Water Monitoring Report for the Ada Tepe Prospect of Khan Krum Deposit 2021

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Table of Contents

TABLES

APPENDICES

1. INTRODUCTIONAND DESCRIPTION OF THE MONITORED SITE

This report was prepared on the basis of an approved Environmental Monitoring Plan of Dundee Precious Metals Krumovgrad EAD and in compliance with Condition No III.20 of EIA Resolution 18-8,11/2011 issued by the Minister of Environment and Water, which grants an approval of the proposed investment project "Mining and Processing of Auriferous Ores from the Ada Tepe Prospect, Khan Krum Deposit, Krumovgrad Municipality". The purpose of this document is to report the analyzed results of the environmental monitoring work completed at the local monitoring network, including sampling points for surface and ground water in the Ada Tepe area, Khan Krum deposit.

This document reports the completed monitoring activities related to the operation of DPMK's Project for Mining and Processing of Gold Ore from Ada Tepe prospect, Khan Krum Deposit, Krumovgrad. The main objective in 2021 was ongoing collection and interpretation of monitoring data about the water quality during the project operation.

The monitoring involved collection of samples at approved points, whose assays were used to identify changes in the condition of the waters in the area of the Ada Tepe prospect of the Khan Krum Deposit. A certified laboratory performed the sampling and the assays.

2. GENERAL

The Water Monitoring Report (the Report) of Dundee Precious Metals Krumovgrad ("DPMK" or "the Company") is drafted to present the results from the environmental monitoring at Ada Tepe Prospect, Khan Krum Deposit, Krumovgrad Municipality, and to meet the commitments of the Company set out in the 2014 Environmental Monitoring Plan, which is approved by the relevant environmental authorities.

This Plan was updated to reflect the mine commissioning in 2019.

With their letter, ref. ПУ-03-14/03.06.2019, the Plovdiv Basin Directorate approved the amendment of the Plan, which dealt in particular with the revised *Surface Water* and *Groundwater* sections, on the condition that the Company would make some additional amendments to the plan and present information about each monitoring point, specifically chemical and quantitative groundwater monitoring. According to the instructions for the update of the Monitoring Plan regarding recently set up groundwater monitoring points at the end of 2019, the Company should take samples and submit results to the Basin Directorate, creating and maintaining data sheets for each monitoring point. All the conditions in that letter, ref. ПУ-03-14/03.06.2019, have been met and the required documentation has been submitted to the authorities.

3. DESCRIPTION OF THE ECOLOGICAL, CHEMICAL AND QUANTITATIVE CONDITION OF THE WATER BODIES RELEVANT TO THE INVESTMENT PROJECT

In terms of the project area, CoM Resolution № 1106/29.12.2016 endorses the 2016-2021 River Basin Management Plan (RBMP) for the East-Aegean Region. The RBMP together with the respective National Program for its implementation is the primary water management tool. The characterisation of the surface and ground water bodies that may be affected by the operation of the gold mining project or are located in the project area takes into account the findings and the measures set out in the 2016-2021 RBMP.

The Company is the holder of Permit #31530328/04.03.2013 amended by Decision # PP-3065/15.03.2017 for groundwater abstraction using a new abstraction facility – a tube well with an infiltration lateral, issued by the Director of East Aegean Region River Basin Directorate in Plovdiv, with a 10-year validity term. The purpose of abstraction is to meet process and drinking water demands, and other water needs. The water supply source is a Quaternary aquifer, BG3G000000Q010 Interstitial groundwater in the Quaternary deposits. Permitted average daily abstraction rate is Q_d = 4.83 L/s; $Q_{max.}$ = 5.0 L/s, the total permitted quantity is 152,250 m³ per annum, of which up to 127,000 m³ to meet process demands, up to 6,500 m³ to meet drinking demands and up to 18,750 m³ to meet other needs.

The quantities of water that were abstracted from Jan. 1 to Dec. 31, 2021, are as follows:

- 13,636 m³ for drinking needs (digital water meter #D1T 500046 readings: 175,766 m³ on Jan. 1 and 185,340 m³ on June 16; failed and replace with a digital water meter #D1T 500045, whose readings were 38,079 m³ on the starting date and 44,930 m³ on Dec. 31; 2,789 m³ were subtracted as 'other needs', #S51EOB19000, in line with the permitted quantity: 6,500 m³ per annum;
- 40,874 m³ for process needs (digital water meter #D1T 500047 readings: 69,137 m³ on Jan. 1 and 110,011 m³ on Dec. 31, in line with the permitted quantity of 127,000 m³ per annum.
- 2,789 m³ for other needs (digital water meter #S51EOB19000 installed on Jul. 29, 2021, whose readings were 1,774 m³ on the starting date and 2,791,07 m³ on Dec. 31.

Surface Water Characterisation.

The site whereon gold ore mining and processing take place is situated in the left portion of the mid-stream watershed of the Krumovitsa River, a right-bank tributary of the Arda River, between the Studen Kladenets and Ivailovgrad water reservoirs.

The river typology of the Arda River basin indicates that the entire watershed of Krumovitsa River - the main watercourse and its tributaries, belongs to a common water body.

The larger tributaries of the Krumovitsa River are the Virovitsa (Kessebir) River, the Vetritsa (Elbassandere) River and the Kaldzhikdere River.

The Krumovuitsa is the main surface water body, which may potentially receive the treated waste water generated by mining and processing of ore. It originates from the southern border ridge (Maglenik) of the Eastern Rhodopes and flows northwards and north. Its total length is 58.5 km, and its watershed area is 670.8 km². At the Krumovgrad town gauge station (HMS

61550), which is the only one in the river watershed, the river has:

- a length of 37.3 km
- a watershed area of 497.6 km²;
- an average gradient of 19‰;
- average elevation of 494 m;
- river network density of 1÷1.5 km/km²;
- average vegetation cover in the watershed of 35% reaching up to 90-100% in the upper parts and down to zero around Krumovgrad.

The soils, which are mainly cinnamon low saline and sandy and clayey-sandy, stony in composition, have eroded severely in the conditions of deforestation, and their water regulation capacity is very poor. This causes rapid runoff from precipitation, which is predominantly rain in this climatic area of Southern Bulgaria.

The river is of the torrential type, with characteristic summer dry-ups in some parts, which categorize it as a Sub-Mediterranean river type (intermittent river), Code R14 (as per the RBMP).

The river typology , of the Arda River basin indicates that the entire watershed of Krumovitsa River, the main watercourse and its tributaries, belongs to a common water body. The river type of the water body is R14b – Sub-Mediterranean Intermittent Rivers.

The parameters that characterise the river flow regime are as follows: drainage area – 497.6 km²; average discharge – 7,320 m³/s, peak discharge – 15,100 m³/s, and low discharge – 2,827 m³/s.

There are municipal waste water treatment plants along the river. A waste water treatment was built in 2019 to treat effluent generated by the Company employees working on the Ada Tepe site. The treated effluent is recycled back to operation. There are no industrial waste sources in place or areas that are identified as impacted by agricultural pollution. The hydromorphological pressure on the BG3AR200R009 surface water body has been categorizes as "weak" in terms of the dykes; impounded areas - weak pressure; drained areas - n/a; urbanization - n/a; inert materials - weak pressure and migration barriers - insignificant pressure.

According to the 2016-2021 RBMP, the importance of impacts caused by climate changes along the Arda River and its tributaries in terms of the adopted climate change scenario RCP 8.5, which refers to a gradual rise of greenhouse gases throughout the century (the most pessimistic scenario), the projected changes in the river flow are most notable in the long term in the period 2071-2100. The surface water bodies in the Arda River basin are within the scope of the following areas of climate change:

- 9 Upper Arda and tributaries
- 10 Lower and Middle Arda and tributaries

The climate change intensity forecast for Uppermost Arda River and its upper tributaries is "moderate", reducing to "weak" for Middle and Lower Arda and its tributaries.

The 2071-2100 forecast for climate change impacts on the Krumovitsa River (BG3AR200R009) is indicated as "weak" (see RBMP Appendix 2, sub-section 21).

