Mongolia - Oyu Tolgoi Copper/Gold/Silver Mine Project Trip Report (May-June 2011)

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USAID staff conducted a site visit to Mongolia's Oyu Tolgoi Copper/Gold/Silver Mine (OT) project that is under consideration for European Bank for Reconstruction and Development (EBRD) and International Finance Corporation (IFC) financing. This site visit was carried out to fulfill USAID's due diligence responsibilities under the International Financial Institutions Act, Title XIII, Section 1303(a)(3), which requires USAID to review multilateral development bank (MDB) projects with potential adverse environmental and social impacts.

This report summarizes information obtained from meetings with a wide range of stakeholders (e.g. government, MDB staff, NGOs, researchers, mining association) in Ulaanbaatar, local government officials (Dalandzadgad, Tsogt Tsetsee, Han Bogd), OT project staff, OT project-affected herders, and from documents in the public domain. Sites visited included the OT project site and surrounding area, the Small Gobi B Strictly Protected Area, Tsaagan Khad (the coal transfer area), the Tavan Tolgoi coal road and the Gashuun Sukhait border crossing. The meetings focused primarily on the environmental and social aspects of the project. The report does not reflect the views of USAID or of the United States Government (USG), and USAID has not substantiated all comments.

This report is divided into the following sections:

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Section 1. Background

Mining Sector

The mining sector is emerging as a major source of employment and revenue for Mongolia. This is in part due to the 1997 Minerals Law, which has played a pivotal role in attracting foreign exploration companies. According to a World Bank (WB) Report (2006), at that time, commercial mining accounted for about 17% of GDP, 58% of export earnings and employed more than12,000 people. These numbers are predicted to rise dramatically as the mining industry expands, suggesting a doubling or tripling of total GDP. Some stakeholders believe that although the Government of Mongolia (GoM) would like to have a single comprehensive mining policy it is still unfocused, so is developing policy in a piecemeal manner.

Prior to major amendments (2006), the 1997 Minerals Law was acknowledged by the international mining community as one of the strongest in mineral licensee rights and obligations in the world, and reportedly was the most investor-friendly and enabling law in Asia.

In 2006, major amendments to the 1997 Minerals Law were passed. These amendments include the following:

- The Windfall Profits Tax imposes a 68% tax on the sale of copper and gold when their market price is in excess of $2,600/ton and $500/ounce. The additional revenue is reportedly targeted for social programs.
- A portion of license fees/royalty payments are to be allocated to the affected local areas. License fees are distributed as follows – 25% to the soum, 25% to the aimag and 50% to the state budget. Royalty payments are distributed as follows - 10% to the soum, 20% to the aimag and 70% to the state budget.

  Local stakeholders reported they have yet to see the benefits of the revenue and believe that the fees and royalty payments are going directly to the central government and are not being allocated to the soum and aimag.

The Minerals Law requires annual reports on exploration or mining activities, annual reports on safety, an Environmental Protection Plan (EPP) for exploration and an EPP and Environmental Impact Assessments (EIA) for mining license holders. The Ministry of Minerals and Energy (MME) was established in 2008 and is now responsible for developing the mining sector.

Additional laws governing the mining sector include:

- the 2004 Law on Special Protected Areas (enacted 2005), which among other things prohibits mining and minerals exploration in nationally designated protected areas. The 2006 amendments to the Minerals Law reinforce this restriction.
- the 2007 Law on Forests keeps mining out of all protected forests.
- the 2009 Law on the Prohibition of Mineral Exploration in Water Basin Areas and Forest Areas extends protection to areas outside of the Specially Protected Areas and prohibits mineral extraction in forests, headwaters and protection areas. It is estimated that between 800-1,000 licenses will be impacted. As of June 2010, the law forced 37 mines to close primarily due to environmental breaches, at a cost of 4.7 B USD in compensation payable by the GoM.

  The mining industry believes the 2009 Law (described above) cannot be effectively implemented because the GoM does not have the money that would be required to pay compensation. They view the purpose of the law as acceptable but not the method since they believe that exploration activity does not have significant impacts on the land. They also pointed out that

although there is a requirement for the companies to be compensated under this law there is no requirement for reclamation of the land. Therefore, reclamation is not being done when companies are forced out, leaving the land in various states of degradation.

Even with additional legislation protecting natural resources, the GoM does not have in-depth experience in environmental protection issues. Stakeholders have raised concern that the GoM cannot supervise companies due to lack of manpower and technical capability. Additionally, given the size and scope of mining activities it is impossible to provide oversight on small mining operations or artisanal (ninja) miners. As the industry grows there will be greater potential for conflict with artisanal miners. It is estimated that there are 60-100,000 artisanal miners in the informal sector, including service providers and 45,000 in the formal sector. Many herders either supplemented their income or turned solely to artisanal mining after the dzuds when livestock were lost and there were no other job opportunities available.

Mongolia has been in compliance with the Extractive Industries Transparency Initiative (EITI) since 2004. It was the 4th country out of 32 countries to be certified. The Prime Minister heads the national council and there are five members from each stakeholder group (GoM, industry and NGOs). There is a working group that meets to discuss reports, audits etc. USAID was not able to meet with any stakeholders involved directly in EITI compliance but heard that the process is going well.

In 2005, the mining debate started around the definition of responsible mining. The Responsible Mining Initiative for Sustainable Development was established as a result of the first Multi-Stakeholder Forum held in 2006, bringing together representatives from government, civil society, industry, and academia. The working groups established as part of this process developed a definition of responsible mining and eight guiding principles, which led to the development of a Declaration on Responsible Mining. This served as the basis for the formation of the Responsible Mining Initiative (RMI). The RMI is currently in the process of developing and assessing the criteria behind the eight guiding principles. More than 60 organizations have signified their support of the Declaration on Responsible Mining, reinforcing the transformation of the RMI into an officially registered NGO in 2007.

The WB Mining Infrastructure Investment Support (MINIS) Project, was approved in May 2011. The project is designed to complement the WB's Mining Technical Assistance Project's objective of developing the regulatory, institutional and planning frameworks to manage the mining sector by helping build capacity to create plans that integrate infrastructure development into a strategy to support Mongolia's extractive industries. The project will provide support for economic, social, technical, environmental advisors and infrastructure feasibility studies associated with the mining sector. It is the GoM choice as to where and how to use these services. The feasibility studies will be done following WB guidelines with 40-50,000 USD/year available for GoM capacity building to conduct better Environmental and Social Impact Assessment (ESIA) oversight.

Southern Gobi Region: Rich mineral resources in Mongolia's Southern Gobi Region are resulting in a rapid expansion of mining and associated development as these resources are being brought to market. Globally significant deposits of coal, copper and gold will create unprecedented population growth in an area with historically low population density. In addition to the expanding urban environment, there will be a need for energy (coal-fired power plants), and linear infrastructure – transmission lines, roads and rail. With this development comes the potential for long-term significant environmental and social impacts including substantial ground water extraction, fragmentation and reduction of grazing land for both livestock and threatened and endangered wildlife, threatening herders livelihoods and increasing pressure on social services (schools, medical facilities). Additionally there is the potential for inflationary

price increases for goods as a result of an increased economic base, which local herders may not be able to afford.

