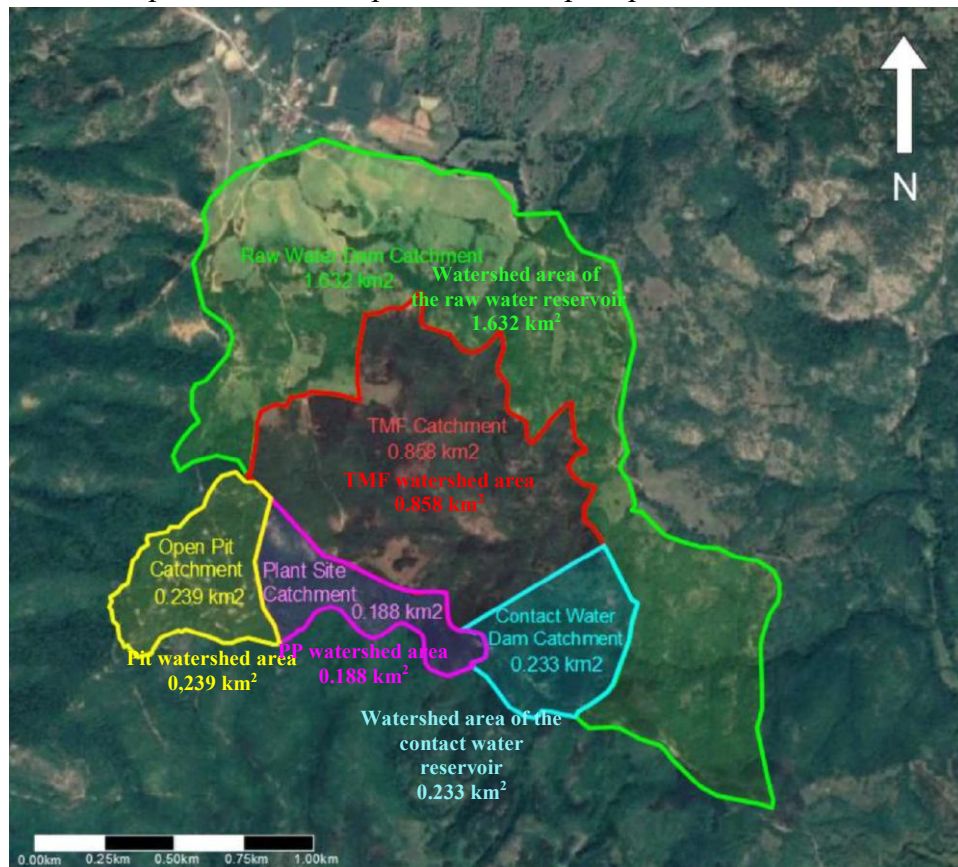


Figure V.2-2 Catchment areas during the operation

Any rain and snow water entering the pit and the stockpiles will be directed to the lowermost parts of these facilities to be pumped from there into the contact water facility. A sump for collection of surface water will be constructed on every bench in the pit and will be used to spray the mine roads. As necessary, any excess mine water will be pumped and sent to the contact-water facility to be used as return water supplement. All stockpiles will be built and developed with slopes at each level securing gravity flow of surface run-off in a direction opposite to the outer edges. A system diverting surface water to the ore processing plant or to the contact water reservoir will be constructed. The upper pit levels, with an open contour, will aid gravity re-direction of precipitation run off from the pit perimeter, thus reducing the need for drainage during the mining of the pit.

Bottled drinking water will be provided. A contract will be entered into with the Water Supply and Sewerage company for delivery of water from a reservoir which is owned by this company and will be situated 800 m. from the personnel service premises in the processing plant area. There is such an infrastructure and its connection to the future project is technically possible. The exact routes will be determined during the detailed engineering design phase.

Building of a central sewage system is not provided since no wastewater treatment plant exists near the site. One option is to use portable cabin services maintained by a specialized company and periodically emptied and transported to a licensed treatment plant. Another option is to design and build a mobile treatment plant adequate to the on-site uses and its removal after on-site operation and closure are completed.

According to the preliminary design, the expected annual deficit of 125,000 to 310,000 m³ of water for the plant will be compensated by a pumping station in the Arpa Dere River situated approximately 1.7 km east of the site.

Water will be pumped directly from the Arpa Dere River during the wet months of the year (January through May). Water from Arpa dere will be abstracted near the point of its confluence with the Yuren dere river adjacent to the Rozino village pumping station. This pumping station has been designed to pump water from a spring flowing into river pool. The flow-rate of this spring varies between 6 and 11 l/s during the entire year and is season dependent. It is calculated that a flow-rate of around 0.34 l/s will be required to supply Rozino village. Any excess water from the spring could, with the relevant justification, be drawn year-round for the industrial needs of the site. The plan is to abstract water from a natural pool without damming or other river blocking construction works.

Surface run-off from the open pit will be used as the first source of processing plant water. This water will be pumped from the open pit sumps into the plant water reservoirs. Water stored in the TMF settling pond will be the second source of processing plant water, and the fresh-water reservoir will be used as a make-up water (third source), if open pit and TMF water is not sufficient or of the quality required by the plant.

No negative impacts on surface water is expected during the operations phase since no objective reasons for such impacts will be present.

C) During Closure and Rehabilitation

The possibility to introduce accelerated evaporation equipment in order to remove water from the contact-water reservoir and from the system in general during site closure and rehabilitation was studied.

The accelerated evaporation concept involves spraying of approximately 5 l/s of water from the reservoir (by each device) at a height of 18 m into the air with an average drop size of less than 100µm. This will be achieved by mobile mechanical evaporators allowing 'zero discharge' on site during site closure. These devices will be installed on the ground or on floating platforms. This allows for operational flexibility and changing of locations depending on wind direction. Any non-evaporated water will remain within the reservoir watershed area with such a system.

The accelerated evaporation forecast, even at the lowest efficiency, is 30% or up to 3028 m³ per month per device. The evaporators will be in active use during mine closure (for a 5 year period of active conservation, as provided for in the investment proposal), when the drainage collected into the contact-water reservoir will be evaporated during the summer months to ensure sufficient volume for winter-time drainage, when evaporation is inefficient.

The climate in the region will favour accelerated evaporation. High average temperatures and relatively low humidity between April and September mean that this could be the optimal accelerated-evaporation period.

Furthermore, on site closing the suction end of the pumping station drawing water from the Arpa Dere River during site operation will be dismantled with minimal impact on the river bed.

No negative impacts on surface water is expected during the closure and rehabilitation phase since no objective reasons for such impacts will be present.

In respect of water extraction from the Arpa Dere River, we highlight the following:

Seasonal water extraction intended for the project, at up to 50 l/s and between January and May (5 months each year). The water will be extracted near the existing Rozino village pumping station, with potable water supply for the population being of priority over the industrial water supply. ***Water for the IP will be extracted pursuant to a permit issued in accordance with the Waters Act and laying down particular water-use conditions and requirements that guarantee potable water supply to the population in the IP area.***

The water deficit of 125,000 - 310,000 m³ specified in the Integrated and Sustainable Water Management Report (**Textual attachment 11**) is a balance-sheet evaluation of the needs of the process plant under various scenarios, and not an unconditional planned extraction of water from the Arpa Dere River. The main project principle is minimal use of fresh water and maximum re-use of water.

Groundwater

The use of ground water by the Investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA' will be limited and only as needed. The hydrogeological study in the deposit area showed insignificant groundwater flow-rates for the process. Therefore, further studies of the hydrogeological conditions and the potential of the groundwater bodies are recommended.

Ground water flowing into the pit sumps will be priority pumped to the plant in order to meet the processing plant requirements. Any excess water will be pumped to the TMF for temporary storage.

Ground water from the open pit will be used as the first source of processing plant water. This water will be pumped from the open pit sumps into the plant water reservoirs.

The contact-water reservoir bottom and sides will be lined in order to reduce contact water seepage. In principle, there should be no seepage from the reservoir, unless the membrane liner is faulty. Any break-through water will join the seeping water flowing from the TMF. Contact water seeping through liner breaks and, also, any seepage from under the facility will report to the contact-water reservoir, directly through the rock drain, or when intercepted by the grout curtain, will be pumped back to the contact water reservoir.

Any water seeping downstream of the curtain will be intercepted by the grout wall. Apart from intercepting contact seepage, this wall will intercept non-contact water as well. It will not allow both flows to mix and we can affirm that any contact water seepage will be restricted along the contact water reservoir axis and are not expected to cause ground water pollution.

Impact on water by drilling and blasting - trial blasting results

We are pointing out once again that the Rozino head reservoir is 2,300 m. away from the pit outline in which mining will be carried out and 1,300 m. from the buffer zone, with a 1,000 m radius from the water intake facility. As can be seen on Figure II.1.2-1, the catchment is close to point 6 (at 620 m) of the future concession area, and this point is downstream of the non-contact water reservoir. As is visible on the maps, no mining is possible in the 1,000 m buffer zone and, therefore, no drilling and blasting, because there will be a man-made water intake, a non-contact water reservoir, required for the IP.

Textual attachment 12 presents a trial blasting report. The main analyses and conclusions are as follows:

1) Subject matter and scope of the study.

Experimental drilling and blasting in the Rozino Deposit have been made to establish the main parameters of side impacts on:

- humans and urban areas
- protected areas and Natura 2000 sites
- surface and ground water
- building structures, technical infrastructure and mining equipment
- ecosystems in the zones of potential impact

This analysis includes the blasting seismic effect, blast wave, noise, flyrock, and the overall evaluation of safety during future operations.

2) Experimental blasting parameters.

Total number of drills: 12 boreholes grouped in 3 blast fields with 4 boreholes in each.

Borehole length: 6 m

Diameter: 102 mm

These parameters are identical to those of the basic design for deposit operation.

The measurements were carried out using specialised certified instruments.

3) Safeguarded facilities and sensitive receptors

Two zones with potential impact on Natura 2000 are defined:

Eco zone 1 – R = 600 m

Eco zone 2 – R = 800 m

Additional control receptors:

Yuren Dere – 650 m

Byala Reka River – 1,050 m

Rozino Village – 1,200 m

Water catchment station – 705 m

Attachment 1 ‘Safeguarded facilities and safety perimeters’ to the Drilling and Blasting Report contains a graphic presentation of these zones.

4) Blasting vibration impact

This evaluation was made in accordance with the requirements of

- Regulation 9/2010 on the Maximum Allowable Vibration Levels
- International seismic protection standards and limit values

5) Results:

The vibration velocities measured during the trial blasting are significantly below the admissible limit values for urban areas and buildings.

The calculated equivalent magnitude is $M < 1$ which is lower than the seismic sensitivity threshold.

The parameters of relative deformation, acceleration and displacement are units lower than the regional seismicity ($K_s = 0.1$).

Conclusion:

The blasting vibration impact poses no risk for buildings, facilities, water bodies or for the population.

6) Airblast wave and noise

This evaluation is consistent with Regulation 6/2006, Regulation 6/2005 and the international practices.

Outcomes:

The airblast wave levels established during the trial drilling and blasting are lower than the applicable limit values for sites and urban areas.

At increasing distances the wave becomes a sonic wave with levels within the daily limit values.

The graphic analysis (Figure 7 of the Drilling and Blasting Report) confirms the compliance of the outcomes with the European national standards.

Conclusion:

The generated airblast waves and noise are no risk for humans, fauna or building structures.

7) Flyrock:

The evaluation is in accordance with the Blasting Safety Code (Attachment 7 of the Drilling and Blasting Report).

The safe distances were calculated using formal dependencies.

All controlled receptors are outside the minimum risk radius.

The structure of the charge, the stemming and the location of the boreholes ensure low flyrock levels.

8) Impact on groundwater

No vibration or dynamic parameters exceeding the natural seismicity of the region have been established.

The conclusion is: *The obtained results allow the conclusion that if the recommended maximum mass of explosive during one delay interval, no excess of vibration velocity at depth causing seismic impacts on ground water and on water sources may be expected and the IP implementation will have no impact on potable water sources which are not directly affected by the blasting works.*

Textual attachment 16 presents a Report on the Hydrogeological Conditions in the area of the evaluated IP. The conclusions in this report are as follows:

Hydrogeological parameters and filtration ratios

The hydrogeological studies and seepage tests confirm the fact that the transmissivity and availability of water in the aquifers in the Rozino Deposit, Tintyava PL, are very low and limited. The seepage ratios defined for the Palaeogenic sediments and for the metamorphous foundation vary between 2.11×10^{-7} and 2.13×10^{-9} m/s, which is indicative of a highly restricted underground flows and lack of significant groundwater migration potential.

Potential danger of seepage from the TMF

The geology, low natural water permeability and the intended preventive measures (HDPE liner, drainage layers, seepage collector) show a minimal potential for seepage from the TMF toward the groundwater. The rock mass is a natural hydrogeological barrier which, combined with the engineering measures, will eliminate the risk of impact on the groundwater.

In addition, the available geochemical and ARD tests of waste materials are indicative of lack of acid-drainage generation potential which is a key pre-requisite for restriction of the risk of acidification and secondary mobilisation of metals.

Potential seepage during backfilling of the pit

Non-aggressive and inert non-acid generating waste rock will be used as backfill. The low filtration capacity of the host rock and the absence of local aquifers ensure that no seepage or groundwater pollution will be caused by the backfilling.

Blastwork impacts

The analysis of the structural and geological conditions and of the hydrogeological conditions shows a poorly developed fracture system. Controlled blasting will not generate any significant new water permeable cracks and will not change the mechanical or seepage properties of the water-bearing rocks.

Impact on potable water sources

The development of the Rozino Deposit will not and cannot affect the potable water sources in the region. This is evidenced by:

- the lack of a hydraulic connection between the IP area and the water abstraction facilities;
- the different aquifer depths and nature;
- the absence of groundwater in the pit area other than limited local occurrences.

The flowrates of the water sources will not be reduced by the IP operations and no change in the groundwater regimens is expected.

Impact on the chemical status of the water

The chemical analyses of ground and surface waters (2019–2023) show stability of parameters without trances of pollution or negative trends. There is no potential in the project to worsen the chemical status or the pH of the ground and surface waters.

A summary conclusion from the Report on the Hydrogeological Conditions in the area of the evaluated IP:

It is established from all studies, tests and analyses that:

- The hydrogeological conditions are low water permeability and limited groundwater flow.
- No seepage or pollution from the TMF or by backfilling can be expected.
- The blast works will have no negative impact on the fractures and on the seepage properties.
- The IP will not affect the potable water supply in the region and poses no risk for the water intake facilities.
- The chemical status of the ground and surface waters will not be impacted.

Development of the Rozino Deposit will not pose a risk for the groundwater, the potable water sources or the quality and quantity of ground and surface water in the region.

Summary of water impact conclusions

The analyses and conclusions in this report show that a definitive guarantee for protection of the surface and ground waters can be achieved by implementation of the proposed and evaluated

design solutions of the IP presented in item II, and by implementing the measures and recommendations in this Report, presented in item IX.

- ***Surface water***

The impact on surface water during all the implementation stages of the investment proposal for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit’ is determined as insignificant. The quality of the surface water used from the Arpa Dere River is as high as 10% of the average multiannual water quantities and are **not expected to have a negative effect (including transboundary negative effect)** and, also, no discharging of waste water into surface water bodies is planned for. A ‘zero discharge’ approach is adopted.

- ***Groundwater***

The implementation of the investment proposal for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA’ **is not expected to have a negative impact** on ground water and will not deteriorate the chemical and quantitative status of the affected groundwater body BG3G000PtPg049 Fissure water - Eastern Rhodopean Complex.

One technological option during the IP implementation is abstraction of water from the Arpa Dere River floodplain by constructing a pumping station in the area of the existing Rozino Pumping Station.

The mining will take place 1,300 m away from the boundary of the 1,000 radius buffer zone of the Rozino Head Reservoir and 2,300 m from the head reservoir and, therefore, no impact on the potable water protection zone is expected. The Clean Water Reservoir will be constructed downstream of the head reservoir, in the point in the concession area closest to it.

The mining operations will be carried out in the seepage zone without reaching the water level. Passive ground water inflow will be priority pumped to the plant in order to meet the processing requirements.

The impact on the chemical status of ground water will be neutralized by lining the contact water reservoir bottom and walls and by constructing a system to intercept eventual break-through involving a curtain drain and a grout curtain.

3 . Soils

3.1. Size of affected areas

The overall intended concession area amounts to **275 ha**, of which **118 ha** will be disturbed. The buffer area covers 157 ha. Some facilities will be developed in areas already processed/disturbed without taking over new areas, with the ‘overlap’ being 261,9 ha.

3.2 Pollution sources

Soil pollution during the IP implementation can be direct - through oil and lubricant spills, and indirectly through deposition of emissions.

The oil products and lubricants which may be emitted during failure of ore mining and processing machines are a potential source of soil pollution. These are local and insignificant and will be localised and removed immediately. Such pollution cannot impact the soil of adjacent terrains. The risk of such pollution is minimal if the equipment is operated and maintained properly.

Machines and facilities in proper working order will be employed and the occupational and technological discipline adhered to, thus avoiding damage caused by transport and production machines, and pollution with fuels and lubricants. Any such pollution will be followed by removing of the polluted soil layer and disposed adequately.

Dust deposition can be caused as follows:

- During mining (dust emissions of short duration and limited impact radius);
- During stockpiling (the geologic materials normally have sufficient moisture content and such an impact could be expected only in the dry months – limited impact radius);
- Soil pollution from open line sources (in-pit and external haulage roads) - limited impact radius, mostly on both sides of the roads;
- During drilling and blasting, instant and singular during blasting.

A primary jaw crusher followed by secondary and tertiary cone crushers will be used for ore crushing. Additionally, air quality in each crusher building will be maintained by a system of sprinklers.

Dust emissions from mining and stockpiling operations do not differ in chemical composition from the soil parent materials in the region and therefore they do not create any risk of altering the properties and fertility of the soil.

Deposition of other emissions: Resulting from deposition on the surface of aerosols and gases containing toxic organic compounds. Blasting, construction machines, and transport vehicles are potential sources of soil pollution. Exhaust in the ambient air contains CO, NO_x, SO₂, CH_{4-des} and dust. These emissions will be limited in time and quantity.

Compaction by construction and mining machines This degrading impact is expected to occur mainly during the mine-field preparatory stages, overburden pre-stripping and construction of auxiliary facilities, including the water reservoirs. This type of damage is of temporary nature.

Stripped rocks which will be stockpiled in designated mined sections will not be the source of toxic substances and will not pollute the soils adjacent to such sections.

3.2. Impact Assessment

Any removed topsoil and soil cover will be temporarily stockpiled. The stockpiled soils will be used during the rehabilitation of areas disturbed by the operation.

The mining workings will be designed to prevent intensive erosion.

The mining activities will impact the soils in the following manner:

- Directly by scooping of the soil during mine-field pre-stripping and construction of auxiliary facilities, including the water reservoirs. The soil will be stockpiled for use in the future rehabilitation.
- Directly by placing of stockpiled fertile / soil layers, overburden and construction and mine waste.

The open pit operation will cause technogenic and anthropogenic disturbance to a substantial portion of the lands, and degrading of the remaining lands.

According to the damaged soil classification scheme, lands damaged by excavation and soil removal belong to the 'Disturbed lands' class with permanent damage and third-degree of impact - completely destroyed.

Lands damaged by compaction, rutting, insubstantial excavation or backfilling, covered in places with construction and industrial waste, wet or eroded, belong to the 'Degraded lands' class with first-degree of impact, and are recoverable with little effort.

a) Construction

The impact on soils will begin with the start of mining preparations, Processing Plant construction, construction of the mine waste facility, placing of the mining equipment, of portable toilets etc. According to Article 43 of the Environment Protection Act, the fertile soil layer is under special protection and, therefore, it will be scooped and placed separately on top-soil stockpiles before construction begins. These activities will be carried out without contamination of or damage to the soil in the neighbouring land properties. Subsequently, the fertile top-soil layer and the soil will be used to rehabilitate the terrain.

The impact during pre-stripping can be defined as mechanical disturbance of the soil genetic profile as a result of soil-cover removal with attendant losses in quality and quantity. This type of disturbance is, according to the Bulgarian legislation (Instruction ПД-00-11/1994 on the Assessment of the Type and Severity of Pollution of Agricultural Lands and Land Use Designations) is '01. Extracted land mass', the type of damage is '013. Mineral extraction sites'. The damage will be permanent.

The main technogenic factors will be the pits followed by the stockpiles, the Processing Plant, the mine waste facility, the water reservoirs, the top-soil layer and the on-site roads.

The most significant impacts will be caused during this stage.

Excavation will cause direct disturbance to the soils, but the the impacts will be reduced by back-filling of the mined spaces during the subsequent stages and by staged technical and biological rehabilitation. The technical rehabilitation will comprise predominantly back-filling of the mined spaces and shaping of horizontal areas, where possible, while the biological rehabilitation will involve planting of vegetation suitable for the region.

b) Operation

Thickening to 70-75% solids is the technology chosen for flotation tailings disposal by means of a thickener separating water (thickening) from the tailings prior to their disposal. This technology will provide several positive effects:

- efficient use of water;
- minimal potential for liquefaction (free sliding or flowing) or breaking of the facility dam which would be a risk for the adjacent lands;
- ease of handling - piling and shaping of the facility for minimal impact on the surrounding terrain;
- improved stability of the MWF body due to reduced water content, enabling its gradual upgrading;
- consideration of natural geographic, geological, geotechnical and geochemical conditions of the site. As the waste is disposed of from the highest toward the lowest stockpile points, it should be noted this disposal enables staged rehabilitation of completed slopes.

The operations in the concession area will not have a tangible physical impact on the surrounding lands and soils, except for dust from the movement of vehicles and construction machinery. This This will be overcome by regular spraying of roads and areas of intensive dust emissions in periods of dry weather.

No physical degradation processes (acidification, significant alkalization, over-saturation, bogging, salination, etc.) and pollution with toxic organic and inorganic chemical substances (harmful aerosols, burst pollution, etc.) are expected if the technological and environmental regulations are complied by the personnel involved in the operations.

Complete rehabilitation will be carried out of the disturbed areas upon completion of the mining and processing operations, using the soil materials stockpiled during the construction phase.

c) Closure and rehabilitation

Designing of the future technical and biological rehabilitation aimed at environmental restoration is required. A good practice is to carry out preliminary assessment of the proposed rehabilitation work, the advantages of the proposed rehabilitation measures, and minimization of the impact on the environment.

It should be noted that self-sown plants establish in the 10-20 cm depth of grey-brown soils with initial stages of formation of grainy-crumbly structured soils in older open-pit mining stockpiles.

Leaving of the concession area requires a certain volume of technical and biological rehabilitation work in disturbed areas, and removal of unnecessary facilities.

Detailed designs will be prepared during the operation for all concession-area leaving activities. The technical rehabilitation will involve terrain levelling. This levelling will be integral to the stacking operations and will be offset by operating costs. Therefore, the rehabilitation process will involve only minimal levelling in order to eliminate any indentations that would occur by consolidation, and ensuring of the necessary inclinations for natural run-off.

Easement strips around the extreme boundaries of the pits and stockpiles, and the disturbed areas, will be restored by biological rehabilitation.

The closure and rehabilitation design should provide for the following tasks:

- removal, storage and utilization of soils from the undisturbed area in which the mining operations will be carried out;
- consecutive, staged performance of technical and biological rehabilitation of post-operation areas, where possible;
- taking of required care for the planted vegetation during the regulatory period of time following the biological rehabilitation.

The soil volumes required for rehabilitation will be the soils removed from the areas during the operation.

Regulation 26 requires restoration of land usability to a degree closest to the initial, and, where this proves impossible, creation of another use with adequate landscaping.

Application of suitable fertilizers will be provided for in order to create better soil conditions and nutrition in the rehabilitated areas. Care for grass sown areas, for example, over the legally required 5 year period, comprises irrigation, fertilization in early spring, and mowing.

In conclusion, the following impact may be expected by the implementation of the investment proposal on this environmental component:

Summary of soil impact conclusions:

By type of impact: substantial, negative within the mining areas, and beneath all adjacent facilities (soil stockpiles, MWF, Processing Plant, water reservoirs, on-site roads) and insignificant in the neighbouring areas. Non-compliance with production discipline may cause compaction of adjacent lands and emissions of dust beyond the concession boundaries.

By territorial extent of the impact: local, within the disturbed lands in the concession area;

Occurrence of impact: permanent, daily, until closure of operations and rehabilitation of the terrain.

Duration of impact: continuous, during the concession period, recoverable to some extent by well performed rehabilitation;

Cumulative and combined impacts: none expected given the significant distance from other operational deposits near-by.

4. Subsurface Environment and Mineral Diversity

The subsurface and the mineral diversity will be negatively and directly impacted by the IP implementation.

According to Article 2, paragraph 1 of the Mineral Resources Act, the mineral resource belongs to the metal-resource group. For information about ore-body morphology, the overall mineral composition and the mineralisation of the ore, see Section IV of this report.

The changes of the geological environment that will be caused by the project implementation may be determined as follows:

- Excavations related to open-pit mining of the profitable mineral.
- Excavations related to the building of the necessary auxiliary facilities. These works will affect the cover and the upper parts of the earth's surface.
- Filling related to the mining process. This concerns overburden stockpiles, soil stockpiles and the construction and mine waste, with some of the stockpiled materials intended for subsequent use in rehabilitation. The stockpiling works will change only the local depth of the covering material.

Following a positive EIA decision, the Investor should develop: A Mine Waste Management Plan, an Overall Ore-Mining Design with a rehabilitation design. These designs will be the basis of annual designs of the same type. No negative impact on the subsurface from optimal extraction of the mineral resource should be expected if the approved designs are complied with.

The following impacts will be caused during the individual IP implementation stages:

a) Construction (pre-stripping and mineral-reserve mining preparation)

The impacts during this stage are related to the beginning of development and mining works in the mine sections - mine construction with uncovering of the mineral resources and construction of auxiliary facilities - the stockpiles, the TMF, the Processing plant, the water reservoirs, the on-site roads, and power lines. The impacts on the subsurface during this stage are

direct, caused by the shaping of the future pit, and indirect, in respect of the remaining auxiliary facilities.

b) Operation (extraction of reserves)

Substantial impact on the subsurface will be caused during this stage by the extraction of reserves.

The operation of the deposit involves two main impacts on the geological environment: formation of man-made empty spaces in the geological environment (mine pits) and man-made seismic impacts caused by blasting during the mining operations.

The seismic impact on the geological environment will be caused by blasting required for mining of the mineral resource. Each blasting plan will be developed in detail in the relevant detailed designs, in consideration of the distances from existing buildings, facilities and infrastructure in the immediate vicinity.

Experimental blasting on-site and under similar conditions was carried out for the purposes of this EIA in order to evaluate the side effects of blasting on the environment of blasting and to provide recommendations for management of process-related blasting during the open-pit mining of the Rozino Deposit. Special measurement equipment was used to obtain the results. The blasting vibration impact and airblast effect were assessed using the method generally accepted in blasting work worldwide (and also embedded in the specialized seismograph software, underlain by the blasting effect (seismic/airblast) relative to the quantity of explosive relationship, and the distance to secured facilities expressed by the so-called separation distance, as follows:

The report on side effect of blasting on the environment for the Rozino Deposit is presented in **Textual attachment No. 12**. The conclusions are as follows:

1) The selected scheme for development of the Rozino Deposit, according to the conceptual design: small-height benches (5m), short boreholes (~6 m) of relatively small diameter (76-102 mm) and is one of the most environmentally benign techniques for mining of ores and minerals by blasting of the rock mass. Using modern explosive charge initiation systems completes the possibilities for efficient management of explosion side impacts.

2) The specialized equipment employed during trial blasting in the Rozino showed blast induced vibration levels lower than the maximum admissible limit values for human and structural safety, and lower than the standard for comfort in the secured zones required by Regulation 9/12.02.2010.

3) The airblast/noise impacts recorded 800 m from the trial blasting site in the Rozino deposit are significantly lower than the maximum admissible limit values stipulated by the current Bulgarian legislation and lower than the limit values accepted throughout the world.

4) The blastwork noise is lower than the recorded background noise measured during the day preceding the trial. According to the persons present during the blasting, the sensation at 600 m and 800 m away was like a ‘weak distant thunder’, which suggests a feeling below Level I of human impact (Table 3 in the Report).

5) The recorded side impact measurements during the blasting in the Rozino deposit fit within the cloud of results obtained through studies carried out in similar mine-engineering, natural and anthropogenic conditions in Bulgaria. This allows for the following:

- ✓ The mathematical formulae derived from these studies should be used to predict the blasting vibration and airblast impacts in the Rozino conditions depending on the distance

from the secured facilities and the weight of the explosive charge ignited in one delay period;

- ✓ Efficient management of the human and environmental seismic and airblast/noise impacts within the admissible limit values by changing the drilling and blasting parameters (mass of the charge ignited during one delay period, stemming length, charge ignition sequence, direction of the blast progression etc.).

The following conclusions can be made from the assessment of the blast impacts on humans and on the environment:

- The drilling and blasting design for the Rozino deposit conforms to the standards for safe impact on humans and structures beyond the limits of the danger zone during burden blasting for all three design blasthole diameters (76, 89 and 102mm) and with separate (stand-alone) delay periods of ignition of each charge and maximum charge weight of up to 30 kg, in accordance with the forecast calculations using the experimentally determined side-impact dependencies on the distance and weight of the exploded charges;
- As the deposit is situated in a Natural 2000 area, the drilling and blasting process should employ the minimal possible side impact on the environment by the blasting. The drilling and blasting parameter with the lowest side impact (Table 9) is the blasting process with charges up to 14 kg. in weight. Barring any other aggravating conditions, it is recommended that the blasthole diameter be 76 mm.
- As mining evolves at depth, conditions of the operation will change. Therefore, periodic check measurements using specialized equipment are recommended in order to update mathematical dependencies (3) and (5) with deposit-specific data, determine the levels of impact and adjust the drilling and blasting parameters as necessary.

It is particularly important when designing and carrying out drilling and blasting to find the most acceptable option in which the explosion side impact be minimized, kept within the admissible limit values and providing the maximum rock-mass crushing effect of the explosion, consistent with the expected parameters, such as: achieving the target grain size of the blown rock mass, minimal displacement of the muckpile, minimal ore loss and dilution, etc.

The main factors in managing the lateral impacts of blasting are as follows:

- Awareness and consideration of the physical, mechanical and structural specifics of the rock mass - a balance needed for efficient combination of the 'rock resistance to fracturing - blast energy' process;
- Determining the stemming length;
- Selection of suitable stemming material ensuring maximum rock mass breakage by the blast energy with minimal lateral impacts. In this case air blast and noise are the priorities;
- Application of lateral blast impact minimization techniques, such as:
 - increased stemming length;
 - reduced charge mass (smaller diameter boreholes, broken charges);
 - application of adequate blasting patterns (orienting the fracture front and the direction of muck displacement, minimizing the charge mass per delay period, etc.);
 - use of protection covers;

Modern blasting systems allow separate/stand-alone delay periods for ignition of each charge. This provides a dual effect: millisecond (short-delay) sequential firing of charges is

employed for better fragmentation of the blasted muck pile and, on the other hand, minimal blast-induced impact on the environment by way of deck loading and use of the minimal explosive charge mass per delay period.

It should be noted that as the pit develops below the upper edge, the airblast and noise impacts will be further limited by the barrier function of the non-mined benches.

In the case of mining for ores and minerals near urban areas, the blasting times, most often during day-light working hours, are coordinated with the local community in order to avoid the surprise effect and with a view to reducing the unpleasant effect on the comfort of residents in the region.

Additional recommendations

Measurements and expert analysis of the blasting vibration impact are recommended in order to take measures during the design and performance of commercial blasting in order to preserve the stability of non-mined and work benches as the pit is deepened.

In respect of all mining facilities within the blasting impact danger zone, blasting and drilling must be designed and carried out in accordance with Chapter Six of the Safety Rules Applicable to Blasting Operations: ‘Special Blasting Works’.

c) Closure and rehabilitation

Closure and rehabilitation is the final stage of mine-section existence. Closure, decommissioning, subsequent rehabilitation of mined areas, processing sites, pads, facilities and unnecessary infrastructure are performed during this stage. Mandatory monitoring is part of this stage.

No impacts on the geological environment are expected during the technical liquidation (dismantling of plant and facilities, removal of used equipment from the site).

Summary of subsoil impact conclusions:

By type of impact: negative and irrecoverable for the natural resource

By territorial extent of the impact: locally, within the mined sections

Occurrence of impact: constant during the concession period

Duration of impact: continuous during the concession period

Cumulative and combined impacts: expected in respect of exhausting of gold-bearing ore reserves in the area.

5. Landscape

a) Construction and Operation

The landscape in the sections will, as a result of IP implementation, sustain anthropogenic and, in particular, technogenic changes. No changes of landscape dominant features in the whole region are expected but a zone of industrial landscape will be formed. Operations in the deposit will cause local changes to the main landscape type, and no substantial change of the internal structure and landscape functions will be allowed by well-organized operations, avoiding further ecological disbalance.

Unfavourable anthropogenic changes will have a stronger impact on the topography, on the soil cover, and on the fauna and flora. This impact will be local, its territorial extent remaining within the worked sections of the concession. The impact will be of continuous nature over the

concession period, of a complex and cumulative nature as regards the mined sections and the industrial site, but will not extend to areas outside. Implementation of the project will cause complete technogenic changes (high level of anthropogenic influence) of some of the landscape, but the landscape in the neighbouring undeveloped areas will remain stable and functional.

The sections will be open-pit mined, which will inevitably involve rock blasting and excavation, and operation of heavy-duty plant and equipment. The project development will substantially modify the physical appearance of the project site by creating a devegetated landform with clearly expressed elevation. Landscape structure and functions will change - the structure will change from horizontal to vertical and will affect the bedrock, topography, soil and vegetation components. The lands of the 'technogenic landscape' will be repurposed.

The negative impacts from the project development will include:

- physical occupation of land;
- devegetation;
- short-term derogation of the quality of environmental media.

Without doubt, development of the deposit will have an irreversible impact on the existing landscape. The footprint of technogenic landscapes will be expanded at the expense of other landscapes during the project operation. The open pit mining will change the topographic forms and land use, and contribute to elevated rates of erosion, pollution of the local environment with non-toxic dust and aerosols, changes in the feeding base of wild animal species and their disturbance. Noise, dust and aerosol pollution of the surrounding areas will disturb the normal life of local populations and may be instrumental for the death of few individuals but not entire populations.

b) Closure and rehabilitation

In order to minimise to some extent the negative effects of the mining operations and to restore the landscape in the region, staged rehabilitation works in mined-out spaces will be carried out by technical and biological means. This rehabilitation is intended to achieve a better arranged space, consistent with the terrain features and more suitable for its future use. The rehabilitation will restore to some extent the altered functional status of the mined spaces in the deposit and in its surrounding region, and will restore the disturbed landscape.

Summary of landscape impact conclusions:

By type of impact: direct, with a high degree of anthropogenic impact in the mining sections and in the auxiliary facilities, and indirect in respect of the terrain in their immediate proximity, through expected visual change.

Duration of Impact: long-lasting - during the concession period

By territorial impact: local, within the developed and mined sections in the concession area;

Cumulative and combined environmental impacts: no cumulative impact on the landscape would be observed at this stage because of the remoteness of other mined deposits of mineral resources.

6 . Flora and Fauna.

6.1. Description and Analysis of the Project Impacts on the Flora

The possible impacts on the flora caused by similar projects are:

1. Direct destruction of vegetation within the IP elements. The entire area of individual IP elements plus small areas closed between them, or between individual elements and their access roads (Figure V.6.1-1) is regarded as affected. Therefore, the directly affected surface area is 147 ha.

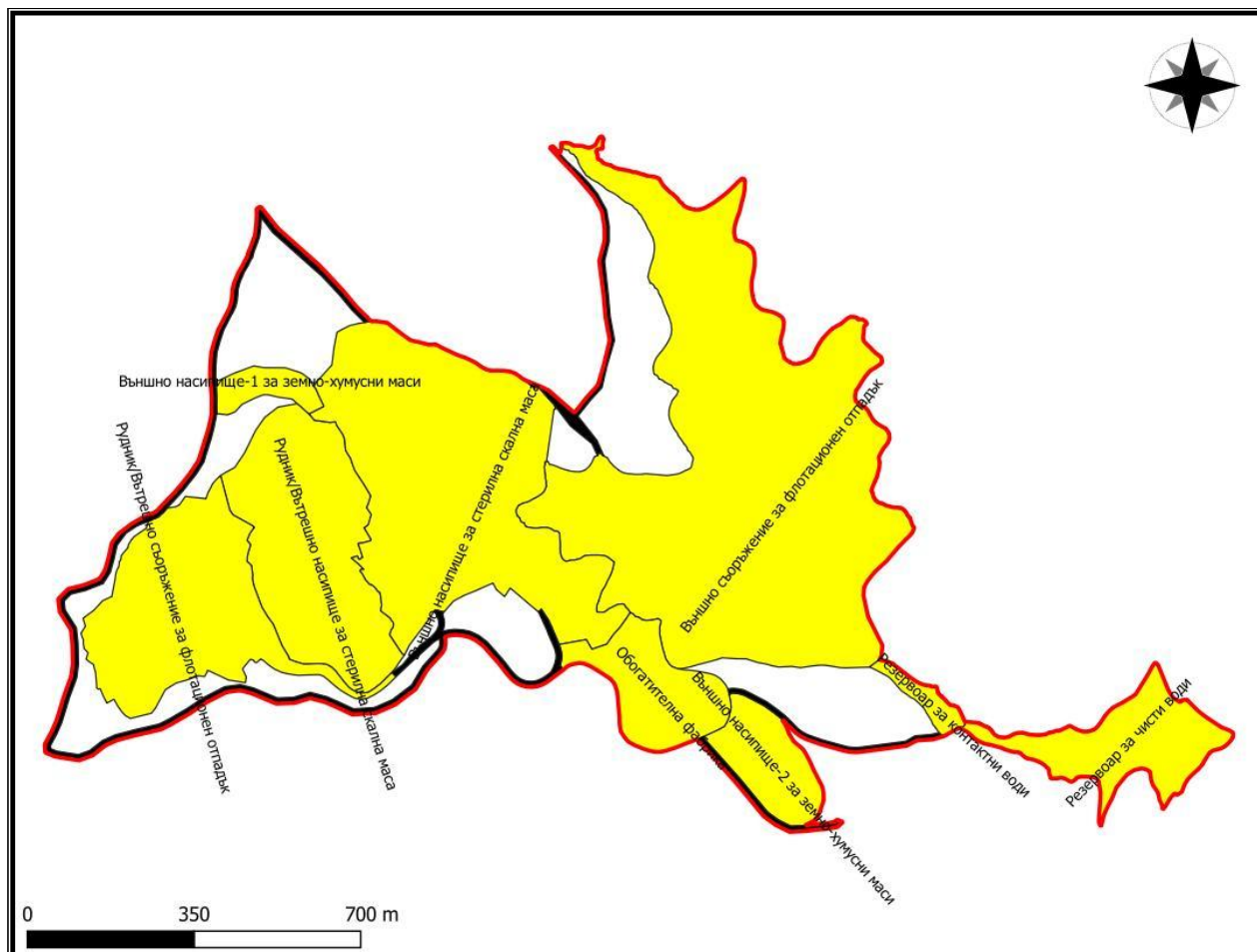


Figure V.6.1-1: Area considered to be directly affected (red outline) by the IP implementation. Yellow polygons – IP elements; black lines – roads for access to these elements.

2. Damage of vegetation by pollution during mining and drilling and blasting (incl. *seismic impacts, blast waves, debris, dust and NOx*). According to the analysis of pollution, no excessive dust and NOx levels are expected outside the concession area. Taken alone, the seismic impact, blast wave or debris cannot cause lasting damage to vegetation or, respectively, to the species' habitats. This is supported by terrain studies around other active mines and quarries in Bulgaria during which natural habitats have been found in immediate proximity to their edges.

3. Fragmentation when an area (polygon) occupied by a vegetation type is affected in a way such that its remaining part(s) are of area insufficient to preserve the characteristics of the affected vegetation type or if these characteristics are impacted negatively. Deterioration or even loss of such characteristics is caused by the so-called "edge effect" whereby abiotic (sun shine,

air humidity, soil moisture etc.) and/or biotic (species composition of tree, brush or grass stands) environmental factors are changed in the strip immediately next to the boundaries of polygons with certain vegetation types (Andren 1994, Bennett & Saunders 2010, Didham 2010, Fahrig 2003, Franklin et al. 2002).

4. Destruction of individual plant species *within the IP elements*. This impact is evaluated only for species of importance for conservation, if any are present in the directly impacted area. The evaluation of the remaining species is included in the evaluation for direct destruction of vegetation.

5. Influx of non-native and/or invasive plant species used during *the biological rehabilitation*. No impacts are expected with the use of species typical of the region and, therefore, will not be evaluated separately.

According to the mapping of vegetation in the IP area, the area of direct impact will include polygons or parts of polygons of 9 habitat types (out of 11 found; Table V.6.1-1, Attachment V.1.1-1 of the Protected Area Impact Report). Four of these habitats are included in Attachment 1 of the Biodiversity Act and is the subject of protection in the Rhodopes - Eastern Protected Zone. The impact they will sustain is assessed in the Protected Area Impact Report.

Only C2.31 Upper currents of permanent, slow-flowing rivers and streams is more limited among the remaining 5 habitats. We have included in this habitat the middle stretch of Yuren dere, which dries up during the hot summer months. This fact and the stony bottom explain the complete absence of macrophytic vegetation. Therefore, the conservation value of this habitat is low. The remaining 4 types of vegetation are of secondary origin, widespread both in this region and in Bulgaria, and occupy large areas in some cases. Some of them are undesirable from the nature-conservation perspective because they occupy areas in habitats of significance for conservation such as coniferous crops. Most often such plant types are disseminated by direct or indirect human intervention because of their adaptability.

Since vegetation of this type is planted in the place of fragmented sections of the habitats of significance for conservation (except for coniferous crops), fragmentation of such vegetation cannot change its characteristics and the impact on the vegetation type. Fragmentation of coniferous crops would increase the participation of indigenous species and gradual ‘taking over’ of individual fragments of adjacent vegetation types.

Therefore, it can be concluded that the impact on the remaining 5 types of vegetation will be **insignificant**.

Our field studies and the information about the biology and the ecology of the respective plant species show that the IP will or may impact individuals of 5 species of high conservation value – pontic fritillary (*Fritillaria pontica*), violet limodore (*Limodorum abortivum*), pink butterfly orchid (*Orchis papilionacea*), autumn lady’s-tresses (*Spiranthes spiralis*), poppy anemone (*Anemone pavonina*). All five species are widespread in the Eastern Rhodopes and/or in Bulgaria, but usually their populations are small. The poppy anemone is an exception, with a numerous population in the Madjarovo area. Finding it in the studied area means that even if it is present there, its populations will be small. An enormous population of pink butterfly orchid

(*Orchis papilionacea*) was found outside the studied area, west of Rozino village, over an area of 15 ha. This allows the conclusion that any destruction caused by the IP will be of singular individuals of these five species. The comparatively broad distribution and/or widespread suitable habitats in the region, and/or the comparatively good adaptivity of these species mean that the impacts caused to them can be defined as **insignificant**.

6.2. Description and Analysis of the Project Impacts on the Fauna

The possible impacts on the fauna caused by similar projects are:

1. Direct destruction of habitats of species within the IP elements. The entire area of individual IP elements plus small areas closed between them, or between individual elements and their access roads (Figure V.6.1-1) is regarded as affected. Therefore, the directly affected surface area is 146.58 ha.

2. Damage of habitats of species by pollution during mining and drilling and blasting (incl. *seismic impacts, blast waves, debris, dust and NOx*). According to the analysis of pollution, no excessive dust and NOx levels are expected outside the concession area. Taken alone, the seismic impact, blast wave or debris cannot cause lasting damage to vegetation or, respectively, to the species' habitats. This is supported by terrain studies around other active quarries in Bulgaria during which natural habitats have been found in immediate proximity to their edges. Habitats of species associated with aquatic environment may be affected by increased turbidity in the water during the mine construction phase.

3. Fragmentation of habitats of species - if an area (polygon) occupied by a species habitat is affected in a way such that its remaining part(s) are of area insufficient to preserve the characteristics of the affected habitat of this particular species. To be used by a species, many species require polygons of certain species-specific size in which potential habitats are present.

4. Barrier effect resulting from mine development, separation of polygons with habitats of species or bio-corridors, so that individuals of such species are deprived of free access to individual parts of the polygon. The barrier effect may be caused by inability of individuals of a species to overcome the quarry area or 'reluctance' to do so because of disturbance. This results in impossible or difficult migration (in a broader sense this could be diurnal migration for feeding, or seasonal migration related to various abiotic factors or breeding, or resettlement), and/or fragmentation of the populations of affected species. No barrier effect for birds and bats is implied by the IP, given its low elevation and the high mobility of these groups of species.

5. Disturbance of individuals of animal species by *moving and operating construction, mining and transport equipment and people*, and by *drilling and blasting*. Not many studies of noise impact on biodiversity have been carried out. There are even fewer accessible studies of this type. For example, Hirvonen (2001) measures equivalent noise level of 56 dBA above which significant impacts on waterfowl nesting around newly-built motorway are established. Based on available literature, Archer (2014) predicts significant impacts by pulsed noise on biodiversity leading to abandonment of territories at maximum noise levels above 80 dBA. Shannon et al. (2015) review the existing literature covering this subject (68 publications concerning terrestrial fauna). The author uses this as the basis to calculate a median equivalent noise level value of 60

dBA as the limit value above which noise-caused impacts on the terrestrial fauna are observed, as is supported by a solid number of published literature.

This impact may cause abandonment of habitats in the area of disturbance, reduced nesting success and/or abandonment of nests with eggs and/or chicks in the case of some more sensitive species (some mammals, birds). The effects of disturbance are species specific. The maximum extent of such impact by noise from the IP elements during normal operation is 110 m. The expected equivalent values at this distance are around 55 dBA. Disturbance during blasting operations may be caused by the seismic effects, the blast wave and debris, and, also, by pulsed noise. An equivalent noise level of 54 dBA was measured in the GUSV quarry (Studena deposit), at a distance of around 650 m. from the blasting field (61 blast holes) (EIA Statement for the IP for Mining of Construction Materials – Dolomites, from the Studena Deposit, Zavodski Stroezi 2 Section, in the lands of the Studena village and the Krapets village, Pernik Municipality). Experimental blasting for the present IP showed maximum average levels of 64 dBA measured at a distance of 800 m. This leads to the conclusion that the drilling and blasting operations will not cause significant disturbance at more than 700 m. from the mine boundaries.

6. Mortality of individuals of animal species during *movement and operation of transport and construction equipment*. This impact will be observed mainly during the mine construction phase because this is when individual animal species are likely to be present within the IP elements. Individuals of small, slow-moving species or slow-moving young of all species residing in the area of the construction works may be affected. Such an impact is not expected or will be insubstantial during the operation phase when the IP will be unsuitable for inhabitation by these species.

Bird mortality may occur because of the power line. Poles of unsuitable construction in the case of 20kV power lines may cause mortality by electrocution. Higher voltage power lines pose no risk of electrocution but collisions of birds with the strike termination cable are likely.

Rehabilitation will have no additional negative effect on the animal species.

Invertebrates

Direct destruction of the entire range of biotic components in within IPs of this type is inevitable during their development.

During construction:

Some habitats will be destroyed directly. This stage will include felling of trees and shrubs, removal of grass, removal of the topsoil substrate and initial pit development. The changes in vegetation will cause change of the invertebrate fauna. The geobiont, stratobiont and epigeobiont invertebrate fauna will be affected. The habitats within these footprints will be destroyed. The fauna in the soil and waste rock stockpile footprint will also change.

The habitats of species demanding wider life-supporting territories will be fragmented. Given the specifics and lifestyle of invertebrates, this effect can be regarded as insignificant.

Barrier effects for invertebrates are also not very likely.

Undoubtedly, there will be disturbance (some species are highly sensitive to human presence) and mortality of individuals (direct destruction during development or collision with transport vehicles, etc.).

During the operation:

At this stage the impacts will be the same, given the staged development of the mine. It is possible to mitigate these impacts to some extent, because much of the animals will already have left the region or will have died out.

Lasting changes in local fauna in the soil and waste rock stockpile footprints will occur. The areas where soil material will be removed and stockpiled will be most affected. The initial pit development will require removal of not only soil but also rock material, which will also be stockpiled.

During Closure and Rehabilitation:

The rehabilitation of these sections will be a difficult and slow process. Improvement of the environment and, to some extent, recovery of habitats and populations are expected during this phase. Disturbance, mortality and pollution by dust or gas will remain as active, but mitigated, factors.

Usually, such 'interventions' in the natural environment change the edificatory plant species and lead to non-typical succession rather than recovery of habitats ('imitation' of primary succession). Pioneer species and communities that are typical of the initial stages of succession will appear. The areas where soil material will be removed will be most affected.

Improper rehabilitation poses risks of influx of aggressive species (introduction of non-native, invasive and synanthropic animals) that will change the structure of the species, being enemies and competitors of the local species.

The consequences which are undesired for the invertebrate fauna may be mitigated through the application of the entire package of proposed measures for mitigation of the negative IP impact on biodiversity in general.

Vertebrate animals

During our field studies and from work on other projects in the part of the Eastern Rhodopes that includes the IP, we have found or inferred from the available habitats that 139 vertebrate animal species can be observed in the area (Table IV.6.1-1). Some amphibians and reptiles, the stork, the raptors, the nightjar, the European roller, some woodpeckers (grey, black, middle spotted woodpecker), songbirds and the wolf are given higher conservation status. All they are subject to protection in the two protected zones in which the IP is situated – the Rhodopes - Eastern Protected Zone (under the Habitats Directive) and the Byala Reka River Protected Zone (under the Birds Directive). The exceptions are the European legless lizard (*Ophisaurus apodus*), the goshawk (*Accipiter gentilis*), the red-breasted flycatcher (*Ficedula parva*) and the wild cat (*Felis silvestris*).

European legless lizards were not registered in the studied area. The studied area offers small habitats for this species - grasslands and shrublands, and rarefied forests along the northern periphery, a small portion of which will be directly affected. Therefore, the impact on the habitat of this species will be **insignificant**. Being peripheral relative to the IP, these habitats allow for an **insignificant** barrier effect. This species is vulnerable to overrunning, but since it was not found during the field studies, its population in the region is small and, therefore, singular individuals will be at risk. Application of the measures provided for in the Protected Area Impact Report may **eliminate** the impact.

A goshawk was found in Yuren Dere. This species nests in high-stem mountain and lowland forests, in river-edge forests and in coniferous plantations. It hunts practically everywhere

(Golemanski 2011, personal observations). The impacts for this species will be the same as those described in the Protected Area Impact Report for the European sparrow hawk (*Accipiter nisus*). If the activities start during the species’ nesting period, the species may leave any nests in or near-by the IP, and such nests are at risk of being destroyed or abandoned with subsequent loss of eggs and/or young chicks. Should this happen, the impact on the species’ population in the area may be **significant**. Mortality may occur because of the power line. Poles of unsuitable construction in the case of 20kV power lines may cause mortality by electrocution. Higher voltage power lines pose no risk of electrocution but collisions of birds with the strike termination cable are likely. The impacts can be **eliminated** by application of the measures envisaged in the Protected Area Impact Report in respect of wild birds which are the subject of protection in the Byala Reka River Protected Zone.

Red-breasted flycatchers were registered only during migration. This species nests mainly in beech forests with natural structure, at elevations between 600 and 1,550 m. a.s.l. (Golemanski 2011). It occurs in various habitats during migration, including urban parks (personal observations). Therefore, the impact on the habitat of this species during migration will be **insignificant**. Since this species does not nest in the region, the disturbance for migrating individuals will also be **insignificant**. **There will be no** mortality.

Wild cats in Bulgaria prefer old, high stem forests but would settle in various other habitats such as woodlands and scrub in which they make their lairs and raise its young. They prefer hunting in open habitats (Peshev et al. 2004, Macdonald & Barrett 1993, personal observations). The IP includes potential habitats of this species but these habitats are spread throughout virtually all Eastern Rhodopes and, therefore, will sustain **insignificant** impact. This species was not found in the studied area but its presence there is not impossible. Even if this is the case, when disturbed, mammals move their lairs and their young outside the area of disturbance. The impact on individuals who may inhabit the area will be **insignificant**. **No impact** on the population of the species will occur in the region.

The impacts on the species included in Attachment 2 of the Biodiversity Act are considered and analysed in detail in the Protected Area Impact Report.

The remaining species, although included in Attachment 3 of the Biodiversity Act or in Bulgaria’s Red Data Book (as ‘Almost threatened’), are widespread and with comparatively numerous populations both in the Eastern Rhodopes and in Bulgaria in general. The impact on the habitats of this species will, therefore, be **insignificant** during migration. The species uses a wide range of habitats, including man-made. Therefore, the impact on its population and its habitats in the region will be **insignificant**.

General conclusions about the impact on the flora and fauna, from the perspective of the EIA Statement:

By type of impact: direct and indirect, of insignificant extent;

By territorial impact: local for the IP terrain and indirect, partially as far as 700 m;

Occurrence of impact: on a daily basis, during the working day and twice per week by drilling and blasting;

Duration of Impact: during the concession period;

Cumulative and combined impacts: analysed in detail in the Protected Area Impact Report.

7 . Cultural and Historical Heritage

The potential significant impacts on the objects of cultural heritage will be the result of all main and auxiliary operations and construction of facilities intended by the investment proposal at all stages of its implementation. One and the same activity may affect different objects of cultural heritage in different ways. These differences will be determined mainly by the location of the objects relative to the design route and to the reach of all main and auxiliary facilities and of the intended construction works. The objects of cultural heritage are invariably linked to the terrain and are, by their nature, an anthropogenic part of the environment. Because of their specific features, they are different from the other impact receptors (such as water, air, soil, landscape, flora and fauna) in several respects: they are impacted directly by the construction and excavation works; any damage is irreversible, restoration is impossible, and the loss of scientific information is irreversible.

Therefore, the evaluation of impacts on the objects of cultural heritage was made in consideration of receptor sensitivity (type of the object, cultural and historical significance, and location relative to the IP boundaries), and the magnitude of impact (type of intended activities).

As regards the archaeological sites registered so far and situated near the concession area, there is no need for individual impact assessment because none of them is directly endangered. However, the archaeological objects near the investment proposal area suggest the existence of other unknown such objects in the region. Therefore it is imperative that the measures provided for by the specialised cultural heritage protection legislation should be complied with.

Predicted impact

Construction works pose a significant danger of disturbing the integrity of the construction works. First, the most serious threat for the archaeological objects are the so-called earthworks - topsoil removal and temporary stockpiling, exploratory digs, mining, and rehabilitation of disturbed terrain. All excavation work types can affect cultural strata, wreck archaeological structures or destroy artefacts. Furthermore, IP implementation may endanger unknown archaeological objects.

The degree of exposure of archaeological objects to damage depends also on their specifics, such as type, chronology, depth of the cultural strata, presence of elements of architecture, the parameters of the protection zones, etc. The objects closest to the areas in which active earthworks will be carried out will be most seriously endangered.

It is clear from the preliminary analysis of expected negative impacts from IP implementation that any of the implementation activities may be a potential hazard of varying intensity for the integrity of cultural values.

a) Construction

The negative impacts on the objects of cultural heritage may be caused by excavation works within the concession limits. Most endangered will be the archaeological cultural values whose specifics make them most difficult to identify. It is very likely that unknown archaeological object may be affected by the construction works. Therefore, and also by virtue of Article 161, paragraph 2 of the Cultural Heritage Act, surveillance by archaeologists will be required during the construction works. If new archaeological sites are identified, the provisions of art. 148 and 160 of the same act will apply.

b) Operation

The operation of the IP for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA’ may pose a threat to any cultural values within its limits. One indirect impact worthy of note is the change of the cultural and traditional landscape of the region.

c) Closure and rehabilitation

At this stage negative impacts can be expected for objects of cultural heritage in the case of top-soil removal outside the concession area.

Summary of conclusions regarding the cultural and historical heritage:

By type of impact: direct, insignificant when the regulatory requirements are complied with;

By territorial extent of the impact: local, within the worked sections;

Occurrence of impact: temporary, until stripping of the top-soil layer; rehabilitation of terrain;

Duration of impact: for the duration of construction and operation phases;

Cumulative and combined impacts: none expected when the regulatory measures are enforced.

8. Waste

Two groups of waste will be generated by the operations: subject to the Waste Management Act, and mine waste subject to the Mineral Resources Act.

8.1. Types and Amounts of Wastes that are Expected to be Generated during IP Construction, Operation, Closure and Rehabilitation Waste Classification

Waste of different types is presented and classified by name and code, as required by Attachment 1 under Article 5, paragraph 1 and Article 6, paragraph 1., item 1 of Regulation No. 2 of 23.06.2014 on Waste Types Classification, issued by the MOEW and MH (SG, issue 66/2014).

♦ Mine Wastes Generated during IP Construction

To a large extent, the construction stage comprises deposit development preparations and *mineral reserve uncovering works in preparation for mining*.

Rehabilitation of existing road connections, setting up a mine plant maintenance pad, construction of supply electricity transmission network, Processing Plant, and of mine dry facilities, installation of a mobile crusher for the MWF headwalls (dykes), and construction of a retaining wall.

Mining preparations will continue with stripping works to prepare 2 stockpiles for topsoil collected selectively where possible and also stored selectively, a mine waste facility, and a temporary low-grade ore stockpile

✓ Hazardous waste

Hazardous waste will be generated during the construction and preparatory phases predominantly by the construction machinery used for the site facilities (mine dry, Processing plant), blasting and preparations for mining.

Hydraulic oil

Used hydraulic oils (non-chlorinated, synthetic and other hydraulic oils) will be generated during emergency/unforeseen change of hydraulic oils used in the hydraulic systems of the equipment employed in the construction of the Processing plant and of the other necessary facilities, during pre-stripping and overburden handling. Unforeseen changes of hydraulic oils will be carried out on a dedicated on-site pad with thickened insulating material preventing seepage of oil products into the soil. The oil will be collected in metal drums and will be transported promptly and handed over for subsequent treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act (WMO).

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: *13 01 10* - Mineral-based non-chlorinated hydraulic oils.*

Estimated waste quantity – 0.540 tpa.

Transmission oil

Used motor oil from gears, engines and transmissions (non-chlorinated, synthetic and other motor oils) will be generated during emergency/unforeseen change of oils of the equipment used during construction, pre-stripping and overburden handling. Unforeseen changes of used oils from gears, engines and transmissions will be carried out on a dedicated on-site pad with thickened insulating material preventing seepage of oil products into the soil. The oil will be collected in metal drums and will be transported promptly and handed over for subsequent treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: *13 02 05* mineral-based non-chlorinated engine, gear and lubricating oils*

Estimated waste quantity – 0.540 tpa

Oil filters

Used oil filters will be generated during emergency/unforeseen replacement of used oil of the equipment used during construction, pre-stripping and overburden handling, and replacement of used oil filters. Unforeseen changes of oil filters will be carried out on a dedicated on-site pad with thickened insulating material preventing seepage of oil products into the soil. The oil filters will be collected in metal containers and will be transported promptly and handed over for subsequent treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: *16 01 07* – Oil filters*

Estimated waste quantity – 3 pcs. per year

Brake fluids

Waste brake fluids will be generated during emergency/unforeseen changes of brake fluids in faulty brake systems of the equipment used during construction, pre-stripping and overburden handling. Unforeseen changes of brake fluids will be carried out on a dedicated on-site pad with thickened insulating material preventing seepage of oil products into the soil. The waste brake fluid will be collected in metal drums and will be transported promptly and handed over for subsequent

treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: *16 01 13* – Brake fluids*

Estimated waste quantity – 0.012 tpa

Batteries

This waste will be generated during incorrect replacement of spent batteries in the equipment used for construction, pre-stripping and overburden handling. The spent batteries will be collected in metal containers and will be transported promptly and handed over for subsequent treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: *16 06 01* – Lead batteries*

Estimated waste quantity – cannot be predicted at this stage.

