

Table 7.2 Responsibility for Executing and Estimating Cost of Mitigation Plans and Improvement Measures for Risks and Impacts of the Preparatory Works

	Component	Description of Potential Impact	Mitigation Measures/Valorization	Cost Estimation (US\$)	Persons Responsible
PHYSICAL ENVIRONMENT	Surface Water & Groundwater	- Modification of drainage patterns and flow of water courses. - Risk of water quality deterioration by re-suspension of sediments. - Risk of contamination by accidental spillage of hydrocarbons or chemical products. - Risk of contamination from sanitary wastewater and other wastes.	Carry out works during the dry season, as much as possible. Otherwise, intercept and redirect surface run-off into vegetated areas to promote sedimentation.	Included in the construction budget	Contractor Environmental Supervisor
			Ensure secure storage of hydrocarbons on-site.	Included in the construction budget	Contractor HSEC Assistant
			Ensure vehicles and equipment are refuelled at least 50 m away from all water courses.	N/A	Contractor Environmental Supervisor
			Ensure construction waste is disposed of at least 50 m away from all water courses.	Included in the construction budget	Contractor Environmental Supervisor
			Design the infrastructures for crossing water courses (Ouéléba access road) based on the maximum flood levels.	Included in the construction budget	Contractor HSEC Assistant
			Ensure emergency spill kits are available on-site for immediate intervention in case of an accident.	Included in the construction budget	Contractor HSEC Assistant
			Implement <i>Operational Guideline – Hydrocarbon Management</i>.	Included in the operation budget	Contractor HSEC Assistant
			Install double-wall tanks or a retention basin (with a containment capacity of 110% of tank volume).	25 000	Contractor HSEC Assistant
			Monitor water quality of the wastewater effluent to ensure conformance with surface water discharge standards of the World Bank (PPAH).	Included in the operation budget	Environmental Specialist
			Analyze the possibility of reusing sludge from the wastewater treatment facility for agricultural fertilizer.	5 000	Environmental Coordinator
			Clean the existing waste disposal site.	50 000	Contractor Environmental Coordinator
			Send all of the waste produced at the Canga East camp to the new waste treatment facilities.	Included in the operation budget	Camp Manager
			Transport hazardous material for recycling or deposition at authorized sites.	Included in the operation budget	Contractor Camp Manager
			Implement <i>Operational Guideline – Waste Management</i>.	Included in the operation budget	Camp Manager Environmental Specialist
	Soil	- Risk of erosion of the stripped grounds during the rainy season. - Risk of contamination by accidental spillage of hydrocarbons or chemical products. - Risk of contamination from sanitary wastewater and other wastes.	Minimize earthworks as much as possible.	N/A	Contractor Environmental Supervisor
			Carry out works during the dry season, as much as possible. Otherwise, limit the possibilities for surface run-off to create erosion zones.	Included in the construction budget	Contractor Environmental Supervisor
			Conserve topsoil in order to restore altered landscapes and (existing) borrow pits.	Included in the construction budget	Contractor
			Restore the altered grounds to their original state and revegetate stripped grounds as much as possible.	25 000	Contractor Environmental Supervisor
			Protect the bottom and sides of the road-side ditches as well as the approaches to the infrastructures for crossing water courses to avoid erosion.	Included in the construction budget	Contractor Environmental Supervisor
			Ensure secure storage of hydrocarbons on-site.	Included in the construction budget	Contractor HSEC Assistant
			Ensure emergency spill kits are available on-site for immediate intervention in the case of an accident	Included in the construction budget	Contractor HSEC Assistant
			Implement <i>Operational Guideline – Waste Management</i>.	Included in the operation budget	Camp Manager Environmental Specialist
			Install double-wall tanks or a retention basin (with a containment capacity of 110% of tank volume).	See <i>Surface Water & Groundwater</i>	Contractor HSEC Assistant
			Implement <i>Operational Guideline – Hydrocarbon Management</i>.	Included in the operation budget	Contractor HSEC Assistant
			Send all of the waste produced at the Canga East Camp to the new waste processing facilities.	Included in the operation budget	Camp Manager
			Clean the existing waste-disposal sites; transport the waste and waste produced at the Canga East Camp to the new waste processing facilities.	See <i>Surface Water & Groundwater</i>	Contractor Environmental Coordinator