Table 3-1 Krumovitsa River and its Tributaries According to the 2016-2021 RBMP

River basin	Water body code	Water body name	Typology	Category	Biological indicators	Physical and chemical indicators	Environmental status/ potential	Chemical indicators
Arda River	BG3AR200R009	Krumovitsa and tributaries	R14b	River	good	good	good	good

There is a significant change compared to previous RBMP data, where the environmental status of the river was assessed as "moderate" and its chemical status as "good", giving an overall "poor" (moderate) status.

Groundwater Characterization

Interstitial and fissure-flow groundwaters dominate the minesite area. Interstitial groundwater flows are typical of the open pit area and along the Krumovitsa river and some of its tributaries.

Fissure-Flow Groundwaters

The project footprint partly overlaps the aquifer identified as BG3G000PtPg049 – Fissure-Flow Groundwaters, Krumovgrad-Kirkovo Zone. It is evident from data presented in Table IV.2.1-8 that the aquifer has the lowest water potential – its modulus is 0.5 L/s.km². Fissure-flow groundwaters are recharged by runoff and predominantly flow along the discontinuities in the metamorphic rocks away from Ada Tepe in the direction of the Krumovitsa river and Kaldzhikdere gully, which are the main drainages of these flows. Sourcing water from this aquifer is limited and usually used to serve local demands only. There are no resources in this aquifer to be used.

According to the 2020 Report on the Quality of the Waters within the East-Aegean Catchment Area (EACA), the chemical quality of BG3G000PtPg049 – Fissure-Flow Groundwaters, Krumovgrad-Kirkovo Zone, in 2020 was classified as ‘poor’ due to the elevated levels of ammoni um, manganese and gross alpha activity. Data from the same report suggested that the groundwater resources of all the aquifers within the EACA were ‘good’. Two aquifers, BG3G00000NQ018 and BG3G00000NQ009, had a water exploitation index (WEI) of 60% (resource status risk). As of the end of March 2021, a report on the condition of water bodies has not yet been published on the Basein Directorate website for the reporting year 2021.

Interstitial Groundwaters

Of particular interest are the waters accumulated in the aquifer coded BG3G000000Q010 – Interstitial Groundwaters in the Quaternary Deposits of the Arda River, which includes the section of the Krumovitsa River terrace extending from Ovchari village to the Arda River. Water in the alluvial aquifers is recharged by precipitation and fissure flow water along the river valleys, by river floodplains and high water along the rivers. An unconfined groundwater flow has been formed in the alluvials, which generally flows in the direction of the hydraulic gradient of the river watershed.

Several water abstraction facilities are set up in the Krumovitsa gravels, which supply Krumovgrad and some other settlements.

The natural (dynamic) resources in the alluvial deposits in the Krumovitsa watershed are relatively low. Given an average transmissivity of 1,500 m^2/d, average hydraulic gradient of 0.002 and average floodplain width of 750 m, the dynamic groundwater draw is 26 L/s. 60 to 80% of the local abstraction resource comes from the Krumovitsa River recharge. Therefore, the EIA Resolution for approval of the Ada Tepe mining operation has set a condition that the Company should treat any wastewater to drinking water quality before discharge to the Krumovitsa.

According to the 2010-2011 RBMP, BG3G000000Q010 Interstitial Groundwaters in the Quaternary Deposits of the Arda River achieved good water chemical status, which was similar to previous years.
The mine was commissioned in 2019.

In line with statutory requirements and in compliance with the conditions under the EIA Resolution 18-8,11/2011, the Company has been issued the following permits:

- Permit #31530328/04.03.2013 amended by Decision # PP-3065/15.03.2017 for groundwater abstraction,
- Water Body Use Permit #33140188/21.08.2015 for discharge of wastewater into surface waters to meet site operational demands, and
- Permit #31190064/0429.04.2020 for surface water abstraction from the Arda River for other purposes (exploration drilling).

General Description of Wastewaters

The water management design at the Krumovgrad Gold Project is driven by a sustainable approach towards “zero discharge”.

The design, however, includes an option for treatment of excess water, which could potentially be produced on the site. A Storm Water Overflow Reservoir (SWOR) is constructed, which is able to handle short-term excess water volumes in the reclaim system resulting from a major rainfall event. The overflow from the main process water reservoir, i.e. the Raw and Process Water Reservoir (RPWR), reports to the SWOR. A pump station is set up to return water from the SWOR to the RPWR.

The second line of defense is a system of three evaporators, which can reduce the water levels in the SWOR in suitable weather conditions. Each evaporator comprises of a fan and a high-pressure suction pump. The evaporators take in SWOR water and then generate a mist above the reservoir to enhance evaporation.

If water levels of the SWOR continue to rise, the water will be diverted from the Process Plant water line to the water treatment facility situated north-west from the Paste Thickener Area.

The purpose of this facility is to meet Condition I.4.2 of EIA Decision No 18-8,11/2011, i.e.

to ensure that waste water is treated to drinking quality level based on chemical indicators. The treated flow can then be discharged via an 8km pipeline into Krumovitsa River, in compliance with Condition I.4.3 of the aforementioned EIA Decision.

The WWTP is the third line of defense if a rainfall event generates excess (surplus) water in the plant reclaim water system. This option will be used on an as-required basis determined by the needs of the actual operation.

The the trigger that causes the WWTP to start is available free capacity of the SWOR.

In 2021, a total of 37,220 m^3 of treated wastewaters were discharged from the site to the Krumovitsa River as excess (surplus) water generated by heavy rains.

4. ENVIRONMENTAL MONITORING/SAMPLING POINTS, INCLUDING THEIR PURPOSE, LOCATION SHOWN ON A SUITABLY SCALED MAP, COORDINATES, ELEVATION, DESIGN

The site water quality survey in 2021 covered 26 water sampling locations – 10 for surface waters and 16 for groundwaters.

The total number of water monitoring locations is 27, of which 10 for surface waters, 16 for groundwaters and 1 for wastewater after treatment (as needed). A map showing the locations of all the surface and groundwater monitoring points is included as Appendix 2. The selected locations are detailed in Table 4-1.1. The table gives a description of each individual point, including name, elevation, coordinates, water type (surface, ground or waste waters), sampling frequency, location and purpose.

Table 4-1.1: Water Monitoring Points							
#	**Name**	**RL (m)**	**Coordinates (WGS84)**	**Water Type**	**Quality Indicators**	**Sampling Frequency**	**Location, Description and Purpose**
1	ESW 01	236	E 387727 N 45. 86,770	SW	as provided in Table 4-1-2	Quarterly	Krumovitsa River – at the point of origin (at confluence of Egrechka River and Kessebirdere) Indicates the surface water quality south of the minesite
2	ESW 02	249	E 253913.391 N 412745,461	SW	as provided in Table 4-1-2	Quarterly	Krumovitsa River upstream of Krumovgrad Indicates surface water quality upstream of town discharges.
3	ESW 03	233	E 38 69 38 N 45 86 342	SW	as provided in Table 4-1-2	Quarterly	Kessebirdere - upstream of confluence with the Egrechka River. Indicates the water quality upstream of confluence with the Egrechka River
4	ESW 04	235	E 38 76 08 N 45 86 646	SW	as provided in Table 4-1-2	Quarterly	Egrechka River – upstream of confluence with Kessebirdere Indicates the water quality upstream of confluence with Kessebirdere
5	ESW 05	222	E 39 03 67 N 45 88 680	SW	as provided in Table 4-1-2	Quarterly	Buyukdere - upstream of confluence with Krumovitsa River Indicates the water quality in Buyukdere upstream of its confluence with the Krumovitsa
6	ESW 06	240	E 386225 N 4588202	SW	as provided in Table 4-1-2	Quarterly	Kaldzhikdere - upstream of the bridge at Pobeda hamlet, Ovchari village. Indicates water quality in the gully upstream of the intersection with the site access road and upstream of the section of the gully flowing by the minesite.
7	ESW 07	220	E 38 77 91 N 45 89 777	SW	as provided in Table 4-1-2	Quarterly	Kaldzhikdere - upstream of confluence with the Krumovitsa Indicates the quality of the stream flowing west of the minesite
8	ESW 08	231	E 388364 N 4587708	SW	as provided in Table 4-1-2	Quarterly	The Krumovitsa, about 200 m downstream of the North Collection Sump of the IMWF
9	ESW 09	215	E 386952 N 4592512	SW	as provided in Table 4-1-2	Quarterly	The Krumovitsa, about 100m upstream of discharge of untreated sewage from Krumovgrad. Reference levels for point ESW 10. Indicates the water quality before discharge of untreated sewage
10	ESW 10	215	E 386822 N 4592681	SW	as provided in Table 4-1-2	Quarterly	The Krumovitsa, about 100m downstream of discharge of untreated sewage from Krumovgrad. The purpose is to assess the impact of untreated sewage discharge from Krumovgrad on the surface waters.
11	EGW 01	n/a	E 388187.46 N 4589517,6	GW	Water level as provided in Table 4-1-2	Monthly 4 times per year	A borehole. The monitoring point is located NE of the site and covers the fissure-flow groundwater flowing in the direction of the Krumovitsa from the entire SE sector of Ada Tepe. It is located in Eocene sandstones and conglomerates. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex

