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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Rehabilitation and Improvement of National Highway No. 20 - Section
from Dong Nai to Lam Dong Province

2013/04/19

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Rehabilitation and Improvement of National Highway No. 20 - Section from Dong Nai to Lam Dong Province

2013/04/19

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1 Introduction

1.1 Project Overview

National Highway 20 starts from Km0 (references to sections of the road is expressed in kilometres [km], Km0 signifies the start of the project and Km268, the end) at Dau Giay T-junction located in the Dong Nai Province and ends at Km268 in Dran Town, Don Duong District, Lam Dong Province. The length of the entire route is 268km, with 75,6km traversing Dong Nai Province and 192,4km traversing the Lam Dong Province. The road provides an important link between two key economic regions, the Dong Nai and Lam Dong Provinces, and provides access to Da Lat City, which is regarded an important economic, political, and cultural centre.

It is proposed that the above-mentioned section of road be upgraded to ensure traffic safety and to accommodate evident increases in traffic flow.

The route is planned to run along the current NR20 in Dong Nai province and will pass through 21 communes. Within Lam Dong province, the road section will traverse through 27 communes. In addition to the construction of the road, the project will also deliver 16 new bridges of varying size. The alignment will be divided into different scales, including delta scale III and mountainous area scale III and IV. Scale III roads are arterial routes, connecting large national and regional economic, political and cultural centres. Scale IV is defined as a highway connecting regional centres, depots, and residential areas.

The project is expected to be delivered in two phases. Phase 1 (Km0 – Km123+105) will be delivered by BT20 contractors and is planned to commence in 2012 and will be completed after 36 months. Phase 2 (Km123+105 – Km268) is planned to start from 2013 and should be completed after 36 months from the date of commencement.

1.2 Scope

BT20 has developed this Environmental and Social Management Plan (ESMP) to identify the environmental and social management and mitigation actions required to implement the project in accordance with the requirements of the International Finance Corporation's (IFC) Performance Standards and applicable Vietnam national legislation. It provides an overview of the environmental and social baseline conditions on the route of the proposed scheme, summarises the potential impacts associated with the proposed rehabilitation and improvement works and sets out the management measures required to mitigate any potential impacts in a series of discipline specific Environmental Management Plans (EMPs). These EMPs are to be utilised by the contractors commissioned by BT20 for the project and will form the basis of site-specific management plans that will be prepared by the contractors as part of their construction methodology prior to works commencing.

The potential impacts and associated mitigation measures and management procedures presented in this ESMP are based on the baseline information and assessments provided in the Report of Environment Impact Assessment Project for Rehabilitation and Improvement of National Highway No. 20 - Section from Dong Nai to Lam Dong Province (October 2011) and the Initial Site Visit Report (July 2012), Environmental Risk Assessment (August 2012) and Environmental and Social Action Plan (ESAP) prepared for the project by WSP Environment & Energy (August 2012).

The ESAP document (referred to above) has been incorporated into this document (See Appendix 14). The Management Plans presented in this ESMP (See Appendices 1-11) detail the environmental and social management procedures, processes and mitigation and monitoring measures required to complete actions identified in the ESAP

In addition to the Management Procedures and Plans presented in this document, reference is also made to the Stakeholder Engagement Plan (SEP) which has been prepared as a stand-alone document for the Project. The SEP outlines the measures to be used for community engagement, dissemination of project information and grievance management and will be utilised as a key element in all the proposed management, monitoring and mitigations measures outlined in this document. This ESMP, ESAP and the SEP are live documents and will up-dated as required during the project implementation.

1.3 Objectives

As the investor, it is BT20's objective to avoid, where practical, unacceptable adverse environmental, social and/or economic impacts. In the circumstance that an impact cannot be avoided, BT20 and Project Management Unit 7 (PMU7) (who will be responsible for the management of the construction phase of the project) are committed to the implementation of appropriate mitigation measures. For clarity in the management structure, PMU 7 will consult with BT20 on matters relating to environmental and health and safety performance, however, PMU 7 will have overall responsibility for planning, implementation, monitoring and enforcement of activities associated with this ESMP and environmental and health and safety performance.

The objectives of this ESMP are to:

- Describe the measures required to implement construction related management and mitigation commitments made in the National Highway 20 (Section from Dong Nai to Lam Dong Province) Environmental Impact Assessment;
- Describe specific additional measures required to implement construction related good practice, approval conditions stipulated by Vietnamese Planning Authority and IFC Performance Standards;
- Identify the roles and responsibilities of the environmental and social management organisation of the project; and
- Communicate environmental and social expectations and requirements throughout the project team.

All contractors and subcontractors shall comply with apply the ESMP requirements as applicable to the tasks they are employed to undertake.

The measures and procedures outlined in this ESMP are commitments made by PMU 7. PMU 7, therefore remain responsible for their implementation. It is recognised that practical implementation of many of the measures may rest with contractors and subcontractors and consequently, PMU 7 will require the implementation of a robust review/audit programme, as described in this ESMP, to measure and ensure that it is executed on their behalf.

1.4 ESMP Structures

The ESMP comprises this document and a series of specific supporting Environmental and Social Management plans which are provided as appendices to this document.

The ESMP outlines the environmental and social management processes and procedures applicable to the project and includes the topics which are common to all environmental and social disciplines.

The ESMP is structured as follows:

- Chapter 1 – Introduction;
- Chapter 2 – International Finance Corporation Performance Standards;
- Chapter 3 – Legal Compliance
- Chapter 4 – Assumptions and Limitations;
- Chapter 5 - Environmental and Social Management;
- Chapter 6 – Environmental and Social Baseline;
- Chapter 7 – Project Description;
- Chapter 8 – Summary of Environmental and Social Impacts;
- Chapter 9 – Summary of Impacts and Management Requirements;
- Chapter 10 – Organisational Commitment;
- Chapter 11 – Contractual;

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- Chapter 12 – Training;
 - Chapter 13 – Measures for Legal Compliance;
 - Chapter 14 – Workforce;
 - Chapter 15 – Occupational Health and Safety;
 - Chapter 16 – Stakeholders;
 - Chapter 17 – Community Health and Safety;
 - Chapter 18 – Emergency Response;
 - Chapter 19 – Supply Chain;
 - Chapter 20 – Climate.
-
- Appendix 1: Air Emissions Management Plan
 - Appendix 2: Noise and Vibration Management Plan
 - Appendix 3: Ecological Management Plan
 - Appendix 4: Waste Management Plan
 - Appendix 5: Water Management Plan
 - Appendix 6: Erosion and Sediment Control Plan
 - Appendix 7: Spill Prevention and Response Plan
 - Appendix 8: Hazardous Materials Management Plan
 - Appendix 9: Raw Materials Management Plan
 - Appendix 10: Cultural Heritage Management Plan
 - Appendix 11: Community Impacts Plan
 - Appendix 12: Draft Program of Environmental Monitoring and Quality Supervision;
 - Appendix 13: Resettlement Action Plan
 - Appendix 14: ESAP
 - Appendix 15: References

1.5 Intended Users

The aim of this document is communicate to the Project Team (including contractors and sub-contractors), the potential environmental and social issues associated with the proposed scheme and the procedures and mitigation measures that are required to be implemented.

The Project Team will utilise this ESMP during project execution to achieve effective, appropriate environmental and social management.

In accordance with the IFCs Access to Information Policy (January 2012), this document will also be made available to the general public via the Project website and in hard copies a specified locations.

2 International Finance Corporation Performance Standards

The following section provides a brief overview of the IFC Performance Standards which informed the development of the ESMP.

2.1 Performance Standard 1

Performance Standard Objective	Supporting Documentation
<p>Performance Standard 1 establishes the importance of integrated environmental and social assessment to identify impacts, risks and opportunities, effective community engagement and the management of environmental and social performance throughout the life of the project. The requirements for the development of an Environmental and Social Management Plan (ESMP) are outlined below.</p> <p>General:</p> <p>Establish an environmental and social impact assessment and management process framework that will incorporate the following elements: (i) policy; (ii) identification of risks and impacts; (iii) management programs; (iv) organizational capacity and competency; (v) emergency preparedness and response; (vi) stakeholder engagement; and (vii) monitoring and review.</p>	<ul style="list-style-type: none"> ■ Guidance Note 1 Social and Environmental Assessment and Management Systems. ■ Environmental and Social Review Procedure (ESRP). ■ Global Reporting Initiative Guidelines (GRI). ■ IFC Sustainability Reports. ■ Environmental, Health and Safety (EHS) Guidelines. ■ Environmental, Health, and Safety (EHS) Guidelines: Electrical Power Transmission and Distribution. ■ International Finance Corporation's (IFC) Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets (2007). ■ The International Finance Corporation's Doing Better Business Through Effective Public Consultation and Disclosure: A Good Practice Manual (1998).

Aspect	Performance Standard Requirements
PS1: Policy	<ul style="list-style-type: none"> ■ Define the environmental and social objectives and principles for achieving sound environmental and social performance ■ Confirm legal compliance requirements (including international obligations / agreements) ■ Allocate responsibility to ensure conformance and implementation
PS1: Identification of Risk and Impacts <i>Note: An environmental impact assessment was undertaken and the risks and impacts reported in the Report of Environment Impact Assessment Project for Rehabilitation and Improvement of National Highway No. 20 - Section from Dong Nai to Lam Dong Province, dated October 2011</i>	<ul style="list-style-type: none"> ■ The process of identifying risks and impacts must: <ul style="list-style-type: none"> ● Be consistent with good industry practice and based on relevant methods and tools for assessment ● Be based on recent environmental and social baseline data at an appropriate level of detail ● Consider the emission of greenhouse gasses and climate change risks (including adaptation opportunities) ● Be applicable to the context of the project's area ● Influence and control, where possible and applicable, the risks and impacts resulting from third party's actions ● Consider risks and impacts associated with primary supply chains (where practicable)

Aspect	Performance Standard Requirements
	<ul style="list-style-type: none"> • Address trans-boundary impacts (if applicable) • Take into consideration findings and conclusions of related and applicable plans, studies, or assessment prepared by relevant government authorities • Identify and implement differential measures to avoid a disproportional negative impact on vulnerable or disadvantaged communities and ensure sharing of development benefits and opportunities
PS1: Management Programmes	<ul style="list-style-type: none"> ■ Describe how risks and impacts are eliminated and / mitigated ■ Identify requirements for performance improvements and develop and implement action plans
PS1: Organisational Capacity and Competency	<ul style="list-style-type: none"> ■ Establish, maintain and an organisational structure that define roles, responsibilities, authority and allocate the required resources (financial and external expertise) to implement the management system
PS1: Emergency Preparedness and Response	<ul style="list-style-type: none"> ■ Identify potential possible accidental and emergency situations and establish and maintain an emergency preparedness and response system
PS1: Monitoring and Review	<ul style="list-style-type: none"> ■ Establish procedures for the monitoring and measurement of the management programme ■ Ensure compliance obligations by third parties are fulfilled (as it relates to the project) ■ Involve community representatives in monitoring where applicable ■ Retain external expert (where required) to verify monitoring information ■ Track performance and undertake trend analysis and document as appropriate ■ Adjust management plans based on outcomes of monitoring activities and adjust plans to improve performance ■ Establish process for periodic senior management review of the effectiveness of the management system
PS1: Stakeholder Engagement <i>Note: Stakeholder engagement process was undertaken and outcomes reported in the <u>Report of Environment Impact Assessment Project for Rehabilitation and Improvement of National Highway No. 20 - Section from Dong Nai to Lam Dong Province, dated October 2011</u></i>	<ul style="list-style-type: none"> ■ Develop and implement a stakeholder engagement plan for identification, continued involvement and effective participation ■ Disclose all relevant information to enable stakeholders to express the views and appropriately respond ■ Conduct an informed consultation and participation process ■ Indigenous Peoples: Refer Performance Standard 7 ■ In instances where the stakeholder engagement is the

Aspect	Performance Standard Requirements
	responsibility of the host government, collaborate (to the extent possible) to ensure that the objectives of the performance standard is met
PS1: External Communications and Grievance Mechanism	<ul style="list-style-type: none"> Receive, appropriately respond to and document comments from the public Establish a grievance mechanism to receive and facilitate resolution of affected communities' concerns and grievances
PS1: On-going Reporting to Affected Communities	<ul style="list-style-type: none"> Provide periodic report to the affected communities regarding project progress, implementation of action plans, issues raised and material changes

2.2 Performance Standard 2

Performance Standard Objective	Supporting Documentation
Performance Standard 2 recognized that the pursuit of economic growth through employment creation and income generation should be accompanied by the rights of workers. To promote the fair treatment, non-discrimination, equal opportunity, maintain, & improve the worker-management relationship, legal compliance, protect workers, a safe and healthy working environment and avoid the use of forced / child labour.	<ul style="list-style-type: none"> Guidance Note 2 Labour and Working Conditions. Good Practice Note on Non-Discrimination and Equal Opportunity Good Practice Note on Managing Retrenchment Workers' Accommodation: Processes and Standards Labor Toolkit: A Practical Screening and Due Diligence Tool for Project Review International Labour Organization (ILO) and United Nations (UN) Conventions.

Aspect	Performance Standard Requirements
PS2: Human Resource Policies and Procedures	<ul style="list-style-type: none"> Adopt and implement the appropriate human resource policies Provide workers with clear understandable documentation explaining worker's rights
PS2: Working Conditions and Terms of Employment	<ul style="list-style-type: none"> Respect collective bargaining agreements with workers organisations Identify and ensure substantially equivalent terms and conditions for migrant workers Develop and implement policies on the quality and management of accommodation and provision of basic services
PS2: Workers Organisations	<ul style="list-style-type: none"> Not to restrict or prevent workers from forming and / join workers organisation
PS2: Non-Discrimination and Equal Opportunity	<ul style="list-style-type: none"> Employment decision will not be made on the basis of personal characteristics unrelated to inherent job requirements Promote equal opportunity, fair treatment and non-discrimination. Take measures to prevent and address harassment, intimidation and / or exploitation
PS2:Retrenchment	<ul style="list-style-type: none"> Develop a Retrenchment Plan to address issues as it relates to

Aspect	Performance Standard Requirements
	legal and contractual requirements
PS2: Grievance Mechanism	<ul style="list-style-type: none"> Provide grievance mechanism for workers to raise workplace concerns
PS2: Protecting the Work Force	<ul style="list-style-type: none"> Persons under the age of 18 will not be employed Forced labour will not be employed
PS2: Occupational Health and Safety	<ul style="list-style-type: none"> Provide safe and healthy work environment Take steps to prevent accidents, injury and disease Apply good international industry practice to assess risk and potential hazards to workers, provide preventative and protective measures, training, monitoring and reporting, emergency preparedness and response procedures
PS2: Workers engaged by Third Parties	<ul style="list-style-type: none"> Take reasonable action to ascertain compliance with the Performance Standard
PS2: Supply Chain	<ul style="list-style-type: none"> Take reasonable action to ascertain compliance with the Performance Standard

2.3 Performance Standard 3

Performance Standard Objective	Supporting Documentation
<p>Performance Standard 3 recognizes that increased economic activity and urbanization often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution, promote more sustainable use of resources, including energy and water and reduce project-related GHG emissions.</p>	<ul style="list-style-type: none"> Guidance Note 3 Resource Efficiency and Pollution Prevention. Environmental, Health and Safety (EHS) Guidelines

Aspect	Performance Standard Requirements
PS3: General	<ul style="list-style-type: none"> Consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention principles and techniques that are best suited to avoid, or where avoidance is not possible, minimize adverse impacts on human health and the environment
PS3: Resource Efficiency	<ul style="list-style-type: none"> Implement feasible measures for improving efficiency in consumption of energy, water and other material inputs
PS3: Greenhouse Gasses	<ul style="list-style-type: none"> Consider alternatives and implement feasible options to reduce project-related GHG emissions Projects that are expected to or currently produce more than

	25,000 tonnes of CO ₂ -equivalent annually, quantify direct emissions annually in accordance with internationally recognized methodologies and good practice
PS3: Water Consumption	<ul style="list-style-type: none"> Adopt measures that avoid or reduce water usage to avoid significant adverse impacts on others
PS3: Pollution Prevention	<ul style="list-style-type: none"> Avoid the release of pollutants or, when avoidance is not feasible, minimize and/or mitigate Address potential adverse project impacts on existing ambient conditions
PS3: Wastes	<ul style="list-style-type: none"> Avoid the generation of hazardous and non-hazardous waste materials. Where waste generation cannot be avoided, reduce, recover and reuse waste Where waste cannot be recovered or reused, treat, destroy, or dispose of it in an environmentally sound manner
Hazardous Materials Management	<ul style="list-style-type: none"> Avoid or, when avoidance is not possible, minimize and control the release of hazardous materials. Assess and manage risks associated with the production, transportation, handling, storage, and use of hazardous materials
PS3: Pesticide Use and Management	<ul style="list-style-type: none"> Formulate and implement an integrated pest management (IPM) and/or integrated vector management (IVM) approach

2.4 Performance Standard 4

Performance Standard Objective	Supporting Documentation
<p>Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances and ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.</p>	<ul style="list-style-type: none"> Guidance Notes 4 Community Health, Safety, and Security Environmental, Health and Safety (EHS) Guidelines

Aspect	Performance Standard Requirements
PS4: Community Health And Safety	<ul style="list-style-type: none"> Evaluate the risks and impacts to the health and safety of the affected communities during the project life and will establish preventive and control
PS4: Infrastructure and Equipment Design and Safety	<ul style="list-style-type: none"> Design, construct, operate, and decommission the structural elements or components of the project in accordance with good international industry practice, taking into consideration safety risks to third parties or affected communities.
PS4: Hazardous Materials Management and	<ul style="list-style-type: none"> Avoid or minimize the potential for community exposure to hazardous materials and substances that may be released by the

Safety	project through modifying, substituting, or eliminating, control the safety of deliveries of hazardous materials, and of transportation and disposal of hazardous wastes
PS4: Ecosystem Services	<ul style="list-style-type: none"> Void adverse impacts on ecosystem services which may result in adverse health, safety risks and/ impacts to affected communities, and if these impacts are unavoidable, implement mitigation measures
PS4: Community Exposure to Disease	<ul style="list-style-type: none"> Avoid or minimize the potential for community exposure to water-borne, water-based, water-related, and vector-borne diseases, and communicable diseases
PS4: Emergency Preparedness and Response (Refer to PS1)	<ul style="list-style-type: none"> Collaborate with the affected communities, local government agencies, and other relevant parties, in their preparations to respond effectively to emergency situations, especially when their participation and collaboration are necessary to respond to such emergency situations
PS4: Security Personnel	<ul style="list-style-type: none"> Retains direct or contracted workers to provide security to safeguard its personnel and property

2.5 Performance Standard 5

Performance Standard Objective	Supporting Documentation
<p>Performance Standard 5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. To avoid, and when avoidance is not possible, minimize displacement, forced eviction, social and economic impacts from land acquisition or restrictions on land use. To improve, or restore, the livelihoods and standards of living of displaced persons and living conditions among physically displaced persons</p>	<ul style="list-style-type: none"> Guidance Notes 5 Land Acquisition and Involuntary Resettlement Handbook on Preparing a Resettlement Action Plan

Aspect	Performance Standard Requirements
<p>PS5: Land Acquisition and Involuntary Resettlement</p> <p><i>Note: The impacts and management requirements relating to resettlement is excluded from this ESAP</i></p>	<ul style="list-style-type: none"> To avoid, and when avoidance is not possible, minimize displacement by exploring alternative project designs To avoid forced eviction To anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions To improve, or restore, the livelihoods and standards of living of displaced persons To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites

2.6 Performance Standard 6

Performance Standard Objective	Supporting Documentation
<p>Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. To protect and conserve biodiversity, maintain the benefits from ecosystem services, promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.</p> <p><i>Note: The environmental to be transformed is regarded as partly modified¹ and partly natural²</i></p>	<ul style="list-style-type: none"> ■ Guidance Notes 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources

Aspect	Performance Standard Requirements
<p>PS6: Protection and Conservation of Biodiversity</p>	<ul style="list-style-type: none"> ■ Minimize impacts on such biodiversity and implement mitigation measures as appropriate ■ Do not convert or degrade natural habitats, unless the following are demonstrated: <ul style="list-style-type: none"> ● No other viable alternatives within the region exist for development of the project on modified habitat. ● Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation. ● Any conversion or degradation is mitigated according to the mitigation hierarchy ■ In areas of natural habitat, mitigation measures will be designed to achieve no net loss of biodiversity where feasible and avoiding impacts on biodiversity through the identification and protection of set-asides; implementing measures to minimize habitat fragmentation, such as biological corridors, restoring habitats during operations and/or after operations; and implementing biodiversity offsets.
<p>PS6: Legally Protected and Internationally Recognized Areas</p> <p><i>Note: Based on the available information, no legally protected and / internationally recognised areas are affected</i></p>	<ul style="list-style-type: none"> ■ Demonstrate that the proposed development in such areas is legally permitted ■ Act in a manner consistent with any government recognized management plans for such areas ■ Consult protected area sponsors and managers, affected communities, indigenous peoples and other stakeholders on the proposed project, as appropriate ■ Implement additional programs, as appropriate, to promote and

¹ Modified habitats are areas that may contain a large proportion of plant and/or animal species of non-native origin, and/or where human activity has substantially modified an area's primary ecological functions and species composition

² Natural habitats are areas composed of viable assemblages of plant and/or animal species of largely native origin, and/or where human activity has not essentially modified an area's primary ecological functions and species composition.

Aspect	Performance Standard Requirements
	enhance the conservation aims and effective management of the area
PS6: Invasive Alien Species	<ul style="list-style-type: none"> ■ Implement measures to avoid the potential for accidental or unintended introductions of invasive alien species ■ Where alien species are already established, exercise diligence in not spreading them into areas in which they have not already been established ■ As practicable, take measures to eradicate such species from the natural habitats over which they have management control
PS6: Management of Ecosystem Services <i>Note: Based on the available information, it is not clear to what extent the affected communities rely on ecosystem services (the economic dependency on land for agriculture is regarded as reliance on ecosystem services)</i>	<ul style="list-style-type: none"> ■ With respect to impacts on priority ecosystem services of relevance to affected communities, adverse impacts should be avoided ■ If these impacts are unavoidable, minimize impacts and implement mitigation measures that aim to maintain the value and functionality of priority services ■ With respect to impacts on priority ecosystem services on which the project depends, minimize impacts on ecosystem services and implement measures that increase resource efficiency of their operation
PS6: Sustainable Management of Living Natural Resources <i>Note: The project does not relate to the primary production of living natural resources</i>	<ul style="list-style-type: none"> ■ This relates to the primary production of living natural resources, including natural and plantation forestry, agriculture, animal husbandry, aquaculture, and fisheries and is not applicable to this project
PS6: Supply Chain	<ul style="list-style-type: none"> ■ When purchasing primary production (especially but not exclusively food and fiber commodities) that is known to be produced in regions where there is a risk of significant conversion of natural and/or critical habitats, systems and verification practices will be adopted as part of the ESMS to evaluate its primary suppliers.

2.7 Performance Standard 7

Performance Standard Objective	Supporting Documentation
Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods, anticipate and avoid, minimize and / compensate for adverse impacts, promote sustainable development benefits and opportunities, establish and maintain an on-going relationship throughout the project's life-cycle, ensure the Free, Prior, and Informed	<ul style="list-style-type: none"> ■ Guidance Notes 7 Indigenous Peoples ■ Convention on Biological Diversity: The Tkarhwaí:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities (2010)

Consent (FPIC) of the Affected Communities and respect and preserve the culture, knowledge, and practices of Indigenous Peoples.	
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Aspect	Performance Standard Requirements
<p>PS7: Indigenous Peoples</p> <p><i>Note: As part of the Environmental Impact Assessment “Indigenous Peoples” have been identified. Based on the information available, no direct impacts are expected resulting from the development proposal (the upgrade of Highway 20). Mitigation and management measures relating to Indigenous Peoples have therefore been excluded. It is recommended that, as part of a programme for continuous improvement, potential impacts be identified and addressed appropriately.</i></p>	<ul style="list-style-type: none"> ■ Identify, through an environmental and social risks and impacts assessment process, all communities of indigenous peoples within the project area of influence who may be affected by the project. ■ Adverse impacts on affected communities of indigenous peoples must be avoided where possible. ■ Where alternatives have been explored and adverse impacts are unavoidable, minimize, restore, and/or compensate for these impacts. ■ Proposed actions will be developed with the informed consultation and participation of the affected communities of indigenous peoples and contained in a time-bound plan. ■ Undertake an engagement process with the affected Communities of indigenous peoples as required in PS1.

2.8 Performance Standard 8

Performance Standard Objective	Supporting Documentation
<p>Performance Standard 8 recognizes the importance of cultural heritage for current and future generations. Consistent with the Convention Concerning the Protection of the World Cultural and Natural Heritage, this Performance Standard aims to ensure that clients protect cultural heritage in the course of their project activities. In addition, the requirements of this Performance Standard on a project’s use of cultural heritage are based in part on standards set by the Convention on Biological Diversity. To protect cultural heritage from the adverse impacts and equitable sharing of benefits from the use of cultural heritage.</p>	<ul style="list-style-type: none"> ■ Guidance Notes 8 Cultural Heritage ■ Convention on Biological Diversity: The Tkarihwaí:ri Code of Ethical Conduct to Ensure Respect for the Cultural and Intellectual Heritage of Indigenous and Local Communities (2010) ■ International Council on Monuments and Sites: Charter for the Protection and Management of the Archaeological Heritage (1990)

Aspect	Performance Standard Requirements
<p>PS8: Protection of Cultural Heritage in Project Design and Execution</p>	<ul style="list-style-type: none"> ■ Identify and protect cultural heritage by ensuring that internationally recognized practices for the protection, field-based study, and documentation of cultural heritage are implemented ■ Develop provisions for managing chance finds through a chance find procedure ■ Consult with the affected communities to identify cultural heritage of importance

	<ul style="list-style-type: none"> ■ Where a project may affect cultural heritage, consult with affected communities who use, or have used within living memory, the cultural heritage for long-standing cultural purposes ■ Allow continued access to the cultural site or will provide an alternative access route previously accessible cultural heritage sites ■ Apply mitigation measures that favour avoidance
<p>PS8: Project's Use of Cultural Heritage</p> <p><i>Note: The project will not make use of heritage resources</i></p>	<ul style="list-style-type: none"> ■ Where a project proposes to use the cultural heritage, including knowledge, innovations, or practices of local communities for commercial purposes, the client will inform the relevant communities of: <ul style="list-style-type: none"> • Their rights under national law • The scope and nature of the proposed commercial development • The potential consequences of such development ■ The client will not proceed with such commercialization unless it enters into an agreement which uses a good faith negotiation process that results in a documented outcome and provides for fair and equitable sharing of benefits from commercialization of such knowledge, innovation, or practice, consistent with their customs and traditions

3 Legal Compliance

BT20 and all contractors and subcontractors must confirm and ensure compliance with all relevant national environmental legal requirements.

