

**Report on the Mining Assets
of KGHM Polska Miedź S.A.
located within
the Legnica-Głogów Copper Belt Area**

September 2012

KGHM
POLSKA MIEDŹ S.A.

Report prepared by an internal team of KGHM Polska Miedź S.A.

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This report contains certain forward-looking statements concerning the business and operations of KGHM. These statements are based on the current knowledge, awareness or opinions of the Management Board of the Company and are subject to known and unknown risks and uncertainties, many of which are beyond KGHM's ability to control or predict. There can be no assurance that such statements will prove to be accurate, and future events, levels of activity, performance or achievements may be materially different from those expressed or implied by such forward-looking statements.

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1. Introduction

We are pleased to present to you the first report on the mining assets belonging to KGHM Polska Miedź S.A., located in the Legnica-Głogów Copper Belt (LGCB) area. Its publication responds to the increasing demand by capital market participants for information concerning the Company and its production potential.

KGHM Polska Miedź S.A., listed for 15 years on the Warsaw Stock Exchange, complies with all informational obligations according to the regulations and the best practices by public companies in Poland. The high standards demonstrated by the Company's published reports and financial information have been honored numerous times by Polish capital market institutions. Among others, the Company was honored in the competition for Best Annual Report for 2010, 2009, 2008 and 2007, organized by the Institute of Accounting and Taxation to promote recognized standards for annual reports applying IFRS/IAS, which encompass recommendations of the International Federation of Accountants (IFAC) and best practice in this area.

Consistent realisation of the strategy to grow the Company and enhance its value resulted in new mineral projects and the acquisition of the Canadian mining company Quadra FNX Mining Ltd. (currently KGHM International Ltd). Today, the KGHM Group is recognized as a global mining company possessing a diversified portfolio of mining assets located in safe jurisdictions.

To meet the demand for information by the world's mining and metals sector, the Company decided to publish this report, which for the first time presents comprehensive information on KGHM's mining assets (i.e. its existing mines as well as development and exploration projects) located in the LGCB and its vicinity.

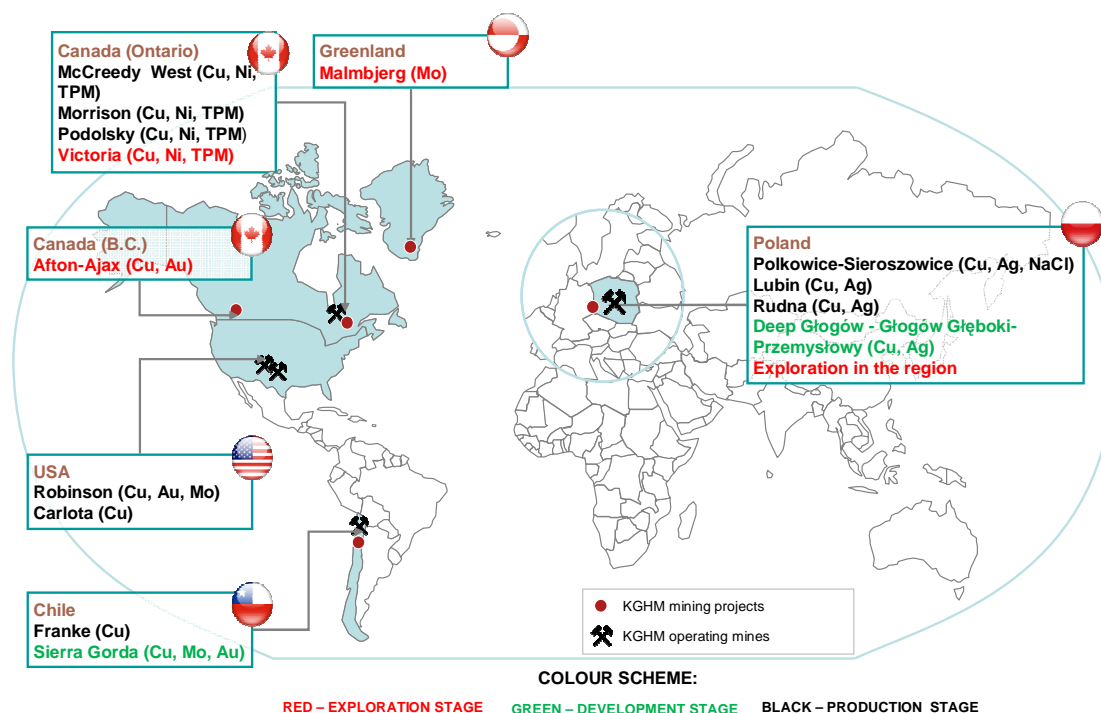
This report is not required by Polish market regulations. Nevertheless, given the leading position of the KGHM Group in the non-ferrous metals market (based on 2011 data, the Company is the 4th largest in the world in terms of mineral resources and reserves, 1st in terms of silver production, and 9th in terms of mined copper production) we decided it prudent to thoroughly describe the domestic mining assets of the Company to the broader global community of investors in the metals and mining sector.

Our next step will be to publish an independent technical report being prepared in compliance with Canadian standard NI 43-101 on the public disclosure of information relating to mineral properties. The report will cover the resources and reserves being currently mined or explored by KGHM, as well as the Company's future potential for copper ore resources located in the LGCB. In this manner we intend to work toward matching the standards of communication practiced by other companies operating throughout the world in the metals and mining sector based on the requirements of their respective listing authorities.

The report has been prepared by an internal team of KGHM Polska Miedź S.A.

The drawing below shows the locations of the mining assets of KGHM Polska Miedź S.A.

Drawing 1 Location of mining assets belonging to KGHM Polska Miedź S.A.



2. Mining assets in the LGCB region

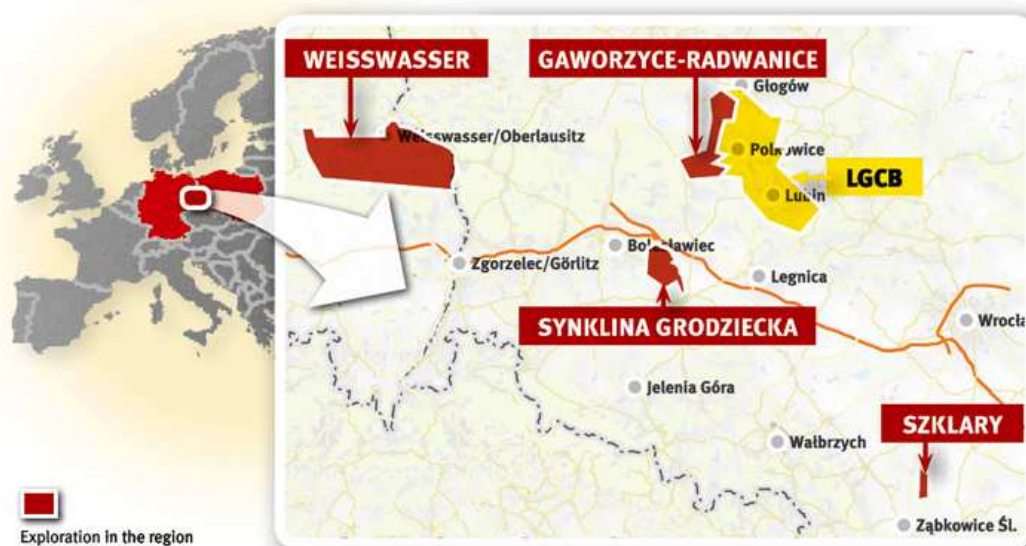
The mining assets of KGHM Polska Miedź S.A. (KGHM) in the LGCB region comprise the underground copper ore mines Lubin, Polkowice-Sieroszowice and Rudna, as well as a project in the pre-production stage - Głogów Głęboki-Przemysłowy (Deep Głogów) and exploration projects:

- Radwanice–Gaworzyce – copper deposit,
- Weisswasser (Germany) – copper deposit,
- Synklina Grodziecka (Grodziecka Syncline) – copper deposit,
- Szklary – nickel deposit.

The mines currently extracting copper ore, the Deep Głogów and Radwanice-Gaworzyce projects are located on the same large deposit and are adjacent to each other (the licensed areas and potential areas border each other, creating a single compact area - drawing 2).

For this reason, general information – regarding the description of natural surface conditions, general geological structure, main surface infrastructure and the mining operations model within the scope of the integrated mining-smelter activity of KGHM – is common to all of the assets described and will be presented in this manner in further parts of this report.

Drawing 2. Location of mining assets of KGHM in the region



2.1. General information

2.1.1. Location, infrastructure

The copper ore deposit mined by KGHM and prospective projects are located in south-western Poland, in an area of approx. 550 km² which is a part of the Sudety Foreland, approx. 80 km to the west of Wrocław in the direction of Berlin. The main cities in the region are Lubin, Głogów and Polkowice. The area has a very well developed network of public roads (including the Polkowice-Legnica no. 3 road and the A4 motorway running next to Legnica) and railway infrastructure.

2.1.2. Topography and climate

The LGCB is located in an area of a large regional unit - the Śląsko-Łużycka Lowland. The features of this terrain were formed during the passage of a continental glacier in this area during the glaciation of southern and central Poland and by the erosion of the terrain after the end of the last glaciation. The region is dominated by lowlands, with local extensive low hills of glacial origin, separated by wide, shallow valleys and flat and extensive depressions. The highest elevations are found in the northern part of the region (the Mesozoic region of the Dalkowskie Hills) with the peak reaching 223 m above the sea level. The LGCB is bordered on the east by the Ścinawska Depression (the Odra River Valley) - a basin located at the height of approx. 90 m above sea level.

The LGCB is located on the left-bank of the catchment of the central Odra River. The main rivers of the area are the Rudna, Zielenica, Zimnica, Potok Dębniak and Kłębanówka. They are of typical lowland character, i.e. the maximum water level is observed in the spring and summer while the lowest in winter.

The structure of land use in the LGCB licensed areas is dominated by arable land and pasturage (59% of the total area). Forests occupy approx. 32% of the area, while the developed areas account for 7.6% of the area.

The counties of Głogów, Lubin and Polkowice, located in the area of the LGCB, have a combined population of over 250 thousand people.

The area is distinctly influenced by a moderate, warm climate with clearly separated seasons. The average annual temperature amounts to around 8.0°C (January average: -2°C, July average: +18°C). The total annual rainfall in the mining areas is 550-600 mm.

2.1.3. Legal situation - licenses and taxes

KGHM has 8 licenses for mining copper ore from six formally separated copper deposits. The mining operations are conducted by three organisational units of the Company – the Mining Divisions Lubin, Rudna and Polkowice-Sieroszowice.

The “**Lubin-Małomice**” deposit is mined by the Lubin mine pursuant to two licenses issued by the Minister of Environmental Protection, Natural Resources and Forestry (MEPNRF):

- No. 231/93 for Mining Area „Lubin I” dated 7 December 1993, amended under the decisions and regulations of MEPNRF: No. BKK/OZ/1865/94 dated 20 December 1993, No. BKK/OZ/1804/96 dated 5 November 1996, No. GK/wk/MN/560/98 dated 6 February 1998, No. GK/wk/AK/487-3367/98 dated 13 August 1998 and No. DG/wk/AK/487-2087/99 dated 4 May 1999 – **valid to 31 December 2013.**
- No. 232/93 for Mining Area “Małomice I” dated 7 December 1993, amended under the decisions and regulations of MEPNRF: No. BKK/OZ/1867/94 dated 20 December 1993, No. BKK/OZ/1799/96 dated 5 November 1996, No. GK/wk/MN/564/98 dated 6 February 1998, No. GK/wk/AK/487-3368/98 dated 13 August 1998 and No. DG/wk/AK/487-2088/99 dated 4 May 1999 - **valid to 31 December 2013.**

The “**Polkowice**” deposit is mined by the Polkowice-Sieroszowice mine pursuant to a license issued by the Minister of Environmental Protection, Natural Resources and Forestry **No. 234/93** for Mining Area “Polkowice II” dated 7 December 1993, amended under the decisions and regulations of MEPNRF: No. BKK/OZ/1870/94 dated 20 December 1993, No. BKK/OZ/1800/96 dated 5 November 1996, No. GK/wk/MN/563/98 dated 6 February 1998, No. GK/wk/AK/487-3370/98 dated 13 August 1998., No. DG/wk/AK/487-2092/99 dated 4 May 1999 and DG/wk/AK/487-2350/2005 dated 1 April 2005 – **valid to 31 December 2013.**

The “**Sieroszowice**” deposit is mined by the Polkowice-Sieroszowice and Rudna mines pursuant to a license issued by the Minister of Environmental Protection, Natural Resources and Forestry **No. 235/93** for Mining Area „Sieroszowice I” dated 7 December 1993, amended under the decisions and regulations of MEPNRF: No. BKK/OZ/1868/94 dated 20 December 1993, No. BKK/OZ/1802/96 dated 5 November 1996, No. GK/wk/MN/562/98 dated 6 February 1998, No. GK/wk/AK/487-3366/98 dated 13 August 1998 and No. DG/wk/AK/487-2091/99 dated 4 May 1999 – **valid to 31 December 2013.**

The “**Radwanice-Wschód**” deposit is mined by the Polkowice-Sieroszowice mine pursuant to a license issued by the Minister of Environmental Protection, Natural Resources and Forestry

No. 10/95 for Mining Area „Radwanice Wschód I” dated 9 May 1995, amended under a decision of MEPNRF No. DG/wk/AK/487-2089/99 dated 9 May 1999 – **valid to 21 May 2015**.

