

Summary

The mining project proposed by Minera y Metalúrgica del Boleo, S.A. de C.V. (MyMB) is located in the old mining district of Santa Rosalía, in the outskirts of the city of the same name, in the municipality of Mulegé, state of Baja California Sur, between the Santa Águeda stream to the south and the El Infierno stream to the north. The district is demarcated by coordinates 27° 19' to 27° 23' north and 112° 15' to 112° 22' west, but the area intended for mining operations is restricted to the basins of the El Boleo, La Soledad, Purgatorio, Providencia and Sin Nombre streams, in the buffer zone of the El Vizcaíno Biosphere Reserve.

The El Boleo mineral deposit was discovered in 1868 and was mined by small-scale entrepreneurs until 1884; subsequently, the region experienced a boom when the Compagnie Du Boleo mining company mined there from 1885 to 1954. During this time, 11 mining estates developed on an area covering 20,627 hectares, with a railway functioning as an axis connecting Santa Rosalía, where the foundry was located, with the most significant mining groups: Soledad (7 km to the north), Purgatorio (5 km to the northeast) and Providencia (2 km to the southwest). The population peaked at 11,660 inhabitants in the year 1918, and this figure remained unsurpassed until 2005 when a census carried out by Corporación Ambiental de México, S.A. de C.V., established that there were 12,012 inhabitants.

Around 1930, the deposits began to show signs of mineral exhaustion, first Soledad, followed by Providencia and then Purgatorio. For this reason, between 1940 and 1950, the population dropped to around one thousand inhabitants. In 1954, at the request of the federal government, the mine resumed operations through Compañía Minera de Santa Rosalía, a mining company held 32% by the state and 67% by private investors. By 1960, the population of Santa Rosalía had risen to 5361 inhabitants.

In 1963, a leaching, precipitation and flotation plant was built, which enabled poorer quality material to be processed; however, in 1973, the private investors involved withdrew due to high operating costs. Between 1977 and 1981, the company posted losses of around 200 million pesos and was subsidized by the federal government. Finally, in 1985, the mining activity came to a definitive end, despite a brief attempt between 1988 and 1989 to use the foundry facilities for minerals brought in from Cananea. This attempt was not successful, due to the high transport costs and technological inefficiency of the plant.

Between 1993 and 2000, exploration works carried out by Minera Terra Gaia, S.A. de C.V. (Terra Gaia) and Minera Curator, S.A. de C.V. (Curator) produced some interesting information, which was taken up by MyMB, for the purposes of properly valuing existing copper-cobalt deposits.

Having resolved the technological problem posed by a high clay content, which made metal extraction difficult, MyMB then became interested in the project. The project involves the extraction and beneficiation of minerals with high copper, cobalt, zinc and manganese content, with an estimated initial duration of 20 years, to be carried out in accordance with the General Work Program, which includes various activities ranging from preparation of the site, open pit mining, underground mining and mineral beneficiation including primary crushing, washing, filtering, secondary crushing and grinding, oxidation leaching, reduction leaching, counter-current decantation, solvent extraction and electrowinning, as well as the recovery of zinc sulfate using evaporation lagoons. In addition, continued exploration activities are also contemplated.

MyMB currently owns a total of 6694.34 hectares of land, of which it plans to use only 801.96 hectares, as shown in the following table, which sets out the surface area already affected by previous mining activity and that which will require removal of vegetation.