3.1 Environmental Legal Compliance

The following environmental legislation³, as referred to in the Report of Environment Impact Assessment Project for Rehabilitation and Improvement of National Highway No. 20 - Section from Dong Nai to Lam Dong Province, dated October 2011, must be considered:

- Environmental Protection Law of the XIth National Assembly of the Socialist Republic of Vietnam, at 8th session, passed on 29/11/2005.
- Decree No. 80/2006/NĐ-CP dated 09/8/2006 of the Government on detailing and guiding the implementation of a number of articles of the Law on environmental protection.
- Decree No. 21/2008/NĐ-CP dated 28/02/2008 of the Government on amendment of and supplement to several Articles of the Decree No. 80/2006/NĐ-CP.
- Decree No. 29/2011/NĐ-CP dated 18/04/2011 of the Government on stipulating the strategic environmental assessment, environmental impact assessment and environmental protection commitment.
- Decree No. 67/2003/NĐ-CP dated 13/6/2003 on environmental protection charges for waste water.
- Decree No. 140/2006/NĐ-CP dated 22/11/2006 of the Government on stipulating the environmental protection at stages of elaboration, evaluation, approval and implementation of development strategies, planning, plans, programs and projects.
- Decree No. 81/2006/NĐ-CP dated 09/8/2006 of the Government on sanctioning of administrative violations in the domain of environmental protection.
- Decree No. 59/2007/NĐ-CP dated 09/4/2007 of the Government on solid waste management.
- Decree No. 04/2007/NĐ-CP dated 08/1/2007 of the Government on Amending and supplementing a number of articles of the Government's Decree No. 67/2003/ND-CP of June 13, 2003, on "environmental protection charges applicable to wastewater".
- Decree No. 117/2009/NĐ-CP dated 31/12/2009 of the Government on the handling of law violations in the domain of environmental protection.
- Circular No. 09/2010/TT- BGTVT, dated 06/04/2010 of the Ministry of Transport on stipulating the environmental protection in the development of transport infrastructure.
- Circular No. 26/2011/TT- BTNMT dated 18/7/2011 of the Ministry of Natural Resources and Environment on detailing a number of articles of the Government's Decree No. 29/2011/NĐ-CP stipulating the strategic environmental assessment, environmental impact assessment and environmental protection commitment.
- Circular No. 02/2005/TT-BTNMT dated 24/6/2005 of the Ministry of Natural Resources and Environment on guiding the issuance of permits for water resource exploration, exploitation and use, or for discharge of wastewater into water sources.
- Circular No. 12/2011/TT-BTNMT dated 14/4/2011 of the Ministry of Natural Resources and Environment on stipulating the hazardous waste management.
- Decision No. 64/2003/QĐ-TTg dated 22/4/2003 of the Prime Minister on approving the plan for thoroughly handling establishments which cause serious environmental pollution.

³ The identification of the applicable environmental legislation was undertaken by environmental assessment practitioner. WSP did not verify the inclusion of all applicable legislation in this list. It is recommended that the project proponent / owner appoint a suitably qualified environmental legal specialist to develop a complete environmental legal register.

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- Decision No. 1696/QĐ-BKHCN dated 28/7/2006 of the Ministry of Science and Technology on promulgating Vietnam Standards.
 - Decision No. 23/2006/QĐ-BTNMT dated 26/12/2006 of the Ministry of Natural Resources and Environment on promulgating the list of hazardous wastes.
 - Decision No. 22/2006/QĐ-BTNMT dated 18/12/2006 of the Ministry of Natural Resources and Environment on the compulsory application of Vietnam environmental standards.
 - Decision No. 04/2008/QĐ-BTNMT dated 18/07/2008 of the Ministry of Natural Resources and Environment on promulgating the national technical regulations on environment.
 - Decision No. 16/2008/QĐ-BTNMT dated 31/12/2008 of the Ministry of Natural Resources and Environment on promulgating the national technical regulations on environment.

4 Assumptions and Limitations

- Certain limitations are imposed as a result of the translation of the Environmental Impact Assessment affecting the legibility of the report.
- As part of the Environmental Impact Assessment “Indigenous Peoples” have been identified. Based on the information available, no direct impacts are expected resulting from the development proposal (the upgrade of Highway 20). Mitigation and management measures relating to Indigenous Peoples have therefore been excluded. It is recommended that, as part of a programme for continuous improvement, potential impacts be identified and addressed appropriately.
- This ESMP should be regarded as a live document and should be reviewed and updated as impacts become apparent during the project life.

5 Environmental and Social Management

This ESMP is developed to complete the address the issues identified in the ESAP and provide measures and actions to mitigate / manage potential adverse impacts, or to enhance positive or beneficial impacts based on the following mitigation hierarchy:

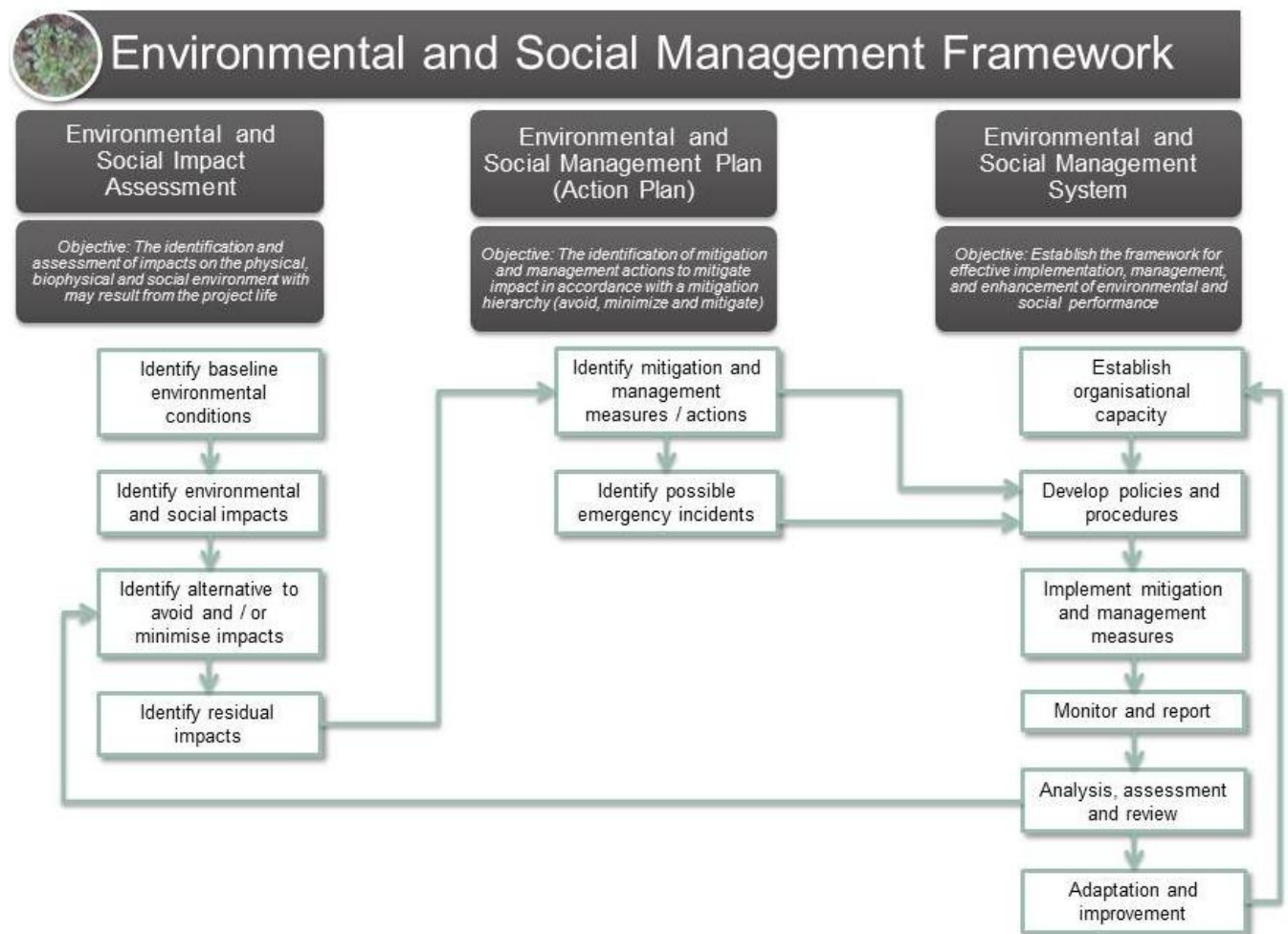
- Avoidance;
- Minimization; and
- Compensation/ Offset.

The project proponent / owner must allocate financial resources and designate responsible personnel within the organisation to implement the management program. A procedure to adjust the ESMP and, to adapt actions and mitigations based on the environmental and social monitoring data must be developed.

It is recommended that the contents of the ESMP be integrated in the overall Environmental, Health and Safety Management System (EHS MS) to be implemented for the project.

5.1 Environmental and Social Management Framework

The environmental management framework allows for the identification of environmental and social impacts, the development of mitigation and / or management actions and the establishment of a structure to ensure the effective implementation and adaption of mitigation and management measures.



5.2 Environmental and Social Impact Assessment

As previously mentioned, the impacts associated with the National Highway 20 upgrade project have been identified as part of the Report of Environment Impact Assessment Project for Rehabilitation and Improvement of National Highway No. 20 - Section from Dong Nai to Lam Dong Province, dated October 2011 and the Initial Site Visit Report (July 2012), Environmental Risk Assessment (August 2012) and Environmental and Social Action Plan (ESAP) prepared for the project by WSP Environment & Energy (August 2012).

The measures and actions included in this ESMP are based on the risks and impacts identified as part of the aforementioned assessments. The effectiveness of the mitigation of impacts must be monitored and the monitoring results must be documented, and the necessary additional corrective and preventive actions identified and implemented.

6 Environmental and Social Baseline Overview

This section provides an overview of the baseline environmental and social conditions along the route of the proposed rehabilitation and improvement works.

6.1 Physical and Biophysical Environment Overview

The Project alignment crosses through two provincial areas in Vietnam, Dong Nai Province and Lam Dong Province. The proposed route will cover a large area and is categorised by several distinct terrain types. From Km0-Km62, the road alignment traverses through the 'delta scale' terrain which is largely flat and even. Continuing on, the line passes through hills and mountain ranges which are an average height of 200-800 meters. The Km62-Km108 section of the road runs through the Chuoi and Bao Loc mountain pass. The final section of the route (Km 108-Km260) passes through mountains at a height of 600-1500m. Km171-km175 crosses through Phu Hiep mountain pass. Within the mountainous terrain, the route largely follows the slopes of the surrounding mountains.

Dong Nai Province

Approximately 76.7km of the route passes through Dong Nai Province. The route largely passes through 'delta scale' terrain and has an average height above sea level of 80-150m. The area is characterised by three main soil groups (soil formed on basaltic rock, Old alluvium and clay slate, and new alluvium) and has a long history of agriculture and forestry production.

Within the area of the proposed route and within Dong Nai, there are two main rivers, these are: Dong Nai River and La Nga River. Within the province, there are interconnecting river networks which are supported by the prolonged rainy season. Water resources within the province are abundant, however as a result of the extensive cultivation, during the dry season there is high demand for water.

Three bridges will be constructed over streams and rivers in this area. Of these, two (Gia Duc and Phuong Lam) will be constructed as replacements on the site of existing bridges, while the third (La Nga) will be a new bridge constructed to the east and adjacent to an existing bridge.

- Gia Duc Bridge (located at KM 1.8). This will be a relatively small bridge (approximately 4 meters in length) and the stream that it spans is currently highly impacted by the urban activity surrounding it including the direct discharge of sewage. The banks of the stream are quite steep and eroded with some scrub vegetation.
- Phuong Lam Bridge (located at KM 64.9) is a small bridge (approximately 5 meters in length). Water quality in the stream is highly turbid and heavily impacted by urban development on all sides.
- La Nga Bridge (located at KM 36). This is the largest of the bridges to be constructed (approximately 600m in length). The river flows north-west and is quite turbid at this location. Numerous houseboats are located on the river in the area and the occupants engage in fish farming in enclosures in the river.

Land-use

The majority of the land use along the road in this area comprises a dense mix of residential/commercial areas in urban areas. There were four general land uses observed along this section of the road which included the following:

- Dense residential/commercial use - There is little to no natural habitat provided within the roadway study area. Any vegetation present is sparse herbaceous species which provides little cover or forage for animals. In the vacant lots where construction staging and storage areas will be built, the vegetation cover will be herbaceous and shrub vegetation and would be expected to provide cover and forage for a variety of insect, small mammal, reptile, and bird species.

Along the roadway, structures for businesses and residences are generally located approximately 5 meters from the edge of pavement. In the urban areas, there are a wide variety of businesses including motorbike and engine repair, electronics, general retail, fuel stations, and restaurants. In the less urbanized areas, the most common businesses are produce stands and restaurants although mechanical repair and retail stores and fuel stations were also present at a lower density. In many of these areas, produce stands and open air restaurants are placed immediately adjacent to the edge of the road shoulder. Also present along the road are occasional government buildings, schools, and religious structures (Buddhist and Christian). In the northern portions of the highway, outside of the urban areas, traffic is generally lighter and there is more use of the road for movement

and sale of produce with was produced in the area. Street lighting is present along the entire length of the road, although only on one side. In addition electrical poles and wires also run alongside the entire length of road in this section and are all within the study area of the roadway.

- Forested - Forested areas are located along the roadway but are outside the roadway study area. In areas where there is forest, the roadway margins have already been cleared and the existing forest is generally further than 5 meters from the edge of pavement. The existing cleared zone vegetation cover is herbaceous and shrub vegetation and would be expected to provide cover and forage for a variety of insect, small mammal, reptile, and bird species. Construction staging and storage areas will not be built in the forested areas.
- Low density residential/agricultural - In these areas, the predominant vegetation cover in the study area is herbaceous and shrub vegetation. In the vacant lots where construction staging and storage areas will be built, the vegetation cover will be herbaceous and shrub vegetation. In the areas impacted by widening the quarry roads, the vegetation cover and habitat is mostly low quality herbaceous cover. All of these land cover would be expected to provide cover and forage for a variety of insect, small mammal, reptile, and bird species.
- River/wetlands - In the area near the La Ngo Bridge, the habitats in the study areas include both terrestrial and aquatic habitats. The terrestrial vegetation cover is herbaceous, mostly grasses with some wetland grasses immediately adjacent to the river. This herbaceous habitat is likely to provide some limited forage area for insects, small mammals, and birds. The aquatic habitat of the river appeared to be of generally good quality. Turbidity of the water was moderately high; however, flow was good and the abundance of fish cultivation in the river indicates the river can support fish species and their food sources. In areas near the Gia Duc and Phuong Lam bridges, the existing aquatic habitat typical of urban settings. The stream habitats are of poor quality with high turbidity, heavy siltation, eroded stream-banks, minimal tree overhang, and uncontrolled sewage runoff. At best, the streams at these bridges provide cover for invertebrates and fish adapted to highly impacted urban streams.

Biological aspects in Dong Nai Province

The majority of the land use along this section of the highway comprises a dense mix of residential/commercial properties. There are no designated ecological areas within the site boundary in Dong Nai Province and no records of any protected species. Habitat within the site boundary comprises primarily of sparse herbaceous species which provides little cover or forage for animals. In the vacant lots where construction staging and storage areas will be built, the vegetation cover will be herbaceous and shrub vegetation and could to provide cover and forage for a variety of insect, small mammal, reptile, and bird species. There are no known areas of natural or critical habitat within the scheme boundary. Areas of modified habitat within and in close proximity to the proposed works consist of agricultural land of low conservation value and impacts on these areas are likely to limited and of a temporary nature (dust deposition and encroachment of earth from stockpiles). Therefore, no ecological/ protected species surveys are required for the area within the scheme boundary. .

Key ecological features in the region

The key ecological areas with the region include:

Tropical forest ecosystem between Km60-Km70;

Tri An Lake with an area of 13,759ha situated approximately 5km from the alignment; and

Cat Tien National Park, with an area of 70,548ha located approximately 4km from the route. This area is of high ecological value and comprises fauna which are mentioned in the IUCN Red List 2006, 2007 and Decree 32/2006/ND-CP SDVN, including: *Rhinoceros sondaicus*, *Pygathrix nigripes*, *Nomascus gabriellae* and *Ursus malayanus*. In relation to aquatic species, the national park includes 5 threatened species as listed in the Vietnam Red Book at national level.

Cultural Heritage

There are no known areas of archaeological significance within the area of the proposed highway development scheme in this area. There are numerous churches and pagodas located along the route, although all of these are outside the scheme boundary. A distinctive rock formation is located KM 45-47 near the town of Dinh Quan and a tourist area has developed at this location where the road bisects the rocks.

Lam Dong Province

Km76 to Km268 (approximately 151.2km) of the route passes through Lam Dong Province which is predominately characterised by hilly to mountainous terrain. The majority of the land within the province is based on steep slopes that are susceptible to erosion and runoff during the rainy season. Much of the soil within the province is suitable for the growth of crops and plantations.

Lam Dong province's water network is characterised by the Dong Nai River, which has three tributaries traversing through the area, these are: Da Dang River, Da Nhim River and Da Huoai River. In addition, the La Nga River runs through the province. Water reserves within the area are high, however higher localities within mountainous regions are unable to use groundwater reserves for irrigation.

Three bridges will be constructed over streams and rivers in this area and these are located at:

- Darleu Bridge (located at KM 86.7). This will be a relatively small bridge (approximately 6 meters in length). Water in the river has a moderately high turbidity and the banks of the river are well covered in herbaceous scrub. Upstream of the bridge there are also sediment bars which also support herbaceous plant species. Water quality in the area of the bridge is generally classified as moderate.
- Dai Quay Bridge (located at KM 88.5). This is a significant bridge spanning the river for a length of 45 meters. The banks of the river in this area are densely vegetated with herbaceous scrub. Water quality in the area is considered to be good.
- Damrhe Bridge (located at KM 97.9). This is a relatively small bridge (approximately 8 meters in length). The watershed of the river in this area is relatively undeveloped and the banks of the channel are densely vegetated with herbaceous scrub. Water quality in the area is considered to be good.

Land-use

The majority of the land use along this section of the road was low density residential/agricultural area. There were three general land uses observed along this section of the road which included the following:

- Low density residential/agricultural - In these areas, the predominant vegetation cover in the study area is herbaceous and shrub vegetation. In the vacant lots where construction staging and storage areas will be built, the vegetation cover will be herbaceous and shrub vegetation. All of these land covers would be expected to provide cover and forage for a variety of insect, small mammal, reptile, and bird species.
- Dense residential/commercial use - There is little to no natural habitat provided within the roadway study area. Any vegetation present is sparse herbaceous species which provides little cover or forage for animals. In the vacant lots where construction staging and storage areas will be built, the vegetation cover will be herbaceous and shrub vegetation and would be expected to provide cover and forage for a variety of insect, small mammal, reptile, and bird species.

Along the roadway, structures for businesses and residences are generally located approximately 5 meters from the edge of pavement. In the urban areas, there are a wide variety of businesses including motorbike and engine repair, electronics, general retail, fuel stations, and restaurants. In the less urbanized areas, the most common businesses are produce stands and restaurants although mechanical repair and retail stores and fuel stations are also present at a lower density. In many of these areas, produce stands and open air restaurants are located immediately adjacent to the edge of the road shoulder. Also present along the road are occasional government buildings, schools, and religious structures (Buddhist and Christian). In the northern portions of the highway, outside of the urban areas, traffic was lighter and there was more use of the road for movement and sale of produce with was produced in the area. Street lighting is present along the entire length of the road, although only on one side. In addition electrical poles and wires also run alongside the entire length of road in this section and are all within the study area of the roadway.

- Forested - Forested areas are located along the roadway but are outside the roadway study area, except in the mountainous areas. In the non-mountainous areas where there is forest, the roadway margins are predominantly herbaceous and shrub cover within 3-4 meters of the edge of pavement with the forest vegetation starting approximately 4-5 meters from the road edge. In the mountainous areas, the forest areas are very close to the road due to the steep slopes, often within a meter. This roadway fringe shrub and forest vegetation would be expected to provide cover and forage for a variety of insect, small mammal, reptile, and bird species. Construction staging and storage areas will not be built in the forested areas.

Biological aspects in Lam Dong Province

The majority of the land use along this section of the highway comprises low density residential and agricultural areas. There are no designated ecological areas within the site boundary in Lam Dong Province and no records of any protected species. Habitat within the site boundary comprises primarily of sparse herbaceous species which provides little cover or forage for animals. In the vacant lots where construction staging and storage areas will be built, the vegetation cover will be herbaceous and shrub vegetation and could to provide cover and forage for a variety of insect, small mammal, reptile, and bird species. There are no known areas of natural or critical habitat within the scheme boundary. Areas of modified habitat within and in close proximity to the proposed works consist of agricultural land of low conservation value and impacts on these areas are likely to be limited and of a temporary nature (dust deposition and encroachment of earth from stockpiles). Therefore, no ecological/ protected species surveys are required for the area within the scheme boundary.

The majority of the route alignment along the Km0-Km76.7 and Km108-Km268 is characterised by secondary scrub that grows on degraded land and grassland which has been subject to erosion and wet soils. The most common plantations along the route are rubber, cashew, pepper, coffee and tea. Surveys have found that there are no rare species as listed on the Vietnam Red Book in relation to insects, birds, reptiles and amphibians, and mammals within these two sections of the route.

The proposed route passes through forests along the Chuoi and Bao Loc mountain pass in Lam Dong province for approximately 20km for the Km76.7-Km98 section. This area comprises natural forests which include broad-leaved forest, evergreen broadleaf forest, secondary forest mixed with bamboo, secondary scrub and grasslands. In addition, this area is used for plantations and crops. Surveys of the area found that there were no rare or threatened species within close proximity to the route or forests areas.

Cultural Heritage and Indigenous People/ Communities

There are no known areas of archaeological significance within the area of the proposed highway development scheme in this area.

An indigenous community is located approximately 1km from the road near KM 85. The community is accessed via a paved road off Highway 20 at KM 84.9. This community is known as the K'Ho (or Koho) and are amongst the poorest of Vietnam's indigenous minority peoples. Traditionally slash and burn farmers, they settled in the southern part of the fertile Central Highlands area of Vietnam.

A popular resort/recreational park known as Madagui is located off of Highway 20 near KM 83. There are some lodging/restaurant areas that have developed adjacent to Highway 20 in this area.

6.2 Social Environment Overview

Dong Nai Province

Dong Nai province occupies approximately 5,907km² of Vietnam and is located in the south east of the country. In 2009, the population within the province was 2,491,262, where approximately 33% of these people inhabited urban areas. Over half of this population are of working age and are employed within industrial related jobs.

Key social indicators:

- Birth rate has reduced to 1.14%;
- 85% of the wards, communes and towns now have secondary education which is universal;
- 72% of the clinics have full time doctors, with 95% of the local areas obtaining national health care. On average, there are 4 doctors to 10,000 people and 17 hospital beds to 10,000 people;

There are three districts within the province which lie close to the proposed route, these are: Thong Nhat, Dinh Quan and Tan Phu.

Thong Nhat District

Thong Nhat is a midland district within Dong Nai Province and shares its administrative boundaries with: Dinh Quan district in the North, Long Khanh Town in the East, Long Thanh district and Cam My district in the South, and Trang Bom district in the West. In 2009, there were 148,273 people in the district, which had a population density of 599,786 people/km². Within Thong Nhat district there are 10 administrative units.

Dinh Quan District

Dinh Quan district is located in the east of Dong Nai province and adjoins Tan Phu district in the north east. This district has an average population of 193,150 people with a density of 198.87 people/km². There are 14 administrative units including Dinh Quan Town and 13 communes within close proximity to the proposed route.

Tan Phu District

Tan Phu is a mountainous district which is situated in the north of Dong Nai province and is approximately 100km from Bien Hoa city. The district is adjacent to Dinh Quan district in the south west and Vinh Cuu in the west. The district covers an area of 775.67km², which accounts for 13.1% of the overall province. The average population in 2009 was 156,684 people, with a density of 201.998people/km². Within the district are 18 administrative areas in close proximity to the proposed route

Lam Dong Province

In 2009, the population within Lam Dong province was approximately 1,186,786 people, presenting a 1.7% population change since 1999. Within the urban area, there are approximately 449,430 people which is lower than the population within rural areas (737,356 people).

Key social indicators:

- The whole province now has universal secondary school education;
- Health care in relation to infectious diseases has strengthened with additional free care being provided to vulnerable age groups;
- The province currently has 7,318 households which are classified as being within poverty who live in temporary houses within remote districts. Vietnam Fatherland Front in Lam Dong province mobilises resources to support poor households in housing and has commenced the construction of over 1,300 houses.

Within the province there are 7 districts Da Huoi, Bao Loc City, Bao Lam, Di Linh, Duc Trong, Da Lat City and Don Duong.

Da Huoi District

Da Huoi is situated within the southwest of Lam Dong province and covers a total area of 495.3km². Its population is approximately 33,864 people with an average density of 76.9people/km². There are 3 communes located in close proximity to the proposed route, Madagui Town, Ham Lam Commune and Dam Ri Town.

Bao Loc City

Bao Loc City was established in April 2010 and is situated on Highway 20 national road, 110km from Da Lat City. The area accounts for 2.38% of the overall province, in which 17,294ha of land is used for agriculture. The majority of the population within the city are Kinh people (150,428 people / 40,104 households) and approximately 2.33% are minority groups. Bao Loc has focused on developing agricultural and industrial sectors and continues to grow tea plantations, processing up to 150,000 tonnes of fresh tea per year. There are 7 communes in close proximity to the proposed route location, namely Dai Lao Commune, Loc Chau Commune, Ward 01, B'Lao Ward, Loc Tein Ward, Loc Son Ward and Loc Nga Ward.

Bao Lam District

Bao Lam district has a sparse population with a density of 75 people/km², the overall population is approximately 109,994 people. Bao Lam district is located within Di Linh – Bao Loc highland, between Bao Loc Town and Di Linh district. The district is situated in the central area of industrial development of the province and plays an important role in the course of social and economic development, especially within the heavy industry sector. The district covers approximately 146,344ha and is one of the largest areas within the province. Both the national Highway 20 and

interprovincial road from Bao Loc to Ham Thuan – Da Mi hydropower project contribute to access to nearby cities and provinces in the south and central regions.

The district has 14 administrative units, including Loc An commune which is located close to the proposed route.

Di Linh District

Di Linh district is situated within the centre of the province and is close to nearby cities. The district has 18 communes and an average population of 154,786 people with a population density of 96people/km². There are 7 communes which lie in close proximity to the proposed route, namely Dinh Trang Hoa Commune, Lien Dam Commune, Di Linh District Town, Tan Nghia Commune, Dinh Lac Commune, Gia Hiep Commune and Tam Bo Commune.