Omnogovi Aimag is a good example of the rapid increase in mining and associated development. In 2005 there was only one large mining operation, Tavan Tolgoi – Ukhaa Khudag (UHG). Today there are 13 mining companies in operation, with 63 licenses issued for extraction and 400 licenses for exploration. Another good example is in Dornogovi Aimag. As of 2009, there were 94 mining licenses and 533 exploration licenses in the aimag.

The key concerns raised by the majority of stakeholders interviewed were:

Water – Availability and use of water for mining activities is the biggest concern as soum center development, herders and wildlife depend on shallow aquifers that could be impacted.

Air Quality - Dust from the Tavan Tolgoi coal road is impacting humans, livestock and grazing areas.

Habitat fragmentation - Restriction of habitat range combined with linear infrastructure is impacting both livestock and wildlife (e.g., khulan and gazelle).

South Gobi Biodiversity: The Central Asian Gobi Desert ecoregion extends south from the desert steppe of the Altay-Sayan ecoregion into the Inner Mongolian Plateau of China, encompassing an area of over 5 million square kilometers within Mongolia. The desert and desert steppe vegetation supports a semi-nomadic lifestyle that has been practiced for centuries. Gobi pastureland has low primary productivity which coupled with scarce water resources, necessitates larger spatial movements of herders, livestock and wildlife. With Mongolia's change to a free market economy, state-supported systems broke down; unemployment rose, prompting many households to return to the countryside and struggle to raise livestock beyond subsistence capacity. In addition, although opinions differ as to their effectiveness, the regulatory mechanisms (stocking rates, pasture use, wildlife protection) were abandoned. Consequently, increased herd size and decrease in herder mobility around wells and other water sources have resulted in land degradation due to overgrazing. This dynamic is being complicated by the changing environmental conditions impacting both water sources and pasture. In recent years, the rise in the cashmere industry has resulted in a dramatic increase in the number of goats within the herds, contributing to further degradation of pasture. The dynamics of scarce natural resources often result in competition between herders/livestock and large wild herbivores for food and water. A 2006 WB report stated that due to human population growth and severe winters, the occurrences of herder – khulan (Mongolian Wild Ass – *Equus hemionus*) conflicts appear to be increasing. At most natural water points there were signs of poaching for khulan meat which is increasingly sold to the market rather than used for subsistence. Since that study, khulan poaching has intensified, causing population numbers to decrease.

Figure 1. Small Gobi B Strictly Protected Area.

The Great Gobi Strictly Protected Area and Small Gobi A Strictly Protected Area (SGA) and Small Gobi B Strictly Protected Area (SGB) are located in the South Gobi. This region provides critical habitat for a

number of rare and endangered species including the khulan, Goitered gazelles, Bactrian camel, and the Gobi bear. The Small Gobi Strictly Protected Areas were designated due to their habitat value to endangered species and relative isolation from hunting pressure and population impacts. Wildlife historically have migrated between both SGA and SGB, depending upon pasture conditions and water availability. The area separating SGA and SGB was not included in either protected area designation due to the potential for future mineral/gas development based on exploration conducted in the area in the 1950s/1960s. The Galba Gobi International Bird Area (IBA) stretches between and partly overlaps with SGA and SGB.

A section of SGB has been allocated to the coal transfer site – Tsaagan Khad, the Gashuun Sukhait border crossing, and will be transected by new roads and more than likely the future railroad. (see below – Linear Infrastructure) The SGB is deemed to be critical habitat regardless of its state of degradation. Therefore it is important to maintain the integrity of SGB. Unfortunately, the border crossing will not be moved because of extensive Chinese development at the border. One measure to improve the current situation that was discussed by protected area management specialists is to

Figure 2. Tsaagan Khad coal transfer area.

Figure 3. Gashuun Sukhait border crossing.

relocate herder families outside of the SGB and prevent new ones from moving in. During our visit we saw three settled herder families and one new family moving in. Through a period of education, protected area management was able to relocate herder families out of SGA without problems. They are planning to take the same approach with herders living in SGB. Another measure discussed was the need for all companies to erect dust breakers around each company's coal yards to contain the coal dust. During briefings, OT stated that Parliament may degazette the piece of the SGB that is being impacted by the border checkpoint, coal transfer station and roads. However, without appropriate mitigation measures for the linear infrastructure, the transportation corridors will result in ecological separation of SGA from SGB.

Figure 4. Fencing by one company along one side of its coal yard.

The national protected areas in Mongolia allocate as little as one percent of their budgets on resource monitoring and more than 90% on salaries and administration. Therefore conservation effectiveness cannot be determined, much less guaranteed (World Wildlife Fund 2010). Further analysis finds that the budget allocated is 3-5 times smaller than what is required to be effective. The Gobi will be developed and pressure will be put on the protected areas either directly or indirectly requiring additional technical assistance. Given the importance of pasture/water sources outside of the protected area system for wildlife, it is of concern that the southern parts of Omnogovi and Dornogovi Aimag areas are almost completely covered by exploration licenses. OT is providing The Nature Conservancy 1 million USD to undertake an analysis of the Gobi under a landscape level approach. The GoM needs to manage issues on a landscape level not mine by mine. Additionally, EBRD is trying to get funds to build GoM capacity to further landscape level planning for the entire Gobi.

Examples of Endangered Species: High profile species that will be impacted by the OT project are: Mongolian Wild Ass - khulan (*Equus hemionus* – threatened*)*, Goitered (Black-tail) Gazelle (*Gazella subgutturosa* - vulnerable*)*, Mongolian Gazelle (*Procapra gutturosa* – near threatened), Houbara Bustard *(Chlamydotis undulate* - vulnerable*),* and Saker Falcon *(Flaco Cherrug* - endangered*).* Below is a brief description of two species that are included in the assessment currently being undertaken by OT's international biodiversity consultants.

Khulan: The khulan are listed in Appendix I of the Convention on the International Trade in Endangered Species of Fauna and Flora and are regarded as threatened with extinction by the World Conservation Union. They have also been added to Appendix II of the Convention on Migratory Species. The majority of the khulan population is found in the southeast Gobi where a WB study was conducted in 2006 to gain a better understanding of the pressures facing this species. The study concluded that infrastructure development in the Gobi poses a significant threat to the khulan. Khulan undertake large-scale movements over the course of a year related to the availability of forage and water. The movements of radio-collared animals were over an area in excess of 90,000 km^2 with the majority of this use outside of the protected areas. The khulan use the protected areas but the areas are too small to provide sufficient water and pasture for a year-round khulan presence. Therefore, conservation efforts for this species and others requiring large-scale movements need to be based on a landscape scale.

Figure 5. Herd of khulan.

The 2006 study showed khulan movement between SGA and SGB. Although water and pasture characteristics are better for SGB than SGA, khulan original foaling grounds had been in SGA. However,

because they cannot move freely between SGA and SGB due to presence of the linear infrastructure (coal road), they have reportedly moved their foaling grounds to SGB. Although numbers are difficult to estimate, it is thought that the current numbers for khulan in SGB are 7,000. Within the past several years, protected area officials moved about 200 khulan into SGA. However, the population has been decreasing in SGA and the population numbers are now estimated at 50-60. Protected area officials believe that the overall population of khulan in the country is decreasing. Earlier research has shown that the Trans-Mongolia railroad is also a barrier to khulan movement and as a consequence they are no longer found east of the railroad.