Table 4-1.1: Water Monitoring Points							
#	**Name**	**RL (m)**	**Coordinates (WGS84)**	**Water Type**	**Quality Indicators**	**Sampling Frequency**	**Location, Description and Purpose**
12	EGW 02	312	E 388103 N 4588506	GW	Water level	Monthly	A village well for irrigation. The point is a well, which is located E-NE of the open pit at the foot of the slope (in Chobanka hamlet), and covers groundwaters flowing in Palaeocene breccio-conglomerates and sandstones (Krumovgrad Group), draining to E-NE to the Krumovitsa. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex
					as provided in Table 4-1-2	Quarterly	
13	EGW 03	312	E 386986 N 4588201	GW	Water level	Monthly	An investigation borehole. The monitoring point is located in the metamorphic complex (metagranites and granite-gneiss) on the west slope of Ada Tepe and its purpose is to monitor groundwater flowing towards Kardzhikdere from the drainage area on the west slope of the deposit. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.
					as provided in Table 4-1-2	Quarterly	
14	EGW 04	229	E 387596 N 4586825	GW	Water level	Monthly	An investigation borehole. The monitoring point is set up in the the metamorphic rocks slope descending to the Krumovitsa River terrace and covers groundwater, flowing south below the mine waste facility. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.
					as provided in Table 4-1-2	Quarterly	
15	EGW 05	220	E 387957 N 4591016	GW	Water level	Monthly	Shaft well 2, Krumovgrad drinking water abstraction constructed the in the alluvials of the Krumovitsa River. It indicates any derogation of the quality of the groundwater for potable and domestic use. The purpose of monitoring is to indicate the water quality of the Quaternary aquifer of BG3G000000Q010 Interstitial Groundwaters in the Arda River Quaternary Deposits.
					as provided in Table 4-1-2	Quarterly	
16	EGW 06	218	E 387590 N 4590649	GW	as provided in Table 4-1-2	Quarterly	Shaft well 1 of Ovchari-Krumovgrad II drinking water abstraction constructed in the alluvials of the Krumovitsa River. It indicates any derogation of the quality of the groundwater for potable and domestic use. The purpose of monitoring is to indicate the water quality prior treatment in the Quaternary aquifer of BG3G000000Q010 Interstitial Groundwaters in the Arda River Quaternary Deposits.
17	EGW 07	230	E 387521 N 4586750	GW	as provided in Table 4-1-2	Pursuant to the Water Abstraction Permit (quarterly as a minimum)	A tube well with infiltration lateral constructed in the alluvials of the Krumovitsa River. It indicates any derogation of the quality of the groundwater for potable and domestic use. The purpose of monitoring is to indicate the water quality of the Quaternary aquifer of BG3G000000Q010 Interstitial Groundwaters in the Arda River Quaternary Deposits.
18	EGW 08	n/a	E 387367 N 4587549	GW	Water level	Monthly	A monitoring borehole (piezometer) high at Ada Tepe, a reference point upstream of the IMWF. It is set in a metamorphic complex – metagranites and gneisses with rare interfingering with schists. The groundwater is fissure-flow type, draining in the direction of the Krumovitsa River.The purpose of monitoring is to indicate the background levels in the groundwater flowing towards the IMWF.
					as provided in Table 4-1-2	Quarterly	
19	EGW 09	n/a	E 388302 N 4587478	GW	Water level	Monthly	Monitoring drill hole (piezometer), at the toe of the north Collection Sump before the Krumovitsa River. It is set in a metamorphic complex – metagranites and gneisses with rare interfingering with schists. The groundwater source is fissure-flow type, with draining direction to the Krumovitsa River. The purpose of monitoring is to indicate the quality of the groundwater that flows downstream of the IMWF.
					as provided in Table 4-1-2	Quarterly	

Table 4-1.1: Water Monitoring Points							
#	**Name**	**RL (m)**	**Coordinates (WGS84)**	**Water Type**	**Quality Indicators**	**Sampling Frequency**	**Location, Description and Purpose**
20	EGW 10	n/a	E 388392 N 4587262	GW	Water level	Monthly	Monitoring drill hole (piezometer), at the toe of the southern Collection Sump before the Krumovitsa River. It is set in a metamorphic complex – metagranites and gneisses with rare interfingering with schists. The groundwater source is fissure-flow type, with draining direction to the Krumovitsa River. The purpose of monitoring is to indicate the quality of the groundwater flow downstream of the IMWF.
					as provided in Table 4-1-2	Quarterly	
21	EGW 11	325	E 385053 N 4589103	GW	as provided in Table 4-1-2	Quarterly	Zvanarka village water abstraction. The wells abstract waters from sources outside of the Krumovitsa gravels. They drain waters in the Paleogene sediments. The purpose of monitoring is to indicate the drinking water quality.
22	EGW 12	220	E 389417 N 4589599	GW	as provided in Table 4-1-2	Quarterly	A shaft well of the pump station at Guliika village. It is constructed in the alluvial deposits of the Krumovitsa River. The purpose of monitoring is to indicate the drinking water quality.
23	EGW 13		E 387011 N 4588460	GW	as provided in Table 4-1-2	Quarterly	The monitoring point is set up in the metamorphic rocks NW of the open pit. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.
24	EGW 14		E 387874 N 4587860	GW	as provided in Table 4-1-2	Quarterly	The point is set up to the east of the ROM Pad. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.
25	EGW 15		E 387360 N 4588393	GW	as provided in Table 4-1-2	Quarterly	The monitoring point is set up to the west of the open pit. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.
26	EGW 16		E 387355 N 4588170	GW	as provided in Table 4-1-2	Quarterly	The monitoring point is set up to the west of the open pit. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.
27	EWW 02	n/a	E 253839.570 N 412836.999	WW	Quantity	Continuous	At discharge of the Wastewater Treatment Plant (for mixed wastewater types). The purpose of monitoring is to indicate the quality of the treated effluent before discharge to the Krumovitsa River (as needed).
					as indicated in Table 2-2.1. in the Waters Section, EMP	Monthly as discharges occur	

* "Seasonal" means:
- Spring – May through June;
- Summer – July through September;
- Fall – October through November;
- Winter – February through March