Duc Trong District

Duc Trong district is situated close to the national Highway 20 (Da Lat – Ho Minh City), interprovincial road 27 (Ninh Thuan – Dak Lak) and Lien Khuong airport. As a result of this location, the district plays an important role in the socio-economic development of Lam Dong province. The district covers an area of 901.8km² with a population of 166,377 people, accounting for 13.8% of the province's population. The population density of the district is the third highest in Lam Dong province. There are 5 communes situated close to the proposed route, namely Ninh Gia Commune, Phu Hoi Commune, Lien Nghia District, Hiep Thanh Commune and Hiep An Commune.

Da Lat City

Da Lat is Lam Don provincial city, located in Lam Viet high land, with an altitude of 1,500m above sea level. Da Lat city is situated in the north of the province and borders Lac Duong commune. The city is also adjacent to Son Duong, Lam Ha and Duc Trong commune. The total area of the city is 393.29km² and is surrounded by mountains. There are five communes/wards which fall near the proposed route, namely Ward 3, Ward 10, Ward 11, Xuan Tho Commune and Xuan Truong Commune.

Don Duong District

Don Duong district is located in the southeast of Da Lat, in the south of Lam Vien Plateau and has an altitude of 100m above sea level. The district covers an area of 61,032ha, 16,816.5ha of this is used for agricultural purposes. The area has 1 town and 9 communes within it and has a population of 94,268 people, of which ethnic minorities account for 30% of the population. Dran Town is situated close to the proposed route.

7 Project Description

7.1 Summary of Key Works

The project will comprise the rehabilitation and reformation of the NR20 highway, in addition to the construction of the associated bridges along the route. Therefore, there are two key works related to the project, these are:

Implementation of the road

- Each section will be planned in terms of time, schedule, progress, the availability of equipment / technology and workforce of the contractors without affecting the NR20's traffic;
- Construction of the road will be carried out on a consecutive basis and therefore no new road section will be permitted to be constructed if a previous section has not been completed;
- Cross culverting will be done before road works; and
- Vertical culverting is required to be in line with other cross culverts and road work to increase quality and the appearance of the road.
- Implementation of bridge work
- Site clearance will be undertaken within the areas of bridge works and trees (including stumps and roots) will be removed within the construction area;
- Temporary bridges and roads will be constructed at the sites of the 12 small and medium bridges where centrelines of the old and new bridge share the same point (these will include the following bridges: Gia Duc, Phuong Lam, Darleu, Dai Quay, Damrhe, Dinh Trang Hoa, Darle, Heip Thuan, Xom Trung, Dinh An I, Cau Dat and Cau Xeo. The 4 remaining bridges will be demolished once the new bridges have been constructed alongside;
- Removal of bridges will include removing the railing system, bridge deck and bridge beam. Concrete and bridge pile foundations will also be removed; and
- New bridges will be constructed through the erection of cast-in-situ concrete pile or driven pile. The erection of a terrestrial supporting pier will be done through the use of a cutting method. Following this, the construction of the foundations/abutment/tower will occur.

The locations of the new bridges are scattered along the road, therefore each site will have its own construction site. Each site will be equipped with a batch plant which may be shared with nearby small bridges within a scope of 10km. Any concrete delivery will be made using NR20. To reduce costs, several construction sites for the bridges will be used to make the beams and to deliver them to other nearby bridge sites.

The project will involve the construction and rehabilitation of the existing National Highway 20, along with the surrounding environment. The objectives & principles for rehabilitation are as follows:

- Achieve physical stability across the site and for all residual landforms;
- Ensure chemical stability of the site;
- Minimise and/ or eliminate any residual environmental impacts;
- Ensure human safety, and
- Ensure that the future land use will be practicable.

Materials for the road will come from 2 active stone mining quarries, which are:

- Quarry Soklu 2 located at ward Nguyen Hue 2, Quang Trung commune, Thong Nhat dist., Dong Nai province. The exploited area is about 15 ha, featured by huge deposit and high-quality rock. The monthly output of the

quarry is approximately 20.000 m³ for construction sites within and beyond the province. Delivery by road; 4-km distance from quarry to project, 1-km distance from the quarry along the stone road with width is 5-6m asphalt concrete road 762 with width is 4-6m., 3-km to Km7+000 of NH20; and

- Quarry Tan Thanh Tu: Locates at Bao Loc town, Lam Dong province. The exploited area is about 12ha, featured by high-quality rock. Monthly capacity of 10.000m³/month, for construction sites within and beyond the province. Delivery by road: 8 km from quarry to project.

Both quarries have mining permits from local authorities, Province Department of Natural Resource, to provide materials for NH20 project.

Construction staging and storage areas for assembly, materials, and equipment storage will be located at 10-15km intervals on unoccupied sites along the highway. While the actual locations of these areas have not yet been identified, BT20 intends to acquire undeveloped and non-forested properties. These construction and storage areas are approximately 800 m² in area and are cleared to bare earth and grasses. There is no plan to house workers in a concentrated location. During construction, BTC plans to rent rooms or space in the homes of residents near the work site to house the 20-30 workers working on each road segment.

Waste materials from demolition, clearing and construction will be recycled and reduced where possible. Material that cannot be reused will be disposed of within existing appropriately municipal waste landfills in each of the districts at the direction of District officials. No new waste disposal areas will be required and therefore, the study area will be unchanged.

On-going Rehabilitation

On-going rehabilitation can be defined as the remediation of the site during the construction and operational phases of the project. It implies that once activity in a particular area of the site ceases, rehabilitation of that area can commence. The following general rehabilitation practices are to be implemented across the site:

- Re-vegetation will take place in areas that were subjected to surface disturbances during the construction phase beyond the actual footprint of the activities. This includes areas where soils were removed or areas where soils and rocks are temporarily or permanently stored and covered with topsoil.
- The purpose of this is firstly to ameliorate the visual impact associated with the disturbance and secondly to prevent resulting impacts from affecting surrounding areas, such as erosion and dust control. In order to achieve these goals it is imperative that the layer of vegetation that is established is similar in appearance and species composition than the surrounding areas. Access to the areas undergoing rehabilitation is to be restricted. Success of the re-vegetation of impacted areas will ultimately be the establishment of a layer of vegetation that is:
 - Similar in appearance, species and structure to surrounding vegetation;
 - Cover impacted areas in order to contain existing impacts and stabilize soil conditions, and
 - Ensure that there are available water resources to maintain new vegetation.
- Erosion control measures for newly rehabilitated areas must be applied.

Rehabilitation of Construction Camps

Sixteen temporary construction camps will be established during the construction phase of the project. The construction camps are located at Km1+880, Km35+712, Km65+056, Km86+700, Km88+850, Km97+900, Km129+500, Km139+300, Km149+303, Km177+800, Km183+376, Km189+200, Km194+771, Km217+810 and Km254+254, Km263+100. Based on the available information it is understood that a number of these camps are likely to be located on farmland that will be leased from the landowners and rehabilitated before being handed back.

The following rehabilitation measures must be implemented at the time of removal of the above-mentioned camps:

- Remove all infrastructure and waste from the site. All hazardous and domestic waste is to be containerised and disposed of at a suitably registered site;
- All fences are to be taken down and removed from site;

-
- Once all structures have been removed from the site, the area is to be contoured to be free draining and is to blend with the surrounding topography;
 - Topsoil removed and stockpiled is to be placed onto the affected areas; and
 - The area is to be re-vegetated with the appropriate species.

Rehabilitation of Farmland

Additional to the measures outlined above during the rehabilitation of farmland, the following measures must be implemented:

- Prior to the contouring of the site, the affected areas are to be inspected for any residual contamination. Any contaminated soils are to be removed and disposed of appropriately;
- Compacted areas must be ripped to a depth of 500mm; and
- Soil sampling should be carried out to determine the fertilizer requirements. Additional soil sampling should also be carried out annually until the levels of nutrients, specifically phosphorus and potassium, are at the required level (approximately 20 and 120 mg / kg respectively).

8 Summary of Impacts and Management Requirements

The following matrices provide a summary of the potential environmental and social impacts and propose management measures associated with the Highway 20, Dong Nai to Lam Dong Province rehabilitation and improvement works.

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
Preparation Phase													
Site Clearance	Removal and re-settlement												X
	Occupancy of houses, building and land											X	X
Permanent occupancy of agricultural land	Affecting production, business											X	X
	Affecting local economy											X	X
	Affecting residents' income			X				X				X	X
	Relocation of businesses											X	X
Removing electrical	Interrupting electric and telecom supply source											X	X

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
and telecom systems	Generation of waste (inert/hazardous) Recycle/reuse where possible. Residual waste to licensed landfill.				X	X			X				
Temporary occupation of agricultural land	Affecting residents' income										X	X	
	Contamination/compression of soils			X			X	X					
Demolition of buildings	Reduced air quality	X		X							X		
	Noise pollution		X								X		
	Generation of waste (inert, hazardous)				X	X		X	X		X		
	Increased traffic movements/ accidents	X	X								X		
Levelling and grading site and access	Reduced air quality	X		X							X		
	Noise pollution		X								X		
	Increased traffic movements/ accidents	X	X								X		
	Impact on archaeological resource									X	X		
	Soil erosion						X						

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
Setting up site working space Installing equipment	Reduced air quality	X		X								X	
	Noise pollution		X									X	
	Waste generation (inert/hazardous)				X			X	X			X	
	Storage/ handling/ use of hazardous materials	X			X	X		X	X			X	
	Increased traffic movements/ accidents/ congestion	X	X									X	
Development of Construction Staging and Storage areas	Reduced air quality	X		X								X	
	Noise pollution		X	X								X	
	Increased traffic generation/ accidents/ spillages	X	X					X				X	
	Land acquisition			X							X	X	X
	Contamination/compre ssion of soils			X		X	X	X				X	
Construction Phase													
Requirement for construction materials	Quarrying of rock	X	X	X	X	X	X	X	X	X	X	X	X
	Extraction of sand	X	X	X	X	X	X	X	X	X	X	X	X
	Extraction of soil	X	X	X	X	X	X	X	X	X	X	X	X

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
	Use of water					X	X			X			
	Increased traffic movements/ accidents/ congestion	X	X					X				X	
Sub-grading, excavating , embanking the road base and road construction	Reduced air quality	X		X								X	
	Noise pollution		X	X								X	
	Traffic disruption	X	X									X	
	Construction waste				X	X		X	X			X	
	Restrictions on access to residential and commercial properties											X	X
	Localised soil contamination			X		X		X				X	
	Controlled /uncontrolled surface water run-off					X	X						
	Soil erosion							X					
	Soil deposition on adjacent land from stockpiles					X	X					X	X
	Impact upon archaeological resource										X	X	

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
Operation of Batching Plants	Reduced air quality	X		X		X		X	X	X		X	
	Noise Pollution		X	X								X	
	Increased traffic generation/ accidents/ spillages	X	X					X				X	
	Land acquisition			X									X
	Contamination/ compression of soils			X			X	X	X	X		X	
	Light Pollution			X								X	
Construction of river flyover Excavating the foundation pit	Land acquisition											X	X
	Noise pollution		X	X								X	
	Reduced air quality	X		X								X	
	Impact upon archaeological resource									X	X		
	Controlled/uncontrolled discharges to water bodies			X		X	X	X				X	
	Soil erosion						X						
	Construction waste				X				X				
	Accidents and spillages			X		X		X				X	

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
	Light Pollution			X								X	
	Increased traffic movements/ accidents/ congestion	X	X					X				X	
Construction of river flyover Excavating the bored piles	Noise Pollution		X	X								X	
	Reduced air quality	X		X								X	
	Impact upon archaeological resource									X	X		
	Construction waste				X			X	X				
	Accidents and spillages			X	X			X				X	
	Increased traffic movements/ accidents/ congestion	X	X					X				X	
	Impact on groundwater					X		X				X	
	Controlled/uncontrolled discharges to water bodies			X		X	X					X	
	Soil erosion						X						
	Light Pollution			X								X	
Construction of river	Noise Pollution		X	X							X		

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
flyover Excavating the upper bridge	Reduced air quality	X		X								X	
	Impact upon archaeological resource									X		X	
	Construction waste				X				X				
	Increased traffic movements/ accidents/ congestion	X	X					X				X	
	Controlled/uncontrolled discharges to water bodies			X		X	X					X	
							X						
	Accidents and spillages			X	X			X				X	
	Impact on groundwater												
	Light Pollution			X								X	
Construction of river flyover and upper bridge	Noise Pollution		X	X								X	
	Reduced air quality	X		X								X	
	Construction waste				X			X	X			X	
	Controlled/uncontrolled discharges to water bodies			X		X	X					X	

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
	Soil erosion						X						
	Increased traffic movements/ accidents/ congestion	X	X					X				X	
	Accidents and spillages			X	X			X				X	
	Light Pollution			X								X	
Operation of Staging and storage yards	Noise Pollution		X	X								X	
	Construction waste				X			X	X				
	Reduced air quality	X		X								X	
	Increased traffic movements/ accidents/ congestion	X	X					X				X	
	Controlled/uncontrolled discharges to water bodies					X	X	X				X	
	Localised contamination/ soil compression			X		X		X				X	
	Light Pollution			X								X	
	Accidents and spillages			X	X			X				X	
General site	Noise Pollution		X	X								X	

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
Maintenance activities	Reduced air quality	X		X								X	
	Waste generation				X			X	X				
	Localised spillages					X		X					
General community effects	Increased traffic movements resulting in increased risk to public												
	Health and safety risks to public												
	Impacts of site security on public											X	
	Presence of migrant workforce (social/cultural)											X	
	Impacts on local resources from construction workforce											X	
	Impact on local facilities form											X	
	Impact on community health from construction workforce											X	
Operational Phase													

Stage / Impact		Management Plans											Resettlement Action Plan/ Business Impact Assessment Plan
		Air Emissions Management Plan (Appendix 1)	Noise and Vibration Management Plan (Appendix 2)	Ecological Management Plan (Appendix 3)	Waste Management Plan (Appendix 4)	Water Management Plan (Appendix 5)	Erosion and Sediment Control Plan (Appendix 6)	Spill Prevention and Response Plan (Appendix 7)	Hazardous Materials Management Plan (Appendix 8)	Raw Materials Management Plan (Appendix 9)	Cultural Heritage Management Plan (Appendix 10)	Communities Impact Management Plan (11)	
Road Users	Noise Pollution		X	X								X	
	Reduced air quality	X		X								X	
	Controlled/uncontrolled surface water drainage discharge			X		X	X					X	
	Increased traffic movements/accidents/congestion	X	X	X		X		X				X	
	Light Pollution			X									

9 Organisation Commitment

9.1 Management Structure

The proposed Environmental and health and safety management structure, the related parties' roles and responsibilities during preparation and construction phase are outlined in the table below:

Unit	Responsibility for environment
PMU7	<ul style="list-style-type: none"> - Select the environmental consultant. The commission will be paid by BT20. - Receive and supervise the environmental report from the Independent Environmental Consultant (IEC), reporting to the Investor (BT20), Department of Natural resources and Environment of Lam Dong and Dong Nai on a weekly basis. PMU7's specialist will be in charge of review environmental report and recommend further actions based on IEC proposal. - Cooperate with BT20 to periodically supervise contractors' activities. Weekly meetings will be held between Contractors, PMU7, BT20 and consultants. In addition, BT20 and PMU7 have assigned personnel for irregular inspection. - In case of any violations or arising works that submitted by the Environmental consultant, PMU7 will request contractors to amend and correct the violation.
Investor BT20 Cuu Long	<ul style="list-style-type: none"> - Receive and supervise the environmental report from the consultant. - Cooperate with PMU7 to periodically supervise contractors' activities. - In case of any violations or arising works that submitted by the Environmental consultant, BT20 Cuu Long will request contractors to amend and correct the violation based on PMU7 decision.
Independent Environmental Consultant	<ul style="list-style-type: none"> - Make reference and prepare site specific plans in accordance with ESMP framework approved by MIGA. The respective contractors will be required to formally commit to requirements of the site-specific Management Plans. - Establish environmental procedure and notify and obtain formal commitment from contractors. - Observe directly the performance of the environmental works, report mitigation measures of the environmental impact result from contractors activities; - Review weekly environmental reports prepared by the Principal Contractor; - Undertake assessments and audits and issue environmental supervision reports on a weekly basis - Report to PMU7 and Investor (BT20-Cuu Long) the performance of the contractors, and recommend countermeasures if any.
Contractors	<ul style="list-style-type: none"> - After receiving and committing to the environmental procedures and Management Plans, Contractors must fully carry out the measures of the environmental protection as indicated; - In case of any violations or arising works that either detected by Environmental consultant or proposed by contractors, they must be reported to PMU7 and Investor for further actions. - If contractors decided to not follow instruction from PMU7 and Investors, construction activities will be halted until necessary actions are taken.

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Unit	Responsibility for health and safety
PMU7	<ul style="list-style-type: none"> - Select technical consultant - Receive and supervise the construction and inspection report from the consultant, weekly reporting to the Investor (BT20), Ministry of Transportation. - Cooperate with BT20 to periodically supervise contractors' activities. Besides of weekly meeting between Contractors, PMU7, BT20 and consultants, BT20 and PMU7 have assigned personnel for irregular inspection/ - In case of any violations or arising works that detected and submitted by the technical consultant, PMU7 will request contractors to amend and correct the violation.
Investor BT20 Cuu Long	<ul style="list-style-type: none"> - Receive and supervise the environmental report from the consultant. - Cooperate with PMU7 to periodically supervise contractors' activities. - In case of any violations or arising works that submitted by the technical consultant, BT20 Cuu Long will request contractors to amend and correct the violation based on PMU decision.
Technical consultant	<ul style="list-style-type: none"> - Make reconciliation between existing health and safety policy with MIGA's approved policy. - Make reference and propose additional site specific plans in accordance with ESMP framework approved by MIGA, if appropriate. - Establish procedure and notify the contractors. - Periodically inspect the performance of the construction activities, health and safety management at construction site. - Analyze and issue reports periodically; - In case technical consultant detect violations at construction site related to health and safety management, they must promptly report to PMU7 and Investor (BT20-Cuu Long) and recommend countermeasures if any.
Contractors	<ul style="list-style-type: none"> - After receiving health and safety procedure, Contractors must inform to fully carry out the measurement of the health and safety protection as indicated; - Contractors must assign at site personnel in charge of health and safety procedure. Any changes related to health and safety procedure must be informed to Technical consultant, PMU7 and Investor BT20 Cuu Long for approval. - In case of any violations or arising works that either detected by technical consultant or proposed by contractors, they must be reported to PMU7 and Investor for further actions. - If contractors decided to not follow instruction from PMU7 and Investors, construction activities will be halted until necessary actions are taken.

9.2 The Role of Independent Environmental Consultant

PMU 7 have committed to commissioning an Independent Environmental Consultant (IEC). The IEC's responsibility will include:

- Ensuring adherence to the requirements of the ESMP;

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- Preparation of site-specific Environmental Management Plans in compliance with the requirements of the Management Plans presented in this ESMP (Appendix 1-12). These plans will then be presented to the respective contractors who will be required to formally to commit to comply to the requirements of the plan;
 - Undertaking audits/ inspections of working practices and facilities (including site works, storage compounds, etc) against the requirements of the site-specific management plans;
 - Reviewing audit/ inspection reports prepared by the Contractors environmental personnel;
 - Provision of guidance and advice to contractors in relation environmental management procedures and mitigation options;
 - Provision of guidance on adaptive management;
 - Responding to incidents incident control/ accidents and ensuring the implementation of appropriate response measures;
 - Develop and maintain a Grievance/Complaints Register and implementation of the grievance response mechanism (See Section 16.4); and
 - Provide independent reports to PMU 7 and BT20 on a weekly basis.

The IEC shall be a suitably qualified individual employed by the PMU 7 on an independent basis.

9.3 Construction Phase

During the construction phase, the principal contractor will be required to allocate the responsibility of overseeing day-to-day compliance with the ESMP to a senior member of his/ her staff. The principal contractor will be responsible for the implementation of all measures included in the ESMP for all activities undertaken in terms of the construction contract (including work undertaken by sub-contractors).

Compliance reviews will be submitted by the principal contractor to the IEC on a weekly basis. Non-conformances, incidents and deviations from the action plan will be communicated to the IEC as soon as possible within 24hours from the time of occurrence.

10 Contractual

The following contractual conditions apply to the site contractors employed by BT20:

- All tendering contractors will be required to provide a formal commitment to comply with the requirements of this ESMP. The contractors will be required to sign compliance appendix within the ESMP.
- Failure to provide a formal commitment to comply with the requirements of this ESMP within submitted tenders would make the tenderer ineligible to be commissioned for the contract.
- The contractor will be required to prepare site-specific Management Plans in accordance with the requirements of Management Plans 1-12 as presented in this ESMP. All Contractor Management plans will be formally reviewed by the Independent Environmental Consultant prior to agreement and sign-off by PMU 7. All plans must be agreed signed-off by PMU 7 within a 3 month period of signing the appendix.
- The contractor will undertake to provide formal written reports to PMU 7 in accordance with requirements set-out Appendix 12: Environmental Reporting Plan.
- The IEC will induct all contractors and sub-contractors and personnel working on the project on the contents of this ESMP and any penalties arising from non-compliance.
- The IEC shall clearly identify the areas that must be protected from disturbance by the contractors' activities at the commencement of the contractors' contract. The Contractor shall restrict all its activities, materials, equipment and personnel to within the area/s specified and prepare a construction area layout plan for approval PM7 and the relevant local authority prior to construction commencement.
- The contractor will responsible for notifying PMU 7 (via the Independent Environmental Consultant) of any complaint or grievances received and of any corrective actions identified and implemented.

11 Training

PMU 7 must identify the knowledge and skills necessary for implementation of the management systems and programs and identify training requirements for the organisation's personnel.

All persons responsible for undertaking work during the life of the project must be trained on the contents of the ESMP. The IEC is responsible for identifying the knowledge and skills necessary for the implementation of the ESMP and associated programmes and to identify training requirements for the workers and staff involved in the implementation of the action plan.

Ensure that all site personnel have a basic level of environmental awareness training. Topics covered should include:

- What is meant by "Environment"?
- Why the environment needs to be protected and conserved.
- How construction activities can impact on the environment.
- What can be done to mitigate against such impacts.
- Awareness of emergency and spills response provisions.
- Social responsibility during construction e.g. being considerate to local residents.
- The IEC should be on hand to explain more difficult/ technical issues and to answer questions.

12 Measures for Legal Compliance

PMU 7 and all appointed agents, contractors and suppliers must confirm and ensure compliance with all relevant environmental, health and safety legal requirements.

It is recommended that a legal register be developed and compliance against the requirements be audited as part of the environmental, health and safety management system.

All applicable standards and guidelines relating to environmental, health and safety must be considered during the development of environmental legal register. All applicable international legalisation and guidelines for Good International Industry Practice (where practically possible) must be identified and included in the register.

12.1 Health and Safety Legal Compliance

The health and safety legal register must be developed to consider all applicable legalisation relating to occupational health and safety for workers, community health, safety and security as well as international legislation and guidelines for Good International Industry Practice (where practically possible).

13 Workforce

13.1 Human Resource Policies and Procedures

All workers performing work for the employer must have a contract which describes the employment relationship. The contract must be provided as part of the hiring process and shall describe all policies and procedures related to working conditions. The employment relationship with vulnerable groups, including women workers, young workers, migrant workers and workers with disabilities must be assessed to mitigate discrimination. Policies and procedures must cover all workers, including direct, contracted and supply chain workers. Policies and procedures dealing with human resource matters include (not limited to):

- Human Resources Policies:
 - Working Relationship.
 - Working Conditions & Terms of Employment.
 - Workers' Organizations.
 - Non-Discrimination & Equal Opportunity.
 - Retrenchment.
 - Grievance Mechanism.
- Protecting the Workforce:
 - Child Labour.
 - Forced Labour.
- Occupational Health & Safety.
- Workers Engaged by Third Parties.
- Supply Chain.

13.2 Working Conditions and Terms of Employment

Working conditions, treatment of workers and worker's terms of employment must be communicated to workers verbally and / or in writing. Where:

- Conditions in the workplace refer to the physical environment, health, and safety precautions, and access to facilities (including all basic services such as sanitary facilities, access to drinking water, etc.).
- Treatment of workers refers to all aspects related to respect for the worker's personal dignity, disciplinary practices and reasons and process for termination.
- Terms of employment refer to remuneration and benefits, deductions, hours of work, breaks, rest days, overtime arrangements, overtime compensation, medical insurance, pension, and leave for illness, vacation, maternity, or holiday.

13.3 Workers Organisations

All workers must be free to join workers' organisations and may enter into collective bargaining agreements with the employer. In the event that some employees are covered by collective bargaining agreements and others are not, the terms and conditions of employment as well as benefits of all employees in similar positions must be equivalent. Where collective bargaining agreements are in place, the employer should verify that these meet the requirements of the applicable legislation. In the absence of such agreements, or where the agreements do not address particular working

conditions and terms of employment, the employer shall provide reasonable working conditions and terms of employment that, at a minimum, comply with the applicable legislation.

Services to workers shall be provided in a non-discriminatory manner and comply with the applicable legislation as well as international standards for quality, security and safety.

13.4 Workers Accommodation

The following standards for workers' accommodation must be observed:

- Compliance with the applicable legislation and regulations;
- Living facilities must be located to avoid flood risk and other natural hazards;
- Living facilities must be situated within reasonable distance from the worksite and transport from the construction camp to the construction site must be safe and free for all workers;
- Living facilities must be built with adequate materials, kept in good repair and must be kept clean;
- The construction camp site must be adequately drained to avoid the accumulation of stagnant water;
- Facilities located in hot weather zones, adequate ventilation and/or air conditioning systems must be provided;
- Living facilities will be provided with adequate lighting (natural and artificial). It is recommended that the window area represents not less than 5% to 10% of the floor area.;
- Emergency lighting must be provided;
- Workers must be supplied with an adequate and convenient supply of free potable water. Depending on climate, weather conditions and accommodation standards, 80 to 180 litres per person per day must be made available. Potable water quality shall meet the applicable drinking water standards and quality and must be monitored;
- Wastewater, sewage, food waste and any other waste must be disposed of appropriately, in compliance with applicable standards and without causing any significant impacts on camp residents, the biophysical environment or surrounding communities. Containers for solid waste collection must be provided and emptied on a regular basis;
- Pest and vector control as well as disinfection must be carried out in compliance with the applicable legal requirements and / or good practice;
- Adequate sanitary and washing facilities as well as cooking and storage facilities must be provided;
- Rest and recreation facilities must be provided;
- Basic healthcare and emergency health response must be provided; and
- Living facilities must allow for sufficient privacy.

13.5 Non-Discrimination and Equal Opportunity

Apply the principles of equal opportunity and non-discrimination through effective methods and as applicable to country specific aspects and the relevant legislation. The basis for recruitment, training and advancement shall be based on experience, skill and qualifications and the process for recruitment and promotion shall be transparent and consistent. Avoid systematic applications of job requirements that would disadvantage certain groups.

