

5.19 SUSTAINABILITY

5.19.1 Background

Sustainable development is defined as *development that meets the needs of the present, without compromising the ability of future generations to meet their own needs* (World Commission on Environment and Development 1987, Government of Canada 1992). Mining is an extractive industry that supplies the world's mineral and metal markets. Inherently, mining disturbs land by removing a non-renewable resource (KJPR 2007). For a socially responsible corporation, the challenge is to develop a financially viable mine in such a way that opportunities for future generations are maintained or enhanced.

5.19.2 Regulatory Context

In Canada and British Columbia, the concept of sustainable development is the foundation of environmental assessment, which considers environmental, social and economic activities in an integrated manner (Canada-British Columbia Agreement for Environmental Assessment Cooperation 2003). In terms of specific legislation, the Canadian Environmental Assessment Act (CEEA) (Government of Canada 1992) requires the consideration of potential adverse environmental effects of the capacity of renewable resources that are likely to be significantly affected by the project. There are no requirements to consider effects on non-renewable resources. There is no legislated requirement to specifically consider sustainable development in applications for environmental assessment in British Columbia.

Few comprehensive assessments completed to date have specifically addressed the notion of sustainability in the context of environmental assessment in British Columbia or Canada. One example was the Joint Panel review of the Kemess North Copper-Gold Mine Project (KJPR 2007) where the project was assessed in terms of five sustainability perspectives to determine whether or not the project was in the public interest. These perspectives included environmental stewardship, economic benefits and costs, social and cultural benefits and costs, fair distribution of benefits and costs, and present versus future generations. In part, this evaluation was based on the Seven Questions of Sustainability developed by the Mining, Minerals and Sustainable Development Global Mining Initiative (MMSD 2002).

Only recently have terms of reference for environmental assessments in Canada specifically referred to sustainability. Examples include the terms of reference for the proposed Gahcho Kué project (NWT), the proposed Mag-Ore Project (Newfoundland), and this project. The assessments of these projects have yet to be completed or published in the public domain.

5.19.3 General Approach and Objectives

In reviewing the literature on sustainable development, it is apparent that there is no standard approach for assessing sustainability. Each community has its own perception of its current and future needs, so sustainability must be assessed in the context of these needs. Furthermore, community needs change over time. Thus, the determination of sustainability must commence with an understanding of current community needs and include a commitment to ongoing engagement to ensure that evolving community needs can continue to be addressed.

This assessment of sustainability commences by determining the communities' current view of sustainable development. This view was established based on a review of various visioning documents produced and published by groups in the socio-economic regional study area (SRSA) and on the results of the initial meetings of the Community Sustainability Committee. The general objectives of the sustainability assessment are to determine whether the project as currently proposed meets the community criteria for sustainability and then to identify opportunities by which Terrane can further contribute to sustainable development in the regional communities. The assessment considers economic, social and environmental sustainability.

Terrane understands the importance of committing to ongoing engagement of local and regional communities to ensure that its project is and continues to be in the public interest. In the assessment of the project's socio-economic effects (Section 5.10, Socio-Economic Effects), it was noted that socio-economic effects cannot be managed by project proponents alone so a shared responsibility model was proposed. To this end, Terrane has already established a Community Sustainability Committee that currently includes the following communities: Fort St. James, McLeod Lake Indian Band, West Moberly First Nations, Mackenzie and Vanderhoof. It is hoped that representatives from other communities, including Nak'azdli First Nation, Halfway River First Nation, and Prince George, will eventually choose to participate on this Committee. Ultimately, Terrane and the Community Sustainability Committee will work together to define sustainability goals on an ongoing basis and will identify how Terrane can best contribute to the sustainable development of the area.

