Undai river diversion project in Oyu Tolgoi

Bazardorj, Sod-Erdene; Purevsuren, Uuganbayar

Oyu Tolgoi is copper and gold mining project located in Gobi Desert region of southern Mongolia. The Oyu Tolgoi mine is situated in a desert-steppe ecosystem, where surface water, in the form of alluvial sub-surface flows and intermittent surface flows in dry river channels play an important role in supporting ecosystems and traditional herding practices. The Undai River (an ephemeral river) flows through the Oyu Tolgoi mine lease area and is close to the open pit. The development of the Oyu Tolgoi open pit and dewatering operations were going to affect Undai dry river bed, which required relocating a portion of the river channel mitigate effect to downstream water movement. Undai River diversion system was developed in 2012-2013 and consists of diversion dams, flood water diversion channel, and subsurface flow diversion. Thus subsurface and surface flows of Undai dry river bed were diverted from its original course, away from effect zone of the open pit, and rejoined the natural channel downstream of Mine Lease Area.

Upon completion of construction works in 2013, long term comprehensive environment monitoring has been conducted. Monitoring has included water level (in monitoring wells and herder wells), water laboratory analysis, surface and subsurface flow rates, flood monitoring and observations. Water quality has improved at the New Bor ovoo spring fresh water and water quality now complies with the Mongolian potable water standard parameters. Measured flow rate range at the New Bor ovoo spring have been 0.3 – 2.6 L/s, depending on summer-autumn rain events. No adverse effect on herders' shallow groundwater wells and local water courses downstream of the diversion structure have been identified in five years of monitoring.

Heavy floods occurred in the summers 2017 and 2018 due to the heavy rainfall events. Surface flows successfully passed through the flood water diversion channel.

The Undai River Diversion Project has been successfully constructed and tested through high rainfall years of 2017 and 2018. The diversion has enabled the development and operation of the open pit, while maintain water levels in shallow wells downstream of the Oyu Tolgoi. The monitoring has demonstrated no change natural regime of downstream alluvial water levels and an improvement in water quality. An unexpected benefit has been the wide range of wildlife species and domestic animals that utilize the New Bor ovoo spring.

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Oyu Tolgoi mine site

The Oyu Tolgoi copper-gold mine is located in the southeast region of Gobi region of Mongolia, approximately 80 km north of China-Mongolian border. Oyu tolgoi is a remote project and extensive infrastructure has been constructed including: Water Supply Borefield, Tailings Storage Facility, Concentrator, Waste Water Treatment Plant, Water Treatment & Bottling Plant, highways, housing, and Undai river diversion project.

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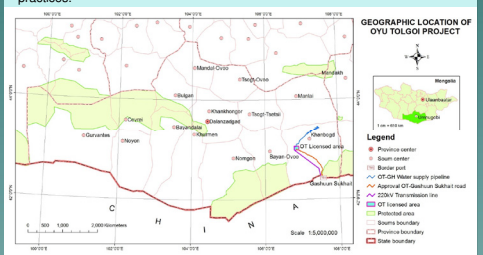
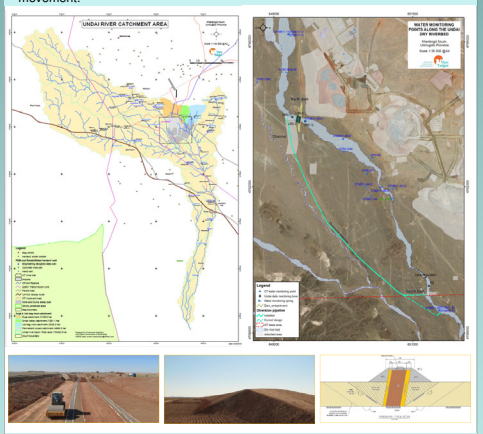


Introduction

Undai dry riverbed is about 120 km long and has 1081 m2 basin area collecting clean subsurface water source for both local community and wildlife. The Undai River (an ephemeral river) flows through the Oyu Tolgoi mine lease area and is close to the open pit. The development of the Oyu Tolgoi open pit and dewatering operations were going to affect Undai dry riverbed, which relocated a portion of the river channel to mitigate impacts to downstream water movement.



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Thus subsurface and surface flows of Undai dry river bed were diverted from its original course, away from impact zone of the open pit, and rejoined the natural channel downstream of Mine Lease Area.

Environment monitoring

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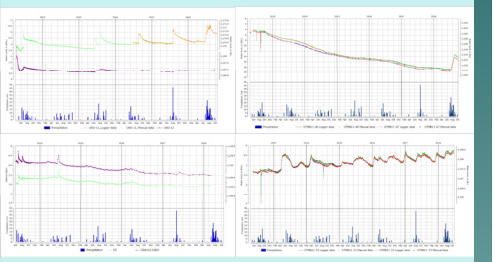

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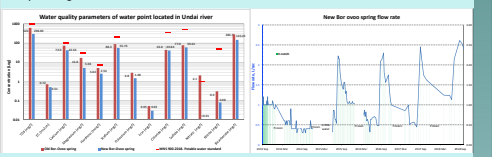

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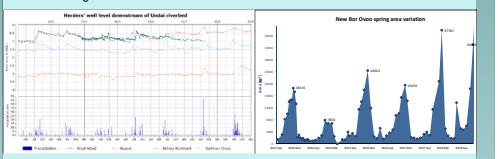

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