Descripción de la instalación		Sup. Impactada (ha)	Sup. No impactada (ha)	Total (ha)	Sup. Con cobertura vegetal (ha)	% de sup. con vegetación respecto al total
Mina	deposito de carbonato 1	0,00	31,29	31,29	31,29	100,00
	deposito de carbonato 2	1,33	9,70	11,03	9,70	87,96
	deposito de yeso	0,00	2,01	2,01	2,01	99,97
	polvorin1	0,17	0,08	0,25	0,08	32,95
	portal de acceso (manto 1)	0,19	0,03	0,22	0,03	14,78
	portal 1 (incluye taller)	0,74	0,06	0,79	0,06	7,01
	portal subterráneo #1	0,92	0,04	0,96	0,04	4,64
	portal subterráneo #5	0,00	1,00	1,00	1,00	100,00
	tajo 1	68,66	35,17	103,83	35,17	33,87
	tajo 2	7,78	5,03	12,81	5,03	39,28
	tajo 3	12,92	35,71	48,63	35,71	73,43
	tajo 4	0,13	5,98	6,11	5,98	97,85
	tajo 5	6,73	4,02	10,74	4,02	37,38
	tajo 6	3,34	3,58	6,92	3,58	51,73
	tepetatera del tajo 6	3,07	0,81	3,88	0,81	20,93
	tepetatera carbonato 1	8,54	16,24	24,79	16,24	65,54
	tepetatera carbonato 2	5,58	6,96	12,54	6,96	55,54
	tepetatera del portal 1	1,37	0,00	1,38	0,00	0,23
	tepetatera del tajo 5	0,82	2,84	3,66	2,84	77,60
	tepetatera del portal de acceso	1,35	0,00	1,35	0,00	0,00
tepetatera del tajo 1	5,42	1,32	6,74	1,32	19,57	
tepetatera del tajo 3 y 4	4,43	1,21	5,64	1,21	21,46	
Subtotal Mina	133,47	163,09	296,56	163,09	43,23	
Planta de Beneficio	Presa de jales (a 227,7m de nivel)	41,33	377,23	418,56	377,23	90,13
	Planta total(incluye): área de deposito de sulfato de zinc, bombas de jales, circuito de decantación a contracorriente, deposito de sulfato de zinc 1, deposito de sulfato de zinc 2, deposito de sulfato de zinc 3, deposito de sulfato de zinc 4, planta de acido y de cogeneración, planta hidrometalúrgica, taller, tubería de bombeo de agua y línea eléctrica, camino a la planta hidrometalúrgica, y demás equipos incluidos del polígono de la Planta	37,46	15,83	53,29	15,83	29,71
	Subtotal Planta	78,78	393,07	471,85	393,07	83,03
Caminos	Línea de jales (incluye bomba booster)	0,36	4,68	5,04	4,68	92,87
	Caminos de servicio	0,25	0,00	0,25	0,00	0,00
	Caminos de acarreo	13,08	15,18	28,26	15,18	53,71
	Subtotal caminos	13,69	19,86	33,55	19,86	59,20
GRAN TOTAL		225,94	576,02	801,96	576,02	71,83

It should be noted that, if approved, the contribution of the El Boleo project to national copper production would position the state of Baja California Sur as the second copper producer surpassed only by the state of Sonora. Additionally, if it became operative, the project would represent 21% of fine copper production, and since surplus production is exported, it would contribute significantly to maintaining a positive trade balance for the mining sector.

According to the latest statistics published by the General Coordinating Office for Mining, part of the Ministry of Economy, metallic cobalt is not currently produced in Mexico to any significant degree. Cobalt is used, extensively, in combination with iron to produce superalloys. Other uses include the manufacture of permanent magnets and batteries. Substantial growth in demand for cobalt is forecast in the context of the latter use, specifically the manufacture of batteries for cell phones and for hybrid cars.

The El Boleo project, with average annual production of 2100 tons of high purity cobalt, would be the largest producer of that metal in North America.

Despite the fact that during the period of French and Mexican mining activity the region developed electric and cable car distribution networks and even a railway network, with the exception of old roads, there are currently no services in the area intended for the tailings dam, or at the underground mine entrance or at the open pits, while the area intended for the beneficiation plant only has road access by Federal Highway no. 1 and an electricity supply that is not sufficient to meet the project's needs. In view of the foregoing, the project is considering developing:

- Electric power plant
- Electric power distribution line
- Seawater collection and distribution line
- Water desalination plant
- Potable water plant
- Waste water treatment plant
- Improvement to access roads
- Radio-communications system

With this infrastructure, the project will be self-sufficient in terms of services and its operations will not have any impact on services available to the Santa Rosalía population.

The general work program consists of 9 principal activities, which comprise:

- Pre-project activities, to last 120 days, between May 23, 2006 and November 6 of the same year. These activities include: preliminary planning and project control, project start-up, completing the scope and valuation of engineering works, engineering configuration planning.

- Engineering design, to last 180 days, between October 10, 2006 and June 18, 2007. This combines final planning and applicable project controls, detailed design, structural design, mechanical design, pipeline design, electrics design and instrumentation design.

Acquisitions, scheduled to last around 400 days, between November 14, 2006 and May 26, 2008. At this stage, the following facilities are brought in: the primary and secondary crushers, mill and washing, atmospheric leaching, partial neutralization and iron removal, solvent extraction of copper, neutralization and counter-current decantation, solvent extraction of zinc and cobalt, electrolytic deposit with insoluble anodes, reagents and services, in addition to the selection of contractors.

- Transportation of construction equipment on site, assuming only 15 days duration, between March 6 and 23, 2007.

- Construction, scheduled to last 335 days, between March 20, 2007 and June 30, 2008. This takes into account construction of the facilities described in the preceding point.

