

RioTinto



BAFWAC

Oyu Tolgoi Mine

**Optimizing the efficient use of
scarce water resources**

a Rio Tinto case study

September 2017

Rio Tinto

Company details

Rio Tinto is a leading global mining and metals group that focuses on finding, mining, processing and marketing the earth's mineral resources. Their major products are aluminium, copper, diamonds, gold, industrial minerals, iron ore, thermal and metallurgical coal and uranium. Rio Tinto has been in business for more than 140 years with a current workforce of about 50,000 in around 35 countries. <http://www.riotinto.com/>

Oyu Tolgoi Copper and Gold Mine, Mongolia

Situated in the southern Gobi desert of Mongolia, approximately 550 kilometres south of the capital, Ulaanbaatar, and 80 kilometres north of the Mongolia-China border, Oyu Tolgoi is jointly owned by the Government of Mongolia (34 per cent) and Turquoise Hill Resources (66 per cent, of which Rio Tinto owns 51 per cent). Since 2010, Rio Tinto has also been the manager of the Oyu Tolgoi project.

Summary of action

Mongolia's mining sector is a significant contributor to the economy as well as a key water user. The Rio Tinto managed Oyo Tolgoi copper and gold mine located in the water scarce South province has recognised the importance of optimizing the use of the scarce water resources and taking a stewardship approach in



order to ensure the long-term future of mine, natural environmental systems and local herder livelihoods.

In response to the situation, Oyu Tolgoi surveyed the area seeking a suitable underground water supply and identified the Gunii Hooloi aquifer, a 150 meter deep resource holding around 6.8 billion cubic metres of non-drinkable saline water. The operation goes to great lengths to use its allocation from this water source efficiently with the water recycle target of greater than 80% of the water used in production being achieved for the last 5 years.

Recycling and conservation practices implemented throughout the operation have seen Oyu Tolgoi using around 420 litres of water to process a tonne of ore (based on 2016 performance), that is around half of the industry average.

Water savings measures implemented have helped the mine reduce its overall water consumption to less than half of the global average for comparable mines

Program rationale

The Oyu Tolgoi Mine is located in an arid, water scarce region of Mongolia that is already being impacted by climate variability and increased desertification. With water being a critical resource for both the livelihoods and the culture of the local herders and as well as an input to the mine operations, Rio Tinto quickly recognised the imperative of optimising the efficient use of the scarce water resources.

“If we were wasteful with water, our mine would have a short life. I know our mine has a potential life that will go generations, many generations, and I would hate to think that decisions that we were making today at a time of plenty could actually cause the mine to not have that really wonderful long term future. **Things get more challenging, I feel, when you have a number of entities that are utilizing the same resource and that’s where it becomes particularly important that none of them are wasteful...**”

Mark Newby Principal Advisor, Tailings and Water Strategy, Oyu Tolgoi

Program approach

The Oyu Tolgoi mine has deployed a number of technologies and measures to reduce its water consumption and enhance its water reuse and resource recovery, including:

- Use of an advanced tailings thickener that reduces water consumption within the tailings transfer and deposition process
- Placement of a plastic cover on the water lagoon to reduce evaporative water loss.
- Operational awareness and education on the importance of recycling and conservation practices.
- Complete treatment and reuse of all domestic wastewater
- Established efficiency target and zero water discharge commitment to the environment
- Comprehensive water monitoring program
- Implementation of an external assurance program supporting the above

Oyu Tolgoi has also collaborated with the International Finance Corporate, 2030 Water Resources Group and 7 other mining companies operating in the Southern Gobi region committing to a voluntary '[Code of Practice](#)' for improving water management practices at the catchment level. This platform has enabled the



mining companies to engage collaboratively with the Mongolian Government and community resulting in the support of training and awareness raising on groundwater protection, and work towards a catchment water accounting framework.

Other actions implemented by the mine to address water-related challenges include participatory monitoring of wells with the local herders to assess the mines impact on water levels, as well as restoration of existing and establishment of new herder wells.

Main challenges that have been encountered include:

- Perception that mining companies and the government were not doing enough to preserve and protect the water supply
- General lack of understanding about the positive water management practices employed by mining companies
- Recognition by the mining companies that an understanding of the cumulative impacts of water use by the mining sector would require a comprehensive and consistent approach to water accounting, along with a better approach to sharing data with government authorities and affected stakeholders.

Results & Benefits

Savings quantified by Rio Tinto over the period 2014 to 2016 include:

~75,000 million litres (of natural groundwater saved/not used compared to the industry average)

85% average water recycling rate

~1.97 tonnes of CO₂ emissions per ton of copper produced (compared with an industry average of 2.5)

- Climate change in the region (recorded above the global average) and its impact for the local community;
- Substantial groundwater water consumption increase in the region due to other mining and infrastructure projects and growth in local livestock numbers, which can cause water shortages in some areas.

These initiatives mean the mine uses approximately 0.42 cubic metres of water per tonne of ore processed, which is less than half the global average for comparable mines.

Lessons learned

- Value of partnering with local communities, regulatory departments and other industry users
- Confirmation of site operations processes with regard to water efficiency
- Importance of water stewardship approach within Rio Tinto

What next?

The next steps for OT:

- Continue the comprehensive water monitoring program to evaluate groundwater aquifer response against Oyu Tolgoi water extraction process;
- Improve engagement program with local community and regulatory stakeholders;
- Improve collaboration with other mining and infrastructure projects to address shared and cumulative water issues;
- Maintain water recycling effectiveness and continue to seek initiatives in water efficiency

Source:

<https://www.commdev.org/shared-water-shared-responsibility-shared-approach-water-mining-sector/>



BAFWAC

BAFWAC was jointly launched by CDP, CEO Water Mandate, SUEZ, and World Business Council for Sustainable Development (WBCSD) in December 2015. The initiative commits companies to analyze and report water-and-climate-related risks and impacts, and to implement collaborative response strategies along the value chain.

bafwac.org