



TESTING LABORATORY DIRECTORATE

EUROTEST CONTROL EAD

1797 Sofia, 16 G. M. Dimitrov Blvd., phone: (02) 9651 600;
phone/fax (02) 8720 596; www.eurotest-control.bg, e-mail: lgi@inet.bg

Accredited Testing and Calibration Laboratory
certified by the Bulgarian Accreditation Service, reg. No. 3-LIK, valid by Oct 31, 2011

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PROTOCOL OF TESTING

No. 4148/29.04.2010

- 1** Surface waters and groundwaters.....
(product name, type, make, etc.)
- 2** Company which requested the testing: Balkan Mineral and Mining EAD - the samples are provided by a representative of.....
- Eurotest Control EAD through protocol no. 369/13.04.2010 in accordance with BNS ISO 5667.....
(name and address of the company, no. and date of the protocol for collection of samples)
- 3** Method of testing: BNS 3424/81; BNS EN 27888/00; BNS 3775/87; BNS 17.1.4.04/80; ISO 6060/89;
BNS ISO 7150-1/02; BNS EN ISO 10304-1/09; BNS EN ISO 6878/05; BNS 15398/81; BNS 15551/82;
BNS EN 1483/07; ISO 11083/94; BNS EN ISO 11885/09 – the parameters are specified in item 7.1 of the protocol
(name and no. of the standards or validated methods)
- 4** Date of receipt of the samples for testing in the laboratory, request ref. no. 519/15.04.2010
- 5** Number of tested samples: 5 water samples collected from groundwaters, Ada Tepe area, Krumovgrad Region.....
(production no., number, and mass of the samples, number of samples shipments, import invoice no., date of production)
- 6** Date/period of the testing: Apr 15, 2010 to Apr 29, 2010.....

DIRECTOR OF

TESTING LABORATORY DIRECTORATE:.....