Houbara Bustard: The Houbara bustard is dependent on desert and semi-desert shrub lands. The Mongolian Gobi is the easternmost part of its global breeding range. Throughout its range, habitat loss and degradation, collision with powerlines, and poaching are key threats to its survival. This species normally occupies open habitat and requires zero or minimum disturbance to successfully breed and raise chicks. Houbara bustards are easily disturbed off their nesting areas thus roads and increased livestock grazing raise concerns for this species. They are also disturbed by tall structures such as transmission towers since the towers can be used by large raptors as perches for preying on the Houbara bustard. The Saker Falcon preys on Houbara bustards and is known to use transmission towers as nesting and perching sites.

Linear Infrastructure

Transport infrastructure in the South Gobi is a geo-political quagmire in a biodiversity sensitive area. The proposed rail line from UHG to the China border has been discussed for a number of years. The amount of coal proposed for export to China (>5 million/tons/year) will drive the economics and necessity of the rail. For example, Phase 3 of the UHG coal project can only take place in the presence of rail. UHG has conducted the feasibility study for the railroad and it is speculated that it will be financed privately at a cost estimated at 500-600 M USD. The most likely scenario will be a build-own-operate-transfer.

Figure 6. OT trucks waiting to cross at Gashuun Sukhait.

Recently, the GoM gave approval for the 2-3 B USD West-East rail project going to Russia with eventual export to the Pacific region, although funds currently are only available for 1-2 km of the 3,000 km line. It is hoped that with the start of construction on this section there will be momentum to allow the start of the rail from Tavan Tolgoi to the China border. However, in the midst of these decisions there do not seem to be any defined GoM standards for building rail infrastructure such as the track gauge that will be used – Russian or Chinese.

Figure 7. Driving conditions on Tavan Tolgoi coal road.

At this point road transport is the only way of moving coal and future copper concentrate for export to China. UHG transports 300 trucks of coal per day on the current Tavan Tolgoi coal road. When the other mines are taken into account, a total of 800-1,300 trucks are traveling this road on a daily basis. However, there are reports that as many as 4,800 trucks/day are operating from Tsogt Tsetsee. Because of the hazardous condition of the current haul road, UHG is building a new 245 km hard surface road that is expected to be completed by July 2011. Other mines in the area will either be using the same road or developing their own road system. Segments of the new road the USAID team viewed did not have any wildlife crossing areas.

The Ministry of Roads, Transportation, Construction and Urban Development is concerned with the ad hoc development of roads in the Gobi by individual mining companies. One issue is that the local governments have the authority to construct their own roads so there is no coordination. Apparently there was originally to be only one road going to the Gashuun Sukhait border which the GoM supported since it would cause less impacts. However, due to political changes there are now two roads – Tavan Tolgoi coal road and OT road. Reportedly, the Tavan Tolgoi road will be private whereas the OT road will eventually be owned by the GoM and they will be responsible for maintaining it. Following the site visit, USAID became aware of reported plans by Ajnai Corporation to build their own road from Tavan Togloi to Gashuun Sukhait to avoid paying fees to UHG for the use of their road to transport coal.

There is widespread concern that transport corridors will be in conflict with both herders and wildlife with no easy solution. Researchers studying khulan and gazelle have determined that the fencing on either side of the present railroad has prevented wildlife movement from east to west along the rail tracks. The fencing is based on Russian standards and Russia reportedly owns one-half of the existing rail. Although documents state that there is a Mongolian law requiring the fencing, in discussions there does not seem to be an actual law but simply a standard practice based on Russian standards. The GoM is open to discussions as whether and where to fence depending on what is the best solution. Several options are being proposed to deal with this issue. The first is that the fencing can be put in areas where there is heavy human/livestock traffic but leave the other areas unfenced to allow for both wildlife and livestock movement. Second option is to not have any fencing and any livestock losses would be compensated. The key reason for this second approach is the fact that khulan do not have migratory corridors and their movement is based on adequate pasture and water resources that are not consistent year to year. A railroad working group was formed but the soum centers did not provide any input into the location of the rail corridor.

Groundwater

The availability of water is the single greatest constraint for mining activities in the South Gobi. This region has limited rainfall and no perennial surface water bodies, thus inhabitants, livestock and wildlife are dependent almost exclusively on some permanent springs, and shallow and deep groundwater wells that are recharged by rain and snow. Deeper aquifers, many containing fossil water, will be used to supply the large quantities of water required for mining and mineral processing. Mining companies are planning on using deep aquifers since there will be less competition from herders and more volume of water. Mining companies state that there is no communication between the shallow and deep aquifers, however, if pressed, there is no proven evidence in the public domain to validate their claim.

A complete analysis of groundwater availability is not available. The Russians did piecemeal assessments, but the information is scattered among different entities. It is estimated that it will take approximately two years to do a complete analysis. In the meantime, new estimates of groundwater availability continue to change as new information becomes available as mining companies continue to explore and

update groundwater models. A recent WB Southern Gobi Regional Environmental Assessment stated that based on conservative assumptions the groundwater potential is 500,000 cubic meters/day for 25 - 40 years. The majority of this is fossil groundwater which is not replenished. About 285,000 cubic meters/day can be withdrawn from the Southern Gobi Region's shallow aquifers altogether, assuming a conservative recharge rate of 1 millimeter per year. This rate of recharge is estimated to only add 1,000 cubic meters of new water a year. Shallow aquifers are vulnerable to pollution from wastewater, leachate from solid waste dumps and chemical spills.

The same WB Assessment estimated that approximately 240,000 cubic meters/day of water is required for existing and near term mining and mineral processing operations. The present total water consumption for rural/urban and livestock is approximately 40,000 cubic meters/day. Based on these conservative assumptions, there is enough groundwater to sustain projected development in the Southern Gobi Region until 2020.

There is one specific component of WB MINIS that will support strengthened management of groundwater by piloting a new institutional structure at two locations in southern Mongolia. Examples of activities include preparing a groundwater management plan, developing a groundwater monitoring plan to regularly measure groundwater levels, groundwater abstractions and groundwater quality etc. This project is also expected to fund an isotope study to better understand water origin, movement and recharge in these deep aquifers. Current water costs are 152 TT/cubic meter but this study is expected to yield additional information to ensure competitive water pricing.

Given the known mineral resources in the area, and continual discovery of new reserves, including a site 40 km north of OT – there is concern whether there will be enough groundwater for not only current and future mining operations, including coal-fired power plants, but also for the growth of the soum centers with associated development activities. An analysis has not been undertaken to look at the probable multiple demands on these deep aquifers. Although most stakeholders stated that the idea of transferring water from the north was not in discussion because the northern lakes are drying up, the GoM is still considering this option and is actively pursuing discussions with outside developers.

Gobi Urban Development

South Gobi soum centers will dramatically increase their population due to mining and associated activities. It is expected that there will easily be a doubling of population in the centers which will put a stress on both natural resources and social services. Tsogt Tsetsee soum center's population has expanded from 1,500 people to at least 13,000 of which 2,000 will have permanent jobs at UHG. Another soum center has witnessed their population increase from 2,300 to 4,000 mine workers to a total of 10,000 people including transients.

The Asian Development Bank is financing a project to support the growth in selected soum centers impacted by mining. It is a given that the demand for water will increase and there is uncertainty about the interaction between the shallow wells and deep aquifers that the mining companies will use for their operations. ADB's project is not designed to set up long-term studies and analysis to evaluate and monitor water quality and quantity. It was recommended that this type of study/analysis should be supported by the mining companies and investors in mining activities. In the meantime, there is recognition from most stakeholders that all the mines in the area need to develop an integrated social management plan that encompasses social services (e.g., hospitals/schools, etc).