The “**Rudna**” deposit is mined by the Rudna mine pursuant to two licenses issued by the Minister of Environmental Protection, Natural Resources and Forestry:

- No. 233/93 for Mining Area „Rudna I” dated 7 December 1993, amended under the decisions and regulations of MEPNRF: No. Bkk/OZ/1871/94 dated 20 December 1993, No. Bkk/OZ/1801/96 dated 5 November 1996, No. GK/wk/MN/561/98 dated 6 February 1998, No. GK/wk/AK/487-3369/98 dated 13 August 1998 and No. DG/wk/AK/487-2093/99 dated 4 May 1999 – **valid to 31 December 2013**.
- No. 24/96 for Mining Area „Rudna II” dated 24.06.1996, amended under a decision of MEPNRF No. DG/wk/AK/487-2090/99 dated 4 May 1999 – **valid to 30 June 2046**.

The “**Deep Głogów**” deposit is now being developed under the GG-P investment project by the Rudna and Polkowice-Sierszowice mines. Ultimately this deposit will be mined by these mines, pursuant to a license issued by the Minister of Environmental Protection, Natural Resources and Forestry No. 16/2004 for Mining Area „Głogów Głęboki-Przemysłowy”, dated 25 November 2004 – **valid to 25 November 2054**.

The deposits are the property of the State Treasury, with whom the Company has concluded agreements for the mining of these deposits. At present work is in progress on obtaining new licenses and concluding new agreements for mining operations, authorizing extraction of the copper ore as of 1 January 2014 in the mining areas „Lubin I”, „Małomice I”, „Polkowice II”, „Sierszowice I” and „Rudna I” and after 2015 in the mining area „Radwanice Wschód”. The Minister of the Environment is the licensing authority with respect to the extraction of ore from these deposits. It is assumed that KGHM should receive the new licenses replacing the expiring ones by the end of September 2013.

The Company also has the following exploration licenses:

- license valid to the end of 2014 for exploration of the salt deposit „Kazimierzów” (occurring above the copper seam in the „Sierszowice” deposit) issued by the Minister of Environmental Protection, Natural Resources and Forestry No. 68/98/p dated 17 November 1998,
- license No. 13/2009/p valid to 31 March 2018 (at present KGHM is waiting for the decision regarding the changes requested to that license – the details are provided in point 2.12.1 of the Radwanice-Gaworzyce Project) for the exploration of the „Radwanice” copper ore deposit, issued by the Minister of the Environment on 31 March 2009,
- license No. 20/2008/p valid to 30 April 2018 (at present KGHM is waiting for the decision regarding the changes requested to that license – the details are provided in point 2.12.1 of the Radwanice-Gaworzyce Project) for exploration of the "Gaworzyce" copper ore deposit, issued by the Minister of the Environment on 30 April 2008.

In addition to the taxes associated with conducting business activity, KGHM also incurs fees to those municipalities in which the activity is conducted (60% of this fee) and to the National Environmental Protection and Water Management Fund (40% of this fee), associated with conducting the mining and exploration activity:

- A one-time fee in the case of exploration projects. Pursuant to art. 133 of the Geological and mining law dated 9.06.2011, an enterprise which receives a license for the exploration of an ore deposit is required to pay a fee, defined in the license as the product of the fee rate (211.62 PLN) times the surface area covered by the license expressed in square kilometres. The fee is assessed again in the case of the extension of the license validity period;

- In half-year settlement periods (mid-point and end of financial year). Pursuant to art. 134 of the Geological and mining law dated 9.06.2011, an enterprise which receives a license for mining an ore deposit is required to pay an extraction royalty, defined as the product of its rate (defined on annual basis, in 2012 it is 3.10 PLN/t of copper ore) and the quantity of extracted ore.

As of 18 April 2012, KGHM is required to pay a minerals extraction tax (i.e. royalty) on copper and silver ore. The tax is assessed on the quantity of copper and silver contained in the produced concentrate and depends on the market price of these metals during the given month, and is charged to the costs of manufacturing the Company's products. This tax is not a deductible cost in the settlement of the corporate income tax. It is estimated that level of this tax paid by KGHM will amount in 2012, for the copper and silver ore mined at all of its mines, to a total of PLN 1.3 billion.

2.2. Mining operations model as a part of the integrated mining-smelter activity

The beginnings of KGHM mining activity in the region go back to the 1950s, when three - now closed - old copper mines were reactivated, and the Legnica smelter, which has been operating since 1953, was built to process the ore extracted from these mines. As a result of Jan Wyżykowski's discovery of vast copper deposits in 1957 near Lubin and Polkowice, work was started on building the oldest of the mines now belonging to KGHM, i.e. the Lubin mine (1960). Two other mines – Polkowice-Sieroszowice and Rudna – were constructed during the years 1962-1980 as well as the ore enrichment plants and two other smelters and a rolling mill.

KGHM is a vertically integrated enterprise which produces electrolytic copper based on its own resources. The copper ore extracted by the three underground mines is processed using flotation in three plants located at each of the mines and belonging to the Ore Enrichment Plants Division of KGHM. The concentrate produced is transported by rail to the Company's smelters, and is the material used in the production of electrolytic copper and other metallurgical products (silver, copper wire rod, OFE and CuAg wire and round billets) at the smelters located in Głogów and Legnica and the rolling mill in Orsk. The flotation waste (tailings) is transported by a network of pipelines to the Żelazny Most tailings pond, which is operated by the Tailings Division of KGHM.

2.2.1. Mining

The technology of mining the copper ore in all 3 mines is based on the room-and-pillar system with the use of blasting for ore extraction. This involves the excavation of a drift network on all four sides of the site to be mined, cutting of the unmined rock mass with rooms and drifts separating a number of operating pillars, as well as extracting of the ore followed by the transport of the ore to underground dumping stations. Here the large rocks are crushed and sifted through a grate, and then the crushed ore is transported to the storage areas near the shafts, from which it is transported to the surface by skip hoisting shafts.

The mining of the copper ore is done in a 4-shift system. It is fully mechanized, with the use of self-propelled mining machines, with most of them equipped with air-conditioned cabins and systems supporting the work of the operators. Mining is conducted in the following cycle: drilling the blasting holes with the support of self-propelled drilling rigs, loading of blasting material to drilled holes by drilling rigs, group blasting of the ore, followed by the ventilation of the areas blasted (from 30 min. to 2 hours; in seismic areas this time is longer). The next stage

involves the loading of the ore using self-propelled loaders into haulage vehicles, and its transport to dumping stations and protection of the exposed face by anchor bolts using bolting rigs. The crushed ore is transported by conveyor belts or mine rail trolleys to the storage sites by the shafts, and is then hoisted to the surface. After the ore is unloaded at the shaft top, it is transported by conveyor belts or railway to the ore enrichment plants located at each of the three mines.

The operations and processes applied at each of the three ore enrichment plants (OEP) are similar. However, due to the varied lithological and mineralogical composition of the ore from individual mines, the production layout of each facility differs. The technology at the ore enrichment plants at the Lubin and Rudna mines is adapted to sandstone-carbonate type ore, while at the ore enrichment plant at the Polkowice mine, the technology is adapted to shale-carbonate type ore. The enrichment technologies applied include the following individual operations: screening and crushing, milling and classification, flotation and drying of the concentrate.

The flotation process results in concentrate with an average copper content of approx. 22-23%, and flotation waste. The Rudna mine OEP produces the highest copper content concentrate (approx. 26%), while the lowest is at the Lubin mine OEP (approx. 14%). The Polkowice mine OEP produces concentrate of approx. 24% copper content. In terms of silver content, the highest content concentrate is produced at the Lubin mine OEP (approx. 790 g/t). The Rudna mine OEP produces concentrate with approx. 653 g/t silver content, while the Polkowice mine OEP produces concentrate with approx. 454 g/t silver content.

The dried concentrate of approx. 8.5% water content is transported by rail to the three smelters: Legnica, Głogów I and Głogów II (Głogów I and Głogów II comprising one large facility). The concentrate originating from the Lubin mine OEP is transported to the Legnica smelter (approx. 52%), to the Głogów I smelter (approx. 47%) and to the Głogów II smelter (approx. 1%). The concentrate from the Rudna mine OEP is processed at the Głogów I smelter (approx. 30%), at the Głogów II smelter (approx. 56%) and at the Legnica smelter (approx. 14%). The concentrate originating from the Polkowice mine OEP is processed at the Głogów I smelter (approx. 82%) and the Głogów II smelter (approx. 18%).

The tailings, in the form of slime, are transported through pipelines to the Żelazny Most tailings pond, where the sedimentation of the solid particles takes place and waste water is collected and redirected to the enrichment facilities. The storage site also serves as a retention-dosage reservoir for excess mine water. The excess water is periodically discharged to the Odra River.

2.2.2. Smelting

The Legnica Smelter produces electrolytic (refined) copper based on KGHM's own concentrate (approx. 61%) and purchased copper-bearing material (approx. 1% concentrate, approx. 37% copper scrap, and approx. 1% blister copper) in a multi-stage process. The main stages include: preparation of the charge material for smelting, its smelting in the shaft furnace to the form of matte copper of 60% Cu content, followed by conversion to the form of raw copper of approx. 98.5% Cu content, fire refining in an anode furnace to produce anodes of 99.2% Cu content, and electrorefining. The final product is refined electrolytic copper cathodes of 99.99% Cu content. The smelter also uses the cathodes to produce copper round billets.

The Głogów I smelter produces refined copper based both on KGHM's concentrate (approx. 84%) and purchased cupriferous material (approx. 1% concentrate, approx. 15% copper scrap).

The smelter applies the shaft furnace technology described above in the section on the Legnica smelter.

The Głogów II smelter produces refined copper based on KGHM's concentrate (approx. 81%) and purchased cupriferous material (approx. 5% concentrate, approx. 3% copper scrap, approx. 11% blister copper). The smelter applies flash furnace technology based on a modified license from the Finnish company Outokumpu. This technology combines three stages: drying of the concentrate, smelting of the matte copper and converting, into one. The dried concentrate is melted into blister copper containing around 99% Cu, which is refined in anode furnace. The slag, which still contains on average 14% copper, is sent to the electric furnace, where the copper is removed while the alloy received is sent to the converters, from which copper is sent for refining in anode furnaces. Copper anodes are sent for electrorefining. The end product is cathode copper containing 99.99% Cu.

In 2011 the three smelters produced a total of 571 041 t of electrolytic copper, including 432 200 t from KGHM's own concentrates.

Approx. 40% of the refined copper produced by all three smelters, mainly from the Głogów smelters, is transported to the Cedynia Copper Rolling Mill Division in Orsk, where copper wire rod is produced by the continuous smelting, casting and rolling process as well as oxygen-free copper rod (Cu-OFE) and oxygen-free, silver-bearing copper rod based on UPCAST technology.

The anode slime produced as a by-product of the electrorefining process at all three smelters contains precious metals, which is further processed at the Precious Metals Plant at the Głogów Smelter to obtain refined silver, gold, palladium-platinum concentrate and selenium. The remaining electrolyte, once the copper is removed, is used to produce crude nickel sulphate.

The dust and slimes originating from the removal of dust from technological exhaust gases at the smelters are mainly smelted in Dörschel furnaces at the Lead Section of the Głogów smelter into crude lead. The crude lead is refined at the Legnica smelter to obtain the final product - refined lead.

The utilisation of converter exhaust gases at the smelters results in the production of sulphuric acid, while treatment of the waste acid leads to recovery of rhenium in the form of ammonium perrhenate and/or metallic rhenium. The metallurgical slag is also reused and sold as road aggregate.

Table 1. Production volumes of main products of KGHM in 2011

	Unit	2011
Electrolytic copper	t	571 041
Copper products:		
Wire rod (Contirod)	t	226 235
Oxygen-free copper rod (UPCAST)	t	15 225
Wire from oxygen-free, silver-bearing copper	t	1 198
Round billets	t	20 320
Granulated copper	t	2 260
Other products:		
Metallic silver	t	1 260
Metallic gold	kg	703.77
Refined lead	t	25 234
Nickel sulphate	t	2 481
Copper sulphate	t	5 533
Technical selenium	kg	84 674
Concentrate Pt-Pd	kg	77.9
Sulphuric acid	t	636 248
Ammonium perrhenate	t	8.7
Metallic rhenium	t	2.9
Salt	t	457 172
Aggregates	t	710 664

The refined copper cathodes produced by the smelters of KGHM are registered as Grade A on the London Metal Exchange, under the following brands: HMG-S for copper from the Głogów I smelter, HMG-B for copper from the Głogów II smelter and HML for copper from the Legnica smelter. Refined silver, produced in the form of bars registered under the KGHM HG brand, holds a certificate of registration from NYMEX and Good Delivery certificates issued by the London Bullion Market Association and the Dubai Multi Commodities Centre.

Under the Smelting Modernization Project, whose implementation is planned in 2014, all copper concentrate will be smelted at the Głogów I (the shift from shaft furnace to flash furnace technology) and Głogów II smelters, while copper scrap and electronic scrap (under the EU's Waste Electrical and Electronic Equipment Directive, or WEEE) will be processed at the Legnica smelter.

2.2.3. Infrastructure

Pursuant to the law, the mines have two independent power supply sources, with one power supply source covering full power demanded by the mining operations, while the other ensures the minimum level of power demand, guaranteeing the safety of people, assets and the environment. The mines' power supply comes from a 110 kV distribution network belonging to TAURON Dystrybucja S.A. Each of the mines supplies the ore enrichment plant in its district.

The mines and enrichment plants have an ensured potable water supply based on valid permits. The water for industrial use mainly comes from drainage of the mines and from the closed production circuits. The IT and communication services are provided by the Data

Center Division of KGHM Polska Miedź S.A. The mining rescue services of the Mining-Smelter Rescue Division are on permanent duty with respect to mining, chemical, ecological, technical and fire rescue. The mines also have in place an underground radio communication system.