Equipment wiping cloths and protective clothing

This waste will be generated during cleaning of the equipment used for construction, pre-stripping and overburden handling, and from work clothes polluted during work. Waste wiping cloths and clothing will be generated in the respective site area. This waste will be collected from the place of their generation and stored in a metal drum on a dedicated site until quantities sufficient for handing over for subsequent treatment are collected, based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: *15 02 02* - Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances.*

Estimated waste quantity – 0.015 tpa

✓ Other Non Hazardous waste

Paper and cardboard packaging;

Paper and cardboard packaging waste will be generated during unpacking of delivered equipment parts, electronic sensors and consumables required for the installation activities. Paper and cardboard packaging waste will be collected separately and will be handed over for subsequent treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act .

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: *15 01 01 - Paper and cardboard packaging*

Estimated waste quantity – 0.015 tpa

Plastic packaging

Plastic packaging waste will be generated from unpacking of materials required for the construction and assembly works and delivered in such packaging. The plastic packaging waste will be collected separately and will be handed over for subsequent treatment based on written

contracts with persons holding the documents required by Article 35 of the Waste Management Act .

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 15 01 02 - Plastic packaging

Estimated waste quantity – 0.015 tpa

Wood

Wooden packaging waste will be generated from unpacking of wooden boxes for machines and facilities delivered in such packaging and required for the construction of the Processing plant and of other facilities during the construction and assembly works. Wooden packaging waste will be collected separately and will be handed over for subsequent treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act .

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 15 01 03 - wooden packaging

Estimated waste quantity – 0.015 tpa

✓ Construction waste

Concrete unsuitable for reuse

Insignificant quantities of unusable concrete will be generated during the construction of the Processing plant and pads for placement of the required machines and facilities, the mining equipment maintenance pad, etc. Any unusable concrete will be stored on a pad intended for preliminary storage at the place of generation and will be handed over to legal entities who apply waste management hierarchy and/or will be transferred to a Regional Waste Management System for use in compliance with the Regulation on Management of Construction Waste and Use of Recovered Materials.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 17 01 01 – Concrete

Estimated waste quantity – 4.2 t, total for the construction

Plastic

Unusable plastics, mainly fasteners, will be generated during the construction of the Processing plant and of the other facilities required for mining and processing of polymetal ores.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 17 02 03 – plastics

Estimated waste quantity - cannot be predicted at this stage. The quantity will be determined during the drawing up of the Construction Waste Management Plan section of the engineering design.

Iron and steel

Metal waste will be generated during the construction of the Processing plant and of the other facilities required for the operation of the deposit. The metal waste will comprise predominantly angle iron, flat bars, shaped iron, construction iron, rebars etc., and will be transported for recycling.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 17 04 05 - Iron and steel.

Estimated waste quantity - cannot be predicted at this stage. The quantity will be determined during the drawing up of the Construction Waste Management Plan section of the engineering design.

Soil and stones

Soil and stone waste will be generated during the rehabilitation of existing road links and building of new roads to the pit, to the processing plant, to stockpiles, to the water reservoirs.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 17 05 04 Soil and stones other than those mentioned in 17 05 03

Estimated waste quantity - cannot be predicted at this stage. The quantity will be determined during the drawing up of the Construction Waste Management Plan section of the engineering design.

✓ Mixed household waste

Household type waste will be generated from the everyday routine of the construction workers prior to the mining operations in the Rozino Deposit. This waste will be collected in beaver-type metal containers and will be handed over for separation (separation of paper packaging, metal, and plastic for recycling, separation of biodegradable waste for composting and reduction of the quantity of biodegradable waste intended for disposal) by the Regional Waste Management Facility (RWMF) for the Kardjali Region - the non-profit association 'For Clean Rhodopes', jointly with the household waste of the Ivaylovgrad Municipality.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 20 03 01 – *Mixed municipal waste.*

Estimated waste quantity – 0.35kg per person per day.

Mine waste during preparations for mining and processing of polymetal ores

According to Article 22b of the Mineral Resources Act and Article 15 of the Regulation on Management of Mine Waste, the mine waste generated during the mining and processing of polymetal Ores from the Rozino Deposit, Tintyava PLA' will be classified as 'non-inert and non-hazardous waste', in particular:

- Code 01 01 01 - wastes from mineral metalliferous excavation, which will be disposed of on a waste rock stockpile;

- Code 01 03 06 - tailings other than those mentioned in 01 03 04 and 01 03 05, that will be disposed of as paste.

- Waste from removal of overburden and excavation and mining

Because of the hardness of the overburden, it is accepted that both the ore and the waste rock will be detached by drilling with subsequent millisecond delay initiation and blasting using the NONEL system.

As it does not contain any payable components but envelops or is hosted in the ore-bearing rocks, the rock overburden in the Rozino Deposit should be selectively removed and stockpiled.

Most generally, the processes for selective removal of waste rock are: drilling and millisecond delay blasting to detach the waste rock from the massif, loading by back-hoe shovel to trucks and hauling to a waste-rock stockpile.

Overall, 26.5 Mt or around 10.8 Mm³ of waste rock will be removed from the deposit by design. Or the expected maximum annual volume is 3.3 Mt (1.3 Mm³/a)

These volumes of waste rock are intended for stockpiling in the WRF to the east of the mine pit.

Backfilling of mined-out spaces will begin after Year 4 (once the reserves in Section 1 are exhausted).

The overburden removal bench heights will be 5 to 10 m.

The waste rock and the ore will be loaded by a 6 m³ backhoe hydraulic excavator, positioned after the blasting and airing of the pit next to the blast field and beginning the loading of the blasted heap. Dump trucks will haul the overburden.

Code under the waste categorization, Regulation 2 of 23.07.2014

- 01 01 01 - Waste from removal of overburden and excavation and mining

The waste quality generated during the entire mining phase will be 3.3 M t/year (1.3 M m³/year) or 26.5 M t/10.8 M m³.

- Processing waste

The processing waste will be disposed of in a thickened state of 70 – 75% solids. This method is preferable to the conventional tailings for the following reasons:

- Higher recovery of return water;
- Lower use of 'fresh' water;
- Smaller disposal area;
- Significant increase in the stability coefficient of disposal facilities containing thickened flotation tailings;
- Significantly reduced risk of compromising of supporting facilities;
- Significantly higher potential for staged rehabilitation.

Disposing of flotation tailings (processing waste) with a 25%/75% water to solids ratio will reduce the footprint and, thus, the volume of the facility by approximately 1÷1.5 ha as compared to conventional disposal where the water to solids ratio is 45%/55%, i.e. there is an approximate 20 to 25% reduction of return water.

The water content of the flotation tailings will be reduced and a thickener will be installed in the processing plant to store the water from the dewatered flotation tailings.

Following exhaustion of the reserves in Section 1 and as the mining works in Section 2 advance, backfilling of the mined out spaces will begin and, again, will be consistent with the best open mining practices. Backfilling is expected to begin during Year 4 or 5 of the operations.

Backfilling has the following positive effects:

- Substantial reduction of the area required to (store overburden) and processing tailings (should the quality of such a process be proven);
- Substantial reduction of the time during which external stacking will be required, allowing for much faster rehabilitation of the possible external stockpile and the external process tailings storage facility.

Code under the waste categorization, Regulation 2 of 23.07.2014

- 01 03 06 - Tailings other than those mentioned in 01 03 04 and 01 03 05

Duration of impact – 11.2 Mt over the entire operation period.

♦ **Mine Wastes Generated during Project Operation**

The following waste-related activities will be carried out during the mining, operation and ore processing in the deposit area:

Hazardous waste

Some waste may be generated by quarrying equipment for mining, loading and hauling only during emergency/unforeseen replacement within the mined sections.

Mineral-based non-chlorinated hydraulic oils

Used hydraulic oils (non-chlorinated, synthetic and other hydraulic oils) will be generated during emergency/unforeseen change of hydraulic oils used in the hydraulic systems of the quarrying equipment for mining, loading and hauling of polymetal ores during the mining operations, and other hydraulic oils generated through unforeseen replacement.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 13 01 10* - Mineral-based non-chlorinated hydraulic oils.

Estimated waste quantity – 1.200 tpa

Synthetic hydraulic oils

Used synthetic hydraulic oils will be generated during emergency/unforeseen change of synthetic hydraulic oils used in the hydraulic systems of the quarrying equipment for mining, loading and hauling of polymetal ores during the mining operations, and other hydraulic oils generated through unforeseen replacement.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 13 01 11* - Synthetic hydraulic oils.

Estimated waste quantity – 1.200 tpa

Synthetic engine, gear and lubricating oils

Used synthetic motor and lubrication oils from gears, engines and transmissions will be generated during emergency/unforeseen replacement of oils in the quarrying equipment for mining, loading and hauling of the mined materials during the operations in the deposit and the use of on-site facilities.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 13 02 06 * – Synthetic engine, gear and lubricating oils

Estimated waste quantity – 0.015 tpa

Equipment wiping cloths and protective clothing

This waste will be generated during cleaning of used quarrying equipment for mining, loading, processing and hauling of mined ore and by pollution of work clothes during work in the Processing plant and in the other facilities. Waste wiping cloths and clothing will be generated in the respective operational area of the pit, the Processing Plant site and the other sites. Waste wiping cloths and attire will be collected from the place of their generation and stored in a metal drum on a dedicated site until quantities sufficient for handing over for subsequent treatment are collected,

based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 15 02 02* - Absorbents, filter materials (including oil filters not otherwise specified), wiping cloths, protective clothing contaminated by dangerous substances.

Estimated waste quantity — 0.250 tpa

Packaging containing residues of dangerous substances or contaminated by dangerous substances

This waste will be generated from the use of hazardous waste required for processing (concentration) of mined ore in the Processing plant and in the other facilities. Waste packaging will be collected from the place of their generation and stored on a dedicated site until quantities sufficient for handing over for subsequent treatment are collected, based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 15 01 10* – Packaging containing residual hazardous wastes or contaminated with hazardous waste;

Estimated waste quantity – 0.150 tpa

Batteries

Such waste will be generated during technological and unforeseen change of spent batteries of the quarrying equipment for mining, loading and hauling of mined ore during the mining operations.

The spent batteries of the quarrying equipment for mining, loading and hauling of mined ore will be replaced in a dedicated on-site pad with thickened insulation materials preventing seepage of hazardous waste into the soil, and in the machine repair shop. Replaced spent batteries will be collected in metal containers and will be transported promptly and handed over for subsequent treatment based on written contracts with persons holding the waste-specific documents required by Article 35 of the Waste Management Act. Waste composition – lead, sulphuric acid

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH: 16 06 01* – Lead batteries

Estimated waste quantity – cannot be predicted at this stage.

No hazardous waste will be stored in the IP area but will be hauled in a timely manner

Household waste

Mixed household waste

Household type waste will be generated during the operations in the Rozino Deposit by the everyday routines of the workers. This waste will be collected in beaver-type metal containers and will be handed over for separation (separation of paper packaging, metal, and plastic for recycling, separation of biodegradable waste for composting and reduction of the quantity of biodegradable waste intended for disposal) by the Regional Waste Management Facility for disposal of residual material in a regulated landfill for non-hazardous municipal waste, jointly with the household waste of the the municipality.

Code under the waste categorization, Regulation 2 of 23.07.2014, MOEW and MH.

20 03 01 – Mixed household waste

Waste quantity – up to 0.35 kg per person per day

◆ **Expected generation of waste during closure and rehabilitation**

Waste generated during the rehabilitation of the deposit will be the same as the waste generated during the period of construction and mining preparations, and will comprise concrete, polluted wiping cloths, and household type waste, but no mining waste.

8.2. Waste Collection, Transport, Re-Use and Disposal

8.2.1. Wastes Generated During the IP Construction Periods (pre-mining)

➤ **Hazardous waste**

Hydraulic oils, gear oils, oil filters, brake fluids and batteries with electrolyte and other quarrying equipment consumables

Unforeseen/emergency changes of consumables on the territory of the deposit will be carried out on a dedicated on-site pad with thickened insulating material preventing seepage of oil products into the soil. Waste generated by unforeseen changing of consumables will be collected in metal containers/drums and will be transported and should be handed over for subsequent treatment based on written contracts with persons holding the waste-specific documents required by Article 35 of the Waste Management Act (WMO).

Equipment wiping cloths and protective clothing

Waste wiping cloths and attire will be generated during cleaning of the equipment used for construction, pre-stripping and overburden handling, and from work clothes polluted during work. This waste will be collected from the place of their generation and stored in a metal drum on a dedicated site at the place of generation until quantities sufficient for handing over for subsequent treatment are collected, based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

➤ **Other Non Hazardous waste**

Paper and cardboard packaging packaging waste generated during the construction of facilities from unpackaged equipment part deliveries will be collected separately and will be handed over for subsequent treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act .

➤ **Construction waste**

Any unusable concrete, plastic, iron, steel and soil and stones generated during the construction and deposit preparation phases will be stored on pads intended for preliminary storage at the place of generation and will be handed over to legal entities who apply waste management hierarchy and/or will be transferred to a Regional Waste Management System for use in compliance with the Regulation on Management of Construction Waste and Use of Recovered Materials.

➤ **Mixed household waste**

Household type waste will be generated from the everyday routine of the workers involved in construction and preparations for mining of the deposit. This waste will be collected in beaver-type metal containers and will be handed over for separation (separation of paper packaging, metal, and plastic for recycling, separation of biodegradable waste for composting and reduction of the quantity of biodegradable waste intended for disposal) by the Regional Waste Management Facility (RWMF) for the Kardjali Region - the non-profit association 'For Clean Rhodopes', jointly with the household waste of the Ivaylovgrad Municipality.

➤ **Mine waste**

- **Waste from removal of overburden and excavation and mining**

Because of the hardness of the overburden, it is accepted that both the ore and the waste rock will be detached by drilling with subsequent millisecond delay initiation and blasting using the NONEL system.

As it does not contain any payable components but envelops or is hosted in the ore-bearing rocks, the rock overburden in the Rozino Deposit should be selectively removed and stockpiled.

Most generally, the processes for selective removal of waste rock are: drilling and millisecond delay blasting to detach the waste rock from the massif, loading by back-hoe shovel to trucks and hauling to a waste-rock stockpile.

These volumes of waste rock are intended for stockpiling in the WRF to the east of the mine pit.

Backfilling of mined-out spaces will begin after Year 4 (once the reserves in Section 1 are exhausted).

- **Processing waste**

The processing waste will be disposed of in a thickened state of 70 – 75% solids. This method is preferable to the conventional tailings management facility.

Disposing of flotation tailings (processing waste) with a 25%/75% water to solids ratio will reduce the footprint and, thus, the volume of the facility by approximately 1÷1.5 ha as compared to conventional disposal where the water to solids ratio is 45%/55%, i.e. there is an approximate 20 to 25% reduction of return water.

The water content of the flotation tailings will be reduced and a thickener will be installed in the processing plant to store the water from the dewatered flotation tailings.

Following exhaustion of the reserves in Section 1 and as the mining works in Section 2 advance, backfilling of the mined out spaces will begin and, again, will be consistent with the best open mining practices. Backfilling is expected to begin during Year 4 or 5 of the operations.

Backfilling has the following positive effects:

- Substantial reduction of the area required to (store overburden) and processing tailings (should the quality of such a process be proven);
- Substantial reduction of the time during which external stacking will be required, allowing for much faster rehabilitation of the possible external stockpile and the external process tailings storage facility.

8.2.2. Wastes Generated during IP implementation

Hazardous waste

Mineral-based non-chlorinated hydraulic oils, synthetic engine, gear and lubricating, synthetic engine, gear and lubricating oils, and batteries

Unforeseen changes of consumables on the territory of the deposit will be carried out on a dedicated on-site pad with thickened insulating material preventing seepage of oil products into the soil. Waste generated by unforeseen changing of consumables will be collected in metal containers/drums and will be handed over in due time for subsequent treatment based on written contracts with persons holding the waste-specific documents required by Article 35 of the Waste Management Act (WMO).

Equipment wiping cloths and protective clothing

Waste from cleaning of the quarrying equipment for mining, loading, processing and hauling of mined ore and from working clothes polluted during work in the Processing plant and in the other facilities will be collected in a metal drum and handed over in a timely manner for subsequent treatment on the basis of written contracts with persons holding the documents required by Article 35 of the Waste Management Act.

Packaging containing residues of dangerous substances or contaminated by dangerous substances

Hazardous substance waste packaging will be collected and handed over in due time for subsequent treatment based on written contracts with persons holding the waste-specific documents required by Article 35 of the Waste Management Act.

Household waste

Mixed household waste

This waste will be collected in beaver-type metal containers and will be handed over for separation (separation of paper packaging, metal, and plastic for recycling, separation of biodegradable waste for composting and reduction of the quantity of biodegradable waste intended for disposal) by the Regional Waste Management Facility (RWMF) for the Kardjali Region - the non-profit association ‘For Clean Rhodopes’, jointly with the household waste of the Ivaylovgrad Municipality.

♦ Expected generation of waste during closure and rehabilitation

Waste generated during the rehabilitation of the deposit will be the same as the waste generated during the period of construction and mining preparations, and will comprise concrete, polluted wiping cloths, and household type waste, but no mining waste.

8.3. Waste transporting scheme. Need for waste storage pads

Treatment of mine waste is part of the Mine Waste Management Plan, as required by the Regulation on Mine Waste Management (promulgated in the SG, issue 5/2016).

Waste from removal of overburden and mining of mineral resources following drilling and millisecond-delay blasting to detach the barren rock from the massif will be loaded by back-hoe shovel onto trucks and hauled to a waste-rock stockpile. Subsequently, a bulldozer will shape the stockpile.

As regards the rock overburden stockpile, it will be bulldozer operated. The waste rock hauled by trucks will be delivered to the stockpile and dumped. Subsequently, a bulldozer will shape the stockpile.

An external stockpile will be developed and in-pit stacking will begin after Year 4.

The boundary between the outer and the in-pit stockpiles is conditional and follows the outline of Section 1 in the pit.

The processed flotation tailings will be disposed of in a thickened state of 70 – 75% solids. Tailings disposal will be preceded by removal of water (thickening).

Disposing of flotation tailings (processing waste) with a 25%/75% water to solids ratio will reduce the footprint and, thus, the volume of the facility by approximately 1÷1.5 ha as compared to conventional disposal where the water to solids ratio is 45%/55%, i.e. there is an approximate 20 to 25% reduction of return water.

Following exhaustion of the reserves in Section 1 and as the mining works in Section 2 advance, backfilling of the mined out spaces will begin and, again, will be consistent with the best open mining practices. Backfilling is expected to begin during Year 4 or 5 of the operations.

Transporting of hazardous and processing waste

The generated waste will be transported outside the concession area by other legal entities. Hazardous and processing waste will be collected separately and will be handed over for subsequent treatment based on written contracts with persons holding the relevant documents required by Article 35 of the Waste Management Act (WMA).

No use of other waste during the site operation period is envisaged by the IP.

Record Keeping and Reporting of Waste Management Activities

Reports are to be prepared for the type and quantity of the waste, which will be generated at the minesite (processing and hazardous waste). The report is to be prepared on an annual basis for the total waste quantity, as required by the current legislation.

The following waste covered by the Mineral Resources Act will be generated: code 01 01 01 - Wastes from mineral metalliferous excavation which will be disposed of at a waste-rock stockpile, and code 01 03 06 - tailings other than those mentioned in 01 03 04 and 01 03 05, that will be disposed of as paste.

Article 22r, paragraph 4 of the Mineral Resources Act requires that the IP prepares a mine waste management proposal as part of the EIA documents and this proposal is presented in **Textual attachment No. 9**. No other mining waste is expected to form.

The IP does not envisage waste treatment activities other than disposal of mine waste.

Summary of waste-impact conclusions:

By type of impact: insignificant

By territorial extent of the impact: limited, within the worked sections

Occurrence of impact: in respect of waste covered by the Waste Management Act - temporary; in respect of mining waste - continuous, daily, until closure of operations and rehabilitation of the terrain;

Duration of impact: continuous, during the deposit operation period, recoverable;

Cumulative and combined impacts on the environment: none expected because of the limited territorial impact and because of technical and biological rehabilitation.

9. Hazardous substances

a) Construction and Operation

Diesel fuel will be used during the construction and operation periods for loaders and haul trucks and for ancillary self-propelled mining equipment. It will be kept in steel tanks with a total volume of 42.5 t. (with an average density of 0.85) - 50,000 l or 55 m³. The number of the tanks and their sizes will be in accordance with a Design for construction of a filling station consistent with the Zoning Act.

Diesel fuel will be delivered by tank trucks and at most 42.5 t will be present on site.

Fuels and lubricants will be used by the service machinery during the construction and operation of the mine.

The required lubricating, hydraulic and cooling oils and grease will be delivered packaged and the packaging will be returned to the vendors in a full-empty scenario.

Present on site, in a storage facility, will be:

- Prista® M10 De motor oil in 2 drums, each of 110 kg. capacity, totalling at 0.22 t. and
- Prista® AN 68 motor oil in 2 drums, each of 110 kg. capacity, totalling at 0.22 t.

Ammonium nitrate - fuel oil (ANFO) and/or site-mixed emulsion are intended for use as **the main explosives**. A contractor will carry out the drilling and blasting works and will deliver the required explosives immediately prior to their use, which excludes the likelihood of explosives being present on site. ***A specialized explosives manufacturer will supply the blasting materials which will not be stored on-site.***

No **chemical substances and mixes** will be used during the mining process. Such materials will be used in the concentration process. The following reagents will be stored and prepared in the reagent supply area:

Frother: Methyl isobutyl carbinol (MBIC). The maximum amount available on site will be 6.6 t., present in: a storage facility and a solution tank with a total capacity of 480 kg – 500 l – 0.6 m³, and a solution feeding tank with a total capacity of 60 kg – 64 l – 0.06 m³ with a solution metering system.

Collector: Potassium Amyl Xanthate (PAX). The maximum amount available on site will be 18.7 t., present in: a storage facility and a solution tank with a total capacity of 1,440 kg – 9,600 l – 10 m³, and a solution feeding tank with a total capacity of 480 kg – 3,200 l – 3.5 m³ with a solution metering system. Two duty/stand-by circulating pumps will feed the solution with PAX to the flotation circuit;

Activator: Copper sulphate (CuSO₄.5H₂O). The maximum amount available on site will be 45 t., present in: a storage facility and a solution tank with a total capacity of 3,000 kg – 20,000 l – 20 m³, and a solution feeding tank with a total capacity of 1500 kg – 10,000 l – 10 m³ with a solution metering system.

Sulphidizing agent: Sodium hydrogen sulphide (NaHS). The maximum amount available on site will be 48 t., present in: a storage facility and a solution tank with a total capacity of 3600

kg – 23,980 l – 25 m³, and a solution feeding tank with a total capacity of 1200 kg – 8,000 l – 8 m³ with a solution metering system.

Collector: Aerofloat 404 (A404). The maximum amount available on site will be 3.6 t., present in: a storage facility and a solution tank with a total capacity of 360 kg – 2,400 l – 2.5 m³, and a solution feeding tank with a total capacity of 60 kg – 400 l – 0.4 m³ with a solution metering system.

Flocculant (mixture): The maximum amount available on site will be 2.2 t., present in an automatic polymer-solution dosage machine. The flocculant distribution system comprises a flocculant dust bin, a feeding auger, an agitated mixing an agitated storage tank and two metering pumps. Polymer solution doses will be prepared in advance in a Tomal PolyRex automatic machine. This will allow for proper solution preparation and aging of flocculants. Both metering pumps will feed the mixed flocculant to the concentrate thickener and to the processing waste thickener. Each line will be equipped with a mixer for further flocculant dilution to 0.02% density upstream of the thickeners.

The delivery, transport, preparation, use, disposal and treatment of solutions and packaging are in line with the regulatory requirements.

The chemical substances and mixtures used during construction (pre-mining), mining operations and closure and rehabilitation are classified by their physical and chemical toxicology and eco-toxicology properties as required by Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP).

Classification of dangerous substances

Hazardous substances are classified in accordance with the requirements of Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP).

According to the Determination of the Risk Potential of the Enterprise, conducted as required by Attachment 3 under Article 103, paragraph 1 of the Environment Protection Act, the enterprise is not classified as 'high/low risk potential' enterprise.

Table V.9-1 Hazardous substances are classified in accordance with the requirements of Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures .

Chemical name ¹	CAS no.	EC No	Hazard category / categories according to Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP) (OB, L 353/1 of December 31, 2008)	Classification according to Annex 3 under Article 103, paragraph 1 of the EPA2	Design capacity of the processing plant(s) (tons)3	Available Quantity (tons)4	Physical properties 5
1	2	3	4	5	6	7	8
Diesel fuel	6833-4-30-5	269-882-7	Flammable liquid, Category 3, H226:: Flammable liquid and vapours Toxic if inhaled, Category 1, H304:: May be fatal if swallowed and enters airways. Irritating the skin, Category 2, H315: Causes skin Acute toxicity, Category 4, H332: Harmful if inhaled Carcinogenic, Category 2, H351: Suspected of causing cancer STOT RE 2 H373: May cause damage to organs through prolonged or repeated exposure. Chronic hazard to the aquatic environment, Category 2 H411: Toxic to aquatic life with long lasting effects. Category 2	Named, Part 2, item 34, B) gas oils (including diesel fuels, household heating fuels and gas oil mixtures); Part 1, Section P, P5B Flammable liquids, Category 2 or 3, not covered by P5a and P56 (because of code H226) Part 1, Section E, E2 Hazardous to the aquatic environment in the Chronic hazard Category, Category 2 (because of code H411)	42.5	42.5	Liquid, stored in normal conditions .
Frother - Methyl Isobutyl Carbinol	108-11-2	203-551-7	Flammable liquid, Category 3, H226 Specific target organ toxicity - single exposure, Category 3, H335	Part 1, Section P, P5B Flammable liquids Category 2 or 3, not covered by P5a and P56 (because of code H226)	10	10	Liquid
Potassium amyl xanthate	2720-73-2	220-329-5	Flam. Solid 1 H228 Acute Tox. 4 H302 Acute Tox. 4 H312	NA	27	27	Dust

			Skin Irrit. 2 H315 Eye Irrit. 2 H319 STOT Single Exp. 3 H335				
A404 Collector (mixture)	-	-	Corrosive to metals, Category 1 H290 Skin corrosion/irritation, Category 1 H314 Serious eye damage/eye irritation, Category 1 H318 Skin sensitization, Category 1 H317 Short-term (acute) aquatic hazard, Category 2 H401 Long-term (chronic) aquatic hazard, Category 2 H411	Part 1, Section E, E2 Hazardous to the aquatic environment in the Chronic hazard Category, Category 2 (because of code H411)	0.4	0.4	Liquid
Flocculant (mixture)	-	-	Serious eye damage/eye irritation; Category 1 H318	Outside	3	3	Flakes and pellets
Sodium hydrogen sulphide	240- 778-0	1672 1-80- 5	Met. Corr. 1 H290 Acute Tox. 3 H301 Skin Corr. 1B H314 Eye Dam. 1 H318 Aquatic Acute 1 H400	Part 1, Section E, E1 Hazardous to the aquatic environment in the Acute Hazard Category, Category 1, or Chronic Hazard, Category 2 (because of code H400) Part 1, Section H, H2 Acute toxicity (because of code H301)	48	48	Flakes
Copper sulphate	7758- 99-8	231- 847-6	Acute Tox. 4 H302 Skin Irrit. 2 H315 Eye Irrit. 2 H319 Aquatic Acute 1 H400 Aquatic Chronic 1 H410	Part 1, Section E, E1 Hazardous to the aquatic environment in the Acute Hazard Category, Category 1, or Chronic Hazard, Category 2 (because of code H400 and H401)	28	28	Solid

Textual attachment 3 presents the Material Safety Data Sheets and the instructions for safe use, as well as the entire correspondence regarding the classification in accordance with Article 103 of the Environment Protection Act.

b) Closure and rehabilitation

Rehabilitation will be staged and will complete at the end of the concession period. A technical and biological rehabilitation design not involving use and storage of hazardous chemicals and materials will be prepared.

Summary of conclusions about hazardous substance impacts

By type of impact: insignificant

By territorial extent of the impact: locally, within the work sections

Occurrence of impact: temporary

Duration of impact: during the deposit operation period, recoverable;

Cumulative and combined impacts: none expected because of the limited territorial impact.

10. Risk Energy Sources and Radiation

10.1. Forecast of the expected noise in the environment during construction, operation, closure and rehabilitation of the IP.

The implementation of the investment proposal will emit noise from operating machines, mining and processing equipment, and from drilling and blasting.

No ionizing radiation will be emitted during the mining operations in the Rozino Deposit.: electromagnetic waves, gamma radiation, emission of particles resulting from radioactive decay. There is no information about excessive natural radiation gamma background of the ore in the deposit under consideration, and no information about disease incidence among the population caused by such impacts.

Directive 2002/49/EC of 25.06.2002 relating to the assessment and management of environmental noise will be enforced in order to minimise the harmful impact of environmental noise.

The main requirements of Directive 2002/49/EC were transposed into our national legislation by way of the *Law on Protection from Environmental Noise* and its secondary legislation.

Regulation 6 of 2006 on Environmental Noise Parameters factoring the level of annoyance during the various parts of the day and night period, the limit values of the environmental noise indicators, in premises in residential and public buildings, in areas and territories intended for residential construction, recreation zones and areas, and mixed-purpose zones, and the harmful effects of noise on the health of the population determines the main noise-impact evaluation factor – the equivalent noise level $Leq, dB(A)$ for the three day-time and night-time periods, as follows:

- day-time noise (07:00-19:00) with a 12-hour duration,
- evening noise (19:00-23:00) with a 4-hour duration,
- night-time noise (23:00-07:00) with a 8-hour duration.

The limit values for noise in different territories and areas and structural zones within and outside urban areas are specified in Regulation 6 of 2006 and are presented in the following table:

Table V.10.1-1. Limit noise level in the various areas and structural zones in and outside urban areas

Areas and structural zones within and outside urban areas	Equivalent sound level, <i>dB(A)</i>		
	Daytime hours	Evening hours	Night hours
Living zones and territories	55	50	45
Central urban parts	60	55	50
Areas impacted by heavy road traffic;	60	55	50
Production and storage areas and zones	70	70	70
Areas for public and individual recreation	45	40	35
Areas for medical facilities and sanatoriums	45	35	35
Areas for scientific research	45	40	35
Quiet areas outside agglomerations	40	35	35
Note: The maximum noise-level limit value during the passage of aircraft over a certain area is 85 dB(A)			

a) Construction and Operation

The IP construction phase will involve in-pit road construction, preparation of stockpile areas (*for topsoil and overburden*), Processing plant construction, and preparation of quarry entry faces.

The construction phase will evolve in parallel with the mining activities which will be carried out during the first year of IP implementation, but can be divided conditionally into a Processing plant construction phase and construction phase for the the remaining activities for staged stripping, mining and processing of mined ore.

The following activities will generate noise during the stripping and mining operations;

- Processing plant construction;
- processing equipment, overburden removal, ore mining and processing;
- transport vehicles hauling overburden to the stockpile and ore to the processing plant ROM pad. A total of 32 heavy-duty vehicle return trips per hour will be required along the on-site service roads.

Noise from industrial plant:

Typical construction and strip mining development equipment will be used during the construction and deposit development phases: excavators, bulldozers, dump trucks, front-end loaders, drill rigs, jaw crushers, etc.

The equivalent noise levels for the main machinery used during the operations in the Rozino deposit will be as follows:

Excavator/Bulldozer	105 <i>dB(A)</i>
Front end loader	109 <i>dB(A)</i>
Dump trucks	68-90 <i>dB(A)</i>
Percussion-rotary drill	110 <i>dB(A)</i>

Noise from transport vehicles:

A formula, described in detail in sub-item V.10.2 was used to determine the equivalent A-weighted noise levels from heavy-duty vehicles in the IP area.

Noise from blasting operations:

As regards this source of intermittent noise, a trial blasting was carried out and a *Report on the Evaluation of the Side Impact of Blasting on the Environment for the project Rozino Deposit, Kardjali Municipality (attached with the EIA statement)*. An expert engineering analysis and assessment were made of the lateral impact of blasting on the environment based on measurements performed using specialized equipment during experimental blasting within the design pit area. The results and forecast impacts are presented in sub-item V.10.2.

b) Closure and rehabilitation

The heavy-duty and processing machinery will not be substantially different from the equipment used during the construction phase. The machines for mining and processing of mined mineral resources will not be used during this phase and, therefore, it may be assumed that the impact will be significantly lower than during the pre-stripping and mining phases.

10.2. Assessment of expected noise impact

According to its impact duration, noise is:

- Constant, with levels changing over time during individual process operations by less than 5 dB(A);
- Inconstant/varying/, with levels changing by more than 5 dB in various process operations. It can be:
 - intermittent noise - interrupted ambient-level noise reoccurring at short intervals;
 - fluctuating noise - varies in level constantly;
 - pulsed noise – perceived as separate shocks and consists of one or several noise energy pulses, each shorter than 1 sec.

The main characteristic of:

- the constant noise is the noise level in dB(A);
- the inconstant noise is the equivalent noise level in dB(A);
- the pulsed noise is the peak sound pressure, in dB(C).

Noise from the construction of the Processing Plant:

The predominant noise during the Processing Plant construction period will be generated by operation of the construction equipment.

Depending on the technical state of repair of the equipment, the expected noise levels in immediate proximity to the source will vary at $80 \div_{\max} 105$ dB(A). The distance to which operation of the machines will cause some negative effect (*noise above the admissible limit values for residential territories and zones of 55 dB(A)*) was calculated using the Method for calculation of noise from local and industrial sources – Regulation 6 of 2006 on the Environmental Noise Parameters. The following formula was employed:

$\Delta L_{\text{dist.}} = L_{\text{Aeq,T}}(*) - L_{\text{Ater,T}} - \Delta L_{\text{scr}}$, where:

- $\Delta L_{\text{dist.}}$ - decreasing noise levels dB(A) depending on the distance (location of impact), determined using the chart on Figure 4.1 of Regulation 6.

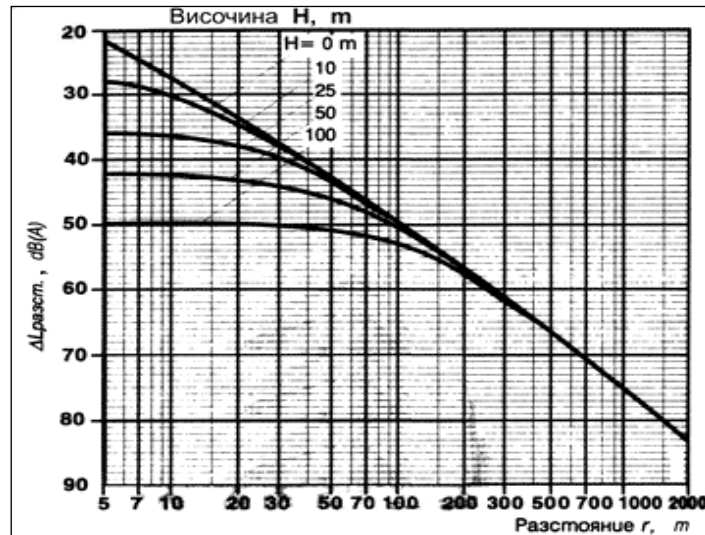


Figure V.10.2-1 Determining of ΔL_{dist} . - decreasing noise levels dB(A) depending on the distance r

- $L_{\text{Aeqv},T(*)}$ is the starting equivalent level of the source of noise dB(A) – in this case, the maximum noise which will be emitted during operation of the machines – 105 dB(A) .
- $L_{\text{Ater},T}$ - equivalent A-weighted levels of noise in the places of impact – the admissible limit value for noise in residential areas and zones is 55 dB(A) during the day time.
- ΔL_{scr} - reduction of noise levels in dB(A) by green plantations etc. – in the worst case, noise reduction is 0 dB(A) .

According to the calculations using the methodology for a radius of 100 m from the source of noise, the maximum noise load will be up to 55 dB(A) , and the maximum noise levels at a distance of $150\div 200 \text{ m}$ from the source will reach 45 dB(A) and the impact on the environment insignificant.

The maximum noise level in places of protection (*the nearest residential building - at a distance of $1,580 \text{ m}$ from the Processing Plant site*) is expected to be as high as only 25 dB(A) , which is 30 dB(A) below the limit values for noise levels in residential zones and areas.

As regards the noise factor, the Investor will fulfil its obligations according to *Regulation 2 on Employee Protection against Risks of Exposure to Noise at Work*, by ensuring maximum occupational environment noise levels of not more than 85 dB(A) , and, where necessary, by making the arrangements necessary to reduce the harmful impact of this factor (*suitable work/rest regimen for workers, individual protective equipment, etc.*).

Noise from industrial plant during stripping, mining and processing:

Regulation 6 of 2006 on Environmental Noise Parameters factoring the level of annoyance during the various parts of the day and night period, the limit values of the environmental noise indicators, in premises in residential and public buildings, in areas and territories intended for residential construction, recreation zones and areas, and mixed-purpose zones, and the harmful effects of noise on the health of the population determines the main noise-impact evaluation factor – the equivalent noise level $L_{\text{eq}}, \text{dB(A)}$ for the three day-time and night-time periods.

The limit values for noise in different territories and areas and structural zones within and outside urban areas are specified in Regulation 6 of 2006 and are presented in the Table V.10.1-1.

The in-pit activities will be performed for up to 14 hours per day - during the day-time and evening hours. The Processing Plant operations will be round the clock. Several industrial sources of noise will be situated on the Rozino Deposit site, with their respective contours and geometric centres. The worst possible scenario of deposit operations was considered - operation of all sources of noise in the nearest proximity to the residential buildings. These are the sources of industrial noise:

- the contour surrounding the equipment serving the external overburden stockpile – the geometric centre is situated at approximately 1,800 m from the nearest residential building in the Byal Gradets village;
- the contour around the mining equipment (*excavator, bulldozer, front end loader, dump trucks*) – the geometric centre is situated at approximately 1,800 m from the nearest residential building in the Byal Gradets village;
- the contour around the Processing Plant – the geometric centre is situated at approximately 1700 m from the nearest residential building in the Byal Gradets village. The latter location is stationary.

The possible noise impacts resulting from the IP implementation were evaluated with the assumption that the noise limit values along the pad boundary in which environmental noise emitting activities are carried out are consistent with the noise levels for production and storage areas and zones of 70 dB(A). In this case, the maximum noise levels emitted by the individual sources were also taken into account.

The calculations were made using the *Evaluation of Noise from Local and Industrial Sources* methodology in Annex 3a of Regulation 6 of 2006 on Environmental Noise Parameters factoring the level of annoyance during the various parts of the day and night period, the limit values of the environmental noise indicators, in premises in residential and public buildings, in areas and territories intended for residential construction, recreation zones and areas, and mixed-purpose zones, and the harmful effects of noise on the health of the population and the *Method to determine the overall noise power emitted into the environment by industrial enterprise and determining the noise level at the place of impact*, approved with Order No. ПД-613/08.08.2012 of the Minister of Environment and Waters.

The surface areas of some contours were calculated using Figure V.10.2-1 (Determining of ΔL_{dist} - reduction of noise levels dB(A) depending on the distance r) from Annex 3 to Regulation 6 of 2006.

The overall noise power level L_p , dB(A), emitted into the environment from the geometric centre of the noise sources, limited by the measurement contours, is determined using the following formula:

$$L_p = \bar{L} + 10 \lg \frac{2S}{S_0}, \text{ dB(A)}$$

where:

$\bar{L}$ is the average noise level along the respective contour - 70 dB(A);

S is the area outlined by the respective measurement contour, [m²];

$S_0 = 1 \text{ m}^2$.

The information about the contours emitting industrial noise into the environment from the operations in the IP area are presented in Table V.10.2-1.

Table V.10.2-1 Selected industrial noise contours during IP implementation

Contour	Geometric centre coordinates, UTM		S m ²	L _p dB(A),
	X	Y		
1. Mining operations in the deposit	408416	4587909	5000	110
2. Processing plant	409023	4587938	51300	120
3. Waste rock stockpiling and compaction	408899	4588018	1500	105

The locations and coordinates of the nearest objects in need of increased noise protection are presented in Table V.10.2-2 and Figure V.10.2-2 below.

Table V.10.2-2 Coordinates of the nearest facilities in need of increased noise protection

Site	UTM coordinate system	
	X	Y
Residential building in the Byal Gradets village	409072.2	4586233.58
Residential building in the Gugutka village	409799.00	4585826.00
Residential building in the Rozino village	408523.23	4589687.88

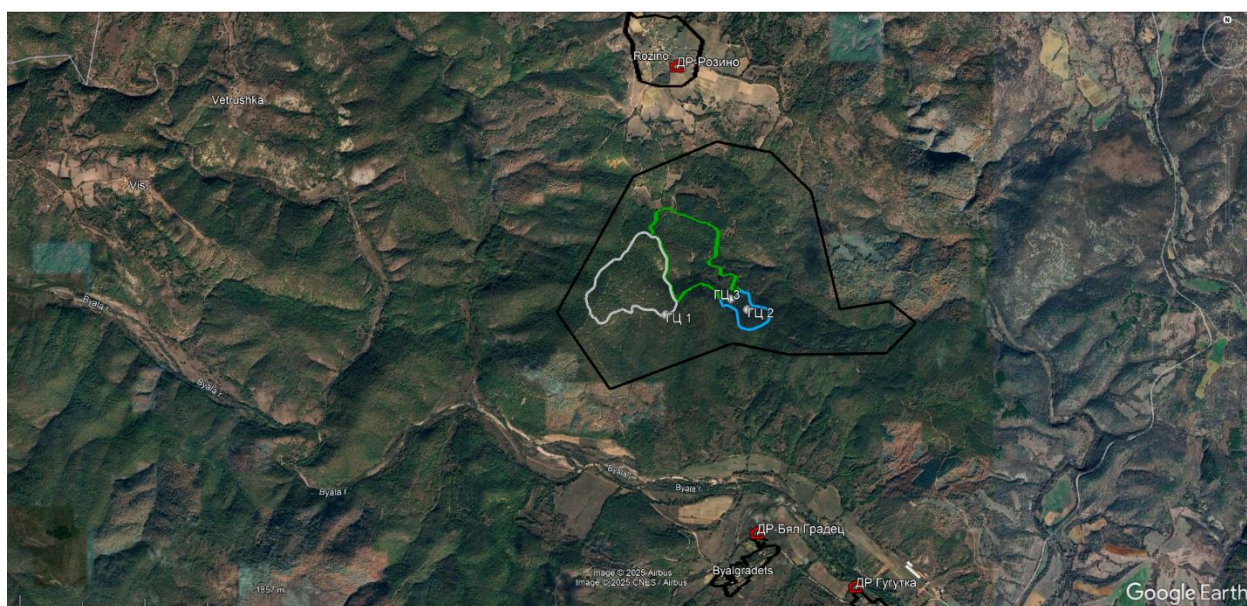


Figure V.10.2-2 .Location of industrial noise sources and the nearest objects in need of increased noise protection

According to the formula, noise levels at the place of impact are calculated using the formula:

$$L = L_p - 20 \times k_n \times \lg r - 8, dB(A)$$

Where:

- L_p. Is the overall noise power level (see Table V.10.2-1);
- r – the distance between the selected point and **the geometric centre** of the area outlined by the respective measurement contour, *m* (see Table V.10.2-4);
- k_n – a coefficient of additional noise reduction depending on the noise-absorption properties of the earth’s surface.

$k_n = 1.4 \div 1.2$ at ground level, with tree and brush cover;

$k_n = 1.1$ at ground level, with grass;

$k_n = 1.0$ at ground level, with loose soil;

$k_n = 0.9 \div 0.8$ for surfaces under asphalt, ice or water.

An area under trees and brushes exists between the sources of noise and the nearest objects. A value of ‘1.4’ is assumed for k_n .

The total noise levels from several sources are calculated in the following manner:

- the noise level at the place of impact is calculated individually for each source;
- a comparison of the noise levels follows, with rounding to the higher level according to Table 2 in the Methodology (*see Table V.10.1-3*) - in this case there are more than three sources of noise and, therefore, the adjustment to the higher level is made consecutively between the first two sources and an adjustment depending on the difference from the third sources is added, etc.

Table V.10.2-3 Determining the total of the valuation levels of individual point sources

Difference between summed levels, dB(A)	1	2	3	4	5	6	7	8	9	10
Adjustment to the higher level to obtain the summed-up level, dB(A)	+3	+2	+1.8	+1.5	+1.2	+1.0	+0.8	+0.6	+0.5	+0.4

Table V.10.2-4 presents a table of the methodology calculation results:

Table V.10.2-4. Noise level calculation results for each source

Source No.	Byal Gradets village		Gugutka village		Rozino village	
	r m	L dB(A)	r m	L dB(A)	r m	L dB(A)
1	4	5	6	7	8	9
1. Mining operations in the deposit	1799	10.9	2200	8.4	3060	4.4
2. Processing plant	1705	21.5	2250	18.1	1820	20.7
3. Waste rock stockpiling and compaction	1793	5.9	2370	2.5	1712	6.5

The maximum noise levels in the area of the sensitive objects in need of increased noise protection will be insignificantly low. The aggregated noise levels in the area of each object in need of increased noise protection are presented in Table V.10.2-5.

Table V.10.2-5. Aggregated noise levels

Place of impact	Calculated aggregated noise levels	Admissible levels according to Regulation 6.	Risk of damage to human health from excessive noise levels
	ΣL dB(A)	dB(A)	YES/NO
1	2	3	4
Byal Gradets village	21.9	45÷55	Not OK
Gugutka village	18.5	45÷55	NO
Rozino village	20.7	45÷55	Not OK

The maximum noise levels in the area of sensitive objects in need of increased noise protection will be insignificant, at 18.5÷21.9 dB(A), with the admissible levels being 45-55 dB(A). It is important to note that at these noise levels (*up to 21.9 dB(A)*) the mining operations on the IP site will not be heard by people in the near-by settlements.

NOISE FROM TRANSPORT VEHICLES:

The following formula was used to determine the equivalent A-weighted noise levels from heavy-duty vehicles in the IP area:

$$L_{Ater,T} = L_{Aeqv,T(*)} + \Delta L_{dist.} + \Delta L_{rel.} + \Delta L_{scr.} + \Delta L_k, [dB(A)]$$

where:

$L_{Ater,T}$ is the equivalent A-weighted noise level in decibel [dB(A)] in the places of impact;

$L_{Aeqv,T(*)}$ is the starting equivalent noise level in dB(A) for the respective 24 hour interval at a distance of 7.5 or 25 m from the axis of the outermost traffic lane and at a height of 2 m above the level of the traffic lane, and is determined using the formulas:

➤ at 7.5 m:

$$L_{Aeqv,T(7.5)} = L_{Aeqv,T(25)} + \Delta L_{speed.} + \Delta L_{surf.} + \Delta L_{slope} + 6.95;$$

➤ at 25 m:

$$L_{Aeqv,T(25)} = L_{Aeqv,T(25)} + \Delta + \Delta L_{surf.} + \Delta L_{slope} - 1.23.$$

The baseline equivalent noise level $L_{Aeqv,T(25)}$ in dB(A) at a distance of 25 m from the outermost lane axis is determined using the formula:

$$L_{Aeqv.(25)} = 37.3 + 10 \lg [N (1 + 0.082 p)], \text{ where:}$$

N is the average hourly intensity of motor-vehicle traffic per hour (MV/hour) over the respective 24 hour period.

- N = 32 trucks per hour (*round trip*) to haul 13,890 t/d of mined material and stripped overburden, with truck carrying capacity of 55 t;

- p - transport flow structure determining the number of motor vehicles as % of the total traffic intensity N - p = 100;

- V_{hv} - average truck travel speed:

$$V_{hv} = 20 \text{ km/h.}$$

- $\Delta L_{speed.}$ - the dB(A) correction for the effect of the maximum allowed speed for light, Vlv and heavy-duty, Vhv, vehicles; depending on the flow structure.

$$\Delta L_{speed.} = L_{lv} - 37.3 + 10 \lg [(100 + (10^{0.1 L_{kc}} - 1)p)/(100 + 8.23 p)], \text{ dB(A)}$$

$$L_{kc} = L_{lv} - L_{hv}$$

$$L_{lv} = 27.7 + 10 \lg(1 + (0.02 V_{lv})^3)$$

$$L_{hv} = 23.1 + 12.5 \lg(V_{hv})$$

- $\Delta L_{surf.}$ - $dB(A)$ correction for the effect of road surface type

$$\Delta L_{surf.} = 0$$

- ΔL_{slope} - $dB(A)$ correction for the effect of longitudinal gradient

$$\Delta L_{slope} = 0$$

- $\Delta L_{dist.}$ - reduction of noise level $dB(A)$ depending on the distance r between the noise source (*the point of emission, situated at a height of 0.5 m in the middle of the direction under consideration*) and the place of impact (*the design point*) without account of the effects of the earth's surface and of the weather. This is calculated using the formula:

$$\Delta L_{dist.} = 15.8 - 10 \lg(r) - 0.0142 (r)^{0.9}, [dB(A)]$$

- $\Delta L_{rel.}$ - reduction of noise level $dB(A)$ by the effects of the earth's surface and the weather, depending on the average noise-spreading height hm (*hm is the distance between the middle of the line connecting the noise source and the design calculation point near the terrain; the value of hm in a flat area is the arithmetic average of the height of the noise source and of the design point*). This is determined using the formula:

$$\Delta L_{rel.} = -4.8 \exp[-(hm/r) \cdot (8.5 + 100/r) 1.3], [dB(A)]$$

$\Delta L_{scr.}$ - reduction of noise level $dB(A)$ by screening facilities and reflection, determined using the relevant methods; depending on the specific conditions, noise-protection berms and walls, natural hills, green plantations, etc. can serve as screening facilities. **The calculations below are made for the worst case, without consideration of screening facilities.**

The calculated equivalent noise level at a distance of 5 m from the in-pit roads does not exceed 40 $dB(A)$. No change of background noise levels related to operating heavy-duty equipment is expected.

NOISE FROM BLASTING OPERATIONS:

Igniting explosive charges in order to fragment rocks during open pit mining for ores and minerals some of the blast energy transits into the air environment and generates an airblast wave propagating at more than 600 m/s. This propagation velocity diminishes as the distance from the explosion increases and the airblast impact becomes acoustic below 343 m/s.

The airblast-wave impact during operations was evaluated using the following parameters:

- Wavefront overpressure, Pa or dB ;
- Frequency, Hz .

The admissible blasting vibration/noise impact limit values during process blasting are regulated as follows:

1. Protection of structures and facilities
2. Protection of human health and comfort

The airblast-wave impact on buildings and other structures (commonly referred to as ‘facility’) depends on:

- The impact duration at the time the airblast wave reaches the facility.
- The position of the facility on site relative to the airblast wave front - frontal or parallel to its propagation.
- The structural response of the facility.

The accepted worldwide blasting practices regarding structural airblast safety are:
 $P+ \leq 0.4 \text{ kPa}$ (146 dB) - complete retention of structural integrity;
 $P+ \leq 0.7 \text{ kPa}$ (150.88 dB) - partial destruction (up to 1%) of glazed building parts;
 $P+ \leq 7.0 \text{ kPa}$ (170.88 dB) - partial structural failure and, mainly, 100% destruction of glazed parts;

$P+ \leq 30.0 \text{ kPa}$ (183.52 dB) - human hearing risk level;

The impact of the frequency (f) generated by the airblast wave is critical for the human organism. Current studies show that when resonating with the inner frequencies of some human organs, this frequency affects psychologically the more sensitive persons. It has been established that the carrying frequency varies between 0.1 and 100 during commercial blasting. At large distances (outside the secured area) it is 1-10 Hz - a range not detected by the human ear. Where $f > 20 \text{ Hz}$, the blast induced wave produces a sound audible at larger distances and affecting humans. The globally accepted "noise" limit at which the airblast-wave generated frequency is not detected by the normal human organism is $f \leq 20 \text{ Hz}$ (I. Cholakov, I. Ivanov, V. Bozadjieva).

The following table presents estimated airblast-wave impacts presented as Pa and re-calculated as $dB(C)$ in order to assess the noise level impact during operational blasting, with blast-hole diameters of 76, 89 and 102 mm under the worst possible conditions: Fresh rock.

Table V.10.2-6 Calculated airblast-wave/noise impact values

МАСИВ		ТИП В.В.	ОХРАНЯВАНИ ЗОНИ	Разстояние	PPV/P+=H.SD ^{1/3}								
					H	PPV	β	H	P+	β	H	P+	β
					19004.4	mm/s	-2.307	3059.1	Pa	-1.151	175.3	dB (C)	-0.087
				R, m	76	89	102	76	89	102	76	89	102
РУДА	Свежи скали	АНФО	Зона на отцепление	450	0.33	0.45	0.59	7.6	8.4	9.2	116	117	118
			Еко зона 1 - Н-2000	600	0.17	0.23	0.30	5.4	6.0	6.6	113	114	116
			Юрен дере	650	0.14	0.19	0.25	4.9	5.5	6.0	112	114	115
			Водосъбирател	705	0.12	0.16	0.21	4.5	5.0	5.5	111	113	114
			Еко зона 2 - Н-2000	800	0.09	0.12	0.16	3.9	4.3	4.7	110	112	113
			р. Бяля река	1050	0.05	0.06	0.08	2.8	3.2	3.5	108	109	110
			с. Розино	1200	0.03	0.05	0.06	2.4	2.7	3.0	106	108	109
		ЕМУЛСИОННО В.В.	Зона на отцепление	450	0.38	0.61	0.79	7.9	9.3	10.1	117	119	120
			Еко зона 1 - Н-2000	600	0.20	0.31	0.41	5.7	6.7	7.3	114	116	117
			Юрен дере	650	0.16	0.26	0.34	5.2	6.1	6.6	113	115	116
			Водосъбирател	705	0.13	0.22	0.28	4.7	5.5	6.0	112	114	115
			Еко зона 2 - Н-2000	800	0.10	0.16	0.21	4.1	4.8	5.2	111	113	114
			р. Бяля река	1050	0.05	0.09	0.11	3.0	3.5	3.8	108	110	111
			с. Розино	1200	0.04	0.06	0.08	2.6	3.0	3.3	107	109	110
НОРМАТИВНИ ИЗИСКВАНИЯ	DIN 4150-Жилищни сгради	mm/s	5.00			-			-				
	DIN 4150-Много чувствителни конструкции	mm/s	3.00			-			-				
	Наредба 9/12022010 - Ден	mm/s	1.07			-			-				
	Ниво I на въздействие върху човека (табл.3)	Pa	-			20			-				
		dB(C)	-			-			120				
	Наредба 6/Наредба 6/15082005-Долни стойности на експозиция за предприемане на действие	Pa	-			112			-				
		dB(C)	-			-			135				

The airblast-wave/noise impacts, calculated under various dependencies, are in the upper range of data (*complete preservation of structural integrity*), which is the forecast for the most severe impacts in the examined cases.

The following was derived from the expert engineering analysis of the airblast wave/ noise impacts:

- The calculated airblast wave/noise values are below than the lower exposure value requiring response laid down in *Regulation 6 of August 15, 2005 on the Minimum Requirements*

for the Health of Workers Operating in Environments with Risks of Exposure to Noise ($< 112 \text{ Pa}$ / $< 137 \text{ dBC}$) and lower than Level I of human impact ($< 20 \text{ Pa}$ / $< 120 \text{ dBC}$) (see Table V.10.2-7).

Table V.10.2-7 Noise impact on humans by level

Levels	IMPACT ON HUMANS: perception, reinforcing factors and response	Pa	dB(C)
Level I	<u>Resembles a distant thunder.</u> <u>Awakens sensitive people.</u>	20	120
Level II	Loud thunder-like sound; Surprising response, awakens sleeping people.	50	128
Level III	Resembling a fist banging on table. Rattling of glasses, movement of unfastened objects on shelves. Fear response; Awakens sleeping people.	100	134
Level IV	Strong blow; Clearly heard over background effects; Rattling of glasses; Vibration of weak structures. Fear reflex. Animals look around and react.	200	140
Level V	Very loud noise. Windows rattle; Buildings vibrate. Fear in most people.	500	148
Comparison	Maximum noise load value recommended by NC.	250	142

Table V.10.2-8 Noise impact on structures and facilities by level

IMPACTS ON STRUCTURES AND FACILITIES	Level	
	Pa	dB(C)
Unfastened objects fall and move on shelves	100	134
Cracks in ceilings; Wallpaper and poorly laid plaster may fall	150	138
Damage to glass	250	142
Cracking paint and wallpaper on drywall surfaces. Cracking plasterwork on wooden walls. Plasterwork falling in strips. Objects may fall from walls and shelves.	350- 500	145 148
Level recommended by Nitro Consult	250	142

Given the commercial blasting specifics, it is assumed that there is no uniform comfort limit value for comfort limit values for blastwork noise impacts in urban areas near open pits in the meaning of Regulation 6 of 2006 (*maximum admissible day-time limit value for residential buildings - 55 dBA*).

The trial-blast forecast values determined using the dependency derived from blasting of charges consistent with the operating blast works during the Rozino Deposit development are, in respect of the lateral airblast wave/noise impact – in the worst case, with a borehole diameter of 102 mm and charge weight of up to 30 kg, blasted within one delay interval, show that the forecast level of impact at a distance of 1,200 m (*as far as the first buildings in the Rozino village*) is 108-109 dB(C), which is classified as Moderately Strong Noise (see Table V.10.2-7) and is within the

limit values between ‘general conversation in a group’ and ‘telephone conversation’ (see Table V.10.2-9).

Table V.10.2-9. Noise levels for individual sources

NOISE LEVELS AT:	dB(A)	≈dB(C) 31.5Hz*
Whispering	10	47
Quiet conversation between two persons	40	80
<u>Regular conversation in a group</u>	<u>60</u>	<u>100</u>
<u>Telephone conversation</u>	<u>75</u>	<u>115</u>
Loud conversation	80	120
Automatic washing machine	80-85	120-125
Automotive transport.	75-106	115-145
Vacuum cleaner	75	115
*Minimal frequency value in the calculator		

Table V.10.2-10. Noise levels for individual sources

EFFECTS OF NOISE ON HUMAN HEALTH		
Noise, dB(A)	Effect on humans	
0-10	Noise perception limits	No effect on health
10-30	Very quiet noise	No effect on humans
30-50	Quiet noise	Slight effect on humans
<u>50-75</u>	<u>Moderately loud noise</u>	<u>Interference with communication, affects people psychologically</u>
75-100	Very loud noise	Inability to operate, impacts hearing
100-120	Unpleasantly loud noise	Hearing impairment, affects people psychologically, damages many other organs
120-150	Painfully loud noise	Loss of hearing

At the same time, it should be noted that the time of exposure to noise generated by technological blasting during mining of mineral resources in Bulgaria is 1-2 s, and that the safe exposure for this impact value (*up to 109 dBC*) is longer than 8 hours (see Table V.10.2-11).

Table V.10.2-11 Noise level and length of exposure without health effects

NOISE LEVEL WITHOUT HEALTH EFFECTS	
Noise level, dB(A)	Duration of exposure,
<u>85</u>	<u>8 hours</u>
88	4 hours
91	2 hours
94	1 hour
97	30 min.
100	15 min.
103	7.5 min.
106	3.8 min.
109	1.9 min.
112	57 sec.

