

VOLUME 1: A NON-TECHNICAL SUMMARY OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT ON THE MADAOUELA WEST PROJECT, ARLIT, NIGER

Prepared For
GoviEx Niger Holdings Limited

Report Prepared by



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UK5618

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1 INTRODUCTION

Uranium was first discovered at the Madaouela Project by the French Commissariat à l’Energie Atomique (“CEA”) in the 1960’s. The CEA conducted exploration drilling on part of the Madaouela area and discovered other neighbouring deposits that are now currently active mines run by AREVA. Since the 1960’s significant exploration has been completed that confirms the presence of uranium at the Madaouela Project. In 2007 the Niger Government issued GoviEx a licence to explore in the Madaouela area to determine if it is possible to economically mine and sell uranium.

GoviEx asked LEGENI (a Nigerien consultancy) and SRK (an international mining environmental consultancy) to find out how the Project might affect people and the environment by doing an Environmental and Social Impact Assessment (ESIA). This summary provides information on the potential positive and negative effects that were identified in the ESIA and possible ways to manage them.

The main reasons to do an ESIA are to:

- *understand the way things are before the Project starts;*
- *predict how the Project might affect people and their environment;*
- *work out ways to manage the good and bad effects of the Project; and*
- *talk to people who are interested in the Project or might be affected by it.*

If you would like to read the full ESIA report and send comments, there are details of where you can access the full report at the end of this non-technical summary.

2 OVERVIEW OF THE PROJECT

The Project is owned by GoviEx Niger Holdings Limited, a wholly owned subsidiary of GoviEx Uranium Inc., a company listed on the Canadian Securities Exchange. The Project will have three main components: (1) two underground uranium mines associated with the Marianne-Marilyn and MSNE-Maryvonne deposits, as shown on Figure 2-1, and an open pit mine for the Miriam deposit; (2) access roads, a water supply wellfield, haul roads and services; and (3) a process plant. These components will be located on the Madaouela West Project area.

In broad terms, once constructed, the Project will comprise the following components:

- Mine area – specifically the two underground mines and an open pit, mine access portals, ventilation shafts, run-of-mine (“RoM”) ore pad and stockpile, explosive magazine, truck loading facilities and other supporting infrastructure (such as internal roads), buildings (administration, change houses, etc.) and services.
- Processing plant – including acid tank leach circuit, sulfuric acid plant and solvent extraction process for uranium and molybdenum saleable products
- Roads and service corridors – specifically the haul road, service roads, overhead power line, tailings and water pipelines.

- Tailings Storage Facility (“TSF”) and Waste Rock Dumps (“WRD”). Tailings from the processing plant will be dry stacked at a clay lined TSF. Waste rock from the Miriam open pit will be dumped at three WRD in the close vicinity of the open pit.

These components are explained in more detail in the sections below.

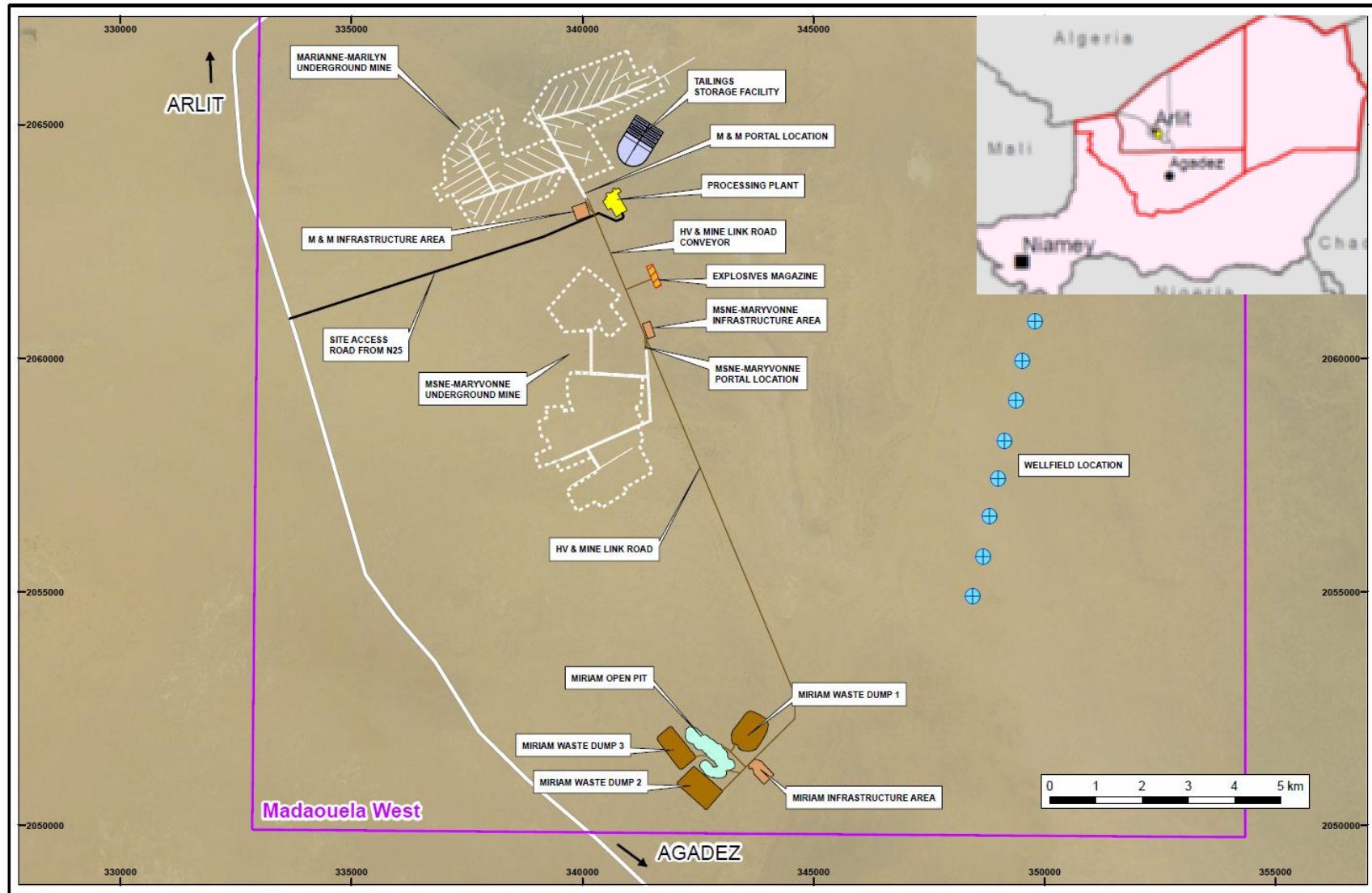


Figure 2-1: Project location

2.1 Construction

Once the final investment decision has been taken by the company and the required approvals and permits are in place, construction in the mine areas and along the roads and service corridors will commence. In general, construction will take place 24 hours a day, 7 days a week for 52 weeks of the year, although there will be exceptions when specific mitigation and management measures require reduced activity. Construction is expected to start within two years of approval by the Niger government and GoviEx board, and will take approximately 18 months to complete.