Labour policies and procedures must address and protect disabled persons and must include appropriate working conditions, access and egress.

A grievance mechanism must be available to all workers and a procedure must be developed to address complaints, handle appeals, and provide recourse for employees. The grievance mechanism must be developed to protect the confidentiality of the worker.

14 Occupational Health and Safety

The appointed contractor will identify potential hazards and develop responses (including design, testing, choice, substitution, installation, arrangement, organisation, use and maintenance of workplaces, working environment and work processes) to eliminate sources of risk or minimize workers' exposure to hazards.

Where hazards are inherent to the project activity, or it is otherwise not feasible to completely eliminate the hazard, residual risks shall be managed through appropriate protective measures, such as controlling the hazard at source through protective solutions and by providing adequate personal protective equipment at no cost to the worker.

Training must be provided to all workers on all relevant aspects of occupational health and safety associated with their daily work, including emergency arrangements. Third parties (visitors and external service providers) must be briefed on the relevant aspects of health and safety and emergency response when accessing the premises.

The appointed contractor must document and report occupational injuries, illnesses and fatalities. It is recommended that a process for reporting near misses and unsafe behaviours be developed as a proactive approach to occupational health and safety risk management. Adequate access to first aid and medical assistance in cases of work related accidents or injuries must be provided.

The overall site management system must be designed with adequate capacity for oversight of occupational health and safety matters.

14.1 Physical Hazards to Workers

Physical hazard to workers must be adequately assessed in may include (but not limited to the aspects included in Table 1⁴.

Table 1: Physical Hazards to Workers

Aspect	Considerations
Rotating and moving equipment	<ul style="list-style-type: none"> Machine design is to eliminate trap hazards and to ensure that extremities are kept out of harm's way under normal operating conditions (for example emergency stops, machine guards, etc. must be installed). Turn off, disconnect, isolate, and de-energize (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, to prevent injury. Design and install equipment, where feasible, to enable routine service, such as lubrication, without removal of the guarding devices or mechanisms.
Noise	<ul style="list-style-type: none"> No employee shall be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. No unprotected ear shall be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C). The use of hearing protection must be enforced actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140 dB(C), or the average maximum sound level reaches 110dB(A). Hearing protective devices provided should be capable of reducing sound levels at the ear to at least 85 dB(A).
Vibration	<ul style="list-style-type: none"> Exposure to hand-arm vibration from equipment such as hand and power tools, or vibrations from surfaces shall be controlled through choice of equipment, installation of vibration dampening pads or devices.
Electrical	<ul style="list-style-type: none"> Mark all energized electrical devices and lines with warning signs. Lock-out and tag-out devices during service or maintenance. Check all electrical cords, cables, and hand power tools for frayed or exposed cords and following manufacturer recommendations for maximum permitted operating

⁴ IFC – Environmental, Health and Safety General Guideline (2007)

Aspect	Considerations
	<p>voltage.</p> <ul style="list-style-type: none"> ■ Double insulate/ ground all electrical equipment used in wet environments. ■ Establish “No Approach” zones around or under high voltage power lines. ■ Vehicles that come into direct contact with, or arcing between, high voltage wires may need to be taken out of service for periods of 48 hours. ■ Identify and mark of all buried electrical wiring prior to any excavation work.
Eye hazards	<ul style="list-style-type: none"> ■ Ensure the appropriate use of machine guards or splash shields and/or face and eye protection devices, such as safety glasses with side shields, goggles, and/or a full face shield. ■ Move areas where the discharge of solid fragments, liquid, or gaseous emissions can reasonably be predicted away from places expected to be occupied or transited by workers or visitors.
Welding/ hot work	<ul style="list-style-type: none"> ■ Provide adequate eye protection such as welder goggles and/ or a full-face eye shield for all personnel involved in, or assisting, welding operations. ■ Special hot work and fire prevention precautions and Standard Operating Procedures (SOPs) must be developed and implemented if welding or hot cutting is undertaken outside established welding work stations.
Industrial vehicle driving and site traffic	<ul style="list-style-type: none"> ■ Train and license industrial vehicle operators in the safe operation of specialised vehicles. ■ Ensure drivers undergo medical surveillance. ■ Ensure moving equipment with restricted rear visibility is outfitted with audible back-up alarms. ■ Establish rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures. ■ Restrict the circulation of delivery and private vehicles to defined routes and areas, giving preference to ‘one-way’ circulation, where appropriate.
Working environment temperature	<ul style="list-style-type: none"> ■ Monitor weather forecasts for outdoor work and provide advance warning of extreme weather and schedule work accordingly (adjust work hours, provide temporary shelters (if required), provide protective clothing and ensure adequate hydration).
Ergonomics, repetitive motion, manual handling	<ul style="list-style-type: none"> ■ Ensure appropriate facility and workstation design, consider the appropriate use of mechanical assistance to eliminate or reduce exertions, select and design tools that reduce force requirements and holding times, provide user adjustable work stations (including left handed persons), incorporate rest and stretch breaks into work processes and conduct job rotation.
Work at heights	<ul style="list-style-type: none"> ■ Install of guardrails with mid-rails and toe boards at the edge of any fall hazard area, ensure the proper use of ladders and scaffolds, ensure the use of fall prevention devices, provide appropriate training , develop rescue and/or recovery plans, and equipment to respond to workers after an arrested fall.
Illumination	<ul style="list-style-type: none"> ■ Use energy efficient light sources with minimum heat emission, undertake measures to eliminate glare/ reflections and flickering of lights, take precautions to minimize and control optical radiation, control laser hazards.
Hazardous materials	<ul style="list-style-type: none"> ■ Identify potential risk of a spill of uncontrolled hazardous materials and prepare a spill control, prevention, and countermeasure plan. ■ Make available all personal protective equipment needed to respond to an emergency.

Aspect	Considerations
Other	<ul style="list-style-type: none"><li>■ <i>Review and assess known and suspected presence of biological agents at the place of work and implement appropriate safety measures, monitoring, training, and training verification programs.</i><li>■ <i>Permit-required confined spaces should be provided with permanent safety measures for venting, monitoring, and rescue operations, to the extent possible. The area adjoining an access to a confined space should provide ample room for emergency and rescue operations.</i>

15 Stakeholders

Continued Stakeholder Consultation must be undertaken during all phases of the project. It is recommended that a Stakeholder Forum be established including directly affected parties, representatives from the local municipality and other identified persons. The forum will serve to communicate project progress, material changes to the project, grievances received and corrective action taken.

The Stakeholder Engagement Plan (SEP) is a live document and must be revised regularly to document all consultation activities proposed and undertaken. The appropriateness and effectiveness of methods of stakeholder engagement should be reviewed on a regular basis and existing methods revised and alternative methods implemented as required. Specific consideration should be given to the inclusiveness of the method utilised to ensure that all stakeholders including individuals, communities and groups and organisations are included.

16 Community Health and Safety

PMU 7 shall during the project life, continue to seek opportunities (not limited to those identified in the environmental and social impact and risk assessment) to improve environmental conditions which affects the surrounding communities (such as improvement of potable water availability or sanitary wastewater collection, treatment, or discharge) especially where these can be provided at marginal cost to the project.

16.1 Community Disease

The Contractor will be responsible for putting in place adequate surveillance programs to screen the health of workers, which may include documenting and reporting on existing diseases to avoid the introduction of new or highly resistant diseases into host communities. Any health information obtained as part of these efforts may not be used for exclusion from employment or any other form of discrimination.

Specific education and training programs for contractors must be developed and implemented to prevent the transmission of communicable diseases. Surveillance, active screening and treatment must be provided to workers in order to prevent the spread of illness in local communities by:

- Undertaking health awareness and education initiatives;
- Training health workers in disease treatment;
- Conducting immunization programs for workers in local communities to improve health and guard against infection;
- Providing health services (treatment through standard case management in on-site or community health clinic); and
- Promoting collaboration with local authorities to enhance access of workers families and the community to public health services and promote immunization facilities.

The IEC shall identify all health risks to affected communities (such as air and water quality impacts) and take the appropriate steps to avoid, minimise and mitigate such impacts via the provisions of the site-specific Environmental Management Plans which support this ESMP.

16.2 Emergency Incidents

PMU 7 will, thought-out the life of the project, continue to assess possible risks to the communities as it relates to emergency incidents (such as the uncontrolled release of pollutants and fire). Specific and timely information on appropriate behaviour and safety measures must be adopted in the event of an accident.

Communities and other stakeholders will have access to information necessary to understand the nature of the possible effect of an accident and an opportunity to contribute effectively, as appropriate, to decisions concerning hazardous installations and the development of community emergency preparedness and response plans.

Specific attention must be given to the transportation of any hazardous materials. A procedure must be developed to ensure compliance with local laws and international requirements relating to the transport of hazardous materials, including waste classification and hazard analysis, labelling, emergency response approach, vehicle and container specifications, training of the drivers, risks associated with the transportation route etc.

Where the consequences of emergency events are likely to extend beyond the project boundary (e.g. hazardous material spill during transportation on public roads), emergency response plans must be developed based on the risks to the health and safety of the affected community and other potentially affected stakeholders.

Emergency plans must address the following aspects of emergency response and preparedness:

- Specific emergency response procedures.
- Communication strategy.
- Trained emergency response teams.
- Emergency contacts and communication systems/protocols.

-
- Procedures for interaction with local and regional emergency and health authorities.
 - Protocols for fire truck, ambulance, and other emergency vehicle services.

16.3 Safety and Security

Measures to reduce safety and security risk must include (but is not limited to) the following:

- Access to construction sites must be restricted;
- Trespassing on neighbouring properties (by workers) must be prohibited and the appropriate disciplinary action must be taken in the event of transgression;
- The appropriate signage must be placed on the boundary or at the entrance to all construction sites, warning against entering the site and highlighting the health and safety risks; and
- Public awareness programmes must be developed to identify areas of particular risk and approaches to reduce risk. This may be expanded to include programmes at schools, along the road in order to advise children of the dangers of traffic.

16.4 Grievance Mechanism

A grievance mechanism will be adopted as presented in Figure 16.4. A grievance/ complaint can be submitted either via a grievance form (as presented in the Stakeholder Engagement Plan) or verbally.

A grievance can be submitted in the following ways:

- By communicating the grievance/ complaint to the local Authority/ commune (using the official grievance form, via letter/note or verbally) who will be responsible for reporting the issue to PMU 7;
- By submitting the grievance directly to PMU 7 (either verbally or via the grievance form); and
- By submitting the grievance to the contractor who will then be responsible for informing PMU 7.

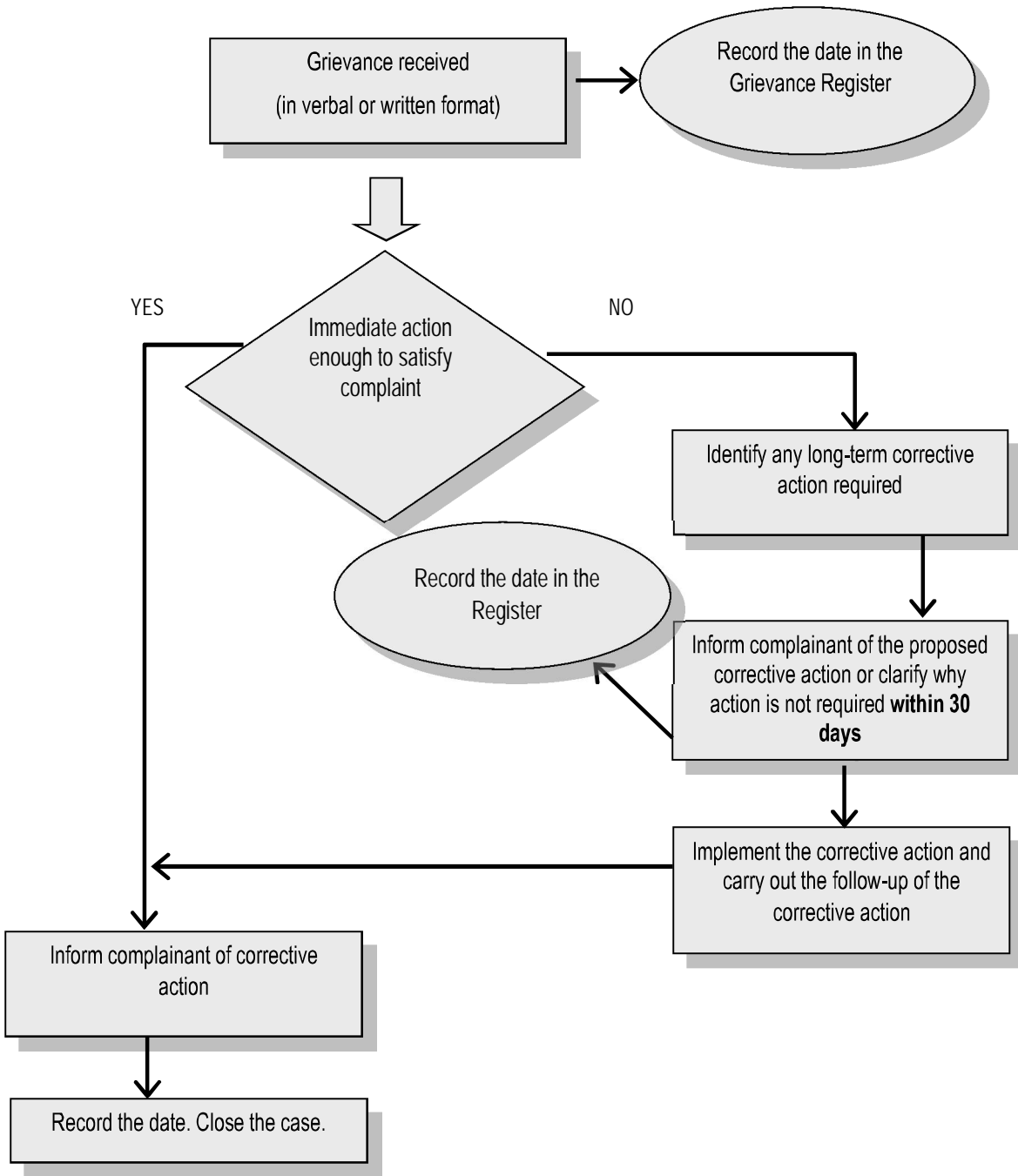
All grievances received will be forwarded to the IEC who will be responsible for recording them in a Grievance/Complaints Register and for implementing the grievance response mechanism.

Grievance Response Mechanism

When a grievance is received, the mechanism for dealing with it will be as follows:

- Grievance received;
- Grievance recorded in the Grievance/ complaints Register;
- For an immediate action to satisfy the complaint, the complainant will be informed of corrective action;
- Implement corrective action, record the date and close case;
- For a long corrective action, the complainant will be informed of proposed action; and
Implement corrective action, record the date and close case.

Figure 16.4: Flowchart for Processing Grievances to be implemented by IEC



17 Emergency Response

Appropriate emergency preparedness and response plans must be developed to ensure the effective management and mitigation of emergency incidents. Procedures must be developed based on the appropriate classification of the possible incidents. The following aspects of emergency preparedness and response must be addressed:

- The identification of the emergency scenarios and the development of appropriate and specific emergency response procedures for each scenario.
- The training of emergency response teams on the appropriate procedures and the use of emergency response equipment.
- The identification of emergency contacts and support services and the development of effective communication systems / protocols (including communication with potentially affected communities).
- As part of the development of emergency preparedness and response plans, involve the appropriate government authorities to determine procedures for engagement, communication and reporting (emergency, health, environmental authorities).
- Emergency equipment and facilities must be provided (e.g., first aid stations, fire fighting equipment, spill response equipment, personal protection equipment).
- Development of decontamination / clean-up procedures and identify critical remedial measures to contain, limit and reduce pollution.
- The identification of potential risk relating the uncontrolled release of hazardous materials and the preparation of a spill prevention, control, and response plans including:
 - Training of operators on spill prevention.
 - Implementation of inspection programmes to confirm the integrity of secondary containment structures and equipment.
 - Development of standard operating procedures for filling containers or equipment and the transfer of hazardous materials.
 - Identification of locations of hazardous materials and associated activities on an emergency plan site map.
 - Identification and availability of the appropriate personal protective equipment and equipment.
 - Clarification of roles and responsibilities of individuals or groups as well as the decision process for assessing severity of the release and determining appropriate actions.

18 Supply Chain

PMU 7 will ensure compliance with the objectives of the ESAP by all suppliers.

19 Climate

To minimise the release of greenhouse gasses to the atmosphere, maintenance of vehicles with specific focus on exhaust systems are required. Energy conservation programmes will be required to be put in place.

Appendix 1: Air Emissions Management Plan

Appendix 2: Noise and Vibration Management Plan

Appendix 3: Ecological Management Plan

Appendix 4: Waste Management Plan

Appendix 5: Water Management Plan

Appendix 6: Erosion and Sediment Control Plan

Appendix 7: Spill Prevention and Response Plan

Appendix 8: Hazardous Materials Management Plan

Appendix 9: Raw Materials Management Plan

Appendix 10: Cultural Heritage Management Plan

Appendix 11: Community Impact Plan

Appendix 12: Draft Program of Environmental Monitoring and Quality Supervision;

Appendix 13: Resettlement Action Plan

Appendix 14: Environmental and Social Action Plan

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
Organisational Commitment	Appoint a suitably qualified independent consultant to verify compliance on a weekly basis for the duration of the construction phase	Objectively verify compliance with the ESAP	Construction phase	Define scope of work and mandate	<i>ESAP compliance audit</i> <i>Weekly</i>	PMU 7	Weekly audit report to be submitted to senior executives representing PMU 7 and BT20 Weekly audit report to be submitted the relevant government department / ministry As part of the environmental, health and safety management system
	Principal Contractor will be required to allocate the responsibility of overseeing day-to-day compliance with the ESAP to a senior member of his/ her staff	Ensure the day-to-day implementation of all measures included in the ESAP and all activities undertaken in terms of the construction contract (including work undertaken by sub-contractors)	Construction phase	Define scope of work and mandate	ESAP compliance review <i>Daily</i>	IEC	Weekly ESAP compliance checklist by principal contractor to the IEC Non-conformances, incidents and deviations from the action plan will be communicated to the IEC immediately As part of the environmental, health and safety management system
	Appoint a suitably qualified independent consultant to verify compliance on an annual basis for the duration of the operational phase	Objectively verify compliance with the ESAP	Operational phase	Define scope of work and mandate	ESAP compliance audit <i>Annually</i>	PMU 7 IEC	Annual audit report to be submitted to senior executives representing PMU 7 and BT20 Annual audit report to be submitted to the relevant government department / ministry As part of the environmental, health and safety management system
Training	Assess training needs of all relevant personnel within the proponent's organisation	Ensure that the IEC and all other relevant personnel has sufficient knowledge and skills necessary for implementation of the management systems and programmes	Project life	Training needs analysis	Performance review <i>Bi-annually</i>	PMU 7	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
Legal Compliance	Develop an environmental, health and safety legal register and audit compliance therewith as part of the environmental, health and safety management system	Confirm and ensure compliance with all relevant environmental, health and safety legal requirements	Project life	Environmental, health and safety legal register Audit reports at the appropriate intervals	Legal compliance review <i>Monthly</i>	IEC	Monthly audit report to be submitted to senior executives representing PMU 7 and BT20 Monthly audit report to be submitted the relevant government department / ministry As part of the environmental, health and safety management system
Risks and Impacts							
Monitoring and Review	Monitor the effectiveness of the mitigation of impacts	Confirm the effectiveness of the mitigation measures	Project life	Environmental and social performance assessment	Performance assessment <i>Monthly</i>	IEC	Monthly audit report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
	If required, identify and implement the necessary any additional corrective and preventive actions	Enhance environmental and social performance	Project life	Amended environmental and social action plan	Performance assessment <i>Monthly</i>	IEC	Amended environmental and social action plan to be submitted to the relevant government departments / ministries as required As part of the environmental, health and safety management system
	Establish a procedure for the identification and mitigation of unforeseen risks and impacts as part of the EHS MS	Identify and mitigate unforeseen risks	Project life	Environmental and social risk and mitigation identification procedure	Performance assessment <i>Monthly</i>	IEC	As part of the environmental, health and safety management system
Workforce							
Worker's Relationship and Working Conditions	Develop human resource policies and procedures	Clearly define worker's terms of employment, their relationship with the employer, working conditions and worker rights	Project life	Human resource policies and procedures	Implementation of policies and procedures <i>On-going</i>	HR department of PMU 7	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	Provide reasonable / appropriate working conditions and terms of employment that, at a minimum, comply with national law	To achieve legal compliance and meet moral / ethical obligations as it relates to basic human rights	Project life	Legal compliance audit	Legal compliance review <i>Bi-annually</i>	HR department of PMU 7	Bi-annual audit report to be submitted to senior executives representing PMU 7 and BT20 Bi-annual audit report to be submitted to the relevant government department / ministry As part of the environmental, health and safety management system
Workers Organisations	Participate and enter into collective bargaining agreements (if required) <i>Note: In the event that some employees are covered by collective bargaining agreements and others are not, the terms and conditions of employment as well as benefits of all employees in similar positions should be substantially equivalent</i>	Allow workers to join worker's organisations and enter into collective bargaining agreements	Project life	Documented agreements	Compliance review <i>Monthly</i>	HR department of PMU 7	Documented agreements to be submitted to senior executives representing PMU 7 and BT20 Reporting requirements to the relevant government department / ministry to be confirmed As part of the environmental, health and safety management system
	Confirm that collective bargaining agreements meet legal requirements	Ensure legal compliance	Project life	Legal compliance audit report	Legal compliance review <i>Monthly</i>	HR department of PMU 7	Monthly legal compliance review to senior executives representing PMU 7 and BT20 Reporting requirements to the relevant government department / ministry to be confirmed As part of the environmental, health and safety management system
	Services to workers shall be provided in a non-discriminatory manner and comply with national and international standards for quality, security, safety and professional competency	Ensure non-discrimination and legal compliance.	Project life	Legal compliance audit report	Legal compliance review <i>Monthly</i>	HR department of PMU 7	Monthly legal compliance review to be submitted to senior executives representing PMU 7 and BT20 Monthly legal compliance review submitted to be submitted to the relevant government department / ministry

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
							As part of the environmental, health and safety management system
Occupational Health and Safety	Identify potential hazards and develop responses to eliminate sources of risk or minimize workers' exposure to hazards	Ensure safe working conditions	Project life	Hazard risk report	Safe work condition audit <i>On-going</i>	Health and Safety Technical Consultant	Periodic risk report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
	Control the residual risks / hazard at source through the use of protective solutions and provide adequate personal protective equipment at no cost to the worker	Ensure safe working conditions	Project life	Personal protective equipment issue (distribution) register	Safe work condition audit PPE review <i>On-going</i>	Health and Safety Technical Consultant	Periodic audit report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
	Provide training to all workers on relevant aspects of occupational health and safety associated with their daily work	Ensure safe working conditions	Project life	Training schedule and attendance register	Toolbox talks <i>Daily</i> Induction of new workers <i>As required</i> Health and safety training <i>Monthly</i>	Health and Safety Technical Consultant	As part of the environmental, health and safety management system
Accidents and incidents	Document and report occupational injuries, illnesses and fatalities (including near misses)	Ensure safe working conditions	Project life	Accidents and incidents register (including near misses)	Incidents review (cause and elimination of hazard) <i>Daily</i>	Health and Safety Technical Consultant	Monthly review to be submitted to senior executives representing PMU 7 and BT20 Reporting requirements to the relevant government department / ministry to be confirmed As part of the environmental, health and safety management system
	Investigate causes and take appropriate action to eliminate	Ensure safe working conditions	Project life	Root causes analysis report	Incidents review (cause and	Health and Safety Technical	Incidents and root cause to be submitted to senior executives

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	risks where possible				elimination of hazard) <i>Daily</i>	Consultant	representing PMU 7 and BT20 Incidents and root cause to be submitted to the relevant government departments / ministries (fatalities only) As part of the environmental, health and safety management system
	Provide adequate access to first aid and medical assistance in cases of work related accidents or injuries	Ensure safe working conditions	Project life	First aid kit availability and adequacy audit report	First aid equipment audit <i>Weekly</i>	Health and Safety Technical Consultant	As part of the environmental, health and safety management system
	Design the site management system with adequate capacity for oversight of occupational health and safety matters	Ensure safe working conditions	Project life	Systems audit report	Systems audit <i>Monthly</i>	Health and Safety Technical Consultant	Monthly audit report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
Physical Hazards to Workers	Identify all physical risks to workers and develop and implement the appropriate mitigation measures <i>Note: The recommendations as included in Section 14.1 must be considered and further developed.</i>	Eliminate physical hazards to workers and effectively mitigate any residual risks	Project life	Hazard risk report	Safe work condition audit <i>On-going</i>	Health and Safety Technical Consultant	Periodic audit report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
Stakeholders							
Stakeholder Consultation	Undertake continued stakeholder consultation during all phases of the project through establishing the appropriate communication mechanisms with directly affected communities and other interested parties	Communicate project progress, material changes to the project, grievances received and corrective action taken	Project life	Minutes of meetings and record of grievances received and response and / action taken	Project progress report <i>Monthly</i> Response to grievances received <i>As required</i>	IEC Health and Safety Technical Consultant	Periodic audit report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
Community Health and Safety							
General	Seek opportunities to improve environmental conditions	Ensure that directly affected communities derive benefit for the development project	Project life	Assessment reports	Performance assessment <i>Monthly</i>	PMU 7 IEC	Periodic audit report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
Community Disease	Put in place adequate surveillance programs to screen the health of workers, which may include documenting and reporting on existing diseases <i>Note: Any health information obtained as part of these efforts, to prevent the transmission of communicable diseases, may not be used for exclusion from employment or any other form of discrimination</i>	Avoid any inadvertent introduction of new or highly resistant diseases into host communities	Construction phase	Health screening reports	Workforce health status <i>Monthly</i>	PMU 7 IEC	As part of the environmental, health and safety management system
	Undertaken surveillance, active screening and treatment to workers	Prevent the spread of illness in local communities	Construction phase	Health screening, treatment and training (training schedule and attendance register) reports	Workforce health status and treatment <i>Monthly</i> Training <i>As required</i>	PMU 7 IEC	As part of the environmental, health and safety management system
Emergency Incidents	Assess possible risks to the communities as it relates to emergency incidents	Ensure community health and safety in the event of an emergency	Project life	Risk register	Risk review <i>Monthly</i>	PMU 7 IEC	Periodic audit report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
	Develop an emergency response and preparedness	Appropriately manage community health and safety in the event of	Project life	Emergency response and	Emergency response and	PMU 7	Periodic review report to be submitted to senior executives