Table 4-1.2: Surface and Ground Water Assays (Accredited Laboratory).		
Point #	Assays	**Frequency**
All surface water points	Cu, As, Fe, Mn, Zn, Al, dissolved oxygen, pH, electrical conductivity, N-NH_4, N-NO_2, N-NO_3, total N, P-ortho-PO_4, total P, BOD5, Cr (VI), Cr(III), petroleum products, Ni, SO_4, Ca, Mg, Cd, Cl, calcium carbonate hardness, Pb, Co, cyanides (free), cyanides (total), chromium (total)*, COD*.	Quarterly by an accredited laboratory
ESW 08, 09, 10 – surface waters	Apart from the envisaged physical and chemical profile listed above, the monitoring should also cover the following the biological elements for quality: Macrozoobenthos-based biotic index (*Methods for Monitoring of Macrozoobenthos in Rivers as a Biological Element (Biotic and Trophic Index*)) and IPS index for phytobenthos – diatom algae (*Methods for Monitoring of Phytobenthos in Rivers as a Biological Element (IPS Index)*) – *Order #РД-412/15.06.2012 of the Ministerof Environment and Waters*.	Annually
EGW 07, after treatment	Pursuant to *Regulation #9 on Drinking Water Quality.* 1. Microbiological indicators according to Table A.1 for water within the meaning of art. 6(1)(1): *E.coli*; enterococci. 2. Table B - chemical indicators: acrylamide, Sb, As, benzene, benzo[a]pyrene, B, bromates, vinyl chloride, 1,2-dichloroethane, epichlorohydrin, Hg, Cd, Cu, Ni, NO_3, NO_2, Pb, pesticides, total pesticides, polycyclic aromatic hydrocarbons, Se, tetrachloroethylene and trichloroethylene, total trihalomethanes, fluorides (F^-), chromium (Cr), cyanides (CN^-). 3. Table C - indicators of: Ph, Al, NH_4, taste, conductivity, Fe, Ca, Mg, Mn, odor, turbidity, Na, total C, total hardness, residual free chlorine, permanganate oxidation, sulphates (SO_4), phosphates (PO_4), chlorides (Cl^-), color, Zn, Clostridium perfringens (incl. spores), coliforms, number of colonies (microbe number) at 22 °C. 4. Table D - radiological indicators: tritium, total indicative dose, total alpha-activity, total beta-activity, natural U.	Quarterly by an accredited laboratory
EGW 7 (Fresh water abstraction well supplying the mine site) after treatment	Pursuant to *Regulation #9 on Drinking Water Quality.* 1. Microbiological indicators according to Table A.1 for water within the meaning of art. 6(1)(1): E.coli; enterococci. 2. Table B - chemical indicators: acrylamide, Sb, As, benzene, benzo[a]pyrene, B, bromates, vinyl chloride, 1,2-dichloroethane, epichlorohydrin, Hg, Cd, Cu, Ni, NO_3, NO_2, Pb, pesticides, total pesticides, polycyclic aromatic hydrocarbons, Se, tetrachloroethylene and trichloroethylene, total trihalomethanes, F-, Cr, CN^- 3. Table C - indicators of: Ph, Al, NH_4, taste, conductivity, Fe, Ca, Mg, Mn, odor, turbidity, Na, total C, total hardness, residual free chlorine, permanganate oxidation, sulphates (SO_4), phosphates (PO_4), chlorides (Cl^-), color, Zn, Clostridium perfringens (incl. spores), coliforms, number of colonies (microbe number) at 22 °C. 4. Table D - radiological indicators: tritium, total indicative dose, total alpha-activity, total beta-activity, natural U.	Four times per year under Regulation 9 on the Municipal and Drinking Water Quality, by an accredited laboratory. One of the four samplings is between 1.08 - 30.09 under the Water Abstraction Permit. Volume of exhausted waters.

Surface and groundwater samples for testing were taken in March, June, September and December 2021, in line with the Monitoring Plan. Samples were taken from all the monitoring points provided that they were wet. SeeAppendix #2 for maps of surface and ground water monitoring points, from which samples were taken in 2021 to examine the quality of water. These points were selected to ensure collection of sufficient data for the proper monitoring of the background water quality in the area around and downstream the Krumovitsa River and its tributaries near the Ada Tepe minesite. The assay certificates are presented in Appendix 3 (digital format). The static water levels are provided.

Chemical tests are in place for water-soluble forms of the elements, which are provided on the front page of each test certificate by an accredited laboratory. The samples were tested in compliance with the laboratory's accreditation and ISO 11885:2007 was applied for water-soluble forms of water samples."

The sampling campaign for biotic index for macrozoobenthos and IPS index for phytobenthos – diatom algae took place in May 2021.

5. MONITORING DURATION AND FREQUENCY

Four sampling campaigns were conducted by an accredited laboratory in 2021 and the water assays for each monitoring point are shown in Table 4-1.2. The monitoring points that were dry at the time of sampling were marked as ‘dry’ in the sampling log. All water quality test results were reviewed against the regulated limits and the assay certificates are provided in Appendix 3 (in a digital format) for better clarity.

Surface water test results were reviewed against the standards under *Regulation #H-4/ 14.09.2012 for Surface Water Characterization* (as amended from time to time) and the *Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants.*

Results from groundwater tests were reviewed against the groundwater quality standards under *Regulation № 1/10.10.2007 on Groundwater Exploration, Use and Protection*. Appendix 3 provides the asays of the tested surface and groundwater monitoring points (MP).

6. TERMS OF USE OF THE MONITORING SYSTEM

The terms of use of the monitoring system are related to the operating cycle of the mine. The open pit and crusher operations are based on three 8-hour shifts a day, 7 days a week. The processing of crushed ore is a continuous operation based on three 8-hour shifts a day, 7 days a week.

The internal monitoring will go in parallel with the mine operations for the entire period from the approval date of the monitoring plan through mine operation and closure.

7. MONITORING DATA ANALYSIS AND REPORTING FORMAT

- The Company submits the internal monitoring results to the Director of the East Aegean Catchment Area Directorate by March 31 in compliance with art. 174 of the Waters Act, and to the Regional Environment and Waters Inspectorate within the deadlines specified in the respective permits issued under the Waters Act;
- Details of the internal monitoring system including the description of the Internal Monitoring Plan (locations, parameters and sampling frequency) and the monitoring results are published on the Company website (in Bulgarian and English).
- By March 31 of each project year, the Company sends a report with the results of the Water Quality Monitoring Plan in English to the Greek Ministry of Environment, Energy and Climate Change. The report includes a full description of the points from which samples are taken (location, etc.), tested parameters, analytical methods and comparison of these data against the emission limit values. The same report in Bulgarian and English is submitted to the Bulgarian Ministry of Environment and Waters.
- The results from the internal water monitoring are provided to the Krumovgrad Municipality.

The analysis of water monitoring data includes a comparison of the water sample assays against the standards for surface, waste and groundwater quality, which are regulated by the by-laws to the Waters Act, and the permit limits under the current water use/discharge permits.

8. CRITERIA FOR TIMELY NOTIFICATION

The criteria for timely notification are:

- upon scheduled shutdowns of the wastewater treatment facility;
- upon emergency shutdowns of the wastewater treatment facility;
- upon unavoidable discharge of wastewaters in an emergency without prior treatment;
- in an emergency leading to unavoidable pollution of surface and ground waters.

If one or more of the above emergencies endangering surface and groundwater quality occurs, notifications and details about the emergency response must be sent to:

- the East Aegean Catchment Area Directorate,
- the Haskovo REWI,
- the Kardzhali Regional Health Inspectorate;
- the Krumovgrad Municipality;
- the Kardzhali District Governor;
- other authorities as directed in the Site Emergency Response Plans.

9. FUNCTIONAL LINES FOR PROVISION OF MONITORING INFORMATION

All water monitoring data are kept with DPMK's Environmental Department in the form of records, databases with assay results, and data sheets.

Annual Monitoring Reports are prepared for each calendar year Copies of the annual monitoring reports are available in Bulgarian and in English on the corporate website at https://www.dundeeprecious.com/English/Operating-Regions/Current-Operations/Ada-Tepe/Documents/default.aspx

10. OTHER REQUIREMENTS REGARDING THE CONTENTS OF THE PLAN

To date, there are no other requirements except those already outlined.

11. RESULTS FROM THE IMPLEMENTATION OF THE MONITORING PLAN

Water sampling and assays were performed by the Eurotest Control accredited laboratory four times in March, June, September and December 2021. Samples were taken from surface waters from the Krumovitsa River and its tributaries, and from groundwater sources, including drinking water abstractions prior to treatment. The accumulation of data on water quality and quantity will enable a more precise impact assessment of the mining and processing operations in the future.

The assay results including a spreadsheet for all monitoring locations are are presented as Appendix 3.

Surface Waters

The water quality of the Krumovitsa River and its tributaries was tested at 10 points in 2021. Surface waters were tested 4 times in March, June, September and December for indicators listed in Section 4.1. of this Report.

According to Regulation № H-4, the river water status falls within four river categories - mountain rivers (R1, R2, R3), semi-mountain rivers (R4, R5) + conditional spring-type rivers(R15), plain rivers (R7, R8, R12, R13), intermittent and Black sea type of rivers (R9, R10, R11, R14). The Krumovitsa River and its tributaries belong to the intermittent type, Code R14b. The environmental assessment of any water body (provided that there are at least 4 assays per year – one for each season) is based on the **average annual values (AAV)**.

The observations at the surface water monitoring locations are as follows:

- MP #1 (ESW 01) – Krumovitsa River, point of origin (confluence of Egrechka River and Kessebirdere) This point is situated 200m south from the minesite and indicates background levels. It indicates the water quality of the waters of the Upper Krumovitsa upstream of the mine site but close to its the southern part.