Construction will require substantial quantities of materials sourced from within the Project area (for example borrow materials), Niger in general (for example aggregates and concrete for building platforms) and imported from elsewhere (for example specialist equipment).

2.2 Mining and processing

Mining is expected, subject to approvals, to start in 2017, ramping up to full production in 2019 and will continue for about 18 years¹.

The Miriam orebody will be mined using an open pit method (see Figure 2-2). The ore is a mixture of value minerals (uranium and molybdenum) and other minerals with little or no economic value.

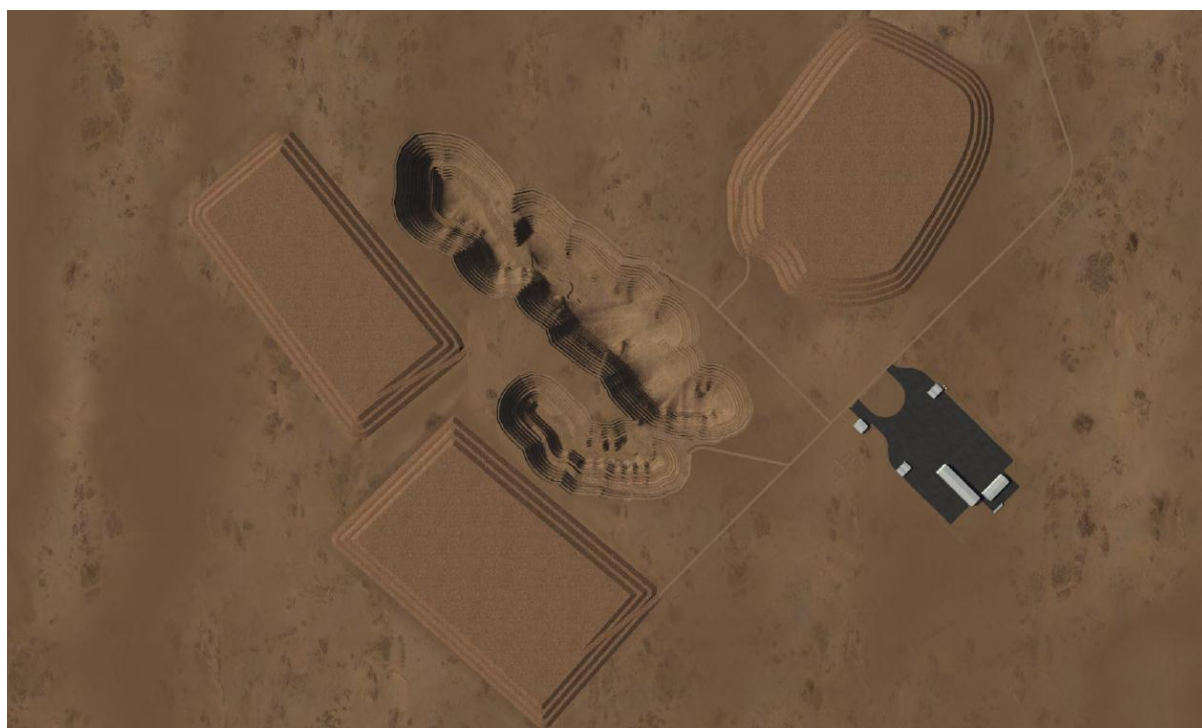


Figure 2-2: Computer simulation of the proposed Miriam open pit area, showing open pit, three waste rock dumps and infrastructure area to the east

Access to the two underground mines will be through portals with each underground mine complex having its own portal. Mining will be carried out using a room and pillar mining method.

¹ The dates for commencement of construction and operation are dependent on obtaining the relevant approvals, suitable uranium price environment and raising of the necessary Project capital.

Blasting is required during mining of the open pit and at the two underground operations; broken ore from the underground mines will be moved to a stockpile at the processing plant via a conveyor and the open pit ore will be transported by road trains along a haul road. The mine will operate 24 hours a day, 7 days a week.

From the stockpile ore will be transferred into the process plant (see Figure 2-3), which is designed to recover the uranium and molybdenum from the ore using a sequence of physical and chemical processes. The plant will process the mined ore at a rate of 4020 tonnes per day, generating uranium and molybdenum oxides as product (for sale) and two kinds of waste (for disposal). A majority of waste (approximately 80%) is generated during the up front radiometric ore sorting (ROS) and Ablation processes. This waste material has low uranium content and does not proceed to the leach stage of the processing circuit. The smaller portion of the waste (approximately 20%) from the process plant is called tailings, which is the residue of the acidic leaching part of the process plant.

The tailings will be placed in a designated and specially designed storage facility and will be capped with the ROS and Ablation reject material to reduce dust and radiation emissions during operation and after closure. After 18 years of operation, approximately 24.5 million tonnes of tailings and rocks will be stored at the tailings storage facility. The storage facility will be clay lined to prevent contamination of groundwater.

The final uranium product will be transported in a secure convoy by road to a port where it will be transferred to a ship for further transport overseas.