5.19.4 Methodology

This sustainability assessment was completed in the following steps:

- It was determined if the capacity of renewable resources are likely to be significantly affected by the project
- Publicly available documents pertaining to sustainability in the SRSA were identified and compiled (Appendix A). These were the:
 - Carrier Sekani Land Use Vision Draft 2006

- Peace Moberly Tract Draft Sustainable Resource Management Plan 2006
- District of Fort St. James Community Vision 2007
- District of Fort St. James Official Community Plan 2001
- Fort St. James Land and Resource Management Plan 1999
- Mackenzie Land and Resource Management Plan 2000
- Regional District of Fraser-Fort George Strategic Priorities 2006
- Potential sustainability goals were extrapolated from the documents under three categories: economic, social and (natural) environment. Those mentioned in three or more plans were selected for evaluation (Appendix B).
- For each potential sustainability goal:
 - it was determined if the project as currently proposed meets the goal
 - leveraging opportunities were identified using professional judgment and discussions documented in minutes from the May 23, 2008 sustainability meeting of the Community Sustainability Committee (Appendix C)

5.19.5 Sustainability Assessment

5.19.5.1 Renewable Resources

Renewable resources are unlikely to be adversely affected by the project. The capacity of renewable resources to meet the needs of the present and those of the project will be unaffected. These conclusions are based on the following discussion.

As described in Section 5.11, Non-traditional Land Use, the following three key renewable resources were identified for consideration:

- loss of available timber and non-timber resources
- reduced fishing opportunities
- reduced hunting, guide outfitting and trapping opportunities

The project will have a direct effect on timber and non-timber resources within the mine site footprint and along the power line right-of-way. Mitigation measures limiting the removal of vegetation and clearly defined reclamation procedures will be implemented to reduce effects on timber and non-timber resources outside the mine site footprint during all phases of the project. Following closure, the loss of timber and non-timber resources associated with the mine site and power line right-of-way is considered reversible because these areas will be reclaimed.

With respect to fishing opportunities, during construction of the power line, access will be limited to employees and contractors. Without mitigation, the power line right-of-way may provide vehicle access to areas previously only accessible by foot or all-terrain vehicle.

Following decommissioning of the power line and closure and reclamation of the right-of-way, this route will be returned to pre-project conditions. The development of the load-out facility will have no effect on fishing in the area because it is sufficiently far from Stuart Lake to have no effect and the streams in the immediate area of the load-out facility are non-fish bearing.

The footprint of the mine site and support facilities will be inaccessible to any hunting, trapping or guide outfitting activities during all phases of the project. Following closure, the loss of hunting opportunities associated with the mine site and power line right-of-way is considered reversible because wildlife will be able to move back to these reclaimed areas.

5.19.5.2 Economic Sustainability Goals

Potential economic sustainability goals identified during the review of literature from communities in the SRSA are:

- economic diversity
- economic opportunities related to tourism and recreation
- stability
- housing affordability

In this section, opportunities and challenges are identified and discussed for each potential economic sustainability goal.

Economic Diversity

Development of the mine will help to diversify the local economic in the vicinity of Fort St. James. As noted in Section 5.10, Socio-Economic Effects, the manufacturing industry accounted for 55% of basic jobs in the LSA and this would decrease to 50% with the addition of the new jobs in mining for regional residents. Thus, operation of the mine will make the LSA less reliant on a single industry and add more resilience in terms of being better able to buffer the effects of temporary or permanent losses of jobs in the manufacturing industry. The increased indirect and induced employment will result in the LSA being able to offer a broader range of goods and services to local residents.

There are some opportunities for enhancing economic diversification. One opportunity is by ensuring that Terrane's procurement policy favours local businesses that are cost competitive and can offer products and services of appropriate quality in a timely manner. Where local companies currently have limited capacity for providing such goods and services, they could be encouraged to participate in joint ventures with out-of-region suppliers.

One constraint to economic diversification, especially for the Mackenzie and McLeod Lake communities, is the existing resource road between these communities and the Mt Milligan project site. Although these communities are geographically close to the mine site, Terrane cannot commit to drawing resources from these communities because of the quality and safety of the existing road and this will limit the potential for the project to benefit these communities. Terrane believes that upgrading the road would remove this bottleneck, thereby enhancing the competitiveness of businesses in Mackenzie and McLeod Lake and increasing opportunities for economic diversification. A discussion of the socio-economic effects of this option is presented in Appendix D.

By adding to the economic diversity of the region, the mine might also serve as a catalyst for other types of development, including other mines or industries demanding similar supplies and services are developed in the area.