2.2.4. Employees

The majority of the employees of the mines (approx. 12.5 thousand people), the enrichment plants of the OEP Division and the Tailings Division (a total of approx. 1.3 thousand people) and the smelters (approx. 3.8 thousand people) live in towns and villages located in the LGCB region. The remuneration of KGHM's employees is defined in the Company Collective Labour Agreement.

2.3. Geology

2.3.1. History

The copper ore deposit in the area of the Fore-Sudetic monocline was discovered in 1957, when copper mineralization was identified in the borehole formerly marked as Sieroszowice IG-1 (at present borehole S-1). The minerals found in the rock samples collected from the drill core were dominated by copper sulphide - chalcocite. The first geological documentation of the Lubin-Sieroszowice deposit (the furthest south-western part of the current deposit area of KGHM), in category C2 (the categories of the confidence level of documentation are explained in section 2.3.3.), submitted on 4 April 1959 by a team from the Polish Geological Institute led by Jan Wyżykowski, was prepared based on the results from 24 boreholes, with 18 of them used to calculate the resources. Based on Polish geological standards, the so-called balance ore resources were estimated at 700 million tonnes, containing 16.5 million tonnes of metal, over an area of 175 km².

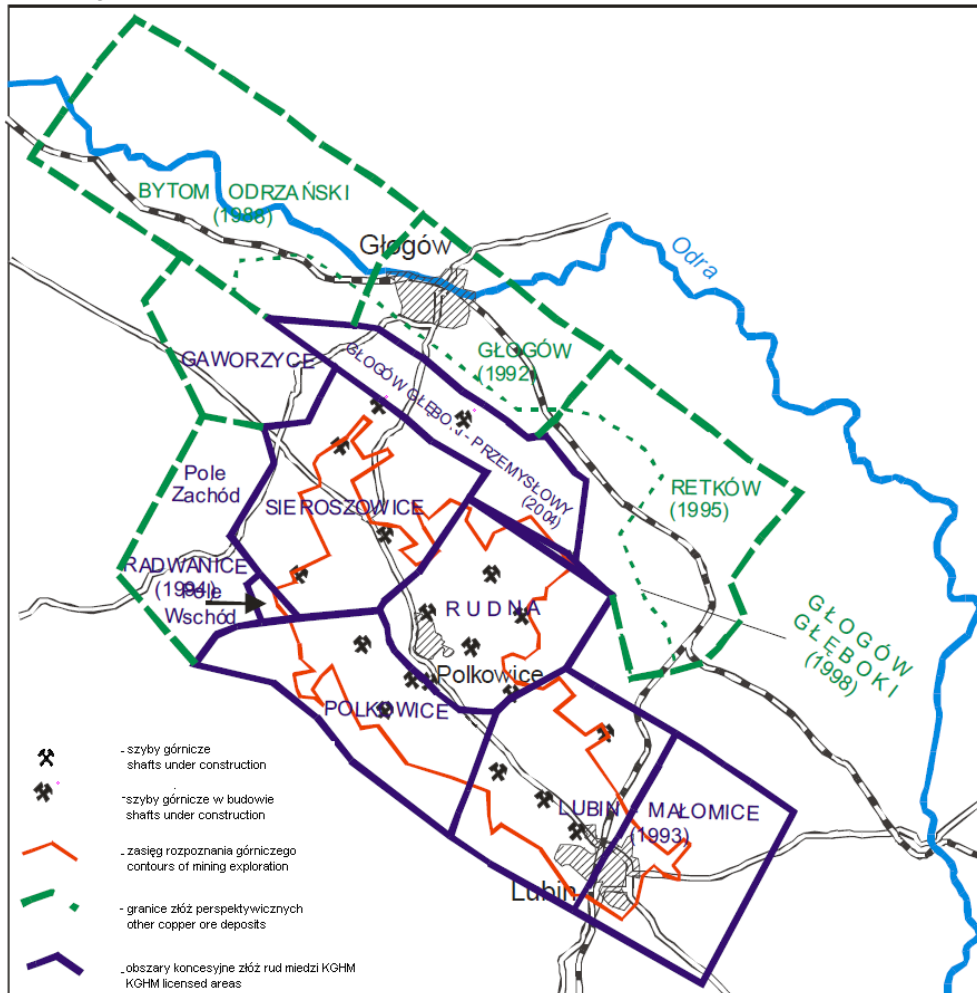
Prior to commencing documentation of the deposit in category C1, the deposit area was divided into three sections: Lubin, Polkowice and Sieroszowice; and the detailed documentation was started from the south-eastern part of the area. The company Przedsiębiorstwo Geologiczne (Geological Enterprise) from Kraków was the contractor for this work. The Lubin section, covering 96 km², was documented in category C2 and C1 in 1959. Polkowice area of the size of 70.6 km², in categories C2 and C1 was documented during the years 1961–1963. The Sieroszowice section, of 53.9 km², was documented in 1962. A total of 312 boreholes were made to 1 January 1968 in the Lubin–Sieroszowice deposit area, representing a total length of 241 248 meters. In 1973 the copper ore in the area "along the dip" of the Fore-Sudetic monocline was documented, covering the deposit in the depth range 1000-1300 m. The area "along the dip" in the south-eastern part was planned for mining by the Rudna mine and in the north-western part by the Sieroszowice mine.

Exploration was conducted during the years 1977-1991 in the area, where the Upper Permian (Zechstein) layers are deposited at the depth of 1200-1500 m, from Bytom Odrzański in the north-west through Głogów, Gawrony to Ścinawa in the south-east. Until 1979 the work was conducted by Przedsiębiorstwo Geologiczne (Geological Enterprise) in Kraków, and then by Przedsiębiorstwo Geologiczne in Wrocław. The results of the surveys allowed documentation of the following deposits in categories C1 and C2: "Bytom Odrzański" (3 boreholes), "Głogów" (3 boreholes) and "Retków-Ścinawa" (24 boreholes).

The "Radwanice" deposit was documented in 1985 in category C1, which in an addendum to the geological documentation in 1994 was divided into the "Radwanice-Wschód" and "Radwanice-Zachód" fields. The "Gaworzyce" deposit was documented the same year

in category C1. In 2004 the deposit in the mining area “Głogów Głęboki–Przemysłowy” (Deep Głogów) was documented in category C1.

Drawing 3. Location of documented copper deposits in the LGCB.



2.3.2. Geology of the deposit

The copper ore deposits mined by KGHM are located in Lower Silesia between Lubin and Głogów (Drawing 3). The documented area of the deposit occupies an area of 40 km by 20 km along the dip, at the depth ranging from approx. 370 to 1380 m. The deposit series is associated with the formations of Upper Permian (Zechstein) dipping along the monocline to the north.

The deposit is located in the border zone of the Fore-Sudetic monocline. The substrate of the the Fore-Sudetic monocline is formed of a complex of poorly explored crystal and sedimentary rocks of the Palaeozoic and Proterozoic eras. The monocline, in the area where the copper ore is found, is formed of sedimentary rocks belonging to the Permian and Triassic eras, dipping at the angle of a few degrees, sporadically several tens or so degrees, in a NE direction. The Permian-Triassic formations of the monocline are discordantly covered by Tertiary and Quaternary sediments. The copper ore deposit of the Fore-Sudetic monocline dipping to the NE, similarly to the layers creating the monocline, is classified as of the stratified

type in the sedimentary rocks (sediment-hosted copper ore deposit). The deposit is formed of accumulations of copper sulphides, occurring in the white and grey-white sandstones of Red Footwall Sandstone (Rotliegendes) and Upper Permian (Zechstein), and in the cupriferous shales and carbonate rocks (mainly dolomites) of the Upper Permian (Zechstein).

The deposit is divided into smaller areas where mining and development is currently underway: "Lubin-Małomice", "Polkowice", "Sieroszowice", "Rudna", "Radwanice-Wschód" and "Głogów Głęboki-Przemysłowy".

The areas showing the domination of sandstone ore ("Lubin-Małomice", "Rudna") are located in the northern and eastern parts of the deposit. The "Radwanice-Wschód" deposit, with no sandstone ore at all, and the "Polkowice" deposit mainly contain carbonate ores. The "Sieroszowice" deposit is divided into two lithological zones: the south-western part with no sandstone ore and the north-eastern side with the inclusion of sandstone ore.

Table 2. Lithological types in the industrial copper ore resources of KGHM mines – as at 31 December 2011.

Lithology		Deposits						
		Lubin-Małomice	Polkowice	Rudna	Sieroszowice	Radwanice - Wschód	Deep-Głogów	KGHM
Carbonates	Share in resources [%]	18.3%	80.3%	11.5%	54.6%	93.0%	26.7%	31.0%
	Cu [%]	1.49	1.83	1.77	1.81	1.62	1.42	1.69
	Ag [g/t]	63	40	58	52	25	63	54
Shales	Share in resources [%]	14.8%	11.9%	5.6%	14.2%	7.0%	13.3%	12%
	Cu [%]	2.73	5.93	6.78	7.98	7.20	8.19	6.02
	Ag [g/t]	144	97	288	175	74	244	188
Sandstones	Share in resources [%]	66.9%	7.8%	82.9%	31.2%		60.0%	57.0%
	Cu [%]	0.91	1.36	1.37	1.53		1.55	1.29
	Ag [g/t]	33	20	31	43		47	36

The average thickness of the documented industrial deposit is highest in the "Rudna" deposit - 4.28 m, and lowest in the "Radwanice-Wschód" deposit – 1.56 m. Compared to the level of the reserves in recent years, the share of the reserves with a thickness of 3.01-7.00 m continues to decrease.

All of the sulphide-type mineral ores contain silver, lead, zinc, cobalt, molybdenum and vanadium. They may occur as their own separate minerals or in the form of isomorphic additions in the copper aggregate minerals. Their documented concentrations do not meet the economical conditions to be classified as suitable for mining, due to the thinness of the zones mineralized with precious metals, the discontinuity of mineralization and its high irregularity. Nonetheless, a substantial part of the precious metals contained in the copper ore deposit goes into the concentrate and is recovered at the smelter during the processing of anode slime.

2.3.3. Resources and reserves

The documented geological resources of KGHM in the LGCB, according to international classification based on the following adopted definitions, are presented in the table below:

- Mineral resources; corresponds to geological resources;
- Inferred Mineral Resources – that part of the resources defined by a low level of confidence, resulting from the geological indications and evidence which have not been verified; correspond to category C2;
- Indicated Mineral Resources – that part of the resources defined by a high level of confidence; the data points are however too scarce to confirm the continuity of the geological body; correspond to category C1;
- Measured Mineral Resources – that part of the resources defined by a high level of confidence; the quantity and quality of information confirms the continuity of the geological body and its borders; correspond to category B.

Table 3. Listing of mineral resources of KGHM's copper ore according to international standards - as at 31 December 2011.

Mineral Resources		Ore deposits						
		Lubin-Małomice	Polkowice	Rudna	Sieroszowice	Radwanice - Wschód	Deep-Głogów	KGHM
Measured Mineral Resources	Ore ['000 t]	207 579	57 686	287 725	65 469		100	618 558
	Cu [%]	1.23	2.30	1.71	3,07		2,55	1,75
	Cu ['000 t]	2 556	1 326	4 915	2 010		3	10 810
	Ag [g/t]	60	44	43	74		109	52
	Ag [t]	12 365	2 525	12 359	4 868		11	32 128
Indicated Mineral Resources	Ore ['000 t]	180 869	57 080	110 133	232 380	7 330	291 487	879 278
	Cu [%]	1.43	2.36	1.68	2.48	1.92	2.40	2.12
	Cu ['000 t]	2 584	1 345	1 846	5 763	141	6 995	18 675
	Ag [g/t]	51	52	59	62	26	79	64
	Ag [t]	9 198	2 959	6 456	14 441	189	22 928	56 169
Mineral Resources	Ore ['000 t]	388 448	114 766	397 857	297 849	7 330	291 586	1 497 836
	Cu [%]	1.32	2.33	1.70	2.61	1.92	2.40	1.97
	Cu ['000 t]	5 140	2 672	6 762	7 773	141	6 998	29 485
	Ag [g/t]	56	48	47	65	26	79	59
	Ag [t]	21 563	5 484	18 815	19 309	189	22 939	88 298

Cut-off criteria adopted for the resources estimation:

- Maximum depth of the deposit's floor - 1500 m
- Minimum copper (Cu) content in the sample contouring the deposit - 0,70 %
- Minimum weighted average equivalent copper (Cu) content considering silver (Ag) content in the deposit profile including bands: $Cue = (\%Cu) + 0.01 (g/t Ag)$ - 0,70 %
- Minimum abundance of balance deposit (Cue) - 50 kg/m²
- Minimum abundance of off-balance deposit (Cue) - 35 kg/m²

Approx. 38.5% of the current balance resources of the deposits have been exhausted. The highest level of exhaustion is in the "Polkowice" deposit (66%), followed by the "Lubin-Małomice" deposit (43%) and "Rudna" deposit (56%), while "Sieroszowice" and "Radwanice Wschód" deposits have been exhausted respectively by 26% and 6%.

The resources estimations were made by the following persons, qualified as mining geologists:

- Lubin mine: Wiesław Szarowski (authorization No. WUG S-541), Jacek Lech (authorization No. WUG L-751), Wiesław Szatarski (authorization No. WUG S-661), Sambor Wawruszczak (authorization No. WUG W-555), Jan Słabicki (authorization No. WUG S-560), Zbigniew Dubiński (authorization No. WUG D-517),
- Polkowice-Sieroszowice mine: Grzegorz Pasternak (Authorization No. WUG P-835), Lesław Sikora (Authorization No. WUG S-632), Artur Kuczak (Authorization No. WUG K-874), Roman Jedlecki (Authorization No. WUG J-749)
- Rudna mine: Wojciech Kaczmarek (Authorization No. WUG K-764), Robert Rożek (Authorization No. WUG R-664), Tomasz Wojtala (Authorization No. WUG W-732), Andrzej Ciesielczyk (Authorization No. WUG C-659).

