



Ausenco

Gibraltar Development Plan 3

Canadian Consulting Engineering Awards 2013

Category E: Natural Resources, Mining, Industry & Energy



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Canadian Consulting Engineering Awards 2013

Name of firm submitting: Ausenco

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Contact name: Don Gale, President of Minerals and Metals, North America

Project title: Gibraltar Development Plan 3

Location of project: McLeese Lake, British Columbia

Component being submitted: Engineering, Procurement and Construction Management (EPCM) services for the Gibraltar Development Plan 3 Project

Category of entry: E - Natural Resources, Mining, Industry & Energy

Project owner/client: Gibraltar Mines Limited (Gibraltar)

Other consultants involved:

- Allnorth Consultants Ltd.
- Farnell-Thompson Applied Technologies Inc.

Contractors involved:

- The Gisborne Group
- Summit Electric Ltd
- Lakewood Electric Ltd
- Lake Excavating Ltd.
- CIF Construction Ltd.
- LoadPath Industrial Ltd.
- Mueller Electric
- Allied Blower

Executive summary

Ausenco provided Engineering, Procurement and Construction Management (EPCM) services for the third phase of the development and modernization of the Gibraltar copper-molybdenum mine, located in McLeese Lake, British Columbia; this project is known as the Gibraltar Development Plan 3 (GDP3) Project.

The objective in this phase was to increase the milling capacity at the mine with minimal interruption to existing copper and molybdenum production – a goal which required innovation in both design and execution to achieve.

GDP3 included the construction of a new stand alone concentrator, which will add an additional 30,000 tons per day to Gibraltar's processing capability. In addition, the project incorporated additional primary grinding, secondary grinding, regrind, rougher flotation, cleaner flotation, concentrate filtration and tailings pumping capacity as well as various ancillary systems and upgrades. A stand-alone molybdenum separation plant was also constructed to replace the existing molybdenum circuit; an addition which will more than double the mine's molybdenum metal production to approximately 2.5 million pounds per year. These modifications and upgrades will enhance Gibraltar's operating flexibility and reliability and ensure that the mine continues to be an economic cornerstone for the region for years to come.

Ausenco met the client's primary objectives while optimizing the site footprint, and delivered the project with an excellent safety record, on an accelerated schedule and on budget.

The GDP3 Project will increase Gibraltar's overall processing capacity to 85,000 tons per day with an annual copper production averaging 165 million pounds.

Project background

Taseko Mines Limited is the owner (75%) and operator of the Gibraltar copper-molybdenum mine, located in south-central British Columbia; the second largest open pit copper mine in Canada and the largest employer in the Cariboo region.

Built in 1972, the mine was originally designed to process 30,000 tons per day, producing approximately 60 million pounds of copper annually. In 2005, the Gibraltar mine started a multi-phase development and modernization program. The first and second modernization phases were initiated in 2006 and 2007, respectively. The initial phase increased the processing capacity of the concentrator to 46,000 tons per day. The second phase increased the processing rate yet again, to 55,000 tons per day. In early 2011, Ausenco was contracted to update a 2008 Scoping Study for the (GDP3) project incorporating process and layout optimizations made possible by the completion of the previous project phases.

Project goals

The client's objectives for the GDP3 Project were to:

- Increase milling capacity at the Gibraltar copper-molybdenum mine from 55,000 tons per day to 85,000 tons per day
- Execute the project with minimum interruption to existing production
- Provide a safe working environment for the mine employees.

Project achievements

Ausenco's GDP3 project team achieved the following:

- Increased milling capacity at the Gibraltar copper-molybdenum mine from 55,000 tons per day to 85,000
- Coordinated plant shut downs to achieve minimal interruption to the existing copper and molybdenum production and stay on the project's critical path
- Significant safety milestone: no lost-time incidents (LTIs) in over 900,000 man-hours worked.
- Optimized the existing site footprint and reused existing facilities and systems to provide cost-effective solutions
- Successful adherence to the project budget
- Project delivery on an accelerated schedule.



Technical innovation

Ausenco's technical excellence and innovation is demonstrated through the following project highlights:

New concentrator

The addition of a new concentrator increased Gibraltar's total processing capacity to 85,000 tons per day. The stand-alone concentrator was designed to minimize changes within the existing concentrator and consequently minimize production disruptions.

Upgraded coarse ore feed system

The GDP3 Project utilized the original in-plant crushing station and conveyer system, made redundant from previous project phases, to supply the additional 30,000 tons per day to the new #2 Concentrator; the crushing plant was refurbished and enlarged to accept feed from the 320-ton haul trucks being implemented by operations. These upgrades were carefully planned in order to avoid interruption to the existing copper and molybdenum production.