Section 2. Oyu Tolgoi Copper/Gold/Silver Mine Project

The OT project is one of the largest investments in Mongolia. Reportedly, OT investments are approximately three times the entire GDP of Mongolia and will increase GDP by 30%. The project is estimated to cost over 10 B USD and could easily increase to more than 20 B USD over the life of the project.

In 2006, Rio Tinto (RT) agreed to form a strategic partnership with Ivanhoe Mines Ltd. by investing in Ivanhoe's Oyu Tolgoi copper-gold-silver mine. The agreement created a path for RT to become the largest shareholder in Ivanhoe Mines. RT was attracted to this project because it is the largest reserve of copper in the world. RT took over management control from Ivanhoe in December 2010. RT shares in Ivanhoe have recently increased from 42% to 46.5%. At the time of this report, RT shares in Ivanhoe were capped at 49% until the current standstill limitation expires on January 18, 2012. Ivanhoe owns 66% shares and the Mongolian Government owns 34% with zero investment with a goal of owning 50% of the OT project.

Ever since the copper/gold/silver reserves were discovered and exploration began in 1997, the OT project has stopped and started over the years due to a variety of factors. In 2008, with a new Prime Minister, the negotiations on the investment agreement were restarted and were concluded in 2010. Full-scale construction at OT is continuing with peak level of activity expected to be reached during the third quarter of 2011. Overall construction reached a 23.3% level of completion at the end of May 2011. Project construction is ahead of schedule and surface mining operations are expected to begin June 12, 2012.

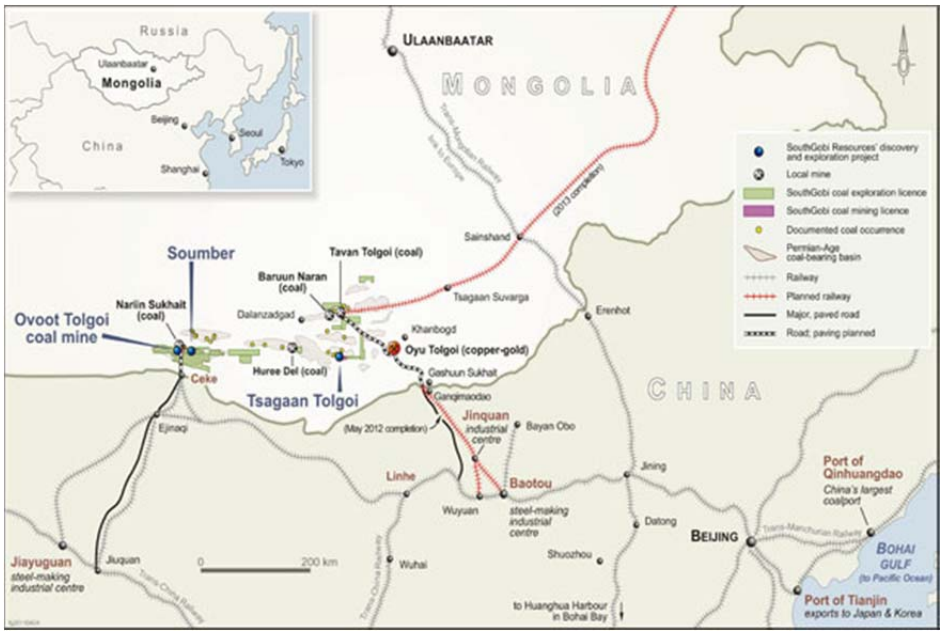

Figure 8. Construction activities at OT site, May 2011.

The open pit mining component of the project will produce 100,000 T/day with a life span of 40-60 years. The underground mine will be capable of producing 80,000 T/day, but will initially only produce 50,000 T/day. The life of the underground mine with its associated deposits could range from 60-120 years. Eventually there will be 250 km of underground mining tunnels at a depth of 1.5 km. It is expected that production will be 360 T concentrate/day within the next five years. Although GoM might build a copper smelter near Sainshand, for the foreseeable future, at least 90% of concentrate will be exported to China. However, there are reports that OT has draft plans for a smelter on its site.

Financing: OT is working to complete a finance package of up to 3.6 B USD comprising the international financial institutions, government credit agencies and commercial banks. The goal is to have the financing package in place by the end of 2011. The IFC and EBRD are considering financing the project with each providing a 300 M USD A loan and 600 M USD syndicated B loan. Financing is considered challenging because the project build-out for the underground mining operations is long – estimated at eight years.

Electricity: Under the current investment agreement, OT can import electricity from China for five years after production has started. After five years, the electricity must be sourced domestically. The GoM at the highest levels, requested this condition during negotiations on the investment agreement. A single coal-fired power plant is being discussed for both UHG and OT operations. At this point, OT is

undertaking an options analysis as a way to influence the GoM to make a decision as to the location of the coal-fired power plant. Since UHG coal operations are producing thermal coal – middlings – which cannot be stored because of self-combustion, the reasonable solution is to use this material in the coal-fired power plant. Certain stakeholders believe that alternative energy sources such as wind/solar cannot be used since the electricity generated cannot be stored. OT will require the greatest amount of electricity for its operations, estimated at 350-400 MW compared to the 40-50 MW required by the coal mining operations. UHG may not have access to enough groundwater (for cooling) to operate the coal-fired power plant if it is located in its vicinity so it may need to be located closer to OT in order to access their groundwater resources. Reportedly, building the power plant will be a joint effort between OT and GoM.

Linear infrastructures: Several stakeholders have stated that the main impacts of the project will be outside of the direct mine footprint – the water pipeline; transmission line and roads. The transmission line will be 220 kV and 120 km long. China will build the transmission line on its side of the border connecting to the Chinese power plant.

The OT road being built to Gashuun Sukhait is approximately 100 km long and will parallel, cross at times and at times be within 10 km of the hard surface road that UHG is building. OT states that it cannot share the same road with the coal companies as their trucks are larger and are moving heavy equipment so OT road needs to be 12 m wide vs 10.5 m for the coal road. Reportedly, OT draft EIAs have not been consistent on the transportation information provided, yet plans for the road are imminent.

Water:

<u>*Groundwater*</u> There are two major deep groundwater aquifers that OT can potentially use to support its mining operations. The primary source for OT development is the Gunii Hooloi aquifer that can be tapped at a sufficient rate to support the mine for approximately 40 years. The Galbyn Gobi aquifer has been considered as an additional supply for OT, although tests have shown a connection, over at least part of the area, between this deep aquifer and shallow aquifers. The quality of the water from these deep aquifers does not meet GoM water quality standards and is not potable for either humans or livestock without treatment.

OT believes that the concerns of water availability for its operations have been resolved. They state that there is strong evidence that the Gunii Hooloi aquifer is a discrete body, embedded in thick layers of clay and located in a different area than water sources for shallow wells. Although not connected directly, there is the possibility of a 'rubber band effect' where shallow wells may be drawn down but this is being monitored closely. There are seven shallow wells used by 21 herders in the project zone of influence. OT has been monitoring water via boreholes since 2003 resulting in a long-term comprehensive database comprising both shallow wells and boreholes. Water usage is expected to peak in summer due to increased evaporation from the tailings pond. Reportedly, OT has concluded that water from the Gunii Hooloi aquifer can be abstracted without impacting surface waters. If there are any issues with water sources, mitigation measures would be developing new shallow wells for delivering water to herders on a daily basis. The new wells will need to be strategically sited to prevent overgrazing of pasture and ensure no negative impacts on wildlife.