NOISE LEVEL WITHOUT HEALTH EFFECTS	
Noise level, dB(A)	Duration of exposure,
115	28.5 sec.
118	14.3 sec.
121	7.1 sec.
124	3.6 sec.
127	1.8 sec.
130	0.9 sec.

The most frequent approach to non-disturbance of the comfort of the people residing near open pits and quarries will involve the use of the approach used most frequently when developing deposits of mineral resources - alignment with the local community of the time most suitable / acceptable for technological blasting.

As mining develops and the pit deepens below the upper edge, the airblast and noise impacts will be further limited by the shielding function of the non-mined benches.

Conclusions in line with the Report on the Assessment of environmental side impact by blasting in the Rozino Deposit, Kardjali Municipality:

The specialized equipment employed during trial blasting in the Rozino Deposit showed blast induced vibration levels lower than the maximum admissible limit values, and lower than the standard for comfort in the secured zones required by *Regulation 9/12.02.2010 on the Maximum Allowable Vibration Levels in Living Quarters*.

The airblast/noise impacts recorded 800 m from the trial blasting site in the Rozino deposit are significantly lower than the maximum admissible limit values stipulated by the current Bulgarian legislation and lower than the limit values accepted throughout the world.

Blastwork noise is lower than the recorded background noise measured during the day preceding the trial.

According to those present during the blasting, the feeling at a distance of 600 m. and 800 m. away was like a ‘distant thunder’.

The recorded side impact measurements during the blasting in the Rozino deposit fit within the cloud of results obtained through studies carried out in similar mine-engineering, natural and anthropogenic conditions in Bulgaria. This allows use of the mathematical formulae derived from these studies should be used to calculate the blasting vibration and airblast impacts in the Rozino conditions depending on the distance from the secured facility and the weight of the explosive charge ignited in one delay period.

The following conclusion can be made from the assessment of the blast impacts on humans and on the environment:

➤ the drilling and blasting design for the Rozino deposit conforms to the standards for safe impact on humans and structures during burden blasting for all three design blasthole diameters (76, 89 and 102 mm) and with separate (*stand-alone*) delay periods of ignition of each charge.

10.3. Vibration

Above-standard general vibrations. Published literature indicates that heavy equipment generates excessive levels of common vibrations. Older equipment generates stronger vibrations.

Operators of trucks, excavators and bulldozers will be exposed to common vibrations. Common vibrations damage primarily the musculo-skeletal and vascular systems. The resonance effect can also cause damage to many internal organs.

Local vibrations – of utility vehicles will be exposed to local vibrations. Their adverse impact on human health results in impairment of the sensory and micro-vascular system of the upper limbs. Those effects are exacerbated when working in an overcooling microclimate.

The drivers of earth moving and heavy duty machines will be exposed to general and local vibrations. These may not exceed the admissible limit values in the case of new and modern equipment. Above-standard vibration levels in some of these (mainly older) machines may cause damage to the vestibular system, the locomotor system and to the parenchyma, and, also, development of vibration disease - a frequent occurrence among such workers. Where vibration sources are present in the occupational environment, the investor will also ensure compliance with the regulations - the Bulgarian State Standard 12.1.012-80 on the general production related vibrations and Bulgarian State Standard 16013-84 on the local production related vibrations.

10.4. Radiation

It can be seen from the assays that the samples from the controlled areas conform to the requirements for specific activeness of natural radionuclides, laid down in Attachment 3, table 3 of the Regulation on Radiation Safety, in order to deregulate large quantities of materials. No hazard is present to the environment, the on-site workers and the population and, therefore, no particular measures and activities are needed to ensure radiation safety.

The gamma-spectrometry analysis results compared to the standards in the current legislation show that the materials removed from the site do not pose a threat to the environment and would not cause changes to the natural radiation background of the site. The radioactivity measured in the studied layers is sufficiently low to prevent pollution and distribution of radioactive isotopes into the remaining environment media.

The mining operations will not be a source of increased radionuclide content and will not cause sudden or gradual increase in radioactivity of the waste rock, the mine waste and the waste water.

As a general rule, fluids and solids are extracted during the mining and processing of polymetal ores and frequently contain natural radioactive isotopes such as Uranium-238, Thorium-232, Radium-226 and 228, Radon-222 (gas). These elements may accumulate in rock formations, pipelines, reservoirs and sediments, and in the water which are present during mining. The Rozino Deposit is a conventional deposit for mining and processing of polymetal ores. According to the laboratory testing of rocks taken from the RTD-015 borehole at depths down to 166 m., **no highly radioactive geological units have been established/registered.**

According to Article 7 of the Regulation on Radiation Safety, two months prior to beginning an activity referred to in Article 1, Enterprises intending to initiate activities involving materials with increased content of natural radionuclides must submit to the Chair person of the Nuclear Regulation Agency information about the activity and the specific activeness of the respective materials and an evaluation of the expected doses.

To ensure prevention, periodic dosimetric control by an accredited laboratory is recommended for the forthcoming stripping and mining operations, with measurement of the

gamma-radiation dose rates at specific points on-site and gamma-spectrometry analysis of representative samples of rock and flotation tailings generated by the operation.

The environmental consequences of higher radioactivity in any elements or layers may be, in principle:

Soil and groundwater contamination

The proposed preventive measures and the process management conditions are not conducive to entry into, and contamination of, the soil, surface or ground waters or the aquifers, of any waste or waste water that may contain radioactive elements.

Surface water pollution

The proposed preventive measures and process management conditions will prevent leaking of waste water and materials that may contain radioactive substances into surface water bodies and cause radiation contamination. Strict water management measures are taken.

Air pollution

Radon vapours – radon is a radioactive gas that could be released into the air during drilling and blasting. Radon is a known carcinogenic material, especially through chronic inhalation. Since the presence of humans is prohibited during drilling and blasting, this assumption is inapplicable.

Welding operations will be carried out during the construction of the Processing Plant. A combined effect of chemical exposure and radiant (ultraviolet and infra-red) energy will be observed during the welding operations, with visible spectrum radiation. The intensity of the infra-red radiation will differ and vary between 100 and 2,450 W/m^2 depending on the technical parameters and weight of the heated material. Regarding ultraviolet radiation - a summary spectral density at a distance of 1 m is specified, being 0.4 - 162 W/m^2 from the heated zone. Infra-red and ultraviolet radiation affect the visual analyser and personal protective equipment such as goggles and helmets will be required.

10.5. Assessment of drilling and blasting impacts

The main requirement during blasting for open-pit mining of ores and minerals is to ensure the maximum blast effect as follows:

- complete blasting of the rocks (without thresholds and level elevation) with commercially suitable grain size of the blasted material;
- management of the blasting side effects within the established safe human and environmental limit values.

Blasting side effects which are the object of evaluation and subject to management during technological blasting include:

- a blasting and seismic effect,
- generation of an airblast wave / noise (*considered in sub-item V.10.2*),
- flyrock;
- emission of harmful gases (*considered in sub-items V.1.1 and V.1.2*).

This sub-item considers blastwork impacts by flyrock.

When blasting on steep slopes and the upper line of the blasted section is higher than the remaining sections by more than 30 M, the radius of the danger zone is determined in accordance with Article 15 of Annex 7 to the Blasting Safety Code, depending on the slope angle or on the

height of the location of the explosion above the level of the secured zone. The safe distance (R) is as follows:

- westward along the slope - $R = 360 \text{ m}$;
- southward along the slope - $R = 380 \text{ m}$;
- eastward along the slope - $R = 400 \text{ m}$.

The radius of the zone secured against the dangerous effects of the blasting works is the longest of the radii determined using various factors, as follows:

1. Airblast impact on humans $R = 94 \div 140 \text{ m}$,
2. Flyrock:
 - on level terrain $R = 320 \text{ m}$;
 - blasting toward a slope $R = 400 \text{ m}$.

3. Article 143 of the Safety Rules Applicable to Blasting Operation requires the following during commercial blasting of borehole charges ($d \leq 110 \text{ mm}$):

- The safe distance for humans of no less than $R = 300 \text{ m}$,
- The safe distance for humans when blasting toward slopes is $R = 450 \text{ M}$.

Since the deposit is situated in a hill, the secured zone radius will not be less than $R = 450 \text{ m}$.

The distance (R) between the outer contour of the design Rozino Mine and the zones to be secured against exceeding the admissible lateral impact levels of the technological blasting operations during operations in the Rozino Deposit is as follows:

- Safety perimeter: $R=450 \text{ m}$
- Eco zone 1 – Natura 2000: $R=600 \text{ m}$
- Eco zone 2 – Natura 2000: $R=800 \text{ m}$
- Water header $R=705 \text{ m}$
- Yuren Dere (*outline of a PA for bird habitats*): $R=650 \text{ m}$
- Rozino Village $R=1200 \text{ m}$

The commercial blasting works during the operation of the Rozino Deposit are designed to break the rock mass using explosive charges placed in blast holes with diameters of 76 to 120 mm. Ammonium nitrate - fuel oil (ANFO) and/or site-mixed emulsion are intended for use as the main explosives.

The derived dependencies for seismic impact dependencies, air blast and noise were used to calculate the predicted levels of impact caused by the highest mass of charge in the single boreholes depending on the distance from the secured facilities, depending on the distance to the secured zones (*see Table V.10.2-3*). For the sake of comparison, the same table presents also the maximum admissible levels used in the Bulgaria and international standards.

As can be seen from the results in Table V.10.2-3, when blasting each charge with a separate delay period, the calculated values for blasting vibration impact for all three charge (*blasthole*) diameters are significantly lower than the admissible limit values for all factors: humans, buildings and facilities, including comfort.

Conclusions in line with the Report on the Assessment of environmental side impact by blasting in the Rozino Deposit, Kardjali Municipality:

The Rozino Deposit mining scheme selected in the basic design involves short benches (5 m), short boreholes (~6 m) of relatively small diameter (76-102 mm) and is one of the most environmentally benign techniques for mining of ores and minerals by blasting of the rock mass. Using modern explosive charge initiation systems completes the possibilities for efficient management of explosion side impacts.

The recorded side impact measurements during the blasting in the Rozino deposit fit within the cloud of results obtained through studies carried out in similar mine-engineering, natural and anthropogenic conditions in Bulgaria. This allows use of the mathematical formulae derived from these studies should be used to calculate the blasting vibration and airblast impacts in the Rozino conditions depending on the distance from the secured facility and the weight of the explosive charge ignited in one delay period.

The following conclusions can be made from the assessment of the blast impacts on humans and on the environment:

the drilling and blasting design for the Rozino deposit conforms to the standards for safe impact on humans and structures during burden blasting for all three design blasthole diameters (76, 89 and 102 mm) and with separate (*stand-alone*) delay periods of ignition of each ;

As the deposit is situated in a Natural 2000 area, the drilling and blasting process should employ the minimal possible side impact on the environment by the blasting. The drilling and blasting parameter with the lowest side impact is the blasting process with charges up to 76 mm. in diameter. Barring any other aggravating conditions, it is recommended that the blasthole diameter be 76 mm.

The results show that where the required trial blasting parameters are observed, the predicted seismic impact levels at different distances outside the pit are as follows:

- consistent with the provisions of Article 1 of Annex 7, Instructions for the Defining of Safe Distances during Blasting under Article 141 of the Safety Rules Applicable to Blasting Operations;
- below the maximum allowable vibration levels in living quarters, as provided for *Regulation 9 of February 12, 2010 on the Maximum Allowable Vibration Levels in Living Quarters*;
- the calculated blasting vibration impact values are substantially lower than the admissible limit values: humans, buildings and facilities, including comfort.

Protective blasting mats are recommended for blasting boreholes at distances below 300 m. from urban areas in order to prevent fly rock and risks for the population and the environment.

10.6. Conclusions

Noise and vibrations

1. Noise impacts from IP implementation will be localised on site. The admissible levels of background noise in residential areas will not be exceeded.

2. Moving heavy-duty equipment will not cause substantial increase of background noise levels.

3. No objects in need of increased protection or residential areas in the secured zone will be affected during blasting operations.

4. The impact on the workers will be insignificant if preventive measures and personal protection equipment are used.

The sources of noise and vibration will be dispersed, with a limited territorial range. The impact will be of short duration and of varying recurrence.

By type of impact: insignificant

Area of impact: Local;

Occurrence of impact: temporary, during the operation phase (*during weekdays*)

Duration of impact: the periods of construction, operation, closure and rehabilitation.

Cumulative and combined impacts: insignificant

Radiation

The machines and facilities used for stripping, mining, closure and rehabilitation are not sources of magnetic, electromagnetic, thermal or other types of radiation.

Under normal operation the IP will not cause radioactive contamination of the environmental media.

Summarised conclusions regarding the impact by radiation and on the natural radiation background

By type of impact: none expected under normal operating conditions; insignificantly negative during potential emergencies, and non-cumulative;

By territorial extent of the impact: local, within the concession area; without impact on the local population and on the protected areas;

Occurrence of impact: very low

Duration of impact: during the period of operation, but only in emergencies;

Cumulative and combined impacts on the environment: The IP will have no measurable cumulative effect on the radiation background in the region.

11. Assessment of the environmental and occupational health aspects and risks to human health

The impacts were analysed for the on-site workers and for the near-by population during the various stages of the IP.

11.1. Risk assessment and health effects during construction

The IP construction phase will involve in-pit road construction, preparation of stockpile areas (*for topsoil and overburden*), Processing plant construction, and preparation of quarry entry faces.

A. Risk factors and impacts on the workers

Bottled drinking water will be provided to the workers. Water from the non-contact reservoir will be used for household purposes (for the toilet facilities). Mobile ISOBOX containers for the administration and change-room facilities are provided for.

Specific work-place conditions exist in respect of construction works and are a complex of production related factors - microclimate, noise and vibrations, dust, toxic gases, and chemical substances. The analysis of their impacts is the following:

Unfavourable micro climate – The micro climate outdoor-worksite conditions depend on the regional climate and weather (analysed in detail in **item IV.1.1** of the EIA Statement). Unfavourable micro-climate conditions caused by high air temperatures and intense evaporation are observed during the summer period. In winter and during the transitional seasons the weather is cold with frequent strong wind and precipitation.

Exposure to unfavourable micro-climate (high or low temperatures, humidity, rain, snow, ultraviolet radiation) is related to body overheating or cooling (overstressed heat regulation), risk of colds, with more temperature and rainfall anomalies with more frequent unfavourable climate being expected, given the trends in climate changes.

UV radiation affects predominantly the skin surface and the eyes, but is known also to suppress the immune system. Abrupt and excessive exposure to UV radiation may cause painful but reversible inflammation of the cornea and ocular conjunctiva felt as ‘sand in the eye’, and to inflammatory skin reddening (erythema - a synonym for sunburn). Long-term exposure to high UV radiation increases both the risk of development of white (non-melanoma) and black (melanoma) skin cancer, and, also, cataract cancer. Acute health effect may be delayed for a few hours, but the latency in diseases caused by chronic exposure to UV radiation is in the order of decades.

The risks are minimized by using adequate work and protective attire consistent with the specific weather, provision of rooms for warming up and rest, provision of suitable liquids (warm drinks in winter and fruit drinks in summer).

High noise levels – Construction machinery, transport vehicles and drilling and blasting will be the sources of noise. The equivalent noise levels for the main machinery used during the operations in the deposit will vary between 68 and 110 dB(A). The effects on the workers are categorised as specific (aural noise effects) and non-specific (extra-aural noise effects):

- *Aural disorders* caused by exposure to noise at work are among the most significant occupational diseases. Aural vulnerability is considered substantially higher after 40 years of age. The consequences for the aural organ can be:
 - masking noise effect or difficult differentiation of noises in the presence of additional noise;
 - aural fatigue (transient lowering of aural-receptor activity as a result of short exposure to noise) - disappears within a week after rest;
 - occupational hearing loss (hearing damage through prolonged exposure) whose worst stage is practical and total deafness - in the event of prolonged exposure to noise levels higher than 85 dB(A);
 - acute acoustic trauma - occurs as a result of sudden exposure to very intense noise exceeding the pain level (such as during drilling and blasting) on unprotected ears. It is typified by acute pain and buzzing in ears, loss of hearing, potential drum membrane rupture, lesions of the auditory ossicles in the middle ear.
- *Extraaural noise effects* – these are related to an indirect impact on the nervous, endocrine, cardio-vascular and other systems as a result of noise stress:
 - The impacts on the central nervous system can cause psychomotor disorders (during exposure to intense and very intense noise), possible effects being difficulty

in simultaneous performance of mental and motor activities, attention-span issues, difficult recovery after work. Highly intense noise may cause dizziness and gait disorders endangering individual and collective safety;

- Noise causes increased secretion of adrenalin and aldosterone, electrolyte changes with increasing serum-calcium and magnesium and increasing of magnesium and phosphate excretions;
- Above-standard noise increases the cardio-vascular risks. There is a prevalent opinion about a positive link between arterial hypertension and exposure to noise, increase in serum cholesterol and triglycerides.

Unfavourable impacts are prevented by measures being taken and instructions applied for adherence construction and transport machinery operation rules, rational work and rest regimens, and extended annual leave. Limiting the duration to exposure by interchanging of workers from various disciplines is considered the most important measure. The technical measures include soundproofing of the cabins of construction machinery and transport vehicles, and choosing of adequate transport-vehicle speeds. Earmuffs are mandatory for those working in the open and compliance with the limit values of exposure according to *Regulation 6 on the Minimum Requirements for the Health of Workers Operating in Environments with Risks of Exposure to Noise, including through periodic measurements of noise*, should be ensured.

General and local vibrations - According to published data and control measurements, heavy-duty and construction machines generate vibrations above the limit values. Older equipment generates stronger vibrations. Operators of trucks, excavators and bulldozers will be exposed to general vibrations. Common vibrations damage primarily the musculo-skeletal and vascular systems. The resonance effect can also cause damage to many internal organs.

The operators of concrete vibrators and tamping machines will be subjected to local vibrations. Their adverse impact on human health results in impairment of the sensory and micro-vascular system of the upper limbs. Those effects are exacerbated when working in an overcooling microclimate.

Compliance with the provisions and limit values laid down in *Regulation 3/05.05.2005 on the Minimum Requirements for Ensuring the Health and Safety of Employees against Risks of Exposure to Vibrations, including aircraft-related vibrations*, must be ensured through measurements. A fundamental technical measure to limit vibrations, incl. noise, is the vibration and noise dampening of the machine cabins, compliance with the technical characteristics regarding general vibrations by construction and transport vehicles.

Radiation - Welding operations will be carried out during the construction of the Processing Plant. A combined effect of chemical exposure and radiant (ultraviolet and infra-red) energy will be observed during the welding operations, with visible spectrum radiation. The intensity of the infrared radiation will differ and vary between 100 and 2,450 W/m² depending on the technical parameters and weight of the heated material. Regarding ultraviolet radiation - a summary spectral density at a distance of 1 m. is specified, being 0.4 - 162 W/m² from the heated zone. Infra-red and ultraviolet radiation affect the visual analyser and personal protective equipment such as goggles and helmets will be required.

Air pollution – Impacts predominantly by damaging the function of the respiratory, cardio-vascular and immune systems. The main pollutants are:

- *High levels of dust* – the activities will be carried in the open. Particulate matter may reach high concentration levels under the worst weather conditions (dry and windless weather). The particulate matter emissions are also fugitive and will depend largely on the weather conditions (wind, humidity, temperature, atmospheric resilience), soil structure, the type and quality of aggregate materials, and other conditions. The inhalable and respirable (PM₄) dust fractions, as well as respirable free silicon dioxide, are of hygiene significance. Dust particles enter the body by inhalation, with the coarser particles being retained in the upper respiratory tract, while the finer matter reaches the lower sections of the respiratory system, damaging the lung tissue. High dust levels involve a risk factor for the development of lung diseases due to the irritating effect of dust, e.g. rhinitis, chronic bronchitis and similar complications, and also for the development of occupational dust-related pathology (pneumoconiosis). Pneumoconioses are occupational lung diseases related to accumulation of dust in the lungs. They include silicosis which is caused by free crystal silicon dioxide which may be contained in the earth and be released in the ground-level air during excavation and backfilling. Silicosis is a fibrous disease of the lungs caused by inhaling and settling of free crystal silicon dioxide.
- *Carbon monoxide* – emitted by transport vehicles. Enters the body by inhalation and binds to haemoglobin in the blood, forming carboxihaemoglobin whose bond is far more stable as compared to oxyhaemoglobin. Its harmful effect arises from disturbed transferring of oxygen to the tissues. Carboxihaemoglobin causes hypoxia in the tissues and disturbances in the oxygen-deficit sensitive organs and tissues - the heart, brain, blood vessels and formed elements. The health risk is evaluated on the basis of carboxihaemoglobin formed in the body, which depends on its concentration in air and duration of exposure;
- *Nitrogen and sulphuric oxides* – when contacting the body, they transform into irritating and corrosive acids affecting mainly the respiratory system causing breathing disorders, lung immunity disorders, exacerbation of existing diseases (asthma, cardio-vascular diseases, chronic lung diseases);
- *Diesel engine exhaust* – these emissions comprise a complex mixture of particles, liquid aerosols, gases and vapours formed as the product of diesel combustion during diesel engine operation. The mix composition depends on the engine type, on the quality of the diesel fuel and on the operating conditions. The mix includes several substances with proven carcinogenic effect. The short-term exposure can cause eye, nose, throat and lung irritation. Prolonged exposure may increase the risk of chronic respiratory diseases, including lung cancer.

According to the assessment on ambient air quality impact, carried out in **item V.1** of the EIA Statement, the expected concentrations of pollutants into the ground-level atmosphere are below the threshold limit values for gases in the occupational environment air. Internal combustion exhaust is released into the atmosphere at high temperature and, therefore, quickly scatter upward. Pollution in the ground air layer settles over short distances (as far as 200 m) and over a large area, thus guaranteeing compliance with the occupational air quality standards.

As required by *Regulation 13 on Employee Protection against Risks of Exposure to Chemical Reagents at Work* and *Regulation 10 on Employee Protection against Risks of Exposure to Carcinogenic, Mutagenic and Reprotoxic Substances at Work*, the Occupational Health and Safety Plan should provide for periodic measurements during the construction phase of any inhalable and respirable particulate matter, respirable free crystal silicon dioxide, diesel engine, vehicle and service plant exhaust (CO_x, NO_x, SO_x, incompletely incinerated hydrocarbons, soot, various types of oil, and the reagents required for the enrichment process, in mg/m³), in keeping with the requirements of Bulgarian State Standard БДС EN 689:2018+A1:2019. 10.

Limiting exposure to particulate matter and to other pollutants in the ambient air should include measures such as spraying (a technical measure), occupational safety instructions, adequate personal protection equipment, preliminary and periodic medical check-ups, and no persons suffering from chronic lung and cardio-vascular diseases should be allowed in workplaces in which exposure to particulate matter is present.

Exposure to hazardous chemical substances – only diesel fuel will be used during the construction phase (no diesel fuel will be stored on site and tank trucks will deliver fuel for the machinery), and motor and lubrication oils (two 110 kg barrels for each type). The health hazards are as follows:

- **Diesel fuel:**
 - Toxic if inhaled, Category 1, H304: May be fatal if swallowed and enters airways.;
 - Irritating the skin, Category 2, H315: Causes skin irritation;
 - Acute toxicity, Category 4, H332: Harmful if inhaled;
 - Carcinogenic, Category 2, H351: Suspected of causing cancer;
 - STOT RE 2 H373: May cause damage to organs through prolonged or repeated exposure.
- **Prista® M10 De motor oil:**
 - Irritating the skin, Category 2, H315: Causes skin irritation;
 - Serious eye damage/eye irritation, category 1 H318: Causes serious eye damage;
 - Serious eye damage/eye irritation, category 2 H319: Causes serious eye irritation;
 - Reproductive toxicity, category 2 H361; Suspected of damaging fertility or the unborn child.
- **Prista AN 68_100 lubricating oil:**
 - Acute toxicity (oral), Category 4, H332: Harmful if swallowed;
 - Sensitisation - skin, category 1 H317: May cause an allergic skin reaction;
 - Serious eye damage/eye irritation, category 1 H318: Causes serious eye damage;

Work involving chemical substances will be carried out in accordance with the material safety data sheets which should be available on site and made known to the workers, who should be inducted in occupational safety.

Physical strain - Work during the mining and processing of polymetal ores is highly mechanised. Manual labour requiring significant physical efforts will also be used as required. In terms of physical strain, the work load can be classified as "moderately heavy" to "heavy". The effects are managed with suitable work schedules and activity-implementation instructions, including changing of work positions and rest during the work shift.

Labour traumatism – Labour traumatism is related to slipping, tripping, and falling risks and, also, striking by falling objects, working in inconvenient posture, and injuries by machinery and equipment. These risks are prevented by applying specific occupational safety instructions and using adequate workwear.

In summary, the impacts on the workers during this stage will be short-term, completely controllable and reversible if adequate occupational safety measures are taken, and, therefore, of minor degree and significance.

B. Risk factors and impacts on the near-by population

Based on the determined impacts by construction/pre-stripping works in the mined areas and facilities on the other environmental media and factors, evaluated in the remaining sub-items of **item V** of the EIA Statement, the risks and impacts on the environmental health and hygiene aspects in near-by settlements and in the nearest sites in need of health protection, are as follows:

- **In respect of ambient air quality in the near-by settlements:**

Entering the respiratory system, atmospheric pollutants, including particulate matter, affect negatively the physiological mechanisms of respiratory tract self-purification, thus extending the duration of exposure and the harmful impact of such substances. Depending on their size and state of aggregation, these pollutants are distributed to various parts of the respiratory system, with the smallest reaching the lung alveolae from where they and the volatile organic compounds absorbed onto their surfaces enter the lung macrophages and, therefore, the entire organism. Undesired health effects may emerge with acute symptoms, most frequently reversible and fading after termination of the short-term exposure, while frequent exceeding of atmospheric pollutant threshold values and cumulative multi-annual exposure may provoke lasting functional and morphological changes of the respiratory tract and lead to chronic disease or exacerbation of existing diseases.

Generally, the potential harmful effect of exposure to atmospheric pollutants, including fine particulate matter, is as follows:

- Reduced pulmonary function;
- Increased susceptibility to respiratory infections;
- Complicated progress of existing cardio-vascular diseases;
- Complicated progress of existing chronic respiratory diseases, including asthma;
- Reduced average lifespan.

These effects imply higher likelihood of:

- Pulmonary carcinoma;
- Foetus development problems (low weight at birth) and inhibited functional development of the respiratory system;
- Increased number of hospitalizations;
- Increased visits to emergency aid medical centres;
- Increased number of visits to general practitioners;
- Increased use of medications.

The construction works involve fugitive emissions of harmful substances released into the ambient air by operating construction machinery and transport vehicles. According to the analyses

carried out in **item V.1** of the EIA Statement, the expected concentrations of pollutants into the ground-level atmosphere are below the threshold limit values for gasses in the occupational environment air. Internal combustion exhaust is released into the atmosphere at high temperature and, therefore, quickly scatter upward. Pollution in the ground air layer settles over short distances (as far as 200 m) and over a large area and, therefore, no ambient air pollutant concentrations are expected to reach the nearest settlements. The intended spraying of the site will reduce further the distribution of atmospheric pollutants.

- **In respect of water, including potable water sources and facilities:**

According to the evaluations made in **item V.2** of the EIA Statement, no negative impacts on surface water are expected during the construction works. The analysis of the impact on ground water during this stage shows that the intended design solutions (bottom and wall lining of the contact water reservoir, drainage curtain, grout wall) will not allow polluting of the ground water. Also, the quantitative status of the affected groundwater body will not deteriorate. Therefore, no human health risks related to potable water quality or quantity are expected.

- **In respect of soil quality in the region:**

The soil cover will be encroached upon directly only in the mining section as a result of extraction and uncovering of the reserves. The soils in adjacent terrains will be affected only by transport vehicle emissions deposited in the immediate proximity to the road surface - to a low extent, of low significance, localised and reversible. Therefore, no negative impacts on arable lands on which agricultural produce is grown are expected and, therefore, no human health risks are present.

- **In respect of harmful physical factors (noise, vibrations, non-ionising and ionising radiation):**

The health risks related to exposure of on-site workers to noise and vibration are reviewed above.

According to the noise-impact analysis and evaluation (in **item V.10** of the EIA Statement), there will be up to 55 dB(A) noise load within a 100 m radius from the noise source (construction machinery) and up to 45 dB(A) at a distance of 150÷200 m from the source and that the environmental impact will be insignificant. The maximum noise level in places of protection (the nearest residential building, in the Byal Gradets village, is 1,548 m away from the Processing Plant site) is expected to be as high as only 25 dB(A), which is 30 dB(A) below the limit values for noise levels in residential zones and areas.

The vibrations are completely localised and occur adjacent to the used construction and transport machinery, without reaching the near-by population.

The activities during the construction phase do not involve generation of non-ionising and ionising radiation and, therefore, the population will not be subjected to risks related to radiation.

- **In respect of waste and hazardous chemical substances:**

Managing the generated **waste** in accordance with the regulatory framework ensures lack of health impacts and risks for the near-by population.

Proper use of **hazardous substances** (diesel fuel and oils used during construction) consistent with the regulatory requirements and with the material safety data sheets is not expected to affect the near-by population which will not be affected by potential accidents (given the small

quantities of hazardous chemicals available on site, and the sufficient distance from the nearest sites in need of health protection).

- **In respect of climate change:**

The consequences of climate change concern only on-site workers because they will be exposed to more extreme weather events (provided that the current climate change trends, temperature and precipitation, in particular, continue). This impact is controllable and adjustable using suitable work clothes and personal protection equipment, selecting suitable work and rest times, and ensuring of suitable amenities. No impacts on the near-by population are expected.

- **Visual impact:**

The topography and existing tree vegetation in the territories between the disturbed areas and the nearest settlements, including the envisaged buffer area within the concession, will prevent any visual impact by the construction works, and the disturbed areas will not be visible by the population.

11.2. Evaluation of risks and impacts during operation (extraction of reserves and processing in the Processing Plant)

A. Risk factors and impacts on the workers

The risk factors for **outdoor workers** (50 persons) involved in mining, stockpiling and tailings management facility operations overlap with the risk factors present during the construction phase, with risks related to **drilling and blasting** being added. The drilling and blasting works involve burst emissions of toxic gases, dust, intense noise, vibrations, and blast waves):

- Blasting vibration impact – The high-speed expansion of gasses during the blasting reaction forms a high-pressure front in the atmosphere around the charge that can cause damage to machines, facilities, buildings, people, animals, etc., a certain distance away.
- Airblast wave – This wave is created by blasting below the ground surface. Non-limiting of this factor may cause damage to near-by structures;
- Flyrock – Rocks thrown out by the blast may cause damage to anyone present in the danger zone, which as a matter of rule and by law is inadmissible;
- Toxic gas impacts – A gas-and-dust cloud is formed above the blast field containing toxic gases produced by the blast reaction, which are hazardous for any people inside this concentrated cloud. Depending on the particular weather during the blast, this cloud scatters and dilutes at a certain distance away from the blast site.

The drilling and blasting impact will be within the admissible limit values when the relevant regulatory framework is complied with, involving correct determining of safe blasting distances (incl. flyrock danger zones, the blast seismic impact distance, the airblast wave distance, and the toxic-gas impact safe distance), adherence to the drilling and blasting rules and standards, and use by the workers of suitable personal protection equipment. Additional measures to safeguard and limit the extent and degree of drilling and blasting impacts are provided for in this particular IP, such as use of blasting mats preventing flyrock. These protective covers could be heavy rubber blasting mats or geotextile or light covers made of wide and smaller mesh nets used together with discarded post-use conveyor belts. Properly positioned over the blast field, the protective covers restrict flyrock. Blasting mats reduce the generated noise and dust raised during

blasting. The individual protective covers will be positioned in a manner that enables blasting fumes to escape. This reduces blasting fume pressure and allows for a debris and dust suppression by the mats. Another substantial advantage is that the covers can be used multiple times. An attachment here presents a *Report on the Evaluation of the Side Impact of Blasting on the Environment, Rozino Deposit*, Kardjali Municipality (Attached with the EIA Statement), while **item V.10.4** of the EIA Statement evaluates the drilling and blasting impact and defines the safe distance and radius of the zone secure against dangerous blasting impacts (not shorter than 450 m.). As can be seen from the results in **Table V.10.2-3**, when blasting each charge with a separate delay period, the calculated values for blasting vibration impact for all three charge (*blasthole*) diameters are significantly lower than the admissible limit values for all factors: humans, buildings and facilities, including comfort.

The risk factors for **workers in the processing plant** (70 persons) are defined by the essence of the activities carried out – crushing and hauling, storing the crushed ore in indoor buffer storage, milling, flotation with reagents (frother: Methyl isobutyl carbinol (MBIC), Collector: Potassium Amyl Xanthate (PAX), Activator: Copper sulphate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), Sulphidizer: Sodium hydrogen sulphide (NaHS), Collector: Aerofloat 404 (A404), Flocculant (mix)), flotation tails thickening, concentrate thickening and filter-press dewatering, generated hazardous waste.

In ore-dressing, the workers are exposed to aerosols of complex composition (dust in the crusher units and vapours in the flotation units), noise, vibrations, discomforting climate.

The workers servicing the crusher units and the conveyor belts have no fixed workplace since they walk around various machines and are exposed mainly to dust and unfavourable microclimate. Adequate ventilation is provided for enclosed premises and proper protective attire and personal protection equipment are provided to the workers.

Reagents are stored in isolated separate storage facility from which they are fed to the flotation units by an automated system. The workers are in no direct contact with the reagents. For a detailed description of the **reagents** and the hazard categories, including human-health hazards, see **item V.9** of the EIA Statement. Their storage and use are consistent with the Material Safety Data Sheets and this guarantees protection of workers against harmful impacts.

The flotation unit workers are operators and the processes are automated, minimizing exposure to toxic chemical reagents. The flotation vessels are open and the content of harmful substances in the vapours is minimal, within the admissible occupational-environment levels, according to the design data. Adequate ventilation is provided.

The processes are automatic, controlled by monitors and sensors picking up any possible deviation from the normal production process, in which case operation of the plant is stopped automatically.

Measures are provided for in the design to limit the emission of pollutants, such as a sprinkler to prevent secondary dust emissions, including during the unloading and crushing processes. Good air quality will be maintained in this way in each crusher building. The crushed material facilities are covered, which will prevent spreading of dust.

Any spill along the circuit is collected by sump pumps mounted on the flotation circuit floor and is fed to the respective points along the flotation circuit.

As regards **hazardous waste generation**, the worker health risks are:

- Used hydraulic oils with code 13 01 10*, gear oils with code 13 02 06*, oil filters with code 16 01 07* comprise the same hazards as the products from which they result, and are considered above;

- Brake fluids with code 16 01 13* - the health risks depend on the contents of the specific brake fluid which, depending on the particular composition, may possess reprotoxic properties (damage of the foetus), may be harmful to the eyes (acute irritation), or highly toxic (harmful if swallowed);

- Batteries with code 16 06 01* - the health risks posed by disused lead batteries result from their components (lead, sulphuric acid, lead dioxide, lead sulphate), and the potential health effects are related to harmful effects from inhalation (caustic to the mucus membranes), harmful skin effects (highly aggressive, causing severe burns), harmful for the eyes (highly aggressive, causing severe burns, may damage the cornea and cause blindness), harmful for the digestive tract (corrosive, may cause burns in the mouth, throat and stomach);

- Equipment wiping cloths and protective clothing with code 15 02 02* may be polluted with the above-mentioned chemical substances and be the source of the same potential human health risks and harmful effects.

Instructions on safe use of all hazardous waste should be prepared.

As regards **noise in the work environment**, the Investor will fulfil its obligations according to *Regulation 6 on Minimum Requirements for the Health of Workers Operating in Environments with Risks of Exposure to Noise*, by ensuring compliance with the noise limit values, based also on periodic noise measurements and, where necessary, by making the arrangements necessary to reduce the harmful impact of this factor (suitable work/rest regimen for workers, individual protective equipment, etc.).

As regards the risks of **radioactive impact**, the activities do not include mining or processing of materials with established higher content of natural radionuclides. The geochemical, spectral and mineralogical studies conducted so far do not show higher concentrations of radioactive elements (U, Th, Ra) in the ore or in the host rocks. The analysed tailings samples (ARD analyses) also do not exhibit any radiological activeness or acid generating potential. The waste materials are classified as harmless, non-acid generating and non-hazardous, confirming the stability of the mineral composition and the inability to mobilize radionuclides. Additionally, 17 representative samples were taken and assayed – one from the flotation tailings and 16 from the rocks at varying depths within the deposit. The assay results show that the samples from the controlled areas conform to the requirements for specific activeness of natural radionuclides, laid down in Attachment 3, table 3 of the Regulation on Radiation Safety, in order to deregulate large quantities of materials. No hazard is present to the environment, the on-site workers and the population and, therefore, no particular measures and activities are needed to ensure radiation safety. Accordingly, there is no need for measures for protection, control and restriction of exposure to radiation in respect of this IP as required by *the Regulation on Radiation Protection during Activities with Materials with Increased Content of Natural Radionuclides*.

Safety instructions are prepared and applied for each work position and adherence to these instructions ensures the prevention of health risks, incidents and accidents.

The risks are defined as long-term, completely controllable and reversible, and, therefore, insignificant.

B. Risk factors and impacts on the near-by population

- **In respect of ambient air quality in the near-by settlements:**

The ambient air impact evaluation in **item V.1.2** of this EIA Statement shows that activities in the worst case (the IP implementation period during which maximum atmospheric air pollution is expected, or the first four years of the IP implementation when mining will be carried out concurrently with stripping of the deposit and dumping of overburden on an external stockpile when mining will be carried out) do not cause any significant impact on ambient air quality, the maximum estimated annual average values for PM₁₀ and PM_{2.5} being substantially below the human-health protection admissible levels.

- **In respect of water, including potable water sources and facilities:**

According to the evaluations made in **item V.2** of the EIA Statement, no negative impacts on surface water are expected. The analysis of the impact on ground water shows that the intended design solutions (bottom and wall lining of the contact water reservoir, drainage curtain, grout wall) will not allow polluting of the ground water. Also, the quantitative status of the affected groundwater body will not deteriorate.

- **In respect of soil quality in the region:**

The soil cover will be encroached upon directly only in the mining section as a result of extraction and uncovering of the reserves. The soils in adjacent terrains will be affected only by transport vehicle emissions deposited in the immediate proximity to the road surface - to a low extent, of low significance, localised and reversible.

- **In respect of harmful physical factors (noise, vibrations, non-ionising and ionising radiation):**

The expected noise impact assessed in **item V.10.2** of the EIA Statement shows that:

- The expected noise levels **generated by machinery during stripping, mining and processing** and reaching the nearest sites in need of health protection – housing in the Byal Gradets, Gugutka and Rozino villages, are significantly lower than the limit value of 45-55 dB(A), and this includes the noise levels from each source - **Table V.10.2-4**, and the total noise levels – **Table V.10.2-5** above. The maximum noise levels in the area of sensitive objects in need of increased noise protection will be insignificant, at 18.5-21.9 dB(A), with the admissible levels being 45-55 dB(A). It is important to note that at these noise levels (up to 21.9 dB(A)) the mining operations on the IP site will not be heard by people in the near-by settlements.
- The transport-vehicle noise calculated as the equivalent level at a distance of 5 m from the in-pit roads does not exceed 40 dB(A). No change of background noise levels related to operating heavy-duty equipment is expected in the nearest settlements;
- The blasting noise has been determined by way of experimental blasting with the estimated impact level at a distance of 1,200 m (as far as the first buildings in the Rozino village) being 108-109 dB(C), which is classified as ‘Moderately loud noise’ (see **Table V.10.2-7**) and is within the limits of impact between ‘conversation in a group’ and ‘telephone conversation’ (see **Table V.10.2-6**). At the same time, the duration of exposure to noise generated by technological blasting during mining of mineral

resources in Bulgaria is 1-2 s, and that the safe exposure for this impact value (up to 109 dBC) is longer than 8 hours.

No breach of the background radiation and no radioactive pollution of air, water and soil on the IP territory are expected. The machines and facilities used for stripping, mining, closure and rehabilitation are not sources of **magnetic, electromagnetic, thermal or other types of radiation**.

- **In respect of waste and hazardous chemical substances:**

Managing the generated **waste** in accordance with the regulatory framework ensures lack of health impacts and risks for the near-by population.

No impact on human health is expected in the case of proper use of **the hazardous substances** in accordance with the regulatory requirements and with the material safety data sheets. No explosives will be stored on site.

- **In respect of climate change:**

IP implementation will not have any effect on the local climate, and the consequences of climate change which are observed and predicted for Bulgaria and for the region under consideration, will not be affected by the IP implementation. Therefore, no impact related to climate changes and arising from the IP is expected for the near-by population.

- **Visual impact:**

Similar to the construction phase, no unfavourable visual impact is expected.

The analyses and assessments of the impact of the IP on the natural environment and on human health show that no excess of limit values and environmental protection standards are expected during the operation period and, therefore, the IP is not expected to lead to changing population health-status trends analysed in item IV.11.

11.3. Evaluation of risks and impacts during closing and rehabilitation

Rehabilitation of areas disturbed by mining and processing of mined materials will involve technical and biological rehabilitation. Staged rehabilitation during the operation and final rehabilitation are intended.

Closure in the mining sections will involve evacuation of the mining equipment and of the production and logistical facilities.

The risk factors during rehabilitation are: toxic exhaust from the internal-combustion engines of the equipment in use, dust, noise and vibrations – this will impact mainly the workers, similar to the impact during construction.

No negative health effects on the population in adjacent urban areas is expected during the closing and rehabilitation.

No negative health effects on the population in adjacent urban areas is expected during the closing and rehabilitation.

Conclusions about the effects on human health:

By type of impact: direct and indirect - for those working on-site, without a tangible negative effect (no exceeding of environmental protection and human-health protection limit values and standards is expected) for the near-by population;

Area of impact: local, predominantly in activity areas and in the immediate proximity, without substantial impact on the nearest objects in need of health protection;

Occurrence of impact: daily, within the worked daytime hours;

Duration of impact: temporary - during the phase of construction, long-term – during the operation phase

Cumulative and combined impacts: insignificant – in respect of ambient air and noise.

12. Transboundary impact

Given the extent, scope and level of influence, the expected impact on the environmental media may be categorised as constant – reclaimable during the time of operation – of local territorial extent after the tenth year, of low intensity, without a cumulative effect and not exceeding the national and European emission limit values, without significant negative effects on human health and on the environmental media and factors.

With reference to the letter of the Ministry of Environment ref. 99-00-587/27.05.2024 and pursuant to Article 98, paragraph 1 of the Environment Protection Act, a notification to a potentially affected party - the Republic of Greece has been sent concerning the EIA procedure and in line with the provisions of the Convention on Environmental Impact Assessment in a Transboundary Context. This notification is consistent with Decision I/4 of the First meeting of the Parties to the Convention.

Letter Ref. OBOC – 68/23.10.2024 of the MOEW contains the response of the Greek state confirming its wish to participate in the EIA procedure as a concerned party. Therefore, the assessment considers in detail the aspects of transboundary impact with particular focus on ‘water’.

It should be stated explicitly that the EIA procedure involved an exhaustive analysis and confirmation of the potential impacts, including through the use of adequate mathematical models and forecasts **for the worst operating conditions in the deposit and at maximum output.**

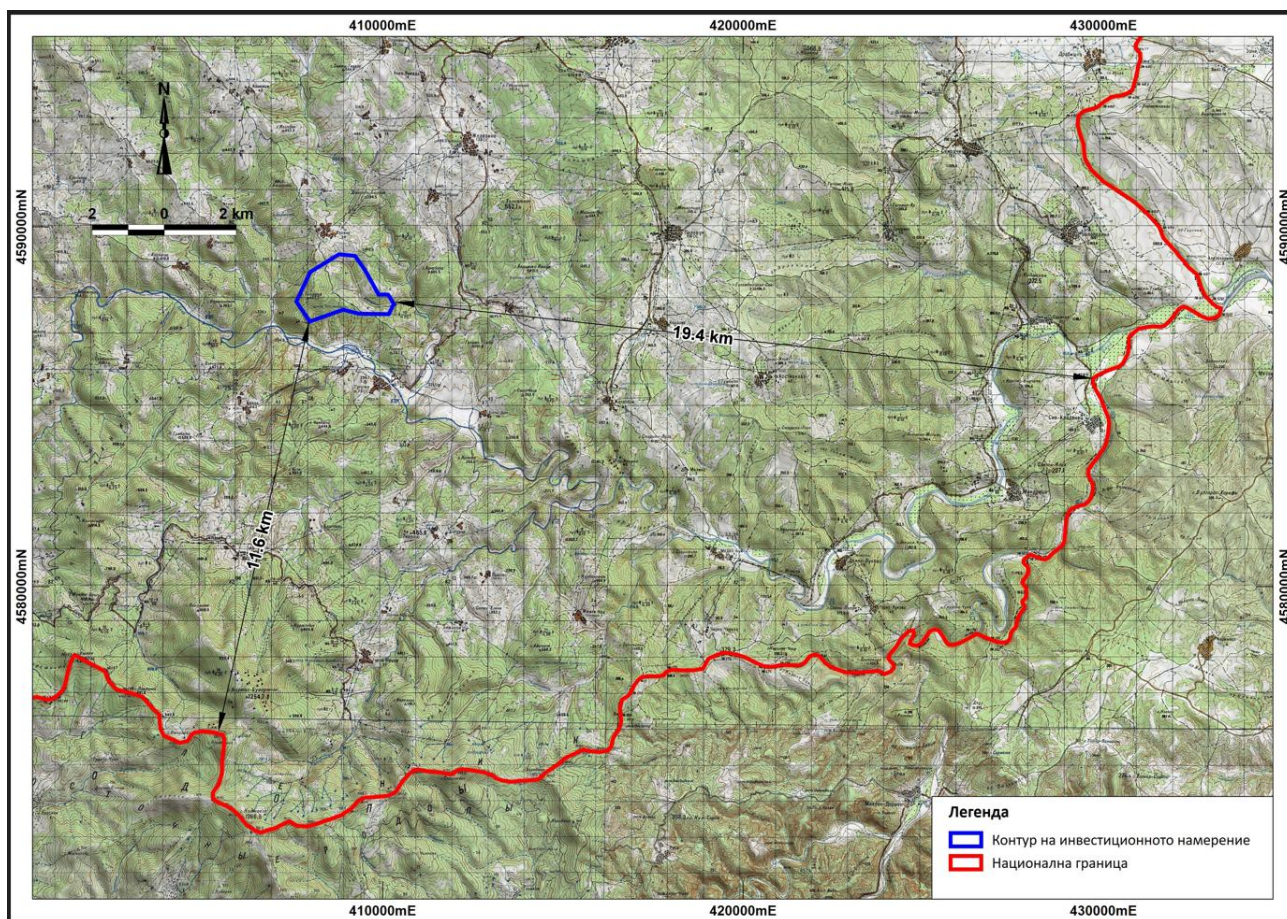


Figure V.12-1. Distance of the Rozino Deposit from the border with the Republic of Greece

The following impacts may be forecasted for the various environmental media and factors:

Ambient air

Any dust and gas emissions during the various IP implementation phases will be restricted to the area of the deposit, meaning it will be local, and pollutants will settle within short distances around the work areas. **It is not possible to emit pollutants which would overcome the regional terrain features (mountainous elevations and river valleys) and reach the territory of the Republic of Greece, even less so in air-polluting concentrations.**

In order to confirm the above statement, additional modelling will be carried out for dust reaching the territory of the Republic of Greece with account for the mitigating effect of the regional topography.

The emissions that will be generated from the operations in the Rozino Deposit, Tintyava PL, are calculated in sub-item V.1.1.

The emissions calculated in sub-item V.1.1 were used as input for the DIFFUSION module used to calculate the concentration of area and linear source pollutants into the ground air layer. According to the input weather information, the module produces the maximum possible one-time pollution under the worst weather conditions or the average annual pollutant concentrations, depending on the wind pattern.

The studied air space dimensions are: - length (*east to west*) – 18,000 m; - width (*north to south*) – 18,000 m (see Figure V.12-2).

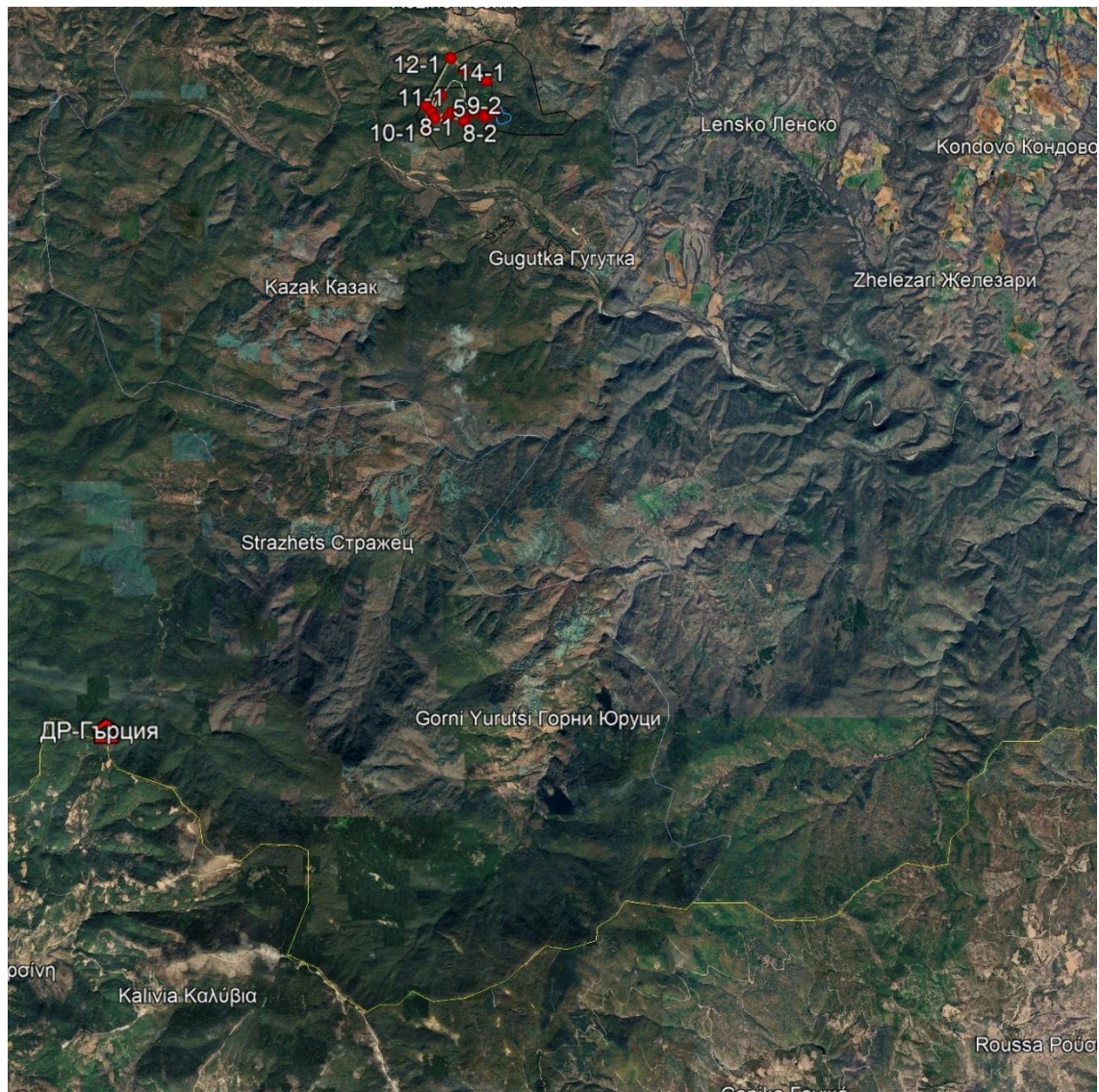


Figure V.12-2 The studied air-space area with indicated sources of pollution and discrete receptors - the nearest territory of the Republic of Greece.

The data about each source that have been fed into the software are presented below. It should be specified that the sources of pollution are situated in the northern part of the area under consideration (see Figure V.12-2) in order to evaluate the impact on ambient air quality (AAQ) mainly toward the Republic of Greece. The AAQ impact evaluation in the IP area is presented in detail in sub-item V.1.2 and does not have to be carried out again.

Area source 1 – Rozino pit, with approximate surface area of 261,900 m² – the pit boundary is reduced to a regular figure (*the black rectangles on Figure V.1.2-1*) because of limitations of the Traffic Oracle software.

X1	Y1	X2	Y2	H	Int.	PM ₁₀	PM _{2.5}
m	m	m	m	m		g/s	g/s
7102	16212	585	448	5	1	0.019437	0.00837

Area source 2 – External overburden stockpile with approximate surface area of 247000 m² – the stockpile boundary is reduced to a regular figure (the black rectangles on Figure V.1.2-1) because of limitations of the Traffic Oracle software.

X1	Y1	X2	Y2	H	Int.	PM ₁₀	PM _{2.5}
m	m	m	m	m		g/s	g/s
7694	16311	395	625	5	1	0.046686	0.016565

Area source 3 (see Figure V.12-2) – Processing plant with approximate surface area of 51,300 m² – the stockpile boundary is reduced to a regular figure:

X1	Y1	X2	Y2	H	Int.	PM ₁₀	PM _{2.5}
m	m	m	m	m		g/s	g/s
8136	16103	225	228	5	1	0.189003	0.0368

Linear source 1 – In-pit 55 t truck hauling of overburden from the Rozino mine to the external overburden stockpile:

Section	X1	Y1	X2	Y2	Width	PM ₁₀	PM _{2.5}
from point-point	m	m	m	m	m	g/(m.s)	g/(m.s)
1-2	7247	16560	7086	16296	6	0.002433758	0.000242231
2-3	7086	16296	7140	16189	6	0.002433758	0.000242231
3-4	7140	16189	7429	16283	6	0.002433758	0.000242231
4-5	7429	16283	7629	16211	6	0.002433758	0.000242231
5-6	7629	16211	7792	16311	6	0.002433758	0.000242231
6-7.1	7792	16311	7793	16275	6	0.000694358	0.000184805
7.1-8.1	7793	16275	7627	16139	6	0.000694358	0.000184805
8.1-9.1	7627	16139	7363	16195	6	0.000694358	0.000184805
9.1-10.1	7363	16195	7010	16053	6	0.000694358	0.000184805
10.1-11.1	7010	16053	6998	16398	6	0.000694358	0.000184805
11.1-12.1	6998	16398	7420	17178	6	0.000694358	0.000184805
12.1-13.1	7420	17178	7634	16973	6	0.000694358	0.000184805
13.1-14.1	7634	16973	8005	16798	6	0.002433758	0.000242231

Linear source 2 – In-pit 55 t truck hauling of ore from the Rozino mine to the Processing Plant:

Section	X1	Y1	X2	Y2	Width	PM ₁₀	PM _{2.5}
from point-point	m	m	m	m	m	g/(m.s)	g/(m.s)
1-2	7247	16560	7086	16296	6	0.001305397	0.000129915
2-3	7086	16296	7140	16189	6	0.001305397	0.000129915
3-4	7140	16189	7429	16283	6	0.001305397	0.000129915
4-5	7429	16283	7629	16211	6	0.001305397	0.000129915
5-6	7629	16211	7792	16311	6	0.001305397	0.000129915
6-7.2	7792	16311	7864	16307	6	0.000372446	9.91248E-05
7.2-8.2	7864	16307	7971	16207	6	0.000372446	9.91248E-05
8.2-9.2	7971	16207	8044	16251	6	0.000372446	9.91248E-05
9.2-10.2	8044	16251	8136	16287	6	0.000372446	9.91248E-05

The used methodology allows calculation of one-time maximum and average annual concentrations in area and linear source emissions. In this case the main atmospheric air pollutant will be dust with average daily and average annual values determined in the 10 μm particle-size and the average annual values in the 2.5 μm particle-size fraction. The average annual concentrations of pollutants in the atmospheric air calculated with the software will be presented below. This software is not applicable to calculating average daily concentrations.

Certain limitations of the software required a twofold consecutive modelling of linear sources – Linear source 1 was modelled first, followed by Linear source 2. This is followed by a separate area-source model. The linear source results recorded in the text (DAT) files are summed up using the SUPERPOSITION module of the Traffic ORACLE package in order to comply with the principle of superposition. This is followed by aggregating the common linear source file with the area source file. The total average annual value (AAV) results expressed with isolines are superimposed over a satellite image of the region, using the Surfer software.

The average annual PM_{10} and $\text{PM}_{2.5}$ concentration results for linear sources are presented in an attachment – the software files.

The average annual PM_{10} and $\text{PM}_{2.5}$ concentration results for area sources are presented in an attachment – the software files.

The results of the aggregation of all pollution sources in the Rozino Deposit. Using the SUPERPOSITION module of the Traffic ORACLE software package are recorded in a text (DAT) file (*attached*).

The two figures below present the isolines of the summed-up concentrations of pollutants from the operation of the Rozino Deposit toward the Republic of Greece, contoured using the Surfer software.

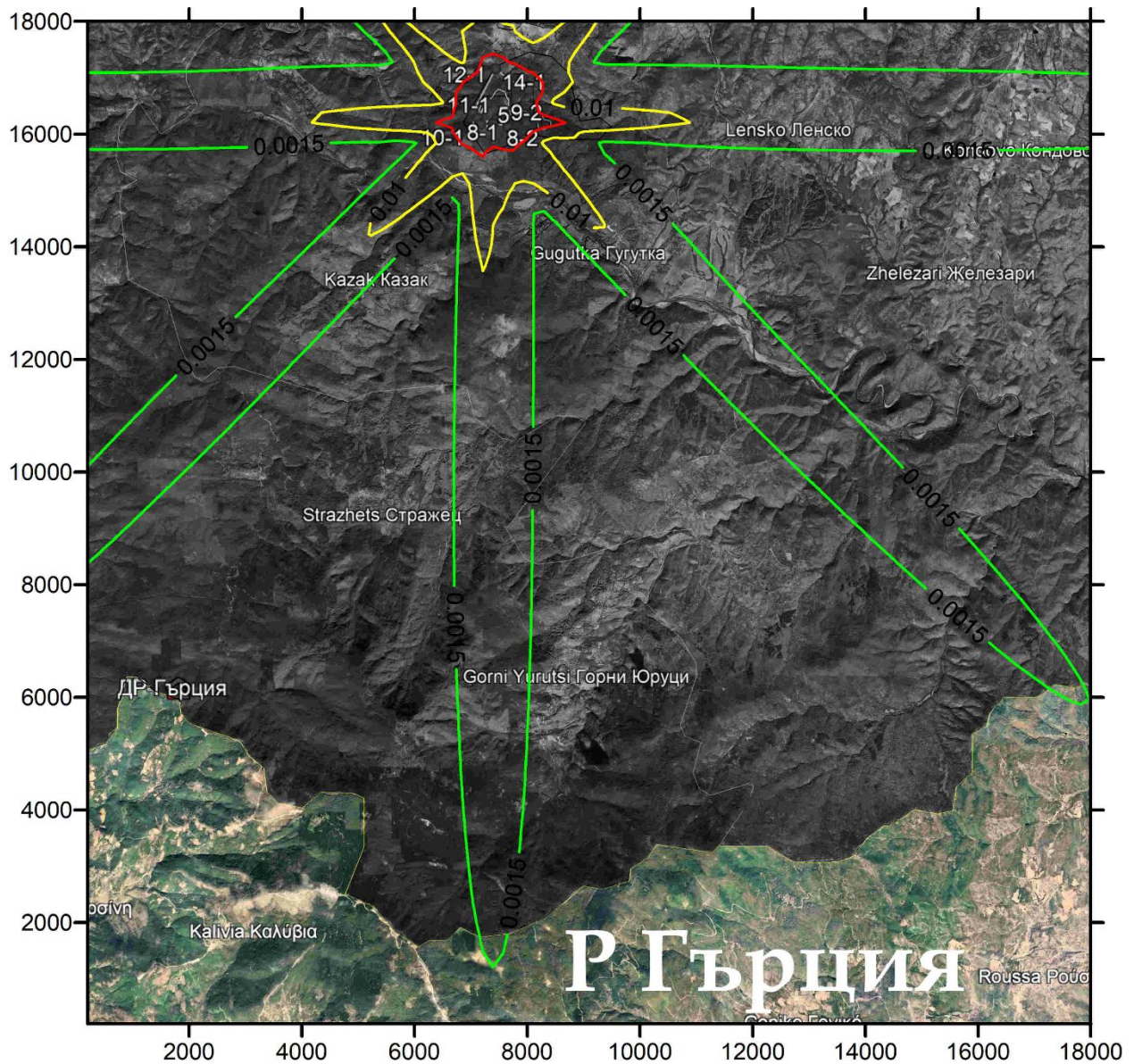


Figure ID V.12-3 AAV of PM₁₀ resulting from the Rozino Deposit operations in the Republic of Greece, mg/m³

The figure above presents the PM₁₀ distribution lines resulting from operations in the Rozino Deposit. The zone where the average annual human-health limit value of 40 µg/m³ is likely to be exceeded is surrounded by a red line. The maximum levels of this pollutant within the Republic of Greece falls to barely 1.5 µg/m³ (the green isoline on the figure) while the average annual human-health protection limit value is 40 µg/m³.