Qualified mining geologist – this is an authorization issued by the State Mining Authority (WUG), confirming the professional qualifications necessary to keep the geological-surveying documentation in underground mining facilities. The scope of requirements necessary to obtain the certificate of professional qualifications is defined in articles 54-59 of the Geological and mining law dated 9 June 2011.

In accordance with the provisions defined in articles 101-103 of the Geological and mining law dated 9 June 2011, and its implementing provisions, above mentioned geologists annually estimate the current resources and reserves for given deposits within the mining areas as well as changes to the former year. The current inventory report on resources and reserves for each deposit, signed by an authorized geologist and director of the mine, and then approved by the appropriate director in the Headquarters of KGHM Polska Miedź S.A., is attached to the geological documentation of deposit. Statistical forms for resources and reserves reporting, based on these inventory reports, are sent to the relevant geological authorities.

The mining reserves of KGHM's mines and of the Deep Głogów project are as follows:

Table 4. Listing of mining reserves of KGHM's mines as at 31 December 2011

Mineral reserves		Mines			Deep Głogów	KGHM
		Lubin	Polkowice-Sieroszowice	Rudna		
Mining reserves	Ore reserves ['000 t]	324 464	336 355	287 097	233 117	1 181 032
	Cu [%]	1.00	1.85	1.65	1.90	1.58
	Cu ['000 t]	3 238	6 232	4 726	4 421	18 617
	Ag [g/t]	42	44	46	61	48
	Ag [t]	13 760	14 928	13 128	14 330	56 146
Ore extraction * ['000 t/year] – dry weight		6 942	10 681	11 999	11 316	
Statistical life of the mine (deposit) [years]		46.7	31.5	23.9	20.6	

* for mines - average output level of last ten years; joint output amounted in 2011 to 29 303 kt; for Deep Głogów project – projected output
[mining reserves (ore reserves) - the geological resources reduced by mining losses and increased to allow for dilution by waste rock]

Mining reserves, according to international standards are regarded as ore reserves and comprise that part of the mineral resources considering the dilution and losses which might occur during extraction. Assessments and studies show that extraction can be rationally justified.

They are divided according to the category (level of confidence) of geological recognition:

- Probable Ore Reserves - correspond to category C1,
- Proved Ore Reserves - correspond to category A+B.

Table 5. Listing of proved and probable reserves of KGHM's copper ore according to international standards - as at 31 December 2011.

Mineral Reserves		Ore deposits						
		Lubin-Małomice	Polkowice	Rudna	Sieroszowice	Radwanice - Wschód	Deep-Głogów	KGHM
Proved Ore Reserve	Ore ['000 t]	156 188	42 244	182 510	74 990		98	456 031
	Cu [%]	1.05	1.78	1.60	1.98		1.80	1.49
	Cu ['000 t]	1 645	753	2 914	1 485		2	6 798
	Ag [g/t]	51	33	41	48		77	45
	Ag [t]	7 925	1 373	7 551	3 582		8	20 438
Probable Ore Reserve	Ore ['000 t]	168 275	54 535	63 685	197 690	7 797	233 019	725 002
	Cu [%]	0.95	1.66	1.60	1.91	1.25	1.90	1.63
	Cu ['000 t]	1 593	905	1 022	3 782	98	4 419	11 818
	Ag [g/t]	35	36	56	50	18	61	49
	Ag [t]	5 835	1 942	3 552	9 920	137	14 323	35 708
Ore Reserve	Ore ['000 t]	324 464	96 779	246 195	272 681	7 797	233 117	1 181 032
	Cu [%]	1.00	1.71	1.60	1.93	1.25	1.90	1.58
	Cu ['000 t]	3 238	1 657	3 936	5 267	98	4 421	18 617
	Ag [g/t]	42	34	45	50	18	61	48
	Ag [t]	13 760	3 315	11 103	13 501	137	14 330	56 146

2.4. Other minerals in the copper ore deposit area

The main minerals found in the area of the copper ore deposit include rock salt and lignite.

The oldest rock salt (Na1) occurs on the prevailing part of the LGCB area, comprising on average 50% of the Upper Permian (Zechstein) profile. The rock salt layer is located 20-120 m above the cupriferous shale. It occupies a significant part of the central and northern part of the Sieroszowice mine, part of the northern edge of the Rudna mine and the Deep Głogów deposit area.

The oldest rock salt (Na1) forms an irregular, monocline-deposited layer, characterised by a general spread toward the north-west and south-east, with a generally slow dip of the strata toward the north-east at an angle of 3-8 °. The thickness of the seam reaches locally up to 200 m. The depth of the floor of the salt layer varies from 630 m in the south to 1540 m in the north-west. It was explored by holes drilled from the surface in an area of over 350 km² between Polkowice and Głogów. The "Kazimierzów" rock salt deposit has been identified in categories

C1 and B from the level of the mine drifts at the Sieroszowice mine. The oldest rock salt resources (Na1) are estimated for the entire LGCB area at the level of approx. 82 billion tonnes, and up to the depth of 1200 m at the level of approx. 42 billion tonnes.

An unevenly thick series of Tertiary sediments (Oligocene, Miocene and Pliocene formations) are deposited on top of the Permian and Triassic sediments forming the Fore-Sudetic monocline and crystalline rocks. Their thickness is substantial and on average amounts to 250 meters. Lignite is found in the area of the Oligocene and Miocene formations, and is part of the Legnica deposits complex located at the border of the Fore-Sudetic monocline and the Fore-Sudetic block. The deposits in the area of the LGCB occur at a depth of approx. 200 m. Their average thickness varies from 22 m in the "Ścinawa" deposit to 30 m in the "Ścinawa-Głogów" deposit. The forecasted resources for a part of the Legnica deposits, i.e. „Ścinawa” (in category C1 and C2), and Fields 4, 5 and 6 of the "Ścinawa-Głogów" deposit (in category D) have been estimated at the level of approx. 9 billion tonnes.

2.5. Mine operations during the last 3 years

The table below presents the total production results of the Lubin, Polkowice-Sieroszowice and Rudna mines (also considering the production of concentrate at the ore enrichment plants) during the last three years.

Table 6. Mine production of the mines and ore enrichment plants of KGHM during the years 2009-2011, including the first half of 2012

	2009	2010	2011	1 st half of 2012
Extraction of copper ore* million t	29.7	29.3	29.7	15.3
Copper content in the ore %	1.68	1.64	1.61	1.60
Copper volume in the ore '000 t	499.5	480.6	479.3	243.7
Silver volume in the ore t	1 411	1 390	1 356	694
Concentrate production * '000 t	1 929.0	1 841.2	1 875.2	942.7
Copper quantity in the concentrate '000 t	439.0	425.4	426.7	215.3
Silver quantity in the concentrate t	1 206	1 181	1 167	593
Payable copper t	421 476	408 429	409 598	206 713
Production cost of own concentrates C1**				
PLN/t Cu payable	7 679	7 138	4 145***	7 352
USD/t Cu payable	2 463	2 365	1 399***	2 246
USD/lb Cu payable	1.12	1.07	0.63	1.02
USD/PLN exchange rate	3.1181	3.0179	2.9636	3.2740
Rock salt extraction	311 083	436 830	457 172	171 766
Capital expenditures in mining in M PLN	833.5	985.1	1 056.5	505.43

* dry weight

** excluding depreciation and including revenues from the sale of silver and gold

*** the difference between production costs of own concentrates C1 during the years 2009-2010 and 2011 results from the higher valuation in 2011 of silver and gold caused by the higher prices of these metals

2.6. Environmental protection

The mines may affect the natural environment through deformation of the surface, seismic activity, emission of mine dust and gases, change in water relations, the discharge of salty water, storage of waste rock and tailings.

KGHM possesses all required environmental permits and certificates to conduct its operations. The impact of its activities on the quality of the water, air and soil is continuously monitored.

KGHM's mines design their operations and carry out mining to minimise seismic hazard. The impact of mining operations on the surface is reduced by leaving the waste rock, originating mainly from development work, at its point of generation to use as backfill in excavated areas and to form the foundation for retaining piles.

Drainage of the water from the mines results in hydrodynamic changes, only affecting the aquifer levels near the ore seam to a small extent. The extensive drainage basin, covering an area of approx. 1500 km² with a depression to 0.7 m, does not cause mining damage at the surface. The mine water pumped to the surface is used for backfilling and for flotation at the Ore Enrichment Plants, and then is cleaned and returned for reuse. The excess salty water is periodically discharged (depending on the absorption capacity of the river) to the Odra river pursuant to Integrated permit No. PZ 200/2012 to operate the Źelazny Most tailings pond dated 30 April 2012, issued by the Marshall of the Lower Silesia voivodeship.

The measurement of emissions of dust-gas pollutants shows that the mining of copper ore does not exceed permissible emission levels, and in the case of some pollutants the results of the measurements are decidedly lower than these levels.

The activities associated with mitigation of both the direct and indirect impact of mining operations and the impact of applied technologies are conducted in cooperation with the leading scientific-technical institutions in this area (such as KGHM Cuprum sp. z o.o. - CBR in Wrocław, the AGH University of Science and Technology in Kraków and Wrocław University of Technology), based on available technical and financial capabilities.

In compliance with environmental and mining regulations in force, KGHM is required to establish, in accordance with the periodically updated "Program and schedule of decommissioning of technological facilities of KGHM Polska Miedź S.A.", accounting provisions for the future closure of the mines and technological facilities as well as restoration of the terrain to its original condition when mining operations cease. These provisions are reassessed on a quarterly basis.

2.7. Outlook for mining operations

The Strategy of KGHM Polska Miedź S.A. assumes a stable level of ore extraction from the mines of the LGCB at the present level (29-30 million tonnes/year) in the long term. The mining reserves of the mines together with the reserves of the Deep Głogów project are such as to allow estimation of the life of KGHM's mines for the next 30 to 40 years, assuming the continuation of the present ore extraction level. To maintain this level over an even longer time horizon, the Company is exploring the possibility of developing the deposits directly abutting the currently mined areas. It is estimated that the current (Radwanice-Gaworzyce) and future (Bytom Odrzański, Głogów, Retków) projects exploring the possibility of mining these deposits could increase the resource base of KGHM by geological resources amounting to approx. 987 million tonnes of copper ore containing approx. 17 million tonnes of copper.

Further development of the copper ore mines involves mining at a depth of up to 1500 m. The virgin temperature of the rock mass at these depths amounts to over 45°C, which contributes to deterioration of the thermal conditions and thus reduces the possibility of human involvement and of mining the ore. Achieving acceptable thermal conditions in the mines is one of the priorities of KGHM. The Rudna and Polkowice-Sieroszowice mines use a central air-conditioning system based on the production of chilled water (approx. 2°C) at the surface and its

distribution through a system of pipelines to the underground working areas. At present the Company is implementing an "Individual work station air-conditioning programme in the mines of KGHM Polska Miedź S.A. for the years 2010-2015", which includes the introduction of air-conditioned cabins in heavy machines and work station machines, including near the underground storage sites, air-conditioned trucks to transport the workforce and personal air-conditioning systems.

As approx. 28% of the deposit being mined by KGHM has a seam thickness of up to 2 m, the Company has initiated a project involving designing and implementing technology for the mechanical excavation of thin ore seams with the use of mining complexes, as an alternative to mining with the use of blasting technology. The positive technical and economic outcome of the operational tests conducted at each of the mines will provide the basis for a decision on implementation of mechanical mining of thin ore seams as a mining method at KGHM.

It is planned to complete the replacement and modernisation of flotation machines at the Ore Enrichment Plants by the end of 2013, which will result in optimisation of flotation capacity, increased output of silver and copper and lower operating costs in the OEPs.

Design work and analyses are also in progress in respect to the project: "Enlargement of the Źelazny Most tailings pond, ensuring the ability to store tailings after 2016". It is planned to extend the current capacity by over 40% through the construction of a new southern storage facility. This is an important condition for continuing mining operations in the LGCB over the long term.

2.8. Lubin mine

Ownership Division of KGHM Polska Miedź S.A. – 100% KGHM Polska Miedź S.A.	
Mining area (marked as OG on the map) „Lubin I” and „Małomice I”	
Mine type	underground
Main mineral	Copper ore
Extraction depth in 2011	480-890 m
Statistical mine life	approx. 47 years
Employment	3 302
Average content of metals in operational resources (ore reserves)	Cu – 1.0% Ag - 42 g/t

2.8.1. Location

The Lubin mine is located to the north of the city of Lubin, with direct access to a road and a railway line. The size of the mining area is 158.2 km².

2.8.2. Formal-legal requirements

The current licenses for the extraction of copper ore in the „Lubin I” mining area (license No. 231/93 dated 7 December 1993 issued by the Minister of Environmental Protection, Natural Resources and Forestry as amended) and the „Małomice I” mining area (license No. 232/93 dated 7 December 1993 issued by the Minister of Environmental Protection, Natural Resources and Forestry as amended) expire on 31 December 2013. The agreements on the mining operations in these areas concluded by KGHM with the State Treasury expire at the same time. At present KGHM is working towards obtaining a new license for the „Lubin-Małomice” mining area, which the Company should receive by the end of September of 2013. The Minister of the Environment is the licensing authority. The next step will be the conclusion of a new agreement on mining operations in this area. The mine has all necessary permits to conduct its operations.

2.8.3. Infrastructure

The mining of the underground deposit is conducted in three areas: „Lubin Central”, „Lubin West” and „Lubin East”. The mine has seven shafts with depth ranging from 494 to 963 m,

including 1 for production, while the others serve personnel hoisting/transport/ventilation functions. The mining is conducted at three levels: 610 m, 740 m and 910 m. The surface infrastructure includes shaft yards, auxiliary facilities and technological networks.