Although the life of the mine is expected to be at a minimum 60 years, OT's water assessment was only for 40 years because that is the amount of time required by GoM law. Reportedly, the lenders are only looking at a 25 year life span assessment. Since 2007, the anticipated life of the mine has increased along with increased estimates of ore production. Based on models, OT has calculated that up to 1325 l/s of water can be safely abstracted but the GoM has only approved 870 l/s. OT will be updating its models

and should be able to show that there are higher levels of water available. In a few years, after operations start, they expect more information will be known about groundwater availability.

Undai River The Undai River is the sole surface water source for this area, although it does not flow year round. The Undai River flows through OT property and will need to be diverted. The issue of concern is that most of the Undai River flow volume is subterranean and surfaces when it is dammed by a dike. One of the springs along the Undai that happens to exist within the boundaries of the mine site is named Bor Ovoo. Several stakeholders believe that an unanswered question is once the water is diverted from flowing from above the mine site and returned to the channel below the mine site, whether the water remaining on the surface will evaporate and therefore not be able to recharge any of the springs/wells downstream. OT staff stated that the subsurface flow diversion will ensure that sediments will flow back into the river.

Water management The site has a zero discharge policy. Wastewater will be reused for road dust suppression and concrete production. At this point, GoM is not able to approved OT's request to reuse water for concrete production because it is not in their laws. The GoM has established a working group to assess/research reusing water for concrete production.

Mine dewatering Mine dewatering is also an issue since the resulting cone of depression has the potential to lower the water table. The EIA assumes a radius of 5 km around the mine which will cause shallow wells to dry up. Considerably larger areas of land could be affected by mine dewatering, where lowering of the surface water table will dry up springs and shallow wells.

Labor/Social: The workforce is estimated by May 2011 to be 11,400; comprised of 5,480 Mongolians, 5,440 Chinese and 480 expats. Most of OT's employees will live in Han Bogd which will need to absorb 10,000-12,000 people within the next 10 years. OT will be developing a water supply system for Han Bogd but the soum center will also need a wastewater treatment system. There is speculation that ADB may contribute funds for that in the future.

OT has formed community groups to help formulate plans for development in the region at the aimag and soum level. These groups are being used to identify services and other needs for towns within the mining areas. OT proposes that herder families will benefit from the project with job opportunities. However, based on interviews with project affected herder families this is not clear. (Section Project-affected Herders)

ESIA: Since taking control, RT has stated that it will attempt to address issues that accrued under Ivanhoe management. RT believes that the new ESIA will address these issues and will be consistent with RT standards.

The Detailed Environmental Impact Assessment (DEIA) is based on production of 100,000 tons concentrate/year. If production is expanded then it will be subject to additional studies. Project construction has started based on the DEIAs that have been reviewed by the GoM. The DEIAs are broken up by sector/area so the potential for cumulative impacts across sectors on a natural resource receptors has not been identified. All mitigation measures are formalized in the Environmental Protection Plans (EPP) and submitted on an annual basis to the Ministry of Nature, Environment and Tourism (MNET) with one-half environmental costs bonded each year to the GoM. The previous year's bond is returned to OT based on compliance with the EPP.

In 2010, OT initiated an update of the ESIA in order to meet international standards for external international financing. The DEIAs and related reports are being integrated into the revised ESIA. The

issues regarding biodiversity, critical habitat, ecosystem services and wildlife movement patterns are reportedly the most significant in reaching lender acceptance on disclosure of the ESIA. An international team was contracted to address the issues associated with biodiversity in the project area. The other red flags that the potential lenders had raised with OT, including water, community and air emissions, have reportedly been addressed.

OT expected to disclose the ESIA in early July. However, this is dependent on the international consultants completing the rapid biodiversity assessment and integrating their findings and recommendations into the ESIA.

Biodiversity RT sees itself as bringing biodiversity management capability to the project. RT has a corporate biodiversity policy of net positive impacts and has stated that they have been successful achieving this policy at the global level and are trying to accomplish this on a site by site basis. However, stakeholders have reported that RT has not been able to verify net positive impacts at any of their projects site.

As mentioned earlier, biodiversity has been highlighted by the lenders as deficient in the ESIA. Biodiversity baseline data has not been collected by OT in any systematic manner prior to initiation of construction on the mine site or designing/constructing the road or transmission line corridor. For example, the OT road cuts through prime migration corridor from SGA to SGB and the transmission line is through the Galba Gobi IBA which is Houbara bustard habitat. OT personnel reportedly record wildlife when seen on an opportunistic basis, however, with this type of data collection it is not possible to gain a full understanding of the potential impacts and appropriate avoidance or mitigation measures. This is further complicated by the fact that construction has been going on for a number of years so any "baseline" data collected at this point needs to be considered shifted or impacted.

There is the perception that OT has been slow to address the biodiversity issues. EBRD hosted a meeting organized by the Business and Biodiversity Offsets Programme (BBOP) in March 2011 to assist OT with its biodiversity "baseline" data collection and analysis. This resulted in a two month consultancy with an international biodiversity team to assess biodiversity concerns within the project area. Addressing biodiversity issues is part of the MDB's financing requirements under IFC's Performance Standard 6 and EBRD's Performance Requirement 6 on Biodiversity Conservation and Sustainable Natural Resource Management.

Independent experts have recommended that in order to determine appropriate mitigation measures for khulan it is necessary to monitor their movement to get an understanding of where and when they move across any linear infrastructure. This should have been done before either the UHG coal road or OT road is built in order to build mitigation measures such as appropriate overpasses, underpasses, road closures into the design and operation of the road. However, it should be recognized that it is difficult to determine khulan crossing points since that is predicted only by understanding vegetation growth patterns and seasonal weather. Additionally, poaching is another significant threat to khulan so mitigation measures need to be in place to ensure that increased access into movement corridors does not result in increased poaching. Although the earlier WB study (2006) had radio-collared khulan, at this point in time, there are no animals radio-collared.

It is not clear what the team of biodiversity consultants will recommend to mitigate project impacts on the khulan. It was suggested that the khulan and road issue is sensitive and complex enough that a panel of experts may need to be convened by either OT or the lenders. OT has been advised that they would be better off financing this panel otherwise the lender community could require it. This would be similar to the panel of experts for the Western Gray Whale which was established for the Sakhalin II oil

and gas project. It was noted that the two roads will be temporary since there will eventually be rail, although it is not known how long before the railroad will be built and what the impacts to the khulan will be in the intervening time with other activities now occurring in the corridor.

The placement and design of power lines are identified as particular threats to the Houbara bustard due to disruption of breeding grounds, increased vulnerability to predators and increased access to hunters and trappers. EBRD has requested OT to avoid finalization of the transmission line route but no decision from OT was known at the time of USAID's visit. However, OT stated they would delay construction of the lines until these issues are resolved for either avoidance or mitigation. The issues of concern for the houbara bustard are the need to avoid the transmission line crossing its critical habitat, including lekking areas as the towers would serve as perching roosts for predatory raptors (Saker Falcon) and the potential for the low flying bustards to fly into the transmission lines. The design of the lines is important as vertical lines increase the chance of bird collisions versus horizontal lines. Based on discussions, it appears that the current design of the lines is vertical orientation, reportedly the worst configuration for the bustard. At the time of the site visit, transmission tower platforms were being put into place and OT was waiting for delivery of the power poles. Based on the extent of construction activities, it is unclear what efforts OT will be able to undertake to effectively mitigate these impacts.