Economic Opportunities Related to Tourism and Recreation

The District of Fort St James has identified tourism and recreation as specific components of its economic development strategy. While the project itself will not directly generate tourism, there may be opportunities for the mine to support tourism in the local area and region. For example, Terrane could arrange to provide mine tours and these could be used to help market the area as a tourist attraction. To maximise benefits to the community, partnerships and joint venture opportunities for local businesses could be explored, for example, a mining education center, as suggested by the Community Sustainability Committee. The main challenge will be to create adequate and appealing services and attractions that will draw tourists to Fort St. James off the Highway 16 corridor. However, any actions that support tourism create the potential for further economic diversification and add to long-term community sustainability.

Stability

Economic stability is usually associated with economic diversity. As noted above, the project will help diversify the local economy and this will increase the capacity of the economy to absorb the potential additional losses in other sectors, such as forestry. While the ultimate closure of the mine may eventually upset this stability, the early development of a mine closure plan that includes training of local residents for employment in other areas will help buffer the effects of mine closure and will contribute to ongoing economic diversity and stability in the region.

With respect to training, the Community Sustainability Committee suggests using programs already available in communities as much as possible. For example, the College of New Caledonia has campuses in Mackenzie and Prince George, which offer occupational based training courses (e.g., millwright training, heavy machinery operator). The committee also suggests working with colleges in the area to develop training initiatives for the mining

sector, if further mining activity is foreseen in the region. With respect to maximising employment for locals, the Community Sustainability Committee suggests providing upfront information on the jobs the mine will offer and specific requirements for hiring such as education and experience.

Housing Affordability

The project will put a strain on housing in Fort St. James because some operational employees will choose to permanently relocate to the community and others will look for temporary local accommodation that will allow them to work at the mine but continue to permanently reside elsewhere in the region. Until adequate housing is provided, the additional housing demands could increase the cost of housing for some regional residents. Terrane is aware of the issues and is working with the community to determine the best way of accommodating its workforce in a manner that does not adversely affect existing residents. However, this is a complex issue and each of the various housing options has its own economic, social and health issues (Section 5.10, Socio-Economic Effects, and Section 5.14, Human Health). Once a suitable housing strategy has been identified, it is expected that the implementation will result additional economic and social benefits for the community, including additional construction employment and income and opportunities for regional residents to move into better quality housing. With more people living in the community, the costs of supporting current municipal infrastructure may actually drop (Section 5.10, Socio-Economic Effects)

The assessment of project effects on housing was predicated on the assumption that all operational workers will be bussed between the mine and Fort St. James on a daily basis. While Mackenzie is nearly equidistant from the mine, the poor quality of the existing road makes it unsafe and unpractical for Terrane to transport workers from that community. However, if the resource road between the Mt Milligan project site and the Mackenzie turn-off is upgraded (see Appendix D), the project will draw more workers from Mackenzie and this will reduce the demands for additional housing in Fort St. James. For this reason, Terrane support current local government proposals to upgrade the forestry road to Mackenzie.

5.19.5.3 Social Sustainability Goals

Potential social sustainability goals identified from available literature in the SRSA are:

- public safety
- community health
- cultural diversity and inclusiveness
- artefact management
- recreation and sport management

- visually attractive community

In this section, opportunities and challenges are identified and discussed for each potential social sustainability goal.

Public Safety

Public safety is concerned with the protection and prevention of significant injury, damage or harm to the general public and incorporates issues related to natural disasters, industrial accidents and malfunctions, and social issues such as crime, drug use and social behaviour. While project developers are expected to minimize public safety risks, actual threats to public safety are typically the responsibility of emergency services organizations.

All major industries are required to make provisions for emergency response and Terrane has evaluated the risks associated with its operations and has prepared such a plan (see Section 6.3, Construction and Operational Plans). As part of the Emergency Preparedness Plan, Terrane will have appropriate emergency response equipment in place and will provide training for staff.

Opportunities to enhance public safety relate to having Terrane coordinate its emergency response activities with other regional response providers, including local and regional governments and other industries. While this may prevent some duplication of emergency response capabilities, it also provides an opportunity for emergency response providers to identify their respective roles and responsibilities to improve the overall response. For example, Terrane could arrange to provide initial emergency response to traffic accidents on some of the roads nearest the mine, rather than wait for responders from Fort St. James. In addition, there could be agreements to share resources in the case of larger emergency events (fires or floods). In the long-term, such an action could contribute to a legacy of integrated emergency response plans in the region.