Yu. Akrabova

7. TEST RESULTS

7.1. Testing/measurements within the scope of accreditation

| # | Parameter | Unit of measurement | Standards/validated methods | Sample no. according to Sample Logbook | Test results (value, below detection) | Parameter value and tolerance | Test conditions |
|----|---|-----------------------------------|-----------------------------|---|---------------------------------------|-------------------------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | pH | pH units | BNS 3424/81 | Water sample PV-001, lab no. 917, from surface waters - Ada Tepe area, Krumovgrad region | 8.31 ± 0.10 | - | Standard |
| 2 | Electrical conductivity | µS/cm | BNS EN 27888/00 | | 206 ± 6 | - | Standard |
| 3 | Total hardness | mgeqv/dm ³ | BNS 3775/87 | | 146 ± 0.15 | - | Standard |
| 4 | Suspended solids | mg/dm ³ | BNS 17.1.4.04/80 | | 6 | - | Standard |
| 5 | Dissolved solids | mg/dm ³ | BNS 17.1.4.04/80 | | 124 ± 4 | - | Standard |
| 6 | COD (bichromatic) | mgO ₂ /dm ³ | ISO 6060/89 | | 11.0 ± 1.1 | - | Standard |
| 7 | Ammonium (NH ₄ ⁺) | mg/dm ³ | BNS ISO 7150-1/02 | | 0.025 ± 0.003 | - | Standard |
| 8 | Nitrites (NO ₂ ⁻) | mg/dm ³ | BNS EN ISO 10304- | | <0.05 | - | Standard |
| 9 | Nitrites (NO ₃ ⁻) | mg/dm ³ | BNS EN ISO 10304- | | <0.10 | - | Standard |
| 10 | Phosphates (PO ₄ ³⁻) | mg/dm ³ | BNS EN ISO 6878/05 | | <0.10 | - | Standard |
| 11 | Sulfates (SO ₄ ²⁻) | mg/dm ³ | BNS EN ISO 10304- | | 15.5 ± 1.6 | - | Standard |
| 12 | Chlorides (as Cl ⁻) | mg/dm ³ | BNS EN ISO 10304- | | 78 ± 0.8 | - | Standard |
| 13 | Sodium (Na) | mg/dm ³ | BNS 15398/81 | | 89 ± 0.9 | - | Standard |
| 14 | Potassium (K) | mg/dm ³ | BNS 15551/82 | | 14 ± 0.1 | - | Standard |
| 15 | Chromium (as Cr ⁶⁺) | mg/dm ³ | ISO 11083/94 | | <0.010 | - | Standard |
| 16 | Mercury (Hg) | mg/dm ³ | BNS EN 1483/07 | | <0.0010 | - | Standard |
| 17 | Cadmium (Cd) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 18 | Copper (Cu) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.0030 | - | Standard |
| 19 | Cobalt (Co) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 20 | Lead (Pb) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 21 | Aluminum (Al) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0503 ± 0.0050 | - | Standard |
| 22 | Iron (Fe) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.1344 ± 0.0134 | - | Standard |
| 23 | Zinc (Zn) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0020 ± 0.0002 | - | Standard |
| 24 | Manganese (Mn) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0067 ± 0.0007 | - | Standard |
| 25 | Arsenic (As) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 26 | Magnesium (Mg) | mg/dm ³ | BNS EN ISO 11885/09 | | 5.24 ± 0.52 | - | Standard |
| 27 | Calcium (Ca) | mg/dm ³ | BNS EN ISO 11885/09 | | 20.58 ± 2.06 | - | Standard |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | pH | pH units | BNS 3424/81 | Water sample PV-002, lab no. 918, from surface waters - Ada Tepe area, Krumovgrad region | 8.29 ± 0.10 | - | Standard |
| 2 | Electrical conductivity | µS/cm | BNS EN 27888/00 | | 603 ± 18 | - | Standard |
| 3 | Total hardness | mgeqv/dm ³ | BNS 3775/87 | | 617 ± 0.62 | - | Standard |
| 4 | Suspended solids | mg/dm ³ | BNS 17.1.4.04/80 | | 6 ± 1 | - | Standard |
| 5 | Dissolved solids | mg/dm ³ | BNS 17.1.4.04/80 | | 362 ± 11 | - | Standard |
| 6 | COD (bichromatic) | mgO ₂ /dm ³ | ISO 6060/89 | | 8.4 ± 0.8 | - | Standard |
| 7 | Ammonium (NH ₄ ⁺) | mg/dm ³ | BNS ISO 7150-1/02 | | 0.117 ± 0.012 | - | Standard |
| 8 | Nitrites (NO ₂ ⁻) | mg/dm ³ | BNS EN ISO 10304- | | <0.05 | - | Standard |
| 9 | Nitrites (NO ₃ ⁻) | mg/dm ³ | BNS EN ISO 10304- | | <0.10 | - | Standard |
| 10 | Phosphates (PO ₄ ³⁻) | mg/dm ³ | BNS EN ISO 6878/05 | | <0.10 | - | Standard |
| 11 | Sulfates (SO ₄ ²⁻) | mg/dm ³ | BNS EN ISO 10304- | | 78.2 ± 7.8 | - | Standard |
| 12 | Chlorides (as Cl ⁻) | mg/dm ³ | BNS EN ISO 10304- | | 12.5 ± 1.3 | - | Standard |
| 13 | Sodium (Na) | mg/dm ³ | BNS 15398/81 | | 16.0 ± 1.6 | - | Standard |
| 14 | Potassium (K) | mg/dm ³ | BNS 15551/82 | | 1.9 ± 0.2 | - | Standard |
| 15 | Chromium (as Cr ⁶⁺) | mg/dm ³ | ISO 11083/94 | | <0.010 | - | Standard |
| 16 | Mercury (Hg) | mg/dm ³ | BNS EN 1483/07 | | <0.0010 | - | Standard |
| 17 | Cadmium (Cd) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 18 | Copper (Cu) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0040 ± 0.0004 | - | Standard |
| 19 | Cobalt (Co) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 20 | Lead (Pb) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 21 | Aluminum (Al) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0537 ± 0.0054 | - | Standard |
| 22 | Iron (Fe) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0747 ± 0.0075 | - | Standard |
| 23 | Zinc (Zn) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 24 | Manganese (Mn) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0057 ± 0.0006 | - | Standard |
| 25 | Arsenic (As) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 26 | Magnesium (Mg) | mg/dm ³ | BNS EN ISO 11885/09 | | 22.09 ± 2.21 | - | Standard |
| 27 | Calcium (Ca) | mg/dm ³ | BNS EN ISO 11885/09 | | 87.1 ± 8.7 | - | Standard |