2.8.4. History

This is the oldest mine in the Lubin–Głogów Copper Belt. Its construction commenced in 1960, following discovery of the copper deposits in Lower Silesia. The mine started operations in 1968 and full production capacity was achieved in 1972 at the level of 4.5 million tonnes of ore/year. Following a capacity expansion initiated in 1973, production by the mine increased to 7.6 million tonnes of copper ore/year.

2.8.5. Geology of the deposit

The mine operates the „Lubin-Małomice” deposit. The dominant lithological type of copper ore is sandstone rocks of White Footwall Sandstone (Weissliegendes), accounting for nearly 67% of the resources. Carbonate rocks of Upper Permian limestone, usually dolomites, account for approx. 18% of the resources, while Upper Permian cupriferous shale accounts for approx. 15%. The average thickness of the deposit is 2.33 m. The depth of the deposit ranges from 368 to 1006 m.

The „Lubin-Małomice” deposit is characterised by very extensive involvement of tectonic deposit rocks, specifically in its south-western part. The deposit occurs here at very shallow depths, just under the loose Cenozoic formations, and is cut by a dense network of high displacement faults. Predominant direction of faults is NW-SE, with the deviation towards NWW-SEE and NNW-SSE. The other directions are W-E and NE-SW.

As a result of this dislocation system, a rock series of Permian-Mesozoic cover was divided into blocks of varying size and shape, and moved vertically and horizontally, forming structures such as horsts and ditches (graben) of different dimensions and amplitudes. There are no clear linear discontinuous dislocations, while there are zones comprising groups of parallel faults of the throws ranging from a few centimeters to a few tens of meters. The throw amplitudes cancel out or add up to give fault zones with variable throw. Their width ranges from 250 to 1500 m.

Crucial to the overall structural picture are faults or fault zones of NW-SE direction: Olsza fault, South Lubin fault, the main Lubin fault.

2.8.6. Mineralization

The copper ore deposit is characterised by varying mineralization both in terms of the type of the minerals, the forms of occurrence and intensity of mineralization. The main minerals are bornite, chalcocite, chalcopyrite and digenite. The carbonate-shale ore contains both the distributed forms in the form of the grains and aggregates as well as ore bags and veins. The ore minerals are usually dispersed in the sandstone ore and are present in one of the forms of the binder or ore lamination. The ore minerals in „Lubin-Małomice” deposit occur in zones. The vertical profile of the deposit, in the floor and the roof, is dominated by pyrite, chalcopyrite, and the middle part is occupied by bornite, chalcocite, digenite and chalcopyrite, while the lead-bearing and zinc-bearing levels are observed above the copper mineralization. The metals accompanying these minerals are: mainly silver, lead, cobalt, molybdenum, nickel, zinc, vanadium.

Silver is found mainly in the form of isomorphic additions in the main ore minerals. The silver content in the deposit is highly differentiated in the vertical profile and horizontal distribution as well. The highest silver content is observed in the cupriferous shale.

The average copper content in the geological resources of the „Lubin-Małomice” deposit is 1.32% Cu. The average silver content is 56 g/t.

2.8.7. Resources and reserves

The table below presents the estimation of the resources and reserves of the Lubin mine („Lubin-Małomice” deposit) according to international standards:

Table 7. Lubin mine resources and reserves according to international standards - as at 31 December 2011.

Resources and reserves	Ore	Metal contents	
	'000 t	Cu %	Ag[g/t]
Measured mineral resources	207 579	1.23	60
Indicated mineral resources	180 869	1.43	51
Total mineral resources	388 448	1.32	56
Proved ore reserves	156 188	1.05	51
Probable ore reserves	168 275	0.95	35
Total ore reserves	324 464	1.00	42

2.8.8. Technical factors - natural hazards

Geothermal conditions – rock temperature

The average geothermal step in the area of „Lubin-Małomice” deposit is 38.0 m/°C, while the average geothermal depth gradient is 3.0°C/100 m. The virgin rock temperature at the level of the Upper Permian floor, which is the main level of mining, ranges from 21.7 to 36.5 °C.

Water hazard

The copper ore deposit within the borders of the „Lubin I” and „Małomice I” mining areas is classified into three levels of water hazard. The highest water hazard encountered is associated with the aquifer level of the limestones and dolomites located above the deposit and the Tertiary subcoal aquifer level. Water inflow to the deposit was as follows: during the years 1994-2010 it was 19.00 m³/min, as at 31 December 2010 – 18.38 m³/min, while the forecasts for the years 2012-2030 project 18.60 -20.70 m³/min.

Rock burst hazard (seismicity)

One of the most significant natural hazards accompanying the underground mining of ores in the LGCB is seismic hazard and its potential consequences: rock bursts and rock mass destressing, in areas where mining is conducted. The factors influencing the occurrence of this hazard are the high strength parameters of the roof rock and its natural tendency to accumulate the elastic energy. The scale of the hazard is also determined by the initial stress distribution in the rock mass resulting from the depth of mining, intensive tectonics of the deposit and the geometry of the mining fields and gobs.

With respect to mining technology, activities are targeted at minimising exposure to the risks associated with rock burst hazard. These activities include performing a particular opening

layout and sequence while excavating the unmined rock mass prior to mining, systematically provoking the rock mass with group face blasting and applying an appropriate waiting time after blasting.

The mitigation methods used by the mine were adjusted to the local conditions of the deposit, the current geological and mining situation in individual mining fields and to the scale of stress signals in the rock mass.

Gas hazard

The gas hazard is associated with the occurrence of gases of natural origin in the rock mass (methane, hydrogen sulphide, sulphur oxides). The sporadic presence and small quantities of methane in the Lubin mine leads to the conclusion that there is no methane hazard. Appropriate ventilation of the working areas is an effective method for reducing the occurrence of gas hazard. There is no hazard of gas and rock outbursts in the area of the „Lubin-Małomice” deposit.

2.8.9. Mine operations

Table 8. Production results of the Lubin mine including the ore enrichment plant, 2009-2011 including the first half of 2012

	2009	2010	2011	1st half of 2012
Ore extraction d.w.* million tonnes	7.15	7.16	7.25	3.6
Cu content %	1.12	1.02	0.96	0.95
Ag content %	68.78	63.53	51.87	50.37
Concentrate production * '000 t	473	434	437	214
Copper content in concentrate %	14.74	14.59	13.83	13.69
Silver content in concentrate g/t	881	869	715	692

**dry weight*

Mining of the copper ore deposit at the Lubin mine is carried out in 8 production areas, which extract ore from 17 mining fields located in the southern and central part of the "Małomice I" mining area and in the north-west, central and southern part of the "Lubin I" mining area.

Mine development work is conducted systematically to ensure planned output is achieved. Development work at the Lubin mine is currently conducted as follows: 3 groups of openings with a total of 8 faces in a southerly direction; 4 groups of openings with a total of 10 faces in an easterly direction; 5 groups of openings with a total of 13 faces in a northerly direction; and 3 groups of openings with a total of 6 faces in a westerly direction. The remaining drift work involves the preparation of subsequent fields for operation/extraction. In 2012 a total of approx. 32 km of tunnels were planned for both operational and preparatory mining areas. This work is conducted both by mine's own staff as well as by external contractors. In the first half of 2012 more than 50% of the plan was achieved.

Capital expenditures in 2011 and the first half of 2012 were related mainly to extension of mining infrastructure and the replacement of mining machines. In 2011 the mine also implemented a machine operation and servicing system (CMMS) and completed tests on a pilot system for the tracking of people and machines underground (iDotra), aimed at the improving workforce safety as well as operational management of mining machines.

2.8.10. Lubin mine ore enrichment plant/concentrator

The Lubin ore enrichment plant, part of KGHM's Ore Enrichment Plants Division, is located near the L-II production shaft in the „Lubin Central” area.

The plant processes sandstone-carbonate type ore. Production involves the following operations: screening and crushing, milling and classification, flotation, and finally drying of the concentrate.

The screening takes place on vibration sieves. The upper product of the sieves is crushed in the hammer crushers and the crushing product together with the bottom product of the sieves is transported by conveyor belts to milling and classification. The objective of the milling and classification system is to achieve the maximum freeing of copper minerals from the intergrowths with the waste rock. The milling process is a wet process and is executed in three steps. The first milling step, due to the sandstone-carbonate character of the ore, takes place in rod drum mills. The second and third step of the milling (additional milling) take place in drum mills, which use balls and cylpebs. The product of milling is graded in spiral graders and hydrocyclones. The material prepared in this manner is pumped to the basic enrichment operation, i.e. flotation, which is targeted mainly at maximum copper recovery. This process takes place in pneumatic-mechanical flotation machines and is executed in several-level circuits, which as result produce concentrate and generate tailings.

The tailings are pumped directly to the Źelazny Most tailings pond, while the concentrate is directed to drying. The dried concentrate of approx. 8.5% water content is transported by rail to the Legnica smelter (approx. 52%), to the Głogów I smelter (approx. 47%) and to the Głogów II smelter (approx. 1%).

2.8.11. Outlook

The Lubin mine plans to maintain copper ore extraction for the next five years at the current level, i.e. 7.6 million t/year. During that time the mining operations will be moved to the northern area of the mine and to the east from shaft L-VI, which will alter its purpose from ventilation to material and personnel hoisting. The mine does not plan in the near future to liquidate any of the shafts. Exploration of the southern and eastern part of the mine will also be carried out. Due to the enlargement of the Źelazny Most tailings pond (on its southern border), the mining operations to the north-west will be intensified from mid-2012 in order to complete them in this area before the enlargement commences.

2.9. Polkowice-Sieroszowice mine

Ownership Division of KGHM Polska Miedź S.A. – 100% KGHM Polska Miedź S.A.	
Mining area (marked as OG on the map) „Polkowice II”, „Sieroszowice I” and „Radwanice Wschód”	
Mine type	underground
Main mineral	Copper ore
Accompanying mineral	Rock salt
Extraction depth in 2011	676-1084 m
Statistical mine life	approx. 32 years
Employment	4 689
Average metal content in ore reserves	Cu – 1.85% Ag - 44 g/t

2.9.1. Location

The mine is located to the west of the city of Polkowice, with direct access to a road and railway line. The mine operates the following deposits:

- „Sieroszowice” – mining area „Sieroszowice I” of 97 km² (15% operated by the Rudna mine),
- „Polkowice” – mining area „Polkowice II” of 75.3 km²,
- „Radwanice-Wschód” – mining area „Radwanice Wschód” of 3.3 km².

2.9.2. Formal-legal requirements

The licenses for the extraction of copper ore from the „Polkowice II” deposit (license No. 234/93 dated 7 December 1993 issued by the Minister of Environmental Protection, Natural Resources and Forestry) and from the „Sieroszowice I” deposit (license No. 235/93 dated 7 December 1993 issued by the Minister of Environmental Protection, Natural Resources and Forestry) expire on 31 December 2013, while the license for extraction from the „Radwanice-Wschód” deposit (license No. 10.95 issued by the Minister of Environmental Protection, Natural Resources and Forestry) – expires on 23 May 2015. At present, work is in progress to obtain a new licenses, which KGHM should receive by the end of September of 2013. The Minister of the Environment is the licensing authority. The next step will concern the conclusion of a new agreement on mining operations in this area.

The mine is also conducting exploratory work on the rock salt deposit „Kazimierzów”, situated above the copper ore layer, in accordance with the license obtained in 1998 and valid to the end of 2014.

The mine has all necessary permits to conduct its operations.

2.9.3. Infrastructure

The deposits mined by the Polkowice-Sieroszowice mine are accessed through 9 shafts with depths ranging from 703 m to 1 057 m, including 4 for production and the others performing ventilation/material/personnel hoisting functions. At present another shaft is being constructed (SW-4) with a planned depth of 1 219 m. Mining is conducted at depths ranging from 800 to 1200 m.

The underground mining of the deposit is conducted in three mining areas: „Polkowice Central”, „Polkowice West” and „SW-1”, under the room-and-pillar system with roof bending.

2.9.4. History

The Polkowice-Sieroszowice mine was created in 1996 as a result of the merger of the Polkowice mine in operation since 1968, with the Sieroszowice mine in operation since 1980. Construction of the Polkowice mine was started in 1962. Full production capacity at the level of 4.5 Mt of ore/year was achieved in 1972. In 1973 this was increased to 7.5 Mt of ore/year. Construction of the Sieroszowice mine was started in 1977. The current production capacity of the mine is approx. 11 Mt of ore/year.

2.9.5. Geology of the deposit

The mine operates in three copper ore deposits: „Polkowice”, „Sieroszowice” and „Radwanice-Wschód”. An accompanying mineral is rock salt, occurring above the copper bearing series in the „Sieroszowice” deposit. The rock salt layer displays local substantial thickness in the central and northern part of the „Sieroszowice” deposit. The salt resources and the form of occurrence of the bed is described in section 2.4., Other minerals in the copper ore area.

The dominating lithological type of copper ore in the „Polkowice”, „Sieroszowice” and „Radwanice-Wschód” deposits is carbonate rock of Upper Permian limestone, accounting respectively for 80%, 55% and 93% of the ore in these deposits. The share of Upper Permian cupriferous shale is respectively 12%, 14% and 7%. The shale ore is very rich in copper and silver minerals, although its thickness rarely exceeds 1 m. The sandstone ore of White Footwall Sandstone (Weissliegendes) is found only in the „Polkowice” and „Sieroszowice” deposits – respectively 8% and 31%.

The average thickness of the „Polkowice” deposit is 2.10 m, including the thickness of carbonate ore amounting to 1.56 m, shale ore to 0.25 m, and sandstone ore to 0.29 m. The average thickness of the „Sieroszowice” deposit is 1.75 m, with slight domination of carbonate ore - on average 0.85 m, while the other types of ore occur thinly, i.e. sandstone ore – 0.63 m and shale ore – 0.27 m. The average thickness of the „Radwanice-Wschód” deposit is 1.50 m.