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	plan	an emergency		preparedness plan	preparedness plan review <i>Monthly</i>	IEC	representing PMU 7 and BT20 Emergency response plan to be submitted to the relevant government departments / ministries for the purposes of confirming and allocating resources in the event of emergency Emergency response plan to be submitted to directly affected communities (where applicable) As part of the environmental, health and safety management system
	Provide the potentially affected community with the relevant information on appropriate behaviour and safety measures will be adopted in the event of an accident	Ensure community health and safety in the event of an emergency	Project life	Emergency response procedure	Emergency plan meetings with communities <i>As required (if significant risks have been identified, update meeting to be held monthly)</i>	PMU 7 IEC	Periodic report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
Safety and Security	Develop measures to reduce safety and security risk	Ensure community health and safety through restricting access to risk areas	Project life	Access procedure and the placement of appropriate signage	Risk and access control review <i>Monthly</i>	Principal contractor PMU 7 IEC	As part of the environmental, health and safety management system
Grievance Mechanism							
General	Develop and maintain a complaints register on site	Identify and appropriately respond to impacts on directly affected persons to ensure legal compliance and meet moral / ethical obligations	Project life	Complaints register	Response to grievances received <i>As required</i>	Principal contractor PMU 7 IEC	Periodic report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
Emergency Response							
	Develop emergency preparedness and response	Ensure pollution prevention and the appropriate response for the	Project life	Emergency preparedness and	Emergency response and	Principal	Periodic report to be submitted to a senior executive representing the

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	<p>plans based on an emergency level classification. Including:</p> <ul style="list-style-type: none"> ■ The identification of the emergency scenarios ■ The development of specific emergency response procedures ■ Training emergency response teams ■ The identification of emergency contacts and communication systems/ protocols ■ The development of the appropriate procedures for interaction with government authorities ■ Identifying and providing emergency equipment and facilities Note: All workers must be adequately trained in the correct use of such equipment ■ Developing protocols for the use of the emergency equipment ■ Developing decontamination procedures and means to proceed with urgent remedial measures to contain, limit and reduce pollution 	protection of workers and affected communities		response plan	<p>preparedness plan review</p> <p><i>Monthly</i></p> <p>Emergency plan meetings with communities</p> <p><i>As required (if significant risks have been identified, update meeting to be held monthly)</i></p> <p>Emergency plan meetings with government authorities</p> <p><i>Monthly</i></p> <p>Training in use of emergency equipment</p> <p><i>Monthly</i></p> <p>Decontamination assessment</p> <p><i>As required</i></p>	contractor PMU 7 IEC	<p>project proponent / owner</p> <p>Emergency response plan to be submitted to the relevant government departments / ministries for the purposes of confirming and allocating resources in the event of emergency</p> <p>Emergency response plan to be submitted to communities that may be affected by emergency scenario's</p> <p>As part of the environmental, health and safety management system</p>
Hazardous Materials	<p>Identify potential risk of a spill of uncontrolled hazardous materials and prepare a spill control, prevention, and countermeasure plan</p> <p><i>Note: A recommendation for the</i></p>	Mitigate and manage environmental, health and safety risks associated with the uncontrolled release of hazardous materials.	Project life	Risk report and emergency preparedness and response plan	<p>Emergency response and preparedness plan review</p> <p><i>Monthly</i></p> <p>Emergency plan</p>	Principal contractor PMU 7 IEC	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	<i>extent of this plan has been provided. The plan must be based on the nature of the risk</i>				meetings with communities <i>As required (if significant risks have been identified, update meeting to be held monthly)</i> Emergency plan meetings with government authorities <i>Monthly</i> Training in use of emergency equipment <i>Monthly</i> Decontamination assessment <i>As required</i>		
Site Rehabilitation	<i>Note: The recommendations as included in Section Error! Reference source not found. must be considered and further developed</i>	Ensure the effective rehabilitation of disturbed areas to restore ecological functioning	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Contractual	Make the tendering contractors aware of the contents of this ESAP	Allocate sufficient resource to the implementation of the action plan	Construction phase	Contractual documentation	Include ESAP in contractual documentation <i>Once-off</i>	PMU 7 IEC	As part of the environmental, health and safety management system
	Induct all contractors on the contents of the ESAP and penalties arising from non-compliance	Effective implementation and financial provisions for remedial action in the event for contractor non-conformance	Construction phase	Training schedule and attendance register Penalties	Induction and training programme <i>Once-off for all contractors and</i>	IEC	Periodic report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
					<i>workers</i>		and safety management system
	Identify areas that must be protected from disturbances	Minimise the area to be disturbed	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	IEC	As part of the environmental, health and safety management system
Environmental Education and General Training	Train all site personnel to have a basic understanding of environmental principles (value of ecosystem services, protection and conservation)	Effective implementation of mitigation and management measures	Construction phase	Training schedule and attendance register	Induction and training programme <i>Once-off for all contractors and workers</i> Toolbox talks <i>Daily</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Climate	Minimise the release of greenhouse gasses to the atmosphere through maintenance of vehicles with specific focus on exhaust systems	Limit the emission of greenhouse gases to the atmosphere	Construction phase	Vehicle service records	Vehicle inspections <i>Ad Hoc</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Investigate and implement energy conservation programmes (where practicable)	Conserve energy to limit the emission of greenhouse gases to the atmosphere	Construction phase	Energy conservation programme	Review of energy conservation initiatives <i>Monthly</i>	Principal contractor IEC	Periodic report to be submitted to senior executives representing PMU 7 and BT20 As part of the environmental, health and safety management system
Air Quality							
General	No burning of waste to be undertaken on site						
Dust emissions	Re-vegetate all disturbed areas as soon as practically possible	Limit windblown dust	Construction phase	Rehabilitation plan	Re-vegetation <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Limit vehicle speed to 35km/hr for all vehicles traveling on unpaved roads	Limit dust emission resulting from vehicle entrained dust liberation	Construction phase	Operational policy	Vehicle speed <i>On-going</i>	Principal contractor	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
						IEC	
	Implement wet dust suppression on unpaved roads and during the demolition of houses	Limit dust emissions form unpaved roads and during the demolition of houses	Construction phase	Dust monitoring results	Dust outfall monitoring <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Keep drop height to a minimum (vehicle offloading of soil, rubble or any other material that will emit dust during handling)	Limit dust emissions during material handling	Construction phase	Dust monitoring results	Dust outfall monitoring <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Wet suppress or cover transported materials that may emit dust during transportation	Limit dust emissions during materials handling	Construction phase	Dust monitoring results	Dust outfall monitoring <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Implement dust suppression measures for all soil stockpiles	Limit windblown dust	Construction phase	Dust monitoring results	Dust outfall monitoring <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Re-vegetate long-term soil stockpiles	Limit windblown dust	Construction phase	Dust monitoring results	Dust outfall monitoring <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Situate soil stockpiles away from the site boundary and sensitive receptors	Limit the impact of windblown dust on sensitive receptors	Construction phase	Dust monitoring results Grievances received	Dust outfall monitoring <i>On-going</i> Grievances received and mitigation action taken <i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Vehicle Emissions	Maintain all vehicles and machinery	Ensure that vehicle emissions being created are not in excess of the manufacturer's specifications of exhaust CO ₂ output	Construction phase	Vehicle service records	Vehicle inspection <i>Ad Hoc</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Investigate and implement initiatives such as cleaner fuel, efficient combustion and	Minimise vehicle emissions	Construction phase	None	Vehicle inspection	Principal contractor	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	catalytic converters				Ad Hoc	IEC	
Noise							
	Undertake activities that is may be regarded as noisy must be undertaken during normal working hours	Reduce noise disturbances	Construction phase	Noise monitoring results	Noise monitoring <i>Weekly (in the event of noisy activities daily monitoring must be undertaken for the period)</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Inform sensitive receptors of noisy activities undertaken outside of normal working hours	Limit impacts on sensitive receptors and where impacts cannot be avoided inform receptors	Construction phase	Noise monitoring results Grievances received	Noise monitoring <i>Weekly (in the event of noisy activities daily monitoring must be undertaken for the period)</i> Grievances received and mitigation action taken <i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Implement noise control measures at source <i>Note: Recommendations for source noise control is included in the action plan, refer Section Error! Reference source not found.</i>	Reduce noise disturbance	Construction phase	Noise monitoring results	Noise monitoring <i>Weekly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Assess and manage all noise complaints	Be informed of and appropriate respond to complaints	Construction phase	Monitoring results Grievances received	Grievances received and mitigation action taken	Principal contractor IEC	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
					<i>As required</i>		
	Undertake monitoring of persistent noise complaints	Determine whether daytime levels exceed ambient +3 dBA.	Construction phase	Noise monitoring results	Grievances received and mitigation action taken <i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Implement blasting methods designed by a suitably qualified engineer	Ensure adherence to acceptable blasting standard to manage noise and vibration	Construction phase	Noise monitoring results	Noise monitoring <i>Once-off during blast</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Soils							
Soil disturbance	Minimise the area to be disturbed	Limit to construction activities to minimise the disturbance of topsoil	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Undertake on-going rehabilitation	Rehabilitate all un-used areas after construction so as to create a feature that emulates the existing landscape as closely as possible, and does not adversely impact on the area in general	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Soil handling and removal	Strip and stockpile topsoil in all areas to be cleared for construction	Optimise soil utilisation	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Soil and Materials Stockpiles	Stockpile soils in close proximity to areas to be rehabilitated	Minimise soil handling requirements	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Implement measures to limit wind and water erosion of soil stockpiles: <ul style="list-style-type: none"> ■ Re-vegetation ■ Covering stockpiles with shade netting 	Resource (soil) conservation through limiting loss of soil through erosion	Construction phase	Erosion monitoring results and controls implemented	Erosion monitoring and control effectiveness review <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	<ul style="list-style-type: none"> Using water as a dust suppressant or the use of synthetic dust suppressants 						
	Surround stockpile with a geotextile fabric fence (where required)	Resource (soil) preservation through limiting loss of soil through erosion	Construction phase	Erosion monitoring results and controls implemented	Erosion monitoring and control effectiveness review <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Replaced soils as soon as practically possible in disturbed areas as part of rehabilitation	Optimise soil utilisation	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Fertilisation and Amendments	Apply fertiliser at an acceptable rate	Ensure effective re-vegetation	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Soil Erosion	Implement erosion control measures <i>Note: Recommendations for erosion control measures are outlined in Section Error! Reference source not found. of the report</i>	Limit loss of topsoil and manage effective re-vegetation as part of rehabilitation	Construction phase	Erosion monitoring results and controls implemented	Erosion monitoring and control effectiveness review <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Hydrocarbon Contamination Amelioration	Implement good housekeeping practices	Limit pollution of soils and water resources	Construction phase	None	Training <i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Workshop areas to be located on hard standing	Limit pollution of soils and water resources	Construction phase	Design plan	Design review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Install secondary containment	Limit pollution of soils and water resources	Construction phase	Design plan	Design review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	Use drip trays when undertaken vehicle maintenance outside of workshop areas	Limit pollution of soils and water resources	Construction phase	Operational policy	Induction and training programme <i>Once-off for all contractors and workers</i> Periodic as part of toolbox talks <i>Ad Hoc</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	In the event of an accidental spill, implement containment measures as outlines in Section Error! Reference source not found.	Appropriately respond to manage and minimise pollution in the event of a spill	Construction phase	Incidents register Corrective action implemented	Review effectiveness of containment measures <i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Soil Contamination: Batching Plants	Implement mitigation and management measures as outlined in Section Error! Reference source not found.	Limit pollution of soils and water resources	Construction phase	Operational Policy	Review of implementation <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Surface Water	Limit areas to be stripped to active areas only	Limit areas susceptible to erosion that will result in sedimentation form soil erosion	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Implement erosion control measures as outlined in Section Error! Reference source not found.	Minimise impacts associated with soil erosion	Construction phase	Erosion monitoring results and controls implemented	Erosion monitoring and control effectiveness review <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Correctly store hazardous materials as outlined in Section Error! Reference source not found.	Limit water contamination	Construction phase	Design plan	Design review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Provide adequate sanitation	Limit water contamination	Construction phase	Design plan	Design review <i>Once-off</i>		As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
Groundwater	Implement mitigation measures as outlined in Section Error! Reference source not found. <i>Note: Additional measures relating to avoiding contamination must be implemented</i>	Limit water contamination	Construction phase	Operational Policy	Implementation of policy <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Flora	Limit to footprint of the construction activities as far as is practically possible	Minimise the destruction of floral communities and ecosystem functioning	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Demarcate operational areas and limit movement of persons and vehicles to such areas	Minimise the destruction of floral communities and ecosystem functioning	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Demarcate and avoid all areas identified to be sensitive in terms of floral communities or ecosystems	Minimise the destruction of floral communities and ecosystem functioning	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Prohibit the collection of vegetation species and firewood	Minimise the destruction of floral communities and ecosystem functioning	Construction phase	Incidents register Operational policy	Incidents register and disciplinary action taken <i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Use indigenous species for the purposes of rehabilitation	Avoid the introduction of vegetation species not naturally occurring in the area and which may become invasive and / or replace naturally occurring vegetation thereby altering ecosystem functioning	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Develop and implement an alien plant identification, eradication and control programme	Avoid the introduction of vegetation species not naturally occurring in the area and which may become invasive and / or replace naturally occurring vegetation thereby altering	Construction phase	Alien invasive and weeds control and eradication plan	Implementation of alien invasive and weeds control and eradication plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
		ecosystem functioning					
Fire Prevention	Develop, as part of the emergency response procedure, a fire control plan	Limit the destruction of floral communities by fire	Construction phase	Fire control and emergency preparedness and response plan	Emergency response and preparedness plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Prohibit open fires, except in designated and controlled areas	Minimise the risk of fire	Construction phase	Operational policy	Implementation of policy <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Vegetation stripping process	Relocate tree and shrub species prior to site clearance activities	Preserve indigenous plant species and protect biodiversity	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Remove all grasses and forbs with topsoil	Enhance and / preserve soil fertility though maximising the organic content of soils	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>During stripping activities</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Re-vegetate all finalised areas on an on-going basis	Re-establish floral habitat and ecosystem functioning	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Fauna	Limit to footprint of the construction activities as far as is practically possible	Minimise the disturbance of faunal communities	Construction phase	Project layout plan	Project plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Prohibit the poaching, snaring and trapping of animals	Avoid disturbance and the destruction of faunal communities	Construction phase	Operational policy Incidents register	Incidents register and disciplinary action taken <i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Correctly store hazardous materials as outlined in Section XX	Avoid disturbance and the destruction of faunal communities	Construction phase	Design plan	Design review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Develop, as part of the	Limit the destruction of faunal	Construction	Fire control and	Emergency	Principal	As part of the environmental, health

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	emergency response procedure, a fire control plan	communities by fire	phase	emergency response plan	response and preparedness plan review <i>Monthly</i>	contractor IEC	and safety management system
Archaeology	Develop a chance find procedure	Minimise and appropriately manage heritage resources	Construction phase	Chance find procedure	<i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Waste	Separate hazardous and non-hazardous waste streams	Avoid the contamination of non-hazardous waste thereby increasing the volume of hazardous waste to be handled and disposed	Construction phase	Operational policy	Review of implementation <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Designate areas for the safe storage of hazardous waste.	Control and manage access to hazardous waste storage areas to ensure health and safety of workers and other persons	Construction phase	Project layout plan	Project plan review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Include concrete / impermeable hardstanding and bunding to prevent spillage of hazardous wastes.	Avoid the contamination of soil and water	Construction phase	Design plan	Design review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Designate areas for the safe storage of general waste	Control and manage access to general waste storage areas to ensure health and safety of workers and other persons	Construction phase	Project layout plan illustrating areas for storage of waste	Project plan review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Separate waste into recyclable and non-recyclable streams	Optimise resource use as part of sustainability objectives	Construction phase	Operational policy	Review of implementation <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Re-use inert construction waste (such as excavated subsoil and building rubble) as backfilling	Optimise resources use as part of sustainability objectives	Construction phase	Operational policy	Review of implementation <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Safely dispose of non-recyclable wastes	Avoid contamination, health and safety impacts from waste disposal	Construction phase	Safe disposal certificates	Confirm safe disposal	Principal contractor	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
					<i>As required</i>	IEC	
	Identify service providers for the recycling of recyclable waste	Optimise resource use as part of sustainability objectives	Construction phase	List of service providers	None	Principal contractor IEC	As part of the environmental, health and safety management system
	Develop, implement a waste management procedure	Ensure the correct handling of wastes to meet the objectives of the ESAP	Construction phase	Waste management procedure	Review of waste management procedure <i>Bi-annually</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Train all staff on the waste management procedure	Train staff in the correct handling of wastes to meet the objectives of the ESAP	Construction phase	Training schedule Attendance register	Induction and training programme <i>Once-off for all contractors and workers</i> Periodic as part of toolbox talks <i>Ad Hoc</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Assign staff responsible for the implementation of the waste management procedure	Allocate responsibility to oversee compliance with the waste management procedure	Construction phase	Appointment	None	Principal contractor IEC	As part of the environmental, health and safety management system
	Develop and implement a litter collection programme	Mitigate the pollution impacts associate with the incorrect handling of waste	Construction phase	Litter collection programme	Implementation monitoring <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Record waste removed from site and obtain and keep the appropriate documentation such as safe disposal certificates	Comply with best practise standards (and legal requirements) relating to duty of care	Construction phase	Safe disposal certificates	Confirm safe disposal <i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Confirm that hazardous waste transporters are appropriately licensed	Comply with best practise standards (and legal requirements) relating to duty of care	Construction phase	Copies of licences and / or permits	Review licenses and permits <i>On appointment and at date of</i>	Principal contractor IEC	As part of the environmental, health and safety management system

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	Conduct inspections of waste storage areas	Avoid pollution, health and safety impacts	Construction phase	Audit results	<i>renewal</i> Waste storage area audit <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Hazardous Materials	Explore opportunities to use non-hazardous materials in place of hazardous materials	Limit the occurrence of hazardous materials which increases the risk of environmental, health and safety impacts	Construction phase	Operational policy	Review of policy implementation <i>Bi-annually (or when new material regarded as hazardous is introduced)</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Summarize hazards presented by chemicals by means of a Material Safety Data Sheet	Provide sufficient information to workers regarding the risks associated with the use of hazardous materials	Construction phase	MSDS	<i>As required</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Prevent the uncontrolled releases of hazardous materials	Avoid environmental, health and safety impacts	Construction phase	Operational policy	Review of implementation <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Designate areas for the safe storage of general waste	Control and manage access to general waste storage areas to ensure health and safety of workers and other persons	Construction phase	Project layout plan illustrating areas for storage of hazardous materials	Project plan review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Include concrete / impermeable hardstanding and bunding to prevent spillage of hazardous materials.	Avoid the uncontrolled release of hazardous materials	Construction phase	Design plan	Design review <i>Once-off</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Prioritize the allocation of resources for emergency response equipment and training programs	Ensure the allocation of sufficient resources to enable appropriate response in the event of an emergency	Construction phase	Emergency response and preparedness plan	Emergency response and preparedness plan review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Establish hazardous materials	Establish management priorities	Construction	Risk register	Risk review	Principal	As part of the environmental, health

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	management priorities based on a hazard analysis of the risk presented by the material	and the correct allocation of resources based on the risk posed by materials	phase		<i>As required</i>	contractor IEC	and safety management system
	Implement management controls to address residual risks that have not been prevented or controlled through engineering measures	Take a precautionary approach to the management of hazardous materials and ensure that residual risks are managed appropriately	Construction phase	Operational policy	Implementation of policy <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Establish the level of risk of hazardous materials through an on-going assessment process	Establish management priorities and the correct allocation of resources based on the risk posed by materials	Construction phase	Risk assessment report and risk register	Risk assessment review <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Develop a hazardous materials management plan	Establish management priorities and the correct allocation of resources based on the risk posed by materials	Construction phase	Hazardous materials management plan	Review of hazardous materials management plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Train all staff on the hazardous materials management plan	Ensure that all workers understand and are able to implement the actions required for the safe handling of hazardous materials	Construction phase	Training schedule Attendance register	Induction and training programme <i>Once-off for all contractors and workers</i> Periodic as part of toolbox talks <i>Ad Hoc</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Conduct inspections of hazardous materials storage areas	Prevent the release of hazardous materials to ensure environmental, health and safety objectives are met	Construction phase	Audit reports	Audit of hazardous materials storage areas <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
Social⁵							

⁵ Impacts and action plans associated with the resettlement of persons are specifically excluded.

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
Economic loss incurred by temporarily displacing farmers	Compensate, based on a rental agreement, farmers for the temporary loss of agricultural land	Compensate directly affected persons for the loss of income due to temporary displacement	Construction phase	Compensation agreements	Review agreements <i>Once-off</i>	Project proponent / owner IEC	Agreements to be submitted to a senior executive representing the project proponent / owner As part of the environmental, health and safety management system
Rehabilitation of land	Once the site is vacated the land must be restored to the satisfaction of the landowner as agreed in the rental agreement	Restore land capability for agricultural use	Construction phase	Rehabilitation plan	Implementation of rehabilitation plan <i>On-going during rehabilitation</i>	Project proponent / owner IEC	Periodic report to be submitted to a senior executive representing the project proponent / owner As part of the environmental, health and safety management system
Economic loss due to services interruption	New services to be installed prior to the decommissioning of the existing services	Avoid disruption of telecommunication and other services to communities and businesses	Construction phase	Design plan and phased services installation plan	Implementation of services installation plan <i>Once-off during implementation</i>	Principal contractor IEC	Periodic report to be submitted to a senior executive representing the project proponent / owner As part of the environmental, health and safety management system
Community Health and Safety	Restrict the development of sensitive receptor facilities (such as schools and healthcare facilities) within a distance of 160m from the highway	Avoid health impacts associated with pollution resulting from increased traffic Avoid noise impacts on sensitive receptors	Operational phase	Regional development plans	On-going reviews and consideration of new development applications <i>On-going</i>	Project proponent / owner Government authorities	As part of the environmental, health and safety management system
	Restrict the development of houses within a distance of 15m from the highway	Ensure safety in the event of an accident and / or incident	Operational phase	Regional development plans	On-going reviews and consideration of new development applications <i>On-going</i>	Project proponent / owner Government authorities	As part of the environmental, health and safety management system
Traffic disruption	Construct additional lanes to either side of the existing road before excavating and reconstructing existing road surfaces	Minimise traffic disruption	Construction phase	Construction plan	Review of construction plan <i>Monthly</i>	Principal contractor IEC	Periodic report to be submitted to a senior executive representing the project proponent / owner As part of the environmental, health and safety management system
	Appropriately plan movement of	Minimise traffic disruption	Construction	Construction plan	Review of	Principal	Periodic report to be submitted to a senior executive representing the

Organisational commitment	Action	Objective	Project phase	Plans, policies, procedures and / or other relevant documentation	Monitoring Requirement and Frequency	Responsible person	Reporting requirements
	construction vehicles		phase		construction plan <i>Monthly</i>	contractor IEC	project proponent / owner As part of the environmental, health and safety management system
	Where required, allocate persons to direct traffic in areas where construction is taking place	Minimise traffic disruption	Construction phase	Construction plan	Review of construction plan <i>Monthly</i>	Principal contractor IEC Government authorities and local police	Periodic report to be submitted to a senior executive representing the project proponent / owner As part of the environmental, health and safety management system
Traffic noise	Erect the appropriate signage discouraging the use of vehicle hooters when traveling through residential areas	Avoid noise impacts on sensitive receptors	Operational phase	Design plan Grievances received	On-going reviews <i>On-going</i>	Project proponent / owner Government authorities and local police	As part of the environmental, health and safety management system
Road safety	Place the appropriate warning and directional signs at areas where construction is taking place	Minimise traffic disruption and ensure road safety	Construction phase	Traffic management plan	Review of traffic management plan <i>Monthly</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Keep road surfaces clear from materials such as soil and gravel	Ensure road use safety	Construction phase	Operational policy	Review of the implementation of the policy <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Limit the movement of heavy vehicles on roads / lanes used by the public during peak hour traffic	Minimise traffic disruption and ensure road safety	Construction phase	Operational policy	Review of the implementation of the policy <i>On-going</i>	Principal contractor IEC	As part of the environmental, health and safety management system
	Monitor erosion at the bridge structure	Ensure structural integrity of bridge crossing	Construction and Operational Phase	Operational policy and monitoring reports	Review of the implementation of the policy <i>On-going</i>	Project proponent / owner Suitably qualified engineer	As part of the environmental, health and safety management system



Appendix 15: References

- INTERNATIONAL FINANCE CORPORATION (1998). *The International Finance Corporation's Doing Better Business Through Effective Public Consultation and Disclosure: A Good Practice Manual*. World Bank Group
- INTERNATIONAL FINANCE CORPORATION (2007). Environmental, Health and Safety (EHS) Guidelines
- INTERNATIONAL FINANCE CORPORATION (2007). *Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets*. World Bank Group
- INTERNATIONAL FINANCE CORPORATION (2009). *Environmental and Social Review Procedure*. World Bank Group
- INTERNATIONAL FINANCE CORPORATION (2012). *Performance Standard Guidance Notes 1 - 8*. World Bank Group
- INTERNATIONAL FINANCE CORPORATION (2012). *Performance Standards 1 – 8*. World Bank Group
- NUCLEAR RESEARCH INSTITUTE (2011). *Report of Environment Impact Assessment Project for Rehabilitation and Improvement of National Highway No. 20 - Section from Dong Nai to Lam Dong Province*
- WSP (2012). *Environmental Risk Assessment for the Rehabilitation and Improvement of National Highway No. 20 - Section from Dong Nai to Lam Dong Province*

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 1: AIR EMISSIONS MANAGEMENT

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
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Checked by	Barry Cowell			
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Authorised by	Barry Cowell			
Signature				
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Environmental and Social Management Plan Appendix 1: Air Emissions Management

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Air Emissions Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objective of this plan is to minimise potential air emission impacts on receptors resulting from rehabilitation and Improvement works on National Highway No. 20 - Section between Dong Nai to Lam Dong Province. Potential receptors on the route could include local residents and businesses and specific fauna.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Waste Management Plan;
- Raw Materials Management Plan;
- Erosion and Sediment Control Plan;
- Hazardous Materials Management Plan;
- Environmental Monitoring Plan; and
- Stakeholder Engagement Plan.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Surveys

Contractors shall undertake air quality monitoring at the established background locations identified in Appendix B. In addition, prior to the commencement of works, the contractor shall identify work locations, including haul routes, construction compounds and hot asphalt batching plants, which represent an air quality risk to community dwellings and other sensitive receptors (including schools, medical centres as identified in Appendix C). The contractor shall then agree with the Independent Environmental Consultant, site specific air quality monitoring requirements at the location of the nearest sensitive receptors and mitigation measures to be implemented at such locations, as required.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to air quality, together with mitigation and management measures to avoid or reduce these impacts.