| # | Parameter | Unit of measurement | Standards/validated methods | Sample no. according to Sample Logbook | Test results (value, below detection) | Parameter value and tolerance | Test conditions |
|----|-----------------------------------|----------------------------|-----------------------------|---|---------------------------------------|-------------------------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | pH | pH units | BNS 3424/81 | Water sample PV-003, lab no. 919, from surface waters - Ada Tepe area, Krumovgrad region | 8.57 ± 0.10 | - | Standard |
| 2 | Electrical conductivity | $\mu\text{S}/\text{cm}$ | BNS EN 27888/00 | | 284 ± 9 | - | Standard |
| 3 | Total hardness | mg/dm^3 | BNS 3775/87 | | 250 ± 0.25 | - | Standard |
| 4 | Suspended solids | mg/dm^3 | BNS 17.1.4.04/80 | | <6 | - | Standard |
| 5 | Dissolved solids | mg/dm^3 | BNS 17.1.4.04/80 | | 171 ± 5 | - | Standard |
| 6 | COD (bichromatic) | mgO_2/dm^3 | ISO 6060/89 | | 7.0 ± 0.7 | - | Standard |
| 7 | Ammonium (NH_4^+) | mg/dm^3 | BNS ISO 7150-1/02 | | <0.013 | - | Standard |
| 8 | Nitrites (NO_2^-) | mg/dm^3 | BNS EN ISO 10304- | | <0.05 | - | Standard |
| 9 | Nitrites (NO_3^-) | mg/dm^3 | BNS EN ISO 10304- | | 0.62 ± 0.06 | - | Standard |
| 10 | Phosphates (PO_4^{3-}) | mg/dm^3 | BNS EN ISO 6878/05 | | <0.10 | - | Standard |
| 11 | Sulfates (SO_4^{2-}) | mg/dm^3 | BNS EN ISO 10304- | | 23.7 ± 2.4 | - | Standard |
| 12 | Chlorides (as Cl ⁻) | mg/dm^3 | BNS EN ISO 10304- | | 82 ± 0.8 | - | Standard |
| 13 | Sodium (Na) | mg/dm^3 | BNS 15398/81 | | 94 ± 0.9 | - | Standard |
| 14 | Potassium (K) | mg/dm^3 | BNS 15551/82 | | 16 ± 0.2 | - | Standard |
| 15 | Chromium (as Cr^{6+}) | mg/dm^3 | ISO 11083/94 | | <0.010 | - | Standard |
| 16 | Mercury (Hg) | mg/dm^3 | BNS EN 1483/07 | | <0.0010 | - | Standard |
| 17 | Cadmium (Cd) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 18 | Copper (Cu) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0034 ± 0.0003 | - | Standard |
| 19 | Cobalt (Co) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 20 | Lead (Pb) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 21 | Aluminum (Al) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0182 ± 0.0018 | - | Standard |
| 22 | Iron (Fe) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0168 ± 0.0017 | - | Standard |
| 23 | Zinc (Zn) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 24 | Manganese (Mn) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0015 ± 0.0002 | - | Standard |
| 25 | Arsenic (As) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 26 | Magnesium (Mg) | mg/dm^3 | BNS EN ISO 11885/09 | | 9.75 ± 0.98 | - | Standard |
| 27 | Calcium (Ca) | mg/dm^3 | BNS EN ISO 11885/09 | | 34.10 ± 3.41 | - | Standard |