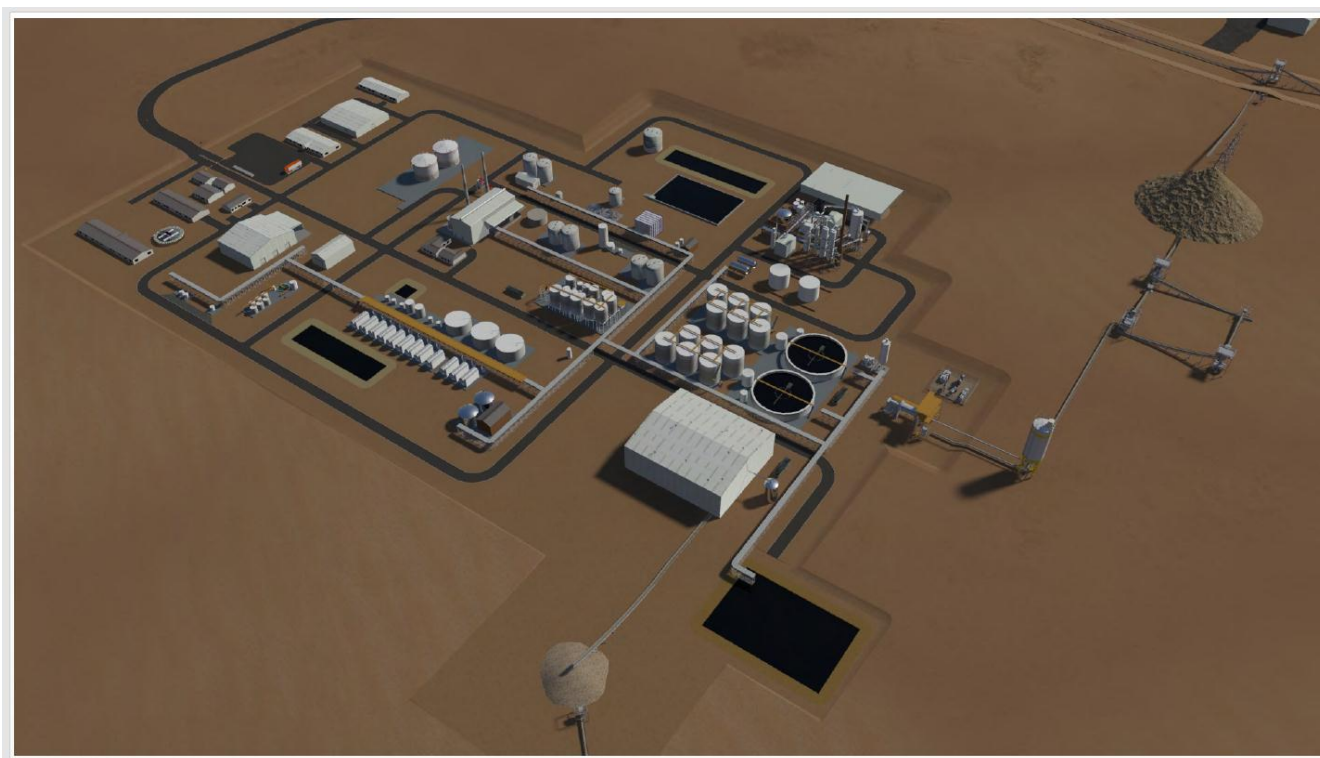


Figure 2-3: Computer simulation of the proposed infrastructure at the processing plant

2.3 Supporting infrastructure

For the mine and process plant to function, other supporting infrastructure is required as summarised below.

- *Haul road and access roads:* A new mine access road (Figure 2-4) will be constructed between the existing N25 road and the process plant. There will also be a heavy vehicle road constructed between the processing plant and the open pit. At present, the main access to the mine site is via a sand track linking the N25 with the Madaouela army camp. This track will not be used for regular access once the main access road has been constructed.

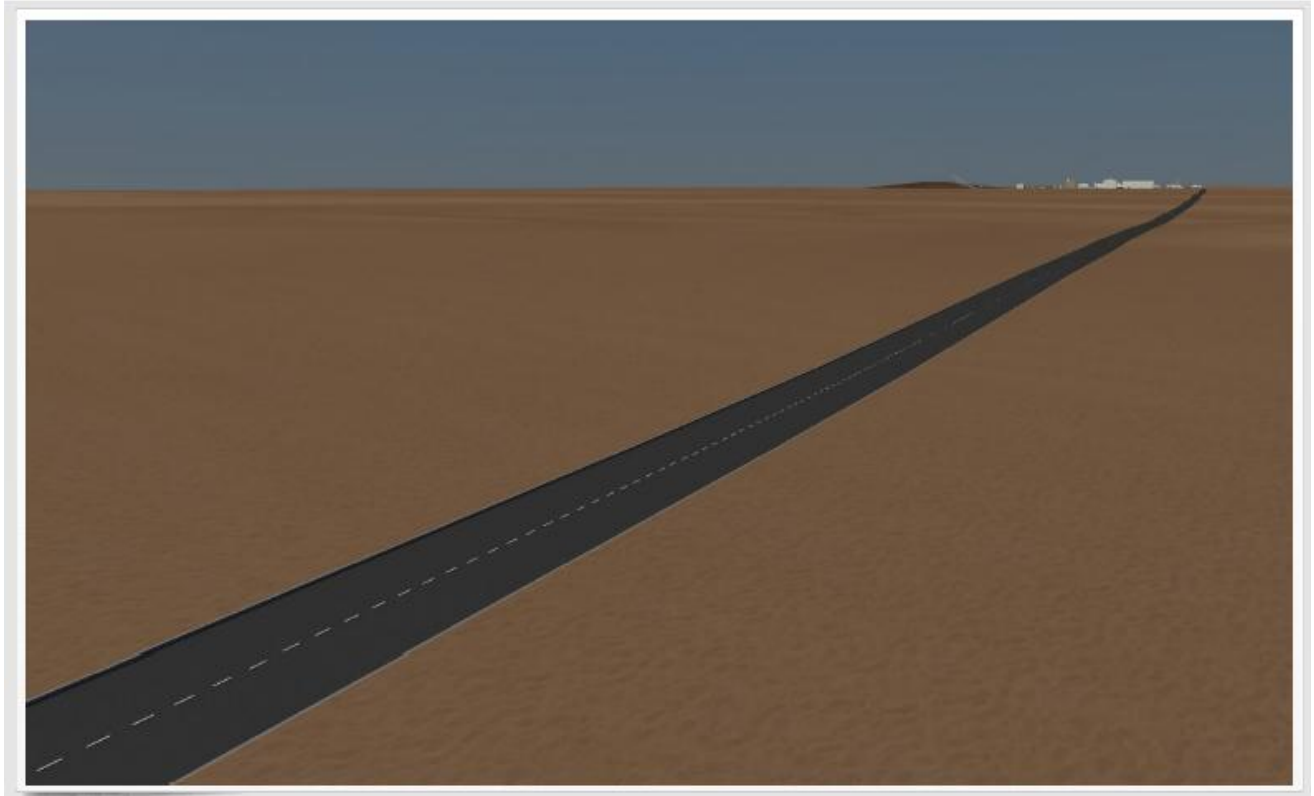


Figure 2-4: Computer generated simulation of the main access road from N25 to processing plant (looking towards the processing plant)

- *Water supply:* Groundwater for use in the mine and process plant will be supplied from dewatering the mine workings and with any additional water requirements met from a water supply well field located in the east of the Project area. Water for domestic purposes will be supplied from the water supply wellfield.
- *Power:* An existing overhead transmission line connects the SONICHAR power station near Tchirozérine with the town of Arlit. The transmission line passes approximately 9.5 km southwest of the proposed development. Electricity will be supplied from the main transmission line via pylon-supported power lines to a sub-station close to the processing plant.

2.4 Employment

Construction will be managed by an Engineering, Procurement and Construction Management (EPCM) contractor, who will select the companies responsible for constructing specific Project components and supporting infrastructure. Wherever possible, this will include Nigerien companies and/or companies employing local labour.

The construction labour force will peak at around 2,000 people, the majority of which will be locally sourced. GoviEx already has a policy of employing a 100% Nigerien workforce wherever practical. Training will be provided to maximise opportunities for transfer to

operational roles on the completion of construction.

Once the Project is fully operational, about 1,050 people will be employed.