Figure 9. OT's transmission tower footings being installed.

There is also concern of potential impacts of various construction activities on the saxaul forest. For example, saxaul forest that is within the pipeline corridor is being destroyed because of construction activities. As far as the surrounding forests, there is concern that if the surface water aquifer is drained, that may affect the saxaul forests because they may be dependent on access to this water.

It is acknowledged that OT's project area is considered as sensitive and critical habitat. Stakeholders have stated that the entire area should be considered critical habitat because of the Galba Gobi IBA and the region of influence also needs to be considered as critical habitat. As part of the biodiversity consultants' mandate, they are to define and identify critical habitat in the area. Consequently, the MDBs will be looking at the proposed linear routes (e.g., roads, transmission lines) in relation to critical habitat and OT's justification for alignment. Both IFC and EBRD do not have a no-go policy in critical habitats. They do have an "offset" element in their safeguard policy so if there is financing by these lenders, it may be possible to strengthen nearby areas for wildlife protection to offset the impacts occurring in the project zone of influence. From the MDB perspective, it is important to look at the particular ecosystem and land to be able to determine appropriate offsets. BBOP believes that offsets can be established to allow for development in critical habitat. EBRD will need to apply the precautionary principle to critical habitat as stated in its safeguard policy. The MDBs have stated that they will seriously consider the consultants recommendations, for example, if road crossings are recommended they will not be ignored.

As experience in other regions has shown, mine and associated development will increase income levels and as this happens the demand for game meat and recreational hunting will probably increase. Therefore OT will need to develop monitoring and other mitigation measures to effectively counteract this potential impact.

Project-affected Herders

Mongolian herders are semi-nomadic pastoralists as a consequence of the environment they have lived in for centuries and are tied to their winter camp sites and water sources. There is no historical concept of land ownership or privatization. Prior to privatization, the soum would track which families used which areas for pasture by season and authorized those families to use those areas. The OT license area is 10 km x 10 km which overlays traditional pasture and water sources of a group of 11 herder families who were involuntarily resettled.

During our visit to the OT site, we were able to visit with several herder families that are being impacted by the project. Reportedly, in Han Bogd, approximately 630 herder families with more than 100,000 livestock are directly or indirectly impacted.

All herder families stated that they did not want the project to stop or slow down as they understand mining will develop their country; however, it is having a very negative impact on their lifestyle and culture. Some interviewees questioned whether there are any other alternative opportunities for Mongolia to develop since it will take decades for the soil to rehabilitate following mining and associated development. They have never asked for cash payment, only employment. Initially the herders believed OT would bring positive development to their area but at this point they are not sure. OT is perceived as a very large company that does not consider issues at the individual level. The herders want to be treated fairly and have adequate access to pasture and water for their livestock. Several herders did not want to be identified as they feared it would cause problems for their and other herder families. All families wanted a good future for their children which appears difficult to provide at this point in time.

Project information/Political Pressure There was consensus that from the beginning there was a lack of information on the project, a lack of understanding of the herders' land ownership laws and knowledge of their own rights. Previous government officials told at least a couple of herder families to not complain or speak out against the project and that they were asking for too much. Consequently herder families signed the resettlement contracts without adequate knowledge of what they were signing. There was also at least one instance where it appears that the head of the family was provided misinformation by local government official and consequently was not at home when the contract was signed. The residents in the area where the groundwater will be taken never agreed to OT using it and are still "protesting." In discussions with herders, it is clear that there continues to be a lack of information and confusion. One family stated that local citizens affected by the mining do not have much opportunity to speak out so wanted to meet with the USAID team. There was discussion about herder families going to court but they lacked the knowledge and means.

Involuntary resettlement The resettlement of the 11 families from their traditional pasture areas started in 2004. One family was moved 10 km from their traditional pasture. Another family was relocated since their main source of water will be fenced within OT's property. Reportedly, the last two families resettled were not assisted by OT due to issues associated with the OT person in charge of resettlement.

The process for resettlement was reportedly short. OT asked the herders to find pasture but the herders said they did not have adequate time to select and consequently their selections of sites were not good. OT built new fences, animal shelters for livestock and also dug wells at the new sites. For one herder family, the well had broken within a year of operation and the animal shelter made from wood was not as well constructed and protective as their previous stone one. This family was also located approximately 400 m from the Tavan Tolgoi coal road. They acknowledged being consulted and selecting the site but they had no knowledge that the coal haul road would be so close. Now they are trapped between the coal road and OT's road. Being this close to the coal road also results in problems with their livestock with noise and dust impacting productivity and grazing pasture. Several herder families have moved back to their original sites. The primary reason for moving back was to accommodate their livestock since in many cases their livestock either went back to their original pasture on their own or herders took them back because of better pasture, housing and water conditions. Out of the families that were initially resettled, 4-5 continue herding and the remaining have stopped altogether – although we were not able to determine what their current status is.

Figure 10. Broken well at one resettlement site.

Figure 11. Tavan Tolgoi coal road from animal shelter at resettlement site.

One aspect of the relocation and site selection that is often overlooked, is that the herders, prior to 2004, were using the best sites that the region had to offer so any alternative site will be inferior. Therefore, herders are being asked to continue their lifestyles in pastures that are inferior.

Figure 12. Old animal shelter constructed of stone.

Figure 13. Animal shelter at resettlement site constructed of wood.

The Undai River has both functional and cultural values to the herders. Trees along the riverbed are considered sacred. Several herders believe that the Undai River has been impacted by climatic changes. We were told by one herder that years ago, the river would run up to a month. Now it only contains water when it rains.

Project Employment Employment opportunities with OT were discussed. OT will hire one employee per herder family and of the 11 families, seven or eight have a family member working for OT. Several herders stated that after conversations with OT personnel they purchased vehicles to be able to work for OT as drivers. Even if they could not use the vehicles purchased, they were willing to drive OT's shuttle buses between the soum center and OT camps. OT personnel who had encouraged the herders to purchase the vehicles with the prospect of future jobs, were not working in the same section when the herders returned to discuss the issue with them. Consequently, neither of these options came to fruition although there was committed interest on the part of the several herders.

It is difficult for individuals to propose projects to OT for employment opportunities. After attending a training course on operating a business, one herder took the initiative and submitted a proposal to OT. In response to the proposal, OT reportedly stated that they do not deal with individuals and that soum government approval for the proposal was required. Some herders expressed interest in the carpentry profession and learning to run a business. The herders perceive that OT does not consider herding as a profession and that OT has the impression that herders are stupid and not educated.

At this point, herders do not have the skills to be employed in positions that pay well. For unskilled workers, the salary does not match the income generated by what a herder with 100 goats would earn so a greater sense of security is not realized. Herders that are employed with companies are stuck between those jobs and herding with no special privileges or advantages. Livestock ownership is still considered the primary safety net.