			Decontaminate the soil at the two sites identified on figure 4.2, and manage the contaminated soil in accordance with internationally accepted practices.	100 000	Contractor HSEC Assistant

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PHYSICAL ENVIRONMENT	Air Quality	- Air quality deterioration caused by dust release. - Air quality deterioration caused by combustion (NO_x, CO, SO₂).	Use water to reduce dust emissions (when needed).	Included in the operation or construction budget	Contractor Employees
			Limit the speed of vehicles in the villages to 40 km/h.	N/A	Employees (drivers)
			Monitor the effects of dust in the villages.	5 000	Community Liaison Officer
			Conduct a feasibility study for the construction of a village-bypass road for the entire Simandou project, if necessary.	50 000	Consultant Director of HSEC
			Select the grain-size of the material covering the airstrip to optimize reduction of dust emissions.	Included in the construction budget	Contractor Site Supervisor
			Locate the housing units at a distance from emission sources, sheltered from dominant winds.	N/A	Rio Tinto Contractor
			In order to respect the new daily limit for SO₂ set by the WHO, sulphur content of fuel must be limited to less than 0.05%, compared to the 0.5% sulphur content used in the ambient air concentration estimation.	N/A	Persons responsible for recruitment
	Noise	Increased noise levels during construction works and operation of the project's infrastructure.	- Limit the construction activities to during the day (between 7:00 and 20:00). - Limit the air transport activities to during the day (between 7:00 and 20:00), except in the case of emergency. - Locate stationary noise sources (generators, incinerators) far from residences.	N/A N/A N/A	Contractor Persons responsible for logistics Rio Tinto Contractor
BIOLOGICAL ENVIRONMENT	Vegetation	- Loss of plant communities. - Risk of fire spreading to vegetation. - Increased pressure on the forestry resources in the area.	Mark the projected site footprints with stakes and ribbons to ensure deforestation and land clearing are limited to the required areas.	Included in the construction budget	Contractor
			Restore altered landscapes with indigenous species of vegetation.	See Soil	Contractor Environmental Supervisor
			Implement <i>Operational Guideline – Hydrocarbon Management</i>.	Included in the operation budget	Contractor HSEC Assistant
			Ensure the availability of fire-fighting equipment in case of accident (e.g., extinguishers).	Included in the operation budget	Contractor HSEC Assistant
			Prohibit workers from exploiting natural resources.	Included in the operation budget	Environmental Coordinator
			Dike-off and maintain fire-wall zones around the tanks and the airstrip.	Included in the operation and construction budget	Contractor HSEC Assistant
			Ensure that trees cut down in deforestation activities on the works' site footprints are made available to the local population (based on consultation with traditional rights representatives in the affected villages).	N/A	Community Relations Officer
			Support the forest rangers of the classified forest of Pic de Fon.	25 000	Centre forestier de N'Zérékoré Brigade de surveillance
	Fauna	- Disturbance of the quietude in the area during construction and operation. - Risk of increasing the pressure on the faunal resources in the area - Risk of collisions with animals. - Erosion of sediments along the roadside, posing a risk to aquatic communities.	Limit deforestation to the minimum required areas.	N/A	Contractor Environmental Supervisor
			Prohibit workers from exploiting faunal resources (hunting, fishing).	Included in the operation budget	Environmental Coordinator
			Ensure surface water circulation is unobstructed (Ouéléba access road).	N/A	Contractor Environmental Supervisor
			Fence-in the aerodrome to reduce risk of collision.	Included in the construction budget	Contractor
			Support the forest rangers of the classified forest of Pic de Fon.	See Vegetation	Forestry Centre of N'Zérékoré Monitoring Team
			Limit the speed of traffic, particularly in the zones of reduced visibility (bends in the road).	N/A	Employees (drivers)
	Biodiversity	- Destruction of faunal habitats. - Risk of introduction of invasive foreign species. - Risk of destruction of certain protected species of vegetation. - Increased pressure on natural resources, caused by population migration into the area.	Clean the construction machinery before transporting it into the Simandou project area to avoid propagation of invasive foreign species and other undesirable contaminants.	Included in the Contractor's contract	Contractor Environmental Supervisor
			Reduce the disturbance of (and encroachment into) the host communities by delineating projected work sites with stakes and ribbons.	N/A	Contractor Environmental Supervisor