  Based on the physico-chemical indicators of 'excellent' quality for intermittent type of rivers (such as the Krumovitsa) and the quality standards for chemical elements and other substances for internal (national) surface waters (AAV-EQS) under Regulation #H-4/14.09.2012 on Surface Water Characterisation, there was one non-compliant assay for aluminum of 60 µg/L, which exceeded the MAC of 25 µg/L and, consequently, the AAV-EQS of 18.4 µg/L exceeded the AAV of 15 µg/L. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants.

  In May 2021, the Executive Environment Agency through its Smolyan Regional Laboratory took samples for laboratory analysis, assessing macrozoobenthos and phytobenthos as BQEs. The results indicated good status of the IPS index and good status of the biotic index.

  Sampling took place on Jan. 21, Jun. 2, Jul. 1, Sep. 29 and Dec. 8, 2021 (The assay certificates are provided as Appendix #3)

- MP #2 (ESW 02) – Krumovitsa River upstream of Krumovgrad. It indicates the water quality upstream of Krumovgrad.

  The assays did not exceed the regulated limits based on the physico-chemical indicators of 'excellent' quality for intermittent type of rivers (such as the Krumovitsa) and the quality standards for chemical elements and other substances for surface waters produced internally (AAV-EQS) under Regulation #H-4/ 14.09.2012 on Surface Water Characterisation. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants.

  The MP has been selected to monitor the background levels of the elements in Upper Krumovitsa upstream of Krumovgrad and was included in the new Water Monitoring Plan in 2019. In 2021, sampling took place on Jan. 22, Jun. 2 and Dec. 12. There is no fourth sample because the MP was dry in March 2021 and could not be sampled.

- MP #3 (ESW 03) – Kessebirdere downstream of Sinap hamlet, upstream of confluence with Egrechka River

  The location of this MP is 600 m to the east of Sinap village. Its purpose is to gather data about any pollution in the water catchment area of Kessebirdere.

  Three samples were tested in the reporting period – the MP could not be sampled in the summer because it was dry. Based on Regulation #H-4/14.09.2012 on Surface Water Characterisation, there was one non-compliant assay for aluminum of 111 µg/L, which exceeded the MAC of 25 µg/L and, consequently, the AAV-EQS of 43.3 µg/L exceeded the AAV of 15 µg/L. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants.

The quality was ‘excellent’ based on all physico-chemical indicators except for BOD5, which classified as ‘good’. The assay certificates are provided as Appendix 3.

- MP #4 (ESW 04) – Egrechka River upstream of confluence with Kessebirdere

  The location of this MP is 500 m to the south of the Process Plant. Its purpose is to gather data about any pollution in the water catchment area of the Egrechka River. This is a background monitoring point, since it is located above the mine site.

  Four water samples were assayed in 2017. Based on Regulation #H-4/14.09.2012 on Surface Water Characterisation, there was one non-compliant assay for aluminum of 104 µg/L, which exceeded the MAC of 25 µg/L and, consequently, the AAV-EQS of 31 µg/L exceeded the AAV of 15 µg/L.

  The quality of the water body was ‘excellent’ based on all physico-chemical indicators. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants. The assay certificates are provided as Appendix 3.

- MP #5 (ESW 05) – Buyukdere upstream of confluence with Krumovitsa River

  The purpose of this point is to gather data about any pollution generated by the hamlets in the watershed and ultimately reporting to the Krumovitsa River. Buyukdere is a right-bank tributary of the Krumovitsa River. Three samples were tested in the reporting period – the MP could not be sampled in the summer because it was dry. Based on Regulation #H-4/14.09, 2012 on Surface Water Characterisation, there was one non-compliant assay for aluminum of 31 µg/L, which exceeded the MAC of 25 µg/L and, consequently, the AAV-EQS of 16 µg/L exceeded the AAV of 15 µg/L. The quality of the water body was ‘excellent’ based on all physico-chemical indicators.

  The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants. The sampling logs are provided as Appendix 3.

- MP #6 (ESW 06) – Kaldzhikdere upstream of the bridge at Pobeda hamlet of Ovchari village.

  It indicates the water quality in the upper portion of the gully upstream of the intersection with the site access road and the site itself.

  Three samples were tested in the reporting period – the MP could not be sampled in the summer because it was dry. Based on Regulation #H-4/14.09, 2012 on Surface Water Characterisation, there was one non-compliant assay for manganese of 646 µg/L and, consequently, the AAV-EQS of 219.5 µg/L exceeded the AAV of 50 µg/L.

  The quality was ‘excellent’ based on all physico-chemical indicators. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants. Sampling took place on Mar. 29, Jun. 2, Jul. 1, Sep. 29 and Dec. 9, 2021. The assay certificates are provided as Appendix 3.

- MP #7 (ESW 07) – Kaldzhikdere upstream of confluence with Krumovitsa

  The location of this MP is 300 m to the N-NE of the confluence point of Kaldzhikdere and the Krumovitsa River. The waters in this gully are directly associated with the runoff from the Ada Tepe hill. The purpose of this point is to gather data about any pollution generated by the mine site and the residential areas in the watershed and ultimately reporting to the Krumovitsa River.

  Three samples were tested in the reporting period – the MP could not be sampled in the summer because it was dry. The assays were compliant with the AAV-EQS under Regulation № H-4/4.09.2012 on surface water characterization.

  The quality was 'excellent' based on all physico-chemical indicators. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants. The assay certificates are provided as Appendix 3.

- MP #8 (ESW 08) – Krumovitsa River downstream of the North Sump of the IMWF.

  Four water samples were assayed in the reporting year. Based on Regulation #H-4/14.09, 2012 on Surface Water Characterisation, there were two non-compliant assay for aluminum of 72 µg/L and 310 µg/L which exceeded the MAC of 25 µg/L and, consequently, the AAV-EQS of 97.5 µg/L exceeded the AAV of 15 µg/L, and one non-compliant assay for iron of 974 µg/L and, consequently, the AAV-EQS of 250 µg/L exceeded the AAV of 100 µg/L. The quality was 'excellent' based on all physico-chemical indicators.

  The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants. Sampling took place on Jan. 22, Jun. 2, Jul. 1, Sep. 29 and Dec. 9, 2021.

  In May 2021 Executive Environment Agency through its Smolyan Regional Laboratory took samples for laboratory analysis, assessing macrozoobenthos and phytobenthos as BQEs. The results indicated good status of the IPS index and moderate status of the biotic index. The assay certificates are provided as Appendix 3.

- MP #9 (ESW 09) – Krumovitsa River 100m upstream of the wastewater discharge point

  The location of this MP is approximately 100m upstream of the discharge point. ESW 09 provides the reference levels for ESW 10. It indicates the quality of the Krumovitsa waters upstream of the discharge point of the site wastewater treatment facility.

  The MP was sampled 5 times during 2021. Based on Regulation #H-4/14.09, 2012 on Surface Water Characterisation, there was one non-compliant assay for aluminum of 73 µg/L, which exceeded the MAC of 25 µg/L and, consequently, the AAV-EQS of 17.8 µg/L exceeded the AAV of 15 µg/L. The quality was 'excellent' based on all physico-chemical indicators except for BOD5 and Total Nitrogen, which classified as 'good'. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants.

In May 2021, the Company commissioned the Executive Environment Agency through its Smolyan Regional Laboratory to take samples for laboratory analysis to assess macrozoobenthos and phytobenthos as BQEs. The results indicated good status of the IPS index and moderate status of the biotic index.

Sampling took place on Mar. 29, Jun. 2, Jul. 1, Sep. 29 and Dec. 8, 2021. The assay certificates are provided as Appendix 3.

- MP #10 (ESW 10) – Krumovitsa River 100m downstream of the wastewater discharge point

  The location of this MP is at the Krumovitsa River, approximately 100m downstream of the discharge point. The purpose of monitoring is to assess the impact of any treated water discharge on the river water quality. The point was sampled 5 times during the reporting period.

  Based on Regulation #H-4/14.09, 2012 on Surface Water Characterisation, there were one non-compliant assay for aluminum of 59 µg/L and 310 µg/L which exceeded the MAC of 25 µg/L and, consequently, the AAV-EQS of 17.2 µg/L exceeded the AAV of 15 µg/L, and one non-compliant assay for manganese of 317 µg/L and, consequently, the AAV-EQS of 65.3 µg/L exceeded the AAV of 500 µg/L.