Modifications to the existing concentrator

Bulk and copper concentrates from both concentrators were fed to two refurbished 80-foot diameter thickeners in the existing plant.

New molybdenum plant

The new molybdenum plant processes bulk concentrate produced by both Gibraltar concentrators; the new molybdenum plant will more than double the mine's molybdenum metal production, to approximately 2.5 million pounds per year.

Reclaim water barge

A new reclaim barge and reclaim water system was constructed to transfer recycled water from the site tailings impoundment to the processing facilities via a new reclaim water pond. The reclaim water pond is sized to provide the necessary surge capacity for the overall site. An overland pipeline feeds process water from the barge to the new pond, where it is stored and subsequently fed by gravity via a second overland pipeline system to the site for distribution to the process facilities.

Accelerated project schedule

The schedule for the GDP3 Project was developed at the onset of the project to detail all Engineering, Procurement and Construction timelines for each discipline and project area.

The total time from EPCM award to mechanical completion for GDP3 was forecast as 20 months. The project critical path flowed through procurement of the Ball and SAG Mills and the finalization of the #2 Concentrator engineering design required to expedite tendering and award activities of the pre-engineered building, in order to expedite the receipt of the foundation loads required to finalize concrete designs and initiate early site construction activities.

The critical activities that contributed to the successful project execution were:

- Early alignment with Taseko to a detailed execution strategy, inclusive of procurement and contracting plans
- Project set up activities, inclusive of the development of a GDP3 WBS aligned with Gibraltar's code of accounts
- Uploading of the Capital Cost Estimate into the project cost control system
- Development and baselining of a detailed level 3 EPCM Master Schedule identifying seasonal construction windows and associated critical activities
- Development of the GDP3 Procurement and Contracting Strategy
- Initiation of a Geotechnical programme to expedite receipt of site specific design criteria
- Development and early "freezing" of key engineering deliverables, inclusive of process flow diagrams, project standards and major equipment specifications
- Maximization of the use of equipment similar to existing and operational site equipment installed during earlier optimization phases made available Vendor Data to be used for the development of early engineering deliverables, in addition to optimizing site spares inventory.

Social and economic benefits

The Gibraltar copper-molybdenum mine is the second largest open pit copper mine in Canada and the largest employer in the Cariboo region. Taseko Mines Ltd. has invested approximately \$700 million to expand and modernize the Gibraltar Mine operation. This multi-phase program has increased the throughput and extended the life of the mine, delivering long-term employment and economic stability to the surrounding communities.

The Gibraltar expansion project is delivering long-term employment and economic stability to the surrounding communities.

Economic highlights:

- Over \$700 million invested in the Gibraltar Mine since 2006; \$325 million towards the GDP3 portion of the modernization program
- The GDP3 Project directly employed over 500 workers at the peak of construction
- The combination of today's copper prices and the additional milling capacity resulting from GDP3 will fuel the local economy for 15 years longer than was expected when the mine restarted in 2004
- The GDP3 project drives investment in goods and services throughout south-central British Columbia
- Past, present and future procurement opportunities that will grow and sustain local businesses.

Environmental impact

Ausenco minimized site footprint by reusing existing facilities and systems where feasible, including utilizing the original in-plant crushing station and conveyer system (made redundant from previous project phases) to supply the additional 30,000 tons per day to the new concentrator.