Working Group for additional project-affected herders USAID understands that there is a working group for assessing the needs of herder families that are affected by project activities, such as those located along the transmission lines or roads. The soum Deputy Governor is the chair of the working group which is also represented by about four herder families. Concern was raised that there could be a conflict of

interest with the Deputy Governor as chair of the working group. The working group is trying to establish the number of families affected and the extent to which they are affected by project activities. For some families the situation is difficult since some project activities are separating water resources from pasture. The working group has the right to hire outside legal advisors, however, there is no financial support to assist. Independent technical advisors would also be of value to the process. Since the working group was not given any information as to the problems each family is facing, there is a desire to meet with each impacted herder family but to date they have not been able to since they are also maintaining their regular jobs. The working group is resolved to not make any decisions/compromises on their own but will discuss with each family because conditions for each family are very different. OT will negotiate with the working group on conditions of the contract for each family affected. There is no time frame for concluding the agreement although the impression is that OT wants this concluded sooner rather than later.

Figure 14. View from Ger impacted by construction of water pipeline.

An example of the issues faced by the working group is a herder family impacted by the road and water pipeline construction since February 2011. The family is currently on their winter grounds which are considered their central place. OT is installing the 70 km water pipeline running from the borefield to the project site. The road construction and traffic are creating significant air quality issues and impacting the quality of the pastures and the ability of the herders to watch their 500 head of livestock. Equally important is the fact that the herder's pasture and water source are being separated by at least two roads and associated construction activities. The water source is approximately 4 km away and livestock need to cross the road in the midst of high volume construction traffic. The herder reported that it is difficult to manage the livestock under these conditions as the horses and camels will select their own path to water and even in a new location the cattle will continue to go back to the original water source. Additionally pasture size is reduced and their herd is divided on either side of the road. The herd needs to be watered 1-2 times a day depending on the stock. Crossing the road to water the livestock is very difficult due to the high volume of traffic and speed of the trucks, which will not stop and will honk, scaring the livestock. The cover to another water source they previously used has been damaged by vehicles running over it and is not useable. Construction noise is also a major problem for livestock. This has resulted in extremely difficult situation for the herder to manage his livestock in a productive and safe manner. OT has visited their ger but there has been no action beyond the discussions. The only limited measure OT has taken is watering the road down twice a day, which is not that helpful given the temperatures and wind. To date there has not been any compensation paid by OT. OT has promised another water source but as of USAID's visit this has not occurred. The option to move is limited since there are other families in the area so there is no space to go to. Their area is also within the area impacted by the airport. Additionally the UB road is close to another winter area and water source. So at this point all of their seasonal pastures/grasslands and territories are being impacted by various development activities.

Herder Concerns

Figure 15. Small herd of camels.

- Negative impacts on ground water either through contamination or draw down by project activities. Although OT has stated that they will create new water sources, some herders do not believe that these new ones will work as well as the original ones. Herders have been experiencing a lowering of the water table over time which seems to be getting worse. It is becoming more and more difficult to find adequate water resources for livestock. For example, one herder reported that in the socialist time, water was sufficient to water 300 camels (60-100 l/day/camel) but now there is not enough to water 30 camels. In one case there is a water source (Hajuu Hurur) that is used regularly by livestock, however, OT will be fencing it within their property so it will not be available for livestock. One family that depends on this water source has been relocated but moved back to their original site due to their livestock continuing to return to their original pasture and water source. The nexus between adequate pasture and access to water is critical for survival of livestock. It was suggested that new water sources need to be established in areas that can support summer pastures. The herders carry most of the risk and OT does not understand the dynamics of herding and the need to follow the livestock to adequate pasture and water sources.
- For herders that remain to be relocated or desire better relocation areas, it is difficult to decide where to move due to increased development and changes in the environment due to desertification. It is economically and psychologically difficult for herder families to move from their traditional land.
- Roads are causing multiple problems including damaging top soil, dust damaging vegetation and reducing pasture availability, and the new roads are a barrier for livestock movement since they are being built up and more difficult for livestock to cross – independent of traffic issues. There is no consultation with herders as to where to site the roads and which roads would be useful – such as the road from Han Bogd to UB.
- Lack of respect for herders cultural and spiritual sites. Specific examples were in relationship to OT removing what is considered sacred trees from the Undai riverbank that had been in existence for 150-200 years.
- Absence of ability to get issues resolved by either local government's public relations office or OT's community relations office. For example, the issue of a broken well was raised on several occasions with OT, but each time there was different personnel and consequently the well remains dysfunctional. Other examples were given that when OT public relations come to visit they just listen and do not offer help/advice. Additionally, follow-up meetings rarely happen.
- There rarely is advance notice or knowledge of what the project is going to do and potential impacts.
- Their concerns/ideas are written down by OT staff but there is never any feedback. They need to have the opportunity to meet with decision makers.
- Concern about the availability of social services with increased population and ensuring that everyone has access to schools and health clinics, etc. The perception is that social services are considered lower responsibility and priority by OT. For example, OT expanded a school however it was not large enough to accommodate all the local students after a couple of years.

- Herders are being pushed from all sides without a clear strategy as to how they will maintain their lifestyle in the face of development. One herder has about 800 livestock but with reduced area for pasture and moving he is not sure what to do with his livestock. It is not possible to stay in one area and rotate grazing since there is so little vegetation that the area will become overgrazed very soon. He recognizes that to become a farmer will require special inputs such as specialized breeds of livestock, which he lacks access and resources for. This has led some herders to change their life style because of future uncertainties with both development and climate change/desertification.
- It is hard to imagine any herder family living around OT because of the noise and traffic associated with its operations for 24 hours a day.

Taken as individual issues, these are easily solvable, however, as a whole they imply that livelihoods in the region are not improving as a result of OT activities. It is unclear how the 30% increase in GDP, attributed to OT, will benefit these herders.

Section 3. Government of Mongolia Oversight

A number of stakeholders believe that the GoM's mindset is to continue signing significant extractive industry investment agreements and build the infrastructure to support those agreements. One of the concerns with this type of strategy is that the GoM lacks the resources and technical capacity to provide adequate oversight of extractive industry activities, including mining. The GoM is perceived to prefer the Erdenet mine model where the mining company develops the communities with little input, if any, from the government. Part of this could be due to the fact that there are not enough government personnel to provide adequate oversight capacity so other stakeholders have proposed to balance needs with capacity. Under these conditions it is difficult for GoM officials to represent the needs and concerns of Mongolian citizens to the industry.

Reportedly, the MNET does not know that much about OT since the company is only part way through the process of the ESIA preparation. It is not clear how engaged MNET is in the ESIA revision process.

Institutional oversight of mining activities is through the General Agency for Specialized Inspection (GASI). In 2003, the EPA was integrated into GASI. The Agency has oversight to ensure that over 150 laws, 3,000 regulations and standards are being appropriately implemented. Their main goal is to ensure that law enforcement is in place and that companies' activities are not harming the environment while pursuing their operational objectives. GASI's aim is to support business within the scope of the law and environmental policies. State chief inspectors are assigned to the aimags and state inspectors and rangers are appointed at the soum level. State inspectors authority is to ensure the laws are being followed to eliminate adverse impacts and they have the authority to suspend activities which are not following the laws and impose administrative penalties on violators.