  The quality was 'excellent' based on all physico-chemical indicators except for BOD5, Total Nitrogen and Nitrogen in Ammonium Ion, which classified as 'good'. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants. Sampling took place on Jan. 22, Jun. 2, Jul. 1, and Sep. 29 and Dec. 8, 2021.

  In May 2021, the Company commissioned the Executive Environment Agency through its Smolyan Regional Laboratory to take samples for laboratory analysis to assess macrozoobenthos and phytobenthos as BQEs. The results indicated good status of the IPS index and moderate status of the biotic index. The assay certificates are provided as Appendix 3.

<u>Groundwaters</u>

The monitoring at these points enables the company to track changes in static water levels and chemical composition of groundwaters. This allows collection of data, which can be used for comparison and assessment of possible indirect impacts of the mine operations on the groundwaters.

Groundwater sampling was conducted in line with the Monitoring Schedule.

The collection of data about the static groundwater levels continued in 2021 and the data is provided in Appendix 3, together with a brief analysis of their dynamics. The monitoring at these points enables the company to track the dynamics of the static water levels and the chemical composition of groundwaters. This allows collection of data, which can be used for comparison and assessment of possible indirect impacts of the mine operations on the groundwaters. The static groundwater levels variances are dictated by the recharge conditions

and seasonal climatic conditions. Our analysis indicates that there is no direct link between water levels measured in various piesometers. However, all of them are directly dependent on recharge from precipitation.

The following groundwater monitoring points were sampled and assayed:

- MP #11 (Borehole EGW 01) – This is a new MP, which was constructed at the end of 2019, and its location is to the NE of the site and covers the fissure flows towards the Krumovitsa River from the entire NE sector of Ada Tepe. It is located in Eocene sandstones and conglomerates. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.

  Samples assayed in 2021 highlighted certain deviations from the quality standard under Regulation #1/2010 on Groundwater Exploration, Use and Protection.

2021 Dynamics and Deviations by Parameters and Date Relative to Water Levels

Parameter	Quality Standard under Regulation #1/2010	Assay by an Accredited Laboratory on 23.03.2021 at GW Level of 2.62 m*	Assay by an Accredited Laboratory on 01.06.2021 at GW Level of 2.67 m*	Assay by an Accredited Laboratory on 16.09.2021 at GW Level of 4.19 m*	Assay by an Accredited Laboratory on 08.12.2021 at GW Level of 3.11 m*
Sodium	< 200 mg/l	120 ± 7	229 ± 14	243 ± 15	130 ± 8
Ammonium	< 0.5 mg/l	1.14 ± 0.06	2.4 ± 0.1	2.6 ± 0.1	1.4 ± 0.1
Iron	200 µg/L	477 ± 48	139 ± 14	134 ± 13	32 ± 3
Manganese	50 µg/L	189 ± 19	90 ± 9	50 ± 5	175 ± 18
Petroleum products	50 µg/L	<20	78 ± 8	50 ± 5	34 ± 3

  The excedance of ammonium is due to the fact that the borehole is located close to agricultural land. Excessive levels are explained by the use of ammonium fertilizers from the farmers.

- MP #12 (Borehole EGW 02) is a well, which is located E-NE of the open pit at the foot of the slope (in Chobanka hamlet), and covers groundwaters flowing in Palaeocene breccio-conglomerates and sandstones (Krumovgrad Group), draining to E-NE to the Krumovitsa. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.

  The laboratory analysis of the collected samples indicated one non-compliant assay for Arsenic in the sample collected on Dec. 12, 2021. The rest of the assayed parameters met the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection. Sampling took place on Mar. 29, Jun. 2, Sep. 29 and Dec. 9, 2021.

- MP #13 (Borehole EGW 03) is located in the metamorphic complex (metagranites and granite-gneiss) on the west slope of Ada Tepe and its purpose is to monitor groundwater flowing towards Kardzhikdere from the drainage area on the west slope of the deposit. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex. It is a new borehole, which was completed at the end of 2019.

  The laboratory analysis of the samples collected in 2021 indicated one non-compliant assay for Manganese in the sample collected on Jun. 4, 2021. The rest of the assayed parameters met the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection.

- MP #14 (Borehole EGW 04) is set up in the metamorphic rocks on the slope descending to the Krumovitsa River terrace and covers groundwater flowing south, downstream of the mining waste facility. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.

  The laboratory analysis of the collected samples indicated one non-compliant assay for Manganese in the sample collected on Sep. 29, 2021. The rest of the assayed parameters met the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection.

- MP #15 (Borehole EGW 15), Krumovgrad drinking water abstraction, constructed the in the alluvials of the Krumovitsa River. It indicates any derogation of the quality of the groundwater for potable and domestic use prior to treatment. The purpose of monitoring is to indicate the water quality of the Quaternary aquifer of BG3G000000Q010 Interstitial Groundwaters in the Arda River Quaternary Deposits.

  The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection.

  In 2021, there were no exceedances of the limits under Regulation #1/2010 on Groundwater Exploration, Use and Protection.

- MP #16 (Borehole EGW 06) Ovchari-Krumovgrad II drinking water abstraction, constructed the in the alluvials of the Krumovitsa River. It indicates any derogation of the quality of the groundwater for potable and domestic use prior to treatment. The purpose of monitoring is to indicate the water quality of the Quaternary aquifer of BG3G000000Q010 Interstitial Groundwaters in the Arda River Quaternary Deposits.

  The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection.

- MP #17 (Borehole EGW 07), a prprietary abstraction well, constructed the in the alluvials of the Krumovitsa River. It indicates any derogation of the quality of the groundwater for potable and domestic use prior to treatment. The purpose of monitoring is to indicate the water quality of the Quaternary aquifer of BG3G000000Q010 Interstitial Groundwaters in the Arda River Quaternary Deposits.

  The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection.
  A water supply system with a chlorination system and a UV sterilisation system was commissioned in 2019. Samples were collected and assayed in 2021 in compliance with the requirements of Regulation #9/16.03.2001 on the Drinking and Household Water Quality. No exceedances were identified.
  The microbiological analysis confirmed that the tested indicators were compliant with Regulation 9/16.03.12001 on the Municipal and Drinking Water Quality despite some minor Enterocicci deviations.

- MP #18 (EGW 08) – It is a new borehole, which was completed at the end of 2019. A monitoring borehole high at Ada Tepe, a reference point upstream of the IMWF. It is set in a metamorphic complex – metagranites and gneisses with rare interfingering with schists. The groundwater is fissure-flow type, draining in the direction of the Krumovitsa River. The purpose of monitoring is to indicate the background levels in the groundwater flowing towards the IMWF.

  The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection except for a single non-compliant assay for Manganese.
  The pH in all the samples taken was below 6.5.

- MP #19 (EGW 09) – It is a new borehole, which was completed at the end of 2019. It is located at the toe of the IMWF North Valley between the North Sump and the Krumovitsa River. It is set in a metamorphic complex – metagranites and gneisses with rare interfingering with schists. The groundwater is fissure-flow type, draining in the direction of the Krumovitsa River. The purpose of monitoring is to indicate the quality of the groundwater flow downstream of the IMWF.

  The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection except for the elevated levels of Sulphates and one non-compliant assay for Calcium.

- MP #20 (EGW 10) – It is a new borehole, which was completed at the end of 2019. It is located at the toe of the IMWF South Valley between the South Sump and the Krumovitsa River. It is set in a metamorphic complex – metagranites and gneisses with rare interfingering with schists. The groundwater is fissure-flow type, draining in the direction of the Krumovitsa River. The purpose of monitoring is to indicate the quality of the groundwater flow downstream of the IMWF.