The area of the „Polkowice” deposit is located in a part of the Fore-Sudetic monocline of strongly developed tectonics. A slightly less developed tectonic structure is observed in the area of the „Sieroszowice” deposit, which has a block-fault structure. The rock strata spread in a NW-SE direction and dip at an angle of 3 - 6° to the NE direction, however in the case of deformed rocks zones (fault zones, folding of the strata), the dip of the strata varies. The deviation from the general strike of the strata varies locally by up to 90°, and the dip angle frequently increases up to 20°.

There are a number of discontinuous dislocations within the "Polkowice" and "Sieroszowice" deposits. Predominant fault direction is NW-SE, with deviations in the direction of NWW-SEE and NNW-SSE. Other dislocation directions are W-E and NE-SW. Decisive for the overall structural picture are: the fault zone between the main Lubin fault, the Sobin fault and the Szklary Górne fault; the Polkowice fault with the "Central Rudna" fault zone; the "Trzebcz-Polkowice" fault zone and "Biedzychowa" fault zone. The level of dislocations in case of the single surface within the "Polkowice" deposit usually does not exceed 1 m. The sum of dislocations may reach several tens of meters.

In addition to typical discontinuous dislocations within the "Sieroszowice" deposit, the specific structure of a fold-and-fault character may be observed. Its direction is consistent with the direction of the W-E major fault zones. In the south, there is so called Paulinowa Syncline, which is concave (saddle) structure of the complex fold-and-fault character. In the southern part of the "Sieroszowice" and "Deep Głogów" deposits there is so called Świnina Anticline. In the central part of the "Sieroszowice" deposit there is a zone of "Bądzów" ditch (graben), which is adjacent on the south to Świnina Anticline. Another structure observed is Jakubów flexure, located in the northern area of the deposit. The strike of above mentioned tectonic structures is consistent with fault zones of the "Rudna" deposit, i.e. "Biedzychowa" fault and "Trzebcz-Polkowice" tectonic events zone.

2.9.6. Mineralization

The copper ore deposits extracted by the Polkowice-Sieroszowice mine are characterised by varying mineralization both in terms of the type of the minerals, the forms of occurrence and the intensity of mineralization. The main minerals are bornite, chalcocite, digenite, chalcopyrite and tennantite. The carbonate-shale ore contains both the distributed forms in the form of grains and aggregates as well as ore pockets and veins. In the sandstone ore the minerals are usually dispersed being either in the form of a binder or ore lamination. All types of the ore are generally dominated by chalcocite mineralization. The metals accompanying these minerals are mainly silver, lead, cobalt, molybdenum and nickel. They either form their own minerals or are found in the form of isomorphic additions in the basic ore minerals.

Silver occurs mainly in the form of isomorphic additions in the main ore minerals. The silver content in the deposit is highly varied in both the vertical profile and horizontal distribution. The highest silver content is observed in the cupriferous shale.

The average copper content in the geological resources of the „Polkowice”, „Sieroszowice” and „Radwanice-Wschód” deposits is respectively 2.33%, 2.61% and 1.92% Cu. The average silver content is respectively 48 g/t, 65 g/t and 26 g/t.

2.9.7. Resources and reserves

The table below presents the resources and reserves of the Polkowice-Sieroszowice mine according to international standards:

Table 9. Resources and reserves of the Polkowice-Sieroszowice mine according to international standards - as at 31 December 2011.

Resources and reserves	Ore quantity	Metal contents	
	'000 t	Cu %	Ag[g/t]
Measured mineral resources			
Polkowice deposit	57 686	2.30	60
Sieroszowice deposit	65 469	3.07	74
Radwanice-Wschód deposit	-	-	-
Indicated mineral resources			
Polkowice deposit	57 080	2.36	52
Sieroszowice deposit	232 380	2.48	62
Radwanice-Wschód deposit	7 330	1.92	26
Total mineral resources	419 945	2.52	59
Proved ore reserves			
Polkowice deposit	42 244	1.78	33
Sieroszowice deposit	74 990	1.98	48
Radwanice-Wschód deposit	-	-	-
Probable ore reserves			
Polkowice deposit	54 535	1.66	36
Sieroszowice deposit	197 690	1.91	50
Radwanice-Wschód deposit	7 797	1.25	18
Total ore reserves	377 257	1,86	45

2.9.8. Technical factors - natural hazards

Geothermal conditions

The average geothermal step in the „Polkowice” deposit is 36.1 m/°C, while the average geothermal gradient is 3.0°C/100 m. The virgin rock temperature at the level of the Upper Permian floor, which is the main level of mine operations, ranges from 27.5 to 35.0°C.

In the case of the „Sieroszowice” deposit, the average geothermal step is 40.9 m/°C, while the average geothermal gradient is 2.8°C/100m. The virgin rock temperature at the level of the Upper Permian floor, which is the main level of mine operations, ranges from 27.2 to 48.7°C and on average amounts to 38.9°C. In order to ensure the required climatic conditions in the parts of the deposit below 1100 m, the mine is using air-conditioning methods to provide employees with the necessary comfort to work (central and work station air-conditioning).

Water hazard

The copper ore deposit within the borders of the „Polkowice” mining area is classified into three levels of water hazard. The highest water hazard for the operations comes from the aquifer level of limestones and dolomites located above the deposit and the Tertiary subcoal aquifer level.

The water inflow to the Polkowice and Sieroszowice mines was as follows: during the years 1994-2010 it was respectively 27.2 and 1.44 m³/min, as at 31 December 2010 it was 31.21 and 2.085 m³/min, while forecasts for the years 2012-2030 project inflow of 16.50-25.30 and 2.1-2.5 m³/min. The total inflow to the „Radwanice-Wschód” deposit does not at present, and should not exceed in the future, the level of 0.1 m³/min. The deposit area encompasses 6 aquifer levels, including 4 mineralized ones.

Rock burst hazard (seismicity)

The description of this hazard is the same as in the case of the Lubin mine.

Gas hazard

Gas hazard is associated with the occurrence of gases of natural origin in the rock mass (methane, hydrogen sulphide, sulphur oxides) and technological gases generated in relation to the mining operations (nitric oxides, carbon oxide, sulphur dioxide). The current results of the surveys conducted show that the „Polkowice” „Sieroszowice” and „Radwanice-Wschód” deposits may be treated as non-methane deposits, though legally-mandated preventative measures are followed during mining operations. In the area of excavation works, where the roof layers rest in close proximity to the anhydrite rocks, a hydrogen sulphide hazard exists. The emission of hydrogen sulphide to the gobs can occur locally, directly behind the mining front, being generated from the closely deposited distressed rock layers.

2.9.9. Mine operations

Table 10. Mine production of the Polkowice-Sieroszowice mine including the ore enrichment plant during the years 2009-2011 including the first half of 2012.

	2009	2010	2011	1 st half of 2012
Ore extraction* Mt	10.37	10.37	10.72	5.63
Cu content in the ore %	1.83	1.84	1.82	1.78
Ag content %	33.75	34.96	35.17	36.91
Concentrate production * '000 t	504	513	534	269.07
Copper content in the concentrate %	24.62	24.13	23.75	24.51
Silver content in the concentrate g/t	433	440	444	488.9
Extraction of rock salt t	311 083	436 830	457 172	171 766

* dry weight

Mining of the copper ore deposit at the Polkowice-Sieroszowice mine is carried out in 11 production areas, which extract ore from 25 mining fields located mainly in the southern and south-western parts of the „Polkowice II” mining area and in the north-west, central and eastern parts of the „Sieroszowice I” mining area.

Mine development work is conducted systematically to ensure the stability of output at the planned level. Development work at the Polkowice-Sieroszowice mine is currently conducted in a westerly direction as follows: 1 group of openings of 4 faces and 2 groups of openings with a total of 5 faces. The remaining drift work involves the preparation of subsequent fields for operation/extraction. The mine is also involved in accessing the Deep Głogów mining area. Altogether, approx. 41 km of drifts are planned for execution in 2012 in this mine and in the Deep Głogów mining area. The work is performed both by the mine's own staff as well as by

external contractors. In the first half of 2012, over 50% of the planned annual tasks were performed.

Within the scope of the license for exploration of the „Kazimierzów” salt deposit, the drifts are constructed at the salt level and the boreholes are drilled from the level of these drifts by a dedicated organisational unit of the Polkowice-Sieroszowice mine. As a result of exploration of the salt deposit, in the first half of 2012, 172 thousand tonnes of salt were extracted.

The major investments carried out in 2011 and in the first half of 2012 include the continuation of the construction of the SW-4 shaft complex and construction of the central air-conditioning station. In addition, investments continued on developing the infrastructure of the working areas.

2.9.10. Polkowice-Sieroszowice mine ore enrichment plant /concentrator

The ore enrichment plant, part of KGHM's Ore Enrichment Plants Division, is located near the P-I and P-II shafts in the „Polkowice Central” area.

The plant processes shale-carbonate ore. The applied enrichment technologies include the same operations – screening and crushing, milling and classification, flotation and drying of the concentrate – as described in the ore enrichment plant for the Lubin mine (described in section 2.8.10, Lubin mine ore enrichment plant/concentrator).

However, due to the different lithological composition of the processed ore, the first milling step takes place in ball drum mills rather than the rod drum mills used at the Lubin OEP for enriching sandstone-carbonate ore.

Waste is pumped directly to the Źelazny Most tailings pond, while the concentrate produced is directed to drying.

The dried concentrate, with approx. 8.5% water content, is transported by rail to the Głogów I smelter (approx. 82%) and the Głogów II smelter (approx. 18%).

2.9.11. Outlook

For the last few years the mine has successively increased output despite the deteriorating deposit conditions. Despite mining at deeper and deeper depths, the mine plans to maintain the current production level, i.e. approx. 11 million tonnes/year, in the near future. The high variation of the deposit and the occurrence of large empty rock zones might be a hazard.

No liquidation of any of the existing shafts is planned in the near future.

Since 2011 the mine has been preparing special areas at the mine faces to serve as a pilot section to carry out trials of a complex for mechanical rock mining of thin ore seams of up to 2 m. This technology might become technically and economically competitive to the traditional technology of using explosives. The start-up of this new section is planned around the start of 2013.

By the end of the first quarter of 2013 it is planned to obtain a license for mining the „Kazimierzów” rock salt deposit. At present the mine is carrying out a project called "Achieving rock salt production at the level of 1 M tonnes/year". This should allow an increase in the production and sale of rock salt as of 2013.

2.10. Rudna mine

Ownership Division of KGHM Polska Miedź S.A. – 100% KGHM Polska Miedź S.A.	
Mining area (marked as OG on the map) „Rudna I” and „Rudna II”	
Mine type	underground
Main mineral	Copper ore
Extraction depth in 2011	920-1170 m
Statistical mine life	approx. 24 years
Employment	4 560
Average content of metals in operational resources (ore reserves)	Cu – 1.65% Ag - 46 g/t

2.10.1. Location

The mine is located north of the city of Polkowice. It mainly mines the "Rudna" deposit, but it also operates in the „Sierszowice” deposit. The size of the mining area is 78 km².

2.10.2. Formal-legal requirements

At present the mine has licenses issued by the Minister of Environmental Protection, Natural Resources and Forestry for the extraction of ore from the following deposits: „Rudna I” (license No. 233/93 dated 7 December 1993), „Rudna II” (license No. 24/96 dated 24.06.1996) and „Sierszowice” (license No. 235/93 dated 7 December 1993). The licenses for extraction from the „Rudna II” and „Sierszowice” deposits expire on 31 December 2013. At present, work is in progress on obtaining a new license for these mining areas, which KGHM should receive by the end of September 2013. The Minister of the Environment is the licensing authority. The next step will concern the conclusion of a new agreement on mining operations in this area. The mine has all necessary permits to conduct its operations.

2.10.3. Infrastructure

The Rudna mine operates in three working areas: „Rudna Central”, „Rudna West” and „Rudna North”. The copper ore deposit is accessed through 11 shafts with depths ranging from 950 to 1150 m , including 3 production shafts, and others performing ventilation/material/personnel hoisting functions. Mining is conducted at depths ranging from 844 to 1250 m. The output is delivered to the Rudna ore enrichment plant. The surface infrastructure includes shaft yards, auxiliary facilities and technological networks.

2.10.4. History

This is the youngest mine in the LGCB. It was built in 1970, with mining commencing in 1974. The construction and extension period of the mine was characterised by very high production dynamics. Output in 1974 amounted to 1.9 Mt of ore/year, while by 1982 it had increased to 11.3 Mt of ore/year. The current production capacity of approx. 12 Mt of ore/year was achieved in 2007.

2.10.5. Geology of the deposit

The mine operates in the "Rudna" deposit and 15% in the „Sierszowice” deposit.

The „Sierszowice” deposit was described in the section on the Polkowice-Sierszowice mine.

The average thickness of the "Rudna" deposit is 4.26 m. The deposit series includes three lithological links: Upper Permian carbonate rocks, clay-dolomite shale and white sandstones of White Footwall Sandstone (Weissliedendes). The lithological development of the deposit series is associated with the existence of depression and elevation zones in the roof of the sandstone. In the depression zones the deposit is present in the sandstones, cuperferous shales and dolomites (clay, smudged and lime). In the elevation zones, with the absence or minimal presence of shales and clay dolomites and substantial reduction of the smudged dolomites, the ore occurs in the dolomites (lime, organogenic or sandy) and sandstones.

The share of individual lithological types of the ore in the balance ore resources is as follows:

- carbonate ore – 11 % of ore resources,
- shale ore - 6% of ore resources,
- sandstone ore - 83% of ore resources.