Local government: In Omnogovi aimag, the area started exporting coal 6-7 years ago with UHG starting operations in 2009. The MNET Department in Dalandzadgad was established in 2008 and became fully functional in 2009. This office is responsible for protecting the environment, making sure the laws are enforced and that project implementation is done correctly. Although they do not undertake the inspections or have monitoring authority, as that is the role of GASI, they do provide the guidelines. This Department covers 350,000 km^2 with seven employees and a budget of 50K. Consequently, this entity is not in a position to regulate private mining companies and other development activities. The Department provides an annual report that sets out the following year's plans and budget. They also provide advice and work cooperatively with other public and private entities to find solutions to problems.

The GASI office, located in Dalandzadgad, has 91 specialists in the following sections: geology, production services, border control and environment. Even with this number of specialists there is a lack of manpower for inspections due to the rapid growth of the mining industry and subsequent development of infrastructure for the industry and soum centers. Generally all provinces have the same number of inspectors but mining is being concentrated in the Gobi. It is the companies' responsibility to take care of the environment and update the EMP on impacts each year. Updated EMPs are approved by the MNET. In addition to inspections, GASI also reviews the companies' EMPs and requirements within these plans. Inspections are managed by the approval of an inspection plan at the beginning of each year and then the inspection is made according to schedule.

GASI specialists will also conduct inspections if they receive a request from either local government or citizens. For example, local citizens may request tests for water pollution and in response, GASI inspectors can take the appropriate samples. Water and soil samples are fairly easy to obtain but it is technically more difficult to take air samples. All samples collected are sent to UB for analysis but in some cases specialists with portable lab equipment have come down to provide additional support. There is one general laboratory in UB and 16 out of 21 provinces have their own lab. The office in Dalandzadgad does not have its own lab and has to send samples to UB. It is important for a laboratory to be set up in Dalandzadgad. There is also a need for proper equipment, tools and trained specialists to work in the laboratory. GASI inspectors need to be trained on the latest technology that the mining companies are using.

Under the 2009 Investment Agreement, the GoM is required to set up a Regional Council for Stakeholders. To assist the GoM, the WB has facilitated the development of a South Gobi Regional Development Stakeholders group with the goal of discussing plans for developing the Gobi.

Issues of concern from the local government perspective are:

- Desertification – The Gobi soil is delicate and easily degraded. This is further impacted by decrease in precipitation and increased wind frequency and speed. Water resources are drying up. In one aimag, there used to be 500-600 spring water wells but now there are only about 200. There is a policy to protect the remaining springs which some companies comply with while others do not.
- Environmental Policy – Projects should have well-defined environmental requirements. There should be a prepared decommissioning plan so that by the time the mine closes the environment is restored back to its original condition.
- Infrastructure Policy – The lack of an infrastructure policy for road development is leading to increased damage to top soil since tracks are made everywhere. Each mining company establishes a road without coordination among the companies. There are so many mining companies that it is not possible to monitor all of them. Additionally, roads are not paved so there are increased issues with dust.
- Water Policy – Water is not a commodity in great supply in the Gobi. Previously, water was used only for livelihoods but now will be used for industrial purposes. Each mining company estimates water usage for only its purposes and is not looking at the cumulative impact of a number of mines impacting the same receptor. Herders have reported dropping water table levels with some measuring at least six meters below normal levels. The GoM cannot finance the development of deeper wells to offset the dropping water table. UHG will be supplying one soum center with potable water. There should be one technical office based in Dalandzagad to monitor and manage groundwater within the region.
- Air Quality Policy - Air quality throughout the area is worsening due to mining activities. Although mining companies are discussing the issues with dust, it remains a problem. There needs to be a unifying policy for all companies to work together to eliminate this issue.

- Public information – Local people should be well informed and included in the process. This way they will have a good understanding of the projects and receive correct information. For example, there is local concern that the shallow well water level will go down due to the mines which could result in local demonstrations. Better information and understanding on the part of the local citizens could mitigate these types of protests and provide alternative solutions. There needs to be better cooperation between the mining companies and local citizens.
- Social responsibility – Mining companies and GoM should ensure positive developments for the communities. Companies and soum centers need to work closely together to develop proper waste management and also greening of the area through tree planting. It was suggested that the three largest companies should establish one garbage disposal area that everyone uses and maintains. Additionally, one soum official recommended that for every hectare developed, a comparable 'green' area should also be developed.
- Wildlife – Available pasture and water sources are shrinking for both wildlife and herders' livestock.
- Livelihood opportunities – There are challenges with agricultural activities and reduced pastures. In one soum center consisting of 250 herder families their herd size went from 106,000 animals to 36,000 as a result of the winter dzud. Herders' lifestyles are changing because of changing environmental conditions and mining activity. Because of the decreasing pasture sizes, there will be a need to change livestock husbandry practices, using a combination of fences and shifting pastures that are actively seeded. Livestock efficiency will also need to be improved via genetic stock and improved veterinarian care.
- Urban growth – Mining and related activities are creating a rapidly increasing population in the soum centers. Increase in the population will pose problems to soum centers trying to meet basic social services. Electricity needs will increase and until new power stations are developed, power will be unpredictable.

Large mining projects are paying better attention to environmental issues than smaller companies. However, MNET is lacking the experience to deal with mining companies. Mining companies are attentive on environmental issues when the loan financing package is being finalized and are perceived to ignore these issues once the financing is in place. It is recognized that this behavior happens all over the world but MNET would like to be able to prevent this happening in Mongolia as much as possible.

At the local government level, authorities rarely, if ever, have the opportunity to meet with higher level government officials to discuss issues. There should also be an avenue where provincial authorities and mining companies have a joint conference to discuss environmental and social issues. An annual conference of all environment units was held last year which the GoM funded. Mining companies attended and thought it was a good idea. The local government entities would like to see it held every year, but to date none of the mining companies have taken the initiative to organize it.

Section 4. Recommendations

Oversight of mining activities

- Local government capacity (aimag, soum, MNET, GASI) needs to be assessed and appropriately strengthened in order to effectively carry out inherent government oversight functions of the mining sector with associated development activities. Capacity strengthening could include increasing the number of MNET and GASI specialists, with appropriate training based on the latest techniques and establishment of laboratories supplied with appropriate equipment.
- Develop the capacity of local groups to monitor changes in the resources they use – e.g. water sources, pasture.

Strategic Planning

- Develop a Gobi Regional Development Strategy so the region is not developed mining project by mining project. This would include:
    - Development of a set of coherent policies on water, air, infrastructure and wildlife at the landscape level for all companies to adhere to.
    - Undertake a cumulative impacts analysis on all receptors (e.g., aquifers, livestock pasture/water sources, migratory herbivores) that would be impacted by mining, its associated infrastructure and related urban development.
    - Develop an integrated strategy that ensures sustainable pasture management for livestock improvement and wildlife conservation needs.
    - Capacity development of stakeholders to implement the Development Strategy.

Biodiversity

- Reassess the need for two separate roads for OT and coal truck traffic and reconsider only one shared road which will reduce the fragmentation of habitat and barriers for wildlife to move between SGA and SGB.
- Ensure the ecological integrity of SGA and SGB through establishing effective mitigation measures to include the ability of wildlife to migrate between the two areas.
- Develop a long-term biodiversity monitoring program integrated into an adaptive management plan for migratory herbivores, key avian species and small mammal species to be used by all mining companies within a specific geographic area.

Communities

- Provide herder families that will be impacted by mining and associated infrastructure, independent technical and legal advice so they are better informed to:
    - Effectively participate in the development of the Regional Development Strategy.
    - Understand project impacts and legal agreements they are being asked to sign.