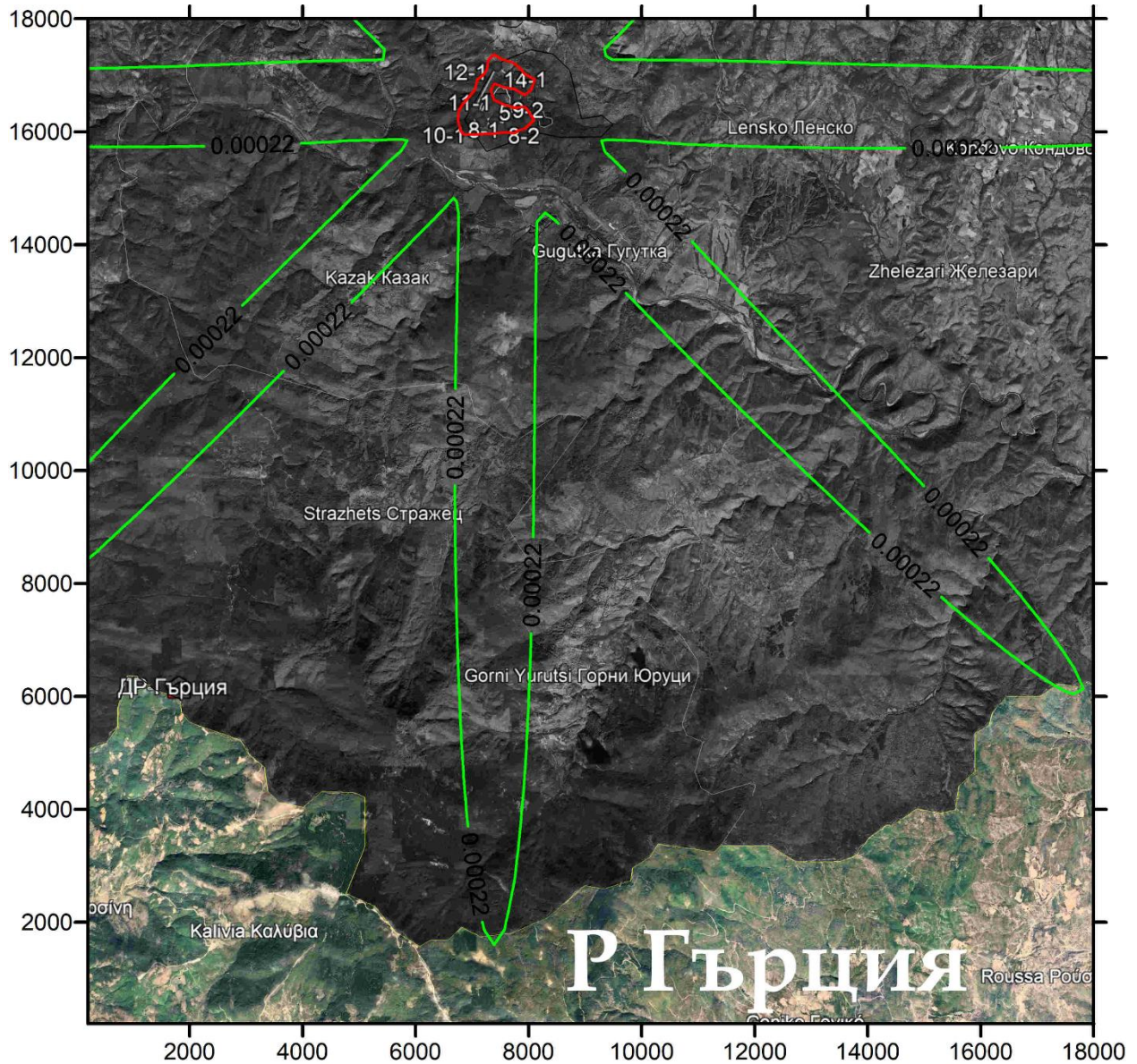


Figure V.12-4 AAV of PM_{2.2} resulting from the Rozino Deposit operations in the Republic of Greece, mg/m³

The red line in the above figure surrounds the zone where the average annual human-health limit value of 20 µg/m³ for PM_{2.5} is likely to be exceeded. The maximum levels of this pollutant within the Republic of Greece falls to barely 0.22 µg/m³ (the green isoline on the figure) while the average annual human-health protection limit value is 20 µg/m³.

It can be concluded from the calculations and emission distribution models for the IP that no transboundary impact will be expected. The maximum dust levels which could scatter outside Bulgaria's border are insignificantly low.

Surface and Ground Water

The Republic of Greece is separated into 14 water management basins. Ivaylovgrad region is adjacent to a zone with code GR12 - Geographic Region of Thrace. The EIA statement will use data from the Thracian River Basin Management Plan (GR12).

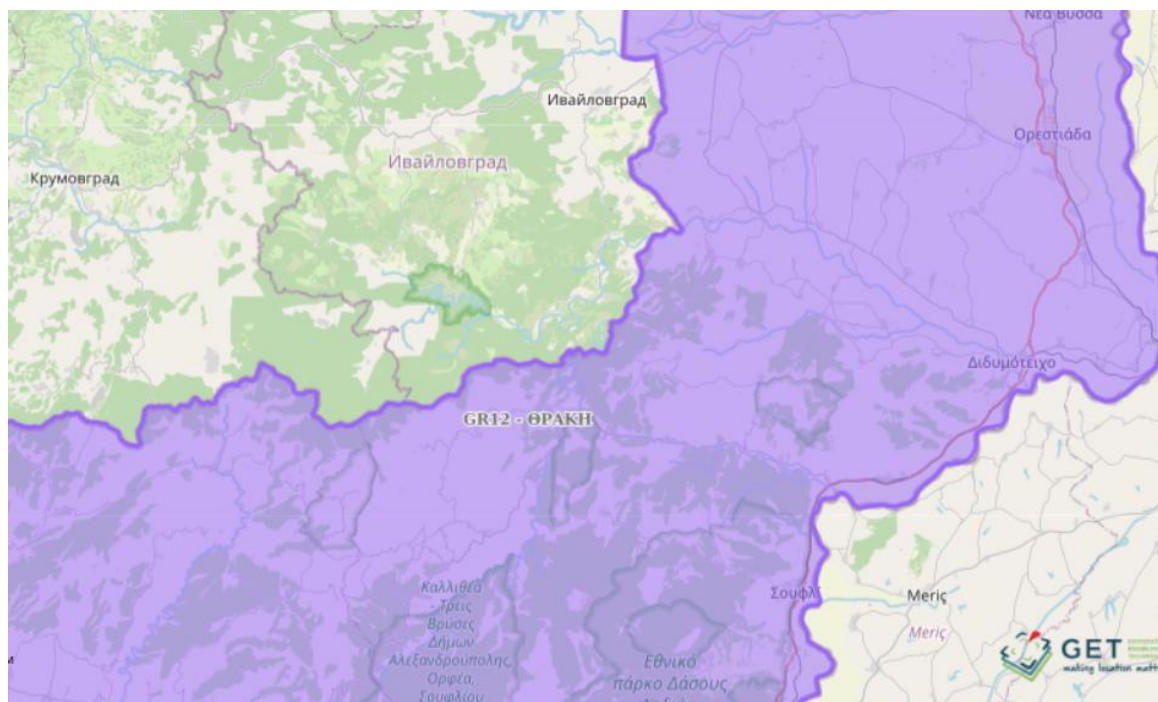


Figure V.12.2-5. Location of Ivaylovgrad and the Thracian water management basin (GR12)

The Thracian water management basin (GR12) is a transboundary basin management region. The western part of the basin borders on the territory managed by the Bulgarian Aegean Basin Directorate where the Nestos and Despatis rivers are transboundary. The central and eastern parts border on the Bulgarian East Aegean Basin Directorate with Arda (Ardas) and Luda reka (Eritropotamos) being the transboundary rivers. The basin of the Evros River is also transboundary in nature, being partially located in the territory of the Bulgarian Eastern Aegean Basin Directorate. The Maritsa River (Evros) is the boundary between Bulgaria and Greece for 12 km, and between Greece and Turkey, with the exception of a stretch upstream in the Nova Visa river where it flows along in Turkish territory.

The Byala River flows into the Luda River - Eritropotamos, in the Greek territory.

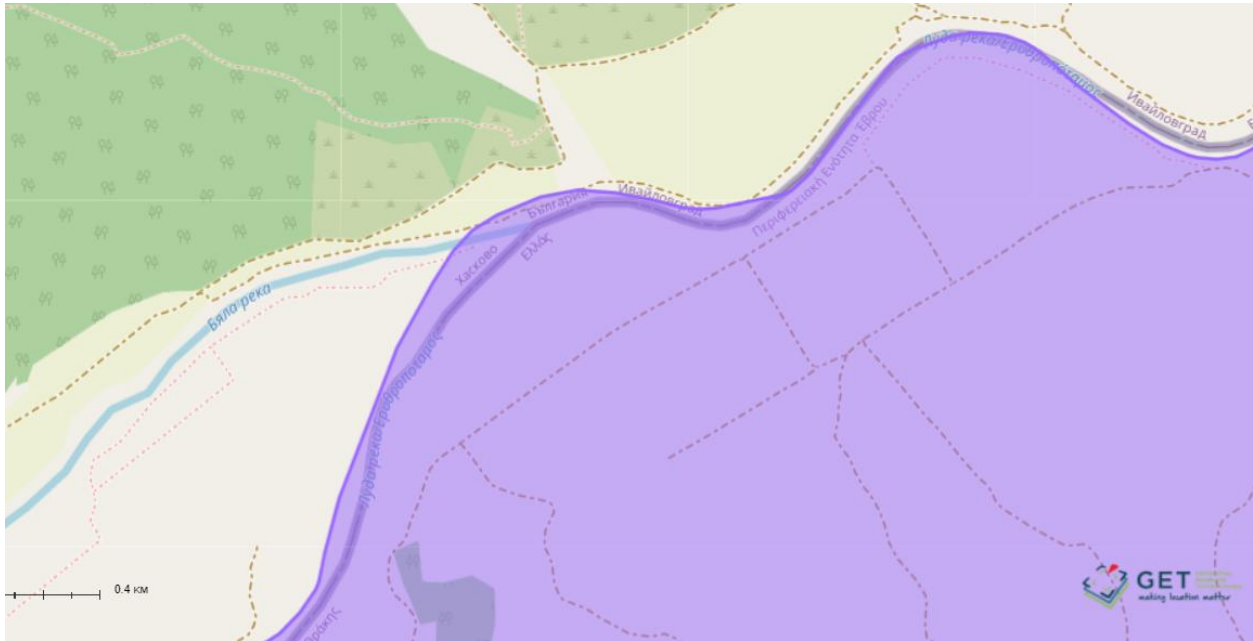


Figure V.12-6. Location of the confluence of the Byala reka (Bulgarian territory) into the Luda reka river (Greek territory)

Two groundwater bodies border on the Investment Proposal area: Drosinio, with code GR120B100, and Soufli – Didimoticho, with code GR12BT150.

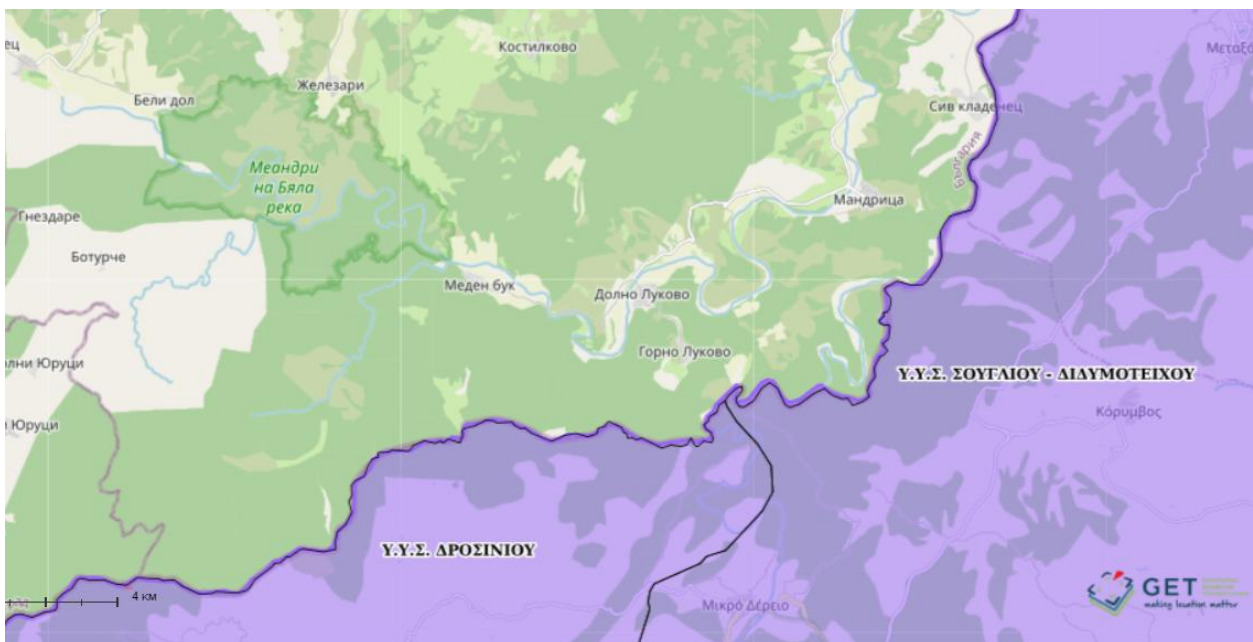


Figure V.12-7. Boundary groundwater bodies

No transboundary impact on the ecological and chemical status of the surface water, water flows and water quantities of the Luda and Byala Reka Rivers entering the Republic of Greece is expected during all stages of construction, operation and rehabilitation of the Rozino Deposit.

As is described in the preceding parts of this statement, the plan is to fill the non-contact open-air water reservoir with water drawn from the Arpa Dere River between January and May, when the flow in this river is sufficient, in the Rozino Pumping Station area, at a rate of 50 l/s (for

an expected total volume of 648,000 m³). This flow is equal to or less than 10% of the average multi-annual water quantity, and will ensure the ecological minimum in the river (Table V.12-1).

Table V.12-1 Hydrological data about the Arpa Dere River.

Water body	F km ²	H _{avg.} m	M _o l/s/km ²	C _v	C _s 2C _v	Q _{avg.} l/s	W _{avg.} 10 ⁶ m ³	Q _{95%} l/s	W _{95%} l/s
Arpa Dere River	69.4	519	14	0.61	1.22	972	30.6	241	7.6

The Arpa Dere River is a left-hand tributary in the middle stretch of the Arpa Dere River. According to the data from Hydrologic Measuring Station 62800, Byala Reka River, Dolno Lukovo village (Table V.12-2), abstracting a total of around 648,000 m³ between January through May amounts to approximately 0.54% of the average water quantities of the Byala Reka River during this period.

Table V.12-2 Averaged water quantities in two points along the Byala Reka River during the 1961-1998 period (according to information from the first RBMP of EAR - Volume V Byala Reka River Basin).

Q avg.	Water quantities by month (M m ³)											
	I	II	III	IV	V	VI	VII	VIII.	IX	X	XI	XII
HydroMeteorology Station 62800, Byala Reka River, Dolno Lukovo Village - F=448												
Q _{avg}	24.0	39.1	27.8	17.8	12.0	5.4	1.1	0.5	0.6	3.0	9.6	23.9
Byala Reka River (as far as the border) - F=593.8												
Q avg.	31.1	50.6	36.0	23.0	15.6	7.0	1.5	0.6	0.8	3.9	12.4	30.9

No surface water will be drawn during the summer months because the lower stretches upstream of the Bulgarian border with Greece, between the Meden buk/Dolno Lukovo villages and the state border (sub-type R14c Sub-Mediterranean ephemeral (intermittent) small and medium sized rivers and streams) the rivers dry up at varying frequency during the years, with separate pools remaining (Figure V.12-1).

the measuring points near the Dolno Lukovo village and at the border, upstream of the confluence with the Luda River.

The Byala Reka River flow is influenced by the Mediterranean climate and varies widely. The coefficient of flow variation near the Dolno Lukovo village is very high, at 0.616, as is the coefficient of asymmetry, at 1.785. The insignificant altitude determines a low rate of runoff - 11.7 l/sec per km². The Mediterranean climate causes a monthly minimum flowrate at the Dolno Lukovo of almost zero by the end of the summer (August - September).

A natural flow regimen is typical of the Byala Reka River and its tributaries - there are almost no man-made water impoundments regulating it. The Byala Reka River enters the Luda River near the boundary with the Republic of Greece.

The watershed area of the Luda River is in Southern Bulgaria and in North-Eastern Greece, in the Eastern Macedonia and Thracian area. This river is more than 100 km long, with 20.2 km on the territory of Bulgaria. It is the final largest right-hand tributary of the Maritsa River, and drains the south-eastern parts of the eastern Rhodopes. The lower stretches of the Luda River (Ερυθροπόταμος, the Red River) is used on a massive scale for irrigation of farmlands on both sides of its valley.

The hydrology information shows that role of the Byala Reka River in forming the Luda River flow on the Greek territory during the summer is highly limited. On the other hand, being recharged by its watershed area, the Luda River maintains year-round flow in the Greek territory (Figure V.12-10, Figure V.12-11, Figure V.12-12).



Figure V.12-10. The Luda River (Eritropotamos) in Greece near Metaxades (in September).



Figure V.12-11. The Luda River (Eritropoatamos) in Greece near Vrızika (in September).



Figure V.12-12. The Luda River (Eritropoatamos) in Greece near Didimotiho upstream of the river mouth (in September).

Therefore, the intended abstraction of water from the Arpa Dere River to fill the non-contact water reservoir total volume of 648,000 m³ during the operation of the Rozino Deposit, to a limited extent in January through May (actually outside the active irrigation season) is not expected to have a negative transboundary impact on the surface water quantities.

No impacts on surface water quality or quantity are expected. The IP will construct two consecutively situated reservoirs (the second one for non-contact, or conditionally clean, water) thus eliminating any likelihood of entry into water bodies of water separated by the IP. No discharging of process and ablation effluent into surface water bodies or into the sewerage systems of urban centres is envisaged. All collected water will be recirculated to the process circuits.

A hydrology study of water resources in surface water bodies has been carried out with regard to the supplying of water for the process. **The possibility for such water use without lowering the water quantities or disturbing the natural water inflows has been ascertained.** Water use will be made possible with a permit issued in accordance with the Water Act.

Also, no impact on the chemical and qualitative status of the groundwater bodies is expected. Also, a hydrogeology study in the deposit area has established that the flow of groundwater is insubstantial. Given the design depth of the pit, there is no reason to expect direct impacts on a groundwater body and to drinking water sources with sanitary protection belt areas and use permits as required by the Water Act.

Therefore, no impacts can be expected to arise and cause negative effects on water quality in the Republic of Greece.

Subsurface

The harmful impact is concentrated mostly on the geological media, since non-renewable natural resources will be extracted. The information from the exploration and the mining technology which will be employed for the deposit allow the assumption that part of the IP area will be affected by the mining operations, **but that the entire region will not be affected in a manner changing the sustainability of the geological media and of its qualitative features, and, even less so, causing transboundary impacts.**

Lands and Soils

Given the nature of the operation – open mining of natural resources, the direct impacts on soils will be local and only in the territory of the Republic of Bulgaria. This will in no way impact the soils in the neighbouring state. **These soils will be restored to the maximum possible extent through timely and staged technical and biological rehabilitation.**

Noise

The analyses and calculations made in Section V prove that the IP implementation will not increase the background noise in the near-by settlements. The maximum noise levels that will reach the objects in need of increased noise protection are lower than the background noise levels in the urban and surrounding natural environments.

The distance to the Republic of Greece means that no elevated equivalent noise levels can reach its territory. Stripping, mining and handling operations and ore processing noise will be extinguished completely near the IP site. No impact on background noise levels in the Republic of Greece will be possible.

As regards blasting, the trial blasting showed that no negative transboundary impact can be expected. The blasting operations are at levels lower than the registered background noise even in near-by protected objects, measured prior to and during the trial blasting day.

Biodiversity

As two protected areas from the Natura 2000 network will be affected, an assessment was made of the IP compliance with the scope and goals for protection of these areas. The Byala reka River is a protected area designated for protection of wild birds and the habitats of protected bird species must be preserved and restored if their nature-conservation status requires improvement. All of its watershed area in Bulgaria is situated within the Rhodopes - Eastern protected zone. **It is inadmissible to cause significant negative impacts on the areas of the national Natura 2000 ecological network which, for its part, is a reason to avoid damage to biodiversity also on the territory of the Republic of Greece. It will be possible to carry out the activities only following approval of the IP as required by the Biodiversity Act.**

Waste

The proposed method for treatment and management of waste generated by the operations does not suggest environmental risks. Flotation tailings with minimal levels of humidity will be disposed of with two consecutive water reservoirs - the second one being intended for non-contact (conditionally clean) water, built downstream of the WRF. **This will eliminate any chance of pollutants entering the water, even during calamities, and reaching the territory of the Republic of Greece.**

Landscape

The significant distances from the border with the Republic of Greece and given the rolling and mountainous topography - a natural barrier to pollutants in the ambient air and a barrier to visual impacts, **no visual or landscape impacts may be expected.**

Health risk

The evaluations and analyses of the IP impact during its different implementation phases (construction, operation, closure and rehabilitation.) show that the impacts are local in scope, predominantly in the directly affected terrains and within the concession area. Insignificant concentrations of particulate matter and noise substantially below the respective limit values reach the nearest settlements. Given the significantly larger distance of 11.6 km from the concession boundary, the analyses show that **no ground are present to suggest any transboundary risks for the health of the population in the border areas of the Republic of Greece, as can be seen from the evaluations for the other components and environmental media, including ambient air quality, noise, water, soils, and hazardous chemical substances.**

VI. DESCRIPTION OF THE LIKELY SIGNIFICANT CONSEQUENCES OF THE ENVIRONMENTAL IMPACTS FROM THE IP ARISING FROM:

6.1. Construction and operation of the investment proposal, including demolition and decommissioning, where applicable

The various IP implementation stages are described in detail in item II of this Statement.

They include mine construction, operation of the deposit, closure and rehabilitation..

The likely environmental consequences of the IP during its various phases are reviewed in detail in Section V of this Statement, with a summary of impact for each environmental media and factor. No significant negative impacts rendering impossible the IP implementation have been identified based on this evaluation. The proposed measures should be applied in order to mitigate the established impacts.

6.2. The use of natural resources and, in particular, the subsurface, soils, water and biodiversity, in consideration, as far as possible, of the sustainable presence of such resources

The purpose of the IP is open pit mining and processing of polymetal gold and silver ore from the Rozino Deposit in the Tintyava PLA, situated on the territory of the Ivaylovgrad Municipality, Haskovo District, and Krumovgrad Municipality, Kardjali District. Decision 467/28.02.2017 of the Minister of Energy allows for prospecting and exploration for metalliferous minerals and ore resources in the Tintyava Property, following which the presence of reserves of economic value has been established. This is the basis of the IP.

Given the nature of the IP, *the subsurface* will be impacted directly by mine-site development and extraction of the natural resource. The reserves in the Rozino Deposit amount to 11.3 Mt of ore grading at 1.33g/t gold and 26.6 Mt of overburden, as described in the Supplement to the Final Report on Reserves’

The consequences of the impacts on the subsurface are in direct connection to the optimal extraction of the mineral resource within the pit areas. Staged technical and biological rehabilitation is intended for maximum restoration of the mined spaces.

The *soils* will be impacted directly by the mining and processing operations. Topsoil layer stripping is intended for removal and subsequent use during the rehabilitation. The surface area of the future concession is **275 ha, of which 118 ha will be disturbed**. This area includes the open pit sites, the waste rock stockpiles, the processing sites, the mine roads, and the water reservoirs. The expected impacts on the earth and soils during the construction and operation phases comprise mechanical disturbance and destruction of the integrity of the soil profile on these particular terrains. These impacts will be minimised to some extent by the technical and biological rehabilitation.

Water

Surface water will be used during the planned abstraction from the Arpa Dere River during January through May of a flow ensuring a quantity of water at approximately 50 l/s (the expected total volume being 648,000 m³), or 10% of the average multi-annual water quantity, thus ensuring the ecological minimum of the river. The plan is to abstract water from a natural pool without damming or other river blocking construction works. A strategy for minimal use of fresh water and maximum recycling in the Processing Plant has been developed.

One technological option, used only as necessary, during the IP implementation is abstraction of water from the Arpa Dere River floodplain (groundwater body BG3G000PtPg049) by constructing a pumping station in the area of the existing Rozino Pumping Station.

Biodiversity

No use of natural resources based on the flora and fauna is envisaged in the IP. All possible impacts on biodiversity, incl. indirect impacts, are evaluated in item V above.

6.3. Emissions of pollutants, noise, vibrations, non-ionizing radiation and radiation; occurrence of harmful impacts and waste disposal and recovery

Regarding atmospheric air pollutants

A quantitative and qualitative assessment of pollutants emitted into the atmospheric air during IP implementation is presented in item V.1. The maximum expected average annual levels of pollution in urban areas from the development of the Rozino Deposit are as follows:

- up to $11.05 \mu\text{g}/\text{m}^3$ for PM_{10} and $1.34 \mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$ in the Rozino Village, with the respective average annual human health limit values being 40 and $20 \mu\text{g}/\text{m}^3$.
- $0.6 \mu\text{g}/\text{m}^3$ for PM_{10} and $0.15 \mu\text{g}/\text{m}^3$ for $\text{PM}_{2.5}$ in the Byal Gradets village.

As regards the harmful physical factors, the activities carried out in the Deposit during all three IP implementation stages are not expected to give rise of above-standard noise for the residential zones in the region. The limit value of 79 dBA for noise in production areas will be exceeded within the site and around the deposit boundaries only near the operating equipment. Noise from on-site production activities will be a factor mainly for the occupational environment.

No change of background noise levels related to the activities in the concession area, including operating heavy-duty equipment along the in-pit roads, is expected.

The predicted impact during blasting operations is classified as 'Moderately loud noise', its impact being within 'Regular conversation in a group' and 'Telephone conversation'. The noise impact is below the lower exposure value requiring response.

The calculated blasting vibration impact values are substantially lower than the admissible limit values for all factors: humans, buildings and facilities, including comfort.

Regarding radiation

It can be seen from the assays that the samples from the controlled areas conform to the requirements for specific activeness of natural radionuclides, laid down in Attachment 3, table 3 of the Regulation on Radiation Safety, in order to deregulate large quantities of materials. No hazard is present to the environment, the on-site workers and the population and, therefore, no particular measures and activities are needed to ensure radiation safety.

The gamma-spectrometry analysis results compared to the standards in the current legislation show that the materials removed from the site do not pose a threat to the environment and would not cause changes to the natural radiation background of the site. The radioactivity measured in the studied geological units is sufficiently low to prevent pollution and distribution of radioactive isotopes into the remaining environment media.

The mining operations will not be a source of increased radionuclide content and will not cause sudden or gradual increase in radioactivity of the waste rock, the mine waste and the waste water.

As a general rule, fluids and solids are extracted during the mining and processing of polymetal ores and frequently contain natural radioactive isotopes such as Uranium-238, Thorium-232, Radium-226 and 228, Radon-222 (gas). These elements may accumulate in rock formations, pipelines, reservoirs and sediments, and in the water which are present during mining. The Rozino Deposit is a conventional deposit for mining and processing of polymetal ores. According to the

laboratory testing of rocks taken from the RTD-015 borehole at depths down to 166 m., **no highly radioactive geological units have been established/registered.**

According to Article 7 of the Regulation on Radiation Safety, two months prior to beginning an activity referred to in Article 1, Enterprises intending to initiate activities involving materials with increased content of natural radionuclides must submit to the Chair person of the Nuclear Regulation Agency information about the activity and the specific activeness of the respective materials and an evaluation of the expected doses.

To ensure prevention, periodic dosimetric control by an accredited laboratory is recommended for the forthcoming stripping and mining operations, with measurement of the gamma-radiation dose rates and gamma-spectrometry analysis of the rock mass and flotation tailings generated by the activities.

The environmental consequences of higher radioactivity in any elements or layers may be, in principle:

Soil and groundwater contamination

The proposed preventive measures and the process management conditions are not conducive to entry into, and contamination of, the soil, surface or ground waters or the aquifers, of any waste or waste water that may contain radioactive elements.

Surface water pollution

The proposed preventive measures and process management conditions will prevent leaking of waste water and materials that may contain radioactive substances into surface water bodies and cause radiation contamination. Strict water management measures are taken.

Air pollution

Radon vapours – radon is a radioactive gas that could be released into the air during drilling and blasting. Radon is a known carcinogenic material, especially through chronic inhalation. Since the presence of humans is prohibited during drilling and blasting, this assumption is inapplicable.

Welding operations will be carried out during the construction of the Processing Plant. A combined effect of chemical exposure and radiant (ultraviolet and infra-red) energy will be observed during the welding operations, with visible spectrum radiation. The intensity of the infra-red radiation will differ and vary between 100 and 2,450 W/m^2 depending on the technical parameters and weight of the heated material. Regarding ultraviolet radiation - a summary spectral density at a distance of 1 m is specified, being 0.4 - 162 W/m^2 from the heated zone. Infra-red and ultraviolet radiation affect the visual analyser and personal protective equipment such as goggles and helmets will be required.

Regarding waste

Stripped overburden and flotation tailings will be hauled to the MWF where it will be classified as category B according to the requirements for mining waste facilities referred to in Article 22b, paragraph 4 of the Mineral Resources Act.

The limited amount of hazardous and non-hazardous production waste which will be generated by operating machines and equipment will be handed over for subsequent treatment based on written contracts with persons holding the waste-specific documents required by Article 35 of the Waste Management Act.

Municipal waste will be generated by the life activities of the personnel and will be

collected in mixed municipal waste bins placed on the processing site. This waste will be hauled periodically by a contractor hauling municipal waste in the Ivaylovgrad Municipality.

The investment proposal does not provide for disposal and re-use of waste in the concession area.

6.4. Human health or environmental risks, including risks arising from accidents or catastrophes

A detailed analysis of **human health** risks and their evaluation are made in item V.11 of the Statement in respect of the population and in respect of the persons working in the impacted areas. The results of this analysis and evaluation show that the population and the persons working on-site will not be exposed to significant risks during all IP implementation stages because:

- no exceeding of the environmental and human-health limit values is expected outside the work areas, and the workers will be provided with adequate personal protective equipment in order to minimise impacts and discomfort typical of the activities under consideration;
 - the operations will not involve storage of hazardous chemical substances in quantities with potential for large-scale accidents;
- an Emergency Plan with specific actions will be used during the IP phases.

Risks during emergency and incidents

Ore mining and processing involve the use of mechanical equipment which could cause serious accidents. Emergencies and incidents involving the mechanical equipment, transport vehicles, Processing Plant and MWF equipment may cause leaks and spills of petroleum products (oils, fuels). These leaks and spills could be small in quantity and over insignificant areas, when the equipment is new or in good repair. Such leaks and spills can be dealt with easily and quickly, provided that oil and fuel adsorbent materials are secured constantly in a location specified in the emergency plan. Also, cases of specific pollution are expected to be extremely rare because they are deviations from the normal processing schedule.

Accidents and trauma of personnel is possible in the event of non-compliance with the occupational health and safety regulations.

Risks concerning the **cultural heritage**, including risks caused by accidents and catastrophes, are possible if the provisions of the Cultural Heritage Act are not complied with.

Archaeological objects which cannot be localised by non-destructive methods may be present in the concession area. If traces of archaeological substance are identified, the provisions of art. 72 and 160 of the Cultural Heritage Act will apply.

Risks for the **environment** and human health may arise if the following natural disasters occur:

Earthquakes

According to Bulgaria's current seismic zoning, the deposit is situated in an area with an earthquake potential of I-VII according to the Medvedev-Sponheuer-Karnik intensity scale. The seismic coefficient for the region is $K_s = 0.10$.

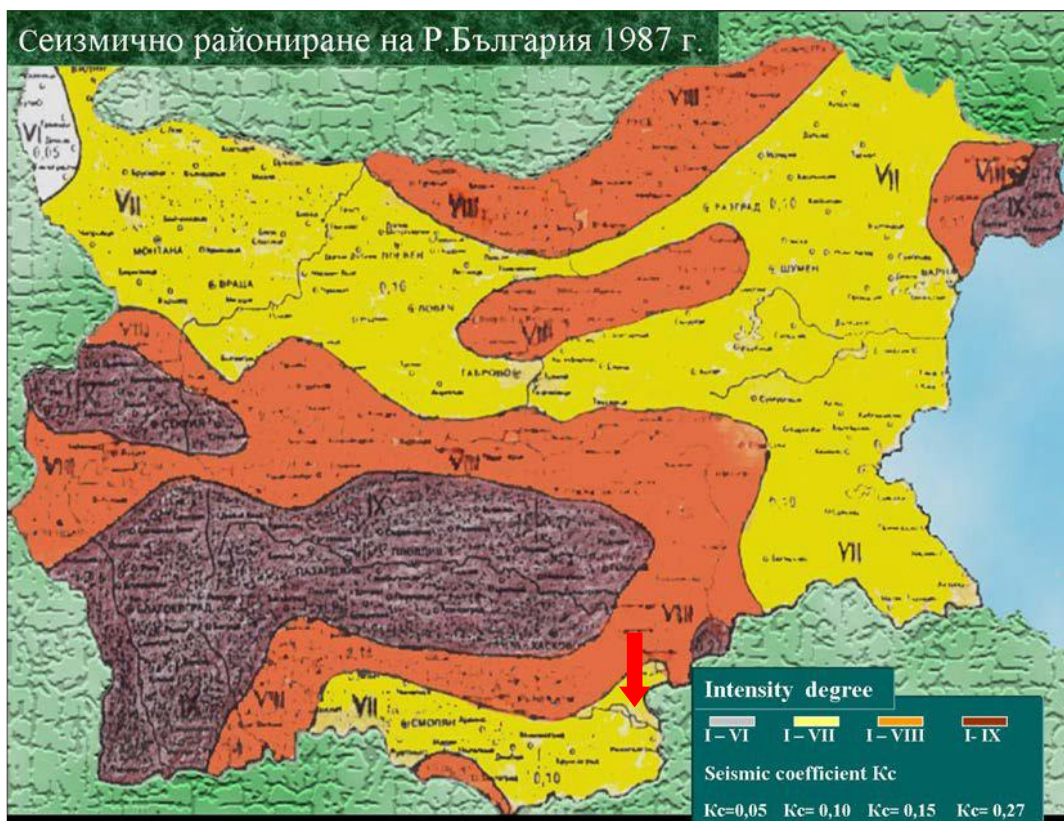


Figure VI.6.4-1 Seismic zoning of Bulgaria

The following destruction can be expected depending on the degree of earthquake impact:

- up to level VI – slight
- levels VI-IX – severe

There are no infrastructural facilities other than existing forest roads in the sections of the deposit.

Landslides

No landslides have been registered in the deposit, according to the register and map of landslides prepared by Geozashtita EOOD - Pernik branch. Two landslides have been registered in the town of Ivaylovgrad - on the Yane Sandanski street and on the Paisi street.

Floods

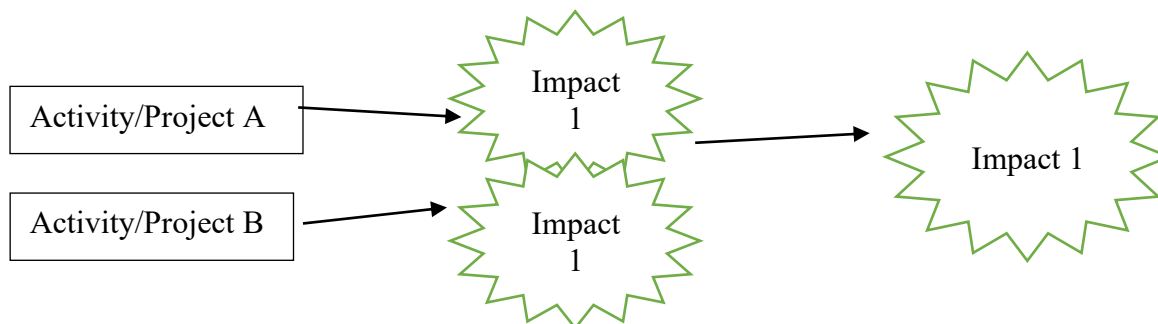
The deposit area is not in a significant flood-risk area.

6.5. Combining of the impact with the impacts from other existing and/or approved investment proposals, in consideration of all existing environmental problems concerning areas of particular ecological importance that are likely to be impacted, or impacts related to the use of natural resources

Assessment of cumulative impacts

Cumulative impacts may result from individually insignificant but collectively significant acts performed over a period of time or concentrated in a certain place. The assessment of cumulative impacts is especially important in the EIA process because some environmental

media/components may already be exposed to certain impacts and the additional impacts may result in near-critical levels. In such cases, the additional impact might bring about an irreversible outcome for the more vulnerable or sensitive areas.



The other aspect required for evaluation of the cumulative impact is the presence of other activities of similar nature of effect, within the geographic extent where potential ecological interactions could act together with the IP and create a more (or less) substantial overall effect.

No excavation of aggregate material from rivers is included in the analysis because the nature of impact is substantially different.

The cumulative impact evaluation approach is based on a general methodological framework which is evaluation of potential cumulative impacts from existing facilities, approved facilities or facilities in the process of approving and/or development on the environmental media/factors.

The cumulative impacts were evaluated using information from the public registers of the Ministry of Environment and Water concerning completed and on-going EIAs for investment proposals, as well as data from the National Concession Register.

It was established from the analysis of the current state of environmental media and factors that no problems exist concerning the environmental parameters, and no pollution in the areas intended for use. In this sense, no combination of the impacts of IP implementation and existing impacts is expected.

However, a combination of impacts with the impacts of other similar activities carried out in relative proximity is expected to cause cumulative impact. The assessment of cumulative impacts should include all facilities with identical environmental impact (such as emissions in the atmospheric air, into the surface and ground waters, harmful physical factors, noise, accumulation of waste, use and storage of hazardous substances), and the effects should be considered for each pollutant emitted into the environment by the various IP elements while in operation.

Textual attachment No 14 presents a list of other IP, plans, programs or projects with potential for cumulative impacts with the present IP.

Cumulative impacts of the IP under consideration

The review of the potential for cumulative impact should be made by environmental media and factors:

- ***atmospheric air***, including emissions from mining, processing and other activities – presented below;

- **water** – no pre-conditions for a cumulative effect on the surface and ground water is present since the IP will not discharge waste water from on-site operations and ablution effluent into surface and/or ground water. The ‘zero discharge’ approach is adopted for this project.
- **soils** – the IP will be implemented in a non-urbanized territory unaffected by economic actions and, therefore, cumulative impact can only be expected in the case of development of other deposits near-by. No such developments have been established so far;
- **geological environment** - the IP will extract natural resources from the deposit under consideration. Cumulative impacts can be expected in respect of exhausting of gold-bearing ore reserves in the region;
- **harmful physical factors** - no cumulative impacts are expected because of the insignificant effect over the background noise levels in near-by settlements (reviewed in detail in item V.10.2). The results of the review of presence of IP in the Rozino Deposit in Table VI.6.5-1 and Table VI.6.5-2 show that no cumulative impacts are possible from other IP, plans, programs or projects.
- **landscape** - since the activity will be carried out in the natural environment, a cumulative impact could be present only if other developed deposits of mineral resources are present near-by. No such developments have been established so far;
- **biodiversity** – a cumulative effect might arise from such plans, programs and projects/investment proposals which **have had, have or will have** the same impacts on the flora and fauna as those from the IP. Other than the natural habitats and species, including birds, which are subject of protection in the Rhodopes - Eastern Protected Zone and in the Byala Reka Protected Zone, the IP will affect insignificantly plant communities and habitats of species of significance for conservation and, therefore, the cumulative impact on them will also be insignificant. The cumulative effects on the natural habitats and the species, including birds which are subject of protection in the two zones, is considered and analyzed in detail in the Compliance Assessment Report.
- **wastes** - as regards **wastes**, no pre-condition for accumulation of impacts is present since stripping materials will be used as backfill in mined-out areas and during the technical rehabilitation, which will relieve some terrains occupied by the mine waste facility.
- **hazardous substances** - given the scale and activities which will be carried out in the deposit, no pre-requisite effect is present for accumulation of the impact with impacts from approved investment proposals, and no significant combined effect on the environmental media and on human health is expected. The distance of the IP relative to projects with similar impacts is significantly larger and no interaction with them can be assumed. Therefore, no combined consequences of individual impacts can be expected.

The the hazardous substances which will be used during the operations on the site are specified in the Classification Report as required by Article 103, paragraph 1 of the Environment Protection Act and Attachment 1 to the Regulation on the Prevention of Major Accidents with Hazardous Substances and Mitigation of their Consequences, and the conclusion in the report is that no high or low risk potential classification applied to the operation, as is confirmed with Haskovo RIEW letter No. ПД-279-(18)/19.06.2023.

A licensed supplier will deliver the explosives immediately prior to the blasting and will carry out the drilling and blasting operations.

- **cultural heritage** - no reasons have been established to expect cumulative impacts on the cultural values.

As regards **atmospheric air**, no pre-requisites are present for accumulation of impacts because of the short range in which pollution from IP on-site operations will scatter (*reviewed in detail in item V.1.2*). According to the information about other IP, plans, programs or projects which may have a cumulative impact with this IP (**Textual attachment 14**), only a Forest Management Plan (FMP), a Hunting Management Plan (HMP) and a Plan for Protection of Forests Areas against Fire (PPFAF) of the Territorial Department of the Ivaylovgrad State Forestry Enterprise are being implemented in the lands of Rozino Village and Gugutka Village. These plans cannot have a cumulative impact on the atmospheric air quality in the region under consideration. Investment proposals with the potential for a cumulative negative impact are those in the area of mining and/or processing of mineral resources. The table below presents the lands in the Ivaylovgrad Municipality where IP for prospecting and exploration or mining of mineral resources are intended, with a preliminary analysis of the likelihood of potential cumulative effect:

Table VI.6.5-1 Distance from the IP boundaries and the lands in which exploration, mining and/or processing of mineral resources is intended

Territory of	Distance from the Rozino Deposit boundaries km	Possible cumulative effect YES/NO/Possible
Ivaylovgrad	>12.5	NO
Belopolyane village	>16.5	NO
Brusino village	>6.5	NO
Bubino village	>12.0	NO
Gornoseltsi village	>11.0	NO
Dolno Lukovo village	>11.0	NO
Zhelezino village	>2	Possible
Kobilino village	>6.5	NO
Kostilkovo village	>8.5	NO
Mandritsa village	>14.0	NO
Meden buk village	>7.5	NO
Nova Livada village	>4.5	NO
Odrintsi village	>15.0	NO
Oreshino village	>11.5	NO
Planinets village	>4.5	NO
Plevun village	>5.5	NO
Pokrovan village	>11.5	NO
Pastrook village	>1.2	Possible
Sborino village	>6.0	NO
Svirachi village.	>12.5	NO
Siv kladenets village	>18.5	NO
Sokolentsi village	>1.5	Possible
Huhla village	>17	NO
Cherni rid village	>6.5	NO

Territory of	Distance from the Rozino Deposit boundaries	Possible cumulative effect
Chernichino village	>13.0	NO

It can be seen from the above that activities which are likely to have a cumulative impact are intended in the villages of Zhelezino, Pastrook, and Sokolentsi situated near the IP site. A slightly more detailed analysis of the likelihood of cumulative impact is required for each IP in which mining/stripping operations near to adjacent settlements are intended. The following table presents all IP which may be implemented near the Rozino Deposit site.

Table VI.6.5-2 Description of IPs near the Rozino Concession and evaluation of the likelihood of cumulative effect

Decision for approval and issuing authority	Pos. No. on Figure VI.6.5-1	IP name	Impacted territories	Assessment of cumulative effect likelihood
45-OC/2008 issued by the MOEW	2	Overall detailed design for prospecting and exploration for rock-lining materials in the Pastrook property.	Pastrook village and Zhelezino village, Ivaylovgrad Municipality, Haskovo District	This detailed design covers two village lands, including the zoning boundaries of the villages of Pastrook and Zhelezino. No commercial discovery has been announced as yet and no contour of the future concession is defined. Therefore, it is impossible to evaluate the potential cumulative effect. However, it should be noted that the Pastrook property is situated to the north-east of the Rozino Deposit and a cumulative effect on the atmospheric air quality in Rozino, Byal Gradets and Gugutka villages to the north or south of the concession area would be impossible.
112-OC/2009 issued by the MOEW	3	Overall detailed design for prospecting for rock-lining materials in the Dyulina mahala property, Zhelezino village, Ivaylovgrad Municipality, Haskovo District.	Zhelezino village, Ivaylovgrad Municipality, Haskovo District	The Dyulina mahala property outline is more than 5 km away from the IP. This distance makes any cumulative effect impossible.
24-OC/2011 issued by the MOEW	1	Overall detailed design for prospecting and exploration for mineral resources in the Chervenica dol property	Sokolentsi village, Ivaylovgrad Municipality, Haskovo District	The Chervenica dol property outline is more than 3 km to the north of the IP. This distance makes any cumulative effect impossible. Furthermore, this property is situated to the north of the Rozino Village, while this IP is to the south. This situations makes any accumulation of dust

Decision for approval and issuing authority	Pos. No. on Figure VI.6.5-1	IP name	Impacted territories	Assessment of cumulative effect likelihood
				concentration from both deposits impossible.
06-OC/2023 issued by the MOEW	4	Overall detailed design for prospecting and exploration for mineral resources in the Tabakova cheshma property	Zhelezino village, Ivaylovgrad Municipality, Haskovo District	The Tabakova cheshma property outline is more than 4 km to the north-east of the IP. No negative cumulative effect would be possible over such a distance.

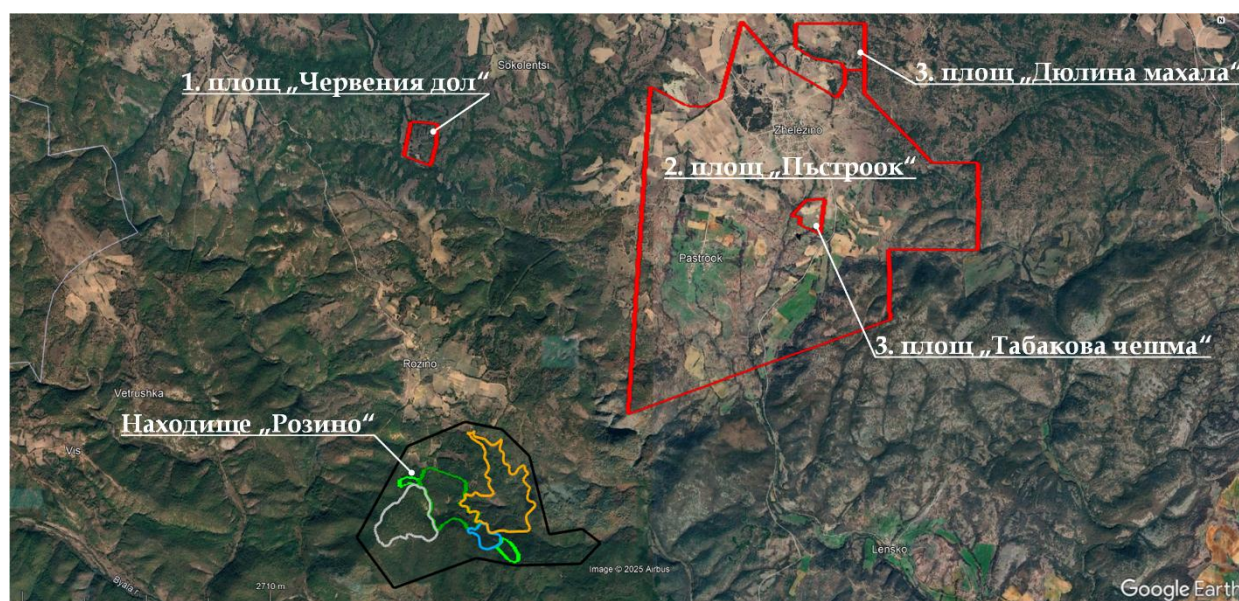


Figure VI.6.5-1 .Location of IPs in neighbouring lands

As regards the *aspects of health and hygiene*, the above analyses and assessments of ambient air quality, noise, soils, water, and hazardous chemical substances indicate that no cumulative impacts on the health of the population of the settlements nearest to the IP and on the workers on-site are expected from the IP for mining of ores and minerals, given the other IP in the region, presented in *Textual attachment 14*.

Summary of cumulative impacts:

❖ Atmospheric air:

The effect on atmospheric air quality is local in extent and cannot be expected to have a cumulative effect.

❖ Lands and Soils:

The lands impacted by mining will be more than 1 km. away from other exploration properties, and the current uses of the intervening terrain will be preserved and no large re-purposed massifs will be formed. According to the regulations and if the exploration properties be granted mining concessions, all mining of natural resources must have plans for rehabilitation of disturbed areas, and these plans must include use of the topsoil layer during the rehabilitation.

❖ ***Subsurface Environment, Mineral Diversity:***

The subsurface will be impacted directly by the mining operations. The significant distance to the various operating polymetal and gneiss deposits means that no impacts on the on the subsurface and no negative geological phenomena such as increased seismic activity, subsidence, slides, rockfalls, rupturing of the earth’s crust etc. will be caused. Extraction of established reserves is controlled by the state via the Ministry of Energy, in accordance with the *National Mining Industry Development Strategy* (2015) and with the terms of the mining-concession granting contracts. According to the Mining Strategy of 2015, Bulgaria is third in copper mining and fourth in gold mining in Europe, which shows our country’s leading position in European mining. The vision in the 2030 strategy is for the Republic of Bulgaria to become a regional leader in sustainable use of mineral resources and reserves and in the development of mining communities. Bulgaria’s mining industry is a key industry and a main driver of economic development. Mining industry is developed by efficient, integrated and long-term use of mineral resources in accordance with the sustainable-development requirements extending to the three main aspects: economic, ecological - green mining industry, and social - corporate social responsibility.

❖ ***Landscape:***

The landscape type changes during surface mine development. This change is limited to the extent of the concession area. The remoteness between the sites and the topography do not allow for formation of large areas with technogenically altered landscape. One additional impact limitation measure is implementation of rehabilitation plans with restoration as close to the initial landscape type as possible.

❖ ***Mining, processing and ore hauling noise:***

The impact on background noise levels in the near-by objects in need of increased noise protection will be insignificant and is not expected to be cumulative.

❖ ***Population and human health***

No cumulative impacts on the health and hygiene aspects of the environment and, respectively, on the population and on human health are expected, including as regards those working on the site.

6.6. IP impact on climate (e.g. the nature and degree of greenhouse gas emissions) and the vulnerability of the IP to climate changes

According to the EC’s Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, 2013, the following aspects should be considered during the assessment of climate change processes and EIA:

- the potentially long-term impact that predicted climate changes will cause to the proposed project and, also, the project sustainability and capability to overcome such impacts;
- long-term trends must be taken into account with or without the evaluated project, and ‘snapshot’ analyses must be avoided;
- The exposure must be evaluated and the risk assessed in consideration of various scenarios of project sensitivity, exposure and vulnerability.

The following possible scenarios should be considered:

- ✓ extreme climatic situations which may impact the project implementation and functioning or aggravate its impact on biodiversity and on other ecological aspects;
- ✓ the time-related dynamic trends in environmental parameters and quality;
- ✓ the best and worst case scenarios related to the two parameters above;

On the other hand, the assessment should consider the Climate Change Restriction Act which conducts the policy of the state to restrict climate changes, and *the National strategy adaptation to climate changes and Action plan* have been adopted with Decision 621 of the Council of Minister of October 25, 2019.

This national strategy is a reference document defining a framework for action to adapt to climate changes (ACC) and priority actions for up to 2030, by identifying and confirming the need for actions to adapt to the climate both for the economy in general and at the sector level, simultaneously underlining the consequences of inaction. The mining industry is not included in the strategy as an economic sector and no goals and risks have been set and identified for it. Only the risks from natural gas mining and delivery are considered.

For its own part, the mining industry is a water user. This is the case with the IP under consideration. Therefore, given its characteristics and its elements, we will include the Water sector in this assessment.

The strategic objectives for the Water sector are:

- ❖ Improved management of adaptation;
- ❖ Strengthening of the knowledge base and awareness about adaptation;
- ❖ Improvement of adaptive management of the water system infrastructure.

The main mid-term and long-term risks for the water sector, expected to result from the predicted climate changes and described in the sector report, which is part of the National strategy adaptation to climate changes, are as follows:

- **Flood and drought** are identified as the most substantial in respect of the water sector. The higher risks of flooding affect the entire country, while the more serious droughts endanger the regions with predicted water shortages. Regions using ground water sources are expected to be at a lesser risk of shortages because of the prediction that climate changes will not affect groundwater availability, the forecasted population decline in Bulgaria and the slow growth of industrial and agricultural activities. High shortage risks may be expected in the regions supplied from surface water sources and hosting intensive and assumably increasing tourism.
- The Black Sea region seems to be the most vulnerable to shortage risks because it uses surface waters and is most visited by tourists. The poor condition in the infrastructure in this region adds another dimension to this increasing risk.
No such risk is relevant for the IP.
- **The key vulnerabilities to such climate dangers** (and their impact on water shortages) are:
 - o *The status and preparedness of infrastructure*: Overloaded, ageing, poorly maintained infrastructure and, therefore, highly vulnerable and most likely inadequate for overcoming of climate changes.
 - o *Preparedness of the human factor*, operator or user: The population and the infrastructure operators have no historical experience and no good practices for flood and drought and, therefore,

are highly vulnerable.

- o Hydro power plants - vulnerable by operation during droughts – this is irrelevant for the IP.
- o *Water services* (water supply, sewerage, irrigation) - vulnerable during droughts – this is partially relevant for the IP, insofar as it will require process water.
- **The main risks for the managed systems** are, therefore, risks for infrastructure and services:
 - o Damages, improper operation and insufficient or sub-standard services;
 - o Risks for the hydro power plants because of low or high river flows - this is irrelevant for the IP.
- **The main risks for the natural systems** are damaged bio-diversity caused both by flooding and by drought.

The *Analysis and Evaluation of Climate-Change Risks and Vulnerabilities for Bulgaria’s Economic Sectors* developed with financial support of the European Regional Development Fund via the 2007-2013 Environment operational program, the mining sector is not considered but is pointed out as one of the main water users. The evaluated IP confirms this and, accordingly, we will consider the specified water-related risks which are associated with extreme occurrences: extreme temperatures and extreme precipitation.

According to this document, the evaluation of water-sector vulnerability caused by climate changes, is as follows:

Table VI.6.6-1. Water-sector vulnerability assessment in accordance with the Analysis and Evaluation of Climate-Change Risks and Vulnerabilities for Bulgaria’s Economic Sectors

System/indicator	Climate scenario IPCC AR5	Outcome probability during the 2016-2035 time horizon			Expected impact (positive +, insignificant or none 0 and negative -)			Sensitivity level 1 - Low 2 - Moderate 3 - High		
		3	4	5	6	7	8	9	10	11
Water	Scenario	$\Delta T^{\circ}C$	$\Delta P\%$	Ex $\uparrow\downarrow$	$\Delta T^{\circ}C$	$\Delta P\%$	ΔEx	$\Delta T^{\circ}C$	$\Delta P\%$	ΔEx
Surface water quantity	RCP2.6	1.5-2.0	0-10	$\uparrow\downarrow$	-	+	+/-	3	3	3
	RCP4.5	1.5-2.0	0-10							
	RSP6	1.0-2.0	0-10							
	RSP8.5	1.5-2.0	0-10							
Ground water quantity	RCP2.6	1.5-2.0	0-10	$\uparrow\downarrow$	-	+	+/-	3	2	3
	RCP4.5	1.5-2.0	0-10							
	RSP6	1.0-2.0	0-10							
	RSP8.5	1.5-2.0	0-10							
Water Quality	RCP2.6	1.5-2.0	0-10	$\uparrow\downarrow$	-	-	-	2	2	3
	RCP4.5	1.5-2.0	0-10							
	RSP6	1.0-2.0	0-10							
	RSP8.5	1.5-2.0	0-10							
drought	RCP2.6	1.5-2.0	0-10	$\uparrow$	-	+	-	3	3	3
	RCP4.5	1.5-2.0	0-10							
	RSP6	1.0-2.0	0-10							
	RSP8.5	1.5-2.0	0-10							
Floods	RCP2.6	1.5-2.0	0-10	$\uparrow\downarrow$	-	+	-	3	3	3
	RCP4.5	1.5-2.0	0-10							
	RSP6	1.0-2.0	0-10							
	RSP8.5	1.5-2.0	0-10							

Total sensitivity points								17	15	18
Total maximum points								15	9	16
Persistence/Vulnerability								0.37	0.55	0.37

where: $\Delta T^{\circ}\text{C}$ – temperature index, $\Delta P\%$ – precipitation index, ΔEx – extreme event index

This sector’s index of sensitivity to climate changes until 2035 is determined as 1.25.

The adaptiveness capacity is ‘insufficient’ and scores 3 points.

Vulnerability index (Y) = Sensitivity (S)/Adaptation capacity (Ac)

$Y = 1.25/3 = 0.41$

According to this index value, the sector is defined as ‘*moderately resilient*’ to climate changes until 2035. The next level is ‘vulnerable’.

Vulnerability index evaluation scale

<u>Index value</u>	<u>Resilience/vulnerability</u>
0.80 - 1.00	Extremely stable
0.50 - 0.79	Very stable
0.20 - 0.49	<i>Moderately stable</i>
0.01 - 0.19	Vulnerable

The indicators for sensitivity of the sector to possible climate changes show a trend toward increasing extreme temperatures and extreme precipitation, deterioration of water quality mainly because of significant flow reduction or by flooding, and serious fluctuation of flows over time.

The water sector exhibits an increased sensitivity to indicators of change in water quantity and quality, to extreme temperatures and precipitation, and, respectively, to the risk of flooding and drought.