The deposit strata spread in a NW-SE direction following the course of the border of the Fore-Sudetic monocline with the Fore-Sudetic block, and dip in a NE direction at an angle from 1 to 6 degrees. The general directions of the spread and dip vary, specifically in the zones of tectonic dislocations and the elevation zones of the sandstone roof. In many cases the strata are seen to be dipping in a SW direction, i.e. in the opposite direction to the general dip of the monocline, and the dipping of the strata locally reach up to 45 degrees.

The occurring non-continuous dislocations are in two basic directions: NW-SE with NNW-SSE or NWW-SEE deviations and in a direction close to W-E. The dislocations of these directions create a system of numerous block structures – horsts and ditches (graben) of various sizes and amplitudes. The main fault zones are as follows:

- "Biedzychowa" fault zone occurring in the south-eastern part of the area with a direction close to W-E with a SSW-NNE deviation. The width of the zone is from 100 to 300 m and the extent of the throw ranges from a few tens to several tens of meters in a northerly direction.
- the parallel direction is also observed in the "Paulinowa" structure in the western part of the deposit, which is composed of spherical faults of a few hundred meters in length and amplitudes from a few to a few tens of meters.
- the Sudety direction NW-SE is represented by the zone of faults of "Rudna Central" occurring in the southern part of the deposit area. It consists of groups of faults forming horsts and ditches with amplitudes from a few to 30 meters. Next to the faults grouped in the aforementioned zones, there are single non-continuous dislocations with amplitudes of up to a few meters. The faults are accompanied by flatly dipping cracks with marked sliding scratches. The dolomite-lime strata have numerous vertically included cracks and show the directions consistent with the directions of non-continuous dislocations.

2.10.6. Mineralization

The "Rudna" deposit displays varying and differentiated mineralization. The main ore minerals are chalcocite, digenite, bornite, chalcopyrite, covellite and tennantite. The carbonate-shale ore contains both the distributed forms in the form of grains and aggregates as well as ore pockets and veins. The ore minerals are usually dispersed in the sandstone ore and are present in either binder or ore laminate form. The highest concentration of the ore minerals is observed in the shale ore. The accompanying elements include mainly silver, lead, cobalt, nickel, vanadium and molybdenum. They create either their own minerals or occur in the form of isomorphic additions in the basic ore minerals.

Silver occurs mainly in the form of isomorphic additions in the main ore minerals. The silver content in the deposit is highly varied in both the vertical profile and horizontal distribution. The highest silver content is observed in the cupriferous shale.

The average copper content in the geological reserves of the "Rudna" deposit is 1.70% Cu. The average silver content is 47 g/t.

2.10.7. Resources and reserves

The table below presents the resources and reserves of the Rudna mine ("Rudna" deposit) according to international standards:

Table 11. Resources and reserves of the Rudna mine according to international standards - as at 31 December 2011

Resources and reserves	Ore quantity	Metals content	
	'000 t	Cu %	Ag [g/t]
Measured mineral resources	287 725	1.71	43
Indicated mineral resources	110 133	1.68	59
Total mineral resources	397 857	1.70	47
Proved ore reserves	182 510	1.60	41
Probable ore reserves	63 685	1.60	56
Total ore reserves	246 195	1.60	45

2.10.8. Technical factors - natural hazards

Geothermal conditions

The average geothermal step in the "Rudna" deposit is 39.8 m/°C, while the average geothermal depth gradient is 2.5°C/100 m. The virgin rock temperature at the Upper Permian floor level, which is the main level of operations, ranges from 34.5 to 47.7°C and on average amounts to 39.2°C. Therefore the "Rudna" ore deposit was classified in the group of "hot" and "very hot" deposits.

In order to ensure the required climatic conditions in the parts of the deposit occurring below 1100 m, the mine is using air-conditioning methods to provide employees with the necessary comfort to work (central and work station air-conditioning).

Water hazard

The copper ore deposit within the borders of the „Rudna I” and „Rudna II” mining areas is classified into three levels of water hazard. The aquifer levels around the deposit – limestone and dolomites of Upper Permian and sandstones of Red Footwall Sandstone (Rotliegendes) – are the source of water inflow to the mine in the area of the "Rudna" deposit. These levels are not very water-logged. Water inflow to the deposit was as follows: during the years 1994-2010 it was 2.085 m³/min, as at 31 December 2010 – 2.556 m³/min, while the forecasts for the years 2012-2030 project 2.0-2.3 m³/min. The deposit area encompasses 6 aquifer levels, including 4 mineralized ones.

Rock burst hazard (seismicity)

The description of this hazard is the same as in the case of the Lubin mine, although it should be pointed out that, in the case of the Rudna mine, the hazard related to seismic events and their potential impact in the excavation areas, in the form of rock bursts and rock mass destressing, mainly given the depth of the operations, is the highest of all the mines.

Gas hazard

Gas hazard is associated with the occurrence of gases of natural origin in the rock mass (methane, hydrogen sulphide, sulphur oxides) and technological gases generated in relation to the mining operations (nitric oxides, carbon oxide, sulphur dioxide). The current results of the surveys conducted show that the "Rudna" deposit may be treated as a non-methane deposits, though legally-mandated preventative measures are followed during mining operations. In the area of mining operations, where the roof layers rest in close proximity to the anhydrite rocks, a hydrogen sulphide hazard exists. The potential hazard of gas and rock outbursts occurs in the areas of mining operations below the depth of 1200 m.

2.10.9. Mine operations

Table 12. Mining production of the Rudna mine including the ore enrichment plant during the years 2009-2011, including the first half of 2012.

	2009	2010	2011	1st half of 2012
Ore extraction * Mt	12.21	11.77	11.74	6.05
Cu content in the ore %	1.87	1.84	1.83	1.81
Ag content %	46.66	48.61	51.33	50.62
Concentrate production * '000 t	951	894	904	459.28
Copper content in the concentrate %	25.76	26.66	26.48	26.13
Silver content in the concentrate g/t	600	647	682	681.24

** dry weight*

Mining of the copper ore deposit at the Rudna mine is carried out in 13 production areas, which extract ore from 25 mining fields located in various parts of the „Rudna I” mining area.

The ore in the Rudna mining area is completely accessed, with development work restricted to preparing subsequent fields for extraction. The mine is also involved in accessing the Deep

Głogów mining area. Altogether, approx. 36 km of drifts are planned for execution in 2012 in this mine and in the Deep Głogów mining area. The work is performed both by the mine's own staff as well as by external contractors. In the first half of 2012, over 50% of the planned annual tasks were performed.

The capital expenditures incurred in 2011 and in the first half of 2012 were mainly dedicated to developing the infrastructure of the mine and replacing mining machines. Work was carried out on the central air-conditioning system - expansion of the surface air-conditioning station.

2.10.10. Rudna mine ore enrichment plant/concentrator

The ore enrichment plant, part of KGHM's Ore Enrichment Plants Division, is located near the R-I and R-II shafts in the „Rudna Central” area.

The plant enriches the sandstone-carbonate type ore from the Rudna and Polkowice-Sieroszowice mines. The enrichment technologies applied include the following operations: screening and crushing, milling and classification, flotation and drying of the concentrate. A detailed description of the technological process is provided in section 2.8.10., Lubin mine ore enrichment plant/concentrator.

The concentrate produced of approx. 8.5% water content is transported by rail to the Głogów I smelter (approx. 30%), the Głogów II smelter (approx. 56%) and to the Legnica smelter (approx. 14%). The waste is pumped directly to the Źelazny Most tailings pond.

2.10.11. Outlook

The operations to 2014 will be conducted within the borders of the developed mining fields. By this time subsequent fields will have been developed in the north-west direction. Further development and mining work is dependent on the start-up of the surface air-conditioning station near shaft R-XI with a total effective cooling capacity of 25 MW. The planned start-up date is 2015. Moving the mining operations to below 1200 m, given the hazards associated with gas and rock outbursts, will require the development of rules and guidelines for conducting mining operations at these depths. The first mining area will begin operating under these conditions by mid-2013.

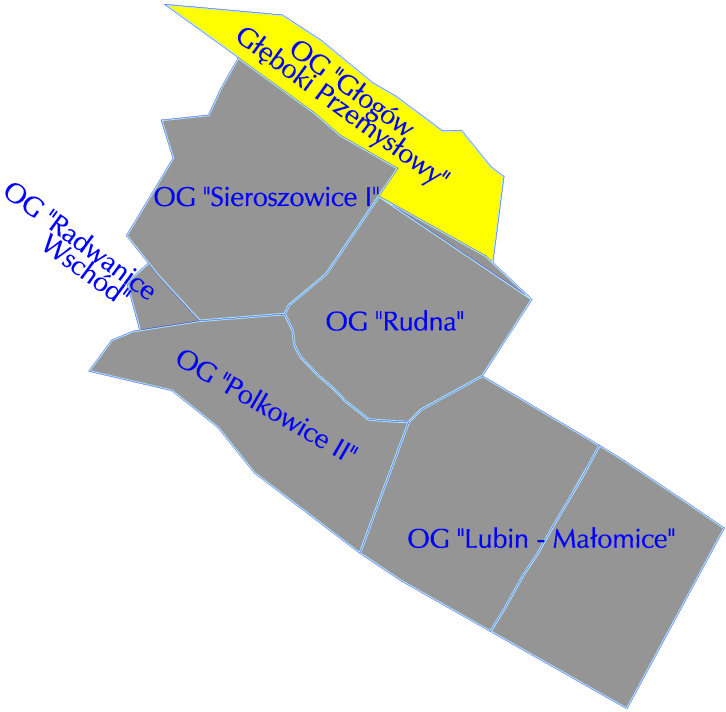
Over the next few years extraction of the ore will remain at around the current level, i.e. approx. 12 million tonnes/year. Maintaining the same production level with decreasing thickness of the ore seam will require higher employment and higher output from mine development. In terms of optimising existing infrastructure, the R-VI shaft is planned to be liquidated. Its functions will be replaced by other shafts. This will allow the mining of reserves in the support pillar of that shaft which have been unavailable to date. In order to maintain the production level from the „Rudna Central” area, it is planned to reduce the size of the support pillar of shaft R-VIII and start the mining of the freed resources.

In October 2012 testing will begin on a belt conveyor measurement system, which will continuously analyse (24/7) the Cu content in the entire ore stream. Positive outcome of the tests will provide the basis for a decision on the use of the analysers in the entire mine. The consequence will be optimising management of the quality of the extracted ore and of the waste rock.

In 2013 testing will begin in the Rudna mine on the use of a mining machine with a rolling-cutting unit within the mechanical extraction of hard rock project.

2.11. Project in pre-production stage - Głogów Głęboki Przemysłowy (GG-P or Deep Głogów)

Ownership Division of KGHM Polska Miedź S.A. – 100% KGHM Polska Miedź S.A.	
Mining area (marked as OG on the map) „Głogów Głęboki-Przemysłowy”	
Mine type	underground
Main mineral	Copper ore
Extraction depth in 2011	1200-1400 m
Statistical mine life	approx. 21 years
Average content of metals in operational resources (ore reserves)	Cu – 1.90% Ag - 61 g/t



The objective of the project is to develop the licensed area of Deep Głogów, with ore reserves as at 31 December 2011 amounting to 6 998 thousand Cu and approx. 23 thousand Ag.

Pursuant to the development model, the deposit will not be mined by a separate mine. It will be mined by the Rudna mine (50%) and the Polkowice-Sieroszowice mine (50%). The enrichment of the ore extracted from the Rudna mine will be handled by the Rudna OEP, while ore from the Polkowice-Sieroszowice will be processed by the Rudna OEP and the Polkowice OEP. Flotation tailings will be stored at the Żelazny Most tailings pond.

2.11.1. Location

The Deep Głogów mining area covers the strip of land running from NW–SE, bordered on the south by the existing mines Sieroszowice and Rudna. The northern border runs parallel to the Odra River valley over a distance of 2.5 km to the south of the Głogów smelter and 3 km to the south of the city of Głogów. The length of the area is approx. 20 km and the width is 3-4.5 km. The size of the Deep Głogów mining area amounts to approx. 56 km².

2.11.2. Formal-legal requirements

KGHM has a license for the extraction of copper ore from the „Deep Głogów” area No. 16/2004 dated 25 November 2004, issued by the Minister of the Environment, valid to 25 November 2054.

In accordance with this license, development work is carried out under investment project Deep

Report prepared by an internal team of KGHM Polska Miedź S.A.

Głogów (GG-P), while the mining will be handled by the Rudna and Polkowice-Sieroszowice mines. The building permits for subsequent surface structures are obtained on an on-going basis.

2.11.3. Geology of the deposit

The copper ore deposit in the Deep Głogów mining area is a continuation of the deposit in the existing mining areas. The deposit has been documented with a confidence level in category C₁ (the accuracy of estimation of the resources +/- 30%) based on 42 boreholes drilled from the surface. The deposit ranges from 1200 to 1400 m in depth and is characterised by varying thickness ranging from 0.74 m to 4.13 m (on average 2.11 m), with varying intensity of the mineralization and a varied lithological structure.

The thinnest parts of the balance resources deposit are in the western and central region (to the north of the Sieroszowice mine), where it is present in the cupriferous shale and in the roof of White Footwall Sandstone (Weissliegendes), as well as locally in the eastern region, to the north of the Rudna mine. Depending on the location of the deposit, three lithological types of ore can be identified: carbonate ore with an average thickness of 0.49 m (27%), shale ore with thickness from 0.02 m to 0.81 m (13%), and sandstone ore with thickness from 1.15 m to 3.59 m (60%).