Figure 2-5: Photographs of GoviEx employees

2.5 Project closure

When the mine eventually closes, unwanted buildings will be removed and where practicable disturbed areas will be filled in and reshaped to look like the surrounding area. There will be some areas that will not look like they did before mining commenced, these will include the tailings storage facility, the waste rock dumps and the open pit. However these areas will be contoured to ensure they are sustainable and safe into the future. GoviEx will also try to find ways for people who worked at the mine to use their skills in other ways when the mine ends.

3 APPROACH TO THE ESIA

The ESIA was undertaken to meet the needs of:

- The Nigerien government, which must decide whether to approve the Project;
- Stakeholders, particularly local communities, who wish to understand the development and the associated environmental and social impacts;
- Potential Project financiers who need to understand the impacts and risks associated with financing the Project; and
- The Project owners who wish to develop and operate the Project in line with Nigerien law and good international industry practice.

3.1 Legislation and guidelines

In Niger, the Constitution of the Seventh Republic (25 November 2010) states in Art. 37 “national and international companies have the obligation to respect the legislation in force regarding environmental matters and are required to protect human health and contribute to the preservation as well as enhancement of the environment” and, in Art. 149 “exploitation and management of natural resources and subsoil must be transparent and consider environmental and cultural heritage protection and the preservation of present and future generations’ interests”.

According to Art. 31 to 36 of the Environmental Management Code (Law No. 98-56 of 29 December 1998) an authorisation must be granted by the Minister in charge of environment (“ME”) prior to construction of a Project likely to impact the environment. The primary environmental approval required by GoviEx is an environmental compliance certificate. The

decision of the ME is based on an assessment of the ESIA report. This requirement is supported by the ESIA Ordinance (No. 97-001 of 10 January 1997) and implemented by the associated decrees (ESIA Decree No. 2000-397/PRN/ME/LCD of 20 October 2000 and the Bureau d'évaluation environnementale et des études d'impact or "BEEEI" Decree No. 2010-540/PCSRD/MEE/LCD of 8 July 2010).

3.2 ESIA process and consultation

ESIA process starts once companies have a fairly good idea of what they plan to do. The ESIA process followed had the following phases:

- **Screening** – to find out if a small or large ESIA should be done.
- **Scoping** – to identify any concerns and impacts that will need to be assessed.
- **Baseline assessment** – to collect information on the existing environmental and social setting of the Project.
- **Impact assessment** – to assess the positive and negative impacts in the context of the existing environmental and social setting.

As part of the scoping phase, meetings were held with local communities and authorities to identify issues that needed to be considered during the ESIA (see side bar). LEGENI/SRK used this information to identify the studies needed to investigate the possible impacts of the Project and appoint appropriate experts to help with the impact assessment. Nigerien and international experts were assisted where possible by community members with local knowledge.

The impact assessment process identified whether impacts would be positive (beneficial) or negative. SRK and the experts used a system of rating (see side bar) to decide how significant the possible impacts on people and the environment would be. SRK and the experts also suggested ways in which the negative impacts can be managed and how beneficial impacts can be improved even further. Impacts were then assessed again, taking these suggestions into consideration to see if the suggested management measures were adequate in terms of eliminating or minimising negative impacts and maximising beneficial impacts.

Issues and concerns

The main issues raised by communities are about:

- *Potential damage to plants, animals, water, soil and air;*
- *Need for jobs;*
- *Possible changes to traditional lifestyle, for example agriculture and livestock rearing;*
- *Road safety; and*
- *Pressure on services and infrastructure.*

Rating of impacts

The significance of a potential impact depends on:

- *The size of the area affected;*
- *How strong or intense the impact is;*
- *How long the impact will last; and*
- *The chance the impact will actually happen.*

4 EXISTING ENVIRONMENTAL AND SOCIAL SETTING

4.1 Physical setting

The Project area is located in the Sahara desert climate zone, the majority of soils have a low organic nutrient content and are frequently eroded by wind and heavy rainfall events. There are currently no permanent abodes or industry on the Project area. Hence the levels of background noise and vibration are assumed to be low, this in conjunction with the distance to potential receptors meant these aspects did not form part of the specialist studies. The following sub-sections describe the baseline environmental findings of the specialist studies.

4.1.1 Climate

To record the existing climate conditions in the Project area, data for analysis has been obtained from two weather stations near the Project site named SOMAÏR and Arlit. Data from Arlit station are provided by the National weather service and SOMAÏR by the SOMAÏR mining operation.

The Sahara desert climate zone, which is fully arid with precipitation less than evaporation so water available for storage, runoff or recharge is minimal. The minimum, average and maximum annual rainfall based on data collected from Arlit between 1972 and 2010 is 0.5 mm (1972), 56.5 mm and 190.8 mm (2010), respectively. The minimum, average and maximum annual rainfall based on the data recorded at SOMAÏR between 1981 and 2011 is 3.5 mm (1983), 45.7 mm and 114.3 mm (1997), respectively. There is little to no rainfall from November to May with peak rainfall generally in August.

Average annual temperature ranges between approximately 15°C and 35°C, with a mean of 28°C. There are three seasons: a relatively cold season, September to February, a hot season, March to June, and a humid season, June to September. In the hot season temperatures can exceed 40°C and in the cold season nights are generally cool with temperatures below 20°C.

The wind blows mainly from the north east and south east, with some easterly winds also observed.

4.1.2 Air Quality

The air was monitored for levels of fine dust in the air, levels of dust fallout onto land and directional dust. Two monitoring programmes took place at a number of locations across the Project area as can be seen in Figure 4-2. As Niger does not currently have air quality standards, the results were compared to various international guidelines. Levels of dust showed a strong seasonal trend, increasing as expected during the dry season. Naturally occurring levels of fine dust in the air are above international guidelines and levels of dust fallout from the air onto land are also high. Levels of nitrogen dioxide and sulphur dioxide (gases typically associated with industrial activity) were found to be low, which is likely to be due to the low concentration of industry in the Project area.



Figure 4-1: A landform within the Project area



Figure 4-2: Air quality monitoring station

4.1.3 Soils

The Project is located in a desert and thus the soils tend to be poorly developed and undergo limited physical or chemical reactions. The evolution of soil is principally controlled by the actions of wind erosion with a systematic stripping of topsoil resulting in poor nutrient and organic matter content. This results in a hummocky terrain of sandy plateaus, plains, valleys and steep rolling hills. Land use within the Project area is restricted to episodic grazing which is prevalent across much of the region. No agricultural activities are undertaken within the Madaouela West tenement.

4.1.4 Water resources

The Project is situated in a region where surface water is scarce and the drainage network consists of ephemeral rivers also referred to as wadis. They are characterised by short duration flow events in response to heavy rainfall and remain dry for most of the year. Surface water usage is limited to supporting the sparse vegetation and opportunistic livestock watering in short lived pools.