Integrated water resource management and integrated management of the risks of flood and drought are of primary importance in the process of adapting to changes in the water sector. This transition will also apply to the evaluated IP.

In view of the above and on the basis of the IP characteristics presented in Section II of this EIA Report, the key vulnerabilities to climate threats by the project may be determined as follows:

- *The status and preparedness of infrastructure:* overloaded, ageing, poorly maintained infrastructure and, therefore, highly vulnerable and most likely inadequate for overcoming of climate changes.

The IP will involve completely new construction and this risk will be avoided by modern design solutions and construction techniques.

- *Preparedness of the human factor,* operator or user: the population and the infrastructure operators have no historical experience and no good practices for flood and drought and, therefore, are highly vulnerable.

The facilities which comprise the IP will be maintained by well-trained personnel and this risk will be avoided.

- *The main risks for the managed systems* are, therefore, risks for infrastructure and services - damages, improper operation and insufficient or sub-standard services;

The IP provides for modern process-management systems and this risk will be avoided.

- *The main risks for the natural systems: damaged bio-diversity caused both by flooding and by drought.*

The IP provides for a set of measures intended to protect biodiversity in the IP area, and this risk will be avoided.

Considering these aspects of climate change impact in respect of the proposed activity, it can be stated that the latter comprises a new mine site using modern technologies consistent with the environment in which they will be implemented and involving application of adequate safety measures. Accordingly, and in view of the above risks, the project could not by itself impact the climate.

Usually, the measures to adapt new engineering project to climate changes are intended to ensure adequate level of resistance to climate change impacts caused by natural events such as severe floods, sudden torrents, heat waves, severe storms and, also, chronic events such as changes of the average values of precipitation, thunder storms and strong winds. The risk of fire should also be considered, given the location of the future project.

Ensuring occupational safety and protection of the process facilities, the IP needs climate resistance that ensures that the development of the mine will not increase the vulnerability of adjacent natural and social structures.

Assessment of the IP vulnerability to climate change

The assessment of the IP vulnerability to climate change should consider the climate specifics of the region in which the activity will be carried out.

The region is under predominant Mediterranean climatic influence, especially so with regard to the Mediterranean cyclons. Apart from that, owing to its wider openness toward the north, cold continental air masses rushing in from the north is felt strongly. Cyclone activeness during the winter term is the reason both for relatively high temperatures and increased and mainly frontal precipitation. Temperatures in January average between 1 and 2°C. Occasional heavy rains fall with up to 80 mm of precipitation per 24 hours.

Precipitation is more scarce in the summers, with rather high extreme temperatures, the averages for July being 23 to 25°C, with many sunny days. Hot tropical air masses rush in and cause periods of drought. Precipitation totals in the summer (June, July, August) between 1976 and 2005 varied between 150 and 200 mm same as during the spring.

North-westerly winds prevail and are active along the valleys and the mountain ridges. Foehn is also present.

As stated above, the mining sector is not an industry considered in the strategic documents. However, this sector uses water, as does the IP under consideration, for which water use and management are envisioned, and, therefore, the main risks associated with the ‘Water’ sector stated in the strategic and reference documents will be considered, as follows: extreme precipitation (rain), extreme positive temperatures (heat waves and drought), and flooding. Given the location, the specific requirements for the project and its activities, the following should be added: land slides, forest fires, strong wind and storms.

The climate in the region is mild, Mediterranean, and there is no need to consider extremely low temperatures, extreme snow falls and snow drifts.

As regards land slides, it should be pointed out that according to the Bulgarian landslide registry kept by the Ministry of Regional Development and Public Works, the IP areas is not in a landslide region.

Two landslides have been registered in Ivaylovgrad, but they are very far from the IP outline, in Ivaylovgrad, area 63, Yane Sandanski st., and area 63, Paisii st.

-
-

In view of these natural conditions, the project is not exposed to landslide risks.

Карта на свлачищата

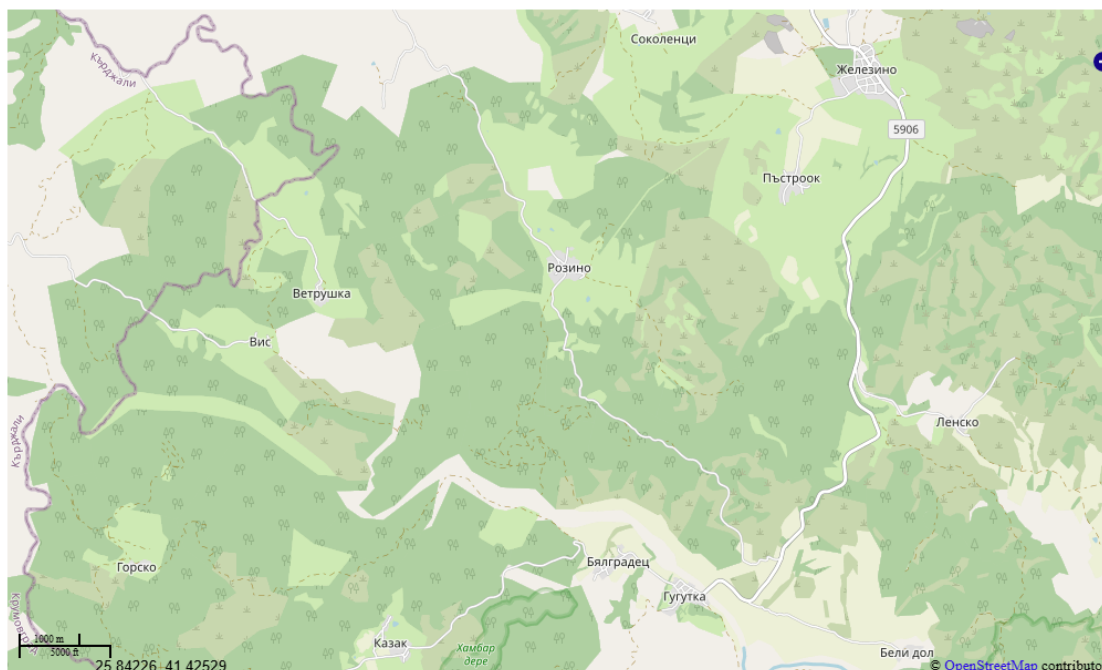


Figure VI.6.6-1. Map of landslides, according to the Landslide Registry

According to the third RBMP of EAR (2022 – 2027) adopted with Decision 937/28.12.2023 of the Council of Ministers, the IP region is not situated in a region with high potential flood risk. The site location (in the uppermost part of the hill) and the topography do not require consideration of this risk because all surface waters flow along the adjacent valleys down to the Byala Reka River bed.

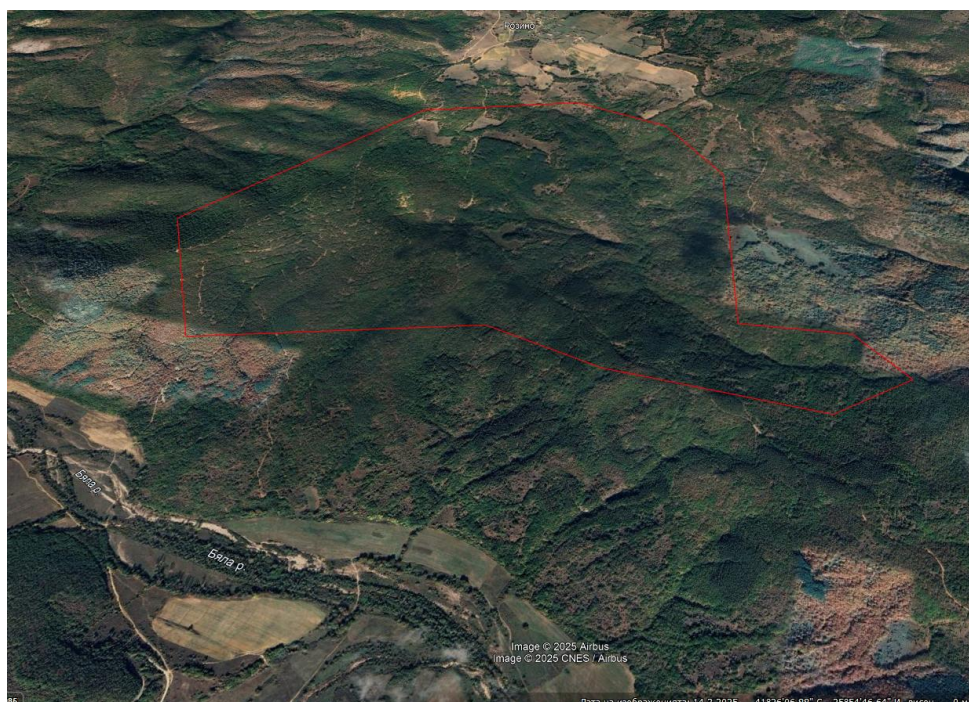


Figure IV.3-2. The contour of the future concession area, Google Earth

A three-level scale was used to evaluate the IP sensitivity, exposure and vulnerability, on the basis of the methodology documents.

SENSITIVITY / EXPOSURE / VULNERABILITY	
HIGH	
AVERAGE	
LOW	

The **IP sensitivity** is viewed on the basis of the geographic and climatic features of the region.

Sensitivity assessment

- **High sensitivity:** the climatic variables (danger) may cause substantial impact on goods and processes, on inputs, on produce and on transport links;
- **Medium sensitivity:** the climatic variables (danger) may cause light impact on assets and process, input products, yields and transport links;
- **Low sensitivity:** the climatic variables pose no danger or their impact is insignificant.

The **IP exposure** is analysed from the perspective of current climatic conditions and, similarly, for future conditions. Also, the present and predicted intensities and frequencies of IP exposure to climatic impacts are considered, in accordance with the geographic location and the climatic features.

Assessment of exposure:

- Exposure with **strong impacts** by climate phenomena with reference to the current and future climatic conditions;
- Exposure with **medium impacts** by climate phenomena (danger) with reference to the current and future climatic conditions;

• Exposure with **weak impacts** by climate phenomena (danger) with reference to the current and future climatic conditions;

The vulnerability of the project is determined by identifying of climate phenomena or their extreme occurrences with potential to impact the project, and on the basis of sensitivity and exposure for both the present and the future conditions. This analysis is made using the matrix where Vulnerability = Frequency x Exposure.

Vulnerability Assessment Matrix

SENSITIVITY	EXPOSURE			
		POOR	AVERAGE	HIGH
	LOW			
	AVERAGE			
	HIGH			

Key

vulnerability	low	average	high

The risk analysis is based on a vulnerability analysis and is focused on identifying of risks and opportunities associated with average or high vulnerability. This involves an analysis of the probability and magnitude of the effects associated with the threat of arising of the situations identified by the vulnerability assessment, simultaneously with the analysis of the risk for the success of the project. The risk analysis matrix is presented in detail in the following table.

Risk classification matrix (overall classification framework)

				Impacts, I				
				Negligible 1	Minor 2	Average 3	Significant 4	Catastrophic 5
Probability, L	5	Almost certain	95%	5	10	15	20	25
	4	Feasible	80%	4	8	12	16	20
	3	Moderate	50%	3	6	9	12	15
	2	Improbable	20%	2	4	6	8	10
	1	Occasional	5%	1	2	3	4	5

Level of risk	Low	Average	High	Extreme

The IP sensitivity to climate change has been analysed with a view to a set of key climatic factors selected on the basis of specific requirements for the IP, and with a view to the specifics of the project implementation area, such as: extreme precipitation, extremely high temperatures, drought and forest fires, local erosion and landslides in the facilities.

This approach is consistent with the main guidelines of the Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, 2013, in respect of the possible scenarios of project sensitivity, exposure and vulnerability.

The specific IP threats may be summarised in the following way:

Extreme precipitation, storm waters and flooding of the facilities

Intensive short duration storm events and torrential rains are a substantial risk for the open pit, the stockpiles (overburden material) and the TMF. The following is possible over a short time during extreme quantities of precipitation:

- *Flooding of the open pit and of the facilities:* A spiking surface run-off may cause filling of the mine excavations with water, slope erosion and difficult access/evacuation. Inadequate drainage poses a risk of temporary interruption of mining and damage of equipment.
- *TMF overtopping and dam break:* The capacity of this facility may be overloaded during extreme precipitation in excess of the design parameters. The risk is overtopping of the dam or the emergency spillway and entry of the water into the contract water reservoir.
- *Stockpile undercutting and sliding:* Strong surface run-off along open stockpile bodies (overburden, dumps) may erode the foundation and cause slope instability. Extraordinary water flows may cause sliding of materials, especially if no strengthening benches and drainage channels are constructed.
- *Damage of infrastructure:* Mine roads, open ditches, pipelines and other auxiliary facilities are vulnerable to storms which may wash away surfacing, fill up storm drains with silt and compromise structural foundations.

Extreme heat and drought

Prolonged periods without rain (drought), combined with extremely high summer temperatures, may affect the project as follows:

- *Shortage of process water:* The process (flotation) requires a constant flow of process water. Prolonged droughts may reduce the flow-rates of the water sources (river flows, ground waters) and compromise the supply to the plant. In the extreme scenario of completely dried up surface water sources, restriction or temporary stopping of production will be required if there is not enough water in the reservoirs or if no other back-up water sources are present.
- *Increased dust loading:* Dry climate causes open surfaces such as stockpiles, roads, and bare mining areas to dry up and to generate more dust during plant and vehicle operation and movement. The lack of moisture in the soil increases the tendency toward dust being raised by winds and by passing vehicles. This may exceed the limit values for particulate mater (PM₁₀/PM_{2.5}) in the air, especially when combined with winds. Drought and heat waves can also cause local air quality deterioration by retaining pollutants during air mass stagnation or temperature inversions during anticyclone weather when dust laden air does not disperse as easily.
- *Worker health and safety risk* Extremely high temperatures (more than 35–40°C during the day) deteriorate open-air work places by increasing the risk of heat stroke, and by causing dehydration and reduced ability to work. Miners and operators of outdoor heavy-duty

machinery are especially vulnerable. Droughts increase the likelihood of dust in the workplaces which, combined with heat, may cause respiratory discomfort.

- *Deteriorated condition of vegetation and rehabilitated areas:* Prolonged periods of drought obstructs the growth of any compensatory planting or grassing of the rehabilitated stockpiles and in the TMF. This will reduce the resilience of the terrains against erosion (the terrain remains unprotected without a vegetation cover) and may extend the period until complete ecological post-closure recovery.

Forest Fires

Higher temperatures and longer dry periods during summers increase the danger of forest and field fires. Summer fires are no rarity in the project area (South-Eastern Bulgaria, near the Eastern Rhodopes). The project vulnerability to fires is as follows:

- *Direct impact of the site by external fire:* A large forest fire in neighbouring forest (during a dry August, for example) may spread toward the mine infrastructure - buildings, facilities, fuel and chemical warehouses. Open storage areas, rubber conveyor belts, electrical power lines, vehicles and other flammable elements are most at risk. A fire in the chemical substance and mixture storage area would be especially critical.
- *Internal fire along plantations and dry slopes:* Open-air stockpiles, dry vegetation along the rehabilitated areas or along the roads may also be set on fire by a spark, by unextinguished fire or by accident (ignition by a machine). In dry weather, a small fire may get out of control and extend to parts of the processing site.
- *Smoke and air quality:* Even if no direct damage is caused, a large forest fire near-by will cover the area with smoke and will pollute the air with fine particulate matter (soot) and toxic gases. This would require evacuation or suspension of work until the situation is brought under control, in order to protect the health of the workers.
- *Secondary effects:* Precipitation following fire on slopes devoid of vegetation increases local erosion (soils lose stability without vegetation). Thus fires increase indirectly the risk of slides and flooding in the future concession area.

Local erosion and slides in the site

Soil erosion and landslide processes on site may be aggravated by the changing climate, especially in the mountainous and rolling mine-site terrain. The combination of intensive precipitation (torrents) and loss of vegetation (drought or through human intervention) leads to the following vulnerabilities:

- *Surface erosion on stockpiles and stripped areas* Strong precipitation may carry away the surface layers of overburden stockpiles, especially if no protective vegetation or geotextile is present. Erosion furrows form and deteriorate the integrity of the slopes. Not only material is lost and landscape is disturbed in this way, but also the water in the reservoirs may become turbid.
- *Undercutting of facility foundations:* Prolonged rains, especially after dry spells (when the soil compacts and water does not seep in) will cause a substantial surface runoff. If such runoff is not handled by the drainage system, the water may undercut embankments (such as the TMF embankment) or the foundations of retaining walls, with subsequent settling and potential breaking.

- **Landslide and rockslide:** Abrupt changes between drought and storm creates a risk - the dry and cracked earth mass quickly soaks water, becomes heavy and loses strength. This increases the likelihood of landslides along the steep mine slopes or stockpile slopes, especially in the case of conducive geological conditions (clay, loess etc.). A landslide may fill up some of the pit or damage the infrastructure (roads, buildings).
- **Wind erosion in periods of drought:** Apart from water erosion, in dry weather the stockpiles are subjected to deflation (scattering of material by the wind). Although slow, deflation is a form of erosion which causes loss of topsoil and creates dust emissions. It occurs predominantly along unsealed dry surfaces (outdoor layers of mine waste, for example).
-

Assessment of the IP vulnerability to climate change

Major Risks	Sensitivity	Exposure		Vulnerability	Risk analysis
		current	Future		
Extreme precipitation, storm waters and flooding of the facilities Floods can be: - torrential, caused by intense precipitation (rarely exceeding 60 – 80 l.m ²), resulting from the large quantity of water falling on the earth's surface, and by insufficient throughput of the drainage facilities. Floods can cause significant damage to the site: The water can undermine the foundations of the facilities and slopes, and damage the engineering facilities, flood the open pit and its facilities, overflow and break the mine waste management facility, and damage mining infrastructure.	average	low	average	average	Unlikely, 20%, given all included technical solutions.
Extreme heat and drought Extreme positive temperatures are defined as outdoor air temperature above + 35°C. The duration of impacts by high temperature is also of importance. The combination of high temperature and strong sun radiation may cause: shortage of process water that would restrict or temporarily stop production; increased dust loading and, therefore, worker health and safety risks; and deteriorated condition of vegetation and rehabilitated areas.	average	low	average	average	Unlikely, 20%, given all included technical solutions.
Forest Fires Higher temperatures and longer dry periods during summers increase the danger of forest and field and can: have a direct impact on the site; cause internal fire along plantations and dry slopes; aggravate the local air quality; cause secondary effects such as local erosion by subsequent rain.	average	low	average	average	Not very likely, 20%, if adequate fire-protection measures are taken.
Local erosion and slides in the site Soil erosion and landslide processes on site may be aggravated by the changing	low	low	low	low	Rarely, 5%

Major Risks	Sensitivity	Exposure		Vulnerability	Risk analysis
		current	Future		
climate. The combination of intensive precipitation (torrents) and loss of vegetation through drought may cause: surface erosion of stockpiles and bare areas; undercutting of facility foundations; local landslides and rockslides, and wind erosion in periods of drought.					
Key vulnerabilities to the above climate dangers: - poor condition and preparedness of infrastructure: poorly maintained infrastructure; human unpreparedness, causing severe vulnerability. These assumptions are of no relevance for the IP because of its characteristics, its specific purpose and the obligations to ensure worker and facility safety.	low	low	low	low	Rarely, 5%
The main risks for managed systems: risks for the infrastructure and facilities, material damage, improper operation and low or insufficient quality of management. The level of IP system management is high and these risks are not present.	low	low	low	low	Rarely, 5%
Risks for natural systems and for biodiversity might occur given the location of the site and the main risks to which it is subject and which are listed above.	average	low	average	average	Not very likely, 20%, if all envisaged preventive measures are implemented.

Summary of the analyses results

Sensitivity: Some parts of the site may be affected by climate changes/risks in a certain manner. The IP sensitivity to impact on assets and processes is medium, considering the location of project components and climate factors: extreme precipitation, extreme positive temperature, drought and forest fires, which could create risks for natural systems and for biodiversity. The sensitivity to local erosion processes is low.

Exposure: the IP is situated in an area in which the above-mentioned climatic risk factors are identified as less likely and poorly manifested, except for extreme precipitation, extremely high temperatures and droughts. Precipitation is more scarce in the summers, with rather high extreme temperatures, the averages for July being 23 to 25°C, with many sunny days. Hot tropical air masses rush in and cause periods of drought and this could create risks for the natural systems and for biodiversity around the IP.

Vulnerability: The project vulnerability to the relevant climatic factors is medium. extreme precipitation, extreme positive temperatures, drought and forest fires, given its exposure, and the nature and level of protection of the facilities, and the current climate data and the climate forecasts

for up to 2100. The vulnerability is medium also because of the potential risks for the natural ecosystems and for the biodiversity.

Risk assessment: According to the climate change forecasts for Bulgaria, the average annual air temperature is expected to increase between 1.6°C and 3.1°C by the year 2050, when the temperature increases during the summer period (July to September) will be more substantial. The project evaluation matrix approach applied above shows an average risk of low likelihood, at 20%, and underpins the need to propose *measures to adapt to the identified climate risks*.

In response to the established risks, the project provides for a package of engineering, technical and organisation measures aimed at increasing climate change resilience. These measures conform to the national priorities for adaptation (increase of infrastructural stability, protection of natural resources and of health), and to the European Adaptation Strategy (for ‘more intelligent, faster and more systematic adaptation’ to climate), and they are:

Measures during extreme precipitation and floods:

- **Extended drainage systems and dewatering:** Stable drainage channels, shafts and slopes for rapid redirection of surface water from the critical areas (the mine, the stockpiles) are provided for at the design stage. The dewatering facilities are sized for higher frequencies of the so-called *precipitation with a 1% return period (100 year rain event)*, with an addition for climate trends (such as +20% intensity). Systems of ditches around the slope tops are provided for to divert stormwater away from the mine slopes and from the stockpiles. Internal drainage is constructed in the open pit levels, from which water is diverted to pumping points. The pumping stations spare capacity allows for extreme situations and back-up power.
- **Reserve free board and control of the TMF:** Increased **freeboard** above the maximum operating level is envisaged for the TMF, to cope with extreme storm inflows. A *spillway/discharging channel* for emergency releasing of water to the water reservoirs is provided for, with a capacity exceeding the historical maximum storm run off. The TMF embankment is constructed with a safety margin accounting for potential muddying and damping. Precipitation and water levels will be monitored during the operation and the supernatant pond level will be lowered in advance (controlled release of water to the reservoirs) after a torrential rain forecast in order to allow for additional freeboard.
- **Strengthening and terracing of stockpiles:** The overburden stockpiles are designed with benches (stepped) of a defined maximum height of the slopes and with berms that stop run off and reduce the energy of water. Anti-erosion mats or geo-meshes are placed on the slopes to retain the surface layer. Internal de-watering pipes are installed in the steepest sections to prevent accumulation of pore water. Ditches intercepting water upstream of the slope are dug around stockpile peripheries. Upon stockpile formation, technogenic rehabilitation (covering with topsoil and planting and sowing) will be carried as soon as possible in order to minimise bare erodible soil surfaces.
- **Plan for emergency response to flooding:** An internal plan is under development to lay down responses in the event of forecast or occurrence of extreme precipitation. It includes: preliminary de-energizing and safeguarding of the electrical equipment in the mine, relocating of equipment to high areas, readiness of emergency pumps and teams; constant

connection to the National Institute of Meteorology and Hydrology for weather warnings (dangerous weather codes). In the event of TMO overtopping, controlled releasing through emergency systems to the reservoirs in order to avoid dam breaking. Scenarios are drilled at least once per year.

The above measures aim to make the site '**climate proof**' for extreme precipitation in accordance with the principles of '**infrastructure resilience**', embedded in the national adaptation strategy and, also, in the EU strategy (requirement for *climate-proofing* of new projects).

Measures during draught and heat waves

- ***Securing of back-up water sources and capacity:*** In order to mitigate the risk of water shortage, the project provides for construction of a **back-up volume (reservoir)** on site for storing of water during the wet period (winter/spring flow) and to provide it during summer droughts. This water body is sized to ensure at least 1-2 months of autonomous plant operation. Additionally, the possibility for alternative water source such as a borehole or existing supply infrastructure is being studied for use in extraordinary circumstances. Returning of water to the process is also a key measure: a maximum amount of the water from the TMF will be returned (more than 70–80%) which will reduce the dependency on fresh water.
- ***Dust suppression and dust control:*** Stronger dust suppression measures will be applied in dry and windy weather. This will involve **regular spraying** of the process roads and the stockpiles using sprinklers (water trucks) with increased frequency during drought. Where practical, ***alternative dust suppression means*** such as biodegradable binding compounds or hygroscopic salts will be used to retain moisture in the surface layer and to reduce the emissions of dust. ***Dust extraction systems*** (bag filters, aspiration) are provided for along the belt conveyors and vibratory mills in the process plant and will operate efficiently in dry atmosphere. Controlling truck speed along unsurfaced roads (up to 30 km/h, for example) is another dust emission reduction measure.
- ***Heat protection and work regimen:*** Adaptive working hours will be introduced in order to protect the staff from the heat by, for example, avoiding heavy physical work in the open pit during the peak afternoon hours. A schedule of early morning and late afternoon shifts will be applied in days with forecast for >35°C. The workers will be provided with ***chilled premises/resting rooms***, enough water for re-hydration, and personal protection equipment against the sun (hats, light-weight breathing attire). Instructions on recognizing heat-stress symptoms will be provided. An heat-stroke emergency aid medical station will be equipped. The heavy-duty equipment (dump trucks, excavators) are air conditioned which also reduces operator risks.
- ***Fire prevention:*** Additional measures will be taken i dry weather when the higher fire-risk levels are announced ('red code' for forest fires, for example): any lighting of open-air fire will be discontinued, outdoor welding and fire works are restricted, fire-fighting watch duty is provided. ***Protective fire strips*** – approximately 10 wide sections cleared of vegetation, will be prepared peripheral to the site (where forests are present) to act as an obstacle to potential surface fires. Fire hydrants and reservoirs on-site are inspected on a regular basis, and especially so before the summer season. The personnel is trained to

respond to forest fires (evacuation routes, use of fire extinguishers, etc.). These measures are closely linked to the subject of fire safety considered in detail in the points below.

With the above measures the project aims to ensure *production resilience* even in extreme drought and heat waves, in accordance with the principles of the national Adaptation Action Plan which underscores the importance of non-interruption of the economic activities during climatic stress.

Fire protection measures

- **Fire breaks and buffer zones:** As is mentioned above, deforested and ploughed strips without dry vegetation will be made around the critical facilities (chemical store, switchyard) to stop any advancing fire. Sustainable green buffers in the TMF will be planted post-closure and will comprise species which are less susceptible to fire.
- **Fire monitoring and early warning:** The enterprise will keep in touch with the regional Fire Safety and Civil Defence directorate and with the forestry enterprise in order to exchange information during increased danger of fire. The possibility to install *thermal cameras or smoke sensors* at higher points (such as on watch towers or on pylons) is being considered, to ensure real-time detection of fire symptoms in the surrounding landscape. The notification and fire-suppression plan will be activated immediately if smoke/fire is detected.
- **Fire extinguishing equipment and training:** The site will be provided with its own primary fire-fighting resources: fire trucks or water tanks equipped with pumps; portable motor sprayers, fire-fighting tools (shovels, fire swatters). Higher-volume fire extinguishers will be available in key locations. The personnel will be provided annual fire-response training and drilling in evacuation and extinguishing of early-stage fires. Spare power supply is provided for the water pumping stations during fire events (when power cuts are frequent).
- **Forest fire plan:** A detailed emergency plan with procedures for response to near-by forest-fires will be developed. This plan will include evacuation criteria, such as the fire approaching at a distance of less than 1 km and strong wind toward the site, all employees who are not involved in fire fighting will be evacuated to a safe location (a pre-determined muster point). Coordination with the local authorities will be provided for in the plan: informing about any on-site hazardous substances that could react to fire; preparedness to assist the professional fire-fighting teams with equipment (bulldozers for clearings, tank-trucks).

These measures follow the national fire-safety rules and the recommendations of the European adaptation strategy which calls for *integration of climate risks such as fire in the management of facilities*. The objective is to minimise damage and to ensure limited impact on the environmental and on the project even during extreme fire events.

Measures against erosion and landslides

- **Engineering and geological studies and stabilization:** Detailed engineering and geological studies have been carried out prior to the excavation works in order to establish any potential land-slide zones. Preventive measures such as buttressing or anchoring of slopes with steel rods and geonets are taken in non-stable areas (such as deep layers of

clay). This will make the pit slopes more resilient to waterlogging. The open pit slopes are designed with inclination and intermediate berms to ensure resilience to water saturation.

- **Rapid rehabilitation and bio-engineering measures:** Technogenic rehabilitation follows immediately in shaped slopes or stockpiles where no more activities are expected - covering with a soil layer *and sowing of grass/planting of deep-rooted plant species*. Vegetation acts as a natural erosion-control shield - its roots stabilise the soil and the above-ground biomass reduces the force of falling drops and wind erosion. Local drought resistant grass and brush species will be used for rapid colonisation of the terrain. **Hydroseeding** may be applied in high-erosion risk areas by pressure-spraying of seeds, mulch and glue onto the slope to ensure rapid growing of grass.
- **Run-off control and sediment trapping:** Again, water management is key – apart from drains, **settling ponds** (small dams) will be constructed peripheral to any areas with bulk materials and will trap sediments carried off by strong rain. The two water ponds are intended to prevent entry of eroded bulk material into the near-by rivers. These facilities will retain sediments the settled material can be returned at a later stage. The level of fill in the settling ponds will be monitored constantly and the ponds will be cleaned as necessary.
- **Slope monitoring:** This involves regular inspections and monitoring by instruments (such as prism reflectors and tachymeters measuring micro-movements) on the most critical slopes - the TMF embankment, the large stockpiles, and the high pit walls. Should a settling trend or cracking be detected, additional strengthening will be undertaken immediately (such as removing of mass from the top, dewatering by means of horizontal drainage, construction of base-reinforcing berms). The early land-slide warning system will allow for evacuation of equipment and personnel from the endangered region and timely stabilisation.

With these measures the project aims to minimise long-term geotechnical risks. They are consistent with the provisions of **Regulation RD-02-20-1 (2012)** on Geotechnical Process Design (Landslides) and with the recommendations of the Ministry of Environment and Waters for integration of climate factors in the land-use planning of industrial facilities. This approach follows the European approach toward **nature-based solutions** (nature-based measures), because it uses most natural means of stabilisation such as vegetation.

Other organisation measures

The following organisation arrangements are envisaged beside the specific technical solutions: inclusion of a ‘**Climate Risks**’ section in the company’s Risk Management Plan; annual reviewing and updating of the adaptation measures in accordance with the latest climate data; education of the management staff on *adaptive management* – i.e. flexible mine planning according to the seasonal forecasts (such as increased mining during colder/humid periods and reduction in times of climatic stress). This is consistent with the national strategy goal to ‘build institutional capacity for adaptation’.

By using these measures, the IP for mining and processing of ore from the Rozino Deposit in the Tintyava PLA becomes compliant with the strategic adaptation framework: the IP vulnerability is reduced and its readiness to cope with the unavoidable consequences

of climate change is improved. This insures that the project’s contribution to the local economy will be stable in the conditions of changing environment.

Calculation of greenhouse gas emissions from the IP

These calculations are presented in detail in item V.1, and only the final results are shown here:

Calculation of greenhouse gas emissions from plant operations:

Greenhouse gas emissions can be calculated from the relative fuel consumption for ore stripping/mining. A relative fuel consumption for $3.75 \text{ dm}^3/\text{t}$ of raw material/overburden allows the calculation that the maximum total consumption of fuel by the plant in the Rozino Deposit will be as high as $16,256 \text{ t/y}$. The maximum greenhouse gas are estimated as:

- 51.4 t/y of CO_2 emissions;
- 2.2 t/y of N_2O emissions or $654 \text{ t/y CO}_{2\text{equivalent}}$;
- 1.3 t/y of CH_4 emissions or $34 \text{ t/y CO}_{2\text{equivalent}}$.

Calculation of greenhouse gas emissions from blasting of mined material:

Greenhouse gas emissions can be calculated from the relative CO_2 emission value for 1 t of explosives – 176 kg/t CO_2 . Annual use of as much as $727,200 \text{ kg}$ will generate up to 128 t/y of CO_2 emissions.

Calculation of greenhouse gas emissions from transport operations:

The greenhouse gas emissions can be calculated using the following emission factors

- for CO_2 - $3,181.89 \text{ g/kg}$;
- for N_2O - 0.07 g/kg ;
- for CH_4 - 0.21 g/kg ;

The following greenhouse gas emission values result from fuel consumption of 216.8 g/km and maximal run of up to $480,000 \text{ km/y}$ between the pit and the stockpile (*road length $\approx 4.0 \text{ km}$*) and $96,546 \text{ km/y}$ between the pit and the process plant (*road length $\approx 1.5 \text{ km}$*):

- 398 t/y of CO_2 emissions;
- 0.07 t/y of N_2O emissions or $2.6 \text{ t/y CO}_{2\text{equivalent}}$;
- 0.21 t/y of CH_4 emissions or $0.7 \text{ t/y CO}_{2\text{equivalent}}$.

6.7. Used technologies and substances

The Rozino Deposit will be open-mined by means of drilling and blasting. Specialized mining equipment will be used for the purpose, comprising excavators, bulldozers, dump trucks etc.

A specialized company will carry out the blast works and will deliver the explosives immediately before blasting.

The topsoil and overburden will be removed and disposed of at the respective soil and overburden stockpiles and will be used for mined-area rehabilitation.

Hazardous chemical substances, preparations and products will be used in the Processing Plant, and diesel fuel for the machines. These materials will be used in compliance with the safety

standards.

A flotation tailings thickening and dewatering process has been chosen in order to reduce impacts.

Almost the same equipment will be used during the rehabilitation, as at the beginning of mine development.

VII. DESCRIPTION OF CONSIDERED AVAILABLE RESULTS FROM OTHER RELEVANT ASSESSMENTS MADE IN LINE WITH THE NATIONAL LEGISLATION THAT ARE RELEVANT TO THE IP AND HAVE BEEN DRAWN UP PRIOR TO THE EIA STATEMENT

A notice about the Overall Detailed Design (ODD) for prospecting and exploration for metalliferous mineral resources in the Tintyava PLA situated in Ivaylovgrad Municipality, Haskovo District and Krumovgrad Municipality, Kardjali District was filed in 2017 in accordance with the Regulation on the Conditions and Procedures for Assessment of the Compatibility of Plans, Programmes, Projects and Investment Proposals with the Scope and Objectives of Protected Area Conservation (The EIA Regulation). In response, a letter from the MOEW No. HC3II-93/30.05.2017 states that the ODD is not subject to a procedure according to Chapter Six of the Environment Protection Act, but falls within the scope of Article 2, paragraph 2 of the EIE Regulation. Since the area concerns two protected areas, Byala Reka and Rhodopes - Eastern, a procedure in accordance with Chapter Two of the EIA Regulation was carried out and Decision 09-OC/2017 was issued to align the ODD.

It should be noted that the exploration area is substantially larger than the area of the IP under evaluation. The Tintyava PLA covers 5,290 sq.km., while the IP area is 275.3 ha, of which 118 ha will be disturbed.

No other evaluations according to the national legislation are being carried out at the present time, or preceding this investment proposal.

The following additional documents, supplemented and signed by their authors, are attached with this EIA Report:

1. Textual attachment No. 10 Hydrology Evaluation of the Byala Reka River and its tributary, the Arpa Dere River
2. Textual attachment 11 Water Management
3. Textual attachment 12 Trial Blasting Report
4. Textual attachment 16: Hydrogeological evaluation.

The conclusions in these documents contain answers to a number of questions and are included in this report.

VIII. DESCRIPTION OF THE FORECAST METHODS OR DATA USED IN DETERMINING THE MAIN ELEMENTS OF UNCERTAINTY AND IN ASSESSING THE SIGNIFICANT ENVIRONMENTAL CONSEQUENCES, INCLUDING DETAILS ABOUT DIFFICULTIES (SUCH AS TECHNICAL FLAWS OR LACK OF KNOW-HOW) EXPERIENCED BY THE CUSTOMER WHEN GATHERING THE NECESSARY INFORMATION

Laws, regulations, methods, guidelines, instructions, orders, decrees, regulations, strategies, plans and programs, and published literature used for forecasting and environmental impact assessment

General

- The Environment Protection Act (EPA), promulgated, SG, issue 91 of September 91, 2022, with the latest amendments)
- The Regulation on the Terms and Procedure for EIA (Promulgated SG issue 25 of March 18, 2003, with the latest amendments)
- The EC Guidelines for the Environmental Impact Assessment (EIA) procedures for investment proposals
- EC’s Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, 2013.
- The EC Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, May 1999

Ambient air

- The Clean Air Act, promulgated SG issue 45/1996, with the latest amendments, amended in the SG issue 41 of 2024.
- Regulation 7/03 May 1999 on Ambient Air Quality Assessment and Management (issued by the Ministry of Environment and Waters and the Ministry of Healthcare, promulgated in the SG, issue 45 dated 14.05.1999, effective as of January 1, 2000)
- Regulation No. 12 of July 15, 2010 on the Air Emission Limits for Sulphur Dioxide, Nitrogen Dioxide, Fine Dust Particles, Lead, Benzene, Carbon Monoxide and Ozone (promulgated in the SG, issue 58/2019, in effect as of 30.07.2010, latest amendments and supplements in the SG issue 79 of 2019.)

The methodologies used:

- - The methodology of the European Environmental Agency (EEA) developed under the European Monitoring and Evaluation Program (EMEP) of the Convention on Long-Range Transboundary Air Pollution, with latest update in 2023 - *NFR Category 2.A.5.a; NFR sector - 1.A.2.g.vii*
- Emissions Factors & AP-42, 8.19.2 Crushed stone processing, 1994;
- Emissions Factors & AP 42, 13.2.4 Aggregate Handling And Storage Piles
- Method for Determination of the Dispersing of the Emissions of Harmful Substances from Motor Vehicles and their Concentration in the Ground Atmospheric Layer

Water

- The Waters Act (promulgated SG issue 67 of July 27, 1999 with the latest amendments, SG issue 79 of September 17, 2024);
- Regulation 1 of October 10, 2007 on the Exploring, Use and Protection of Ground Water (promulgated in the SG, issue 87/2007 with the latest amendments and supplemented in the SG issue 102 of December 23, 2016);

- Regulation 3 of November 16, 2000 on the Terms and Conditions for Surveying, Designing, Approval and Operation of Sanitary Protection Zones around Water Sources and Drinking Water Supply Facilities and around Mineral Water Sources Used for Medical, Preventive, Drinking and Hygiene Purposes (Promulgated, SG, issue 88 dated November 27, 2000).
- Regulation No. H-4 of 14.09.2012 on the Characterization of Surface Water issued by the Minister of Environment and Water, promulgated, SG, issue 22 of March 5, 2013, in effect as of March 5, 2013, with the latest amendments and supplements, issue 67 of August 4, 2023, in effect as of August 4, 2023.
- Regulation on the Environmental Quality Standards for Priority Substances and for Certain Other Pollutants, adopted with Decree of the Council of Ministers No. 256 of November 1, 2010, promulgated, SG, issue 88 of November 9, 2010, in effect as of November 9, 2010, with the latest amendments and supplements, issue 97 of December 11, 2015, in effect as of December 11, 2015.

Subsurface

- The Mineral Resources Act (Promulgated in the State Gazette, issue 23 of March 12, 1999);
- Regulation on the Management of Mining Waste (Promulgated in the SG, issue 5 of 2016);

Soils

- Soils Act (SG issue 89 dated November 06, 2007, with the latest amendments)
- Forests Act (promulgated in the SG, issue 19 dated March 08, 2011, with the latest amendments)
- Agricultural Lands Protection Act (SG, issue 35/1996, with the latest amendments)
- Rules on the Implementation of the Agricultural Lands Protection Act (SG, issue 84/1996, with the latest amendments)
- Regulation 3 of August 01, 2008 on the Maximum Allowable Concentrations of Harmful Substances in the Soils (SG, issue 71/2008)
- Regulation 26 of October 02, 1996 on the rehabilitation of Damaged Terrains, Improvement of Unproductive Lands, Removal and Utilization of the Humus Layer (SG 89/1996, amended and supplemented in the SG, issue 30/2002)
- Regulation on the Categorization of Agricultural Lands Following Changes of their Purpose (SG issue 90 of October 24, 1996, with the latest amendments and supplements, SG issue 55/2017)
- Regulation No. 4 of January 12, 2009 on the Monitoring of Soils promulgated in the State Gazette issue 19/13.03.2009

Landscape

- The European Landscape Convention (Ratified with a Law on October 13, 2004; Promulgated in the SG issue 94 of 2004, in force as of March 01, 2005)
- Regional Landscape Zoning in Bulgaria. География на България. Monograph. BAS. С. 1996.
- Typological Landscape Zoning in Bulgaria. География на България. BAS. Sofia 1996

Biodiversity

Methodology

The field studies of plant habitats and plant and animal species were carried out in May 2017, August and September 2018, May, June and July in 2019, and June 2022. Data from other studies of ours in this part of the Eastern Rhodopes were used - August 2014, July and September 2016, April, May and June 2018, July 2020, March and May 2022, and March 2025.

The studied area (SA) was defined as a 110 m. buffer around all elements of the investment proposal (IP) plus a 700 m. buffer around both pits. This is the distance over which we expect maximum impact to be caused by disturbance to more sensitive species such as raptors, black stork and large mammals from machines and people during the construction and operation phases and from the drilling and blasting works during operation. The entire area of individual IP elements plus small areas closed between them, or between individual elements and their access roads is regarded as affected.

Initial mapping of the habitats in the studied area was carried out using the distance method (Brainerd et al 2006). A study area was outlined around the IP boundaries using QGIS Desktop 3.4 Madeira (WGS 84/UTM 35N coordinate system) (see above). Using visual interpretation of satellite images (Google Earth, 5.2.1.1588), and data from the ‘Mapping and determining the nature conservation status of natural habitats and species - Phase I’ Project (MOEW 2022) as reference, polygons of homogeneous habitats were outlined by hand in a GIS environment (Quantum GIS 2.14.8-Essen). The principles and methods of this mapping are based on the CORINE Land Cover methodology (Commission of the European Communities 1994). The polygons drawn in advance in the buffer were verified during the field work. Subsequent corrections were made as necessary and habitat classification according to EUNIS (Davies et al. 2004).

Typical locations were described during the on-site work in order to obtain the most complete possible idea about the habitats in the studied area. The transect method was used to describe the defined communities. The geobotanical descriptions feature the species names according to Kozhuharov (1992) and Asyov et al (2012), while the evaluation of plant species is in accordance with the five-point Brown - Blanke (Guinochet 1973) rating. The habitats of significance for conservation were identified using the Guidelines for Identifying the Habitats of European Significance in Bulgaria. (Kavrakova et al. 2009).

Plant species of significance for conservation (listed in the attachments to Bulgaria's Red Data Book or the Biodiversity Act) were established using the transect method.

The invertebrate were studied using the standard method with ‘pitfall’ traps comprising plastic 500 ml containers, half full with super-saturated acetic acid and salt solution, buried to the substrate level. Flying species and other species not falling into the trap were observed directly during the walk-over the areas. Also, the suitability of the habitats for the specific species were also evaluated.

The on-site study of amphibians, reptiles and mammals was based on the transect method whereby the researcher observes the terrain on both sides, walking at a moderate pace. Specific microhabitats, such as heaps of stones, puddles, watering troughs, were studied in more detail. The individuals or traces of their activities which were observed (prints, excrements, shelters etc.) were registered using GPS devices.

The transect method and stationary observations were used to study the bird fauna. The time in which the various individuals were sighted along the route was recorded (with a down-to-the minute accuracy). The GPS tracker data allow to determine their approximate locations. Birds were established by direct sighting and acoustically by their species-specific calls. A 10x50 magnification binoculars and a 2-60x80 magnification telescope were used for the sightings.

This assessment of the impact of the project on bats was based on own field studies conducted between 14 and 16 September 2018, 24-28 May 2019 and 20-25 June 2019, which is the period for migration of some species, finding shelter and raising young, and on available published data and archived information about bat presence in the region. Benda et al. (2003) also summarized the available information about bats in the region. The suitability of potential bat habitats within the investment proposal area and the studied area was verified during the field studies. The field-work and result analysis methodology for this study was consistent with the recommendations of EUROBATs and the Swedish National Energy Administration (Ahlen, 2003; Rodrigues et al. 2008, Petrov 2008). The field study method and approach described below have been applied multiple times during field studies of bats in the Republic of Bulgaria.

One specific method to estimate the composition of species and activeness of bats during the above studies was registration and analysis of echo-location and social ultrasounds by means of a Transect Tranquility detector. BatSound 3.1 for Windows was used to analyse the recordings, with consideration of the following main sound parameters: duration of separate sounds (ms), time period between subsequent sounds (ms), sound frequency with maximum energy (kHz), highest and lowest frequency (kHz), and the specific sonogram shape. The detector was used to record sounds during the dark part of the day, for a period of 180 seconds starting 1 hours after sunset. The records were made in certain points using three working frequencies in the 30-120 Hz range. GPS units combined with portable computers were used to identify the geographic location of the points of measurement. Google Earth was used to provide the map of the region over the Internet, with real-time access to a 3D model of Earth with detailed satellite photographs of each point of the Earth's surface.

Standard 6 and 12 m. bird nets were used and the hollows in old and dead trees with crevices and peeling bark were inspected with an endoscope. The study was a multiple-species type and was carried out using the transect and point methods - walk and spot counts.

The impacts on the natural habitats which are the object of protection in the zones (impacted areas, distances, mortality risk, likelihood of disturbance) were calculated and analysed in a GIS environment (QGIS Desktop 3.4 Madeira, Google Earth Pro 7.3.6.10201) using our mapping and data from the 'Mapping and determining the nature conservation status of natural habitats and species - Phase I' Project (MOEW 2022), provided by MOEW pursuant to the Access to Public Information Act.

Legal Framework

- Biodiversity Act (promulgated SG, issue 77 dated August 9, 2003, with the latest amendments);
- Protected Areas Act (promulgated SG, issue 133 dated November 11, 1998, with the latest amendments);
- Non-energy mineral extraction and Natura 2000 guide, EC, 2010

Health risk

- Health Law;
- Occupational Health and Safety Act;
- Emergencies Protection Act;
- Regulation 5 on the Procedures, Manner and Periods for Risk Assessment;
- Regulation No.7 on the Minimum Requirements for Occupational Health and Safety and Use of Equipment at Work
- Regulation 15 on the conditions, procedures and requirements for development and introduction of physiological regimes of labour and rest during work;
- Regulation on the types of work for which reduced work hours are established;
- Regulation No 3 on the compulsory preliminary and periodic medicinal inspections for the workers;
- Regulation 2 on the minimum requirements to occupational health and safety applicable to construction works;
- Regulation no 6 on the Minimum Requirements for the Health of Workers Operating in Environments with Risks of Exposure to Noise;
- Regulation no 3 on the Minimum Requirements for the Health of Workers Operating in Environments with Risks of Exposure to Vibrations;
- Regulation 9 on the Maximum Allowable Vibration Levels in Living Quarters;
- Regulation 10 on Employee Protection against Risks of Exposure to Carcinogenic, Mutagenic and Reprotoxic Substances at Work;
- Regulation 3 on the Minimum Requirements for the Health and Safety of Employees When Using Personal Protective Equipment at Work;
- Regulation ПД-07-3 on the Minimal Requirements for Occupational Microclimate, including Parameters such as Temperature, Humidity, and Air Flow Velocity;
- Regulation No.16 on the physiological rules and regulations for manual work involving heavy objects;
- Regulation No. 6 on the Environmental Noise Indicators of Time-Dependent Levels of Discomfort, Environmental Noise Limits, Methods for Assessment of Noise Levels and Negative Effects of Noise on Human Health;
- Regulation on Radiation Protection during Activities with Materials with Increased Content of Natural Radionuclides.

Evaluation methodology used:

The analyses and evaluations of expected impacts on the population, human health and the aspects of health and hygiene were made using the following approach:

1) Consultation during the EIA process (at the EIA scoping phase) with the relevant competent human health and health-and-hygiene authorities and consideration of their requirements and recommendations in the drawing up of the EIA statement.

2) Determining the extent of the impact on the basis of IP forecasts, the IP location, the expected environmental impacts (and, in particular, in respect of air, water and harmful physical factors which are most important for mineral resource mining projects), incl. when using

information from EIAs for similar sites currently in the process of approval/implementation/operation;

3) Analysis of the current status of the health and hygiene aspects in the area impacted by the IP using available data from official sources such as the National Institute of Statistics, the National Centre for Public Health and Analyses, the Regional Health Inspectorate - Haskovo, and the Ivaylovgrad Municipality;

4) Identification of worker and population health-risk factors;

5) Evaluation of the expected health impacts by nature, degree, significance, duration, frequency and accumulation (for the workers and for the population) according to the level of detail of IP forecasts;

6) Proposing of measures for the fullest possible restriction of unfavourable IP implementation impacts on human health and on the aspects of health and hygiene;

7) Deriving of a conclusion about IP admissibility relative to the current regulatory human-health requirements and standards.

Harmful Physical Factors

- The Environmental Noise Protection Act (SG, issue 74 dated 74 of 2005, with the latest amendments, SG 101 of 2020)
- Regulation 6/26.06.2006 on the Environmental Noise Indicators of Time-Dependent Levels of Discomfort, Environmental Noise Limits, Methods for Assessment of Noise Levels and Negative Effects of Noise on Human Health. (promulgated in the SG, issue 58 of 2006 with the latest amendments and supplements, SG 24 of 2022)
- The Regulation on the Essential Requirements and Environmental Noise Compliance Assessment of Equipment and Plant for Use Outdoors (SG, issue 11 of 2004, with the latest amendments and supplements in SG 87 of 2017)
- The Regulation on Radiation Protection adopted with Decree of the Council of Ministers No. 20 of 14.02.2018, most recently amended and supplemented.
- Regulation on Radiation Protection during Activities with Materials with Increased Content of Natural Radionuclides.

The methodologies used:

- Method Determining the Total Noise Power Emitted in the Environment from Industries and Determination of the Noise Levels in the Area of Impact
- Method to account for automotive traffic noise
- Evaluation of noise from local and industrial sources in accordance with Attachment 3 to Regulation 6 of 2006

Waste

- Waste Management Act (promulgated in the SG issue 86/30.09.2003, with latest amendments))
- Regulation 2 on the Classification of Waste (promulgated SG, issue 44 dated May 25, 2014, with the latest amendments)

Hazardous substances

- Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures (CLP)

Heritage of History and Culture

- Cultural Heritage Act (Promulgated in the State Gazette, issue 19 of March 13, 2009, with the latest amendments) and its secondary legislation.

IX. DESCRIPTION OF THE MEASURES TO AVOID, PREVENT, MITIGATE AND, WHERE POSSIBLE, ELIMINATE THE ESTABLISHED SIGNIFICANT UNFAVOURABLE ENVIRONMENTAL AND HUMAN-HEALTH CONSEQUENCES, AND DESCRIPTION OF THE PROPOSED MONITORING MEASURES (E.G. DRAWING UP OF AN ANALYSIS AFTER THE IP IMPLEMENTATION), WITH EXPLANATIONS OF THE EXTENT TO WHICH THE SIGNIFICANT UNFAVOURABLE ENVIRONMENTAL AND HUMAN-HEALTH CONSEQUENCES WILL BE AVOIDED, PREVENTED, MITIGATED OR ELIMINATED. THE DESCRIPTION SHOULD COVER BOTH THE STAGES OF CONSTRUCTION AND OF OPERATION, AND SHOULD INCLUDE A MEASURE IMPLEMENTATION PLAN

In order to prevent and, where possible, discontinue any harmful impacts on the environment and on human health which may result from the IP implementation, the team of independent experts authoring the EIA Statement proposed measures, and have also adopted and introduced the measures and requirements in the statements received during the consultations concerning the terms of reference for this statement. Should any specific situations arise during the operations in the deposit, other additional measures will be taken as well.

Operations on the site should be carried out under strict environmental and occupational health and safety self-monitoring, and under active on-going government authority control by the Regional Inspectorate of Environment and Waters, the East Aegean Basin Management Directorate, the Regional Health Inspectorate and the Labour Inspectorate.

One mandatory site-operation condition is the presence of a plan for self-monitoring of environmental media whose parameters will be coordinated with the competent environmental authorities.

The following measure in respect of *the subsurface* should be pointed out: - strict compliance with the projects for mining and rehabilitation of disturbed areas during the concession period and on an annual basis, and compliance with the Mine Waste Management Plan, following approval of these project and the plan by the competent authorities.

As regards **drilling and blasting**: Modern blasting systems allow separate/stand-alone delay periods for ignition of each charge. This provides a dual effect: millisecond (short-delay) sequential firing of charges is employed for better fragmentation of the blasted muck pile and, on the other hand, minimal blast-induced impact on the environment by way of deck loading and use of the minimal explosive charge mass per delay period.

In reality, the blasting vibration parameters in the zone of Active Blasting Vibration Impact is managed via:

- the mass of the charge
- the charge construction
- pre-splitting blasts (to a distance from a non-work bench or around 15 m)
- the scheme of borehole connection in the blast field and the delay time.

As mining evolves at depth, the operating conditions will change. Periodic control measurements are recommended, therefore, using specialized equipment, with updating of the mathematical dependencies determining the levels of side impact of blasting on the near and far impact zones and, where necessary, adjustment of the drilling and blasting parameters and taking of additional management measures. It is important to note that individual and separate drilling and blasting passports are prepared for each particular blasting work.

Additional Recommendation regarding Drilling and Blasting

Measurements and expert analysis of the blasting vibration impact are recommended in order to take measures during the design and performance of commercial blasting in order to preserve the stability of non-mined and work benches as the pit is deepened.

In respect of all mining facilities within the blasting impact danger zone, blasting and drilling must be designed and carried out in accordance with Chapter Six of the Safety Rules Applicable to Blasting Operations: ‘Special Blasting Works’.

Recommendations regarding non-ionising radiation and radiation

The following risk prevention and management measures should be employed with a view to prevention, avoidance of pollution from any fluids and solids extracted from the subsurface and capable of containing natural radioactive isotopes such as Uranium-238, Thorium-232, Radium-226 and 228, Radon-222 (gas):

- Periodic monitoring and control of mine-waste radioactivity.
- Use of protective equipment and safe technologies in mining, if presence of natural radioactive isotopes such as Uranium-238, Thorium-232, Radium-226 and 228, Radon-222 (gas) is proven.
- Strict treatment and storage of naturally occurring radioactive materials and waste, if discovered through periodic monitoring.
- Legal regulation by national and international bodies (such as IAEA - the International Atomic Energy Agency) if the above should apply to the operations. According to Article 7 of the Regulation on Radiation Safety, two months prior to beginning an activity referred to in Article 1, Enterprises intending to initiate activities involving materials with increased content of natural radionuclides must submit to the Chair person of the Nuclear Regulation Agency information about the activity and the specific activeness of the respective materials and an evaluation of the expected doses.

Table IX-1. Measures to prevent, reduce or, where possible, discontinue the harmful impacts on the environment

No. #	Measures	Period	Objective
AMBIENT AIR			

No. #	Measures	Period	Objective
1.	Development of an efficient blasting technology with reduced emission of toxic gases and dust	Engineering	Limiting the emission of toxic gasses and unfavourable health impacts for on-site workers
2.	Spraying of internal and external transport roads in dry and windy weather	Construction and Operation	Reduction of dust pollution in the region and protection of soils
3.	Periodic spraying in the handling areas	Construction and Operation	Restriction of dust emissions into the ground atmospheric layer.
4.	Development and approval of a handling operations instruction	Construction and Operation	Restriction of dust emissions into the ground atmospheric layer.
5.	Prevention of transport vehicle overloading	Construction, operation, and closure and rehabilitation	Restriction of dust emissions into the ground atmospheric layer.
6.	Using machines in good repair, maintaining the stripping, mining, processing and transport equipment in good repair	Construction, operation, and closure and rehabilitation	Reduction of harmful emissions into the ambient air. Protection of waters and soils
7.	Disallow idling operation of the mining and transport equipment	Construction, operation, and closure and rehabilitation	Reducing automotive exhaust emissions
8.	Perform blasting during suitable wind direction - from the nearest settlement toward the mine	Operation	Ensure gas and dust emission spreading away from the settlement
9.	Use of blasting mats when blasting in the final contour of the pit in the direction of the near-by settlements	Operation	Restriction of dust emissions during blast work.
10.	Maintenance of minimal height of mined material stockpiles	Operation	Restriction of dust emissions into the ground atmospheric layer.
WATER			
11.	Prevent work below the ground-water static level.	Operation	Prevent direct ground-water pollution.
12.	Limiting activities increasing the risk of direct or indirect introduction of hazardous substances or other pollution in the ground water	Construction, operation, and closure and rehabilitation	Prevent direct ground-water pollution.
13.	Prevention of discharges of waste water, including ablution effluent, into surface and/or ground water	Operation	Prevent direct surface and ground-water pollution.