Another aspect of public safety relates to communities' concerns about potential social problems that may arise from a sudden increase in income and large numbers of non-local workers temporarily residing in the community. Available evidence suggests there is some risk that increased incomes can lead to increases in substance use, crime, prostitution, the transmission of sexual-related infections, and other socially unacceptable behaviours such as binge partying. There is also a concern that workers who may not be permanent residents of the community will not feel a strong connection to the host community and may lack a sense of moral obligation to act according to social norms established in that community.

As noted in Section 5.10, Socio-Economic Effects, Terrane is aware of these concerns and, in recognition that it has limited abilities to influence the behaviour of its employees, it has proposed that it work with local communities, community based organizations, and provincial government departments to monitor and address these issues. It is expected that through

this shared responsibility approach, Terrane and other parties will also be able to identify opportunities for addressing other social problems of importance to the community that may not be directly related to the mine.

Community Health

Part of sustainability relates to maintaining the health of people in the communities. The Community Sustainability Committee has identified several opportunities to address community health issues including:

- communicating project development to Northern Health so that hospitals have the chance to increase provisions in Fort St. James in a timely manner
- an appropriate role within the Buckley-Nechako health and safety study to raise awareness of a need for increased health services in the region

Terrane has examined various pathways by which the construction and operation of its mine could affect the regional population, including workers and current and future residents of the SRSA. This work determined that the project will not adversely affect community health. Nevertheless, in the case of a workplace accident, Terrane will have emergency health services on site and will arrange for seriously injured workers to be transported to appropriate regional medical facilities.

Terrane could enhance its potential effects on community health by expanding the orientation and training program to include regular educational courses on healthy lifestyles and other matters of concern to workers. Such programs could also be extended into the community so that workers' families and other members of the community could also participate. A community extension program could increase the probability of increased community cohesion and stability in the long-term. However, any such programs would be developed and managed in cooperation with community health and service providers.

By participating the Community Sustainability Committee Terrane may also be able to play other roles in affecting community health. For example, as new health issues arise (an influenza pandemic, for example) Terrane may be able to adopt health practices (inoculation programs) that could benefit its workforce and the surrounding communities.

Cultural Diversity and Inclusiveness

The primary concerns related to cultural diversity and inclusiveness relate to ensuring that Aboriginal people have a fair and equal opportunity to participate in construction and operation with the proviso that increased participation in a wage economy will not lead to a loss of language or culture or the ability to continue to participate in traditional land use practices. To address these concerns Terrane has a non-discrimination policy for all aspects of its activities and will develop training and procurement opportunities that allow

Aboriginal people and companies to be involved in the project. In addition, Terrane will include cultural sensitivity training as part of its orientation and training of project workers and contractors. This could be extended into a community program available to workers' families and other members of the community.

As traditional land uses (e.g., fishing, hunting, trapping, berry picking) and cultural events occur at specific times of the year, it may be possible to adjust work schedules to allow Aboriginal workers to take leave during this time. Through consultation with the Aboriginal community it should be possible to plan for these activities in advance so that all those that wish to participate can do so. Such actions would contribute to the continuing community harvesting and cultural activities in the potentially affected communities in the short- and long-term. Challenges would include avoiding a division in the workforce. A balanced approach will be needed to avoid resentment from other workers.

Artefact Management

While there is some potential that artefacts may be uncovered in the course of constructing and operating the mine, Terrane has strategies in place to ensure that such artefacts are identified and managed appropriately (see Archaeological and Cultural Heritage Resources Management Plan in Section 6.3, Construction and Operational Plans). Monitoring, management and reporting systems will attempt to ensure continuous progress towards sustainability. At this time, Terrane sees limited opportunities for enhancing effects other than by assisting the community in protecting, maintaining and displaying artefacts of major importance to the historical, archaeological, and paleontological heritage of the local area.

Recreation and Sport Management

These aspects of sustainability relate to the communities' wishes for increased opportunities for recreation and sports and the management of outdoor recreation so that land use is not adversely affected.