The uranium ore bodies in the region are hosted within sandstone aquifers. The Madaouela and COMINAK ore deposits are hosted by the geological formations supporting the Guezouman aquifer and the SOMAÏR ore deposit is hosted by the Tarat aquifer formation. The Tarat aquifer supports the water supplies to the towns of Arlit and Akokan and has been impacted by dewatering in the past to facilitate mining of SOMAÏR. The communities to the east of the Project area have their own water supply boreholes, which are tapping older pre-carboniferous aquifers.

The groundwater monitoring data shows groundwaters are generally neutral to alkaline (pH 7.1 to 12.3) and can be classified as fresh. There was found to be minimal seasonal variation in groundwater quality across the six rounds of sampling (July 2012 to October 2014), this reflects the low levels of rainfall in the region resulting in virtually no infiltration to groundwater. In general the water quality was poorer in the vicinity of the ore bodies and could not be used for drinking water purposes without treatment. Trace metal concentrations were generally low, although elevated molybdenum concentrations were recorded in many of the samples collected, particularly those from wells in the vicinity of the army camp. Slightly elevated uranium concentrations were also recorded in boreholes in the vicinity of the army camp. These elevated uranium concentrations are thought to be occurring as these wells intercept the ore bodies of Marianne and Marilyn.



Figure 4-3: Photographs of types of community borehole

4.1.5 Biological setting

Approximately 40% of the Project area is covered by South Saharan Steppe and Woodlands ecoregion in the northwest and with 60% covered by the Sahelian Acacia Savanna ecoregion in the southeast.

The Southern Steppe and Woodlands ecoregion used to attract large herds of arid-adapted migratory herbivores after the rains but the area has been overgrazed by herds of domestic livestock and habitat degradation is widespread. This ecoregion serves as a transition from the Sahara to the Sahel.

There are no Legally Protected conservation areas, Internationally Recognised conservation areas or Priority Sites for biodiversity located within 50 km of the Project area.

The only endemic faunal species occurring in the two ecoregions on the Project area are small, arid adapted rodents. Only one species of vertebrate is strictly endemic to the South Saharan Steppe, the gerbil *Gerbillus dongolanus*. Other near endemic mammals found were two more species of gerbil *Gerbillus mauritaniae* and *G. principulus*. The Sahelian Acacia Savannah has four endemic species within the genus *Gerbillus* (*Gerbillus bottai*, *G. muriculus*, *G. nancillus* and *G. stigmonyx*).



Figure 4-4: Examples of the biological setting

4.1.6 Radiological Baseline

The Project area is located in a region of elevated background radiation due to the natural presence of high concentrations of uranium in the earth. The baseline study looked at the communities to the east of the Project area, the Project area and Arlit/Akokan to provide a holistic view of the current radiation doses received by community members.

A baseline estimation of the total radiation dose received by a person present in and around the Project area was calculated using a range of scenarios that produced a low, medium and high value for the dose received. The estimated radiation dose was calculated from several sources, including: external cosmic radiation; external radiation received from the ground; inhaled dust and radioactive gases; ingestion of radionuclides on foodstuffs; and drinking of water containing radionuclides. The low scenario predicted a total dose that was just below the world average, however the average and high calculated doses for the area were both above the world average total dose. The highest calculated doses are to the east of the Project Area. It is worth noting that the calculated total doses were still lower than some other regions globally that have naturally elevated radionuclides in their soils.

4.2 Social setting

4.2.1 Population demographics

The Project is located southeast of the town of Arlit, the capital city of the Arlit Department, in the Agadez Region of the Republic of Niger. Arlit is about 200 km north of Agadez town,

800 km northeast of the capital Niamey and 170 km southeast of the Algerian border. The Arlit Department has less than one person per square kilometre, with more than 70% of the Department's population living in the Arlit Commune. The population is young with a median age of 15 years and 50% are between 0 and 14 years of age.

Arlit Commune has a multi-ethnic population of approximately 160,000 inhabitants, mainly associated with AREVA's mining operations whilst the villages in Gougaram and Dannet, in contrast, have a population of approximately 6,500 and 10,000 respectively. The rural communes are predominantly occupied by Touareg tribes and the occasional Fulani tribe. The Touareg are semi nomadic, travelling within the Department and Region whereas the Fulani can be considered more traditionally nomadic, travelling across the country and beyond.

4.2.2 Services and infrastructure

The proximity of the towns of Arlit and Akokan are an asset for the Project. The towns are well established, regionally important centres with some houses having electricity and potable water, with standpipes in other areas, and no electricity or access to piped water in the poorer areas. Every government administration is represented and the main banks have outlets. There are filling stations, bus transportation, repair shops; essentially all that is needed to sustain the community services that would provide for people associated with mine development; though it is noted some of these services are currently under pressure due to population growth. There are few paved roads in the region. The N25 connects Arlit to Agadez and then Niamey.

There is no mains electricity in the rural areas and water is collected from wells and/or boreholes fitted with pumps.



Figure 4-5: A classroom in Gougaram

The Arlit Commune has 43 primary schools (36 state controlled and 7 private) and 14 secondary schools (6 state and 8 private). In the rural communes of Gougaram and Dannet there are no secondary schools. There are 11 primary schools and 32 village classrooms in Gougaram (Figure 4-6) and 22 primary schools in Dannet

There are two hospitals located in Arlit and Akokan, owned by Areva. There is one public hospital currently under construction and 17 integrated health centres, of which just one has a doctor and one is a military facility. Of the 40 health clinics in the department, only 20 are fully functional. There are five doctors, 36 nurses and three midwives, all based in Arlit. Only one doctor, three nurses and one midwife are based in the public facilities; the others are private health workers. There are two ambulances and two medical motorbikes to cover the three communes. Most rural communities rely on traditional medicine practices.

4.2.3 Livelihoods

Most households in the urban communities in the study area are involved in horticulture, primarily for home use but extra crops are sold. Mining related employment is the second highest livelihood followed by traders and artisans. The rural villages are occupied by semi-nomadic tribes with livestock keeping as the dominant economic activity. The daily and annual activities in rural communities revolve around their livestock's feeding and breeding patterns.

Women tend to be responsible for the processing of animal products, especially fermented milk foods such as cheese from camels milk.



Figure 4-6: Photographs of natural resource use in Project area

According to the social study, the current urban employee market is experiencing a large disparity between those seeking jobs and the number of positions available. This is compounded by the slowdown in the extraction of uranium at SOMAÏR and COMINAK.

4.2.4 Standard of living

Niger ranked 187th and last in the 2014 Human Development Index, with 76% of its people living on less than USD2 a day. Although the country has made gains in per capita GDP, infant mortality and education in recent years, poverty and social inequality have not decreased significantly. Poverty is deepest in rural areas and rural women and girls are among those worst affected.

The population of Arlit and Akokan is urban, multicultural, multi faith and has grown up around the mining industry over the last 40 years with the majority of livelihoods geared towards employment or work in mining and related sectors.