Start-up tests, scheduled to last around 175 days, between December 11, 2007 and August 11, 2008, which will involve tests to be carried out in the aforementioned facilities.

- Start-up, scheduled to last 200 days, between August 11, 2008 and May 15, 2009. This stage envisages four phases in which production will gradually increase until it reaches 33, 60, 75 and 100% of planned production capacity.

- Operation, initially scheduled to last around 5220 working days or 20 years. It should be noted that as new exploration activities develop, the lifetime of the project may be extended.

- Mine closure, unless exploration activities and metal price evolution should indicate otherwise. It is estimated that activities will cease around 2030, taking into account the need for approximately 523 days for closure, between August 14, 2028 and August 14, 2030, as a preliminary estimate.

As indicated previously, the project is located in the buffer zone of the El Vizcaíno Biosphere Reserve (INE, 1994).

The Management Program of the El Vizcaíno Biosphere Reserve (PMRBV), published in 2000, specifies the following rules among its regulations.

With regard to Administrative Regulations within the PMRBV that must be observed, the following should be highlighted:

Rule 54. In the Reserve buffer zone, fishing, mining, forestry and farming activities may continue to be carried out, provided they have been duly authorized by the competent authorities, in addition to those activities undertaken by communities living within the buffer zone, in accordance with the zoning order established in the Management Program, provided such activities are compatible with the objectives, criteria, programs and projects related to sustainable use and land suitability, taking into account the requirements of programs for ecological control and other applicable legal provisions.

Rule 76. For the execution of new works or for activities involving the exploration and exploitation of mineral resources within the Reserve buffer zone, the Ministry for the Environment, Natural Resources and Fisheries (SEMARNAP) will evaluate all applications individually, under the terms specified in the General Law of Ecological Equilibrium and Environmental Protection (LGEEPA), its regulations with regard to environmental impact and protected natural areas, official Mexican standards, the Management Program and other applicable legal provisions.

Rule 77. Mining activities currently carried out in the area may continue provided they are conducted in accordance with the terms of applicable legal instruments at all times.

Rule 78. Any project concerning mining exploration and exploitation must be compatible with the conservation objectives of the Reserve and with the criteria established by applicable official Mexican standards for the sustainable use and development of natural resources.

This Presentation was prepared with the aid of characterization studies performed by Corporación Ambiental de México, S.A. de C.V. (CAM), between 1995–1998 and 2003–2005.

At that time, around 13,600 hectares were involved in the study zone in which information was gathered and field surveys were conducted to characterize the following environmental factors:

Climate: Data was analyzed from records spanning almost 100 years for temperature and precipitation and shorter periods in relation to winds, air quality, hurricane paths etc.

Geology: Past works were reviewed and feedback was obtained from the promoter's team of geologists.

Geomorphology: Digital elevation models and a Geographic Information System (IDRISI) were used.

Soil: Three soil characterization studies were performed: one global vision, another focusing on an area of interest to Minera Curator, analyzing just under 100 soil samples obtained from slightly more than 150 soil profiles and, finally, a study specific to the area intended for construction of the tailings dam, aimed at gathering the information required pursuant to NOM-141SEMARNAT-2003 (Ministry for the Environment and Natural Resources Standard 141 of 2003).

Hydrology: A census was taken of water resource use at regional level and water quality was assessed for groundwater in wells and water-logged shafts. As part of the 2005 works for design of the tailings dam, aquifer vulnerability was determined.

Oceanography: Two biological sampling studies were performed (plankton, benthos and nekton) and an oceanographic buoy was installed to forecast currents.

Vegetation: Three studies were performed with biological material sampling and collection, characterizing the terrestrial vegetal associations present, including estimates of abundance and diversity. The last of these was aimed at establishing the presence of protected species as per NOM-059-SEMARNAT-2001.

Fauna: Three sampling studies were performed for characterization of bird fauna; two studies for amphibians and reptiles and two further studies for characterization of mammalian fauna. None of these cases involved the gathering of material for scientific collections.

Collections were restricted to the capture of specimens and their release following identification and sexing.

Socio-economics: A retrospective review was performed examining population behavior from its origins and a survey was carried out encompassing just under 85% of Santa Rosalía residences and a 2005 census. Additionally, an analytical survey was carried out using birth, morbidity and mortality data available from health sector institutions.

Historical monuments: The catalog of historical monuments available from the National Institute of Anthropology and History was reviewed and updated. In addition, visits were made to cemeteries located throughout the mining district and a survey was conducted of graves found in them.