  The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection except for the following non-compliant assays:

2021 Dynamics and Deviations by Parameters and Date Relative to Water Levels

Parameter	Quality Standard under Regulation #1/2010	Assay by an Accredited Laboratory on 23.03.2021 at GW Level of 12.56 m	Assay by an Accredited Laboratory on 01.06.2021 at GW Level of 12.32 m	Assay by an Accredited Laboratory on 16.09.2021 at GW Level of 14.38 m	Assay by an Accredited Laboratory on 08.12.2021 at GW Level of 11.41 m*
Manganese (Mn)	50 µg/L	1298 ± 65	728 ± 73	1460 ± 73	386 ± 39
Iron	200 µg/L	1367 ± 68	1827 ± 91	735 ± 74	43 ± 4
Petroleum products	50 µg/L	111 ± 6	25 ± 3	<20	<20

- MP #21 (EGW 11) – Zvanarka drinking water abstraction. The wells abstract waters from sources outside of the Krumovitsa gravels. They drain the flows in the Paleogene sediments. The purpose of monitoring is to indicate the quality of the water for potable and domestic use prior to treatment

The laboratory analysis of the water samples from the pump station indicates that the ion levels are compliant with Regulation 1/2010 on Groundwater Exploration, Use and Protection.

- MP #22 (EGW 12) – A tube well of the pump station at Guliika village. It is constructed in the alluvial deposits of the Krumovitsa River. The purpose of monitoring is to indicate the quality of the water for potable and domestic use prior to treatment

  The laboratory analysis of the water samples from the pump station indicates that the ion levels are compliant with Regulation 1/2010 on Groundwater Exploration, Use and Protection.

- MP #23 (EGW 13) – It is a new borehole, which was completed at the end of 2019. It is set up in the metamorphic rocks to the NW of the open pit. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.

  The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection except for the following non-compliant assays:

2021 Dynamics and Deviations by Parameters and Date Relative to Water Levels

Parameter	Quality Standard under Regulation #1/2010	Assay by an Accredited Laboratory on 23.03.2021 at GW Level of 2.57 m	Assay by an Accredited Laboratory on 01.06.2021 at GW Level of 2.64 m	Assay by an Accredited Laboratory on 01.06.2021 at GW Level of 2.64 m	Assay by an Accredited Laboratory on 08.12.2021 at GW Level of 2.78 m
Manganese (Mn)	50 µg/L	2.0 ± 0.2	432 ± 43	706 ± 71	328 ± 33
Iron	200 µg/L	18 ± 2	188 ± 19	1295 ± 65	8.7 ± 0.9

- MP #24 (EGW 14) – It is a new borehole, which was completed at the end of 2019. The point is set up to the east of the ROM Pad. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.

  The point was dry during the four sampling campaigns in 2021 and therefore no samples for laboratory analysis were collected.

- MP #25 (EGW 15) – It is a new borehole, which was completed at the end of 2019. The monitoring point is set up to the west of the open pit. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.

  The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection except for two non-compliant assays – one for Nickel and one for Petroleum Products.

- MP #26 (EGW 16) – It is a new borehole, which was completed at the end of 2019. The monitoring point is set up to the west of the open pit. The purpose of monitoring is to indicate the water quality of BG3G000PtPg049 – Fissure-Flow Groundwater, East Rohodope complex.

The laboratory analysis indicates that the tested parameters meet the quality standards under Regulation #1/2010 on Groundwater Exploration, Use and Protection. There was one non-compliant assay for Manganese and the Petroleum Products levels were close to the EQS limit.

The point was sampled only three times in 2021 because it was dry on Dec. 8, 2021.

After the confirmation of the non-compliant assays for Petroleum Products in the new groundwater piesometers and the analysis of the causes for those exceedances, which was conducted by a certified hydrologist, the Company developed measures and took steps to clean the piesometers, using purpose-built equipment. The cleaning campaign results indicated that the Petroleum Products levels dropped significantly at the affected locations and confirmed that the method was successful. The results for 2021 support the above conclusion.

Wastewater

- MP #27 (EWW 02) at discharge of the Wastewater Treatment Plant (for mixed wastewater types). Monitoring of water quantity and quality prior to discharge into the Krumovitsa River.

In 2021, a total of 37,220 m³ of treated wastewaters were discharged from the site to the Krumovitsa River as excess (surplus) water generated by heavy rains.

A Water Sampling Record (from Monitoring Point #27) is presented in Appendix 3. Results show no exceeding of individual emission limits under Water Body Use Permit #33140269/09.09.2021 for wastewater discharge into surface waters for site operational needs.

On 20.04.2021 REWI-Haskovo conducted planned site inspection and emission control during water discharge time. Inspectors took a water sample from the WTP's discharge point.

On 25.01.2022 REWI-Haskovo conducted a site inspection. Report findings stated no discharge of treated wastewater and hence no water sample was taken. REWI experts received a copy of Record # 3595/22.02.2021 issued by an accredited lab with test results from WTP downstream water sampling during the discharge period.

Following these inspections, the Company has not received any environmental sanctions or found non-compliant under the terms of related Permits.

12. ASSESSMENT OF THE EFFICIENCY OF THE MONITORING NETWORK IN 2021

Efficiency

The current site monitoring design proves to be a good tool for characterisation of the surface waters and groundwaters in the area of the Ada Tepe deposit and gives a good indication of any potential changes in the hydrodinamic and hydrochemical conditions. The review of the monitoring data brings the following conclusions about the efficiency of the monitoring system:

- The location of the monitoring points makes it possible to evaluate the current water status, providing the option for comparison with a potential future contamination of surface and groundwaters as a result of the Krumovgrad Gold Project operation based on data of the hydrogeological and hydrochemical conditions near the contour of the mine, which feature various types of groundwaters that geologically relate in some way to the Ada Tepe mineralisation and the strata beneath it;
- In addition the physico-chemical parameters for surface water, the following BQEs are also monitored at ESW 01, ESW 08, ESW 09 and ESW 10: Macrozoobenthos-based biotic index (Methods for Monitoring of Macrozoobenthos in Rivers as a Biological Element (Biotic and Trophic Index)) and IPS index for phytobenthos – diatom algae (Methods for Monitoring of Phytobenthos in Rivers as a Biological Element (IPS Index)). The results for 2021 are included in this Report.
- In the surface waters, an excessive content of some elements was reported in the points before the production site. The company took measures to establish the exceedances by assigning a team of experts to study and identify the source of pollution in the upper reaches of the river. It is due to be implemented in 2022 and the identified measures to address the non-compliance will be included in the 2022 report.
- The collection of data about the static water levels continues monthly.
- Pursuant to the requirements received by letter from the Ministry of Environment and Water issued on 26-00-552 / 28.06.2021, the Company developed a *Methodology for implementation of measures to establish the causes of pollution and deterioration of water.* The report for 2021 has been prepared in accordance with the approach and measures in the prepared methodology.
  For instance: in the newly built groundwater points, the Company assigned to a qualified hydrogeologist an analysis of the reasons that led to the identified exceedances, based on which measures and deadlines were developed to restore normal values, using specialized equipment to clean the inner tube of the piezometers, where the presence of staining was detected. After two cleaning of the affected piezometers, in 2021 the results showed that the cleaning gave the expected result and the values are within the permissible norms according to Ordinance №1 / 2010 for research, use and protection of groundwater.

13. CONCLUSION

The summary of the laboratory analyses conducted in 2021 and the review against the quality standards under Regulation No H-4/ 14.09.2012 on Surface Water Characterization (as amended from time to time) and the priority substances under Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants and Regulation 1/2010 on Groundwater Exploration, Use and Protection brings to the following conclusions:

Surface waters:

- Krumovitsa River (Uppper Krumovitsa upstream of Krumovgrad) monitoring points ESW 01 and ESW 02:
  The assays did not exceed the regulated limits based on the physico-chemical indicators of ‘excellent’ quality for intermittent type of rivers (such as the Krumovitsa) and the quality standards for chemical elements and other substances for surface

waters produced internally (AAV-EQS) under Regulation #H-4/ 14.09.2012 on Surface Water Characterisation, except for Aluminum. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants;