The majority of houses in Arlit, Akokan and Teslem are made from mud or clay brick, locally referred to as 'banco'. There are a few luxury homes found in the area built by SOMAÏR and COMINAK and around 2,000 mine employees live in estates, with a clubhouse and restaurants. In the poorer areas of the towns, dwellings are made from sticks and straw and scrap materials ranging from sheet metal to cardboard. The Touareg nomads, in rural areas, live in covered tents, while the Fulani live in small collapsible huts made of woven mats.

4.2.5 Cultural heritage

Through interviews and field surveys, sites of cultural importance were identified and mapped for the Project area. One hundred and forty seven heritage sites were visually identified within the Project area. The sites have been classified into three main groups, namely: funeral (tombs), settlement (remains of habitations such as ruins and various fragments of tools and potteries) and natural (fossils and ostrich eggs) sites. Of the sites identified only two funeral sites are within the proposed infrastructure footprint. There may be additional sites buried in the sand which would only be identified when earth works commence.

5 IMPACT ASSESSMENT

The ESIA aimed to cover the full range of environmental and social impacts resulting from the Project, including risks to community health and safety. The impact assessment process started during the scoping phase by identifying and defining Project-related impacts based on stakeholder questions and comments during the consultation process and the experience of the ESIA team. As the ESIA progressed, the significance of the impact was determined and

evaluated using a standard approach.

Detailed descriptions of the identified impacts are included in the ESIA report, however some of the key questions identified during the ESIA process, along with how these have been addressed, are provided below. These are the questions that were generally raised by stakeholders. A complete list of the impacts assessed in the ESIA report is provided in Table 6-1.

How will water availability be affected?

Removing groundwater to facilitate mining and supply the operations may cause groundwater levels in the surrounding areas to drop in the direct vicinity of the mines and the wellfield. The drawdown could potentially affect wells to a small extent that are on the Project area (the Madaouela well, Ebergaz and Tejiat), although the drawdown is not expected to affect the overall yield of the wells. No community wells outside of the Project area are expected to be affected, although ongoing monitoring of village water supply wells will be undertaken to confirm the extent of any impacts. Work to confirm the extent of groundwater drawdown is ongoing but GoviEx has committed to providing water to communities accessing water boreholes in the Project Area should they experience water shortages as a result of the Project activities. Wherever possible process water will be provided by underground and open pit mine dewatering, minimising the use of the water supply well field.

Will water quality be impacted?

In terms of water quality the key issue is potential contamination of local aquifers used as drinking water sources for humans and livestock. This could potentially occur from seepage from the mine waste facilities or from erosion and accidental spills of potentially hazardous materials such as hydrocarbons.

Operational and closure control measures will be put in place to reduce the potential leaching of contaminants from the material left over after mining, including: the waste rock dumps; the open pit; the underground workings; and the tailings. Although there is the potential for contaminants to be generated by these waste facilities the proposed control measures along with the high evaporation rate in the region means that little to no seepage is expected to reach aquifers currently being used by communities, especially as community aquifers are different from those planned to be used by the mine and a considerable distance from the Project.

GoviEx has included a number of measures to a) minimise erosion to prevent sediment being washed into surface waters; and b) to prevent any soil contaminated by spills being carried into surface waters or leached into ground waters. GoviEx has also committed to developing an Emergency Response and Preparedness Plan, which will include spill response measures.

What are the potential air quality impacts on local communities and the environment?

A study has been carried out on the potential impacts on air quality in the surrounding area. While gases such as sulphur dioxide and nitrogen oxides are potential pollutants, they are predicted to have a minor impact on the environment. Dust is the main potential pollutant with the impact assessment focussing on the fine fraction of dust in the air that has the potential to affect human health.

Existing levels of airborne fine dust in and around the Project area are naturally well above guideline values. Additional fine dust resulting from Project activities could make this worse, particularly around the mine site, process plant and sections of the haul road and service

roads, however there are no permanent abodes within the Project area and the occasional high values observed at Ebergaz and Arlit-Teslem are only expected to occur under very specific climatic conditions occurring a few times a year.

To manage dust GoviEx has committed to a number of mitigation measures, including:

- Using dust control measures, such as wetting, chemical dust suppressant and / or suitable covers.
- Restricting vehicle speeds on unpaved roads, especially on roads where they pass close to receptors.

What are the noise impacts on local communities and wildlife?

Background noise levels in the area will increase as a result of Project machinery and vehicles. Vibration from the underground mine is not expected to cause an impact due to the depth of the workings and the distance from communities. Due to the considerable distance to the communities the significance of the increased background noise levels on local communities is predicted to be low. The marginal increase in noise may disturb animals in the immediate area around the Project infrastructure and activities. The area affected is small, and there are large areas of similar habitats around the Project which these animals are likely to move to.

Noise for Project workers is an occupational health and safety issue, and the appropriate protective equipment will be provided.

Will the Project affect the quality of the soil?

The soils across the majority of the Project area are already of limited agricultural potential due to low nutrient levels and limited ability to retain what minimal water arises from rainfall. Soils within the immediate Project infrastructure footprint will be affected during construction and operation either as a result of increased potential for erosion, compaction or potential for contamination by accidental spills of potentially hazardous materials such as reagents, oils and fuels. Beyond the area used for Project infrastructure, the quality of the soil may also be slightly impacted by wind or water erosion, through equipment or activities compressing the soils, the deposition of air-borne dust or water-borne sediments, or other contamination. Measures will be implemented to minimise impacts during construction and operation, rectify accidental spillages and any disturbance will be remediated at closure.

Will the Project increase the radiation levels in the area?

The Project area is located in a region of elevated background radiation due to the natural presence of high concentrations of uranium in the earth. There will be an increase of radiation, radon and particulate radionuclides in the vicinity of the mine infrastructure. The tailings storage facility (TSF), the vents from the underground, the open pit and the ore material awaiting processing at the processing plant will be the highest sources of radiation but due to the absence of people in the area this will primarily be an occupational health and safety concern to be dealt with through GoviEx's Radiation Management Plan. Based on the radiological assessment, the average annual increase of radiation for current communities is predicted to be very low (<1% increase).

Community engagement programmes informing stakeholders of the risks of radiation will be conducted and signs and/or fencing will be placed in the vicinity of areas of higher radioactivity (for example the TSF) to reduce the time that people spend in the immediate area.

How will the Project impact on plants and animals?

About 330 ha of land will have to be cleared for the mine, process plant and roads. The disturbed area contains several types of sparse vegetation, which are also found in the wider region. The impact will be managed by keeping the “footprint” of infrastructure as small as possible.

The Project area is home to a large number of insects and a number of birds and mammals. These are also found in the wider region. Individual animals may be affected where the land is cleared and where infrastructure cuts across their habitat range, however no impacts are expected on regional populations.

Will the Project increase pressure on natural resources?