No. #	Measures	Period	Objective
14.	Use of construction and transport equipment in good repair within the concession-area boundaries	Construction, operation, and closure and rehabilitation	Prevent surface and ground-water pollution.
15.	Preventing of pollution in the Byala Reka, Yulan Dere and Kokardja Dere rivers by construction materials and fuel and lubricants from the transport equipment.	Construction and Operation	Achievement of the goals for water body BG3MA100R270 - Byala Reka River and its Tributaries, set forth in the third RBMP, which are preservation of the good ecological status and prevention of its deterioration.
16.	Disallowing of storage of waste in areas stripped of topsoil.	Construction	Prevent ground-water pollution.
17.	Starting a water-abstraction permitting procedure with the East-Aegean Basin Directorate.	Construction	Compliance with the water use and protection legislation.
18.	Maintaining the clean and contact water networks in good repair, and their attendant water-recycling facilities, with periodic monitoring and preventive maintenance.	Operation	Prevention of waste water (and contact water) spills and pollution of the surface and ground waters.
19.	Prohibition for repair works within the IP boundaries, except during emergencies.	Construction, operation, and closure and rehabilitation	Prevent surface and ground-water pollution.
20.	Ensuring limited access to the water intake facilities.	Operation	Prevention of spills and overuse of natural resources
SUBSURFACE			
21.	Include in the Overall Design for mining from the deposit staged technical and biological rehabilitation consistent with the technical specifics of the various sub-projects and with the specific vegetation.	Engineering	Maximum restoration of disturbed terrain.
22.	Performance of all mining and processing activities within the limits of the concession area.	Construction and Operation	Compliance with the Mineral Resources Act
23.	Strict adherence to the approved Overall and Annual Detailed Designs for mining and rehabilitation of the deposit.	Construction, operation and rehabilitation	Regulatory compliance
24.	Strict adherence to the approved Mine Waste Management Plan	Construction and Operation	Compliance with the Mineral Resources Act

No. #	Measures	Period	Objective
25.	Application of lateral blast impact minimization techniques, such as: - increased stemming length; - reduced charge mass (smaller diameter boreholes, broken charges); - application of adequate blasting patterns (orienting the fracture front and the direction of muck displacement, minimizing the charge mass per delay period, etc.); - use of protection covers.	Operation	Ensuring occupational safety
26.	In the case of mining for ores and minerals near urban areas, the blasting times, most often during day-light working hours, are coordinated with the local community in order to avoid the surprise effect and with a view to reducing the unpleasant effect on the comfort of residents in the region.	Operation	Ensuring occupational safety
LANDS AND SOILS			
27.	Stripping and stockpiling of soils and of the fertile soil layer in accordance with the provisions of Regulation 26/02.12.1996 (with latest amendments and supplements in the SG, issue 22/2002). Define and designate the temporary top-soil stockpiling locations within the sites dedicated for this purpose.	Construction and Operation	Use of soils and of the fertile soil layer for rehabilitation
28.	Development of a soil monitoring plan in accordance with Article 29, paragraph , item 2 of the Soils Act	Construction, operation, and closure and rehabilitation	Timely identification of negative processes occurring in the soils and prediction of their development with a view to soil conservation.
29.	Staged rehabilitation of the disturbed areas and use of stockpiled soil and overburden.	Operation Closure and rehabilitation	Prevention of dangerous physical and geological phenomena
30.	Prevention of pollution of soils external to the work sections	Operation	Protection of soils in the region
WASTE FACILITIES			
31.	Separate collection of waste and its handing over in a timely manner for transporting and subsequent treatment	Construction, operation, and closure and rehabilitation	Prevention of scattering of waste and and pollution of soil and water

No. #	Measures	Period	Objective
32.	Handing over of waste for subsequent treatment based on written contracts with persons holding the documents required by Article 35 of the Waste Management Act.	Construction, operation, and closure and rehabilitation	Manage wastes in compliance with the WMA.
33.	Only vehicles and mobile equipment in good operating condition must be used in and outside the concession area. Transporting of hazardous wastes only in closed metal containers/drums.	Construction, operation, and closure and rehabilitation	Prevention of scattering of waste and and pollution of soil and water
34.	Waste oil from emergency oil change must be collected in a manner that enables their recycling – in closed, chemically resistant and spill-proof containers which are marked and kept indoors.	Construction, operation, and closure and rehabilitation	Eliminate spills and pollution of soil and water. Manage waste in compliance with the WMA.
35.	In case of accidental (uncontrolled) spillage of oil or other pollutants, immediate removal of any contaminated soil and rock and its transporting to a suitable waste disposal site permitted to accept such wastes.	Construction, operation, and closure and rehabilitation	Eliminate spills and pollution of soil and water. Manage waste in compliance with the WMA.
36.	Placement of household type waste bins	Construction, operation, and closure and rehabilitation	Manage waste in compliance with the WMA.
HAZARDOUS SUBSTANCES			
37.	Hazardous substances (diesel fuel, oils, grease) should be used in accordance with the accident, release or spill prevention measures and with the exposure control measures, set forth in the relevant regulation/administrative order, in the Material Safety Data Sheets and in the instructions about safe use.	Construction, operation, and closure and rehabilitation	Protection of the environment and human health against the impact of hazardous chemical substances.
LANDSCAPE			
38.	Designing for technical, biological, and landscape and land-use rehabilitation consistent with the adjacent landscapes.	Engineering	Ensuring of natural inclusion of the rehabilitated terrains into the adjacent landscape
39.	Carrying out of staged and timely rehabilitation (technical and biological) of the disturbed areas in accordance with the approved rehabilitation designs.	Operation and closure and rehabilitation	Acceptable landscaping of the terrain, integration of the rehabilitated terrain into the local landscape

No. #	Measures	Period	Objective
BIODIVERSITY			
40.	Sodium lamps will be used for exterior lighting (emitting mainly in the red and yellow parts of the spectrum, attracting substantially fewer nocturnal insects as compared to mercury-luminescent lamps which emit significant amounts of blue and ultraviolet rays). Limit the number of lamps down to 2 per ha.	Designing Construction and Operation	Limiting the strong attraction and disorienting effect of the lamps which disorient and easily kill nocturnal insects. Reducing the mortality of insects, including insects which are subject of protection in the protected zone.
41.	Using only tree and brush species which are indigenous in the country. Approving of the list of species by a botany expert.	Engineering and rehabilitation	Preserving of the nature of vegetation in the region including the natural habitats which are the subject of protection in the zone. Prevention of the spreading of invasive species.
42.	Traffic is not allowed off the approved roads and courses to the various IP elements. Vehicles must drive only on approved roads that have clear and permanent signs.	Construction and Operation	Prevention of further destruction of vegetation in the machine-traffic zones, including natural habitats which are subject of protection in the protected zone. Restricting the disturbance and mortality rates of animals, including species which are subject of protection in the protected zone.
HARMFUL PHYSICAL FACTORS			
43.	Modern mechanical equipment should be used during the IP implementation in order to reduce noise pollution of the environment, as is required by the Regulation on the Essential Requirements and Environmental Noise Compliance Assessment of Equipment and Plant for Use Outdoors (SG, issue 11 of 2004)	Engineering, construction, operation, and closure and rehabilitation	Less noise emissions into the environment from the operating machinery and transport vehicles.
44.	Rational selection of the charge construction and of its parameters (overdrilling depth, charge length, stemming length, charge decking, blasthole diameter, selection of suitable stemming material, adequate	Operation	Controlling of blasting side effects (including impacts on the subsurface and on protected buildings and facilities)

No. #	Measures	Period	Objective
	selection of upper or lower charge priming, application of adequate blasting patterns (orienting the fracture front and the direction of muck displacement, minimizing the charge mass per delay period, etc.); and detonation charging system		
45.	Conduct systematic control of the compliance with the admissible limit values for noise in the natural and residential environments.	Operation	Minimisation of noise impact on workers
46.	Carrying out of periodic self-measurement of noise parameters in accordance with Regulation 27 dated 5.04.2006 on the Work of the National Environmental Noise Monitoring System and the Requirements for Carrying out Internal Monitoring and Reporting of the Industrial Sources of Noise in the Environment	Operation	Monitoring of the 70 dBA hygiene limit value for industrial areas
47.	Disallow idling operation of the mining and transport equipment	Operation	Reduction of noise pollution
48.	Use of blasting mats when blasting in the final contour of the pit in the direction of the near-by settlements	Operation	Restriction of dust emissions during blast work.
CULTURAL AND HISTORIC HERITAGE			
49.	Preliminary archaeological studies – searching for archaeological objects within the future concession area in accordance with Article 161, paragraph 1 of the Cultural Heritage Act in order to establish the presence of unknown objects and to take measures for their conservation.	Prior to construction and mining works.	In order to prevent destruction of unknown archaeological objects,
50.	Rescue excavations (provided that archaeological objects are found in the sites that will be disturbed directly in the concession area)	Prior to construction and mining works.	If archaeological objects are registered If structures and artefacts are found and show features of cultural values, operations are stopped immediately and Article 72 of the Cultural Heritage Act is applied immediately.
HEALTH AND HYGIENE ASPECTS			
51.	An occupational health and safety plan, prepared for the phases of construction, operation, and closure	Prior to construction	Provision of occupational safety and health for on-site

No. #	Measures	Period	Objective
	and rehabilitation, should provide for periodic control measurements of occupational factors, including chemical agents, and the parameters of the operations (including drilling and blasting) and the worker health protection measures should be adjusted according to the results.		workers during the various IP implementation phases.
52.	The workers should be provided with adequate personal protection equipment consistent with the work performed. Monitor whether the PPEs are fit for purpose and used correctly.	Construction, operation, and closure and rehabilitation	Reduction of negative impacts on workers' health
53.	Development and introduction of a work and rest regimen during work.	Construction, operation, and closure and rehabilitation	Reduction of labour traumatism
54.	Provision to the workers of refreshing and warm drinks during hot or, respectively, cold periods during the year.	Construction, operation, and closure and rehabilitation	Ensuring of occupational health and safety
55.	Indicate mine workings and approaches to them that may pose danger of falling to people or animals, as well as subsidence, caving and landslides in the pit area with warning boards and secure with concrete-pole and mesh or barbed wire fences.	Construction, operation, and closure and rehabilitation	Prevention of occupational accidents.
56.	Regular induction of on-site workers, training, initial and periodic medical check-ups.	Construction, operation, and closure and rehabilitation	Ensuring of occupational health and safety
57.	Provide personnel on site trained in first aid in the event of accidents, and a first-aid kit with the necessary medicines and dressing should be provided.	Construction, operation, and closure and rehabilitation	Ensuring of occupational health and safety

Section VI of the EIA Report proposes mitigation measures for affected protected areas from the National Environmental Network Natura 2000;

- ‘Rhodopi - East’, code BG0001032, for protection of natural habitats and wild flora and fauna;

- ‘Byala reka’, code BG0002019, for protection of wild birds.

MOEW's proposals in Letter Ref. No. OBOC-68-65/20.10.2025, as follows: "In item IX of the EIA, 'Description of the measures to avoid, prevent, mitigate and, where possible, eliminate the established significant unfavourable environmental and human-health consequences', on page 250, we propose that the following be added to the goal, described in the report, *'Implementation of the measures should lead to maximum protection of the populations of plant and animal species situated in the IP or in its immediate vicinity'*:"

In item 3.1. on page 256, measure 41, replace the words 'only ... indigenous' with 'local plant species which are suitable for the region'. It is impossible to find the sufficient number of indigenous species' saplings, cuttings or seeds. The rehabilitation material will be taken from the available numbers and species in the existing nurseries, and it is important that those species are local and not alien and that they will be favourable for the environment.

In 3.2. on page 256, add a new measure, 4.2, about the phases of engineering and construction, with the implementation result being preserved biological diversity, with the following text: 'The IP site-preparation activities should begin outside the period of nesting and raising of the chicks between March 12 and June 30.' This is a compensatory measure relating to the text on page 167 - 'If the activities start during the species' nesting period, the species may leave any nests in or near-by the IP, and such nests are at risk of being destroyed or abandoned with subsequent loss of eggs and/or young chicks. Should this happen, the impact on the species' population in the area may be significant.'

In 3.3. add a new measure 43 for the design and construction phases, with the implementation result being conservation of biodiversity, with the following text 'Transport vehicles and machines must not leave the existing/designated roads during the performance of respective activities described in the IP.'

In 3.4. add an electric pole safeguarding measure, related to the texts on page 165 'Burd mortality may occur because of the power line. Poles of unsuitable construction in the case of 20kV power lines may cause mortality by electrocution. Higher voltage power lines pose no risk of electrocution but collisions of birds with the strike termination cable are likely.'

3.5. in respect of the 5 protected species described on page 167 - European legless lizard (*Ophisaurus apodus*), Eurasian goshawk (*Accipiter gentilis*), red-breasted flycatcher (*Ficedula parva*) and wild cat (*Felis silvestris*), present doable, measurable and controllable measures in the table and specify whose obligation it is to carry out these measures and place a condition for provision of scientific consultation and observation during their implementation.

Comment by the EIA Report authors: These proposals are entirely within the MOEW's purview and the ministry may, at its own discretion and within its competencies, being the environmental authority, propose conditions and measures for inclusion in the EIA decision. Given the obligation for independence of the EIA Report writers during the assessment, formulating measures to prevent and reduce impact and the signed affidavits referred to in Article 83, paragraph 4 of the Environment Protection Act signed by each expert, and the respective criminal liability, we refrain from expressing a position on these proposals and recommendations.

Measures in the EIA Report:

- ❖ Mine construction should begin outside the April 01 - August 15 and November 20 - March 10 periods.

These periods account for the nesting of birds which are subject to protection in the Byala Reka protected zone. These times include the goshawk nesting period (nest building starts in early April; Simeonov et al 1990), the breeding period of wild cats (birth is in April, Peshev et al 2004), the majority of the European legless lizard's active season, including both its breeding and its hibernation periods.

- ❖ The 20 kV powerline pylons should be of a type preventing electrocution of birds, or should have insulated live parts. An ornithology expert should be consulted about this measure during the engineering design phase.
- ❖ (contact) plates (bird diverters), rotating spheres or spirals made of phosphorescent material must be installed on the strike termination cables of powerlines above 20 kV. An ornithology expert should be consulted during the engineering design phase about the type, longitudinal placement and spacing of these devices.

A measure concerning the European legless lizard (*Ophisaurus apodus*), the goshawk (*Accipiter gentilis*), the red-breasted flycatcher (*Ficedula parva*) and the wild cat (*Felis silvestris*), as provided for in the EIA Report:

- ❖ Mine construction should begin outside the April 01 - August 15 and November 20 - March 10 periods.

These periods account for the nesting of birds which are subject to protection in the Byala Reka protected zone. These times include the goshawk nesting period (nest building starts in early April; Simeonov et al 1990), the breeding period of wild cats (birth is in April, Peshev et al 2004), the majority of the European legless lizard's active season, including both its breeding and its hibernation periods.

Red-Breasted Flycatchers have been established only during migration (the species nests in old-growth beech forests, which are not present in the region). This species may be seen everywhere during this period, including in landscaped spaces between apartment buildings in large cities (personal observations). There will be virtually no impact on the species. No measures are required for this species.

X. DESCRIPTION OF THE EXPECTED SIGNIFICANT ENVIRONMENTAL AND HUMAN-HEALTH IMPACTS OF THE IP RESULTING FROM THE VULNERABILITY OF THE IP RISKS OF SERIOUS INCIDENTS AND/OR DISASTERS OF SIGNIFICANCE TO THE IP. THE RELEVANT INFORMATION SHOULD BE OBTAINED BY RISK ASSESSMENT. THE DESCRIPTION SHOULD INCLUDE THE APPLICABLE MEASURES TO PREVENT OR MITIGATE THE THE SIGNIFICANT UNFAVOURABLE ENVIRONMENTAL AND HUMAN-HEALTH CONSEQUENCES OF THESE EVENTS, AND DETAILS ABOUT THE PREPAREDNESS AND PROPOSED RESPONSES TO SUCH EMERGENCIES.

1. Description of expected significant unfavourable impacts by the investment proposal on the environment and on human health determined during the risk assessment

No conditions exist on the IP site for large-scale accidents, according to the criteria for reporting of large-scale accidents as required by Annex 5 of the Environment Protection Act.

2. Description of applicable measures intended to prevent or mitigate significant unfavourable consequences of large-scale accidents

No measures are envisaged because no large-scale accident can occur on the IP site.

XI. OBSERVATIONS AND OPINIONS EXPRESSED BY THE PUBLIC CONCERNED, OF THE AUTHORITIES COMPETENT TO MAKE AN EIA DECISION OR OFFICIALS AUTHORISED BY THESE AUTHORITIES, AND OTHER SPECIALIZED INSTITUTIONS, AS WELL AS THE STATES AFFECTED – IN A TRANSBOUNDARY CONTEXT, AS A RESULT OF THE CONSULTATIONS HELD

The project documentation required under art. 4, par. 1 of the EIA Regulation has been submitted to the Haskovo RIEW. The concerned municipalities and mayor's offices are notified.

The Minister of Environment and Water has requested by letter ref. 99-00-587/27.05.2024 that the Director of RIEW Haskovo forward the entire case file to the MOEW, the assumption being that the Minister is the competent authority as regards this procedure. The Director of RIEW Haskovo has complied with this request by way of Letter ref. ПД-279-(38)/2023/29.05.2024.

Pursuant to the requirements of art. 95, par. 1 of the EPA, the Customer has identified the stakeholders that should be involved in the Consulting process on the scope and content of the Environment Impact Statement, as follows:

- MOEW;
- The Ministry of Healthcare;
- The RIEW Haskovo;
- The East Aegean Basin Directorate - Plovdiv;
- The Ministry of Energy;
- The Ivaylovgrad Municipality:
 - Rozino village;
 - Gugutka village;
 - Byal Gradets village.
- The Regional Museum of History in Haskovo;
- The Water Supply and Sewerage OOD of Haskovo, Ivaylovgrad region;
- The Regional Forestry Directorate – Kardzhali, the Ivaylovgrad State Forestry Enterprise;
- The Regional Directorate of Agriculture.

Copies of received statements, opinions and recommendations regarding the Terms of Reference for the EIA Statement are presented in **Textual attachment 7** to this EIA Statement.

For information about accepted and rejected remarks from written statements received during the consultation on the Terms of Reference of the EIA Statement see **Table XI-1**.

Statements concerning the proposed Terms of Reference for the EIA Statement were received from: The East Aegean Basin Management Directorate with headquarters; the Haskovo Water Supply and Sewage EOOD company; The Haskovo Regional Directorate of Agriculture of the The Ministry of Agriculture and Foods; the Ministry of Energy; the Ministry of Healthcare; the Haskovo Regional Inspectorate of Environment and Waters; South-Eastern State Enterprise of the The Ministry of Agriculture and Foods, the State Forestry Enterprise of Ivaylovgrad.

All remarks and proposals in the received statements have been considered in the statement and reasons for their use or refusal are presented.

As a Table XI-2 presents the first assessment of the EIA Report quality made with letter by the MOEW, ref. No. OBOC-68-65/20.10.2025 and the way in which the notes in the report are reflected.

Table XI-1. Information about consulting as per the EIA scope and accommodation of the received statements

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
1. EABD, Plovdiv, Ref. No. IY-02-231(1) dated December 18, 2024.	Subject: Consultations to determine the scope of the Terms of Reference concerning the Environmental Impact Assessment (EIA) for the investment proposal for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.’.	
	1. Suitably scaled maps indicating the exact location of the activities envisaged in the investment proposal should be presented in the EIA Statement. The report should also present the design mining depth.	Accepted and reflected in the statement
	2 . Provide information about the state of surface and ground water bodies impacted by the investment proposal	Accepted and reflected in item V.2. of the EIA Statement
	3 . Describe whether the IP implementation will impact the following: Water bodies in the meaning of the Water Act, sanitary protection areas, potable water supply sources, channels and other waterworks and water protection zones in accordance with Article 119a of the Water Act. It should be noted that the groundwater body designated as BG3G000PtPg049 - Fissure – Eastern Rhodopes Complex has, in accordance with Section III of the RBMP, been designated as a drinking groundwater body in the meaning of Article 119, paragraph 1, item 1, related to paragraph 4, item 1 of the Water Act..	Accepted and reflected in item V.2. of the EIA Statement
	4 . The activities concerning surface and ground waters and envisaged in the investment proposal should be reviewed thoroughly. According to the Terms of Reference, the IP will construct two consecutively situated reservoirs (the second one for non-contact, or conditionally clean, water) thus eliminating any likelihood of entry into water bodies of water separated by the IP.	Accepted and reflected in item V.2. of the EIA Statement
	Given the investor’s intentions to fill the non-contact water reservoir from the Rozino Pumping Station area of the Arpa Dere River, the Company must apply suitable and applicable measures for reusing of the precipitation, waste and drainage water into a closed return cycle in order to reduce the planned abstraction of water and to ensure efficient water use.	Accepted. An Integrated and Sustainable Water Management Report was developed.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	Provisions should be made for construction of drainage ditches peripheral to the mine field and to the open pit must be provided for in order to collect precipitation and snow-melt run-off from higher levels to prevent entry of surface water into the pit.	Accepted. An Integrated and Sustainable Water Management Report was developed.
	5 . The EIA Report should consider the possible impact of the investment proposal on the surface water must be reviewed with regard to the provisions of Article 116 , paragraph 1, item 4 of the Water Act and the measures embedded in the RBMP of ,2016-2021) and concerning the IP.	Accepted and reflected in item V.2. of the EIA Statement
	6 . Carry out and submit an assessment of any negative changes to the hydromorphological regime of the Arpa Dere River caused by the investment proposal and by the intended abstraction of water to fill up the non-contact water basin. The assessment should be drawn up by relevant experts in this field.	Accepted, a Hydrology Evaluation of the Byala Reka River and its tributary, the Arpa Dere River was made.
	7. Note that the following potable water supply groundwater sources are situated in the IP area: – The tube well of the Gugutka Pumping Station used to supply potable water to the Gugutka and Byal Gradets villages in the Ivaylovgrad Municipality is situated approximately 2,000 m. south of point 7 of the concession area outline. This water-abstraction facility is not provided with a sanitary protection belt as required by Regulation 3 of October 10, 2000. – The ‘Rozino’ head reservoir used for drinking water supply and owned by a state forestry enterprise is situated in the lands of the Pastrook village, Ivaylovgrad Municipality, around 500 m. east of point 6 of the concession outline. This water-abstraction facility is not provided with a sanitary protection belt as required by Regulation 3 of October 10, 2000. It is obvious that there are water supply sources in the IP area without sanitary protection belts, situated within a 1,000 radius buffer zone. Therefore, the prohibitions and restrictions laid down in Attachment 1 to the National Catalogue of Measures of the River Basin Management Plan must be complied with.	Taken into consideration
	An assessment is required about whether individual sections of the investment proposal fall within the future II nd and III rd belts of the Sanitary Protection Zones of near-by potable water sources should be made. If they do fall within these belts, note	Information was requested of the EABD in accordance with the Public Information Access Act.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	that certain prohibitions, restrictions and limitations in the event of proven necessity apply as per Regulation 3 of November 16, 2000 on the Terms and Conditions for Surveying, Designing, Approval and Operation of Sanitary Protection Zones around Water Sources and Drinking Water Supply Facilities and around Mineral Water Sources Used for Medical, Preventive, Drinking and Hygiene Purposes (Promulgated, SG, issue 88 dated November 27, 27.10.2000r.	Decision for provision of access to public information No. 3ДОН-01-9/31.01.2025 by the EABD Director (Textual attachment No 15) states explicitly that 'At the present time we have no information about any future II nd and III rd belts of Sanitary Protection Zones for near-by potable water supply sources'.
	8 . In the EIA Report, characterise the hydrogeological conditions and factors be described (based on hydrogeological studies and on a hydrogeological report submitted to the East Aegean Basin Directorate), affecting groundwater quality and quantity in the region, in order to clarify the effect of the Rozino Deposit operation process on the ground water and, in particular, the drinking water supply sources for the urban centres in the deposit area. Include in the statement the information about the existing water abstraction facilities provided by the Ivaylovgrad Municipality with letter Ref. IIY-01- 183(3)710.05.2023, the Krumovgrad Municipality with letter Ref. IIY-01 -183(4)712.05.2023 and by the Haskovo Water Supply and Sewerage EOOD company with Ref. No. IIY-01-183(2)/03.05.2023. A competent person (a geology and hydrogeology engineer) must prepare this part of the statement.	Accepted and reflected in the statement.
	9 . The provision for using the flotation tailings (processing waste) as backfill for the Section 2 pit after Year Six and the potential risk of migration of hazardous substances toward the groundwater makes it necessary to prepare a mine waste characterization in order to determine the mine waste properties and behaviour.	Accepted. Preliminary qualitative laboratory studies were carried out and they do not indicate presence of any hazardous substances. These studies should be repeated during the operation phase.
	10. Drilling and blasting will be used during the mining of the Rozino Deposit. This requires assessment of the effect of drilling and blasting on groundwater in the IP area and, in particular, on drinking-water sources. Submit to the East Aegean Basin Directorate a report on the effect by drilling and blasting on the groundwater in the	Accepted. A Drilling and Blasting Works Report was prepared and is attached.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	Rozino Deposit area. Where necessary, measures to protect potable water sources should be applied.	
	11. Forecast and assessment of the expected impact on surface and ground water and on the water protection zones during the operation of the site, in view of the impact assessment conclusions and results and envisage measures to prevent any negative impacts on these waters as necessary.	Accepted and reflected in item V.2. of the EIA Statement
	12. It should be considered when drawing up the EIA Report that an updating procedure is under way for the River Basin Management Plan covering the period 2022-2027 and some of the updating activities are aimed at updating the surface and groundwater protection goals and the measures to achieve these goals. Drawing up of the EIA Report should take into account the stages of updating of the River Basin Management Plan and its environmental objectives and draft documents. The information and documents will be published periodically and will be publicly available on the web page of the Eastern Aegean Basin Directorate.	Accepted and reflected in item V.2. of the EIA Statement
2. Water Supply and Sewage EOOD - Haskovo Ref. No. 2950 dated 18.12.2024.	<u>Regarding:</u> Consultations to determine the scope of the Terms of Reference concerning the Environmental Impact Assessment (EIA) for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.'“.	
	1 . No pollution of surface and ground water used to supply urban centres along the Byala Reka River should be allowed.	Accepted and reflected in the statement.
	2 . No activities polluting the underground water aquifers should be allowed.	Accepted and reflected in the statement.
	3 . Where mining by blasting is used, request a statement by a hydrogeologist certifying that the blasting will not impact the groundwater sources.	Accepted and reflected in the statement.
	4 . The flow-rates and chemical parameters of the potable water sources in the investment proposal area should be preserved.	Accepted and reflected in the statement.
3. Ministry of Agriculture and Foods, Haskovo	<u>Subject:</u> Terms of Reference concerning the EIA for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.'”	Positive opinion.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
Regional Directorate of Agriculture. Ref. No. Д-407-1 dated December 04, 2024.	Regarding Your letter received in the Haskovo Regional Directorate of Agriculture with attached Terms of Reference for the scope and content of a statement about the Environmental Impact Assessment for the implementation of the Investment Proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.' with Tintyava Exploration AD as the investor, and having familiarized ourselves with the submitted documentation and within the framework of our competence, we are notifying You that: The submitted Terms of Reference was prepared in accordance with the requirements of Article 10, paragraph 3 of the Regulation on the Terms and Procedures for Conducting Environmental Impact Assessments, and therefore, the Haskovo Regional Directorate of Agriculture has no objections or recommendations concerning its content and scope.	
4 . The Ministry of Energy, Ref. No е.-26-T-749 dated December 19, 2024.	REGARDING: Consultations to determine the scope of the Terms of Reference concerning the Environmental Impact Assessment (EIA) for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district'. This is to notify you that with regard to the Terms of Reference for the scope and content of EIA for the above-mentioned investment proposal sent to us, it was established, following a review of the information contained in the ToR and concerning the deposit and the Mine Waste Management Plan (MWMP), that:	
	1. Boundary point 15 of the Rozino Deposit exceeds the design concession outline by 2.8 m and, therefore, If the current parameters are approved by the competent authority, the provisions of Article 37, paragraph 1 of the Mineral Resources Act will not be fulfilled (<i>When a concession is presented, a concession area is defined and includes: 1 The area of the deposit or individual sections of the deposit, and 2 the areas required to carry out the activities external to mining under the concession</i>).	Corrected.
	2. The text 'The Rozino deposit reserves amount to 13.6 Mt of ore, with 26.5 Mt of overburden' on page 10 is inconsistent with the supplement of the geology report	Corrected.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	approved by the SCE (Specialised Committee of Experts reviewing and accepting geology reports submitted to the Ministry of Energy).	
	3. As regards the remaining part of the Terms of Reference for the scope and content of the EIA, the Ministry of Energy has no objections.	Positive opinion.
5. Ministry of Healthcare, Ref. No. 26-00-2518 dated 27.12.2024.	In connection with Your letter received at the Ministry of Healthcare and requesting expression of opinion on the scope and content of the Terms of Reference concerning the Environmental Impact Assessment (EIA) for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo District', we are notifying you of the following: We suggest that based on the assessment of the impact on environmental media, you draw up an independent health assessment and consider in detail the following aspects of these issues in the assessment:	--
	1 A complete, exhaustive and well illustrated information about the location and exact distances from the nearest urban areas and other sites which are subject to health protection in the meaning of § 1, item 3 of the Additional Provisions of the Regulation on the Terms and Procedures for Conducting Environmental Impact Assessments (SG, issue 25 of 2003, latest amendments in the SG, issue 3 of 2011) to all facilities which are potential sources of impacts and are included in the investment 2003, Maps are mandatory attachments with the information to be presented to the Ministry of Health.	Accepted and reflected in the statement.
	2 . Background assessment of the local environmental factors and media (air, surface and ground waters, soils, noise, etc.)).	Accepted and reflected in the statement.
	3 . Identification of the occupational and living-environment factors presenting risks of damaging human health during construction, subsequent operation and decommissioning of all sites and facilities related to the investment proposal..	Accepted and reflected in the statement.
	4 . Detailed and exhaustive information about the extent of expected unfavourable impact on individual environmental and living factors and components, with special attention to:	Accepted and reflected in the statement.
	4.1. The future impact on surface and ground water and soils in the region and, therefore, on all potable water supply sources with or without established sanitary	Accepted and reflected in the statement.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	protection belts that are or could be impacted by the operation of the facilities. The EIA report should include up-to-date information about:	
	- the exiting potable water supply of urban areas near the Investment Proposal area such as water bodies and water-abstraction facilities for potable water supply, sanitary protection belt areas, information about the quantity and quality of potable water supplied to the users in accordance with Regulation 9/2001 on the Quality of Water Intended for Human Consumption (promulgated in the State Gazette, issue 30/28 March 2001);	Accepted and reflected in the statement.
	- analysis and assessment of possible impacts from the Investment Proposal construction and operation stages - impact on surface and ground water within the site;	Accepted and reflected in the statement.
	- measures to limit pollution of water in the region should be recommended.	Accepted and reflected in the statement.
	Scenarios of emergency situations and disasters, including spills from the TMF and their effect on water quality in the potable water supply sources, in the surface and in the ground water should be considered.	Partially accepted. The flotation tailings are not liquid and cannot cause floods.
	In view of the above and of the intentions to build a pumping station in immediate proximity to the potable water supply pumping station, prepare and attach with the EIA Statement a specialized hydrological and/or geological engineering expert assessment answering the following questions concerning the pressure and risks put on water by the implementation of the investment proposal:	Accepted. These have been prepared: Hydrology evaluation of the flows of the Byala Reka River and its tributary Arpa Dere River; Report on hydrogeological conditions in the Rozino Deposit IP area; Report on integrated and sustainable management of water and Report on the assessment of lateral impact of blasting on the environment.
	- is there any risk for the potable water supply of urban areas in the region; Will the investment proposal lower the flow-rate of potable water supply sources; Will the investment proposal change the quality of the potable water used by the population in the region;	
	- is there any likelihood for releasing of polluted drainage and mine water outside the mine area and the TMF area; Will the IP impair the chemical status and will it change the pH of the surface and ground water in the region?	
	- how will the drilling and blasting impact on the quantity and quality of the water from the potable water sources and on the surface and ground water?	

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	As regards soils, assessment should be made of soil pollution by heavy metals and with other hazardous substances, with provision for specific measures against potential pollution of adjacent lands by the investment proposal.	Accepted. The relevant analyses along the path of distribution of potential pollutants have been made. No sources of heavy metals and hazardous substances that could pollute the soils are present.
	4.2. The potential impact on ambient air, with modelling of expected pollution (including generation and spreading of offending odours) from point and area sources. The ambient air quality analysis should cover all of the nearest urban areas within the investment-proposal area, and all sites which are subject to health protection in the meaning of § 1, item 3 of the Additional Provisions of the EIA Regulation. The distances from the nearest sites which are subject to health protection should be presented on maps.	Accepted. The relevant modelling and calculations have been made.
	The EIA Statement will consider in more detail the atmospheric air pollution sources and will make a detailed analysis of the deposition of pollutants in the ground-level atmospheric air, as follows:	Accepted. The relevant modelling and calculations have been made in accordance with the applicable methodologies. Measures based on modelling data and on calculations are proposed.
	- the expected emissions of dust and harmful substances during construction, transporting and operation should not be interpreted separately - the cumulative loading should be evaluated: Health assessment! Health assessment.	
	- a mathematical model of distribution of non-fugitive and fugitive emissions from the mine, the TMF and other auxiliary facilities to the nearest urban areas should be prepared for the preparatory (construction) and operation periods.	
	- this modelling should include also linear models for transport flows servicing the site and hauling of concentrated ore to the final destination, and should calculate their contribution to the fugitive emissions of dust and gas in the urban areas through which the vehicles will go.	
	- the EIA Report should present in detail measures to reduce local impacts from the expected dust and gaseous emissions.	
	4.3. The expected noise and vibration pollution with the relevant calculations of expected noise and vibration levels generated by the facilities at the boundary of town-planning and urban zones of the nearest urban centres and within the urban zone	Accepted. The relevant calculations have been made in

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	proper. The Rozino deposit in the Tintyava PLA is situated in the lands of the villages of Rozino, Gugutka, Ivaylovgrad Municipality, Haskovo district, and information is provided only about the Rozino village, from which the deposit is 1.2 km. away. The border with Greece is to the east and south, and the municipalities of Lyubimets, Majarovo and Krumovgrad are situated to the north and west.	accordance with the applicable methodologies.
	The operations during the various IP implementation phases are expected to increase the background noise levels in the immediate vicinity of the Project. As regards the population in the region, increased noise impacts by traffic and construction machinery are possible. The risk factors during the operation and their impact on the health of the residents in the urban centres and residential buildings closest to the concession area - the Rozino, Byal gradets and Gugutka villages, should be assessed.	Accepted. The relevant calculations have been made in accordance with the applicable methodologies.
	The main impacts during the operations phase are related to the mining activities. Mainly those working on the site will be exposed directly to health risk factors. Recognized and well-established good occupational health and safety practices should be envisaged for each activity type and minimise the specific occupational risks. Also, a forecast of expected noise impacts in the natural and urban environments by drilling and blasting and by crushing during the operation should be made. The applicability of the best available techniques should be assessed in view of the expected high health risk, irrespective of the statement on page 6 of the information, namely that "The open mining and flotation processing of natural raw materials is outside the scope of Annex 4 of the Environment Protection Act and, therefore, the IP does not require an integrated permit in the meaning of Chapter Seven, Section Two of the Environment Protection Act. Thus, there is no need for an assessment of the applicability of BATs for the proposed technologies." Measures to limit the noise impact and additional measures to reduce noise in the occupational environment should be proposed.	Accepted. The relevant calculations have been made in accordance with the applicable methodologies.
	4.4. The following types of waste are expected during the operation of the investment proposal and may be divided into two main groups:	Accepted and reflected in the statement.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	- wastes falling within the subject matter of the Wastes Management Act (WMA); - mining waste falling within the subject matter of the Mineral Resources Act. The EIA Report should include measures for safe management of the above wastes.. The EIA Report should include a structured description of all types of waste, by hazardous and non-hazardous grouping, which will be generated and managed during the operation of the investment proposal. Their impact on the natural, occupational and living environments and on human health should be assessed. Particular attention should be paid to the likelihood of leaching and infiltration of heavy metals and other hazardous substances out of the TMF and into the surrounding soils and ground water, and of the risk of dust being carried over from the flotation tailings toward the surrounding areas and urban centres during periods of drought. Special measures for the TMF should be proposed in this regard.	
	5. Identification of new risk factors and pollutants, if expected during the implementation of the investment proposal.	Accepted and reflected in the statement.
	6. Determining the potentially affected population and territories, zones and/or sites which are subject to health protection depending on the territory scope of the impacts on the natural and living environments. This should be underpinned by the mathematical modelling of distribution and predictive calculation of envisaged concentrations and levels of harmful substances emitted into the natural and living	Accepted and reflected in the statement.
	7. Predictive forecast of the extent of expected pollution reduction in the natural and living environments by individual pollutant, as a result of introduction of new more high-technological and environmentally sound production processes and equipment	Accepted and reflected during the drawing up of the IP and in the statement.
	8 . Characterisation and ranking of individual risk factors according to their impact on the human health and comparison to the applicable hygiene standards and requirements pertaining to both workplaces and affected residential areas. Determining the most important risk factors for the impacted population and the working in the site.	Accepted and reflected in the statement.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	9 . Assessment of the possibilities for combined, complex, cumulative and remote impact of risk factors both on the workers and on the population which is subjected to the unfavourable impact, considering also the production activities of other enterprises in the region, and the municipal and national roads.	Accepted and reflected in the statement.
	10. Analysis of the health and demographic status of the population of the nearest towns, villages and hamlets based on the most recent demographic data (birth rate, death rate, natural growth, infant mortality, etc.) and morbidity data (level and structure. The data must be compared to the district and national average. A predictive assessment should be made of the impact after the investment proposal is implemented, with a review and assessment of the health status of the potentially impacted population and with analysis and interpretation of demographic indicators and morbidity indicators for the regions (using data from the most recent available 3-5 year period) in which the population could be impacted by construction and operation of the investment proposal	Accepted and reflected in the statement.
	11. Assessment should be made of the human health risks with reasoned proof that the residents in the urban centres will not be subjected to health risks caused by pollution of the living environment, and health protection and risk management measures should be proposed..	Accepted and reflected in the statement.
RIEW Haskovo Ref. No ПД-279-(46) dated 20.12.2024.	Subject: Consultations to determine the scope of the Terms of Reference concerning the Environmental Impact Assessment (EIA) for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo District'.	--
	Regarding the submitted draft of the Terms of Reference concerning the Environmental Impact Assessment (EIA) for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA', we have the following remarks:	
	Include in the EIA for the investment proposal more detailed information about the formation and management of flotation waste with attendant diagrams or schemes of facilities and of the process, and of the waste disposal technology.	Accepted and reflected in the statement.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	Consider in detail the waste water generated in this way, and include information about its quantity, quality and treatment as necessary..	Accepted and reflected in the statement.
	Include in the assessment clear and summarized information about all the generated flows of waste water.. Submit reasoned information about the generated quantities of contact and non-contact water, and provide data and reasoning about the volumes of the relevant facilities and basins.	Accepted and reflected in the statement.
	Draw up a balance of water quantities and provide proof that no larger quantities of water that will require discharging will be generated during high-water periods (provided that the non-contact water reservoir receives surface run-off from the site)..	Accepted. An Integrated and Sustainable Water Management Report was developed.
	Pay special attention to the danger of waste-slurry or return-water spills and, also, of other emergency situations, and provide for efficient measures to prevent such occurrences.	No 'waste slurry' is present, according to the IP. Flotation tailings is present, and is not liquid but dewatered.
7. MOEW, Ref. No. OBOC-68-28 dated 14.02.2025.	Subject: Terms of Reference concerning the Environmental Impact Assessment (EIA) for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the territory of Ivaylovgrad Municipality, Haskovo district'.	
	As regards the information presented in the ToR, we have the following remarks and recommendation which should be reflected in the final ToR and taken into consideration during the drawing up of the EIA Statement.	
	1. In respect of the requirements of Chapter Six of the Environment Protection Act (EPA):	
	1.1. According to Article 96, paragraph 1, item 1 of the Environment Protection Act, the EIA Statement should characterize in detail the investment proposal, with all processes and activities within the IP extent. In this regard, we note that an overall assessment of the environmental impact of the IP requires submission of a passport for the carrying out of blasting works.	Accepted and reflected in the statement.
	1.2. The EIA Statement should contain a full, exhaustive information about all activities included in each of the proposed alternatives, visualised by maps and schematics.	Accepted and reflected in the statement.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	1.3. The IP implementation alternatives should be described in an equal manner.	Accepted. The potential reasonable alternatives are presented in item III of the Statement. The limitations of the receiving environment have been taken into consideration during the drawing up of the IP under consideration: restriction of the IP footprint on the earth's surface and the direct impact of a smallest territory; the presence of Natura 2000 protected areas; the prohibitions and restrictions arising from the Waters Act and the RBMP; the requirements of the Mineral Resources Act for maximum extraction of the natural resource; flotation tailings management using the latest and environmentally benign technology. This is why no other reasonable alternative has been put forward.
	1.4. The EIA Statement should designate clearly the new sites and the existing sites which will be used during the IP implementation - the process plant, roads, pumping station, power line etc., for each proposed alternative option.	No facilities exist on the territory of the future concession area and there are no reasonable alternatives.
	1.5. The statement should contain a conclusion as regards the preferred IP option, consistent with the drawn up environmental impact assessment.	There are no practicable variant options of the IP.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	1.6. We note that according to Article 11, paragraph 1 of the EIA Regulation, up-to-date data, modern knowledge and methods of evaluation should be used in the drawing up of EIAs.	Accepted and reflected in the statement.
	1.7. The list of attachments in item 8, 'List of the required annexes, lists and others', of the submitted EIS Scope, should be extended with the written declarations required by Article 11, paragraph 4 of the EIA Regulation, signed personally by each expert and by the team manager.	Accepted. Attached with the EIA Statement.
	1.8. Item 9.4 of item 9, 'EiA statement stages, phases and deadlines', should consider the requirement decreed with letter Ref. No. OBOC-68-17/18.11.2024 of the MOEW for drawing up of a report assessing the degree of impact over protected areas.	Taken into consideration.
	2 . Regarding the component 'Waters'	
	2.1. The interests of the public are violated when water extraction or water use creates a threat for: limiting general water extraction or use; endangering the country's defence and security; violating the provisions of the river basin management plans; negative impacts on banks, on facilities, on water quality and on protected areas or wasting of water - Article 49, paragraph 1 of the Environment Protection Act;	Considered during the compilation of the IP.
	2.2 No rights of water extraction and water use acquired by the granting of permits and exercised by virtue of this Act, etc. - Article 49, paragraph 3 of the Environment Protection Act;	Should be entered as a condition in the EIA Decision.
	2.3. The conditions stated in the EABD's statement with Ref No. OBOC-68-13/26.09.2024 of the MOEW (Ref. No. IIY-10-182-16/ 26.09.2024 of the EABD) must be complied with. This includes the condition that no mining operations are to be carried out in a 1,000 m radius around water-intake structures without surrounding sanitary protection belt areas.	Considered in the statement. Should be entered as a condition in the EIA Decision.
	2.4. The following is prohibited in river-side floodplains and the lands associated with water reservoirs: disposal and treatment of waste, washing and maintaining of transport vehicles and equipment, disposal of waste - Article 134 of the Waters Act;	Considered in the statement. Should be entered as a condition in the EIA Decision.
	2.5. The following is prohibited for protection against harmful impacts on water: disturbing the natural state of river beds, banks and river-side floodplains, using river beds as dump sites for waste, soil and rocks, keeping or storage of materials which	Considered in the statement. Should be entered as a condition in the EIA Decision.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	would increase significantly the destructive force of the water during flood events - Article 143 of the Waters Act.	
	2.6. No discharges to water bodies are envisaged by the IP. However, there is a risk of water seepage into ground water body BG3G000PtPg049 - Fissure – Eastern Rhodopes Complex. Therefore, the EIA Statement must present the following results and analyses of completed studies:	Accepted. These have been prepared: Hydrology evaluation of the flows of the Byala Reka River and its tributary Arpa Dere River; Report on integrated and sustainable management of water and Report on the assessment of lateral impact of blasting on the environment
	2.6.1. Results from determining the hydrogeological parameters of aquifers and defining the seepage ratios of rock varieties in the Rozino Deposit, Tintyava PLA;	
	2.6.2. Determining the potential threat of seepage of water from the TMF into the regional ground waters.	
	2.6.3. Determining the potential for water seepage from backfilling of the pit with waste rock material;	
	2.6.4. Assessment of the impact of blasting works on the mechanical parameters of water-bearing rocks. Possible occurrence of additional fissures.	
	2.6.5. Analysis and evaluation of blastwork impact, analysis and evaluation of the impacts of ore mining and removal of material from the mine pit, and analysis and evaluation of the impact of the material disposed in the TMF and as backfill on the potable water intakes used by the population in the region of the Rozino Deposit, Tintyava Property. This includes water intakes used by the Water Supply and Sewerage company and by the Ivaylovgrad Municipality with or without established sanitary protection belt areas.	
	2.6.6. Regarding the Rozino head reservoir situated 500 m away and intended for potable water supply to settlements in the area, but having no established sanitary protection belt area, provide an evaluation about the possible surface area of which the sanitary protection belt would be a part during a certain mode of operation of the facility, in order to prevent subsequent prohibitions and restriction for use.	All existing sources of water around the future concession area have been investigated. Facilities of the Haskovo Water Supply and Sewerage Company are situated 800 m to the east and 1,800 m to the south of the IP boundaries - the Rozino Pumping Station (in the Arpa Dere River floodplain) and the Gugutka Village Pumping

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
		Station (in the Byala Reka River floodplain) (Figure IV.2.2-1, Table IV.2.2-11, and Table IV.2.2-12. Information was requested of the EABD in accordance with the Public Information Access Act. Decision for provision of access to public information No. 3ДОИ-01-9/31.01.2025 by the EABD Director (Textual attachment No 15) states explicitly that 'At the present time we have no information about any future II nd and III rd belts of Sanitary Protection Zones for near-by potable water supply sources'.
	2.6.7. Evaluation of the impact of all activities on the quality and quantity composition of water abstracted in the potable-water supply area.	Accepted. These have been prepared: Hydrology evaluation of the flows of the Byala Reka River and its tributary Arpa Dere River; Report on integrated and sustainable management of water and Report on the assessment of lateral impact of blasting on the environment
	3 . Regarding the component 'Ambient air'	
	For information refer to the site of the Haskovo REIW (https://haskovo-riew.egov.bg/wps/portal/haskovo-riosv/control/air) and to the annual air quality bulletins published on the Executive Environmental Agency's site (https://eea.government.bg/bg/dokladi/God_bul_KAV/index)	Noted. Compliance with the regulatory framework is mandatory, as a general rule.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	The investment proposal should not lead to further air pollution in the area and, in this regard, the applicable provisions of Article 70 and Article 11 of Regulation 1 on the Limit Values for Harmful Substances (Pollutants) Released into the Atmosphere from Sites and Operations with Point Sources (Promulgated in issue 64 of the State Gazette of 2005) should be complied with during the envisaged construction and operation (and blasting).	
	4. Regarding the component 'Biodiversity':	
	4.1. Information about the implementation of the technical and subsequent biological rehabilitation is provided, and the rehabilitation should ensure the achieving of a sustainable status of the site not requiring maintenance. Edit the two bullet points at the beginning of page 30 on biological rehabilitation as follows: "It will comprise: ➤ forestation of the areas intended for returning to the forestry fund by creation of a nursery of saplings of local tree species and shrub (oak, Austrian pine, hawthorn, dog rose etc.) which will be required for rehabilitation; ➤ sowing of grass in the areas intended for restoration as agricultural land, by purchasing of seed mixes of Bulgarian species, sowing and growing."	The experts writing the EIA Statement signed declarations of independence and objectivity in their work, and for non-intervention in the phrasing of the IP, and do not accept proposals for editing of the texts. This proposal can be made in a different suitable way, in consideration of the rights of the competent environmental authority.
	4.2. Edit the entire text and all Latin names of the plant and animal species (where not done so) should be in italic font style, as per the International Taxonomic Nomenclature.	Accepted.
	4.3. Based on the lists of protected plant and animal species drawn up during field studies in the IP area, present in the EIA Statement practicable, doable, and measurable measures which should become subject to monitoring, and are intended to prevent, reduce or terminate the significant harmful impacts and to be implemented during the periods of construction, operation and closure and rehabilitation. Implementation of the measures should lead to maximum protection of the populations of plant and animal species situated in the IP or in its immediate vicinity.	Accepted.
	4.4. Present in the statement a cumulative evaluation with regard to biodiversity and any existing similar activities near the IP.	Accepted.

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	5. Regarding 'Climate'	
	When identifying risks during the evaluation, additional measures to adapt to climate risks should be provided for as	No IP-related risks have been identified and, therefore, no measures are required.
	6. Regarding the factor 'Waste'	
	6.1. Two months prior to IP implementation, the Investor should classify all waste generated before and after the IP implementation, in accordance with Article 7 of Regulation 2 on the Classification of Wastes.	These proposals should be entered as conditions in the EIA Decision.
	6.2. The Investor must keep records as required by Article 10 of Regulation 1 Regulation 1 on the Procedures and Forms to Provide Information about Waste Related Activities, and on the Procedures for Keeping of Public Registers in the National 'Waste' Information System (NWIS).	
	6.3. The Investor must hand over all generated waste to persons holding the documents required by Article 35 of the Waste Management Act (WMA) for the respective waste code, on the basis of an executed contract.	
	6.4. The Investor must comply with the provisions of the WMA and of the secondary legislation for its implementation.	This proposal has no practical meaning. Compliance with the legislation is mandatory without explicit entry.
	7. Regarding the component 'Soil'	
	7.1. The capital mine construction works and removing of the topsoil layer during the first and second years, during the operation, ore mining and disposal of topsoil and overburden should be carried out in consideration of the provisions of Section II - Removal and Utilization of the Humus Layer and Section III - Defining areas for rehabilitation, for use of topsoil and topsoil deposition areas of Regulation 26 of the Regulation on rehabilitation of disturbed areas, improvement of sub-productive lands, removal and use of the topsoil layer.	These proposals should be entered as conditions in the EIA Decision.
	7.2. The rehabilitation project should be developed in view of the requirements of Article 16, paragraph 1 of Regulation 26 on regulation of disturbed areas, improvement of sub-productive lands, removal and use of the topsoil, and of Article	

Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
	17 of the same provision concerning the procedures for coordination of rehabilitation projects.	
	7.3. Provide a detailed description of the soil-damaging processes as required by Article 12 of the Soils Act (SA), and describe and comply with the relevant provisions of Article 13 of the SA, including items 1, 2, 4, 5 and 10, in respect of construction works, stripping of topsoil during the first and second years, during operation and during mining.	All processes are described. Compliance with the applicable legislation is mandatory without explicit entry. No IP processes causing salination, acidification and pollution of soils with harmful substances are intended.
	8. In respect of hazardous chemical substances and the risk of large-scale accidents and/or disasters: Include in the EIA Statement the following measures for planned use of hazardous substances or mixtures at the stage of construction and operation:	These proposals should be entered as conditions in the EIA Decision.
	Hazardous chemical substances and mixtures must be delivered with attendant material safety data sheets (MSDS) in the Bulgarian language consistent with the provisions of Regulation (EU) 2020/878 Amending Annex II to Regulation (EC) 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH). Regarding the storage and use of hazardous substances and mixtures, comply with the conditions set out in the MSDS.	
	Service (maintain and repair, such as oil changes, refuelling, charging of lubricants, etc.) machines and equipment, transport, assembly and hauling/construction machines in specialised and dedicated places and repair facilities without allowing for spills of fuels and lubricants from the construction and transport equipment.	
	In the EIA Statement, evaluate the IP vulnerability to risk of large-scale accidents and/or disasters of significance for the IP, having received the relevant information by means of risk assessment.	This information is presented in item VI.6.4. The facility is not classified as high risk potential, as confirmed by the Executive

<i>Organisation</i>	<i>Statement</i>	<i>Reasons for Acceptance/ Non-Acceptance</i>
		Environmental Agency's letter Ref. No. YK-3741/30.12.2021.
	The Investor should note that some of the attached MSDS are not up to date as required by Regulation (EU) 2020/878 Amending Annex II to Regulation (EC) 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and do not reflect correctly the classification of substances and mixes stated in the Statement in accordance with Article 103 of the Environment Protection Act (Ref. No. OBOC-68-19/04.12.2024). The Investor must provide MSDS in the Bulgarian language, prepared in accordance with the requirements of Regulation (EU) 2020/878, and an updated report on the classification referred to in Article 103 of the Environment Protection Act, as needed. Attached with the Report referred to in Article 103 of the Environment Protection Act should be adequate documentation evidencing the manner of classification, the origin, the type and the composition of the processing waste - tailings, which will be generated by the flotation process.	No current MSDS related to the specific production process are available at the present time because the operations are in the future. MSDS published on-line by similar production processes in Bulgaria were used, as well as the classification list from the database of the European Chemicals Agency. The hazardous chemicals and materials classification process is extremely dynamic and MSDS will be available only after the mining concession is granted, the processing plant constructed to a pre-commissioning stage, which will take at least 5 years if the issued administrative acts are not appealed against. At that time the facility will have to be re-classified against the actual MSDS for the used hazardous chemicals and materials. A mine waste management proposal is presented with the report and shows the flotation tailings classification.

<i>Organisation</i>	<i>Statement</i>	<i>Reasons for Acceptance/ Non-Acceptance</i>
	9. Regarding the Convention on Transboundary Environmental Impact Assessment (Espoo, 1991) Letter No. OBOC-68/23.10.2024 of the MOEW, published on the MOEW site, the Greek government has informed the Republic of Bulgaria of its intention to take part in the environmental impact assessment for the IP 'Mining and Processing of Polymetal Ores from the Rozino Tintyava PLA' situated in the lands of the Ivaylovgrad Municipality, Haskovo District. This requires deposition of the EIA Statement and the Report assessing the degree of impact on protected areas by the above IP also in the Greek language for submission to the Greek state	Item V.12 of the Statement presents an additional analysis of transboundary impacts.
8. Ministry of Agriculture and Foods, South-Eastern State Enterprise, State Forestry Enterprise Ivaylovgrad, Ref. No. АСД-09-50 dated February 10, 2025.	Subject: Your letter Ref. No. 32/13.11.2024 and our Ref. No. АСД-09-335/18.11.2024 in connection with the consultations to determine the scope of the Terms of Reference concerning the Environmental Impact Assessment (EIA) for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district'. Having familiarized ourselves with the scope and content of the submitted Terms of Reference for the environmental impact assessment (EIA) for the investment proposal 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA situated in the lands of Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo District', and pursuant to Article 95, paragraph 3 of the Environmental Protection Act, the Ivaylovgrad branch of the State Forestry Enterprise has no proposals and objections concerning the Terms of Reference and presents a positive opinion thereto.	Positive opinion.

Table XI-2 First assessment of the EIA Report quality made with letter by the MOEW, ref. No. OBOC-68-65/20.10.2025 and the way in which the notes in the report are reflected.