			Avoid disturbance of the gallery forests in the low-lands of the plateau located near the future camp and near the right-of-way on the crest of the Simandou chain.	N/A	Contractor Environmental Supervisor
			Reforest the temporary construction areas and disturbed landscapes with indigenous species.	See Soil	Contractor Environmental Supervisor
			Prohibit workers from exploiting natural resources or depending upon them for food or other means, and implement a public awareness campaign.	Included in the operation budget	Environmental Coordinator
			Mark and protect vegetation in the inventory parcel G-1 surveyed by RBG Kew (see figure 4.2) near the existing camp, in order to preserve the CITES-classified threatened orchid species.	Included in the operation budget	Environmental Coordinator

	Component	Description of Potential Impact	Mitigation Measures/Valorization	Cost Estimation (US\$)	Persons Responsible
HUMAN ECONOMIC ENVIRONMENT	Vulnerable Groups	- Risk that vulnerable and/or disadvantaged groups and individuals will not be able to benefit from the project because of social exclusion. - Increased security risk for vulnerable persons (e.g., sick, handicapped).	Before project works begin, identify vulnerable groups and individuals through the Community Liaison Officers and ensure they are adequately informed so that the objectives, impacts, potential dangers, and security measures of the project are understood.	Included in the operation budget	Community Liaison Officers
			When necessary, offer assistance to vulnerable groups who could suffer damage from construction works.	Included in the operation budget	Community Liaison Officers
			Pay particular attention to vulnerable groups, prior to carrying out activities involving dynamite (specifically, deaf individuals or those with reduced hearing).	Included in the operation budget	Community Liaison Officers
			In the case where compensation should be offered to vulnerable persons, provide additional assistance in thoroughly explaining the compensatory procedure in order to ensure understanding, and thus, proper compensation.	Included in the construction budget	Representative of Rio Tinto Compensation Commission
			Provide the opportunity for the vulnerable/handicapped persons to profit from the economic benefits of the project, in particular, during the operation phase (e.g., supply of fresh agricultural produce).	10 000	Regional Development Coordinator
	Gender	- Improvement of conditions for women through social investment initiatives. - Development of income-generating activities for women, particularly during the operation period.	Ensure that the women are consulted and informed (within the framework of the consultation program, associated with the implementation of a plan for mitigation and valorization of project impacts and risks).	Included in the operation budget	Community Relations Coordinator
			Take into account women's concerns by identifying measures to limit the inequalities between men and women.	Included in the operation budget	Community Relations Coordinator
			Give precedence to the women for direct and indirect employment opportunities of the preparatory works.	N/A	Persons responsible for recruitment
			Equal treatment to both women and men. Compensation should be offered to women; they should also receive additional assistance to ensure their understanding, and thus, proper compensation.	Included in the construction budget	Representative of Rio Tinto Compensation Commission
			Improve the conditions of women through social investment initiatives (see <i>Community Development Plan</i>, section 7.3.4).	Included in the annual Social Investment budget	Investment Committee
	Induced Migration	- Increased migrant population in the adjacent villages, risking the creation of: - Risk of social tension; - Land-access problems; - Increased pressure on natural resources and public service infrastructure. - Risk of changing cultural and social environment.	On a regular basis, inform the local and national populations about the development of the project, the project's schedule, the amount and type of work needed and the recruitment periods.	Included in the operation budget	Public Relations Coordinator
			Through publicity campaigns (for the entire project), specify that no one will be hired without registering at the project office beforehand.	Included in the operation budget	Public Relations Coordinator
			Hiring for Rio Tinto will be done on a priority basis for hiring the local population (in the case of equal competency) in order to reduce immigration.	N/A	Persons responsible for recruitment Contractor
			Train the local population so that they are qualified to gain employment.	20 000	Rio Tinto Development Education Centre