During construction, Terrane will house its workers in a camp and will provide recreation facilities so that there should be no demands on the community. However, during operations, most mine workers will be temporarily or permanently residing in Fort St. James and the demand on recreational facilities will increase. As noted in Section 5.10, Socio-Economic Effects, Fort St. James has an arena but no community centre or recreation complex and the lack of such facilities is seen as an issue for current residents. Terrane sees the development of additional recreational facilities as a shared problem that must be addressed jointly by local and regional governments, Terrane and other major employers, and potential facility users, and Terrane is prepared to participate in the process of securing such facilities for the community. Facilities need to be designed in a manner that is sustainable for the community, even after the mines closes. Opportunities for enhancing

recreational and sport could relate to the sponsorship of events that would increase overall participation.

With respect to the management of outdoor recreation, Terrane will not allow its workers to hunt or fish while at the site in order to ensure that fish and wildlife populations are not unduly stressed. While Terrane has no jurisdiction over access management (e.g., access to land for recreation), which is under provincial jurisdiction, it could participate in government initiatives for land and resource use management planning.

Visually Attractive Community

One of the goals of the District of Fort St. James is for the community to be visually attractive, clean, and pleasant. Some communities in BC have even gone so far as to adopt design guidelines and themes for building that support tourism marketing. Terrane will commit to consulting with the community on the appearance of any construction that it undertakes in the community, potentially including housing. The challenge will be ensuring each product is visually attractive to the communities in the long-term.

5.19.5.4 Environmental Sustainability Goals

Potential environmental sustainability goals identified from available literature in the SRSA are:

- integrated resource management
- air quality
- fish populations and habitat
- wildlife populations and habitat

In this section, opportunities and challenges are identified and discussed for each potential environmental sustainability goal.

Integrated Resource Management

The BC Integrated Land Management Bureau (undated) defines integrated resource management as “a land management regime that identifies and considers resource values, in the context of social, economic, and environmental objectives.” Integrated resource management involves the management of more than one resource in the same general area, for example, water, soil, timber, livestock and minerals. The goal of integrated land management is resource stewardship guided by the principle of sustainable use. Land and resource management planning is a provincial jurisdiction.

Terrane has evaluated its project in the context of the existing land and resource plans for the region and has determined that the proposed mine development is consistent with these

plans. In support for future integrated resource management, Terrane is willing to participate in land and resource use management planning with the expectation that this will enhance opportunities for long term stewardship of the area.

Air Quality

Terrane has evaluated projects on air quality and has determined that it will meet all regulatory requirements (Section 5.3, Climate and Air Quality). Overall, the project will be a small contributor with regards to emissions. At the present time, there are few opportunities for the project to enhance its effects on air quality other than by committing to purchase green power to minimize its overall carbon footprint and by engaging the community in an audit of project emissions so that progress towards sustainability can be monitored.

Fish Populations and Habitat

Terrane has conducted an assessment of potential project effects on fish populations and habitat, and has developed a habitat compensation plan that will ensure that fish populations can be sustained and possibly enhanced (Section 5.6, Fish and Aquatic Resources, Appendix B). The plan has been designed to make a positive overall contribution toward the attainment of ecological sustainability at the local and regional levels.

Wildlife Populations and Habitat

In designing the project, Terrane has committed to disturbing as small a footprint as possible. It has conducted an assessment of project effect on wildlife and wildlife habitat and has concluded that the project will not adversely affect the sustainability of wildlife populations (Section 5.8, Wildlife).

There may be an opportunity to enhance wildlife habitat may when the mine is decommissioned. In the light of mountain pine beetle infestations in mature pine forests, it may be possible to align reclamation activities so to maximize efforts to attract wildlife into the local area and region. This activity, if feasible, would be coordinated with the Ministry of Forests and Range and/or forest companies active in the region.

5.19.6 Summary

Overall, the EIA has examined the full range of project effects on the economic, social and environmental conditions on local communities and in the broader region and has determined that the project is sustainable in that it does not compromise the needs of future generations. In some instances this conclusion is based on a specific mitigation and enhancement measures that Terrane will implement to ensure sustainability. In cases where there is less certainty about the nature and management of adverse effects,

particularly socio-economic effects, Terrane has committed to working with communities and local and regional governments to monitor project effects and other changes in communities, and develop appropriate effects management strategies that will meet the long-term needs of the communities. The ongoing operations of the Community Sustainability Committee will ensure the economic, social and environmental sustainability of the region.

5.19.7 References

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