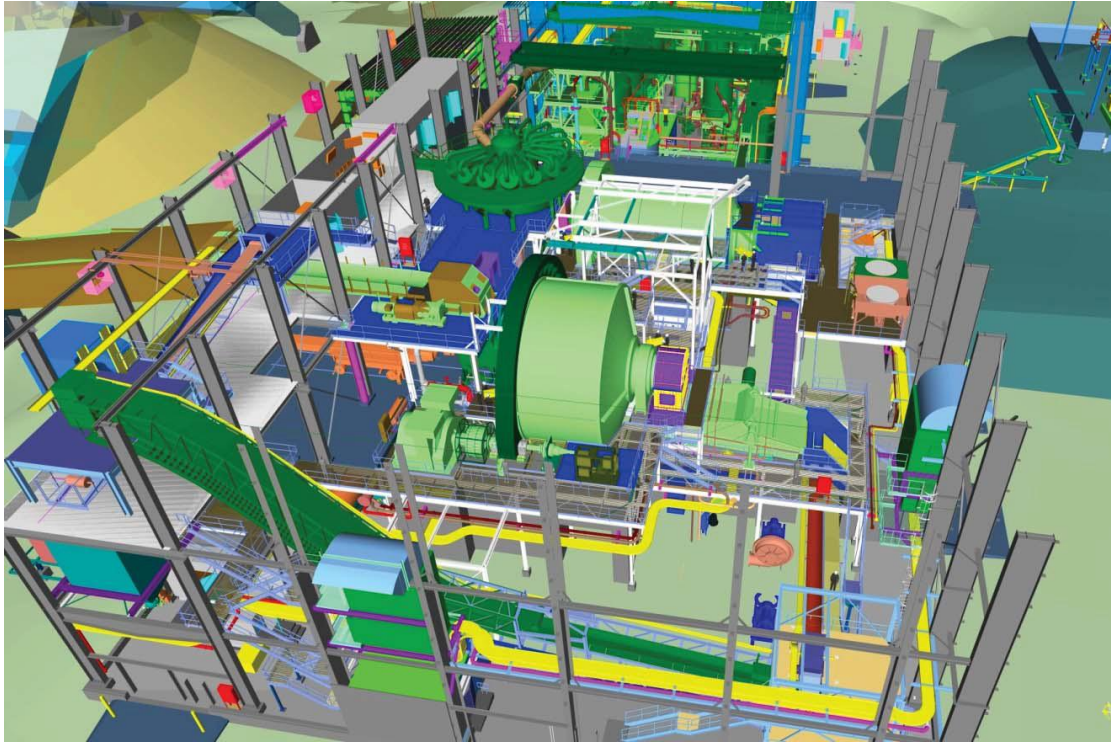
In addition, Gibraltar will continue to reduce freshwater requirements through the re-use of process water. As part of GDP3, a new reclaim barge and reclaim water system were constructed to transfer recycled water from the site tailings impoundment to the processing facilities via a new reclaim water pond.



Gibraltar site



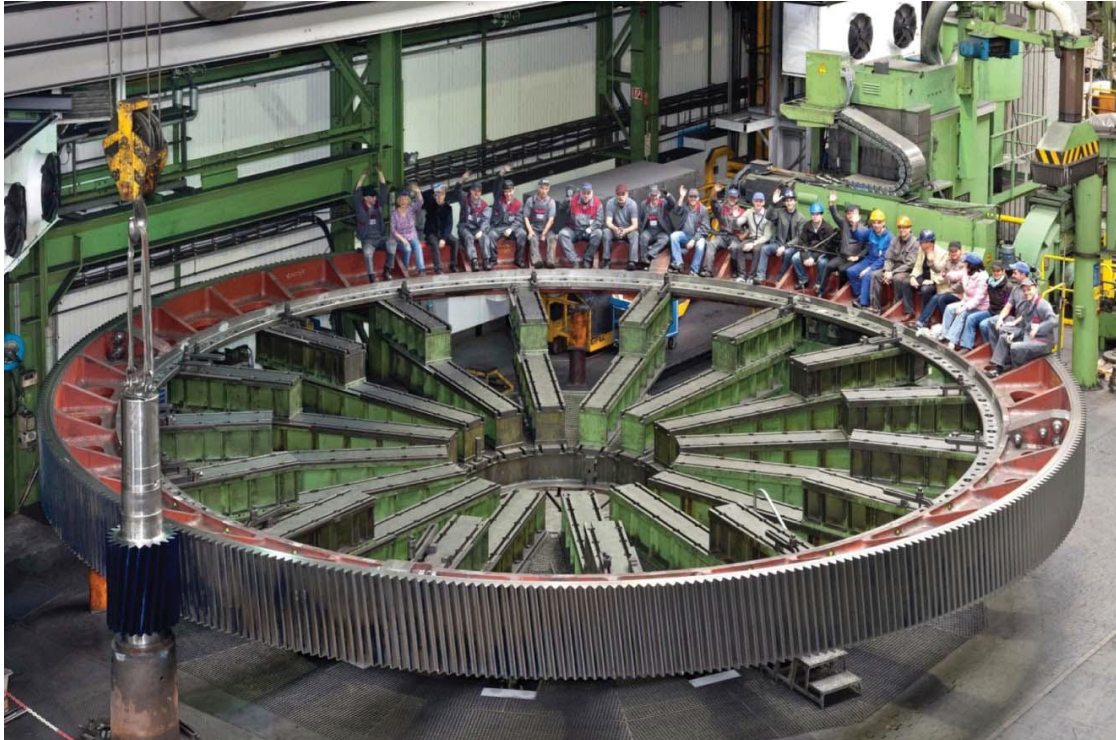
No. 2 concentrator looking east



3D model of grinding area



Molybdenum plant



SAG mill gear



34" diameter SAG mill



Concentrator No. 2 flotation area



Reclaim water barge