2.11.4. Mineralization

The copper mineralization identified in the Deep Głogów deposit is typical for the entire copper ore deposit in the Fore-Sudetic monocline. The dominating mineralization is in the form of small grains of sulphides distributed in the bed-rock, most often evenly, sometimes concentrated in the form of smudges and extended pockets. Locally, during the documentation stage, the coarse-grain forms of mineralization were observed in the form of veins of varying thickness or irregularly located pockets. All of the copper ore types found in the Deep Głogów deposit (sandstone, shale and carbonate ore) are dominated by simple copper sulphides: chalcocite and digenite. The accompanying elements include lead, silver, cobalt, zinc and nickel.

The average copper content for the geological resources of the Deep Głogów deposit amounts to 2.40% Cu. The average silver content is 79 g/t.

2.11.5. Resources and reserves

The table below presents the resources and reserves of the Deep Głogów deposit according to international standards:

Table 13. Resources and reserves of the Deep Głogów deposit according to international standards - as at 31 December 2011.

Resources and reserves	Ore quantity	Metals content	
	'000 t	Cu %	Ag [g/t]
Measured mineral resources	100	2.55	109
Indicated mineral resources	291 487	2.40	79
Total mineral resources	291 586	2.40	79
Proved ore reserves	98	1.80	77
Probable ore reserves	233 019	1.90	61
Total ore reserves	233 117	1.90	61

2.11.6. Technical factors - natural hazards

High temperature is the main negative factor amongst the geological and mining conditions associated with the future mining of this deposit, which will require the use of special ventilation and air-conditioning equipment. The copper ore deposit in the Deep Głogów area is classified as a very hot deposit, with an average virgin rock mass temperature of 47.8°C. For this reason all mining conducted in this area requires the use of various methods of air cooling. The basic method involves the use of central air-conditioning, i.e. cooling of the air using chilled water produced at a surface air-conditioning station and delivered through a system of pipelines to the coolers located at the underground work sites. All self-propelled machines working in this region will be equipped with air-conditioned cabins. Work station air-conditioning, comprised of cooling of the air in cabins at the permanent work stations (i.e. at the ore dumping stations, electric switchboards and in the cabins of conveyor belt operators), will be used as well.

Based on the results of hydrogeological analysis of the projected Deep Głogów mining area and the hydrogeological conditions of the developed part of the deposit in the northern part of the Rudna mine, it can be assumed that the level and nature of water inflow from the levels around the deposit will not constitute a water hazard to these operations. There may occur a real water hazard as a result of water inflow from the boreholes or the inflows from the neighbouring mining areas.

No increased hazard of rock bursts is expected as a result of the increased mining depth (initial stress). The Deep Głogów mining area has a different geological structure to that encountered in the Rudna and Polkowice-Sieroszowice mines, specifically with respect to the strata above the deposit, where the rock salt bed reaches substantial thickness, mainly at the expense of the anhydrite layers. It is expected that the thick layer of rock salt located above the deposit might have a beneficial impact on geomechanical conditions.

The gas hazard level is monitored. Tests are being conducted to determine the degree of this hazard and to implement the appropriate prevention rules.

2.11.7. Project status

The scope of the project includes

- access to the Deep Głogów mining area through development of groups of openings from the Rudna and Polkowice-Sieroszowice mines, which will constitute the ventilation-transport system for the future mining activities,
- sinking and construction of the GG-1 shaft complex in the Deep Głogów mining area (approx. 7.5 m in diameter and 1340 m in depth) to provide ventilation,
- construction of surface air-conditioning stations, and
- equipping the mine with the requisite infrastructure, including in particular ventilation and air-conditioning equipment and machinery for horizontal transport of the ore.

The Deep Głogów deposit is currently being accessed from the Rudna mine through 3 groups of openings totalling 11 mining faces, and from the Polkowice-Sieroszowice mine (from the SW-4 shaft) through 3 groups of openings totalling 11 mining faces.

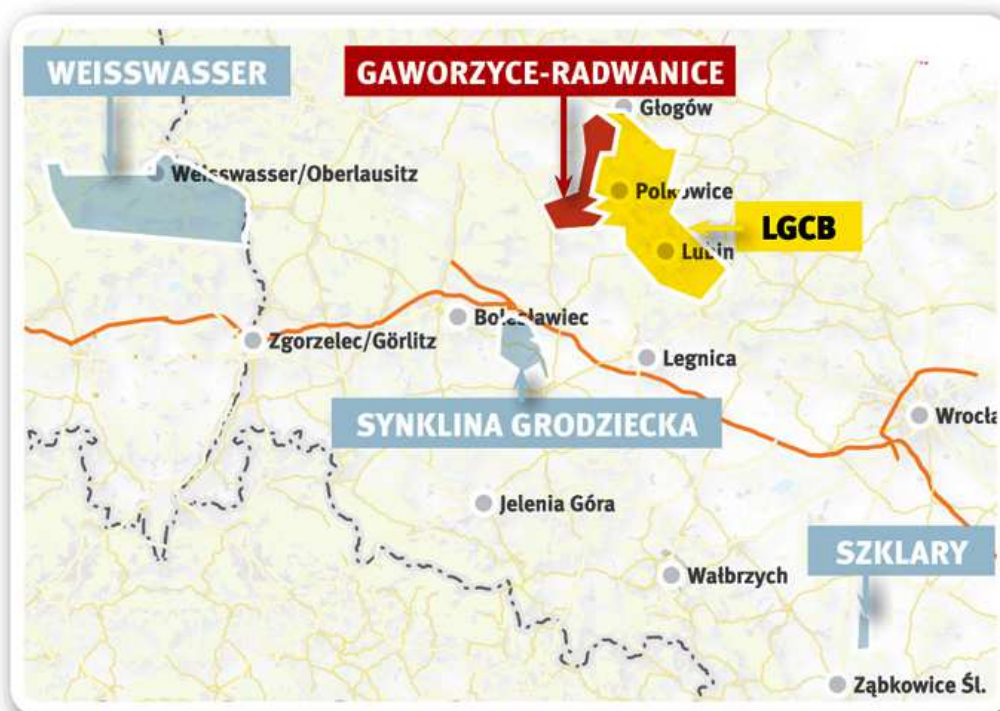
In the first half of 2012 around 6 of the approx. 13 km of drifts described above were developed, i.e. 46.4% of the plan (this work is described above in the sections on the Rudna and Polkowice-Sieroszowice mines). As these drifts are constructed, their infrastructure is also developed, including power supply, dewatering, ventilation and air-conditioning, and ore transport, as well as work connected with heavy equipment chambers.

Sinking of the GG-1 shaft started in 2010 and its completion is planned for 2019. The scope of development work to sink the GG-1 shaft included design work and the drilling of freezing holes. The construction of temporary and final structures for sinking the shaft is in progress. Planned date for starting the freezing of the rock mass: August 2012; planned date for starting the deepening of the shaft: June 2013.

The total estimated capital expenditure on the Deep Głogów project amounts to PLN 2.8 billion. Expenditures already incurred during the years 2005-2011 amount to PLN 541 million.

2.12. Exploration projects

2.12.1. Radwanice-Gaworzyce Project



The project objective is to assess the possibility of exploiting the „Radwanice” and „Gaworzyce” copper deposits, abutting on the west the areas currently being mined by the „Polkowice-Sierszowice” mine. It is expected that positive drilling results will add to the resources and reserves of KGHM by approx. 82 million tonnes of copper ore (2 million tonnes of Cu). KGHM has the exploration licenses for both ore deposits.

The original scope of geological works aimed at exploration of the „Radwanice” deposit foresaw the drilling of 13 boreholes in stage I and 9 boreholes in stage II as well as site surveys, laboratory tests and estimation of resources and reserves. The survey covers the area of 52.26 km². So far 3 out of 13 projected boreholes for stage I have been completed.

The original scope of geological work at the „Gaworzyce” deposit encompassed the drilling of 6 boreholes in stage I and a maximum of 8 boreholes in stage II. The survey covers the area of 48.21 km². So far 2 out of 6 projected boreholes for stage I have been completed.

On 16 February 2012 applications were filed for a change in the licenses altering the scope of geological work and its timeframe. For both deposits the number of boreholes is planned to be reduced in favour of surface geophysical tests to be conducted in two stages. The further drilling work might still be conducted upon the completion of these tests.

The estimated project capital expenditures amount to approx. PLN 50 million.

2.12.2. Grodziecka Syncline project (Synklina Grodziecka)

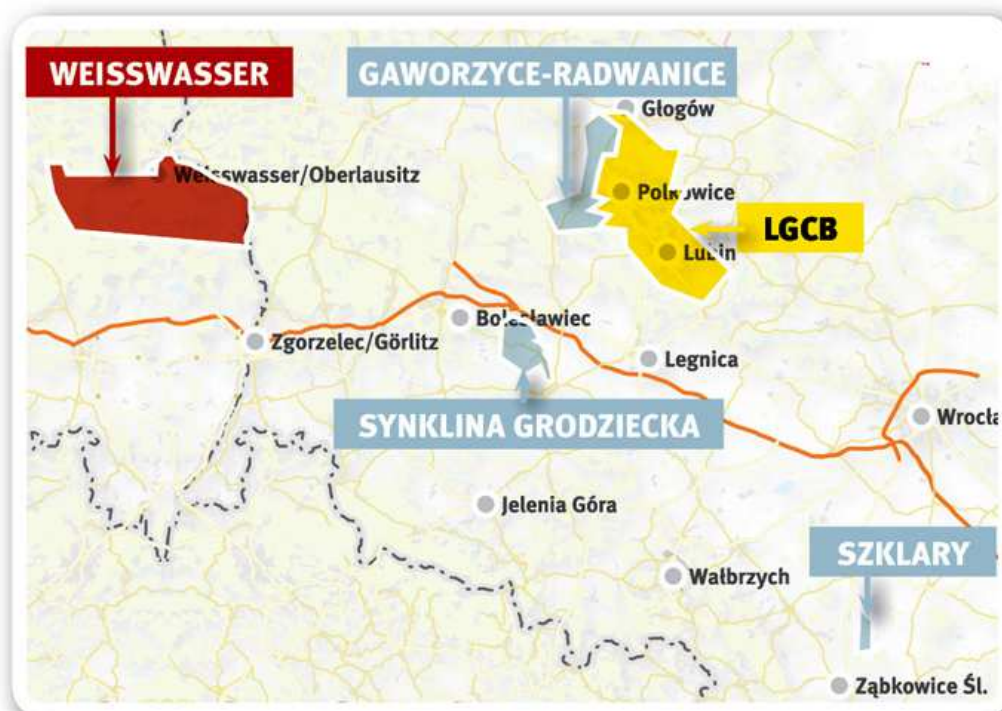


The project objective is to explore, by the end of 2013, the areas of documented copper ore deposits „Wartowice” and „Grodziecka Basin” in the confidence level category C1 (a part of the ore deposits already documented in category C2) and to increase the resources and reserves in category C1 in these areas beyond the delineating boreholes. The explored and documented deposits are located partially in the area of the so-called „Old copper belt” - the region of Iwiny, Wartowice, Lubichów, Żeliszów and Bolesławiec. The largest mine in this area was the Konrad mine, which ceased mining activities in 1989 for economical reasons.

Exploration and documentation in the documented area of the „Grodziecka Syncline” is divided into two stages: the first will involve drilling 9 boreholes and the second 6 or more, depending

on the the results obtained. To date 8 boreholes have been drilled, geophysical studies have been completed and samples from the drilled cores have been taken. The survey covers area of 66.73 km². The drilling programme in the Bolesławiec area should be completed in 2013. The estimated capital expenditures for the project amount to approx. PLN 75 million.

2.12.3. Weisswasser Project



Exploration of the copper and silver ore deposits in the Upper Permian formations in the licensed area „Weisswasser” (Saxony in Germany), based on the assumptions, is aimed at discovering a copper ore deposit with minimum resources of approx. 1.5 million tonnes of equivalent copper. The project is conducted by KGHM Kupfer AG (100% of the shares belong to KGHM). KGHM Kupfer AG has a license for the exploration of minerals for commercial purposes in the area of 364 km², issued by the Saxon Higher Mining Office, valid to 31 December 2013.

Analysis of archival materials on the area covered by the copper exploration license resulted in the identification of a promising area located to the south of the town of Weisswasser, around the ore mineralization indications identified in a single borehole. The exploration aims at investigation of the copper mineralization in this area. The first stage involved the drilling of 4 boreholes, geophysical borehole measurements and surface seismic measurements. These activities were completed in June 2012 and the first analyses of the samples were made. The positive output of the first stage of exploration will provide the basis for a decision on

subsequent stages of exploration. The capital expenditures incurred for stage I of the project amounted to approx. EUR 12 million.

2.12.4. Szklary project



The objective of the project is to conduct studies and analyses in order to provide the basis for a decision on the development of a nickel ore deposit in the vicinity of Szklary near Ząbkowice Śląskie (approx. 60 km south of Wrocław). This deposit, formed as a result of the erosion of serpentinite, was mined during the years 1890-1982, initially as an underground mine, then as an open pit with a smelter, which was closed due to low profitability.

A number of exploratory boreholes were drilled during the years 2006–2011 in the „Szklary I” licensed area (a total of 93 boreholes totalling 2466 m). It is assumed that this work will be continued until 2013, and will result in the geological documentation of the „Szklary I” nickel ore deposit in category C1. In addition, as of 2010, work was started on the development of waste-free nickel ore processing technology (laboratory tests have been completed to date). In December 2011 design and analysis work was also started on geological and hydrogeological analysis (development of a hydrological model of the deposit), a concept for the storage of waste from the nickel ore leaching process, a comprehensive deposit development model (a model of the open pit, mine infrastructure, machinery and equipment etc.), selection of the site for the Szklary facility (open pit, hydro-metallurgical plant, waste storage facility) considering infrastructure for the delivery of basic raw materials, utilities and production materials. The expenditures for the project at this stage will amount to approx. PLN 11 million.