- Tributaries of the Krumovitsa River (Egrechka River, Kesebir River, Buyuk Dere and Kaldjik Dere) monitoring points ESW 03, ESW 04, ESW 05 and ESW 06:
  The levels of the specific pollutant Aluminum (Al) exceeded the EQS in 2020 and 2021. Elevated levels were observed in the entire Krumovitsa watershed and the highest of them were recorded in the tributaries upstream of the Ada Tepe mine (Egrachka River and Kessebirdere). The levels in the rest of the tributaries (Buyukdere and Kaldzhikdere) were lower but still exceeded the regulated EQS.
  Elevated aluminum levels were also observed in monitoring point ESW 08, located between ESW 03, ESW 04 and ESW 05, ESW 06, i.e. ESW 08 has already been impacted by the upper tributaries of the Krumovitsa River (Egrechka ESW 04, Kessibir ESW 03). Single exceeding events for aluminum and iron have been registered in monitoring points ESW 03, ESW 04 и ESW 01 in the upper stream of the Krumovitsa River, as well as in ESW 08, incl. prior to the minesite's commissioning. Considering these circumstances and historic monitoring of Krumovitsa surface water quality, impact from the minesite has been ruled out.
  The levels gradually dropped down downstream of confluence with the Krumovitsa River; yet, exceedances were recorded at both ESW 09 and ESW 10 near Krumovgrad. The trend in the results from the site monitoring in 2016, 2017, 2018 and 2019 was the same. The Al levels were below detection in some months, below the EQS in other, and yet there were months when they exceeded the EQS in most of the Krumovitsa watershed, e.g. October 2017 and December 2018). The monitoring data do not point to the Ada Tepe site as the possible source of the aluminum pollution and the likely "culprit" are the elevated background levels of this element in the upper parts of the Krumovitsa watershed; In 2022 Dundee Precious Metals Krumovgrad EAD initiated a voluntary survey to establish any sources of pollution along the upper stream of the Krumovitsa River, upstream DPM's minesite. The Company assigned the survey to a team of experts and the survey itself was titled "Identifying the source of established elevated levels of certain elements (aluminum, manganese and iron) in surface waters in the upper stream of the Krumovitsa River, upstream of DPM's minesite. The experts found some historic mines in Krumovitsa's upper watershed. Based on this information, the experts drafted and implemented a Monitoring Program covering the necessary number of monitoring points. Their location was chosen in consideration of the potential historic impact of former local mines. Monitoring results showed that elevated aluminum levels were measured in monitoring points close to old asbestos and chromite ore mines. These former mines have never been rehabilitated and currently represent a potential source of environmental pollution. The chromite ore mine is in close proximity to the upper stream of the Krumovitsa River.
  DPM Krumovgrad EAD cannot and should not be held responsible for historic mines operated in the past by other legal persons. Field survey conducted by the experts has now been completed and a comprehensive report shall be presented by end 2022. A copy of it shall be submitted to the MoEW by 31.03.2023 together with the 2022 Water Report.

- Krumovitsa River (Lower Krumovitsa, 100 m upstream and downstream of discharge of untreated sewage from Krumovgrad) monitoring point ESW 09 and ESW 10:

The quality was ‘excellent’ based on all physico-chemical indicators except for BOD_5, Total Nitrogen and Nitrogen in Ammonium Ion, which classified as ‘good’. Single exceeding events for MACs of Aluminum and Manganese under Regulation #H-4/14.09, 2012 on Surface Water Characterisation were noted. The assays were compliant with the MAC under the Regulation on Environmental Quality Standards for Priority Substances and Some Other Pollutants;

- Typical deviations from the regulated levels were observed for Nitrogen and Phosphorus (biogenic elements), Dissolved Oxygen and BOD_5 at ESW 09 and ESW 10 near Krumovgrad. The cause of those deviations are the discharges of untreated sewage from two of the Krumovgrad main sewers immediately upstream of the MPs. Typically, these deviations are observed in the low water periods in the summer and autumn and therefore have a specific impact on the BQEs that are indicators of a biogenic pollution depending on their life cycle. The biogenic load at both locations cannot be attributed to the Krumovgrad Gold Project operation based on the type, method and level of treatment in the WWTP (reverse osmosis) and the fact that DPMK reuse the wastewaters in production, which are discharged only in case of extreme storm events, due to heavy rainfall, and after prior treatment. The sewage generated on the site is treated in the site sewage treatment plant and the treated effluent is reused in production.

- Regarding these conclusions, it is necessary to seek information about other anthropogenic or natural sources of pollution. To be able to conduct a valid determination of the chemical status of the waters, DPMK will introduce a minimum monitoring frequency for priority substances in accordance with Annex V to the Water Framework Directive, which will be monthly (12 times a year). The focus of this monitoring will be the regulated EQS without exceeding them.

- The assessment of the ecological status of phytobenthos as a BQE indicated a steady trend of a ‘good’ status in all the monitoring locations upstream and downstream of the mine site. On one hand, those data confirm there was no toxic pollution (phytobenthos is sensitive to it), but on the other it should be noted that the samples were collected in the high water period in May, when the limits for physico-chemical parameters normally would not be exceeded. The phytobenthos life cycle is short, 20 to 30 days, and therefore the communities can recover quickly shortly after an occasional pollution episode provided that sufficient flow is available. That could explain the ‘good’ status of this BQE even downstream of the discharge from the Krumovgrad main sewers, although it is most sensitive to biogenic pollution. This conclusion indicates that despite the compliance with the BQE assessment methodology, additional samples must be collected during low flows in the summer period (before the river ceases to flow). The purpose is to collect sufficient information and data to reject all doubts and ensure tracking. For 2022 DPM Krumovgrad plans to conducted two sampling and analysis of BEC, phytobenthos.

Groundwaters

- A total of 16 monitoring boreholes, which are described in the approved Site Water Monitoring Plan, have been set up in the Ada Tepe area to assess the chemical status of the groundwaters there. Where there is water, the monitoring points were sampled and assayed in 2021.

- Groundwater quality in the monitoring locations is associated with the mineralogy of the specific strata intersected by each borehole, and the strata the monitored flows go through before reporting to the MP. Evident from the information presented in this Report, there are elevated concentrations of certain metals, which may be a combination of the local mineralogy, corroded casings of old piesometers (which are no longer used for water monitoring, nor sampled), and borehole contamination during their development. Elevated ion levels were most frequently identified for Iron (Fe), Manganese (Mn) and occasionally Arsenic (As) and Petroleum Products.

- During the long-term monitoring of groundwater in the area, both in the years before the start of construction or mine activities by the Company, and during the construction and operation activities, the analyzes show exceedances of Iron (Fe), Aluminum (Al), Manganese (Mg) and rarely Petroleum Products and Arsenic (As) in different monitoring locations.

- The levels of certain elements such as Fe, Mn and As are expected to be naturally higher due to the fissure-flow type of the local groundwaters, and the infilling of fractures in the upper part of the metamorphic complex is naturally dominated by manganese and iron hydroxides. The elevated arsenic levels can be attributed to the pyritized carbon lenses in this complex and the subsequent oxidation processes, which may elevate the microelements of the pyrite association.

- In 2021, data were collected on the geochemistry of rocks and their association with the chemical composition of groundwater. After their treatment in 2022, a comparison of pore and crack waters will be made. A comparison of the two water bodies of Ada Tepe and the Krumovitsa River is forthcoming. Survey results confirm conclusions made as of this date, i.e. that certain elements display elevated groundwater levels considering local mineralogy. A comprehensive report on the survey shall be presented by 31.03.2023 together with the 2022 Water Report.

- The monitoring of the water abstractions for potable and domestic use did not indicate exceedances of the limits under Regulation #1/2010 on Groundwater Exploration, Use and Protection.

Wastewater

- Monitoring Point 27 (EWW 02) at discharge of the Wastewater Treatment Plant (for mixed wastewater types). Monitoring of water quantity and quality prior to discharge into the Krumovitsa River.

- In 2021, a total of 37,220 m³ of treated wastewaters were discharged from the site to the Krumovitsa River as excess (surplus) water generated by heavy rains.
  A Water Sampling Record (from Monitoring Point #27) is presented in Appendix 3.
  Results show no exceeding of individual emission limits under Water Body Use Permit #33140269/09.09.2021 for wastewater discharge into surface waters for site operational needs.

- On 20.04.2021 REWI-Haskovo conducted planned site inspection and emission control during water discharge time. Inspectors took a water sample from the WTP's discharge point.

- On 25.01.2022 REWI-Haskovo conducted a site inspection. Report findings stated no discharge of treated wastewater and hence no water sample was taken. REWI experts received a copy of Record # 3595/22.02.2021 issued by an accredited lab with test results from WTP downstream water sampling during the discharge period.

- Following these inspections, the Company has not received any environmental sanctions or found non-compliant under the terms of related Permits.