Contractor shall develop an Air Emissions Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Consultant commissioned by BT20 will be responsible for reviewing the Air Emissions Management Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Emission Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
General		Contractor for each section of the highway development will prepare an Air Quality Management Plan.	A1	On-going	Contractor
		Monitoring to be undertaken at established monitoring sites (See Appendix B and at nearest sensitive receptors as agreed with independent Environmental Consultant) in accordance with the requirements of the IFC EHS General Guidelines (April 2007) (see Appendix A) and Vietnam Standard QCVN 05:2009/BTNMT."	A2	On-going	Contractor/ Independent Environmental consultant
		Undertake periodic monitoring in the vicinity of plant/activities with the potential for significant emissions (e.g, hot asphalt batching plants, soil storage compounds, etc).	A3	On-going	Contractor/ Independent Environmental consultant
		Undertake air monitoring at locations with persistent air quality complaints	A4	As required	Contractor/ Independent Environmental consultant

Emission Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Dust from site clearance and construction works	Dust emissions resulting in potential nuisance, human health and aesthetic impacts	Limit vehicle speed to 35km/hr for all vehicles travelling on unpaved roads and keep vehicles to marked trafficable areas.	A5	On-going	Contractor
		Ensure that all roadways are maintained	A6	On-going	Contractor
		Implement wet dust suppression on unpaved roads during works	A7	On-going	Contractor
		Ensure that vehicles carrying loads with the potential to generate dust are appropriately sheeted.	A8	On-going	Contractor
		Situate all soil stockpiles away from site boundaries and sensitive receptors.	A9	On-going	Contractor
		Keep drop height to a minimum (vehicle offloading of soil, rubble or any other materials that will emit dust during handling).	A10	On-going	Contractor
		Implement dust suppression measures for all stockpiles	A11	On-going	Contractor
		Re-vegetate long-term stock piles	A12	Review prior to construction	Contractor
Emissions from plant and vehicles	Reduced air quality with consequent and project nuisance. Greenhouse gas emissions	Select construction equipment based on industry good practice.	A13	On-going	Contractor
		Ensure that all plant is turned-off while not in use.	A14	On-going	Contractor
		Locate fixed and mobile equipment (e.g, hot asphalt batching plants, generators) away from sensitive receptors.	A15	On-going	Contractor
		Service all diesel-powered equipment on a regular basis.	A16	On-going	Contractor
		Ensure that construction plant is maintained on a regular basis	A17	On-going	Contractor

Emission Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		No burning of waste to be undertaken on site.	A18	On-going	Contractor

Roles and Responsibilities

The Contractor's Air Quality Management Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Air Quality Management Plan.

Training, Awareness and Competency

The Contractor's Air Quality Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Air Quality Management Plan are competent on the basis of education, training and experience.

The Contractor's training activity associated with the Air Quality Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall report to the Project Environmental Department (via the Independent Environmental Consultant) the results of the surveys undertaken in accordance with the relevant components of the Air Quality Management Plan and integrate the results, including additional mitigation and management measures as agreed with Company, with the Air Quality Management Plan.

Contractor's monthly report to Company shall include:

- Number and results of verification inspections prescribed in Table A; and
- Results of Monitoring as prescribed in section 4.0

Appendix A: Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree 21/2008/NĐ-CP dated 28/02/2008 on amending, supplementing some articles of Decree 80/2006/NĐ-CP dated 09/08/2006 of the Government regarding detailed regulations and guidance of implementation of some articles of the law on environment protection;
- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;
- Circular No.28/2011/TT-BTNMT on technical procedure of air and noise environment monitoring's;
- QCVN 05: 2009 Air Quality – Surrounding air quality standard; and
- QCVN 06: 2009 Air Quality – Permitted maximum content of toxic substances in surrounding air.

IFC Performance Standards

The following IFC Performance Standards are applicable to air emissions and ambient air quality during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts (2012)*, which establishes requirements for assessment, management, organizational capability, training, community engagement, monitoring, and reporting.
- IFC Performance Standard 3: *Resource Efficiency and Pollution Prevention (2012)*, and specifically the following provisions:

“The objectives of pollution prevention are a) to avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities; and b) to promote the reduction of emissions that contribute to climate change.”

“To achieve these objectives, clients should take into account the potential impact of their emissions on the ambient conditions (such as ambient air quality) and seek to avoid or minimize these impacts within the context of the nature and significance of pollutants emitted. Large projects with potentially significant emissions and /or high impacts may require impacts on the surrounding environment (i.e., changes in ambient levels) to be monitored, in addition to the implementation of control measures.”

“General requirements. During the design, construction, operation and decommissioning of the project (the project life-cycle) the client will consider ambient conditions and apply pollution prevention and control technologies and practices (techniques) that are best suited to avoid or, where avoidance is not feasible, minimize or reduce adverse impacts on human health and the environment while remaining technically and financially feasible and cost-effective. The project-specific pollution prevention and control techniques applied

during the project life-cycle will be tailored to the hazards and risks associated with project emissions and consistent with good international industry practice as reflected in various internationally recognized sources, including IFC's Environmental, Health and Safety Guidelines (the EHS General Guidelines)."

"Pollution Prevention, Resource Conservation and Energy Efficiency. The client will avoid the release of pollutants or, when avoidance is not feasible, minimize or control the intensity or load of their release. This applies to the release of pollutants due to routine, non-routine or accidental circumstances with the potential for local, regional, and trans-boundary impacts. In addition, the client should examine and incorporate in its operations resource conservation and energy efficiency measures, consistent with the principles of cleaner production."

"Technical Guidance. The client should refer to the current versions of the EHS Guidelines when evaluating and selecting pollution prevention and control techniques for the project. These documents contain the performance levels and measures that are normally acceptable to IFC and are generally considered to be achievable at reasonable costs by existing technology."

"Ambient Considerations. To address adverse project impacts on existing ambient conditions, the client will: (i) consider a number of factors, including the finite assimilative capacity of the environment, existing and future land use, existing ambient conditions, the project's proximity to ecologically sensitive or protected areas, and the potential for cumulative impacts with uncertain and irreversible consequences; and (ii) promote strategies that avoid or, where avoidance is not feasible, minimize or reduce the release of pollutants, including strategies that contribute to the improvement of ambient conditions when the project has the potential to constitute a significant source of emissions in an already degraded area. These strategies include, but are not limited to, evaluation of project location alternatives and emissions offsets."

"If ambient levels are in compliance with relevant ambient quality guidelines and/or standards, projects with potentially significant emissions of pollutants should be designed so as to reduce the potential for significant deterioration and to ensure continuing compliance."

The following IFC Guidelines are applicable to air emissions and ambient air quality during construction. Contractor shall meet the intent of these guidelines:

- IFC EHS General Guidelines (April 2007), incorporating WHO Ambient Air Quality Guidelines (1987, 1999 and 2006); Section 1.1 and 4. Relevant provisions include that::
 - Emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards⁹ by applying national legislated standards, or in their absence, the current WHO Air Quality Guidelines¹⁰ (see Table 1.1.1), or other internationally recognized sources¹¹;

Table 1.1.1: WHO Ambient Air Quality Guidelines^{7,8}		
	Averaging Period	Guideline value in µg/m3
Sulfur dioxide (SO ₂)	24-hour	125 (Interim target-1)
	10 minute	50 (Interim target-2)
		20 (guideline)
		500 (guideline)
Nitrogen dioxide (NO ₂)	1-year	40 (guideline)
	1-hour	200 (guideline)

Particulate Matter PM ₁₀	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)
	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)
Particulate Matter PM _{2.5}	1-year	35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline)
	24-hour	75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline) Ozone 8-hour daily maximum 160 (Interim target-
Ozone	8-hour daily maximum	160 (Interim target-1) 100 (guideline)

- 7 - World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile.
- 8 - Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.
- 9 - Ambient air quality standards are ambient air quality levels established and published through national legislative and regulatory processes, and ambient quality guidelines refer to ambient quality levels primarily developed through clinical, toxicological, and epidemiological evidence (such as those published by the World Health Organization).
- 10 - Available at World Health Organization (WHO). <http://www.who.int/en>.
- 11 - For example the United States National Ambient Air Quality Standards (NAAQS) (<http://www.epa.gov/air/criteria.html>) and the relevant European Council Directives (Council Directive 1999/

Appendix B: Background Air Quality Monitoring Locations

Symbol	Position	Location on Route	Coordinates
A1	Dau Giay intersection (National Highway 1A Intersection)	Km00	X=733898; Y=1210467
A2	Gia Kiem residential area	Km9	X=737746; Y=1218366
A3	Phu Cuong, Dinh Quan residential area (Phu Coung market)	Km19	X=738442; Y=1226648
A4	Centre of Phu Cuong commune	Km21+500	X=740931; Y=1226750
A5	La Nga residential area	Km34+600	X=747097; Y=1240093
A6	Dinh Quan town	Km48+150	X=758436; Y=1240456
A7	Tan Phu town	Km58	X=765741; Y=1246955
A8	Phuong Lam residential area (near Phuong Lam market and Phuong Lam)	Km65+500	X=772248; Y=1249196
A9	Madagui residential area (Da Huoai, Lam Dong)	Km76	X=775943; Y=1258487
A10	Damri town, Lam Dong	Km94	X=790342; Y=126796
A11	Loc Chau residential area (near Hai Ba Trung Primary School, Loc Chau market)	Km117	X=804277; Y=1276849
A12	Loc Son residential area (near Loc Son primary school, Hoa lu Kindergarden)	Km123	X=807861; Y=1276626
A13	Loc An residential area (near Loc An B primary school, Loc An high school)	Km131+600	X=816979; Y=1278256
A14	Hoa Ninh residential area (near Le Hong Phong high school, Hoa Ninh market)	Km137+400	X=820972; Y=1277254
A15	Di Linh residential area (near Vo Thi Sau primary school)	Km154	X=835274; Y=1281450
A16	Tan Nghia Town (near Tan Nghia II primary school, Phupc Lac pagoda)	Km160+400	X=838550; Y=1285124
A17	Phu Hiep residential area (near Phu Hiep primary school, Gia Hiep secondary school)	Km170+500	X=846967; Y=1287333
A18	Hiep Thuan residential area, (near Hiep Thuan secondary school)	Km184	X=858989; Y=1287529
A19	City Block 10, Liên Nghĩa town	Km199	X=866619; Y=1297686
A20	Hiep Thanh residential area (Dinh An secondary school)	Km211	X=873930; Y=1306180

Symbol	Position	Location on Route	Coordinates
A21	Dinh An residential area (Dinh An secondary school)	Km218	X=876810; Y=1312324
A22	Residential area of District 9, Da Lat (Tran Phu high school)	Km235	X=877449; Y=1322971
A23	Da Loc residential area, Xuan Tho (Xuan Tho high school)	Km245	X=884835; Y=1321518
A24	Cau Dat residential area, Xuan Truong (Xuan Truong secondary school)	Km254	X=887021; Y=1315705
A25	Don Duong residential area (across National Highway 27)	Km268	X=892143; Y=1311747

Appendix C: Location of Sensitive Receptors

The location of receptors sensitive to air quality emissions identified on Highway 20 between Dong Nai and Lam Dong Provinces.

Site ref no:	Site	Location on Route	Distance from Road (m)
1	Ninh Phat church	KM6	50
2	Thang Long secondary school	KM9	60
3	Dau Giay secondarys school	KM9+100	80
4	Vo Dong parish, Thanh Son parish	KM10	60
5	Bach Lan parish	KM13+400	50
6	Nguyen Ba Ngọc parish	KM14	50
7	Phu Cuong church	KM17+50	60
8	Phu Cuong market	KM19+100	30
9	Nguyen Du primary school	KM45	50
10	Nguyen Thi Minh Khai secondary	KM45+400	60
11	Thọ Lam parish	KM64	50
12	Phuong Lam market	KM65	30
13	Phuong Lam parish	KM65+500	60

Site ref no:	Site	Location on Route	Distance from Road (m)
14	Phu Trung secondary school	KM69+500	50
15	Phu Lam parish	KM70	50
16	Dại Lao healthy centre	KM110+900	60
17	Loc Chau market	KM116+700	30
18	Hai Ba Trung primary school	KM117+50	50
19	Bao Loc secondary and vocational school	KM119	60
20	Hoa Lu preschool education	KM123	50
21	Loc Son - Bao Loc primary school	KM123+200	45
22	Loc An B primary school	KM13+150	45
23	Loc An secondary school	KM131+800	50
24	Loc An clinic	KM132	60
25	Loc An A primary school	KM132+200	45
26	Le Hong Phong secondary school	KM137+400	50
27	Hoa Ninh market	KM137+450	30

Site ref no:	Site	Location on Route	Distance from Road (m)
28	Vo Thi Sau primary school	KM154	45
29	Tan Nghia II primary school	KM160	50
30	Tan Nghia church	KM160+250	50
31	Phuoc Lac pagoda	KM160+600	60
32	Dinh Lạc market	KM162+300	30
33	Dinh Lạc primary school	KM163	45
34	Tan phu church	KM165+450	45
35	Gia Hiep secondary school	KM170	50
36	Phu Hiep parish	KM170+600	50
37	Phu Hiep secondary school	KM171	45
38	Hiep Thuan primary school	KM184	60
39	Ninh Gia primary school	KM186+700	50
40	Ninh Gia secondary school	KM188+200	50
41	Son Trung secondary school	KM189+500	45

Site ref no:	Site	Location on Route	Distance from Road (m)
42	Nguyen Thai Binh secondary school	KM192+700	45
43	Son Trung primary school	KM196+800	50
44	K'Long primary school	KM214+600	60
45	K'Long church	KM214+700	60
46	Hiep An secondary school	KM216+400	50
47	Dinh An primary school	KM217+600	60
48	Tran Phu high school	KM235	100
49	Phan Chu Trinh secondary school	KM235+300	100
50	Xuan Thọ healthy centre	KM242+800	45
51	Da Loc - Xuan Thọ church	KM243+900	50
52	Xuan Thọ secondary school	KM245+200	70
53	Xuan Truong primary school	KM254+150	80
54	Xuan Truong primary school	KM257+800	80
55	Trạm Hạnh - Xuan Truong protestant church	KM259+300	70

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 2: NOISE AND VIBRATION MANAGEMENT PLAN

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

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Environmental and social management plan appendix 2: noise and vibration management plan

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Noise and Vibration Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objective of this plan is to minimise potential noise and vibration impacts on receptors resulting from rehabilitation and Improvement works on National Highway No. 20 - Section between Dong Nai to Lam Dong Province. Potential receptors on the route could include local residents and businesses and specific fauna.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Ecological Management Plan;
- Community Health and Safety Plan;
- Environmental Monitoring Plan; and
- Stakeholder Engagement Plan.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Surveys

During construction works, the Contractor shall undertake background noise monitoring at the locations previously monitored (as identified in the EIA and presented in Appendix B of this document) in order to confirm general compliance with the requirements of Vietnamese national legislation QCVN 26:2010 and IFC EHS General Guidelines (April 2007) (see Appendix A). In addition the contractor will also identify additional work locations, including haul routes and construction compounds, which represent a noise and vibration risk to community dwellings and other sensitive receptors (including schools, medical centres etc, as identified in Appendix C). The contractor shall then agree with the Independent Environmental Consultant, site specific noise and vibration monitoring requirements at the location of the nearest sensitive receptors and mitigation measures to be implemented at such locations, as required.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to noise and vibration, together with mitigation and management measures to avoid or reduce these impacts.

Contractor shall develop a Noise and Vibration Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Consultant commissioned by BT20 will be responsible for reviewing the Noise and Vibration Management Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Noise/ Vibration Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/ Frequency	Responsible Party
Noise from construction vehicles and plant (including Batching Plants)	Disturbance to residents, business and local ecology	Contractor for each section of the highway development will prepare a Noise Management Plan. The plan should be designed and noise monitoring undertaken by appropriately qualified specialists.	N1	N/A	Contractor
		Engage with residents and businesses in areas where potentially significant noise levels are to result from construction activities. (see also Stakeholder Engagement Plan).	N2	As required	Contractor
		Ensure that construction works are only undertaken in defined working hours (weekdays 8h00 – 17h00 and weekends 8h00 – 13h00). In the event that noisy activities are undertaken outside of the specified working hours, all noise receptors will be informed of such activities in advance.	N3	On-going	Contractor
		In accordance with IFC EHS General Guidelines (April 2007), incorporating WHO Guidelines for	N4	On-going	Contractor

Noise/ Vibration Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/ Frequency	Responsible Party
		<p>Community Noise (1999); the contractor should implement mitigation measures to achieve the following measured daytime noise levels at the nearest sensitive receptor:</p> <ul style="list-style-type: none"> • 55 dBA for residential; and • 70 dBA for industrial/commercial <p>or;</p> <ul style="list-style-type: none"> • or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site. 			
		Utilise noise mitigation measures (including the construction of bunds, metal sheet walls) in order to limit noise levels at sensitive receptors.	N5	On-going	Contractor
		Ensure that equipment to be used meets industry best standard in relation to noise attenuation.	N6	Review prior to construction	Contractor
		Ensure that all plant is turned-off while not in use.	N7	On-going	Contractor
		Limit work vehicles and plant to designated access and work site areas.	N8	On-going	Contractor
		Ensure that noise suppression systems on plant and vehicles are maintained.	N9	On-going	Contractor
		All pneumatic tools to be used in close proximity to residential properties should be fitted with an air exhaust port silencer.	N10	On-going	Contractor
		Assess and manage all	N11	On-going	Contractor

Noise/ Vibration Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/ Frequency	Responsible Party
		noise complaints.			
		Undertake noise monitoring at locations with persistent noise complaints.	N12	On-going	Contractor
		Implement blasting methods designed by a suitably qualified engineer	N13	On-going	Contractor

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Noise and Vibration Management Plan.

Contractor's Noise and Vibration Management Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

Company shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of Company's responsibilities in the Noise and Vibration Management Plan.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Noise and Vibration Management Plan are competent on the basis of education, training and experience.

Contractor's Noise and Vibration Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

Contractor's training activity associated with the Noise and Vibration Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Company shall ensure that all Company personnel responsible for the execution of Company's tasks and requirements in the Noise and Vibration Management Plan are competent on the basis of education, training and experience.

Company's training activity associated with the Noise and Vibration Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall report to the Project Environmental Department the results of the surveys undertaken in accordance with the relevant components of the Ecological Management Plan and integrate the results, including additional mitigation and management measures as agreed with Company, with the Noise and Vibration Management Plan.

Contractor's monthly report to Company shall include:

- Number and results of verification inspections prescribed in Table A

Appendix A: Legal and Other Requirements

Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree 21/2008/NĐ-CP dated 28/02/2008 on amending, supplementing some articles of Decree 80/2006/NĐ-CP dated 09/08/2006 of the Government regarding detailed regulations and guidance of implementation of some articles of the law on environment protection;
- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;
- Circular No.28/2011/TT-BTNMT on technical procedure of air and noise environment monitoring's;
- QCVN 26: 2010/BTNMT National technical standard on noise.
- QCVN 27:2010/BTNMT National technical standard on vibration.

IFC Performance Standards

The following IFC Performance Standards apply to noise and vibration issues during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts* (2012) which establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring and reporting.
- IFC Performance Standard 3: *Resource Efficiency and Pollution Prevention* (2012), and specifically the following provisions:
 - “The objectives of pollution prevention are to a) to avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities; and b) to promote the reduction of emissions that contribute to climate change”.
 - “To achieve these objectives, clients should take into account the potential impact of their emissions on the ambient conditions (such as ambient noise levels) and seek to avoid or minimise these impacts within the context of the nature and significance of pollutants emitted. Large projects with potentially

significant emissions and/ or high impacts may require impacts on the surrounding environment (i.e changes in ambient levels) to be monitored, in addition to the implementation of control measures”

“General requirements. During the design, construction and decommissioning of the project (the project life-cycle) the client will consider ambient conditions and apply pollution prevention and control technologies and practices (techniques) that are best suited to avoid or, where avoidance is not feasible, minimise or reduce adverse impacts on human health and the environment while remaining technically and financially feasible and cost-effective. The project-specific pollution prevention and control techniques applied during the project life-cycle will be tailored to the hazards and risks associated with the project emissions and consistent with good international industry practice, as reflected in various internationally recognised sources including IFC’s Environmental, Health and Safety Guidelines (the EHS General Guidelines).”

“Technical Guidance. The client should refer to the current versions of the EHS Guidelines when evaluating and selecting pollution and prevention and control techniques for the project. These documents contain the performance levels and measures that are normally acceptable to IFC and are generally considered to be achievable at reasonable costs by existing technology.”

“Ambient Considerations. To address adverse project impacts on exiting ambient conditions (such as air, surface and groundwater and soils) the client will:

- (a) Consider a number of factors, including the finite assimilative capacity of the environment, existing and future land use, existing ambient conditions, the project’s proximity to ecologically sensitive or protected areas, and the potential for cumulative impacts with uncertain or irreversible consequences: and
- (b) Promote strategies that avoid or, where avoidance is not feasible, minimise or reduce the release of pollutants, including strategies that contribute to the improvement of ambient conditions when the project has the potential to constitute a significant source of emissions in an already degraded area. These strategies include, but are not limited to, evaluation of project location alternatives and emission offsets.”

“If ambient levels are in compliance with relevant ambient quality guidelines and/or standards, projects with potentially significant emissions of pollutants should be designed so as to reduce the potential for significant deterioration and to ensure compliance.”

The following IFC Guidelines apply to noise and vibration during construction. The contractor shall meet the intent of these guidelines:

- IFC EHS General Guidelines (April 2007), incorporating WHO Guidelines for Community Noise (1999); Section 1.7 and Section 4.1, which specify:
- Noise impacts should not exceed the levels presented in Table 1.7.1 (P52), or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Table 1.7.1 – Noise Level Guidelines⁵⁴		
Receptor	One Hour LAeq (dBA)	
	Daytime 07:00 – 22:00	Nighttime 22:00 - 07:00
Residential; Institutional; Educational ⁵⁵	55	45
Industrial; Commercial	70	70

54 – Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organisation (WHO), 1999.

55 – For acceptable indoor noise levels for residential, institutional and educational settings refer to WHO (1999).

-
- Planning activities should be undertaken in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance.
 - The use of noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for construction plant.
 - Avoiding or minimising project transportation/plant movements through community areas.

Appendix B: Background Noise Monitoring Locations

Locations for Background Noise Surveys

Symbol	Position	Location on Route	Coordinates
A1	Dau Giay intersection (National Highway 1A Intersection)	Km00	X=733898; Y=1210467
A2	Gia Kiem residential area	Km9	X=737746; Y=1218366
A3	Phu Cuong, Dinh Quan residential area (Phu Cuong market)	Km19	X=738442; Y=1226648
A4	Centre of Phu Cuong commune	Km21+500	X=740931; Y=1226750
A5	La Nga residential area	Km34+600	X=747097; Y=1240093
A6	Dinh Quan town	Km48+150	X=758436; Y=1240456
A7	Tan Phu town	Km58	X=765741; Y=1246955
A8	Phuong Lam residential area (near Phuong Lam market and Phuong Lam)	Km65+500	X=772248; Y=1249196
A9	Madagui residential area (Da Huoai, Lam Dong)	Km76	X=775943; Y=1258487
A10	Damri town, Lam Dong	Km94	X=790342; Y=126796
A11	Loc Chau residential area (near Hai Ba Trung Primary School, Loc Chau market)	Km117	X=804277; Y=1276849
A12	Loc Son residential area (near Loc Son primary school, Hoa lu Kindergarden)	Km123	X=807861; Y=1276626
A13	Loc An residential area (near Loc An B primary school, Loc An high school)	Km131+600	X=816979; Y=1278256
A14	Hoa Ninh residential area (near Le Hong Phong high school, Hoa Ninh market)	Km137+400	X=820972; Y=1277254
A15	Di Linh residential area (near Vo Thi Sau primary school)	Km154	X=835274; Y=1281450
A16	Tan Nghia Town (near Tan Nghia II primary school, Phupc Lac pagoda)	Km160+400	X=838550; Y=1285124
A17	Phu Hiep residential area (near Phu Hiep primary school, Gia Hiep secondary school)	Km170+500	X=846967; Y=1287333
A18	Hiep Thuan residential area, (near Hiep Thuan secondary school)	Km184	X=858989; Y=1287529
A19	City Block 10, Liên Nghĩa town	Km199	X=866619; Y=1297686
A20	Hiep Thanh residential area (Dinh An secondary school)	Km211	X=873930; Y=1306180
A21	Dinh An residential area (Dinh An secondary school)	Km218	X=876810; Y=1312324

Symbol	Position	Location on Route	Coordinates
A22	Residential area of District 9, Da Lat (Tran Phu high school)	Km235	X=877449; Y=1322971
A23	Da Loc residential area, Xuan Tho (Xuan Tho high school)	Km245	X=884835; Y=1321518
A24	Cau Dat residential area, Xuan Truong (Xuan Truong secondary school)	Km254	X=887021; Y=1315705
A25	Don Duong residential area (across National Highway 27)	Km268	X=892143; Y=1311747

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 3: ECOLOGICAL MANAGEMENT PLAN

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

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Prepared by	Ian Williams			
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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 3: ECOLOGICAL MANAGEMENT PLAN

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Ecological Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objective of this plan is to:

- Avoid, where practicable, and reduce impacts on terrestrial and aquatic habitats and specific habitat features of ecological importance.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Water Management Plan;
- Hazardous Materials Management Plan;
- Raw Materials Management Plan;
- Spill Prevention and Response Plan;
- Erosion and Sediment Control Plan;
- Cultural Heritage Management Plan; and
- Program of Environmental Monitoring and Quality Supervision.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Surveys/Audits

The Contractor shall undertake the following surveys/Audits:

- Ecological surveys of proposed sand dredging locations (as identified in Appendix B);
- Audits to confirm that measures identified in Management Plans (specified in Table A) are implemented. These include:
 - Dust mitigation measures as identified in Air Emissions Management Plan (Ref: EC9);
 - Noise mitigation measures as identified in Noise and Vibration Management Plan (Ref: EC11);
 - Erosion and Sediment control measures as identified in the Erosion and Sediment Control Plan (Ref: EC12, 13, 14);
 - Waste management measures as identified in the Waste Management Plan (Ref: EC18);
 - Hazardous materials management as identified in hazardous Materials Management Plan (Ref: 19);
 - Spill Prevention and Response measures in the Spill Prevention and Response Plan (Ref: EC20).
- The contractor will undertake regular audits of storage mounds and compounds to confirm that there is no encroachment of soil from storage mounds onto vegetated areas adjacent to works areas