N o.	Organisation	Statement	Reasons for Acceptance/ Non-Acceptance
1.	Ministry of Environment and Water, Ref. No. OBOC-68-65/20.10.2025.	Regarding: 'Assessment of the quality of an Environmental Impact Assessment report, including the report on the evaluation of the degree of impact by the investment proposal (IP) for Mining and Processing of Polymetal Ores from the Rozino Tintyava PLA, Ivaylovgrad Municipality.' Following the review of the above-mentioned report on EIA and the report on the evaluation of the degree of impact attached with it and filed with the Ministry of Environment and Waters (MOEW) with ingoing ref. No. OBOC-68-30/08.08.2025, substantial omissions and inconsistencies have been found as regards the quality assessment, and no decision can be made.	
		<i>I. As regards the EIA Report:</i> According to Article 14, paragraph 4 of the Regulation on the Terms and Procedures for Conducting Environmental Impact Assessments (the EIA Regulation), the EIA Report quality assessment is negative. The following ambiguities and omissions have been found:	
		<u><i>I. As regards Water:</i></u>	
		1.1. According to the 'Information about consulting and accommodation of the received statements' submitted with the EIA Statement, some of the conditions and remarks imposed by the MOEW's statement concerning the EIA scoping, have been taken into consideration and included in the report. Also, a 'Integrated and Sustainable Water Management Report', 'Hydrology Evaluation of the Byala Reka River and its tributary, the Arpa Dere River' and 'Report on the assessment of lateral impact of blasting on the environment' have also been prepared and submitted. In the EIA Statement, Table XI-1. '<i>Information about consulting and accommodation of the received statements</i>', concerning <i>Water</i>, it is stated in respect of items 2.6.1. -2.6.5. that a '<i>Hydrology Evaluation of the Byala Reka River and its tributary, the Arpa Dere River</i>', '<i>Integrated and Sustainable Water Management Report</i>' and '<i>Report</i>	Accepted. The following additional documents, supplemented as pointed out in the remarks, and signed by their authors, are attached with this EIA Report:

	on the assessment of lateral impact of blasting on the environment' have been submitted, but a review of these documents showed that they lack the following: • Results from determining the hydrogeological parameters of aquifers and defining the seepage ratios of rock varieties in the Rozino Deposit, Tintyava PLA; • Determining the potential threat of seepage of water from the TMF into the regional ground waters; • Determining the potential for water seepage from backfilling of the pit with waste rock material; • Assessment of the impact of blasting works on the mechanical parameters of water-bearing rocks. Possible occurrence of additional fissures; • Analysis and evaluation of blastwork impact, analysis and evaluation of the impacts of ore mining and removal of material from the mine pit, and analysis and evaluation of the impact of the material disposed in the TMF and as backfill on the potable water intakes used by the population in the region of the Rozino Deposit, Tintyava Property. This includes water intakes used by the Water Supply and Sewerage company and by the Ivaylovgrad Municipality with or without established sanitary protection belt areas.	1. Textual attachment No. 10 Hydrology Evaluation of the Byala Reka River and its tributary, the Arpa Dere River 2. Textual attachment 11 Water Management 3. Textual attachment 12 Trial Blasting Report 4. Textual attachment 16: Hydrogeological evaluation. The conclusions of these documents contain answers to the questions raised.
	1.2. Water balance modelling shows that the required active volume in the fresh-water dam will be approximately 300,000 m³ and, therefore, the dam was designed for a total permitted volume of 365,000 m³. The modelling shows that an input of 50 l/s of water during 5 months of the year is sufficient to supply the project based on this water volume. According to the preliminary design, the expected annual deficit of 125,000 to 300,000 m³ of water for the plant will be compensated by a pumping station in the Arpa Dere River situated	Water balance modelling and modelling of water quantities planned for extraction were made in consideration of the water quantities needed for IP implementation as intended and there no justified reason for lowering of these water quantities. These quantities are estimated according to the IP process needs and expected demands.

	approximately 1.7 km east of the site. Water will be pumped directly from the Arpa Dere River during the wet months of the year (January through May). Water from Arpa dere will be abstracted near the point of its confluence with the Yuren dere river adjacent to the Rozino village pumping station. This pumping station has been designed to pump water from a spring flowing into river pool. The flow-rate of this spring varies between 6 and 11 l/s during the entire year and is season dependent. It is calculated that a flow-rate of around 0.34 l/s will be required to supply Rozino village. Any excess water from the spring could, with the relevant justification, be drawn year-round for the industrial needs of the site. The plan is to abstract water from a natural pool without damming or other river blocking construction works. Bottled water will be provided for drinking purposes and industrial water will be used for ablutions. Building of a central sewage system is not provided since no wastewater treatment plant exists near the site. The 'zero discharge' approach is adopted and no discharging of waste water into surface water bodies is planned. According to the above, the planned abstraction of water from the Arpa Dere River remains and no lowering of the quantities drawn is planned for, neither the possibility for lowering the quantities has been considered.	The hydrology evaluation in Textual attachment 10 defines the main hydrology characteristics required for justifying of the water-use regimen. In the case of the Arpa Dere River (in the section upstream of the confluence with the Yuren Dere River), the average multi-annual flow (discharge rate) is calculated as 1,037 m³/s or 32,707 M m³/a of annual flow. An ecological minimum was defined on this basis (ecological minimum) of 0.104 m³/s, accepted as 10% of the discharge rate and should be guaranteed during the planning and implementation of the water consumption, including the priority water supply for the population.
	1.3. Information from the River Basin Management Plan (RBMP) of the Eastern Aegean region is presented in a table, showing the connection between terrestrial ecosystems and the BG3G000PtPg049 ground-water body. There is no analysis concerning the compliance with the provisions of Article 116, paragraph 1, item 4 of the Waters Act, stating that all water and water bodies are protected against depletion, pollution and damage in order to maintain the required water quantity and quality, healthy environment, preserve the ecosystems, protect the landscape and prevent economic loss, including the provision for development of aquatic ecosystems and of the terrestrial	Accepted. This analysis is presented in itm II.2 Groundwater, pages 69-71.

		ecosystems related to them, as well as the measures in the 2022-2027 RBMP concerning the IP at hand.	
		1.4. The EIA statement presents information about the envisaged water extraction and its potential impact on the surface water body. The plan is to fill the non-contact open-air water reservoir with water drawn from the Arpa Dere River between January and May, when the flow in this river is sufficient, in the Rozino Pumping Station area, at a rate of 50 l/s (for an expected total volume of 648,000 m³). This flow is equal to or less than 10% of the average multi-annual water quantity, and will ensure the ecological minimum in the river. Hydrological data about the Arpa Dere River are presented in a table. The Arpa Dere River is a left-hand tributary in the middle stretch of the Arpa Dere River. According to the data from Hydrologic Measuring Station 62800, Byala Reka River, Dolno Lukovo village (according to the submitted table), abstracting a total of around 648,000 m³ between January through May amounts to approximately 0.54% of the average water quantities of the Byala Reka River during this period. It is pointed out in connection with the statements made in the EIA report that the intended abstraction of water from the Arpa Dere River to fill the non-contact water reservoir total volume of 648,000 m³ during the operation of the Rozino Deposit, to a limited extent in January through May (actually outside the active irrigation season) is not expected to have a negative transboundary impact on the surface water quantities. The attachments to the EIA Report present a Hydrology Evaluation of the Byala Reka River and its tributary, the Arpa Dere River, near the Gugutka village, Ivaylovgrad Municipality, Haskovo District. The submitted paper is not signed. There is no analysis and conclusion in the hydrological assessment about the specific water-abstraction quantity envisaged in the IP, and its impact on the water flow.	Accepted. Textual attachment 10 of the EIA Report presents the discharge rate of the Byala Reka River and its tributary of Arpa Dere River, prepared in accordance with the remarks and signed by its authors. The intended water abstraction from the Arpa Dere River is estimated following a hydrological study and is aligned with the requirement to maintain an ecological minimum of 0.104 m³/s, defined as 10% of the average multi-annual flow of the Arpa Dere River upstream of its confluence with the Yuren Dere River. The existing Rozino village pumping station operates in the region at 10 l/s, while the planned water abstraction for the IP averages at approximately 8 l/s with a technical capability for 1 pump operation at 50 l/s / 2 pump operation at 100 l/s toward balancing ponds. The hydrogeological analysis shows that full-capacity water abstraction during an average year would be possible in January-May and in December, guaranteeing the ecological minimum and the water supply to the settlement. The water quantities in June-November are below the ecological minimum and water abstraction will be possible only during rainfall that ensures an instantaneous flow rate of more than 0,164 m³/s (164 l/s) which is the sum of the ecological minimum, the maximum quantity for the Rozino Village and the capacity of one pump (50 l/s). It is noted that the water extraction lagoon is approximately 50 m³ and, therefore, ensuring normal operation would require a regimen tied to the available inflow/precipitation

			events. In conclusion, applying this seasonal and conditional regimen of water abstraction is intended to prevent potable water shortages and to ensure maintenance of the ecological minimum and, at the same time, to provide the quantities of water required for implementation of the IP.
		1.5. According to the EIA Statement, the investment proposal does not concern domestic water supply facilities and their sanitary protection belt areas. Only a dry well (P-19) near Rozino Village, along the road to Gugutka Village, and the Anasa fountain (G-1) (not in use) near Gugutka Village are situated within the future Rozino Concession Area. Other water sources have been identified in the wider area around the IP site, used for watering of livestock and irrigation, and water sources which are not used or have dried up. Facilities without permits are situated 800 m to the east and 1,800 m to the south of the future 'Rozino' concession - the Rozino Pumping Station of the Haskovo Water Supply and Sewerage Company (in the Arpa Dere River floodplain, Water body BG3G000PtPg049) and the Gugutka Village Pumping Station (in the Byala Reka River floodplain, Water body BG3MA100R270). No evaluation has been made as to whether individual IP sections are not within future sanitary protection zones around potable water abstraction facilities without sanitary protection belt areas, less than 1,000 m. from the boundaries of the future concession area.	The assessment is presented together with the EIA Statement filed with the MOEW in August 2025. The following explicit statement is made: All existing sources of water around the future concession area have been investigated. Facilities of the Haskovo Water Supply and Sewerage Company are situated 800 m to the east and 1,800 m to the south of the IP boundaries - the Rozino Pumping Station (in the Arpa Dere River floodplain) and the Gugutka Village Pumping Station (in the Byala Reka River floodplain) (Figure IV.2.2-3, Table IV.2.2.-11, and Table IV.2.2-12. Information was requested of the EABD in accordance with the Public Information Access Act. Decision for provision of access to public information No. 3ДОИ-01-9/31.01.2025 by the EABD Director (Textual attachment No 15) states explicitly that 'At the present time we have no information about any future IInd and IIIrd belts of Sanitary Protection Zones for near-by potable water supply sources'. Therefore, such an assessment would not be possible and our expert statement remains. In addition, there is no geological hydraulic connection between the Gugutka Pumping Station and the Rozino Pumping Station because the Gugutka PS abstracts water from the Byala Reka floodplain and from its tributaries upstream of the

			deposit. The Rozino PS is recharged by the karst springs east of Arpa Dere and its tributaries, whose watershed area does not include the Rozino Deposit and, in particular, the open pit.
		1.6. The EIA statement does not contain information about the hydrogeological parameters and factors (based on hydrogeological studies and on a hydrogeological report submitted to the East Aegean Basin Directorate), affecting groundwater quality and quantity in the region, in order to clarify the effect of the Rozino Deposit operation process on the ground water and, in particular, the drinking water supply sources for the urban centres in the deposit area.. No hydrogeology report is presented in the attachments with the statements and the team of experts who wrote the statement does not include a geologist-hydrogeologist.	Accepted. This information is included in pages 67 -70. The hydrogeology report is presented in Textual attachment 16 and is signed by its authors. A hydrogeology engineer has been included in the team.
		1.7. The report presents information about drilling and blasting. A report on the assessment of the side impact of blasting on the environment is attached, but is not signed and no document certifying the author's credentials is presented. Since the deposit is situated in a hill, it is assumed in the paper that the secured zone radius will not be less than $R = 450$ m. The following conclusions can be made from the assessment of the blast impacts on humans and on the environment, and some of these conclusions are as follows: The drilling and blasting design for the Rozino deposit conforms to the standards for safe impact on humans and structures beyond the limits of the danger zone during burden blasting for all three design blasthole diameters (76, 89 and 102 mm) and with separate (stand-alone) delay periods of ignition of each charge and maximum charge weight of up to 30 kg, in accordance with the forecast calculations using the experimentally determined static-impact dependencies on the distance and weight of the exploded charges; There is no conclusion directly relating to the surface and groundwater in the region, having in mind that a potable water supply head reservoir is present approximately 620 m. east of the property.	The Rozino head reservoir is 2,300 m. away from the pit outline in which mining will be carried out and 1,300 m. from the buffer zone boundary, with a 1,000 m radius from the water intake facility. As can be seen on Figure II.1.2-1, the catchment is near point 6 of the future concession area, and this point is downstream of the non-contact water reservoir. As is visible on the maps, no mining is possible in the 1,000 m buffer zone and, therefore, no drilling and blasting, because there will be a man-made water intake, a non-contact water reservoir, required for the IP. We are pointing out once again that the mining will be 1,300 m. away from the boundary of the 1,000 m radius buffer zone and 2,300 m from the head reservoir and, therefore, we see no reason to exclude the buffer zone area around the Rozino head reservoir from the future concession area. Excluding this area will deprive us of the possibility to build a

			non-contact water reservoir which is needed for the IP. Trial blasting: No vibration or dynamic parameters exceeding the natural seismicity of the region have been established. Conclusion: The obtained results allow the conclusion that if the recommended maximum mass of explosive during one delay interval, no excess of vibration velocity at depth causing seismic impacts on ground water and on water sources may be expected and the IP implementation will have no impact on potable water sources which are not directly affected by the blasting works. These supplements were added to Section V.2 of the Report.
		1.8. The 2022-2027 River Basin Management Plan of the Eastern Aegean Directorate provides for the following measures: • The following measure is provided for in Attachment No 7, section 7 of the River Basin Management Plan of the Eastern Aegean Directorate: Prohibitions and restrictions for activities in the potable water protection zones and in the sanitary protection belt areas and buffer zones around water abstraction facilities/systems, and implementation action for measure: DW_1_35 Prohibition for mining of underground mineral resources, including aggregate, within a buffer zone with a radius of 1,000 m. from groundwater abstraction facilities for potable water supply. The code of this measure is DW_1; • The following measure is provided for in Attachment No 7, section 7 of the River Basin Management Plan of the Eastern Aegean Directorate: Prohibitions and restrictions for activities in the potable water protection zones and in the sanitary protection belt areas and buffer zones around water abstraction facilities/systems, and	Accepted. The Report has been supplemented. <u>Regarding the DW_1 measure and the DW_1_35 measure implementation action:</u> This information is presented on page 71. We are pointing out once again that the mining will be 1,300 m. away from the 1,000 m radius buffer zone and 2,300 m from the head reservoir and, therefore, we see no reason to exclude the buffer zone area around the Rozino head reservoir from the future concession area. Excluding this area will deprive us of the possibility to build a non-contact water reservoir which is needed for the IP. <u>Regarding the DW_1 measure and the DW_1_4 measure implementation action:</u> The IP area does not encroach on potable water facilities or the sanitary protection belts established around them. This information is presented on pages 72 – 73 and in Table IV.2.2-12.

	implementation action for measure: DW_1_4 Compliance with prohibitions and restrictions in the sanitary protection belt areas in accordance with the order designating the area and the list in Attachment No 1 of the National Catalogue of Measures (RBMP). The code of this measure is DW_1; - The following measure is provided for in Attachment No 7.2.1, section 7 of the River Basin Management Plan of the Eastern Aegean Directorate: Prohibition for extraction of aggregated at less than 50 m. from river banks, measure implementation action: HY_3_1 Prohibition for extraction of aggregated at less than 50 m. from river banks. The code of this measure is HY_3; - The following measure is provided for in Attachment No 7, section 7 of the River Basin Management Plan of the Eastern Aegean Directorate: Prevention of discharging of priority substances in the groundwater, measure implementation action: GD_1_2 Prohibition or restriction of activities increasing the risk of direct or indirect discharging of priority and hazardous substances or other pollutants into ground water, including uncovering groundwater to the surface by removal of sediments and soils covering the water body. The code of this measure is GD_1. In connection with the above, the EIA statement should be added to as follows:	<u>Regarding the HY_3 measure and the HY_3_1 measure implementation action:</u> No mining of aggregate near (50 m) river banks is envisaged for the Rozino IP. <u>Regarding the GD_1 measure the GD_1_2 measure implementation action:</u> The mining operations will be carried out in the seepage zone without reaching the water level. Passive ground water inflow will be priority pumped to the plant in order to meet the processing requirements. The impact on the chemical status of ground water will be neutralized by lining the contact water reservoir bottom and walls and by constructing a system to intercept eventual break-through involving a curtain drain and a grout curtain. This information is presented on page 154.
	- All papers attached with the EIA statement should be signed and with attached documentary evidence of the required credentials of the report author.	Done.
	- Describe the hydrogeological parameters and factors (based on hydrogeological studies and on a hydrogeological report submitted to the East Aegean Basin Directorate), affecting groundwater quality and quantity in the region, in order to clarify the effect of the Rozino	The company is not part of this correspondence and does not possess these letters. Letter Ref. No. IIV-01-183(3)/10.05.2023 of the Ivaylovgrad Municipality indicating a header reservoir (property

		Deposit operation process on the ground water and, in particular, the drinking water supply sources for the urban centres in the deposit area.. Include information about the existing water abstraction facilities provided by the Ivaylovgrad Municipality with letter Ref. IIY-01 - 183(3)710.05.2023, the Krumovgrad Municipality with letter Ref. IIY-01 -183(4)712.05.2023 and by the Haskovo Water Supply and Sewerage EOOD company with Ref. No. IIY-01-183(2)/03.05.2023. The following conclusions can be made from the assessment of the blast impacts on humans and on the environment, and some of these conclusions are as follows:	62953.177), a pumping station (property 59197.45.59) and the Rozino pressure water-supply pipeline, was presented following additional request. These properties are external to the IP. All facilities, including the facilities pointed out by the Ivaylovgrad Municipality, are shown on Figure IV.2.2-3. Table IV. 2.2-12. And Table No. IV.2.2-11 provide information about water abstraction facilities in the IP area, provided from the EAR Basin Directorate and from the Haskovo Water Supply and Sewerage Company. Water sources in the territorial range of the IP site or in its wider surroundings We point out that there are only 2 water sources in the future concession area - P-19 - a dry well in the Rozino Village, along the road toward Gugutka village, and Г-1 - a disused water fountain, Anasa, Gugutka village.
		- Consider the possible IP impact on surface water concerning the compliance with the provisions of Article 146, paragraph 1, item 4 of the Waters Act, stating that all water and water bodies are protected against depletion, pollution and damage in order to maintain the required water quantity and quality, healthy environment, preserve the ecosystems, protect the landscape and prevent economic loss, including the provision for development of aquatic ecosystems and of the terrestrial ecosystems related to them, as well as the measures in the 2022-2027 RBMP concerning the IP at hand.	The Report has been supplemented. This analysis is presented on pages 70 - 75.
		- An assessment is required about whether individual sections of the investment proposal fall within the future IInd and IIIrd belts of the Sanitary Protection Zones of near-by potable water sources should be made. If they do fall within these belts, note that certain prohibitions, restrictions and limitations in the event of proven necessity apply as per	The assessment is presented together with the EIA Statement filed with the MOEW in August 2025. The following explicit statement is made: All existing sources of water around the future concession area have been investigated. Facilities of

		Regulation 3 of January 16, 2000 on the Terms and Conditions for Surveying, Designing, Approval and Operation of Sanitary Protection Zones around Water Sources and Drinking Water Supply Facilities and around Mineral Water Sources Used for Medical, Preventive, Drinking and Hygiene Purposes (Promulgated, SG, issue 88 dated November 27, 27.10.2000.	the Haskovo Water Supply and Sewerage Company are situated 800 m to the east and 1,800 m to the south of the IP boundaries - the Rozino Pumping Station (in the Arpa Dere River floodplain) and the Gugutka Village Pumping Station (in the Byala Reka River floodplain) (Figure IV.2.2-3, Table IV.2.2.-11, and Table IV.2.2-12. Information was requested of the EABD in accordance with the Public Information Access Act. Decision for provision of access to public information No. 3ДОН-01-9/31.01.2025 by the EABD Director (Text attachment No 15) states explicitly that 'At the present time we have no information about any future IInd and IIIrd belts of Sanitary Protection Zones for near-by potable water supply sources'. Therefore, such an assessment would not be possible and our expert statement remains. In addition, there is no geological hydraulic connection between the Gugutka Pumping Station and the Rozino Pumping Station because the Gugutka PS abstracts water from the Byala Reka floodplain and from its tributaries upstream of the deposit. The Rozino PS is recharged by the karst springs east of Arpa Dere and its tributaries, whose watershed area does not include the Rozino Deposit and, in particular, the open pit.
		- Supplement the conclusions made in the Report on the Evaluation of the Side Impact of Blasting on the Environment and include conclusions specifically about the surface and ground water, having in mind that a potable water supply head reservoir is situated approximately 620 m east of the property. This potable water supply source should be included among the object for protection in the report.	The Rozino head reservoir is 2,300 m. away from the pit outline in which mining will be carried out and 1,300 m. from the buffer zone boundary, with a 1,000 m radius from the water intake facility. As can be seen on Figure II.1.2-1, the catchment is near point 6 of the future concession area, and this point is downstream of the non-contact water reservoir. As

			is visible on the maps, no mining is possible in the 1,000 m buffer zone and, therefore, no drilling and blasting, because there will be a man-made water intake, a non-contact water reservoir, required for the IP and the water quality in this reservoir should also be protected. The trial blasting report has been supplemented and is presented in Textual attachment 12. According to the supplements: No vibration or dynamic parameters exceeding the natural seismicity of the region have been established. Conclusion based on the report: The obtained results allow the conclusion that if the recommended maximum mass of explosive during one delay interval, no excess of vibration velocity at depth causing seismic impacts on ground water and on water sources may be expected and the IP implementation will have no impact on potable water sources which are not directly affected by the blasting works.
		- The measures described above and applying to the IP should be considered in the report.	Reflected in the EIA Report.
		2. In respect of ambient air and climate	
		2.1. Greenhouse gas emissions:	
		It is pointed out in the EIA statement that the IP implementation will not contribute to climate change, i.e. no greenhouse gas emissions will be generated ". This allegation contradicts the findings in the report where it is noted that exhaust from diesel generators and construction and transport machinery will be generated during the construction and operation phases. Also, standard measures to limit greenhouse gas emissions are described in the text (such as maintenance of the	Accepted. The relevant supplements have been made in sections IV.1, V.1. and VI.6.6.

		machinery, avoiding idling, applying of the EU standards) but no quantitative costing is available.	
		No other greenhouse gas emission sources such as blasting, ore processing (energy intensive processes), concentrate hauling and TMF operations and rehabilitation are considered. Thus, there is insufficient information concerning greenhouse gasses. A quantitative calculation of emissions as tCO ₂ e/year should be made for each phase, with costing by reference indicators.	Accepted. The relevant supplements have been made in sections IV.1, V.1. and VI.6.6.
		2.2. Adapting to climate change: The report includes a paragraph describing 'primary and secondary health effects' by climate change - heat waves and cold waves, diseases by vector, polluted food and water, mental disturbance. This information is true and useful, but is presented in a general, informative way and is not related to the investment proposal under consideration. In conclusion, the authors point out that 'no significant IP related negative impacts have been identified and, therefore, no adaptation measures are required'. This conclusion is insufficiently reasoned. There is no analysis of the impact of climate-related risks, typical of the region, such as: • extreme precipitation and storms - risk for the pit, the tailings storage facility and the stockpiles; • drought and hot waves - insufficient water for flotation, worker health risks; • forest fires - a real threat in the Eastern Rhodopes; • slides and erosion - possible increase caused by the changing regimen of precipitation. These risks are not assessed and no specific adaptation measures are proposed (such as engineering solutions for drainage, back-up	Accepted. This supplement in Section VI.6.6 of the report is consistent with EC's Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, 2013.

		water supply sources, fire-control measures, emergency response plans).	
		2.3. The EIA Report does not refer to key documents which set the framework for integration of aspects of climate: • National strategy adaptation to climate changes and Action plan; • • Long-term strategy for climate mitigation until 2050; • European strategy adaptation to climate changes (2021). In view of the above and as regards climate change, the information in the report should be supplemented with: • A quantitative assessment of greenhouse gas emissions from all stages and facilities, with costing; • Analysis of the vulnerability of the project to climate-related risks and extreme events; • Specific engineering and organisational measures for adaptation.	This addition to the report is consistent with EC's Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment, 2013. Referring and comparing to goals and priorities in strategic documents is used in the environmental assessment procedures but not in the EIA procedures, because the level of detail in the evaluations is substantially different. According to Article 96, paragraph 1, item 5, letter e, of the Environment Protection Act, the EIA Statement must contain: IP impact on climate (e.g. the nature and degree of greenhouse gas emissions) and the vulnerability of the IP to climate changes). According to the analyses and in response to the established risks, the project provides for a package of engineering, technical and organisation measures aimed at increasing climate change resilience. These measures conform to the national priorities for adaptation (increase of infrastructural stability, protection of natural resources and of health), and to the European Adaptation Strategy (for 'more intelligent, faster and more systematic adaptation' to climate) - Section VI.6.6 of the report. Costing of greenhouse gas emissions cannot be made at the current stage of IP development and as no mining concession has been granted that would allow detailed engineering design. Furthermore, emission costing will not contribute anything of real value to the EIA, since the process is dynamic and the actual IP implementation could be possible after

			5 years at the earliest, when quotas and prices are most likely going to differ.
		2.4. Air monitoring is insufficient - there is no overall long-term control program. The link to certain climate factors such as temperature inversions etc., is not taken into account. The analysis is limited to technical parameters and does not consider the cumulative effects with other sources of pollution. Also, the connection to the health risks for the population is not covered in sufficient detail.	Upon IP approval and obtaining of a mining concession, a self monitoring plan will be prepared and will be coordinated with the competent environmental authorities. The cumulative impacts are reviewed in VI.6.5, and all other IPs against which the analysis was made are pointed out in Textual attachment 14. The health risks are considered comprehensively in section V.11 and, also, in section VI.6.5. The population health-risk assessment in item V.11 has been supplemented in accordance with the note. The word 'sufficiently' is completely subjective and does not point at any particular omissions. Therefore, it is unclear exactly what is missing in the analysis, so that it could be supplemented. The supplements are at the discretion of the experts who wrote the respective parts.
		The EIA Report does not consider the interactions of climate, air and water in a uniform logical framework.	The analyses and evaluations are consistent with the applicable EU methodological guidelines and instructions pointed out in the EIA statement. Neither makes a requirement that a 'uniform logical framework' be available and that the interactions between climate, air and water be considered. No such regulations and no other methodological instructions exist, other than those specified.
		3. Regarding the component 'Biodiversity':	
		In item IX of the EIA, 'Description of the measures to avoid, prevent, mitigate and, where possible, eliminate the established significant unfavourable environmental and human-health consequences', on page 250, we propose that the following be added to the goal, described in the report, <i>'Implementation of the measures</i>	Comment by the EIA Report authors concerning the remarks with measures in item IX: These proposals are entirely within the MOEW's purview and the ministry may, at its own discretion and within its competencies, being the environmental authority,

		<i>should lead to maximum protection of the populations of plant and animal species situated in the IP or in its immediate vicinity</i> ':	propose conditions and measures for inclusion in the EIA decision. Given the obligation for independence of the EIA Report writers during the assessment, formulating measures to prevent and reduce impact and the signed affidavits referred to in Article 83, paragraph 4 of the Environment Protection Act signed by each expert, and the respective criminal liability, we refrain from expressing a position on these proposals and recommendations.
		In item 3.1. on page 256, measure 41, replace the words 'only ... indigenous' with 'local plant species which are suitable for the region'. It is impossible to find the sufficient number of indigenous species' saplings, cuttings or seeds. The rehabilitation material will be taken from the available numbers and species in the existing nurseries, and it is important that those species are local and not alien and that they will be favourable for the environment.	Clarification: Autochthonous species is a species originating in a specific region or ecosystem by way of local natural evolution. Such species are present naturally, having adapted to the local conditions, and are vital for the health and biodiversity of the ecosystem. The term is synonymous with 'local' and is the opposite of non-native or introduced species. On the other hand, the (scientifically) vague term 'local' may apply to any species occurring in the region, such as the acacia. In order to avoid ambiguities, the expression 'tree and bush species autochthonous to the region' is replaced with the expression 'tree and bush species autochthonous to the country'.
		In 3.2. on page 256, add a new measure, 4.2, about the phases of engineering and construction, with the implementation result being preserved biological diversity, with the following text: 'The IP site-preparation activities should begin outside the period of nesting and raising of the chicks between March 12 and June 30.' This is a compensatory measure relating to the text on page 167 - 'If the activities start during the species' nesting period, the species may leave any nests in or near-by the IP, and such nests are at risk of being destroyed or abandoned with subsequent loss of eggs and/or young	The EIA Report provides for this measure. - Mine construction should begin outside the April 01 - August 15 and November 20 - March 10 periods. These periods account for the nesting of birds which are subject to protection in the Byala Reka protected zone. These times include the goshawk nesting period (nest building starts in early April; Simeonov et al 1990), the breeding period of wild cats (birth is in April, Peshev et al 2004), the majority of the

		chicks. Should this happen, the impact on the species' population in the area may be significant.'	European legless lizard's active season, including both its breeding and its hibernation periods. This measure is also written in the EIA Report.
		In 3.3. add a new measure 43 for the design and construction phases, with the implementation result being conservation of biodiversity, with the following text 'Transport vehicles and machines must not leave the existing/designated roads during the performance of respective activities described in the IP.'	The proposed measure duplicates the meaning of Measure 42 included in the EIA Report.
		In 3.4. add an electric pole safeguarding measure, related to the texts on page 165 'Burd mortality may occur because of the power line. Poles of unsuitable construction in the case of 20kV power lines may cause mortality by electrocution. Higher voltage power lines pose no risk of electrocution but collisions of birds with the strike termination cable are likely.'	The EIA Report provides for such measures. - The poles for a 20 kV powerline should be of a type preventing electrocution of birds, or with insulated live parts. An ornithology expert should be consulted about this measure during the engineering design phase; - Deflecting (contact) plates (bird diverters), rotating spheres or spirals made of phosphorescent material must be installed on the strike termination cables of powerlines above 20 kV. An ornithology expert should be consulted during the engineering design phase about the type, longitudinal placement and spacing of these devices. These measures are also written in the EIA Report.
		3.5. in respect of the 5 protected species described on page 167 - European legless lizard (<i>Ophisaurus apodus</i>), Eurasian goshawk (<i>Accipiter gentilis</i>), red-breasted flycatcher (<i>Ficedula parva</i>) and wild cat (<i>Felis silvestris</i>), present doable, measurable and controllable measures in the table and specify whose obligation it is to carry out these measures and place a condition for provision of scientific consultation and observation during their implementation.	The EIA Report provides for a measure concerning these species. - Mine construction should begin outside the April 01 - August 15 and November 20 - March 10 periods. These periods account for the nesting of birds which are subject to protection in the Byala Reka protected zone. These times include the goshawk nesting period (nest building starts in early April; Simeonov et al 1990), the breeding period of wild cats (birth is in April, Peshev et al 2004), the majority of the

			European legless lizard's active season, including both its breeding and its hibernation periods. This measure is also written in the EIA Report. Red-Breasted Flycatchers have been established only during migration (the species nests in old-growth beech forests, which are not present in the region). This species may be seen everywhere during this period, including in landscaped spaces between apartment buildings in large cities (personal observations). There will be virtually no impact on the species. No measures are required for this species.
		4. Concerning 'Soils' and 'Subsurface Environment and Mineral Diversity':	
		4.1. There is no detailed analysis in the EIA Report of the mineral diversity external to the auriferous ores. The risk of geochemical processes (drainage, mobilization of heavy metals etc.) is not considered at depth.	Accepted. Added to Section IV.4.
		4.2. The cumulative impact assessment is very simplified.	Not accepted. This is a subjective and unreasoned allegation in respect of the EIA Report quality evaluation criteria and in respect of the applicable cumulative-impact analysis methodology. The cumulative impacts are assessed by environmental component and media, in accordance with the EU Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions, May 1999, as indicated in the statement. No other guidelines are available presently.
		4.3. Description of the ore - the main object of the IP, is inconsistent and does not give a realistic idea about the mineral and chemical composition of the ore. Gold is stated as the only element to be mined and recovered, and it remains unclear if integrated use of the	Accepted. The answers to questions in items 4.3.1 to 4.3.4 have been supplemented in Section IV.4 of the report.

		ore is provided for, and, also, there is no information about silver and other payable metals. Therefore:	
		4.3.1. How many types of ore have been found in the Rozino Deposit in the Tintyava PLA and what are they? 'Ore' is an economic term and differs substantially from other similar terms such as ore deposition and mineralization. Therefore, the ore types to be mined in the deposit should be substantiated in advance depending on the natural specifics, the technology of mining and the enrichment of the payable components. But if only one type of ore is concerned and its reserves have been estimated, this must be shown clearly throughout the report.	
		4.3.2. It is not clear why the ore in the deposit is defined as polymetal once (in the EIA Report title) and as polymetal (gold-silver) on page 11, and, a third time, as a polymetal gold-silver (page 11 again). It is not clear what other metals are known, estimated and potentially recoverable from the ore in the deposit, so that this ore is classified as polymetal. No such data is presented in the report and no reason to refer to the ore as polymetal is given.	
		4.3.3. The Rozino Deposit in the Tintyava PLA is referred to multiple times as gold-silver in the EIA report. Reserves of 11.3 M t of ore grading at 1.33 g/t gold are stated. But no mentioning is made of any estimated resources or reserves of silver or of its presence in the ore. Also, the expected IP implementation end product is concentrate bearing gold only. The ore flotation circuit is described in detail, with the target gold grade in the final concentrate is between 22 and 30 g/t depending on the gold grade in the input ore. There is no description about how this process will be controlled and how the gold grade will be determined. It is unclear what the loss of gold, silver and other payable components will be to the flotation tailings. The presence of pyrite in the tailings may cause serious problems in the regional environment.	

		4.3.4 It is unclear in what form gold is present in the ore from the deposit. The answer to this question concerns directly the ore processing technology. It is mentioned once in the EIA report that 'no native gold has been found in the ore' (page 39), while gold established in single samples only is described (page 85). It is highly likely that the majority of the gold in the deposit is presence in the form of a mix with other minerals. If the form in which gold is present in the ore, exactly what input natural product (mineral or a group of minerals) will be subjected to enrichment by flotation in order to obtain the expected final product - gold bearing concentrate containing Au g/t?	
		4.3.5. As regards impact on soils: The evaluation of soil pollution accounts only for the soils in the IP area. There is no information about soils in near-by villages and farmlands which are threatened by fugitive dust emissions from the drilling and blasting operations, crushing, hauling of crushed ore, milling, and from the deposition of fine dust-size tailings. In this connection, environmental monitoring in selected polygons in the region should be provided for prior to and after deposit operations begin.	The allegation about agricultural lands being threatened by dust emissions is subjective and unsubstantiated. The mathematical modelling for PM10 and PM2.5 and its presentation on the respective figures (V.1.2-3 and V.1.2-4) shows definitively that particulate matter will settle within the concession area. The maximum PM10 levels in the nearest residential areas is lower than 11 µg/m³, a level that cannot have any effect on human health, let alone soils. The water to solids ratio in the flotation tailings is 25/75 and is achieved by thickening. Thickened tailings are also less prone to raising of dust. Upon IP approval and obtaining of a mining concession, a self monitoring plan will be prepared and will include soil monitoring. The plan will be agreed with and approved by the environmental authorities.
		4.3.6. On page 80 of the EIA report, the text: '<i>The analysis results show compliance for all parameters with the limit values set forth in Regulation 3/2008 on the Limit Values for Harmful Substances in Soils and in Annex 2 under Article 4 Concentrations, Maximum Admissible Concentrations, Intervention Concentrations for Persistent Organic</i>	The text has been misunderstood by the reader or has been taken out of context. There is an explicit statement: 'According to the Regional Environmental Status Report drawn up by the Haskovo RIEW in 2022...' i.e. data taken from the

		<i>Pollutants and Oil Products in Soils</i> should be corrected. The analysis results should point at the content of harmful substances in the soils which are fit within the limit values set forth in Regulation 3/2008 on the Limit Values for Harmful Substances in Soils and in Annex 2 under Article 4 - Concentrations, Maximum Admissible Concentrations, Intervention Concentrations for Persistent Organic Pollutants and Oil Products in Soils.	respective report by the Haskovo RIEW and cannot be corrected. It can be seen from the maps that there are no industrial sources of soil pollution in the IP and no persistent organic pollutants and oil product pollution are present.
		4.3.7. On page 153 of the report, the text 'Any removed topsoil and soil cover will be temporarily stockpiled. The stockpiled soils will be used during the rehabilitation of areas disturbed by the operation.' should be completed with text regarding the actual removal, storage and utilization of the topsoil layer and whether this will be in accordance with Section II of Regulation of October 2, 1996 on the Rehabilitation of Damaged Terrains, Improvement of Low-Productivity Areas and Utilization of the Topsoil Layer.	Regulation No. 26/1996 is referred to in item V.3.2. 'Assessment of Impact'. Detailed and fully comprehensive information about topsoil removal and subsequent rehabilitation is presented in item II.2 and item II.3 of the EIA statement. To avoid unnecessary exacerbation of the report, repeating of things written already is avoided.
		4.3.8. On page 254 of the report, - Measure 27, in the sentence "Define and designate the temporary top-soil stockpiling locations within the sites dedicated for this purpose." - remove 'and designate'. - Add after this sentence: 'If the top-soil layer cannot be used immediately upon being removed, it shall be stored in top-soil stockpiles, Article 10 of Regulation 26/02.12.1996. - Measure 28, in the sentence 'Development of a soil monitoring plan in accordance with Article 29, paragraph , item 2 of the Soils Act' add the word: 'self' before 'monitoring'.	Comment by the EIA Report authors: These proposals are entirely within the MOEW's purview and the ministry may, at its own discretion and within its competencies, being the environmental authority, propose conditions and measures for inclusion in the EIA decision. Given the obligation for independence of the EIA Report writers during the assessment, formulating measures to prevent and reduce impact and the signed affidavits referred to in Article 83, paragraph 4 of the Environment Protection Act signed by each expert, and the respective criminal liability, we refrain from expressing a position on these proposals and recommendations.
		5. In respect of hazardous chemical substances and the accident risk.	
		The text on page 122 referred to in item 11.2 Risk factors related to the population and to human health 'Hazardous chemical substances	Not accepted. The text in item IV.11.2 concerns the existing/current status of risk factors and we are

		– No activities involving storage and use of hazardous chemical substances are carried out in the concession area. The nearest enterprise with a potential risk for a large-scale incident involving hazardous substances is 45 km. away' is inaccurate and we propose that it should be made more accurate. This information contradicts the inventory list hazardous chemicals and materials (which will be used and stored) presented in Table V.9.1. Hazardous substances are classified in accordance with the requirements of Regulation (EC) 1272/2008 on classification, labelling and packaging of substances and mixtures, on page 186.	confirming its validity. A clarification has been added, as follows: Hazardous chemical substances – <i>No activities involving storage and use of hazardous chemical substances are carried out in the concession area <u>at the present time</u>. The nearest enterprise with a potential risk for a large-scale incident involving hazardous substances is 45 km. away.</i>
		6. The following health-related disadvantages are established from a review of the documents by the Ministry of Healthcare	
		6.1. The following health-related disadvantages are established from a review of the documents by the Ministry of Healthcare	
		The analyses of expected impacts on the environmental media have not been followed by: - Characterisation and ranking of individual risk factors according to their impact on the human health and comparison to the applicable hygiene standards and requirements pertaining to both workplaces and affected residential areas. Determining the most important risk factors for the impacted population and the working in the site. - Assessment of the possibilities for combined, complex, cumulative and remote impact of risk factors both on the workers and on the population which is subjected to the unfavourable impact, considering also the production activities of other enterprises in the region, and the municipal and national roads. - A predictive assessment of the impact after the investment proposal is implemented. Review and assessment of the health status of the potentially impacted population and with analysis and interpretation of demographic indicators and morbidity indicators for	The risk factors are characterised and evaluated in item V.11 of the EIA Report, separately in respect of the on-site workers and the near-by population. An evaluation of compliance with the current hygiene standards and requirements has been made with reference to the regulations applicable to the IP in consideration and to the required actions and measures in respect of occupational safety and health and for protection of the health of the population. No other production enterprises and national roads are present in the region. This is written in item II.1. and is seen in all figures in the report concerning the location, including Figure No. II.1.2-1 and Figure No. IV.11-1. The analysis of cumulative impacts is presented in Section VI.6.5. of the report, with the following explicit statement: <i>As regards the aspects of health and hygiene, the above analyses and assessments of</i>

	the regions (using data from the most recent available 3-5 year period) in which the population could be impacted by construction and operation of the investment proposal. - An overall assessment, in a separate section, on the basis of all completed analyses and assessments in the report, of human health risks with reasoned proof that the residents in the urban centres will not be subjected to health risks caused by pollution of the living environment, and health protection and risk management measures should be proposed.	<i>ambient air quality, noise, soils, water, and hazardous chemical substances indicate that no cumulative impacts on the health of the population of the settlements nearest to the IP and on the workers on-site are expected from the IP for mining of ores and minerals. No joint cumulative impact with other IPs is expected. Textual attachment 14 of the EIA Report presents an exhaustive list and describes 92 other IPs, plans and programs, with which a cumulative effect has been considered. Apart from the IP for prospecting, exploration and mining of ores and minerals, only forestry projects and plans, and one game-animal management IP are present in the region, but bear no negative human-health potential cumulative with the IP under consideration.</i> The health status of the potentially affected population is made in item IV.11.1 of the Report with data from the latest available 5-year period (2019-2023) using the parameters presented in item 10 of the letter from the Ministry of Healthcare Ref. No. 26-00-2518 of 27.12.2024 (during ToR consultations). According to the evaluations of the Environmental Impact Assessment in item V of the EIA Report and the evaluations in item V.11 concerning human-health impact by the IP, the near-by populations will not be affected by above-standard atmospheric-air pollution and noise, and will not be at risk of soil and potable water pollution and impact by chemical substances. Therefore, the IP is not expected to cause changes to the currently observed health and demographic trends among the near-by population.

			The health risk assessment is presented and structured in the respective sections of the report in accordance with the legal requirements, namely: IV.11 (current status of the population and health risk factors), V.11 (identification of risks and evaluation of IP impact on human health – incl. impacts for the workers and near-by population), VI.6.4, VI.6.5, VIII, IX, X, XII and XV, based on consultations during the preceding phase of the ToR procedure, including consultations with the Ministry of Healthcare. The EIA Report is prepared as a single document including human-health evaluation in accordance with Article 96, paragraph 1 of the Environment Protection Act. Therefore, positioning risk assessment in a separate section would be a violation of the regulated report structure. The evaluation of the IP impact on human health presented in item V.11 was supplemented in accordance with the notes made by the Ministry of Healthcare. We are pointing out that according to item 74 of § 1 of the Additional Provisions of the Environment Protection Act, the impact assessment is a process comprising: a) the drawing up of the EIA report by the IP proponent is in compliance with Articles 95 and 96...'. The experts who wrote the report adhere strictly to these legal provisions.
		6.3. No discussion is made in the documents about radiation protection related to the Regulation on Radiation Protection during Activities with Materials with Increased Content of Natural Radionuclides (Adopted with Decree of the Council of Ministers No. 229 of 25.09.2012, promulgated in the SG, issue 76 of 5.10.2012,	Sections IV.10, V.10, VI.6.3 and IX of the EIA Report have been supplemented. The laboratory radiology analyses are presented in Textual attachment 17.

		amended and supplemented in issue 110 of 29.12.2020). According to Appendix 1 under Article 1, paragraph 1 of this Regulation, mining and processing of polymetal ores from the deposit which is the subject of this IP, fall within the scope of the regulation.	In response to remarks 6.3, 6.4 and 6.5, concerning radioactivity protection and the need to evaluate natural radionuclides in the ore and tailings, we are making the following clarification: 1. Regulatory framework and applicability The activities provided for in the investment proposal for the Rozino Deposit do not include mining or processing of materials with established higher content of natural nuclides (NRN). Nevertheless, to ensure full compliance with the provisions of the Regulation on Radiation Protection during Activities with Materials with Increased Content of Natural Radionuclides (Decree of the Council of Ministers No. 229/25.09.2012, amended and supplemented in SG issue 110/29.12.2020), an additional verification and laboratory control is under way to confirm the absence of radiological risk. 2. Sampling and laboratory analysis Additionally, 17 representative samples were taken and assayed for this radiology evaluation – one from the flotation tailings and 16 from the rocks at varying depths. In accordance with the requirements of the Regulation, the samples were submitted for gamma-spectrometry analysis in the accredited laboratory of DIAL EOOD in Buhovo. We expect the laboratory results and statements by November 20, following which they will be presented officially as an attachment iwth the additional EIA Report. 3. Available data and preliminary assessment

			The geochemical, spectral and mineralogical studies conducted so far do not show higher concentrations of radioactive elements (U, Th, Ra) in the ore or in the host rocks.. The analysed tailings samples (ARD analyses) also do not exhibit any radiological activeness or acid generating potential. The waste materials are classified as <i>harmless, non-acid generating and non-hazardous</i>, confirming the stability of the mineral composition and the inability to mobilize radionuclides. 4. Connection to the former uranium mining site The former (1960-1965) uranium exploration site 'Planinets' is situated in the lands of the Planinets village (approximately 5.5 km east of the Rozino Deposit). According to the geological data, this type of mineralisation is limited to specific lithological horizons outside the Palaeogene sediment basin of Rozino. Therefore, no geological pre-requisites exist and hydrogeological connectivity increases the content of natural radionuclides in the IP area. 5. Conclusion According to available data and on laboratory analysis results, no exceeding of the radiation background is expected, or risks for water, the population and the personnel.
		6.4. The EIA Report does not consider the factor of ionising radiation and the health risk has not been evaluated. No results about the content of radionuclides in the rock mass and in the waste (mining waste and tailings) are attached in the main documents or in the narrative Attachment No 9. In respect of ionising radiation, it is stated only that the natural radiation background for the population is not	Accepted. Sections IV.10, V.10, VI.6.3 and IX of the EIA Report have been supplemented despite the explicit text in the EIA ToR: 'Radiation: Mining of ore from the deposit and its subsequent processing will not involve emitting of ionising radiation, electromagnetic waves, gamma radiation and

		expected to be exceeded, but this is utterly insufficient form the perspective of risk assessment.	emission of particles from radioactive decay. There is no information about exceeding the natural radiation gamma background in the IP area, and no information about disease incidence among the population. No harmful radiation and sources of radioactivity have been found in the IP area. No ionizing or non-ionizing radiation will be emitted into the environment from the IP during its two phases - construction and operation. Therefore, we propose that radiation be not considered in the EIA Statement.' The Ministry of Healthcare did not remark on this proposal during the ToR consultations in its letter Ref. No. 26-00-2518 or 27.12.2024 but now reports it as an omission.
		6.5. No monitoring of radiological natural and living environments and of the mining waste and tailings is provided for in the EIA report. Note that the former uranium mining site 'Planinets' is situated in the lands of the Planinets village, 5 km on a straight line from the Rozino Village, Ivaylovgrad Municipality. The presence of such a site suggest potential for higher content of natural radionuclides also in the IP area. As we have already noted, no analyses of the content of radionuclides in the ore from the deposit are presented. Based on the above item 4-6, information about the ionizing radiation should be added to the EIA report, i.e. records of analyses to determine the contents of radionuclides in the rock mass sampled at various depths in the site, and in the flotation tailings.	Accepted. Sections IV.10, V.10, VI.6.3 and IX of the EIA Report have been supplemented. See the answer to this remark in item 6.4.
		6.6. As regards the ambient air, the report shows that the main pollutant will be PM₁₀ and PM_{2.5} dust fractions. The utilized methodology allows for calculation of the maximum single and average annual concentrations of these fractions emitted from area and linear sources, but there is a substantial deficiency, because the used	Accepted. Supplements have been made in sections IV.1, V.1. and V.12. Methodologies approved by the Minister of Environment and Water were used because the Bulgarian competent authorities can verify the

	software is inapplicable for calculating daily average concentrations. With a total of 88 blasting operations during the year, the risk of achieving above-standard average daily concentrations of PM₁₀ during those days is substantial. Therefore, evidence must be presented that the average daily PM₁₀ admissible limit value (LV) will not be exceeded for more than 35 times per one calendar year (Regulation No. 12 of July 15, 2010 on the Air Emission Limits for Sulphur Dioxide, Nitrogen Dioxide, Fine Dust Particles, Lead, Benzene, Carbon Monoxide and Ozone). The report does not contain any information about the expected number of motor vehicles, transport schemes and linear models for external transport flows servicing the site, and for hauling of the flotation concentrate to the final destination, and no calculation about their contribution to fugitive dust and gas emissions in the urban areas through which the motor vehicles will pass. Therefore, the necessary information should be added to the EIA Report.	results of these models. Foreign methodologies cannot be verified in this manner and, accordingly, are not welcomed by the local authorities. As regards the second paragraph: It is stated explicitly in the EIA statement that: 'The final concentrate product will be transported for end-user processing along the national road network, which is not the subject of analysis in this EIA Statement.' As defined by the Principal and by the scope of assessment, the IP does not include concentrate hauling to the end user because no commercial relationship exists and cannot exist with any plant which could process the concentrate. This can be clarified only after the construction permit is obtained and mining initiated. Nevertheless, the EIA Report presents purely hypothetical possibilities for access by transport to and from the concession area, Figure II.1.2-2. The IP proponent will use all-electric trucks that do not emit harmful substances and noise into the environment.
	6.7. As regards the surface and ground water, the EIA Report takes under consideration only some of the recommendations in the EIA scoping reflected in letter Ref. No. 26-00-2518/27.12.2024 of the Ministry of Healthcare. To function, the site will need significant amounts of water and the EIA Report does not clarify sufficiently the utility and hygiene consequences for potable water quantity and quality in the region that the envisaged intensive drawing of water will have, such as the '50 l/s fresh-water source in the Arpa Dere river near the Rozino Pumping Station between January and May (i.e. 5 months of the year)'. It is stated on page 149 that an expected shortage of water for the plant of approximately 125,000 to 310,000 m³ is expected. In this situation we are of the opinion that the envisaged water abstraction from the Arpa Dere River next to the existing Rozino village pumping	Relevant conclusions have been added to the reports concerning the ground and surface waters and the drilling and blasting works and are presented in Textual attachments 10, 11, 12 and 16. Water from Arpa dere will be abstracted near the point of its confluence with the Yuren dere river adjacent to the Rozino village pumping station. This pumping station has been designed to pump water from a spring flowing into river pool. The flow-rate of this spring varies between 6 and 11 l/s during the entire year and is season dependent. It is calculated that a flow-rate of around 0.34 l/s will be required to supply Rozino village. Any excess water from the

	station can create drinking water shortages, the absence of this risk not being proven in the EIA Report and in the expert reports attached with it. This concerns not only water supply sufficiency for the Rozino Village, but also for the settlements downstream along the Byala River to which the Arpa Dere River is a tributary. There is no substantiated comment about the applicability of the 19161-1998 data used in the analysis in Table No. V.12-2 Averaged water quantities in two points along the Byala Reka River. There is no reasoned hydrogeological expert assessment on these matters. Is there any risk for the potable water supply of urban areas in the region; Will the investment proposal lower the flow-rate of potable water supply sources. The 'Report on the assessment of lateral impact of blasting on the environment' noted on page 268, column 3 of Table XI-1 is improperly referred to because it does not contain any text concerning the question raised in the ToR about how will the drilling and blasting works affect the quantity and quality of water from potable water supply sources adn on the ground and surface water. An expert answer to this question is also missing from the narrative part of the EIA Report. The EIA Report does not provide a definitive answer to the question will it deteriorate the chemical status and will it change the pH of the surface and ground water in the region?. Given the priority importance of protecting the purity of water resources, especially groundwater resources, whose quality recovery following pollution is limited, it is necessary to guarantee definitively that the surface and ground water purity will be preserved. Lastly, but not least, it is pointed out that industrial water will be used for household purposes (cleaning of sanitary units etc.) but no mention is made of what water will be used for sanitary purposes (washing of hands, bathing etc.), having in mind that this water should meet the provisions of Regulation 9 on the Quality of Water Intended for Human Consumption.	spring could, with the relevant justification, be drawn year-round for the industrial needs of the site. This information is presented on page 71. A contract will be entered into with the Water Supply and Sewerage company for delivery of water for hygienic purposes from a reservoir which is owned by this company and will be situated 800 m. from the personnel service premises in the processing plant area. There is such an infrastructure and its connection to the future project is technically possible. The exact routes will be determined during the detailed engineering design phase. Outside the analyses and conclusions in this report, protection of the quality and quantity aspects of water is carried out following the conditions and measures in the respective permits issued in accordance with the Waters Act and will follow the future EIA decision, if positive. A definitive water protection guarantee can be achieved by implementing the proposed and evaluated design solutions in the IP and by applying thee measures and recommendations of this report.

		6.8. The mining activities will generate potentially hazardous waste that could present a human health risk. However, this risk is not considered and evaluated sufficiently in the report. Therefore, the EIA Report should be supplemented. Note that the processing waste designated in the EIA report as non-hazardous with code 01 03 06 - Tailings other than those mentioned in 01 03 04* and 01 03 05* mirrors hazardous waste with codes 01 03 04* and 01 03 05 according to Regulation 2 on the classification of waste. This means that it should be established whether this waste belongs to code 01 03 06 by testing in accordance with the Regulation in order to prove its non-hazardous properties after the waste is generated. Otherwise this waste should be classified with code 01 03 04* or 01 03 05*. In this sense, the EIA Report should include a measure requiring to conduct a processing waste classification procedure because of the mirror codes.	The notion of 'sufficient' or 'insufficient' is subjective and non-quantifiable. No specific instructions about supplementing are present. All industrial activities generate hazardous waste and the IP in question is no exception. Detailed data about generated waste by type and quantity, the manner of its management and measures to reduce their impacts are presented in items II.4, IV.8, V.8, VI.6.3, VI.6.5 and IX. The assessment of waste-related health risks presented in item V.11 summarises the detailed assessment in item V.8 and is complemented with the risks from hazardous waste. In addition, note that the classification of waste and its environmentally sound management are mandatory according to the legislative framework and will be done at the relevant sages after approval of the IP. In this sense, the human health risk is fully controllable and no occurrence of an extraordinary such risk required additional investigation can be assumed.
		6.9. As regards the physical factors noise and vibration:	
		As is stated above by the Ministry of Healthcare, the report does not present forecasts about the expected number of heavy duty vehicles, about the schemes of transportation of flotation concentrate hauling streams. Also, there is no evaluation of the possible impact on urban areas of noise and vibrations related to such transport.	It is stated explicitly in the EIA report that: 'The final concentrate product will be transported for end-user processing along the national road network, which is not the subject of analysis in this EIA Statement.' As defined by the Principal and by the scope of assessment, the IP does not include concentrate hauling to the end user because no commercial relationship exists and cannot exist with any plant which could process the concentrate. This can be clarified only after the construction permit is obtained and mining initiated. Nevertheless, the EIA Report presents purely hypothetical possibilities for

			access by transport to and from the concession area, Figure II.1.2-2. The IP proponent will use electric trucks that do not emit harmful substances and noise into the environment.
		While assessing the potentially affected population and areas by the various human-health risk factors and their comparison to the current hygiene standards, the authors of the report have come to the conclusion that no above-standard noise and vibration can be expected during the pre-operation period and, also, during operation of the site. As regards the intermittent blasting noise, a trial blasting was carried out and a Report on the Evaluation of the Side Impact of Blasting on the Environment for the project Rozino Deposit (attached with the EIA Report). The results and forecasts present the impact of blasting on the environment based on measurements performed using specialized equipment during experimental blasting within the design pit area. However, no overall evaluation is made of the environment in the nearest urban areas.	An overall living environment evaluation was made in item IV.11 of the EIA Report with population health analysis according to available data from the National Statistics Institute, the Regional Health Inspectorate, and the National Centre for Public Health and Analyses, and an analysis of the current environmental health determining factors is made. The data in item IV.11 consider the current situation. The IP's impact on the living environment and on human health is presented in item V.11 and has been supplemented according to the remarks made in the Ministry of Healthcare's statement. As can be seen by the analyses and assessments, no excess of human-health limit values and standards are expected in the nearest settlements.
		As the mining advances at depth, the labour conditions and the environmental impact will be altered. Therefore, we are of the opinion that irrespective of the initial forecasts, the EIA Report should include a measure requiring periodic control measurements, updating of the mathematical models with specific deposit data, determining the levels of impact, and, where necessary, adapting the blasting parameters.	A risk assessment will be carried out for each work place in accordance with <i>Regulation 5 on the Procedures, Manner and Periods for Risk Assessment</i>, and measures will be provided for management of any identified risks. This assessment will be updated following any change of workplace conditions, i.e. the type of updating should also be required by the regulatory framework. In addition to item IX, a measure has been added to the Health and Safety Plan that should provide for periodic control measurements of occupational factors, including chemical agents, and the parameters of the operations (including drilling and

			blasting) and the worker health protection measures should be adjusted according to the results.
		6.10. Last, but not least, note that the mining will be in a pit, which suggests pollution of environmental media (acoustic comfort, ambient air, including indoor air, vibrations, ionizing radiation). Therefore, a more detailed assessment of the health risk in the living environment should be added to the EIA Report, and a series of measures to prevent and reduce such impacts should be proposed.	The health-risk assessments made in item V.11 refer also to the assessments of IP impact on atmospheric air quality and to the assessment of impact by harmful physical factors. These assessments show that the established atmospheric-air quality and noise limit values in the nearest urban areas and sites which are subject to health protection will not be exceeded. Vibrations will be of local impact and will not reach the settlements. No ionising radiation is expected. The relevant supplements have been made in items IV.1, V.10. and V.11. Item IX of the EIA Report present measures to prevent and reduce the evaluated impacts on the workers and on the population.
		6.11. Occupational environment:	
		Air pollution (page 208 of the EIA Report) in the occupational environment - inhalable and respirable (PM ₄) particulate matter and respirable free crystal silicon dioxide are of hygienic significance in the occupational environment and not PM ₁₀ and PM ^{2.5} . According to the Bulgarian legislation (Regulation No 13 dated 30 December 2003 on Employee Protection against Risks of Exposure to Chemical Reagents at Work), periodic monitoring of inhalable fraction (mg/m ³), respirable fraction (mg/m ³) and free crystal silicon dioxide (mass %) must be provided for, and, also, of diesel engine exhaust, transport and service machinery (Cox, NO _x , SO _x , incompletely incinerated hydrocarbons, soot, various types of oil, and the reagents required for the enrichment process, in mg/m ³), in keeping with the requirements of Bulgarian State Standard БДС EN 689:2018+A1:2019.	The assessment has been corrected in the specified EIA Report section in accordance with the instructions, and the future measures to suppress dust in the occupational environment have also been specified.

		Engineering and technical measures to reduce dust and chemicals in the occupational environment and to minimize the occupational exposure to the lowest possible levels must be included and described in detail, having in mind that the PPEs protecting the respiratory organs are not intended for constant protection of workers.	
		6.12. The regulatory documents described in the item 'Aspects of health and hygiene' (page 248 of the report) show that the applicable regulatory documents related to the health requirements and applicable to the assessment of health risks posed by the IP have not been taken into consideration in the health risk assessment.	No specific missing documents are pointed out. Regardless, the regulatory documents considered necessary during the assessment have been taken into consideration and other sources of information have been used at the discretion of the authors of the EIA Report.
		In conclusion, the Ministry of Healthcare is of the opinion that the EIA report should be reworked and supplemented in accordance with the above and in consideration of the recommendations in Letter No. 26-00-2518/27.12.2024 of the Ministry of Healthcare.	The report has been re-worked and supplemented in accordance with the remarks.
		The requirements of Article 12, paragraph 1, item 4 of the EIA Regulation have not been fully met, and according to this article, the EIA Report should include also a list of the experts and the team leader who authored the EIA Report, with each signing against the report section written by them. The attached list of experts and the team leader does not contain signatures.	The EIA Regulation is archaic as regards the the EIA Report authors' personal data and it does not reflect the requirements of Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC. It is exactly with a view to personal data protection according to this Regulation, that the experts' signatures are missing in the list and the declarations are submitted only to the competent environmental authority.
		The declarations required in Article 12, paragraph 1, item 5 of the EIA Regulation should be filed on paper with all validity requirements and a wet signature, and the content of the electronic copy should be identical with the content on paper. Accepting documents only with scanned or electronic signatures would not conform to the requirements of the EIA Regulation.	The requirements of the EIA Regulation are not synchronized with the Law on Electronic Documents and Electronic Certification Services and with Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services

			for electronic transactions in the internal market and repealing Directive 1999/93/EC. According to the current legislation, qualified electronic signatures are equal to the signatures affixed by hand.
		8. The East-Aegean Basin Directorate has requested an up-to-date statement since Decision No. 920/31.12.2024 of the Council of Ministers adopts the 2022-2027 East-Aegean River Basin Management Plan. Letter OBOC-68-61/26.09.2025 by the MOEW expresses the statement (copy attached for consideration) of the East-Aegean Basin Directorate that part of the IP concession area is situated in the area with code DW 1 for implementation of measure DW 1 35 in the 2022-2027 East Aegean River Basin Management Plan and the 1,000 m radius buffer zone around the groundwater abstraction for potable water supply (the Rozino head reservoir in the village of Pastrook in the Ivaylovgrad Municipality) should be excluded from the concession area in the Rozino Deposit.	The Rozino head reservoir is 2,300 m. away from the pit outline in which mining will be carried out and 1,300 m. from the buffer zone, with a 1,000 m radius from the water intake facility. As can be seen on Figure II.1.2-1, the catchment is near point 6 of the future concession area, and this point is downstream of the non-contact water reservoir. As is visible on the maps, no mining is possible in the 1,000 m buffer zone and, therefore, no drilling and blasting, because there will be a man-made water intake, a non-contact water reservoir, required for the IP. We are pointing out once again that the mining will be 1,300 m. away from the 1,000 m radius buffer zone and 2,300 m from the head reservoir and, therefore, we see no reason to exclude the buffer zone area around the Rozino head reservoir from the future concession area. Excluding this area will deprive us of the possibility to build a non-contact water reservoir which is needed for the IP.
		II. As regards the Mine Waste Management Plan:	
		According to the presented Mine Waste Management Plan (MWMP) attached with the EIA report for the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit' in the Tintyava PLA, Ivaylovgrad Municipality, the Ministry of Energy has been consulted. In this connection, a statement Ref. No. OBOC-68-62/06.10.2025 of the MOEW, according to which the information about mine waste management is not duly presented in the Mine Waste Management Plan.	Textual attachment 9 presents a mine waste management proposal and not a plan. No such plan has been developed as yet, in accordance with the regulatory framework which stated explicitly: According to Article 22r, paragraph 4 of the Mineral Resources Act (MRA), provided that the investment proposal for activities engendering mining waste is subject to a procedure pursuant to Chapter Six of the

	This MWMP does not reflect the intent of the Proponent concerning the management of waste from the Concentrator Plant. This information is presented as an intention, but it does not reflect the capacity of the mine waste facility (MWF) which is a tailings storage facility. In essence, the TSF facilities that will be constructed to ensure its stability are not pointed out, and there is no information about the overall physical stability of the TSF, but only its surface area without additional information is presented. Note that when categorising the TSF, one of the conditions is to ensure the physical stability of the constructed facility, which is not part of the plan. The Mine Waste Management Plan must include all conditions and measures, including programs to prevent harmful environmental impacts as required by Article 22r, paragraph 5 of the Underground Resources Act (URA). According to the requirements included in the Mine Waste Management Regulation (MWMR), Annex 1, the operators must present such programs. In conclusion, note that mine waste should be classified with consideration of the cyanide limit values laid down in Article 22r, paragraph 6 of the URA, if cyanides are used in the enrichment process.	Environment Protection Act, the investment proposal must include the mining waste management proposal. The mining waste management proposal was prepared in accordance with these provisions and is consistent, to the relevant level of detail, with the provisions concerning the development of mining waste management plans. Its content follows the structure laid down in the Mine Waste Management Regulation (promulgated in the SG, issue 5 of January 19, 2016, amended), and with Directive 2006/21/EC on the management of waste from extractive industries. The mining waste management plan will be intended to prevent, reduce or limit the harmful impacts of waste onto the environment and will be drawn up after an EIA decision to approve the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.' is made. This is also the provision of Article 22r, paragraph 7 of the Mineral Resources Act which orders the Operator to present, together with the Mine Waste Management Plan, to the Minister of Energy an enacted EIA Decision issued in accordance with Chapter Six of the Environment Protection Act and containing a reasoned explanation that the mining waste management is not contradictory to the waste management plans and programs required by the Wastes

			Management Act. This plan must be approved by the Minister of Energy. Nevertheless, the mine waste management proposal has been supplemented to the maximum possible extent and in consideration of the current IP phase - feasibility study. The lack of detailed and technical designs does not allow for actual stability calculations, providing for and sizing of additional facilities etc. This is no technical possibility for this at present. However, the mine waste management proposal has been supplemented to the extent possible. As described in detail in the EIA Report, the mined ore concentration process will not involve the use of cyanides. The same applies to the list of hazardous chemicals and mixes.
		III. As regards the attached report on the evaluation of the degree of impact The following was found from the review of the information presented in the report in accordance with the quality assessment criteria provided for in Article 24, paragraph 3 of the Regulation on the Terms and Procedures for Assessment of the Compatibility of Plans, Programs, Projects and Investment Proposals with the Scope and Objectives of Protected Sites (the CA Regulation): The report on assessment of the degree of impact is structured in accordance with the provisions of Article 23, paragraph 2 of the CA regulation, but the information presented in this report is incomplete and insufficient for a reasoned decision, because of the following:	
		1. The proposed draft of the EIA Report does not include the detailed analysis and cumulative impacts from the many granted areas for prospecting and/or exploration and concessions for mining of underground mineral resources in the BG0001032 Rhodopes - Eastern protected zone and, in particular, in the lands of the Ivaylovgrad	Textual attachment 14 of the EIA Report describes 92 other IPs, plans and programs available and accessible in the MOEW's registers at the time of preparation of the report.