			Monitor the demographics of the Simandou zone in order to plan interventions based on the population capacity of the area.	60 000	Coordinator/Community Development Consultant
	Health	- Risk of increasing contagious disease transmission (STI, HIV/AIDS, etc.). - Deterioration of the quality of life in the communities caused by irritants (noise, stress, dust, lighting) and increased waste and wastewater discharge.	Restrict the access to the Canga East Camp and offer all basic services on-site.	Included in the operation budget	Camp Manager Security Guards
			Implement an awareness/prevention program on health risks with a local NGO that targets the workers and communities.	25 000	Health and Safety Officers ONG
			Develop the new health centre to provide adequate care to the workers.	Included in the operation budget	Rio Tinto Doctors
			Monitor the occurrences of malaria and implement a malaria control program conforming with Rio Tinto's corporate policy.	Included in the operation budget	Health and Safety Coordinators Doctors
			Implementation of Rio Tinto's HIV/AIDS strategy.	Included in the operation budget	Doctors Health and Safety Officers
			Distribution of insecticide-impregnated bed nets to employees.	Included in the operation budget	Coordinators – Health and Safety Officers
			During construction and camp operation, avoid stagnant water accumulation, which could support the growth of malaria vectors (mosquitoes).	N/A	Contractor Health and Safety Coordinator
			Select the grain-size of the material covering the airstrip to optimize the reduction of dust emissions.	Included in the construction budget	Contractor
			Limit the air transport activities to during the day (between 7:00 and 20:00), except in the case of emergency.	N/A	Persons responsible for logistics
			Limit the speed of vehicles in the villages to 40 km/h.	N/A	Employees (drivers)
			Direct emergency lighting in the direction of the track and towards the ground, to avoid disturb the nearby communities.	N/A	Contractor Site Supervisor
			Monitor the disturbances caused by the airstrip (noise, dust, light).	5 000	Community Liaison Officers
			When needed, implement measures for dust abatement or investigate the possibility of covering the airstrip.	5 000	Consultant Director of HSEC

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HUMAN ENVIRONMENT	Safety	• Risk of accidents related to the increased circulation in the villages and on the roads (population, livestock). • Fire hazard caused by the building site or operation of the project infrastructure. • Safety risk for the workers caused by dynamiting activities or explosions/fires in hydrocarbon/chemical storage tanks.	• Ensure secure storage of hydrocarbons on-site.	Included in the construction budget	Contractor Assistant HSEC
			• Ensure the safety of camp residents by establishing adequate safety surveillance.	Included in the operation budget	Camp Manager Security Guards
			• Limit the speed of vehicles in the villages to 40 km/h.	N/A	Employees (drivers)
			• Implement safety measures and train the personnel in conformance with Rio Tinto's corporate safety policy.	Included in the operation budget	Coordinator – Health and Safety Supervisors
			• Dike-off and maintain fire-wall zones around the tanks and the airstrip.	Included in the operation budget	Contractor HSEC Assisstant
			• Ensure the availability of fire-fighting equipment in case of accident (e.g., extinguishers).	Included in the operation budget	Contractor HSEC Assisstant
			• Implement <i>Operational Directive – Hydrocarbon Management</i>.	Included in the operation budget	Contractor HSEC Assisstant
			• During the construction period, ensure the safety in the work areas (airstrip, Ouéléba access road) to ensure the safety of the villagers and livestock (trails/paths interrupted by construction work), in particular, by protection barriers, signals, and adequate surveillance.	Included in the construction budget	Contractor Health and Safety Supervisor
			• Through consultation with affected populations, clear new paths to replace those interrupted by the airstrip to allow the farmers to reach their fields.	5 000	Employés Rio Tinto Villageois
			• Maintain traffic on the N-1 road during construction of the aerodrome and ensure adequate signalization during the construction period.	Included in the construction budget	Contractor Health and Safety Supervisor
			• Restore the N-1 road and other public infrastructure at the end of construction.	Included in the construction budget	Contractor Health and Safety Supervisor
			• Implement <i>Operational Guideline – Explosives</i>.	Included in the construction budget	Contractor Health and Safety Supervisor
			• Hire competent and highly qualified personnel for the dynamiting activities.	Included in the construction budget	Contractor Health and Safety Supervisor