Baseline ecological surveys undertaken as part of the EIA process and follow-up focused site appraisals undertaken by WSP have identified that there are no designated ecological areas within the site boundary and no records of any protected species. Habitat within the site boundary comprises primarily of sparse herbaceous species which provides little cover or forage for animals. In the vacant lots where construction staging and storage areas will be built, the vegetation cover will be herbaceous and shrub vegetation and could provide

cover and forage for a variety of insect, small mammal, reptile, and bird species. There are no known areas of natural or critical habitat within the scheme boundary. Areas of modified habitat within and in close proximity to the proposed works consist of agricultural land of low conservation value and impacts on these areas are likely to be limited and of a temporary nature (dust deposition and encroachment of earth from stockpiles). Therefore, no ecological/ protected species surveys are required for the area within the scheme boundary.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to ecology, together with mitigation and management measures to avoid or reduce these impacts. The contractor shall develop an ecological management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Consultant commissioned by BT20 will be responsible for reviewing the Ecological Management Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Site clearance for widening of road corridor	Habitat loss	Ensure that the extent of vegetation to be cleared is clearly identified on technical drawings and appropriately marked on the road corridor	EC1	Prior to clearance works	Contractor
		Prohibit works from exceeding the approved working corridor.	EC2	On-going	Contractor
Site clearance for construction of staging and storage areas	Habitat loss	Ensure that the minimum number of staging and storage areas required are constructed.	EC3	Prior to construction	BT20/ Contractor
		Ensure that sites chosen for staging and storage sites are located in areas of low ecological value	EC4	Prior to construction	BT20/ Contractor
		Ensure that the extent of vegetation to be cleared is clearly identified on technical drawings and appropriately marked on site.	EC5	Prior to construction	Contractor
		Prohibit works from exceeding the approved working corridor.	EC6	On-going	Contractor
Site clearance for construction of	Habitat loss	Ensure that the extent of vegetation to be cleared is clearly identified on technical drawings and appropriately marked on site.	EC7	Prior to construction and on-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
access roads		Prohibit works from exceeding the approved working corridor.	EC8	On-going	Contractor
Dust from construction works and batching plants	Dust deposition impacting on habitat and fauna	Ensure that dust mitigation measures outlined in the Air Emissions Management Plan (Appendix 1 of ESMP) are fully implemented.	EC9	On-going	Contractor
		Ensuring that concrete batching plants are not located in close proximity to ecologically sensitive areas	EC10	Prior to construction	Contractor
Noise from construction works, plant and vehicles	Disturbance to fauna	Ensure that noise mitigation measures outlined in the Noise and Vibration Management Plan (Appendix 2 of ESMP) are fully implemented.	EC11	On-going	Contractor
Encroachment of soil from storage mounds onto vegetated areas adjacent to works areas	Sediment deposition impacting on habitat and fauna	Ensure that mitigation measures to prevent the encroachment of material from stockpiles/storage mounds outlined in the Erosion and Sediment Control Plan (Appendix 6 of ESMP) are implemented.	EC12	On-going	Contractor
Soil erosion resulting from exposure and destabilisation of landforms and soils storage	Sediment entering rivers/ streams/ lakes from resulting in increased turbidity/reduced water quality and impacts on biodiversity	Ensure that measures outlined in the Erosion and Sediment Control Plan (Appendix 6 of ESMP) are implemented.	EC13	On-going	Contractor
Bridge/channel construction works	Erosion of riverbanks/ changes in sedimentation/ erosion patterns resulting in increased turbidity/reduce	Ensure that measures outlined in the Erosion and Sediment Control Plan (Appendix 6 of ESMP) are implemented.	EC14	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
	d water quality and impacts on biodiversity				
Dredging of sands from rivers for the production of cement	Impacts on benthic fauna	Identify land based sources of sand and avoid the requirement for dredging from river where possible	EC15	Prior to dredging works	Contractor
		Undertake ecological surveys at proposed dredging locations prior to the commencement of dredging activities.	EC16	On-going	Contractor
		Where surveys identify the presence of sensitive/significant ecological receptors, identify alternative source location and/or develop appropriate mitigation measures	EC17	Prior to dredging activities	BT20/ Contractor
Waste deposition in rivers/streams	Reduced water quality resulting on impacts on biodiversity	Ensure that mitigation measures outlined in the Waste Management Plan (Appendix 4, ESMP) are implemented.	EC18	On-going	Contractor
Leaks/spillages from plant, vehicles and storage compounds	Soil contamination and impacts on vegetation	Ensure that hazardous materials management procedures, as outlined in the Hazardous Materials Management Plan (Appendix 8 of ESMP) are fully implemented.	EC19	On-going	Contractor
		In the event of spillages/leaks being occurring/ being identified, ensure the procedures outlined in the Spill Prevention and Response Plan (Appendix 7 of ESMP) are implemented.	EC20	On-going	Contractor
Light pollution during construction phase and permanent road lighting	Disturbance to, harassment of and decreases in animal and plant individuals/ communities	Direct light in construction areas and from permanent road lighting to reduce illumination of surrounding areas and minimise disturbance to nocturnal fauna, where security and health and safety factors allow.	EC21	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Wildfires	Wildfire destroying habitat	Leave cleared vegetation to rot and prohibit burning if a fire hazard exists.	EC22	On-going	Contractor
Development of new and existing quarries/ sand and/or soil pits	Loss of habitat	Ensure that ecological surveys are undertaken prior the development of new/extension of existing quarries/ sand pits / soil pits	EC23	Prior to development	Contractor
		Implement appropriate mitigation measures (including the creation of buffer zones) to protect any significant habitat/ fauna identified.	EC24	Prior to development	Contractor
Lack of awareness of construction personnel	Damage to habitat and fauna	Ensure that all construction personnel are provided with appropriate training in ecological awareness, as appropriate to their work activities	EC25	On-going	Contractor

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Ecological Management Plan.

The Contractor's Ecological Management Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Ecological Management Plan are competent on the basis of education, training and experience (see EC25 in Table A above).

The Contractor's Ecological Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

All training activity associated with the Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall report to the Project Environmental Department the results of the surveys/audits/inspections undertaken in accordance with the relevant components of the Ecological Management Plan

Contractor's monthly report to Company shall include:

- Number and results of surveys/audits/ inspections.

The Independent Environmental Consultant will also undertake verification audits/ inspections and will submit routine reports to the PMU 7's Project Environmental Department.

Appendix A: Legal and Other Requirements

Legal and Other Requirements

The Contractor shall comply with all applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions.

Vietnam Laws and Regulations

The Contractor shall comply with all applicable Vietnam Laws and Regulations.

- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;
- Circular No.29/2011/TT-BTNMT on technical procedure of continental surface water monitoring;
- Circular 33/2011/TT-BTNMT on technical procedure of soil environment monitoring;
- QCVN 03:2008 National technical standard on permitted limit of heavy metal in soil.
- QCVN 15:2008 National technical standard on residue of plant protection chemicals in soil.
- QCVN 08:2008 National technical standard on surface water.

IFC Requirements

The following International Finance Corporation (IFC) Performance Standards are applicable to ecology during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts (2012)*, which establishes requirements for assessment, management, organizational capability, training, community engagement, monitoring, and reporting
- IFC Performance Standard 4 and Guidance Note 4: *Community Health, Safety and Security (2012)*, which requires Projects to avoid or minimise adverse impacts due to activities on soil, water and other natural resources in use by affected communities.
- IFC Performance Standard 6: *Biodiversity Conservation and Sustainable Management of Living Natural Resources (2012)*.

PS: 6 specifies the following requirements:

- States the requirement to assess the significance of potential impacts on all levels of biodiversity as an integral part of the Social and Environmental Assessment process. This process will consider relevant threats to biodiversity and ecosystem services, especially focusing on habitat loss, degradation and fragmentation, invasive alien species, overexploitation, hydrological changes, nutrient loading, and pollution.
- The requirement to minimise any conversion or degradation of modified habitat, and, depending on the nature and scale of the Project, identify opportunities to enhance habitat and protect and conserve biodiversity as part of the Project's operations.

-
- Do not significantly convert or degrade such habitat, unless the following conditions are met:
 - There are no technically and financially feasible alternatives;
 - The overall benefits of the Project outweigh the impacts, including those to the environment and biodiversity; and
 - Any conversion or degradation is appropriately mitigated.
 - Design natural habitat mitigation measures to achieve no net loss of biodiversity where feasible, which may include a combination of actions, such as:
 - Post-construction restoration of habitats;
 - Offset of losses through the creation of ecologically comparable areas that is managed for biodiversity; and
 - Compensation to direct users of biodiversity.
 - The requirement to minimise any conversion or degradation of natural habitat, and, depending on the nature and scale of the Project, identify opportunities to enhance habitat and protect and conserve biodiversity as part of the Project's operations.
 - The client will not significantly convert or degrade natural habitats, unless all of the following are demonstrated:
 - No other viable alternatives within the region exist for development of the project on modified habitat;
 - Consultation has established the views of stakeholders, including Affected Communities, with respect to the extent of conversion and degradation; and
 - Any conversion or degradation is mitigated according to the mitigation hierarchy.
 - The client will not intentionally introduce any new alien species (not currently established in the country or region of the project) unless this is carried out in accordance with the existing regulatory framework for such introduction. Notwithstanding the above, the client will not deliberately introduce any alien species with a high risk of invasive behaviour regardless of whether such introductions are permitted under the existing regulatory framework.

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 4: WASTE MANAGEMENT PLAN

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

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Prepared by	Ian Williams			
Signature				
Checked by	Barry Cowell			
Signature				
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Signature				
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Report number	Appendix 4			
File reference	004			

Environmental and social management plan appendix 4: Waste management plan

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Waste Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objectives of the plan are to:

- Establish waste management priorities based on the understanding of the potential Environmental, Health and Safety (EHS) risks and impacts associated with the project and considering the consequences of waste generation;
- Considerate the prevention, reduction, reuse, recovery, recycling, removal and disposal of waste arising from project activities in such a manner as to minimise the potential impacts to human health and the environment;
- Disposal of waste that cannot be recovered or reused at approved facilities and in an environmentally sound manner;
- Minimise, Contain, transport, handle and dispose of solid and liquid wastes arising from project construction activities in such a manner as to minimise impacts to human health and the environment; and
- Dispose of wastes at licensed facilities approved by BT20.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Ecological Management Plan;
- Spill Prevention and Response Plan;
- Community Health and Safety Plan;
- Environmental Monitoring Plan; and
- Stakeholder Engagement Plan.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Auditing

During the project, the Contractor should develop and inventory of waste. This should include all waste streams, classifications, quantities, storage requirements, options for reuse / recyclability and treatment and disposal requirements. This should be reviewed periodically throughout the life cycle of the project to ensure it encompasses everything.

As waste producers, the Contractor has a 'duty of care' obligation regarding the management of waste. The Contractor is obliged to minimise the risk of pollution and ensure that those that handle and dispose of the generated waste are authorised to do so. Third party audits should be undertaken and relevant paperwork maintained to ensure that the waste generated is being handled, treated and disposed of appropriately.

Regular inspections of waste storage areas should be carried out by the Contractor and findings should be documented.

Prior to the commencement of works, the Contractor should agree with the mitigation measures to be implemented. Regular checks should be carried out to ensure that these are being implemented and that they are effective.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to waste, together with mitigation and management measures to avoid or reduce these impacts. Table B identifies the typical waste streams that will be generated by the project along with appropriate storage methods and disposal options.

Contractor shall develop a Waste Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Consultant commissioned by BT20 will be responsible for reviewing the Waste Management Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Source of waste impact	Potential Impact	Mitigation and Management	Ref. No	Monitoring / Frequency	Responsibility
<p>Pre-construction preparation works.</p> <p>To include waste associated with:</p> <ul style="list-style-type: none"> ■ Demolition of 1,98m² of houses in six districts of Dong Nai and 11,130m² of houses in six districts of Lam Dong province. ■ Clearing trees and ground ■ Developing the construction site 	<p>Increased generation of waste.</p>	<p>It is envisaged that the majority of the waste generated during this demolition is reusable. Incorporate into the design the use of recyclable materials.</p> <p>Develop a waste inventory; this should detail the different waste streams, classification, quantities, storage requirements, potential use, and treatment and disposal arrangements. Ensure the waste hierarchy is applied.</p>	W1	<p>Undertake audits to demonstrate compliance with local and IFC requirements.</p> <p>Periodically review the waste inventory and update as necessary.</p> <p>Establish recycling objectives and formal tracking of waste generation and recycling rates.</p>	Contractor
	<p>Pollution of nearby receptors (i.e. controlled waters)</p>	<p>Develop procedures and controls to ensure appropriate storage of waste to minimise risk of pollution.</p>	W2	<p>Undertake audits to demonstrate compliance with local and IFC requirements.</p>	Contractor
	<p>Inappropriate disposal of waste (i.e. fly tipping)</p>	<p>Ensure that appropriately licensed transportation contractors and disposal sites are identified and used. Develop procedures and controls.</p> <p>Gain authorisation from</p>	W3	<p>Documented evidence of waste movements.</p>	Contractor

Source of waste impact	Potential Impact	Mitigation and Management	Ref. No	Monitoring / Frequency	Responsibility
		the urban environmental sanitation company for transport and treatment of waste.			
	Generation of dust	Ensure that measures outlined in the Air Emissions Management Plan (ESMP Appendix 1) are implemented.	W4	On-going	Contractor
	Noise and vibration from vehicle movements	Ensure that measures outlined in Noise and Vibration Management Plan (ESMP Appendix 2) are implemented.	W5	On-going	Contractor
Waste generation during construction phase: To include waste associated with: <ul style="list-style-type: none"> ■ Road construction ■ Drain construction ■ Bridge construction ■ Construction equipment ■ Concrete mixing ■ Work camp 	Generation of stone and waste earth, toxic gas, waste oils, domestic waste.	<p>Review waste sources during the planning and designing phases to identify expected waste generation, identify opportunities for source reduction and reuse and recycling.</p> <p>Incorporate into the design the use of recyclable materials.</p> <p>Develop a waste inventory; this should detail the different waste streams, classification, quantities, storage requirements, potential use, and treatment and disposal arrangements. Ensure the waste hierarchy is applied.</p>	W6	<p>Undertake audits to demonstrate compliance with local and IFC requirements.</p> <p>Periodically review the waste inventory and update as necessary.</p> <p>Evidence of waste movements.</p> <p>Establish recycling objectives and formal tracking of waste generation and recycling rates.</p>	Contractor
	Inappropriate disposal of waste (i.e. fly tipping)	<p>Ensure that appropriately licensed transportation contractors and disposal sites are identified and used. Develop procedures and controls.</p> <p>Gain authorisation from the urban environmental sanitation company for transport and treatment of waste.</p>	W7	Documented evidence of waste movements.	Contractor

Source of waste impact	Potential Impact	Mitigation and Management	Ref. No	Monitoring / Frequency	Responsibility
	Pollution of nearby receptors (i.e. controlled waters)	<p>Develop procedures and controls for on-site storage, minimising the risk of pollution.</p> <p>During the design phase of the project ensure that measures are developed and implemented to minimise pollution to receptors, ensure these measures are implemented (e.g. using a grating net with geo-textile material during construction of the upper bridge to minimise pollution of the river.)</p> <p>When using the floating tank in the river, the waste oil and oily rags will be segregated and stored in labelled containers on the barge. This will be replaced when full. The full container will be stored on concrete hardstanding in a secure location.</p> <p>Ensure the storage yard is surrounded by a fence of geo-textile.</p> <p>Provide storage for domestic waste on the construction sites and at the site huts. Assess options for recyclable materials.</p>	W8	<p>Undertake audits to demonstrate compliance with local and IFC requirements.</p> <p>Establish recycling objectives and formal tracking of waste generation and recycling rates.</p>	Contractor
	Generation of dust	Ensure that measures outlined in the Air Emissions Management Plan (ESMP Appendix 1) are implemented.	W9	On-going	Contractor
	Noise and vibration from vehicle movements	Ensure that measures outlined in Noise and Vibration Management Plan (ESMP Appendix 2) are implemented.	W10	On-going	Contractor

Source of waste impact	Potential Impact	Mitigation and Management	Ref. No	Monitoring / Frequency	Responsibility
Generation of hazardous waste Activities include: Replacing machine oils Performing maintenance tasks on equipment	Soil, groundwater and surface water contamination.	Establish and implement operational controls for on-site storage of hazardous waste. Store hazardous waste in a secure area on concrete hardstanding. Ensure containers are labelled so contents can be identified (TCV 6707/2000).	W11	Undertake audits to demonstrate compliance with local and IFC requirements.	Contractor
		Ensure the waste hierarchy is applied.		Conduct regular inspections of waste storage areas and document the findings.	
		Where liquid waste is stored in volumes greater than 220 litres, secondary containment should be implemented. The available volume of secondary containment should be at least 110% of the largest storage container of 25% of the total storage capacity.	W12	Maintain an inventory of hazardous waste generation, to include quantities, storage requirements and disposal arrangements. Review this document periodically. Report hazardous waste information to the Company and the Ministry of Natural Resources and Environment	Contractor
		When using the floating tank in the river, the waste oil and oily rags will be segregated and stored in labelled containers on the barge. This will be replaced when full. The full container will be stored on concrete hardstanding in a secure location.	W13		Contractor
	Waste contamination	Minimise hazardous waste generation by implementing stringent waste segregation in order to prevent commingling of hazardous and non-hazardous waste.	W14	Periodic checks of hazardous waste storage area	Contractor
	Inappropriate disposal of waste (i.e. fly	Ensure that appropriately licensed transportation	W15	Documented evidence of waste	Contractor

Source of waste impact	Potential Impact	Mitigation and Management	Ref. No	Monitoring / Frequency	Responsibility
	tipping)	<p>contractors and disposal sites are identified and used (registered with the Ministry of Natural Resources and Environment, Circular No. 12/211/TT-BTNMT). Develop procedures and controls.</p> <p>Register the waste source with the Department of natural Resources and Environment in Dong Nai province.</p>		movements.	
<p>Waste management and disposal</p> <p>Including:</p> <p>Waste inventory</p> <p>Waste transfers</p>	Soil, groundwater and surface water contamination.	<p>Establish and implement operational controls for material handling, spill response, storage, transportation and disposal.</p> <p>Develop a waste inventory, detailing waste minimisation, segregation and disposal. Use the inventory to identify opportunities for reuse / recycling.</p>	W16	Periodic reviews of the operational procedures and the waste inventory ensure that all activities and wastes are captured.	Contractor
		<p>Develop and enforce Duty of Care procedures. Whereby the waste producer has a duty to ensure that waste is properly managed from generation to disposal.</p> <p>Undertake audits of third party contractors responsible for transporting and disposing of waste.</p> <p>Maintain documented evidence of all waste transfers.</p> <p>Ensure contractors regularly collect waste from the project site.</p>	W17	Documented evidence of waste movements.	Contractor

Table B: Typical Waste Streams Generated

Waste stream	Composition	Classification	Proposed Storage Method	Options for waste treatment and/or disposal	Option(s) Recommended
Construction waste	Concrete, asphalt, gravel, stone, inert materials, wood, metals, plastics, insulation, packaging(material bags), plasterboard/gypsum, general waste	Recyclable/ Combustible	Waste skips; inert materials stockpiled on hardstanding	Crush inert materials and reuse on-site; segregate metals, wood, plastics and send to reprocessor; disposal to landfill. As part of the design phase assess the potential for the recycling of the construction waste.	Segregate metals and send to reprocessor; investigate recycling feasibility for other materials; disposal to landfill.
Topsoil	Turf, soil, gravel	Inert	On-site storage areas to await reuse	Reuse on-site (consider options for use as bunds to offer acoustic screening); reuse off-site; disposal on-site; disposal off-site	Reuse on-site (bunds for acoustic screening)
Waste from vegetation clearance	Wood, plant matter	Combustible	On-site storage areas	Composting of plant matter on-site; composting of plant matter off-site; recycling of wood by reprocessor (logging); disposed to land	Recycling of wood by reprocessor (logging)
Domestic waste	Food waste, sanitary waste, card and paper, packaging, plastics, textiles.	Recyclable / compostable / combustible	On-site storage in wheeled bin containers	Segregate recyclable materials (glass bottles, paper, plastics, metals etc.) and send to reprocessors; disposal to landfill Composting of food waste offsite. Sanitary waste to be treated at the local sewage treatment works.	Segregate recyclable materials and send to reprocessors; disposal to landfill. Composting

Waste stream	Composition	Classification	Proposed Storage Method	Options for waste treatment and/or disposal	Option(s) Recommended
Waste engine oil	Oil	Hazardous / combustible	On-site storage in bunded containers	Off-site reprocessing	Off-site reprocessing Waste engine oil can be easily reprocessed off-site
Solid hazardous waste	Oily rags Empty containers	Hazardous / combustible	On-site storage, segregated and stored in a labelled wheeled bin container	Off-site reprocessing then reuse. Disposal to landfill	Off-site reprocessing then reuse.

Seven waste disposal sites have been identified within close proximities of the site. All seven sites are authorised with the relevant local authority and the official working document is available. It is recommended that Contractor obtains a copy of this document as part of their Duty of Care obligations. Investigate the materials that each disposal site is authorised to receive and ensure only waste within this scope is dispatched to the site. Where recyclable waste is generated, identify reprocessing facilities where these materials can be handled.

Roles and Responsibilities

The main contractor will be responsible for delivering the waste management plan and will be responsible for coordinating and managing day-to-day responsibilities for waste management throughout the construction period.

The Main Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Waste Management Plan.

Contractor's Waste Vibration Management Plan shall describe any necessary environmental controls or mitigation measures to be implemented. The plan shall be periodically reviewed and as necessary updated.

The Contractor will monitor the performance of sub-contractors and will be responsible for appropriate collection, segregation, treatment and transfer of waste for appropriate processing and disposal of waste.

The Contractor will maintain appropriate documentation to demonstrate compliance with local and international standards.

Company shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of Company's responsibilities in the Waste Management Plan.

Training, Awareness and Competency

The raising of environmental awareness is viewed as a crucial element in the appreciation and implementation of a Waste Management Plan. It is impertuned that the environmental requirements are appropriately communicated.

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Waste Management Plan are competent on the basis of education, training and experience.

Contractor's Waste Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

Contractor's training activity associated with the Waste Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Company shall ensure that all Company personnel responsible for the execution of Company's tasks and requirements in the Waste Management Plan are competent on the basis of education, training and experience.

Company's training activity associated with the Waste Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall report to the Project Environmental Department the results of the surveys undertaken in accordance with the relevant components of the Ecological Management Plan and integrate the results, including additional mitigation and management measures as agreed with Company, with the Noise and Vibration Management Plan.

Contractor's monthly report to Company shall include:

- Number and results of verification inspections prescribed in Table A
- Waste transfer documentation
- The waste inventory
- Performance indicators (recycling objectives and rates)

Appendix A: Legal and Other Requirements

Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree 21/2008/NĐ-CP dated 28/02/2008 on amending, supplementing some articles of Decree 80/2006/NĐ-CP dated 09/08/2006 of the Government regarding detailed regulations and guidance of implementation of some articles of the law on environment protection;
- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;
- Decree No. 59/2007/NĐ-CP dated 09/4/2007 of the Government on solid waste management.
- Decision No. 23/2006/QĐ-BTNMT dated 26/12/2006 of the Ministry of Natural Resources and Environment on promulgating the list of hazardous wastes.
- Circular No. 12/2011/TT-BTNMT dated 14/4/2011 of the Ministry of Natural Resources and Environment on stipulating the hazardous waste management.

IFC Performance Standards

The following IFC Performance Standards apply to noise and vibration issues during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts* (2012) which establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring and reporting.
- IFC Performance Standard 3: *Resource Efficiency and Pollution Prevention* (2012), and specifically the following provisions:
 - “The objectives of pollution prevention are to a) to avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities; and b) to promote the reduction of emissions that contribute to climate change”.
 - “The client will avoid or minimise the generation of hazardous and non-hazardous waste materials as far as practicable. Where waste generation cannot be avoided but has been minimised, the client will recover and reuse waste; where waste cannot be recovered or reused, the client will treat, destroy and dispose of it in an environmentally sound manner. If the generated waste is considered hazardous,

the client will explore commercially reasonable alternatives for its environmentally sound disposal considering the limitations applicable to its transboundary movement. When waste disposal is conducted by third parties, the client will use contractors that are reputable and legitimate enterprises licensed by the relevant regulatory authority.”

‘Because of the risks to the environment and the ever-increasing costs and liabilities associated with the management and disposal of waste material, PS3 requires clients to investigate options for waste avoidance, waste recovery and waste disposal during the operational stage of the project. The level of effort in addressing this requirement depends on the risks associated with the waste materials generated by the project. Clients should reasonably inquire about the location of the final disposal of their waste, even if the disposal is conducted by a third party, and especially if the waste is considered to be hazardous to human health and the environment. If no suitable disposal method is available through commercial or other means, the client should develop their own recovery or disposal facilities or work through their local business association or other similar entity to identify viable alternatives or approaches.’

‘In cases where the waste treatment, storage or disposal alternative selected has the potential to generate polluting emissions, the client should apply adequate control techniques to avoid, minimise or reduce these emissions according to the requirements of paragraphs 4, 10 and 11 of PS3.

- IFC Performance Standard 4: *Community Health, Safety and Security* the following points are relevant to waste management.

‘The client will evaluate the risks and impacts to the health and safety of the affected community during the design, construction, operation and decommissioning of the project and will establish preventive measures to address them in a manner commensurate with the identified risks and impacts. These measures will favour the prevention or avoidance of risks and impacts over minimisation and reduction.’

‘Where the project poses risks to or adverse impacts on the health and safety of affected communities, the client will disclose the Action Plan and any other relevant project-related information to enable the affected communities and relevant government agencies to understand these risks and impacts, and will engage the affected communities and agencies on an ongoing basis consistent with the requirements of PS1.’

The following IFC Guidelines are applicable to construction waste management. The Contractor shall meet the intent of these guidelines:

- IFC EHS General Guidelines (April 2007), section 1.6 and section 6
- IFC EHS Guidelines, *Industry Sector Guidelines, Toll Roads*

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 5: WATER RESOURCES MANAGEMENT PLAN

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks				
Date	19 th April 2013			
Prepared by	Ian Williams			
Signature				
Checked by	Barry Cowell			
Signature				
Authorised by	Barry Cowell			
Signature				
Project number	36099			
Report number	Appendix 5			
File reference	005			

Environmental and social management plan appendix 5: water resources management plan

Rehabilitation and Improvement of National Highway No. 20 – Section from Dong Nai to Lam Dong Province

19/04/2013

Client

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Introduction

Objectives

BT20 has developed this Water Resource Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objective of this plan is to minimise potential effects on water resources and associated receptors resulting from rehabilitation and improvement works on National Highway No. 20 - Section between Dong Nai to Lam Dong Province.

Potential receptors along the route could include surface water features (i.e. rivers, streams, drainage channels, ponds), groundwater resources and associated users and specific flora and fauna.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Ecological Management Plan;
- Community Health and Safety Plan;
- Environmental Monitoring Plan; and
- Stakeholder Engagement Plan.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Surveys

During construction works, the contractor will identify additional work locations, including haul routes and construction compounds and aggregate borrow pits, which may potentially represent a risk to sensitive water resource receptors (including rivers, streams, drainage ditches, ponds etc) due to their proximity. Prior to the commencement of works, the contractor shall agree with the Independent Environmental Consultant site specific mitigation measures to be implemented at such locations to mitigate potential negative effects.