		Municipality, requested with letter Ref. No. OBOC-68-17/18.11.2024 of the Minister of Environment and Water. The report should contain a detailed analysis of the potential impacts and the cumulative effect relative to the submitted and active permits for prospecting and/or exploration and concessions for mining in the BG0001032 Rhodopes - Eastern protected zone and in the BG0002019 Byala Reka protected zone. The following analysis should be added to item II of the EIA Report:	Attachment II.1 to the EIA Report points out all IPs, plans and programs used to assess the cumulative impact on natural habitats and habitats of species which are subject to protection in the protected zones. Attachment V.1.1-1 presents a habitat (EUNIS) distribution map of the studied area. A total of 452 other IPs are described in the attachments to the EIA report. Beside the MOEW's registers, assessing the cumulative effect involved using data about other IPs, plans and programs, obtained from the MOEW, the Haskovo RIEW and the Smolyan RIEW in accordance with the Access to Public Information Act. Such data was provided with the following decisions: - Permit 3Д-31/26.03.2025 of the Minister of Environment and Water. - Permit 8/18.03.2025 of the Director of RIEW Haskovo. - Permit 1/10.03.2025 of the Director of RIEW Smolyan. All this information has been taken into consideration and included in the respective attachments to both reports. The EIA experts have no access to other data available in MOEW's internal system. This remark is unsubstantiated, it does not specify which particular IP, plan or program is missing and, therefore, we cannot factor in such an omission.
		- Analysis of the potential impacts which may lead to cumulative impacts caused by the current permits for prospecting and/or exploration in the BG0001032 Rhodopes - Eastern protected zone for	Reflected in the EIA Report.

		conservation of the natural habitats of wild flora and fauna, and in the BG0002019 Byala Reka protected zone for conservation of wild birds;	
		- Analysis of the potential impacts which may lead to cumulative impacts caused by the current concessions for mining of underground mineral resources (approved investment proposals for mining of underground mineral resources) in the BG0001032 Rhodopes - Eastern protected zone for conservation of the natural habitats of wild flora and fauna, and in the BG0002019 Byala Reka protected zone for conservation of wild birds;	Reflected in the EIA Report.
		- Overall analysis in respect of potential impacts with regard to approved plans, programs and projects and investment proposal of different nature, within the BG0001032 Rhodopes - Eastern protected zone for conservation of the natural habitats of wild flora and fauna, and in the BG0002019 Byala Reka protected zone for conservation of wild .	Reflected in the EIA Report.
		The analysis should describe the individual impacts which could arise as a result of the cumulative effect, by type and degree in respect of the species and natural habitats which are the subject of protection in the protected areas, according to Article 24, paragraph 3, item 4 of the CA Regulation;	Reflected in the EIA Report.
		• Description (characteristics, quantity) of other plans, programs and projects / investment proposals (in the same lands, municipality, protected zone; not only of the same nature and irrespective of who implements them) taken into consideration and with which the project being assessed may cause a significant negative impact on the protected zone;	See the response in item 1 above.
		• The cumulative effect analysis should define: 1) the geographic boundaries within which the cumulative effect should be studied, knowing that these effects may be different for different types of impact (such as impact on water resources, noise, vibrations, atmospheric air etc.) and may extent over different distances; 2) all	See the response in item 1 above.

		possible sources of impact arising from the project under consideration, together with other sources in the environment, and other impacts which may arise from other proposed plans, programs and projects/investment proposals, the time and phases of such plans, programs and projects/investment proposals; 3) the type of impacts (such as noise, reduction of water resources, chemical emissions etc.) which may impact the structure and the functions of the protected zone; 3) the mechanism by which the potential cumulative effect (by water, air, accumulation of impacts over time or in space) occurs. If the nature-conservation status of a habitat or species in the zone is already unfavourable or the critical threshold levels for impact over the specific elements of the habitats or species have been exceeded (or when the zone is subject to cumulative effect which will lead to any of these states), each additional plan, program or project/investment proposal that alone or in interaction with others adds additional impacts to these levels. The conclusions of the analysis must indicate clearly which project elements together with which plans, programs and projects/investment proposals have been taken into account when making a decision about the combined effects. Simply stating that 'accumulation of impacts will not occur' is insufficient.	
		The matter described in item II of Annex II-1 is not attached with the submitted EIA Report.	A hard copy and electronic copy are attached.
		The submitted list of plans, programs and projects/investment proposals, presented in the EIA Report in narrative attachment 14, Table on Cumulative Effects in Rozino is incomplete as regards approved IPs of similar nature to take place in the BG0001032 Rhodopes - Eastern protected zone, and, in particular, in the lands of the Ivaylovgrad Municipality. The list should be supplemented after a check in the public register of data for on-going or completed EIA procedures, accessible on the MOEW web page, section Prevention (EIA) Public EIA registers:	Textual attachment 14 of the EIA Report describes 92 other IPs, plans and programs available and accessible in the MOEW's registers at the time of preparation of the report. Attachment II.1 to the EIA Report points out all IPs, plans and programs used to assess the cumulative impact on natural habitats and habitats of species which are subject to protection in the protected

		https://www.moew.government.bg/bg/prevantivna-dejnost/ovos/publicni-registri-ovos/. All approved plans, programs and projects/investment proposals should be taken into consideration in the analysis of cumulative effects.	zones. Attachment V.1.1-1 presents a habitat (EUNIS) distribution map of the studied area. A total of 452 other IPs are described in the attachments to the EIA report. Beside the MOEW's registers, assessing the cumulative effect involved using data about other IPs, plans and programs, obtained from the MOEW, the Haskovo RIEW and the Smolyan RIEW in accordance with the Access to Public Information Act. Such data was provided with the following decisions: - Permit 3Д-31/26.03.2025 of the Minister of Environment and Water. - Permit 8/18.03.2025 of the Director of RIEW Haskovo. - Permit 1/10.03.2025 of the Director of RIEW Smolyan. All this information has been taken into consideration and included in the respective attachments to both reports. The EIA experts have no access to other data available in MOEW's internal system. This remark is unsubstantiated, it does not specify which particular IP, plan or program is missing and, therefore, we cannot factor in such an omission.
		• For example, the submitted analysis for the assessment of the cumulative impact in combination with other plans, programs and projects/investment proposals, the IP for Mining and Processing of Auriferous Ores in the Ada Tepe Section of the Khan Krum Deposit in the Krumovgrad Municipality approved with EIA ruling No. 18-8, 11/2011 of the Minister of Environment and Waters has not been taken into consideration in this analysis and in the determining of the potential cumulative impacts. Therefore, the analysis in item II of the EIA Report	The Ada Tepe mine has been included in the assessment of cumulative impacts. The additional information is as follows: In total, the affected areas according to the EIA Ruling are 85 ha. The rehabilitation plan requires restoration of all 85 ha, or 100% of the affected territories, according to the EIA ruling. As at the end of 2025, 14,8512 ha have been rehabilitated. All benches in the open pit will

		should account for the parameters, characteristics and the habitats and species impacted by the implementation of the IP for Mining and Processing of Auriferous Ores in the Ada Tepe Section of the Khan Krum Deposit in the Krumovgrad Municipality approved with EIA Ruling No. 18-8, 11/2011 of the Minister of Environment and Waters.	be biologically rehabilitated. The main goal of the rehabilitation is to restore critical habitats such as 6220 and juniper habitats. As per the Krumovgrad Municipality's request, 6 ha should remain non-rehabilitated for future use as a tourism and camping area with electricity, water supply and waste water treatment. These terrains include the Processing Plant administrative building, the wastewater treatment facility for domestic effluent, and the existing road infrastructure allowing access to the tourism zone. Therefore, approximately 97% of the entire affected area will be rehabilitated. Information about the state of completion of the rehabilitation is present in the Haskovo RIEW, and such information is submitted by DPM Krumovgrad on an annual basis.
		2. Item V.1.1. of the EIA Report concerning the protected zone BG0001032 Rhodopes - Eastern for conservation of the natural habitats of wild flora and fauna states that 17,3182 ha (0.122 % of this habitat in the protected zone) of priority natural habitat 91AA* Eastern forests of pubescent oak are directly affected. The conclusion about the degree of impact in this point is evaluated as 'insignificant'. However, the EIA Report does not include any reasoning and expert analysis of how the direct loss of areas from the natural habitat will affect its nature conservation status (NCS) in the protected zone and at the biogeographical level, in accordance with Article 22 of the CA Regulation. The assessment should apply to all NCS parameters, including the cumulative effect analysis. IP alternatives should be considered and assessed with regard to the impact on the natural habitat of priority for conservation. Adequate mitigation measures reducing or eliminating the impacts on the natural habitat should be proposed. As a result of the analysis, existence or non-existence of the assumption under Article 33 of the Biodiversity Act (BA) should be proven.	Reflected in the EIA Report.

	3. There is no clarity as regards the information presented on pages 39-42 of the EIA Report concerning the expected direct or indirect impact on natural habitat 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites). The EIA Report should clarify whether the IP affected areas are subject to conservation of the priority form of the natural habitat (*important orchid sites). It should be established, for this reason, if the affected parts of the 6210 habitat possess the characteristics of the priority form, according to the Guidelines for Identifying the Habitats of European Significance in Bulgaria, by on-site inspection during a period of vegetation suitable for the species of orchids. Depending on the inspection results, the conclusions in the EIA report concerning the expected degree of impact of natural habitats should be reviewed and reworked, an analysis should be presented as to how direct loss of areas in the priority habitats will impact its NCS in the protected area and on the biogeographic level, in compliance with Article 22 of the CA Regulation. The assessment should apply to all NCS parameters, including the cumulative effect analysis. IP alternatives should be considered and assessed if the priority form of the habitat is affected. Adequate mitigation measures reducing or eliminating the impacts on the natural habitat should be proposed. As a result of the analysis, existence or non-existence of the assumption under Article 33 of the Biodiversity Act (BA) should be proven.	Reflected in the EIA Report.
	4. The conclusions in Part V.2. of the EIA Report describe the species and habitats for which negative impacts are expected - 4 types of natural habitats are impacted, the habitats of 30 species which are subject of protection in the BG0001032 Rhodopes - Eastern protected zone, fragmentation of habitats, fragmentation of the habitats of 25 species, a barrier effect for 12 species and mortality for 23 species. However, the analysis and conclusions in the EIA Report do not include an assessment as to how these impacts will affect the NCS of these species with reference to all NCS parameters, taking into account,	Reflected in the EIA Report.

		among others, the analysis of the cumulative effect. The assessment should be made in respect of all NCS parameters. Adequate mitigation measures reducing or eliminating the impacts should be proposed.	
		5. Similarly, as regards the conclusions presented in Section V.2. of the EIA Report in respect of the directly affected 23 bird species which are subject of protection in the BG0002019 Byala Reka protected zone. However, the analysis and conclusions in the EIA Report do not include an assessment as to how these impacts will affect the NCS of these species with reference to all NCS parameters, taking into account, among others, the analysis of the cumulative effect. The assessment should be made in respect of all NCS parameters. Adequate mitigation measures reducing or eliminating the impacts should be proposed.	No NCS has been or is being defined in respect of the bird species protected in the PA, both at the zone level and at the biogeographic and national levels (see REPORTING ACCORDING TO ARTICLE 12 OF THE BIRDS DIRECTIVE).
		6. Part VI. The proposed mitigating measures should be reworked in accordance with the results from the impact analyses in Section V, because the EIA Report in its current revision is incomplete and inconsistent with the conclusions of the impact analysis. For example, the analysis of the impact on certain bird species (for example, short-toed snake-eagle etc.) contain mitigation measures which, however, are not included with the measures in Part VI. Mitigation Measures proposed. This part should present all mitigation measures for all species and natural habitats for which they are proposed.	Reflected in the EIA Report.
		7. The alternatives, proposed and described in the EIA Report, are not consistent with the results and conclusions about the expected impacts on species and natural habitats and are not intended for mitigation of such impacts. Adequate alternatives that account for the identified impacts should be proposed, considered and assessed.	Reflected in the EIA Report.
		8. The attachments described in the EIA Report in Section XIII in electronic form. Attachments, which are not attached with the submitted EIA Report in electronic form.	Reflected in the EIA Report.
		IV. Regarding the Convention on Transboundary Environmental Impact Assessment (Espoo, 1991): in transboundary context (Espoo, 1991).	It is notable that the competent authority refers only to the international document and to its own letters, but not to the national legislation which addresses

		Letter No. OBOC-68-28/14.02.2025 of the Ministry of Environment and Waters to Tintyava Exploration AD, item 9 'Regarding the Convention on Transboundary Environmental Impact Assessment (Espoo, 1991)' <u>presents information that the Greek government wishes to and declares that it will participate, with Letter Ref. No. OBOC-68/23.10.2024 of the MOEW concerning the impact assessment procedure for the IP in consideration.</u> In this connection, a letter Ref. No. OBOC-68-40/19.08.2025 of the Ministry of Environment and Water has been sent to Tintyava Exploration AD informing that adhering to the principles of international cooperation during environmental impact assessment and, in particular, in the transboundary context, one copy of the EIA Report should be submitted as soon as possible in the Greek language with all attachments (including a report on the assessment of the degree of impact) on paper and in electronic form for evaluation of the quality of the report, of the executive summary and of the final version of the EIA scoping, with reflected remarks and submitted results from consultations with all affected municipalities and concerned agencies. At the present time, the Ministry of Environment and Waters has not received a letter from Tintyava Exploration AD with an attached copy of the EIA Report in the Greek language with all attachments for submission, in accordance with Article 4 of the Convention on Transboundary Environmental Impact Assessment (Espoo, 1991), should be submitted from the country of origin to the concerned country. The Ministry of Environment and Water, being the competent authority, takes all the necessary and efficient measures to prevent, reduce and control the significant transboundary impact resulting from the proposed activities while complies with the Convention on Transboundary Environmental Impact Assessment and with Article 7 of Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment.	the implementation of the Convention at the national level. Also, letter Ref. N. 35-2/26.08.2025 from the IP proponent and Ref. No. OBOC-68-46/27.08.2025 of the MOEW whereby the proponent delivers its opinion regarding the procedure in the transboundary context has not been taken into account. This position stands and the proponent will fulfil its obligations regarding the interest to participate in the procedure expressed by the Republic of Greece in accordance with the regulatory requirements, namely: Pursuant to Article 25, paragraph 1, items 5-7 from the Regulation on the Terms and Procedure for EIA: 1. According to the provisions of Article 25, paragraph 1, items 5-7 of the EIA Regulation, the sequence of actions and the content of the documents, when Bulgaria is the country of origin in a transboundary EIA procedure, are the following: a) preparing an EIA statement: the Principal must present to the competent authority an additional copy of the statement, translation of the entire statement or of a part of the statement if agreed upon between the competent authorities of the two countries, and a translation of the executive summary; b) quality assessment of the EIA statement: apart from all requirements in Chapter Four, the competent authority dedicates particular attention to the transboundary impacts and to the measures for their prevention and restriction; c) sending to the competent authority of the concerned state the EIA statement (its translation, if

	During implementation of the the procedure referred to in articles 3, 4 and 5 of the Convention on Transboundary Environmental Impact Assessment, no possibility for participation by the concerned state, the Republic of Greece, has been provided. The right, which the Espoo Convention and Directive 2011/92 provide to the concerned public in the affected states is the right to active and effective involvement in the decision making procedures. The same right is granted to the Bulgarian concerned public by the national legislation. We have a state, constituted into the consultancy procedure for the report on the IP for Mining and Processing of Polymetal Ores from the Rozino Tintyava PLA. The documents, required but not submitted, for this consultation prevents the legitimate conducting of such consultation by the competent environmental authority - the MOEW. The statements expressed during the consultations in the Republic of Bulgaria and in the Republic of Greece should be taken into consideration during the preparation of the report on the assessment of the environmental impact by Tintyava Exploration Ad’s investment proposal. With a view to the above, having reworked and supplemented the investement proposal (IP) for Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA’, situated in the lands of the Ivaylovgrad Municipality, Haskovo District in accordance with the above remarks concerning the EIA Report and the PAIR to ensure the legitimate holding of the transboundary procedure, the proponent of the IP must ensure equality of the content in the documents in the Bulgarian and the Greek languages.	agreed upon) and the translation of the executive summary and providing an opportunity for consultation about: the potential transboundary impacts and the measures to prevent or mitigate the impact; the possible proposed IP alternatives; other matters of mutual interest; This is the meaning also of the requirements of Article 5 of the Convention on Environmental Impact Assessment in a Transboundary Context, according to which consultation must be held: ‘The Party of origin shall, after completion of the environmental impact assessment documentation, without undue delay enter into consultations with the affected Party concerning, inter alia, the potential transboundary impact of the proposed activity and measures to reduce or eliminate its impact.’ In order to prevent procedural violation and to comply with the basic principle of sufficiency and comprehensiveness of the documents, upon receiving a positive evaluation of the quality of both reports - the EIA Report and the report on compatibility assessment with the protected areas form the national ecological network Natura 2000, these reports will be translated and submitted to the MOEW for subsequent actions. Such an approach would avoid potential procedural violations and multiple sending of different revisions of the statements to the concerned country that would confuse the Republic of Greece’s administrative authorities insofar as they have their own internal procedures and no similar practices with documents of different revisions.

2.	East-Aegean Basin Directorate, ref. N. ПУ-010-808(2) dated 26.09.2025.	As regards the <i>Statement in accordance with Article 155, paragraph 1. item 23 of the Water Act concerning the Investment Proposal (IP)</i> for Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, with Tintyava Exploration AD as the proponent In response to a letter with Your ref. No. OBOC-68-51/03.09.2025 received by us and requesting an up-to-date statement regarding the IP admissibility relative to the regimens determined in the 2022-2027 River Basin Management Plans (RBMPs) and Flood Risk Management Plan (FRMP) in the East Aegean region, we are informing You that additional information should be presented. The investment proposal made by the proponent intends to carry out mining and processing of polymetal (gold-silver) ores from the Rozino Deposit, Tintyava License, with a future concession area of 275 ha, of which 118 ha will be disturbed. At the time of writing the EIA Report, there is no executed agreement granting a concession for the deposit. The main activities considered herein are: - open pit mining of polymetal ores; - flotation of the ore to concentrate; - construction and operation of the necessary attendant infrastructure - roads, water supply, power supply, material stores, mine waste facility, etc.; - staged rehabilitation of the disturbed areas. The concession period is set as 35 years The purpose of the IP is open pit mining and processing of polymetal gold and silver ore from the Rozino Deposit in the Tintyava PLA. The open pit mining process will involve liberation of the natural resource from overburden, mining by drilling and blasting, and crushing of the mined material. Ore processing will comprise flotation to produce concentrate as the final product from the plant. No ingot metal will be produced. The mining waste will be disposed of in mining waste storage facilities.	The Rozino head reservoir is 2,300 m. away from the pit outline in which mining will be carried out and 1,300 m. from the buffer zone, with a 1,000 m radius from the water intake facility. As can be seen on Figure II.1.2-1, the catchment is near point 6 of the future concession area, and this point is downstream of the non-contact water reservoir. As is visible on the maps, no mining is possible in the 1,000 m buffer zone and, therefore, no drilling and blasting, because there will be a man-made water intake, a non-contact water reservoir, required for the IP. We are pointing out once again that the mining will be 1,300 m. away from the 1,000 m radius buffer zone and 2,300 m from the head reservoir and, therefore, we see no reason to exclude the buffer zone area around the Rozino head reservoir from the future concession area. Excluding this area will deprive us of the possibility to build a non-contact water reservoir which is needed for the IP.

		The measured reserves and resources continue to an approximate depth of 195 m., with around 95% of them lying at less than 120 m., with approximately 140 m. The planned maximum depth of the pit is approximately 140 m from the terrain surface. The pit bottom is intended to reach an elevation of 435 m. A contractor will carry out the drilling and blasting works and will deliver the required explosives immediately prior to their use, which excludes the likelihood of explosives being present on site. The determined mass of the charge will be mandatory for the drafting of each drilling and blasting pattern. Stockpiling will involve selective stacking by bulldozer and trucking. Selective/separate disposal of: - Earthfill and topsoil. - Waste rock (overburden); - Flotation tailings (processing waste). According to the pre-feasibility studies, the mined-ore processing sequence includes the following main auxiliary activities: - crushing and hauling; - Storage of crushed ore in a covered intermediate storage facility - a reinforced concrete area covered by a canopy and with a feeder underneath; - milling (ball mill) - flotation; - flotation tailings thickening and disposal in a mine waste facility; - concentrate thickening and filter-press dewatering; - auxiliary activities - provision of: water, air and reagents. The IP will require processing water (for the processing plant and for dust control, and potable water for the) personnel. The hydrology report on the hydrology study of existing surface water bodies shows that water can be used from Arpa valley between January and May, when its river flow is sufficient, to supply via the	

	Rozino Pumping Station a water flow of at least 50 l/s (for an expected overall volume of 648,000 m³) which is equal to 10% of the average-multiannual water quantity, and to guarantee the ecological minimum for the river. An open non-contact water reservoir will be filled during this period by constant pumping. One possible water-abstraction option is to build a pumping station near the existing Rosino Pumping Station used for supplying of potable water to the village of Rozino. The higher water flow in February, March and April allows for using higher flow rates, at around 100 l/s during these months, to fill the non-contact water during higher precipitation-related inflows. As the pit develops during the years, the Rozino mine watershed area will accumulate precipitation water. This water will report to an open contact-water reservoir and will be used in the process. The hydrological study in the deposit area showed insignificant groundwater flow-rates and that groundwater abstraction would be utterly insufficient for the process. Part of the water will be returned for optimal water use. No waste water will be generated during the construction period. Generation of the following waste water is expected for the site: process-related and generated from the flotation and concentrate dewatering process, and ablution effluent from the mine-site workers. All this water will be recycled, using the contact-water reservoir as a buffer storage. No discharging of process-related waste water into water bodies or into the sewerage systems of urban centres is envisaged. A local ablution-effluent treatment facility (utilizing microbiological sludge) will be constructed with the treated water being fed to the contact water reservoir. No discharging of ablution effluent into water bodies or into the sewerage systems of urban centers is envisaged. Surface precipitation water and mine run-off will be diverted to the contact-water reservoir.	

		Such waste water will be generated throughout the mine life. The nearest groundwater sources used for potable water supply found in the Rozino Deposit area are: - The tube well of the Gugutka Pumping Station used to supply potable water to the Gugutka and Byal Gradets villages in the Ivaylovgrad Municipality is situated approximately 2,000 m. south of point 7 of the future concession area outline. This water-abstraction facility is not provided with a sanitary protection belt as required by Regulation 3 of October 10, 2000. - The ‘Rozino’ head reservoir used for drinking water supply and owned by a state forestry enterprise is situated in the lands of the Pastrook village, Ivaylovgrad Municipality, around 620 m. east of point 6 of the future concession outline. This water-abstraction facility is not provided with a sanitary protection belt as required by Regulation 3 of October 10, 2000. Attachment 7.2.1. under Section 7 of the updated Aegean River Basin Management Plan of the East-Aegean Basin Directorate, adopted with Decision 920/31.12.2024 of the Council of Ministers, provides for a measure with code DW_1 and name: Prohibitions and restrictions for activities in the potable water protection zones and in the sanitary protection belt areas and buffer zones around water abstraction facilities/systems, and implementation action for measure: DW_1_35 Prohibition for mining of underground mineral resources, including aggregate and construction materials, within a buffer zone with a radius of 1,000 m. from groundwater abstraction facilities for potable water supply. In view of the circumstances described above, some of the design concession area, which is the subject of the IP, falls within the scope of the measure provided in the 2022-2027 Aegean River Basin Management Plan of the East-Aegean Basin Directorate, and the 1,000 m radius buffer zone around the groundwater abstraction for potable water supply (the Rozino head reservoir in the village of Pastrok in the	

		Ivaylovgrad Municipality) should be excluded from the concession area in the Rozino Deposit.	
3.	Letter from MOEW Ref. № 04-09-119/10.09.2025	The following health-related disadvantages of the EIA Report have been established during a review of the documents: 1. The EIA Report does not account for all recommendations from the Ministry of Healthcare pointed out in our letter Ref. No. 26-00-2518/27.12.2024. 2. Section IV. 'Description of the relevant aspect of the current state of the environment' (baseline scenario), pages 102 to 118, considers the aspects of health and hygiene, but in respect of the current state of the environment. 3. The analyses of expected impacts on the environmental media have not been followed by: - Characterisation and ranking of individual risk factors according to their impact on the human health and comparison to the applicable hygiene standards and requirements pertaining to both workplaces and affected residential areas. Determining the most important risk factors for the impacted population and the working in the site; - Assessment of the possibilities for combined, complex, cumulative and remote impact of risk factors both on the workers and on the population which is subjected to the unfavourable impact, considering also the production activities of other enterprises in the region, and the municipal and national ; - A predictive assessment of the impact after the investment proposal is implemented. Review and assessment of the health status of the potentially impacted population and with analysis and interpretation of demographic indicators and morbidity indicators for the regions (using data from the most recent available 3-5 year period) in which the population could be impacted by construction and operation of the investment proposal. - An overall assessment, in a separate section, on the basis of all completed analyses and assessments in the report, of human health risks with reasoned proof that the residents in the urban centres will not	As regards item 1 – The EIA Report and, also, all other attached documents concerning the 'water' and drilling and blasting components, have been supplemented as necessary. As regards item 2 – Section IV concerns the current state of the environment, and, respectively, of the aspects of health and hygiene considered in item IV.11, i.e., the baseline scenario has been considered, and the impact assessment is in item V.11 according to the legislated structure of the EIA Report and to the ToR established during the preceding phase of this procedure. As regards item 3, first dash: The impact assessment in item V.11 has been supplemented, as instructed. At this stage, the IP in consideration has no organisation chart with all the necessary positions, and neither the exact workplace conditions nor factors can be specified and, therefore, no risk assessment each workplace is possible at this stage of IP development. The risk factors are characterised and evaluated in item V.11 of the EIA Report, separately in respect of the on-site workers and the near-by population. An evaluation of compliance with the current hygiene standards and requirements has been made with reference to the regulations applicable to the IP in consideration and to the required actions and measures in respect of occupational safety and health and for protection of the health of the population.

	be subjected to health risks caused by pollution of the living environment, and health protection and risk management measures should be proposed. 4. No discussion is made in the documents about radiation protection related to the Regulation on Radiation Protection during Activities with Materials with Increased Content of Natural Radionuclides (Adopted with Decree of the Council of Ministers No. 229 of 25.09.2012, promulgated in the SG, issue 76 of 5.10.2012, amended and supplemented in issue 110 of 29.12.2020). According to Appendix 1 under Article 1, paragraph 1 of this Regulation, mining and processing of polymetal ores from the deposit which is the subject of this IP, fall within the scope of the regulation. 5. The EIA Report does not consider the factor of ionising radiation and the health risk has not been evaluated. No results about the content of radionuclides in the rock mass and in the waste (mining waste and tailings) are attached in the main documents or in the narrative Attachment No 9. In respect of ionising radiation, it is stated only that the natural radiation background for the population is not expected to be exceeded, but this is utterly insufficient from the perspective of risk assessment. 6. No monitoring of radiological natural and living environments and of the mining waste and tailings is provided for in the EIA report. Note that the former uranium mining site 'Planinets' is situated in the lands of the Planinets village, 5 km on a straight line from the Rozino Village, All areas.. The presence of such a site suggest potential for higher content of natural radionuclides also in the IP area. As we have already noted, no analyses of the content of radionuclides in the ore from the deposit are presented. Based on the above item 4-6, information about the ionizing radiation should be added to the EIA report, i.e. records of analyses to determine the contents of radionuclides in the rock mass sampled at various depths in the site, and in the flotation tailings.	As regards item 3, second dash: No other production enterprises and national roads are present in the region. This is written in item II.1. and is seen in all figures in the report concerning the location, including Figure No. II.1.2-1 and Figure No. IV.11-1. The analysis of cumulative impacts is presented in Section VI.6.5. of the report, with the following explicit statement: As regards the aspects of health and hygiene, the above analyses and assessments of ambient air quality, noise, soils, water, and hazardous chemical substances indicate that no cumulative impacts on the health of the population of the settlements nearest to the IP and on the workers on-site are expected from the IP for mining of ores and minerals. No joint cumulative impact with other IPs is expected. Textual attachment 14 of the EIA Report presents an exhaustive list and describes 92 other IPs, plans and programs, with which a cumulative effect has been considered. Apart from the IP for prospecting, exploration and mining of ores and minerals, only forestry projects and plans, one IP for archaeological activities and one game-animal management IP are present in the region, but bear no negative human-health potential cumulative with the IP under consideration. As regards item 3, third dash: The health status of the potentially affected population is made in item IV.11.1 of the Report with data from the latest available 5-year period (2019-2023) using the parameters presented in item 10 of the letter from the Ministry of Healthcare Ref. No. 26-00-2518 of 27.12.2024 (during ToR consultations). According to the evaluations of the Environmental Impact

	7. As regards the ambient air, the report shows that the main pollutant will be PM₁₀ and PM_{2.5} dust fractions. The utilized methodology allows for calculation of the maximum single and average annual concentrations of these fractions emitted from area and linear sources, but there is a substantial deficiency, because the used software is inapplicable for calculating daily average concentrations. With a total of 88 blasting operations during the year, the risk of achieving above-standard average daily concentrations of PM₁₀ during those days is substantial. Therefore, evidence must be provided that the threshold limit values for the average daily concentration of PM₁₀ will not be exceeded more than 35 times in one calendar year (Regulation 12 of July 15, 2010, most recently amended and supplemented in the SG, issue 79/2019). The report does not contain any information about the expected number of motor vehicles, transport schemes and linear models for external transport flows servicing the site, and for hauling of the flotation concentrate to the final destination, and no calculation about their contribution to fugitive dust and gas emissions in the urban areas through which the motor vehicles will pass. Therefore, the necessary information should be added to the EIA Report. 8. As regards the surface and ground water, the EIA Report takes under consideration only some of the recommendations in the EIA ToR reflected in letter Ref. No. 2600-2518/27.12.2024 of the Ministry of Healthcare. To function, the site will need significant amounts of water and the EIA Report does not clarify sufficiently the utility and hygiene consequences for potable water quantity and quality in the region that the envisaged intensive drawing of water will have, such as the '50 l/s fresh-water source in the Arpa Dere river near the Rozino Pumping Station between January and May (i.e. 5 months of the year)'. It is stated on page 149 that an expected shortage of water for the plant of approximately 125,000 to 310,000 m³ is expected. In this situation we are of the opinion that the envisaged water abstraction from the Arpa Dere River next to the existing Rozino village pumping station can	Assessment in item V of the EIA Report and the evaluations in item V.11 concerning human-health impact by the IP, the near-by populations will not be affected by above-standard atmospheric-air pollution and noise ,, and will not be at risk of soil and potable water pollution and impact by chemical substances. Therefore, the IP is not expected to cause changes to the currently observed health and demographic trends among the near-by population. As regards item 3, fourth dash: The health risk assessment is presented and structured in the respective sections of the report in accordance with the legal requirements, namely: IV.11 (current status of the population and health risk factors), V.11 (identification of risks and evaluation of IP impact on human health – incl. impacts for the workers and near-by population), VI.6.4, VI.6.5, VIII, IX, X, XII and XV, based on consultations during the preceding phase of the ToR procedure, including consultations with the Ministry of Healthcare. The EIA Report is prepared as a single document including human-health evaluation in accordance with Article 96, paragraph 1 of the Environment Protection Act. Therefore, positioning risk assessment in a separate section would be a violation of the regulated report structure. The evaluation of the IP impact on human health presented in item V.11 was supplemented in accordance with the notes made by the Ministry of Healthcare. As regards items 4, 5 and 6: Accepted and implemented. Analyses have been carried out in an accredited laboratory and the results are interpreted

	create drinking water shortages, the absence of this risk not being proven in the EIA Report and in the expert reports attached with it. This concerns not only water supply sufficiency for the Rozino Village, but also for the settlements downstream along the Byala River to which the Arpa Dere River is a tributary. There is no substantiated comment about the applicability of the 19161-1998 data used in the analysis in Table No. V.12-2 Averaged water quantities in two points along the Byala Reka River. There is no reasoned hydrogeological expert assessment on these matters. Is there any risk for the potable water supply of urban areas in the region; Will the investment proposal lower the flow-rate of potable water supply sources. The ‘Report on the assessment of lateral impact of blasting on the environment’ noted on page 268, column 3 of Table No: improperly referred to because it does not contain any text concerning the question raised in the ToR about how will the drilling and blasting works affect the quantity and quality of water from potable water supply sources adn on the ground and surface water. An expert answer to this question is also missing from the narrative part of the EIA Report. According to EABD’s letter Ref. No. IIV-01-183(5)/26.05.2023, the IP is admissible and its implementation will not have any significant impact on water and aquatic ecosystems, provided that the regulatory requirements are complied with and that no pollution of river beds by mining materials is allowed and no hazardous materials generated by ore mining are discharged in surface and groundwater. However, the EIA Report does not provide a definitive answer to the question will it deteriorate the chemical status and will it change the pH of the surface and ground water in the region?. It should be noted that the Basin Directorate presents the conclusion in its above-mentioned letter that there exists a likelihood that the IP may impact the waters and the aquatic systems in the region. Given the priority importance of protecting the purity of water resources, especially groundwater resources, whose quality recovery	in items IV.10 and V.10p V.11 and VI.6.3 of the EIA report by an adequately qualified expert, certified by by the Nuclear Regulatory Agency. These results are presented in the health-risk sections designated above. There is no need, according to the laboratory analyses and the impact assessment, for radiological monitoring during operation of the site, but is recommended. It should be pointed out that there is no connection to the former uranium mining site. The former (1960-1965) uranium exploration site ‘Planinets’ is situated in the lands of the Planinets village (approximately 5.5 km east of the Rozino Deposit). According to the geological data, this type of mineralisation is limited to specific lithological horizons outside the Palaeogene sediment basin of Rozino. Therefore, no geological pre-requisites exist and hydrogeological connectivity increases the content of natural radionuclides in the IP area. As regards item 7: Methodologies approved by the Minister of Environment and Water were used because the Bulgarian competent authorities can verify the results of these models. Foreign methodologies cannot be verified in this manner and, accordingly, are not welcomed by the local authorities. As regards the expected number of motor vehicles: It is stated explicitly in the EIA statement that: As defined by the Principal and by the scope of assessment, the IP does not include concentrate hauling to the end user because no commercial relationship exists and cannot exist with any plant

	following pollution is limited, it is necessary to guarantee definitively that the surface and ground water purity will be preserved. Lastly, but not least, it is pointed out that industrial water will be used for household purposes (cleaning of sanitary units etc.) but no mention is made of what water will be used for sanitary purposes (washing of hands, bathing etc.), having in mind that this water should meet the provisions of Regulation 9 on the Quality of Water Intended for Human Consumption. It is notable that the EIA Report states that 'The approach of 'zero discharge' of surface and ground water has been adopted in the IP'. Therefore, the opinion of the East Aegean Basin Directorate on this matter should be attached with the EIA Report. 9. The mining activities will generate potentially hazardous waste that could present a human health risk. However, this risk is not considered and evaluated sufficiently in the report. Therefore, the EIA Report should be supplemented. Note that the processing waste designated in the EIA report as non-hazardous with code 01 03 06 - Tailings other than those mentioned in 01 03 04* and 01 03 05* mirrors hazardous waste with codes 01 03 04* and 01 03 05 according to Regulation 2 on the classification of waste. This means that it should be established whether this waste belongs to code 01 03 06 by testing in accordance with the Regulation in order to prove its non-hazardous properties after the waste is generated. Otherwise this waste should be classified with code 01 03 04* or 01 03 05*. In this sense, the EIA Report should include a measure requiring to conduct a processing waste classification procedure because of the mirror codes. 10. As regards the physical factors noise and vibration: As stated above, the report does not present forecasts about the expected number of heavy duty vehicles, about the schemes of transportation of flotation concentrate hauling streams. Also, there is no evaluation of the possible impact on urban areas of noise and vibrations related to such transport. While assessing the potentially	which could process the concentrate. As defined by the Principal and by the scope of assessment, the IP does not include concentrate hauling to the end user because no commercial relationship exists and cannot exist with any plant which could process the concentrate. This can be clarified only after the construction permit is obtained and mining initiated. Nevertheless, the EIA Report presents purely hypothetical possibilities for access by transport to and from the concession area, Figure II.1.2-2. The IP proponent will use all-electric trucks that do not emit harmful substances and noise into the environment. As regards item 8. Accepted. All attached documents concerning the 'water' and drilling and blasting components have been supplemented. The probability of significant impact on waters is expressed by the Basin Directorate in connection with the provisions of article 155, paragraph 1, item 23 of the Waters Act, concerning the admissibility of the IP, and is not a final conclusion. A contract will be entered into with the Water Supply and Sewerage company for delivery of water for hygienic purposes from a reservoir which is owned by this company and will be situated 800 m. from the personnel service premises in the processing plant area. There is such an infrastructure and its connection to the future project is technically possible. The exact routes will be determined during the detailed engineering design phase.

	affected population and areas by the various human-health risk factors and their comparison to the current hygiene standards, the authors of the report have come to the conclusion that no above-standard noise and vibration can be expected during the pre-operation period and, also, during operation of the site. As regards the intermittent blasting noise, a trial blasting was carried out and a Report on the Evaluation of the Side Impact of Blasting on the Environment for the project Rozino Deposit attached with the EIA Report. The results and forecasts present the impact of blasting on the environment based on measurements performed using specialized equipment during experimental blasting within the design pit area. However, no overall evaluation is made of the environment in the nearest urban areas. As the mining advances at depth, the labour conditions and the environmental impact will altered. Therefore, we are of the opinion that irrespective of the initial forecasts, the EIA Report should include a measure requiring periodic control measurements, updating of the mathematical models with specific deposit data, determining the levels of impact, and, where necessary, adapting the blasting parameters. 11. Last, but not least, note that the mining will be in a pit, which suggests pollution of environmental media (acoustic comfort, ambient air, including indoor air, vibrations, ionizing radiation). Therefore, a more detailed assessment of the health risk in the living environment should be added to the EIA Report, and a series of measures to prevent and reduce such impacts should be proposed. 12. Occupational environment Air pollution (p. 208 of the EIA Report). The inhalable and respirable (PM₄) dust fractions, as well as respirable free silicon dioxide, and not PM₁₀ and PM_{2.5} are of hygienic significance in the occupational environment. According to the Bulgarian legislation (Regulation No 13/2003, most recently amended in the SG issue 28 dated 02/04/2024, and Regulation 10/2003, most recently amended and supplemented in the SG issue 28 of April 02, 2024), periodic monitoring of inhalable fraction (mg/m³), respirable fraction (mg/m³) and free crystal silicon	The zero discharge is commented in EABD's letters Ref. No. IIY-01-183(5)/26.05.2023 and Ref. No. IIY-02-231(1)/18.12.2024, attached with the EIA Report. The notion of 'sufficient' or 'insufficient' is subjective and non-quantifiable. No specific instructions about supplementing are present. All industrial activities generate hazardous waste and the IP in question is no exception. Detailed data about generated waste by type and quantity, the manner of its management and measures to reduce their impacts are presented in items II.4, IV.8, V.8, VI.6.3, VI.6.5 and IX. The assessment of waste-related health risks presented in item V.11 summarises the detailed assessment in item V.8 and is complemented with the risks from hazardous waste. In addition, note that the classification of waste and its environmentally sound management are mandatory according to the legislative framework and will be done at the relevant sages after approval of the IP. In this sense, the human health risk is fully controllable and no occurrence of an extraordinary such risk required additional investigation can be assumed. As regards item 10: It is stated explicitly in the EIA report that: As defined by the Principal and by the scope of assessment, the IP does not include concentrate hauling to the end user because no commercial relationship exists and cannot exist with any plant which could process the concentrate. As defined by the Principal and by the scope of assessment, the IP

	dioxide (mass %) must be provided for, and, also, of diesel engine exhaust, transport and service machinery (Cox, NOx, SOx, incompletely incinerated hydrocarbons, soot, various types of oil, and the reagents required for the enrichment process, in mg/m³), in keeping with the requirements of Bulgarian State Standard БДС EN 689:2018+A1:2019. 10. Engineering and technical measures to reduce dust and chemicals in the occupational environment and to minimize the occupational exposure to the lowest possible levels must be included and described in detail, having in mind that the PPEs protecting the respiratory organs are not intended for constant protection of 13. The regulatory documents described in the item 'Aspects of health and hygiene' (page 248) show that the applicable regulatory documents related to the health requirements and applicable to the assessment of health risks posed by the IP have not been taken into consideration in the health risk assessment. In conclusion, the Ministry of Healthcare is of the opinion that the EIA report should be reworked and supplemented in accordance with the above and in consideration of the recommendations in Letter No. 26-00-2518/27.12.2024.	does not include concentrate hauling to the end user because no commercial relationship exists and cannot exist with any plant which could process the concentrate. This can be clarified only after the construction permit is obtained and mining initiated. Nevertheless, the EIA Report presents purely hypothetical possibilities for access by transport to and from the concession area, Figure II.1.2-2. The IP proponent will use all-electric trucks that do not emit harmful substances and noise into the environment. An overall living environment evaluation was made in item IV.11 of the EIA Report with population health analysis according to available data from the National Statistics Institute, the Regional Health Inspectorate, and the National Centre for Public Health and Analyses, and an analysis of the current environmental health determining factors is made. The data in item IV.11 consider the current situation. The IP's impact on the living environment and on human health is presented in item V.11 and has been supplemented according to the remarks made in the Ministry of Healthcare's statement. As can be seen by the analyses and assessments, no excess of human-health limit values and standards are expected in the nearest settlements. As regards item 11 The health-risk assessments made in item V.11 refer also to the assessments of IP impact on atmospheric air quality and to the assessment of impact by harmful physical factors. These assessments show that the established atmospheric-air quality and noise limit values in the nearest urban areas and sites which are subject to health protection will not be exceeded.

			Vibrations will be of local impact and will not reach the settlements. No ionising radiation is expected. Supplements have been made in sections IV.10, V.10, VI.6.3 and IX, Item IX of the EIA Report present measures to prevent and reduce the evaluated impacts on the workers and on the population. As regards item 12 The assessment has been corrected in the specified EIA Report section in accordance with the instructions and the future measures to suppress dust in the occupational environment have also been specified. A risk assessment will be carried out for each work place in accordance with Regulation 5 on the Procedures, Manner and Periods for Risk Assessment, and measures will be provided for management of any identified risks. This assessment will be updated following any change of workplace conditions, i.e. the type of updating should also be required by the regulatory framework. In addition to item IX, a measure has been added to the Health and Safety Plan that should provide for periodic control measurements of occupational factors, including chemical agents, and the parameters of the operations (including drilling and blasting) and the worker health protection measures should be adjusted according to the results. As regards item 13. The regulatory documents considered necessary during the assessment have been taken into consideration and other sources of information have been used.

			The EIA Report has been re-worked and supplemented in accordance with the instructions.

XII. CONCLUSION IN LINE WITH THE PROVISIONS OF ARTICLE 83, PARAGRAPH 5 OF THE ENVIRONMENT PROTECTION ACT

The main conclusions about the assumed extent of the impact expected from implementation of the Investment Proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district.' can be summarised as follows:

The harmful impact is concentrated mostly on the geological media, since non-renewable natural resources will be extracted. The atmospheric air, soils, landscape, flora and fauna will also be unavoidably impacted, given the nature of the investment proposal - open-pit mining of metalliferous mineral resources. This impact will be of limited duration, during the future concession of up to 35 years.

It should be pointed out explicitly that the impact analyses and the modelling of emissions into the atmospheric air, the drilling and blasting impacts, the noise impacts, the annoyance of the population and the forecasts in this statement were made with the worst operating conditions for the deposit, with a maximum output.

Ambient air

Application of the measures specified in item VII of this EIA Statement will limit the impact on ambient air quality by the IP within the area surrounding the deposit. No change of background levels of air pollution is expected in the near-by settlements. No negative human-health effect is expected. The cumulative pollution in the urban environment will be negligible. It can be concluded from the calculations and emission distribution models for the IP that no transboundary impact will be expected.

Surface and Ground Water

The impact on surface water during all the implementation stages of the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit' is determined as insignificant. Up to 15 of the multi-annual water quantities will be abstracted from the surface water of the Arpa Dere River (Water Body BG3MA100R270 - Byala Reka River and its Tributaries) and is not expected to cause an impact (including transboundary) on the watershed area of the Byala Reka River. The water on site will be returned to the process with minimal recharging from water abstraction, precipitation and treated process water, and no discharging of waste water into surface water bodies is planned for. A 'zero discharge' approach is adopted.

The implementation of the investment proposal for 'Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA' is not expected to have a negative impact on ground water and will not deteriorate the chemical and quantitative status of the affected groundwater body BG3G000PtPg049 Fissure water - Eastern Rhodopean Complex. The mining operations will be carried out in the seepage zone without reaching the water level. Passive ground water inflow will be priority pumped to the plant in order to meet the processing plant requirements.

The impact on the chemical status of ground water will be neutralized by lining the contact water reservoir bottom and walls and by constructing a system to intercept eventual break-through involving a curtain drain and a grout curtain.

One technological option during the IP implementation is Limited abstraction of water from the Arpa Dere River floodplain by constructing a pumping station in the area of the existing Rozino Pumping Station.

No cumulative impact on waters exists - no discharging of wastewater is planned for.

No transboundary impact is expected, based on the analyses made in this statement.

Subsurface

The analysis of the existing status of the subsurface and the mining technology which will be employed for the deposit allow the assumption that part of the IP area will be affected by the mining operations, but that the entire region will not be affected in a manner causing substantial changes of the sustainability of the geological media and of its qualitative parameters. The mineral resource will be extracted fully and without loss (wastage), as is required by law, provided that the approved detailed designs for development and rehabilitation and the mine waste management plan are compiled with.

Noise

The activities during the different IP implementation phases will lead to changing noise levels in the near-by residential areas. The effect on noise levels in the area will be local in extent and is not expected to have a cumulative effect. It can be stated with a sufficient degree of credibility, based on the distribution calculation for noise generated during IP implementation, that no transboundary impact would be possible.

Radiation

The gamma-spectrometry analysis results compared to the standards in the current legislation show that the activity will not endanger the environment and would not cause changes to the natural radiation background of the assessed terrain and its surroundings. The radioactivity measured in the studied geological units is sufficiently low to prevent pollution and distribution of radioactive isotopes into the remaining environment media. No hazard is present to the environment, the on-site workers and the population and, therefore, no particular measures and activities are needed to ensure radiation safety.

Biodiversity

The IP implementation will cause insignificant impact on the fauna and flora, provided that the proposed measures are complied with.

Health risk

The main impact by the IP implementation phases will be on the on-site workers, and is typical of this activity type (mining). Using adequate personal protection equipment and complying with the relevant occupational health and safety requirements will reduce such impacts to insignificance, without threat to workers' health.

No significant impact on the near-by population and objects in need of health protection is expected because the IP will not cause violation of the environment and human-health protection limit values. The measures proposed in the EIA Statement, including measures concerning air quality, harmful physical factors, and water, will prevent/limit the harmful impacts to the possible minimum.

As regards the remaining environmental media and factors, including waste, the impact will be insignificant because the territory that will be included in the future concession area will be affected and the terrain will be rehabilitated to the maximum extent possible upon completion of operations in the mined sections and closure of the mine.

According to the nature and extent of the assumed negative impacts, the team of experts who are the authors of this EIA statement has made recommendations and propose measures to prevent, reduce and, where possible, discontinue the harmful environmental and human-health impacts.

Depending on the conclusions from the environmental and human-health impact assessments, the team of independent experts who developed this EIA statement is of the opinion that no significant negative impact on the environment and on human health can be expected as a result of IP implementation, provided that the recommendations and proposed measures to prevent, reduce and, where possible, discontinue the harmful impacts on the environment and on human health.

Based on the detailed analysis of impacts by construction, operation and closure and rehabilitation of the IP for ‘Mining and Processing of Polymetal Ores from the Rozino Deposit, Tintyava PLA, situated in the lands of the Rozino village and Gugutka village, Ivaylovgrad Municipality, Haskovo district’ on humans, on the environmental media and on the factors affecting it, the authors of this EIA Statement recommends to the Supreme Expert Environmental Council of the MOEW to APPROVE the implementation of the investment proposal made by TINTYAVA EXPLORATION AD with mandatory implementation of the proposed measures to reduce potential impacts identified in this assessment.

XIII. DESCRIPTION OF THE DIFFICULTIES (TECHNICAL REASONS, INSUFFICIENT OR MISSING DATA) EXPERIENCED DURING THE GATHERING OF INFORMATION FOR EIA STATEMENT

No difficulties occurred during the collection of information required for the preparation of the EIA Statement.

XIV. OTHER INFORMATION - AS DECIDED BY THE COMPETENT AUTHORITY OR BY THE PERSON AUTHORISED BY THE COMPETENT AUTHORITY

No other information as decided by the competent authority or by the person authorised by the competent authority has been received.

XV. A REFERENCE DOCUMENT LISTING IN DETAIL THE SOURCES USED FOR THE DESCRIPTIONS AND ASSESSMENTS IN THE REPORT

Sources of Data:

Ambient air

- Климатичен справочник за НР България, т.4, издателство „Наука и Изкуство“, София, 1982 г.; Климатичен справочник – Валежи в България, издателство БАН, София, 1990 г.
- Програма за опазване на околната среда на Община Ивайловград, 2023 - 2028 година;
- Regional report on the State of the Environment in 2023, Haskovo RIEW;
- Methodology of the European Environmental Agency (EEA) developed under the European Monitoring and Evaluation Program (EMEP) of the Convention on Long-Range Transboundary Air Pollution, with latest update in 2023 updating 2023- *NFR Category 2.A.5.a; NFR sector - 1.A.2.g.vii*
- Emissions Factors & AP-42, 8.19.2 Crushed stone processing, 1994;
- Emissions Factors & AP 42, 13.2.4 Aggregate Handling And Storage Piles
- Concession agreements for existing deposits in the IP area

Water

- ПУРБ на Източнореломорски район (2010 – 2015 г.), том V Бяла река.
- ПУРБ на Източнореломорски район 2022 – 2027 г., приет с Решение № 920/31.12.2024 г. на Министерски съвет за приемане на актуализиран План за управление на речните басейни в Източнореломорски район за басейново управление за периода 2022-2027 г. и национална програма за изпълнението му
- ПУРН на Източнореломорски район 2022 – 2027 г., приет с Решение № 937/28.12.2023г. на Министерски съвет за приемане на План за управление на риска от наводнения в Източнореломорски район за басейново управление за периода 2022-2027 г.
- Добив и първична преработка на злато съдържащи руди от находище „Розино“, доклад за интегрирано и устойчиво управление на водите, април 2025 г.
- Христова Н., Речни води на България, издателска къща „Тип – топ прес“ 2012 г.

Subsurface

- Геоложки доклад за резултатите от проведените геолого-проучвателни работи на находище РОЗИНО с изчисляване на запасите и ресурсите от златни руди по състояние към 01.03.2019 година;
- Национална стратегия за развитие на минната индустрия, 2015 г.;
- Регистър на свлачищата в България, „Геозащита“ ЕООД – клон Перник;
- Топографски и геоложки карти на района, специализирана геоложка литература, касаеща района.

Soils

- Атлас на почвите в България. Койнов В., И. Кабакчиев и К. Бонева Земиздат. София, 1998 г
- Почвознание. Проф. д.с.с.н.Марин Пенков. Агролес, София, 1996 г.
- Почвено-географско райониране, География на България - Н. Нинев, Академично издание, 1997 г.
- Почвена ерозия и борбата с нея, проф. к.т.н.инж. Иван Станев, ВИАС София, 1987 г.

- Оценка на земеделските земи в България, Проф. д.с.с.н. Марин Пенков ВИАС София, 1995 г.
- Регионални доклади за състоянието на околната среда през 2022, 2023 и 2024 години на РИОСВ-Хасково;

Biodiversity

Reference

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- Бисерков, В. (гл. ред.). 2011.** Червена книга на България, Електронно издание. Т. III. Природни местообитания. Интернет адрес: <http://e-ecodb.bas.bg/rdb/bg/>.
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- Йорданов, Д. (отг. ред.). 1963-1979.** Флора на НР България. Т. 1 – 7. Изд. БАН, София.
- Кавръкова, В. и кол., ред. 2009.** Ръководство за определяне на местообитания от европейска значимост в България. Второ, преработено и допълнено издание. София, Световен фонд за дивата природа, Дунавско – Карпатска програма и Федерация „Зелени Балкани”.
- Кожухаров, С. (ред.). 1992.** Определител на висшите растения в България. Наука и изкуство, София.
- Пеев, Д. (гл. ред.). 2011.** Червена книга на България, Електронно издание. Т. I - Растения и гъби. Интернет адрес: <http://e-ecodb.bas.bg/rdb/bg/>.
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Landscape

Ландшафтна структура – П. Петров, География на България 1997 г. Академично издание

Ландшафтно планиране, арх. В. Тролева, инж. Г. Цолова, УАСГ, 1997 г.

Harmful Physical Factors:

- Regional report on the State of the Environment in 2023, Haskovo RIEW;
- Method Determining the Total Noise Power Emitted in the Environment from Industries and Determination of the Noise Levels in the Area of Impact
- Method to account for automotive traffic noise
- Evaluation of noise from local and industrial sources in accordance with Attachment 3 to Regulation 6 of 2006
- Concession agreements for existing deposits in the IP area

Aspects of health and hygiene

- Статистически данни за 2019-2023 г. (население – брой, възрастова структура, раждаемост, смъртност, естествен прираст, умирация по причини), публикувани на интернет страницата на Националния статистически институт (НСИ);
- Таблица на адресно регистрираните по постоянен и настоящ адрес лица за периода 2019-2023 г. за с. Бялградец, с. Розино, с. Гугутка, община Ивайловград и област Хасково, публикувана на интернет страницата на Главна дирекция „Гражданска регистрация и административно обслужване“ (ГД ГРАО);
- Информация, предоставена по реда на Закона за достъп до обществена информация (ЗДОИ) от РЗИ-Хасково (с писма с изх.№ 93-11/10.10.2023 г. и с Решение № 14/2024 г.);
- Информация, предоставена по реда на ЗДОИ от община Ивайловград, предоставена с писма с изх.№ 30-00-528/1/16.10.2023 г. и изх.№ 30-00-563/1/04.12.2024 г.;
- Годишен доклад на министъра за здравеопазването за състоянието на здравето на гражданите за 2023 г.;
- Регионалният профил на област Хасково за 2023 г.;
- Общ устройствен план на Община Ивайловград;
- Доклад с анализ и оценка за качеството на водата, предназначена за питейно-битови цели в Хасковска област за 2024 г. на РЗИ-Хасково;
- Годишен доклад от проведения мониторинг на източници на нейонизиращи лъчения на територията на област Хасково за 2024 г. на РЗИ-Хасково;
- Здравеопазване. Кратки статистически справочници с годишни данни за 2019-2023 г., публикувани на интернет страницата на Националния център по обществено здраве и анализи (НЦОЗА);
- Съвременни хигиенно-екологични проблеми, Жени Стайкова, Университетско издателство „Св. Климент Охридски“, София, 2018 г.;
- Хигиена. Хигиена и екология. Том I, под ред. на проф. д-р Димитър Цветков, Изд. Камея ООД, София 2014г.;
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- Медицина на бедствените ситуации, под ред. на доц. Ил. Михайлова, дм и соц. Р. Чакърва, дм, 2011 г.
- Safety and health in opencast mines, second (revised) edition, International Labour Organisation, 2018

(https://www.ilo.org/sites/default/files/wcmsp5/groups/public/@ed_dialogue/@sector/documents/normativeinstrument/wcms_617123.pdf)

Cultural Heritage

- National Institute of Immovable Cultural Heritage;
- Computer System Archaeological Map of Bulgaria

XVI. DECLARATIONS OF EXPERT INDEPENDENCE AND COMPETENCE

These declarations are presented in *Textual attachment No 1* to this EIA Statement.

XVII. ATTACHMENTS - TEXTUAL AND ELECTRONIC

1. Textual attachments

1.1. Textual attachment No 1 - information about the experts who prepared this EIA Statement

1.1. List of experts in accordance with Article 83, paragraph item 2 and item 2 of the Environment Protection Act

1.2. Copies of higher education diplomas - in electronic form

1.3. Written declarations by the experts in accordance with Article 11, paragraphs 3 and 4 of the Regulation on the Procedure and Conditions for Conducting of Environmental Impact Assessment - on hard copy

1.2. Textual attachment No 2 Permit No. 467/28.02.2017 of the Minister of Energy

1.3. Textual attachment No 3 Additional Agreement 3/23/01.2023 under the Contract of 02.05.2017 between Tintyava Exploration AD and the Minister of Energy

1.4. Textual attachment 4 Company's letter Ref. No. 017/08.05.2019 and ME's letter Ref. No. E-26-T-364/15.05.2020.

1.5. Textual attachment 5 Letters concerning the transboundary procedure

1.6. Textual attachment 6 Letter Ref. No. IIY-01-183 (5)/26.05.2023 from the EABD Director

1.7. Text attachment 7 – Copies of letters concerning consultations

7.1. Letter by the Minister of the MOEW – Sofia, Ref. No. OBOC-68/28/14.02.2025.

7.2. Statement concerning the terms of reference by the Director of EABD - Plovdiv, Ref. No. IIY-02-231/1/18.12.2024.

7.3. Statement regarding the Terms of Reference by the Haskovo RIEW, Ref. No. ПД - 279/46/20.12.2024.

7.4. Statement regarding the Terms of Reference by the Haskovo Agriculture Directorate, Ref. No. ПД -407/1/04.12.2024.

7.5. Statement regarding the Terms of Reference by the Haskovo Regional Health Inspectorate, Ref. No. 26 -00/-2518/27.12.2024.

7.6. Statement regarding the Terms of Reference by the Ivaylovgrad State Forestry Enterprise, Ref. No. АСД-09-50/10.02.2025.

7.7. Statement regarding the Terms of Reference by the ME, Ref. No. E26-T-749/19.12.2024.

7.8. Statement regarding the Terms of Reference by the Haskovo Water Supply and Sewerage Company, Ref. No. 2950/18.12.2024.

1.8 Textual attachment 7A Letter from the MOEW, Ref. No. OBOC-68-65/20.10.2025 – first quality assessment.

1.9. Textual attachment No 8 Registry of impacted properties

1.10. Textual attachment No 9 Mine waste management proposal

1.11. Textual attachment No. 10 Hydrology Evaluation of the Byala Reka River and its tributary, the Arpa Dere River

1.12. Textual attachment No 11 Integrated and Sustainable Water Management Report

1.13. Textual attachment No 12 Report on the assessment of lateral impact of blasting on the environment

1.14. Textual attachment 13 Material Safety Data Sheets and correspondence regarding the classification in accordance with Article 103 of the Environment Protection Act

1.15. Textual attachment No. 15 Other plans, programs or projects with potential for cumulative impact by the IP under consideration.

1.16. Textual attachment 15 Decision to grant access to public information No. ЗДОН-01-9/31.01.2025 of the EABD Director

1.17. Textual attachment 16 Hydrogeological study report. Letter from the EABD Ref.No. ИУ-10-182(8)/12.05.2024 and statement by an independent expert in hydrogeology.

1.18. Textual attachment 17 Records of radiology studies.

3. Attachments in electronic form

3.1. Electronic attachment 3.1. Mathematical modelling DAT files

XVIII. EXECUTIVE SUMMARY

Presented in a separate attachment with the EIA Statement

XIX. REPORT ON THE ASSESSMENT OF THE COMPLIANCE OF THE IP WITH THE SUBJECT AND OBJECTIVES FOR CONSERVATION IN PROTECTED AREAS OF THE NATURA 2000 NATIONAL ENVIRONMENTAL NETWORK

This report was presented separately, as a stand-alone document as part of the EIA Statement documents.