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----|-----------------------------------|----------------------------|---------------------|---|---------------------|---|----------|
| 1 | pH | pH units | BNS 3424/81 | Water sample PV-004, lab no. 920, from surface waters - Ada Tepe area, Krumovgrad region | 8.36 ± 0.10 | - | Standard |
| 2 | Electrical conductivity | $\mu\text{S}/\text{cm}$ | BNS EN 27888/00 | | 555 ± 17 | - | Standard |
| 3 | Total hardness | mg/dm^3 | BNS 3775/87 | | 558 ± 0.56 | - | Standard |
| 4 | Suspended solids | mg/dm^3 | BNS 17.1.4.04/80 | | <6 | - | Standard |
| 5 | Dissolved solids | mg/dm^3 | BNS 17.1.4.04/80 | | 333 ± 10 | - | Standard |
| 6 | COD (bichromatic) | mgO_2/dm^3 | ISO 6060/89 | | 8.1 ± 0.8 | - | Standard |
| 7 | Ammonium (NH_4^+) | mg/dm^3 | BNS ISO 7150-1/02 | | <0.013 | - | Standard |
| 8 | Nitrites (NO_2^-) | mg/dm^3 | BNS EN ISO 10304- | | <0.05 | - | Standard |
| 9 | Nitrites (NO_3^-) | mg/dm^3 | BNS EN ISO 10304- | | 1.1 ± 0.1 | - | Standard |
| 10 | Phosphates (PO_4^{3-}) | mg/dm^3 | BNS EN ISO 6878/05 | | <0.10 | - | Standard |
| 11 | Sulfates (SO_4^{2-}) | mg/dm^3 | BNS EN ISO 10304- | | 75.3 ± 7.5 | - | Standard |
| 12 | Chlorides (as Cl ⁻) | mg/dm^3 | BNS EN ISO 10304- | | 125 ± 1.3 | - | Standard |
| 13 | Sodium (Na) | mg/dm^3 | BNS 15398/81 | | 172 ± 1.7 | - | Standard |
| 14 | Potassium (K) | mg/dm^3 | BNS 15551/82 | | 24 ± 0.2 | - | Standard |
| 15 | Chromium (as Cr^{6+}) | mg/dm^3 | ISO 11083/94 | | <0.010 | - | Standard |
| 16 | Mercury (Hg) | mg/dm^3 | BNS EN 1483/07 | | <0.0010 | - | Standard |
| 17 | Cadmium (Cd) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 18 | Copper (Cu) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0033 ± 0.0003 | - | Standard |
| 19 | Cobalt (Co) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 20 | Lead (Pb) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 21 | Aluminum (Al) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0106 ± 0.0011 | - | Standard |
| 22 | Iron (Fe) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0213 ± 0.0021 | - | Standard |
| 23 | Zinc (Zn) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0425 ± 0.0043 | - | Standard |
| 24 | Manganese (Mn) | mg/dm^3 | BNS EN ISO 11885/09 | | 0.0032 ± 0.0003 | - | Standard |
| 25 | Arsenic (As) | mg/dm^3 | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 26 | Magnesium (Mg) | mg/dm^3 | BNS EN ISO 11885/09 | | 20.92 ± 2.09 | - | Standard |
| 27 | Calcium (Ca) | mg/dm^3 | BNS EN ISO 11885/09 | | 77.2 ± 7.7 | - | Standard |