The Project will change the access to natural resources that are currently used occasionally by the rural communities in the vicinity of the Project area, in particular grazing and collection of firewood. This may occur by restricting access to areas (such as the processing plant, TSF and conveyor lines that can act as a barrier to the movement of people, animals and vehicles) thereby increasing pressure on remaining accessible areas. To assess the impact, the timing and extent of grazing areas in the region were assessed by means of a community mapping exercises and verified by the biodiversity study. The results indicated the overall impact is expected to be small as the total Project footprint is approximately 330 ha which equates to around 0.7% of the total Project area and approximately 0.4% of the pastoralists estimated grazing and browsing area in the cold dry season (considered the most important grazing period by the communities consulted).

GoviEx has committed to only fencing specific areas and keeping land disturbance/clearance to an absolute minimum. Inform and provide community members the opportunity to collect plants of use (e.g. for medicinal purposes, firewood, fruits) prior to clearing the areas for surface infrastructure construction. GoviEx has also agreed to engage rural Project affected people in economic displacement discussions to determine how best to manage any loss of pasture in order to minimise the impact on community members.

What will be the benefits like jobs and money? How will the Project ensure jobs go to local people?

At present most rural community members do not have formal jobs and income levels are quite low. There are two existing mines operating close to Arlit and Akokan providing direct employment and there are businesses that provide services to the mines and their employees. The Project will need new workers and wherever possible local people will be employed.

The Government will benefit from increased revenue from taxes and royalties. GoviEx has also committed to not constructing a separate mine camp at the Project area and this will ensure more of the money earned by mine employees is spent in the local community.

Although jobs will be created, some of these are short term (construction) and some require specific skills that may not be available in the local areas. However, GoviEx has committed to a number of measures to improve benefits to local communities including:

- Preferential employment of local people by both GoviEx and contractors, if they meet the requirements for the job, and development of a transparent recruitment strategy.
- Development of a skills and training programme to increase the number of Nigerian employees.

- Keeping local communities and businesses informed of the recruitment and procurement processes and any job opportunities.

Salaries for mine workers tend to be higher than other non-mining jobs in the region and this will provide a monetary injection into the local economy. Creation of jobs as well as generation of indirect employment through stimulation of demand for goods and services could provide a positive benefit to Arlit's local economy through a multiplier effect and may offset the loss of jobs associated with the closure or ramping down of the existing operations.

How will the Project manage impacts on cultural heritage?

The Project will be designed to avoid cultural heritage sites as far as possible. However during land clearance work some sites may be disturbed, including funeral sites. If sites of conservation or cultural importance are affected by the Project, these will be recorded, relocated or preserved according to Nigerien requirements. A procedure will be developed so that if any sites are found during land clearance work, these new sites will be managed appropriately.

Will the local services and infrastructure be able to cope?

The infrastructure in the urban settlements of Arlit and Akokan includes private housing, hospitals and schools in the AREVA employee settlements. Outside of this area infrastructure is poor. While this urban host community has grown around the historical mining sector, it has also become a transit town for people migrating across the desert between Niger and other North African States and those looking for work. The Project could potentially attract a small number of people to the area which could put slightly more pressure on existing services and infrastructure. The potential impact of this problem is considered low as the scale of the proposed mine is much smaller than the existing operations and the job opportunities far fewer. This potential problem can be turned into a benefit by supporting the government to develop or expand services and infrastructure if needed.

Will community health suffer?

The region already has two operating mines, which employ more people than the proposed Project. The Project could potentially slightly increase the prevalence of communicable diseases in the communities. Also as people have more money they change their lifestyles, this may make other diseases more common, such as diabetes, obesity and heart disease. The effects can be significantly reduced by raising awareness and supporting projects that help avoid these health issues. GoviEx has also committed to establishing a community vector (mosquito) control programme including residual spraying and environmental management of staff housing and office areas.

Will increased traffic cause more accidents?

Traffic safety risks will exist as a result of people potentially using the mine's haul road (due to its improved state) and from mine-related vehicles using the public roads. GoviEx has committed to the following measures to minimise the risk to local communities:

- Enforce speed limits and safe driving practice by GoviEx vehicles;
- Apply traffic calming measures and warning signs on mine roads;
- Control dust on and around mine site roads to maintain visibility.

6 SUMMARY OF PROJECT IMPACTS

The impacts of the Project have been arranged in groups, as presented in Table 6-1, in order of importance for the decision-making process. The residual impact significance rating provided in the table assumes the management measures described within the ESIA report have been successfully implemented.

The first group of impacts in Table 6-1 represent the most important impacts for decision makers. Positive impacts are denoted with a “+ive” after them and represent the main benefits created by the Project from an environmental and social perspective and may be considered to balance some or all of the negative impacts. These include increasing government revenue during construction and operation, and the provision of employment and income for Nigerien people leading to reduced poverty. The only negative impacts with a high significance before management measures is related to the proposed wellfield, however by maximising re-use of the mine dewatering and implementing the other proposed mitigation measures the significance of this can be reduced to medium.

Table 6-1: Summary of impact significance ratings

Grouping	Identified impacts	Residual impact rating
Most important positive and negative impacts needing to be taken into account during decision making.	Water supply wellfield impacting on local aquifers and groundwater users	Medium
	Increased government revenue from fiscal and foreign exchange income	High +ive
	Direct and Indirect employment of Nigeriens residing in the Arlit Department	Medium +ive
Negative impacts having a high or medium significance without management and that require careful monitoring to ensure management measures are effective. If monitoring reveals additional management/remedial measures required, these must be implemented without delay.	Mine dewatering impacting on local aquifers and groundwater users	Medium
	Potential post-closure leaching of deleterious constituents from flooded underground mine workings to groundwater impacting on local aquifers and groundwater users	Medium
	Particulate matter from operations exacerbating health issues associated with the naturally high dust levels in the region	Low
	Land clearance for surface infrastructure causing loss, degradation and/or fragmentation of natural habitat and potential loss or disturbance of species of conservation value	Low
	Direct exposure to radiation through proximity to TSF and inhalation or ingestion of tailings material or process water	Low
	Increased demand on infrastructure and for services and goods	Low
	Change in community dynamics and social relationships	Medium
	Reduced access to the Project area for water and pasture	Low
	Increased infectious disease transmission between workers and the host community	Low
Impacts that can be managed readily through measures that are not difficult to implement and are known to be reliable.	Impacts of site infrastructure on storm water runoff patterns	Low
	Potential leaching of deleterious constituents from the waste facilities to groundwater impacting local aquifers and groundwater users	Low
	Seepage and discharge from waste water systems	Low
	Potential post-closure impacts of Miriam open pit on water users	Low
	Degradation and/or alteration of landscape resulting in loss of a soil resource and reduced land capability	Low
	Contamination of soils from solid or liquid waste or from aerial deposition	Low

Grouping	Identified impacts	Residual impact rating
	Gaseous emissions from operations exacerbating health issues in the region	Low
	Tailings dam forming pool during the rainy season and acting as an attractive nuisance to birds in the region	Low
	Direct inhalation of radon and radionuclides from the ventilation systems of the underground mines	Low
	Accidental spills of uranium concentrate during packaging and transport	Low
	Increased incidences of avoidable accidents and injuries	Low
	Accidental damage or loss of archaeological sites resulting from land clearance for construction of Project infrastructure and looting	Medium

Green shading indicates potential positive impacts, red and yellow shading represents potential medium and low negative impacts, respectively.