			• Implement a communication program to inform the local population of the dynamiting activities (in particular, vulnerable individuals).	Included in the construction budget	Community Relations Coordinators
			• Establish a safety perimeter around the dynamite zone and deploy security guards to ensure that no one enters the safety perimeter.	Included in the construction budget	Contractor Health and Safety Supervisor
			• Give audible warnings before dynamiting operations.	Included in the construction budget	Contractor Health and Safety Supervisor
			• Fence-in the aerodrome (airstrip, buildings, infrastructure) and ensure security of the facilities by the presence of a security guard.	Included in the construction and operation budgets	Contractor Security Guards
			• Monitor the volume of traffic and the safety in the villages along the course.	5 000	Community Liaison Officers
			• Conduct a feasibility study for the construction of a village-bypass road for the entire Simandou project, if necessary.	See <i>Air Quality</i>	Consultant HSEC Assistant
	Land Use	• Appropriation of grounds potentially used for agricultural activities and subsistence farming. • Loss of revenues for communities.	• Optimize the footprint of projected work sites in order to reduce the amount of agricultural land affected and the number of persons affected.	Included in the construction budget	Regional Development Coordinator Contractor
			• Mark the outline of the projected work sites with stakes and ribbons to ensure deforestation and land clearing are limited to the required areas.	Included in the construction budget	Contractor Site Supervisor
			• Implement the compensation plan for loss of cultivable grounds and natural resources.	To be determined	Rio Tinto Compensation Commission
			• Carry out compensatory activities with adequate communication.	Included in the construction budget	Community Relations Coordinator
			• Ensure that trees cut down during deforestation activities on the projected work sites are made available to the local population (based on consultation with representatives of customary legislation in the affected villages).	N/A	Community Relations Officers
	Cultural Heritage	• Access road passing by the old village of Mamouroudou (risk of destruction).	• Study in progress to layout the path of the access road and determine the value of the old village site and smelter of Mamouroudou.	10 000	Consultant
			• If necessary, optimize the layout to protect the elements of interest.	Included in the construction budget	Regional Development Coordinator Contractor
			• If site preservation is not feasible, the cultural heritage management plan will be implemented (see section 7.3.6).	To be determined based on results of the study	Regional Development Coordinator
	Employment	• Temporary and permanent job creation. • Strengthening of the relationship between Rio Tinto, its employees, and the local communities.	• Implement the workers management plan and labour conditions implemented for the Simandou project (see section 7.3.7).	Included in the operation budget	Persons responsible for recruitment Contractor
			• Priority given to hiring of local workers, including women.	N/A	Persons responsible for recruitment Contractor
			• Train the local population so that they are qualified to gain employment.	See <i>Induced Migration</i>	Rio Tinto Development Education Centre
			• Offer work conditions that exceed the standards of the Guinean Republic's Labour Code.	N/A	Persons responsible for recruitment

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HUMAN ENVIRONMENT	Economic Repercussions	- Local and regional socio-economic spin-offs caused by the presence of workers and infrastructure of the region. - Poverty reduction.	Give preference to highly labour-intensive work techniques.	N/A	Contractor
			Grant contracts to local companies and communities (e.g., deforestation, road maintenance).	N/A	Rio Tinto Contractor
			Adopt a local goods and services purchasing policy.	N/A	Rio Tinto Contractor
			Inform the population of available positions and prioritize local recruitment.	Included in the operation budget	Community Relations Coordinator
			Grant procurement contracts for the camp to the local population (on a priority basis), with regards to fresh food and produce, in particular.	N/A	Camp Manager Persons responsible for procurement
	Landscape	Alteration of the visual landscape.	Harmonize the integration of the new facilities with the existing infrastructure and landscape (shapes, colours, materials).	Included in the construction budget	Rio Tinto Contractor
			Benefit from site topography to maximize the field of vision from the housing units of the camp.	NA	Rio Tinto Contractor