| # | Parameter | Unit of measurement | Standards/validated methods | Sample no. according to Sample Logbook | Test results (value, below detection) | Parameter value and tolerance | Test conditions |
|----|---|-----------------------------------|-----------------------------|---|---------------------------------------|-------------------------------|-----------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | pH | pH units | BNS 3424/81 | Water sample PV-005, lab no. 921, from surface waters - Ada Tepe area, Krumovgrad region | 8.56 ± 0.10 | - | Standard |
| 2 | Electrical conductivity | µS/cm | BNS EN 27888/00 | | 333 ± 10 | - | Standard |
| 3 | Total hardness | mgeqv/dm ³ | BNS 3775/87 | | 3.04 ± 0.30 | - | Standard |
| 4 | Suspended solids | mg/dm ³ | BNS 17.1.4.04/80 | | <6 | - | Standard |
| 5 | Dissolved solids | mg/dm ³ | BNS 17.1.4.04/80 | | 200 ± 6 | - | Standard |
| 6 | COD (bichromatic) | mgO ₂ /dm ³ | ISO 6060/89 | | 8.3 ± 0.8 | - | Standard |
| 7 | Ammonium (NH ₄ ⁺) | mg/dm ³ | BNS ISO 7150-1/02 | | <0.013 | - | Standard |
| 8 | Nitrites (NO ₂ ⁻) | mg/dm ³ | BNS EN ISO 10304- | | <0.05 | - | Standard |
| 9 | Nitrites (NO ₃ ⁻) | mg/dm ³ | BNS EN ISO 10304- | | 0.91 ± 0.09 | - | Standard |
| 10 | Phosphates (PO ₄ ³⁻) | mg/dm ³ | BNS EN ISO 6878/05 | | <0.10 | - | Standard |
| 11 | Sulfates (SO ₄ ²⁻) | mg/dm ³ | BNS EN ISO 10304- | | 36.3 ± 3.6 | - | Standard |
| 12 | Chlorides (as Cl ⁻) | mg/dm ³ | BNS EN ISO 10304- | | 8.5 ± 0.9 | - | Standard |
| 13 | Sodium (Na) | mg/dm ³ | BNS 15398/81 | | 11.0 ± 1.1 | - | Standard |
| 14 | Potassium (K) | mg/dm ³ | BNS 15551/82 | | 1.6 ± 0.2 | - | Standard |
| 15 | Chromium (as Cr ⁶⁺) | mg/dm ³ | ISO 11083/94 | | <0.010 | - | Standard |
| 16 | Mercury (Hg) | mg/dm ³ | BNS EN 1483/07 | | <0.0010 | - | Standard |
| 17 | Cadmium (Cd) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 18 | Copper (Cu) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0031 ± 0.0003 | - | Standard |
| 19 | Cobalt (Co) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.0010 | - | Standard |
| 20 | Lead (Pb) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 21 | Aluminum (Al) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0115 ± 0.0012 | - | Standard |
| 22 | Iron (Fe) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0193 ± 0.0019 | - | Standard |
| 23 | Zinc (Zn) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0522 ± 0.0052 | - | Standard |
| 24 | Manganese (Mn) | mg/dm ³ | BNS EN ISO 11885/09 | | 0.0070 ± 0.0007 | - | Standard |
| 25 | Arsenic (As) | mg/dm ³ | BNS EN ISO 11885/09 | | <0.010 | - | Standard |
| 26 | Magnesium (Mg) | mg/dm ³ | BNS EN ISO 11885/09 | | 10.66 ± 1.07 | - | Standard |
| 27 | Calcium (Ca) | mg/dm ³ | BNS ISO 6058/02 | | 43.26 ± 4.33 | - | Standard |

NOTE I: If required, the protocol of testing may include opinions and interpretations of the tests (conclusions are not allowed) only if compliant with the regulations in item 5.10.5 of BNS EN ISO/IEC 17025.

NOTE II: The test results refer only to the tested samples. Excerpts of the protocol of testing should not be copied without the written consent of the testing laboratory.

PERSONS WHO CARRIED OUT THE TESTING:
S. Dimitrova, Eng.
.....
V. Nedelcheva
.....
S. Mihaylova, Eng.

DEPARTMENT
MANAGER:.....
Hr. Stanchev, Eng.

DIRECTOR OF
TESTING LABORATORY
DIRECTORATE:
Yu. AkraBova