7 IMPLEMENTATION OF MANAGEMENT MEASURES

The management measures committed to by GoviEx in its Project description and the additional mitigation measures identified during the impact assessment process have been used to develop an Environmental and Social Management Plan (ESMP), as presented in Volume 3 of the ESIA. The Project will develop and implement an Environmental and Social Management System (ESMS) prior to the start of construction to ensure this plan is implemented. The objectives of the ESMS will be to:

- Undertake the ongoing identification and assessment of potential environmental and social impacts, both adverse and beneficial, building on this ESIA;
- Avoid, or where avoidance is not possible, minimise, mitigate or compensate for adverse impacts and enhance positive impacts on workers, affected communities, and the environment;
- Ensure affected communities are engaged on issues that could potentially affect them; and
- Promote improved social and environmental performance of the Project through the effective use of management systems.

Measures included in the ESMP will be put in place to achieve the following objectives:

- Recognise that social responsibility and environmental management are core corporate priorities;
- Establish and maintain relationships with internal and external stakeholders;
- Maintain information on legislative requirements and environmental and social aspects associated with the Project activities;
- Assign clear accountability and responsibility for environmental protection and social responsibility to management and employees;
- Provide a process for achieving targeted performance levels;
- Provide appropriate and sufficient resources, including training, to achieve targeted performance levels on an ongoing basis;
- Evaluate environmental performance and social responsibility against GoviEx environmental and other policies, objectives, targets and seek improvement where appropriate; and
- Establish a management framework to audit and review the GoviEx ESMS and identify opportunities to improve the system and resultant environmental and social

performance.

7.1 Monitoring

The ESMP includes a monitoring programme which aims to:

- Provide measurements of environmental and social impacts of the Project;
- Ascertain and demonstrate compliance with conditions of approval and other legislation;
- Provide sufficient evidence to address any claims made against the Project in respect of environmental and social matters;
- Track performance of the ESMS and progress in the implementation of the ESMP;
- Track and measure key indicators and other performance measures over time to improve the Project's performance and reduce the likelihood of environmental incidents; and
- Inform decision processes for determining management actions.

7.2 Rehabilitation and Closure Strategy

A Rehabilitation and Closure Strategy has been produced that is a framework to enable GoviEx to develop a detailed closure plan that covers rehabilitation of the area and determine how much money it must put aside to do this. Closure related impacts, risk and benefits from the Project identified during the ESIA process will be re-assessed continually throughout the life of the Project, as part of the ESMS, with the aim of progressing the plan from conceptual in nature to a detailed implemental plan as the operation progresses. The objective of this review process is to use the outcome of ongoing operational monitoring and mine planning to refine the closure and rehabilitation measures so that at least two years prior to actual planned closure the actions required are thoroughly identified and relevant costs allocated.

The mine closure planning for the Project will follow good international industry practice and aim to:

- present a vision for closure, with clearly defined closure outcomes and completion criteria;
- should incorporate physical and socio-economic considerations and be an integral part of a project life cycle;
- include financial provisions to ensure that there are sufficient funds available to complete the prescribed closure activities;
- be regularly updated and refined to reflect changes in mine development and operational planning, as well as the environmental and social conditions and circumstances;
- include appropriate aftercare and continued monitoring of the site pollutant emissions and related potential impacts;
- include adjustments to closure funding arrangements to reflect any changes in mine closure requirements.
- all structures (e.g. tailings impoundments) should remain stable such that they do not impose a hazard to public health and safety as a result of physical failure or physical deterioration;
- design tailings structures should be decommissioned so that water accumulation on the surface is minimised and that any water from the surface of the structure can flow away via drains or spillways and these can accommodate the maximum probable flood event;
- ensure surface water and groundwater should be protected against adverse environmental impacts and leaching of chemical should be prevented to protect human health and ensure compliance with water quality objectives.

Where possible disturbed areas will be shaped so the land has a similar type of landform as before the Project. Some disturbed areas will not look the same as before mining commenced, such as the open pit, the waste rock dumps and the tailings storage facility. These disturbed areas will be contoured to ensure they are safe and the landforms are sustainable into the future.

7.3 Stakeholder Engagement Plan

A Stakeholder Engagement Plan (SEP) has been prepared to document what was done during the ESIA process. The first step in the engagement process was the identification of stakeholder groups, followed by identification of stakeholders within these groups; these stakeholders can be specific individuals, organisations, governmental departments, local businesses, media bodies etc. It is important to ensure the correct stakeholders are identified and engaged with in an appropriate manner during the ESIA and across the mine life. The list of interested parties will evolve as new stakeholders are identified and some existing stakeholders are no longer involved during the life of the Project.

The SEP includes a grievance mechanism that enables GoviEx to plan a program of engagement activities, to utilise a range of engagement tools to communicate with key stakeholders and affected communities, and implement the grievance mechanism so the progress of addressing any complaints or issues is recorded on regularly.

7.4 Other plans

The other supporting documentation for the implementation of the ESMS that have been or will be produced includes:

- Developed as part of this ESIA
 - Environmental and Social Management Plan;
 - Stakeholder Engagement Plan;
 - Rehabilitation and closure strategy.
- Additional plans to be prepared during detailed design for construction include (note these may be individual or combined plans):
 - Construction Management Plan (addressing land clearance, water / waste management, air quality, noise, vibrations and other environmental impacts associated with construction);
 - Community Development Plan;
 - Economic Displacement and Livelihoods Restoration Plan;
 - Human Resources Management Plan;
 - Heritage Resources Management Plan;
 - Grievance Management Plan;
 - Health and Safety Plan; and
 - Security Management Plan.
- Additional plans to be prepared and / or reviewed during the construction phase ready for operation include (note these may be individual or combined plans):
 - Community Health and Safety Plan;
 - Water and Waste Management Plans;
 - Land and Wildlife Management Plan;
 - Air Quality Management Plan;
 - Emergency Preparedness and Response Plan;

- Hazardous Materials Management Plan; and
- Closure and Rehabilitation Plan based on the closure strategy.

8 CONCLUSION

If it goes ahead, the Project will cause some negative impacts that cannot be avoided, but will also result in several positive social and economic benefits. The majority of negative impacts can be reduced to acceptable levels through effective management measures. However, some negative impacts remain; the Government and communities need to decide whether these are outweighed by the positive benefits the Project is likely to generate.

9 CONTACT DETAILS

If you would like to read the full ESIA report and send comments, please contact SRK or GoviEx at the addresses below.

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