The contractor shall conduct environmental assessments at surface water abstraction sites to confirm water abstraction requirements do not impact on downstream users or environmental flows.

Management and Monitoring

The contractor shall undertake water quality and level monitoring at the locations previously monitored (as identified in the EIA and presented in Appendix B of this document) in order to confirm general compliance with the requirements of Vietnamese national legislation QCVN 08:2008/BTNMT - National technical regulation on surface water quality (see Appendix A).

The contractor shall develop a Water Resources Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Supervision Consultant acting on behalf of BT20 will be responsible for reviewing the Water Resources Management Plan prepared by the contractor and for ensuring that it is consistent with this framework document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Site clearance, demolition and preparation	Physical (i.e. dust, sediments) and chemical (i.e. oil, petrol etc) contaminants resulting in a reduction in water quality	<p>Ensure use and storage of hazardous materials is in accordance with IFC General EHS Guidelines: Environmental, such as:</p> <ul style="list-style-type: none"> ▪ Ensure all hazardous substances and materials are stored in appropriate locations with impervious hardstanding and adequate secondary containment; ▪ Construction workers to be provided with adequate training on use, storage and handling of hazardous substances; ▪ Portable spill containment and clean-up equipment to be provided at appropriate locations on site and training in the use of the equipment. <p>(See Raw Materials Management Plan – Appendix 9 and Spill Prevention and Response Plan –</p>	W1	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		Appendix 7 of the ESMP).			
		<p>Ensure that mitigation measures outlined within the Erosion and Sedimentation Plan (Appendix 6 of ESMP) are fully implemented.</p> <p>Measures to be implemented include:</p> <ul style="list-style-type: none"> - Scheduling works to avoid heavy rainfall periods (i.e., during the dry season) to the extent practical; - Contouring and minimizing length and steepness of slopes; - Mulching to stabilize exposed areas and re-vegetating areas promptly; and -Lining steep channel and slopes (e.g. use jute matting) 	W2	On-going	Contractor
		Ensure that dust mitigation measures outlined in the Air Emissions Management Plan (Appendix 1 of ESMP) are fully implemented.	W3	On-going	Contractor
		Develop a procedure for managing the discovery of contamination to minimize or reduce the risk to water resources.	W4	Prior to construction	Contractor
		Develop an Emergency Preparedness and Response Plan in accordance with IFC General EHS Guidelines: Environmental.	W5	Prior to construction	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		The contractor shall undertake water quality and level monitoring at the locations previously monitored (as identified in the EIA and presented in Appendix B of this document) in order to confirm general compliance with the requirements of Vietnamese national legislation QCVN 08:2008/BTNMT - National technical regulation on surface water quality (see Appendix A).	W6	On-going	Contractor
	Increased flood risk from surface water run-off	Ensure that the extent of vegetation to be cleared is clearly identified on technical drawings and appropriately marked on the road corridor to minimise the increase in surface water run-off	W7	Prior to construction	BT20 / Contractor
		Re-vegetate cleared areas promptly	W8	On-going	Contractor
		Provide temporary surface water drainage system including settlement ponds / sediment traps prior to discharge points to control volume of discharge	W9	On-going	Contractor
Staging and storage sites	Reduction in water quality from storage of construction materials / chemicals	Ensure that the minimum numbers of staging and storage areas possible are used. Where possible, ensure that all staging and storage areas are not located within 50m of surface water courses.	W10	Prior to construction	BT20 / Contractor
		Ensure use and storage of hazardous materials is in accordance with IFC General EHS Guidelines: Environmental, such as: ▪ Ensure all hazardous substances and	W11	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		<p>materials are stored in appropriate locations with impervious hardstanding and adequate secondary containment.</p> <ul style="list-style-type: none"> ▪ Construction workers to be provided with adequate training on use, storage and handling of hazardous substances ▪ Portable spill containment and clean-up equipment to be provided at appropriate locations on site and training in the use of the equipment. <p>(See Hazardous Materials Management Plan – Appendix 8 and Spill Prevention and Response Plan – Appendix 7 of the ESMP).</p>			
		Ensure that dust mitigation measures outlined in the Air Emissions Management Plan (Appendix 1 of ESMP) are fully implemented.	W12	On-going	Contractor
		Ensure that mitigation measures outlined within the Erosion and Sedimentation Plan (Appendix 6 of ESMP) are fully implemented.	W13	On-going	Contractor
		Develop an Emergency Preparedness and Response Plan in accordance with IFC General EHS Guidelines: Environmental.	W14	Prior to construction	Contractor
	Increased flood risk to construction workers	Ensure that staging and storage sites are not located within high water levels associated with rainy season.	W15	Prior to construction	BT20 / Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party	
		Avoid vegetation stripping immediately prior to or during rainy season, where possible.	W16	Prior to construction	Contractor	
		Ensure that appropriate temporary drainage is implemented to ensure staging and storage sites are not inundated during rainy season	W17	Prior to construction	Contractor	
Material extraction for road construction	Physical (i.e. dust, sediments) and chemical (i.e. oil, petrol etc) contaminants resulting in a reduction in water quality	Develop measures to prevent, minimise, or control impacts caused by extraction activities in accordance with IFC EHS Guidelines for Construction Materials Extraction, such as: <ul style="list-style-type: none"> ▪ Adoption of settlement ponds, sumps, and lagoons designed to allow adequate retention time. ▪ Construction of a dedicated drainage network; ▪ Installation of sediment traps along water drainages, including fascines, silt fences, and vegetation traps. 	W18	Prior to construction	Contractor	
		Ensure that mitigation measures outlined within the Erosion and Sedimentation Plan (Appendix 1 of ESMP) are fully implemented.	W19	On-going	Contractor	
		Develop an Emergency Preparedness and Response Plan in accordance with IFC General EHS Guidelines: Environmental.	W20	Prior to construction	Contractor	
		Effects on ecology from dredging sands from river bed	Ensure that mitigation measures outlined in the Ecology Management Plan (Appendix 3 of ESMP) are fully implemented.	W21	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
	Increased flood risk from surface water run-off	<p>Develop measures to prevent, minimise, or control impacts caused by extraction activities in accordance with IFC EHS Guidelines for Construction Materials Extraction, such as:</p> <ul style="list-style-type: none"> ▪ Storm water peak runoff rate should not exceed the peak predevelopment runoff rate for a particular design storm; ▪ Adoption of settlement ponds, sumps, and lagoons designed to allow adequate retention time. 	W22	Prior to construction	Contractor
Road construction including sub-grading, excavating and embanking the road base	Physical (i.e. dust, sediments) and chemical (i.e. oil, petrol etc) contaminants resulting in a reduction in water quality	<p>Ensure use and storage of hazardous materials is in accordance with IFC General EHS Guidelines: Environmental, such as:</p> <ul style="list-style-type: none"> ▪ Ensure all hazardous substances and materials are stored in appropriate locations with impervious hardstanding and adequate secondary containment. ▪ Construction workers to be provided with adequate training on use, storage and handling of hazardous substances ▪ Portable spill containment and clean-up equipment to be provided at appropriate locations on site and training in the use of the equipment. 	W23	On-going	Contractor
		<p>Ensure that dust mitigation measures outlined in the Air Emissions Management Plan (Appendix 1 of</p>	W24	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		ESMP) are fully implemented.			
		Ensure that mitigation measures outlined within the Erosion and Sedimentation Plan (Appendix 1 of ESMP) are fully implemented.	W25	On-going	Contractor
		Develop an Emergency Preparedness and Response Plan in accordance with IFC General EHS Guidelines: Environmental.	W26	Prior to construction	Contractor
	Reduction in water quality from increased erosion.	Ensure that mitigation measures outlined within the Erosion and Sedimentation Plan (Appendix 1 of ESMP) are fully implemented.	W27	On-going	Contractor
Bridge construction	Reduction in water quality.	Implement measures outlined in IFC General EHS Guidelines: Environmental , such as: <ul style="list-style-type: none"> ▪ Consider installation of free-spanning structures (e.g., single span bridges). 	W28	Prior to construction	BT20 / Contractor
		<ul style="list-style-type: none"> ▪ Restricting the duration and timing of in-stream activities to the dry season and avoiding periods critical to biological cycles of valued flora and fauna (e.g. migration, spawning, etc.) ▪ For in-stream works, using isolation techniques such as berming or diversion during construction to limit the exposure of disturbed sediments to moving water 	W29	On-going	Contractor
		Ensure that mitigation measures outlined in the Erosion and Sedimentation	W30	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		Management Plan (Appendix 6 of ESMP) are fully implemented.			
		Ensure emergency response procedures are developed in line with IFC guidance documents in the event of an accidental release of contamination.	W31	On-going	Contractor
	Change in river flow dynamics from bridge construction	Ensure that any channels and ditches required as part of road construction are designed to allow for post-construction flows.	W32	Prior to construction	BT 20 / Contractor
	Inundation during periods of heavy rainfall	Schedule construction activities to avoid heavy rainfall periods (i.e. during the dry season) to the extent practical.	W33	On-going	Contractor
Water consumption	Increased water consumption associated with construction camps	<p>Preparation of a water management program including:</p> <ul style="list-style-type: none"> ▪ Identification, regular measurement, and recording of principal water usage associated with workers facilities. ▪ Review of measurement (metering) should emphasize areas of greatest water use and enable further water efficiency measures to be considered. 	W34	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
	Water consumption associated with construction / concrete batching etc	<p>Consideration of the following IFC General EHS Guidelines: Environmental water conservation measures.</p> <ul style="list-style-type: none"> ▪ Implement water use efficiency to reduce the amount of water usage. ▪ Storm/Rainwater harvesting and use where possible. ▪ Re-use of treated waste water to be included in project design processes where feasible. ▪ Project design to have measures for adequate water collection, spill control and leakage control system. 	W35	On-going	Contractor
Waste water discharges	Reduction in water quality from increased waste water discharges from concrete batching plant	<p>Manage waste water discharges in line with IFC General EHS Guidelines: Environmental.</p> <p>Generation and discharge of wastewater of any type should be managed through a combination of:</p> <ul style="list-style-type: none"> ▪ Water use efficiency to reduce the amount of wastewater generation ▪ If needed, application of wastewater treatment techniques to reduce the load of contaminants prior to discharge, taking into consideration potential impacts of cross-media transfer of contaminants during treatment (e.g., from water to air or land) 	W36	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
	Reduction in water quality from increased waste water discharges from workers camps	<p>Manage waste water discharges in line with IFC General EHS Guidelines: Environmental</p> <p>Adequate portable or permanent sanitation facilities serving all workers should be provided at all construction sites.</p> <p>Adopt water efficiency measures to reduce the amount of wastewater generation.</p>	W37	On-going	Contractor

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Water Resources Management Plan.

Contractor's Water Resources Management Plan shall describe the resources allocated and responsibility for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

The company shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of Company's responsibilities in the Water Resources Management Plan.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Water Resources Management Plan are competent on the basis of education, training and experience.

Contractor's Water Resources Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

Contractor's training activity associated with the Water Resources Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Company shall ensure that all Company personnel responsible for the execution of Company's tasks and requirements in the Water Resources Management Plan are competent on the basis of education, training and experience.

Company's training activity associated with the Water Resources Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall complete regular monitoring of all mitigation measures developed to determine their effectiveness at reducing and minimising adverse effects. Where evidence of impacts are identified or implemented mitigation measures appear to be inadequate additional mitigation measures will be developed and implemented.

The contractor shall report to the Project Environmental Department the results of the monitoring / surveys / audits / inspections undertaken in accordance with the relevant components of the Water Resources Management Plan.

Contractor's monthly report to Company shall include:

- Number of monitoring / surveys / audits / inspections;
- A summary of the findings and results of all monitoring / surveys / audits / inspections; and
- Where evidence of impacts are identified or implemented mitigation measures appear to be inadequate additional mitigation measures will be developed and reported.

The Independent Environmental Consultant will also undertake verification audits/ inspections and will submit routine reports to the PMU 7's Project Environmental Department.

Appendix A: Legal and Other Requirements

Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree No. 21/2008/NĐ-CP dated 28/02/2008 of the Government on amendment of and supplement to several Articles of the Decree No. 80/2006/NĐ-CP;
- Decree No. 67/2003/NĐ-CP dated 13/6/2003 on environmental protection charges for waste water;
- Decree No. 04/2007/NĐ-CP dated 08/1/2007 of the Government on Amending and supplementing a number of articles of the Government's Decree No. 67/2003/ND-CP of June 13, 2003, on "environmental protection charges applicable to wastewater";
- Decree No. 59/2007/NĐ-CP dated 09/4/2007 of the Government on solid waste management;
- Circular No. 02/2005/TT-BTNMT dated 24/6/2005 of the Ministry of Natural Resources and Environment on guiding the issuance of permits for water resource exploration, exploitation and use, or for discharge of wastewater into water sources.
- Circular No. 12/2011/TT-BTNMT dated 14/4/2011 of the Ministry of Natural Resources and Environment on stipulating the hazardous waste management;
- Decision No. 22/2006/QĐ-BTNMT dated 18/12/2006 of the Ministry of Natural Resources and Environment on the compulsory application of Vietnam environmental standards;
- QCVN 08:2008/BTNMT - National technical regulation on surface water quality;
- QCVN 09:2008/BTNMT - National technical regulation on underground water quality;
- QCVN 14:2008/BTNMT - National Technical Regulation on Domestic Wastewater;
- QCVN 24:2009/BTNMT - National Technical Regulation on Industrial Wastewater;
- QCVN 01:2009/BYT - National technical regulation on drinking water quality;
- QCVN 02:2009/BYT - National technical regulation on domestic water quality.

IFC Performance Standards

The following IFC Performance Standards apply to water resource issues during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts* (2012) which establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring and reporting.

-
- IFC Performance Standard 3: *Resource Efficiency and Pollution Prevention (2012)*, outlines objectives to avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities and to promote more sustainable use of resources, including energy and water.

The IFC has produced a series of Environment, Health and Safety (EHS) guidance notes that are considered relevant to controlling adverse impacts on water resources. These guidance documents include:

- IFC General EHS Guidelines: Environmental (2007)
- IFC EHS Guidelines: Construction Materials Extraction (2007)

The contractor shall meet the intent of these guidelines

Appendix B: Surface Water Monitoring Locations

Locations for Water Monitoring

Code	Name of bridge	Station	Sampling frequency
W1	Gia Duc	Km1+540	1 time in day /2 water layers/01 section
W2	La Nga	Km35+712	1 time in day /2 water layers/2 section
W3	Phuong Lam bridge	Km65+056	1 time in day/2 water layers/01 section
W4	Da Huoai river	Km87+350	1 time in day /2 water layers/01 section
W5	Suoi Tien	Km96+200	1 time in day /2 water layers/01 section
W6	Dai Nga bridge	Km129+500	1 time in day /2 water layers/01 section
W7	Dinh Trang Hoa bridge	Km139+300	1 time in day /2 water layers/01 section
W8	Lien Dam bridge	Km149+303	1 time in day /2 water layers/01 section
W9	Darle bridge	Km177+800	1 time in day /2 water layers/01 section
W10	Hiep Thuan bridge	Km183+376	1 time in day /2 water layers/01 section
W11	Dai Ninh bridge	Km189+200	1 time in day /2 water layers/01 section
W12	Xom Trung bridge	Km194+771	1 time in day /2 water layers/01 section
W13	Dinh An I bridge	Km217+810	1 time in day /2 water layers /01 section
W14	Dat bridge	Km254+254	1 time in day /2 water layers/01 section
W15	Xeo bridge	Km263+100	1 time in day /2 water layers /01 section

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 6: EROSION AND SEDIMENT MANAGEMENT

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

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Environmental and Social Management Plan Appendix 6: Erosion and Sediment Management

Rehabilitation and Improvement of National Highway No. 20 – Section from Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Erosion and Sediment Control Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objectives of this plan are to maintain stable landforms, reduce erosion and enhance reinstatement and to reduce potential adverse effects on stream/river water quality and sedimentation.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Air Quality;
- Ecological Management Plan;
- Waste Management Plan;
- Raw Materials Management Plan;
- Hazardous Materials Management Plan;
- Spill Prevention and Control Plan; and
- Water Management Plan.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Surveys

The contractor will undertake periodic surveys of erosion on the edges of the road and of the riverbanks in the vicinity of bridge works. The surveys should be undertaken every 3 months in the dry season and every month in the wet season as a minimum.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to erosion and sediment mobilisation, together with mitigation and management measures to avoid or reduce these impacts.

The Contractor shall develop an Erosion and Sediment Control Management Plan which will, as a minimum, incorporate the measures described in Table A, but shall not be limited to these measures. An Environmental Supervision Consultant of BT20 will be responsible for reviewing the Erosion and Sediment Control Management Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Sub-grading, excavating, embanking the road base and road construction	Soil erosion resulting in reduced water quality, flooding, reduced agricultural productivity and impact on reservoir capacity and life expectancy.	Assess and establish erosion and sediment control requirements (particularly in relation to site preparation earthworks (soils storage mounds), riverbanks adjacent to bridge works, site drainage), detailing specific erosion and sediment controls to be implemented (e.g., diversion drains, sediment ponds and fabric silt curtains). The controls should limit the mobilization and dispersion of sediment into freshwater and estuarine environments.	ES1	Undertake visual surveys every 3 months in dry season and monthly in wet season as a minimum.	Contractor
		Should erosion result in any serious collapse of roadside slopes/ banks, the contractor should implement appropriate mitigation measures. These could include: <ul style="list-style-type: none"> - Constructing of a retaining wall, combining drainage and surface reinforcement. - Construction of a retaining wall or arranging rock or 	ES2	On-going	Contractor

<p>reinforcing surface to protect and contribute retaining wall to protect slope.</p> <ul style="list-style-type: none"> - Planting grass to reinforce the surface in combination with drainage. 			
<p>Ensure that there are no discharges of solid waste from construction and/or domestic waste into rivers.</p>	ES3	On-going	Contractor
<p>Ensure that high embankment and embankment adjacent to rivers and lakes shall be reinforced with rubble stone, mortar 10 MPa, 25cm in thickness, that is above the ballast layer, 10cm in thickness for anti-erosion purpose.</p>	ES4	On-going	Contractor
<p>To prevent the risk of overflow and erosion of soil in temporary storages areas, the following measures will be implemented:</p> <ul style="list-style-type: none"> ▪ Quantity of material stored will be limited to 20-25 m² and mounds will be no higher than 1.5m; and ▪ The temporary storages must be surrounded by a geotextile fabric fences and securely reinforced to avoid collapsing. 	ES5	On-going	Contractor
<p>Ensure that any material overflowing from stockpiles/ storage embankments onto residential/ agricultural land is removed immediately upon identification.</p>	ES6	On-going	Contractor
<p>Provide a commitment to compensate for damages to agricultural land/other</p>	ES7	On-going	Contractor

	<p>others caused by sedimentation.</p>			
	<p>Install and regularly maintain screens to collect mud from surface water. (The mud screen is made of geo-textile fabric and arranged at least 10cm depth and consolidated to avoid falling in).</p> <p>Undertake regular checks of screens (at least twice per day) to ensure drainage channels are clear of mud.</p>	ES8	On-going	Contractor
	<p>In order to prevent oil and solvent in the mixture of liquid asphalt used for covering road from entering into the water source, the construction of asphalt concrete road surface should only be undertaken on dry days, and when road base is dry.</p> <p>If it rains during the operation, it needs to cancel the construction and prepare the dry sand to cover the road surface when adhesive asphalt is spraying.</p>	ES9	On-going	Contractor
Erosion and landslides in wet season in the excavation areas	<p>Programme works to ensure that excavation and embankment are completed for each road base section and compacted before wet season.</p>	ES10	On-going	Contractor
	<p>When undertaking excavation works in hilly and mountainous areas:</p> <ul style="list-style-type: none"> ▪ limit clearance of the vegetation cover beyond the scope of site clearance; ▪ undertake excavations in areas with high positive slope, 	ES11	On-going	Contractor

		excavate in dry season: <ul style="list-style-type: none"> Undertake slope stability and erosion protection before the peak time of wet season. 			
		For excavation works during the rain season, construct temporary drainage channels to divert water to natural soakaways away from areas of potential erosion	ES12	On-going	Contractor
		Ensure that crossculverts are clear and new/ existing drainage systems are installed and operable prior to main rain season	ES13	On-going	Contractor
		Ensure that grass slopes on the margins of roads are replanted with grass as soon as the construction is completed.	ES14	On-going	Contractor
Construction of bridge abutment, pier and bridge ends	Change in sedimentation/ erosion regime of the river bed resulting from the change in flow velocity in the vicinity of the bridge piers and ends	Implement design measures to minimise issues of erosion of riverbanks in the vicinity of new bridges/ bridge improvements. This could include the construction of stone embankments and the planting of vegetation on slopes.	ES15	Design Stage	BT20/ Contractor
		When excavating foundation pits during the wet season, ensure that temporary mud screens are located around the pit. around the foundation pit. The screen should be cleared at least twice a day to operate effectively.	ES16	On-going	Contractor
		Implement measures to ensure that there are no discharges of bentonite mixed mud into river; All bentonite mud should be appropriately transferred and stored in the temporary storage	ES17	On-going	Contractor

		yard.			
		Prevent solid waste generated during bridge construction from entering water bodies. This should include the use of nets lined with geotextile as a barrier when implementing the construction of bridge.	ES18	On-going	Contractor
		To prevent the collapse of road at the head of bridge, the surface of slope should be planted, to prevent erosion, and combine with the suitable drainage system.	ES19	On-going	Contractor
Discharges from batching plants and dewatering of excavations and washing-down of plant and equipment	Reduced water quality and associated impacts on fish and benthic fauna	<p>Ensure that mitigation measures outlined in the Ecology Management Plan (Appendix 3 of ESMP) are fully implemented.</p> <p>Ensure that waste water from the batching plants is collected and treated recycled for reuse.</p> <p>Ensure that all water from dewatering operations is treated in settling ponds prior to discharge.</p> <p>Ensure that all water for used for washing down plant and equipment is collected in a settling pond prior to discharge.</p>	ES20	On-going	Contractor
Contaminated surface water/ stormwater discharge during road operation	Reduced water quality and associated impacts on fish and benthic fauna	Ensure that road drains and silt traps are maintained on a regular basis.	ES21	On-going	Contractor

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Erosion and Sediment Control Management Plan.

The Contractor's Erosion and Sediment Control Management Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

The Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of Company's responsibilities in the Erosion and Sediment Control Management Plan.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Erosion and Sediment Control Management Plan are competent on the basis of education, training and experience.

The Contractor's Erosion and Sediment Control Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

The Contractor's training activity associated with the Erosion and Sediment Control Management shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall report to the Project Environmental Department the results of the surveys undertaken in accordance with the relevant components of the Erosion and Sediment Control Management Plan,

Contractor's monthly report to Company shall include:

- Number of surveys of erosion undertaken during the month and summary of the findings; and
- A summary of any actions undertaken where erosion issues have been identified.

Appendix A: Legal and Other Requirements

Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree 21/2008/NĐ-CP dated 28/02/2008 on amending, supplementing some articles of Decree 80/2006/NĐ-CP dated 09/08/2006 of the Government regarding detailed regulations and guidance of implementation of some articles of the law on environment protection;
- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No. 02/2005/TT-BTNMT dated 24/6/2005 of the Ministry of Natural Resources and Environment on guiding the issuance of permits for water resource exploration, exploitation and use, or for discharge of wastewater into water sources.

IFC Guidance

The following IFC Performance Standards are applicable to erosion and sediment control during construction. The contractor shall meet the intent of these guidelines:

- IFC EHS General Guidelines (April 2007), Section 4
Recommended soil erosion and water system management approaches include:
- Sediment mobilisation and transport: Reducing or preventing erosion by:
 - Scheduling to avoid heavy rainfall periods (ie, the dry season) to the extent practical;
 - Contouring and minimising length and steepness of slopes;
 - Mulching to stabilise exposed areas;
 - Re-vegetating areas promptly; and
 - Designing channels and ditches for post-construction flows.
- Clean runoff management:
 - Segregating or diverting clean water runoff to prevent it mixing with water containing a high solids content, to minimise the volume of water requiring treatment prior to discharge.
- Road Design:
 - Limiting road gradients to reduce runoff-induced erosion; and

- Providing adequate road drainage based on road width, surface material and maintenance.
- Disturbance to water bodies:
 - Depending on the potential for adverse impacts, installing free-spanning structures (e.g, single span bridges) for road watercourse crossings;
 - Restricting the duration and timing of in-stream activities to lower low periods (e.g, dry season), and avoiding periods critical to biological cycles of valued flora and fauna; and
 - For in-stream works, using isolation techniques such as berming or diversion during construction to limit the exposure of disturbed sediments to moving water; and
- Structural (slope) stability
 - Providing effective short term measures for slope stabilisation, sediment control and subsidence control.

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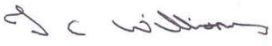




ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 7: SPILL PREVENTION AND RESPONSE MANAGEMENT PLAN

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

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Environmental and social management plan appendix 7: Spill Prevention and Response management plan

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from Dong Nai to Lam Dong Province

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Introduction

Objectives

BT20 has developed this Spill Prevention and Response Plan as part of its Environmental and Social Management Plan (ESMP).

The objective of this plan is to prevent spills and in the event of a spill, to minimise the environmental and social impact.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Ecological Management Plan;
- Waste Management Plan;
- Community Health and Safety Plan;
- Environmental Monitoring Plan; and
- Stakeholder Engagement Plan.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Risk Assessments

As part of a detailed execution plan and prior to the commencement of work, the Contractor shall carry out a detailed risk assessment. This should establish the high risk locations and activities and identify measures to mitigate impacts and reduce the risks to as low as reasonably practical. As part of the risk assessment, specific response measures should be developed. The Contractor's spill risk assessment will be subject to review and approval by an Independent Environmental Consultant commissioned by BT20. The Independent Environmental Consultant will be responsible for reviewing the Spill Risk Assessment prepared by the contractor and for ensuring that it comprehensively covers conditions on site.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to noise and vibration, together with mitigation and management measures to avoid or reduce these impacts.

Contractor shall develop a Spill Prevention and Response Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. The Environmental Supervision Consultant of BT20 will be responsible for reviewing the Spill Prevention and Response Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues. Due to the different scopes of work and work locations, not all management and mitigation measures in the Spill Prevention and Response Plan, Contractor should ensure that all applicable mitigation measures are implemented. Contractor should maintain spill and emergency response plans on site.

Table A: Management and Monitoring

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Spillage of oil/fuel/chemicals during transport, storage, handling or refuelling	Pollution of nearby receptors (i.e. controlled waters)	<p>Prior to the commencement of construction activities, Contractor shall undertake a spill risk assessment to establish high risk locations and activities. The risk assessment will identify measures to reduce associated risks to as low as reasonably practical. Site and activity specific response measures will be incorporated into Contractor's Spill Prevention and Response Plan.</p> <p>As a minimum this should cover:</p> <ul style="list-style-type: none"> - A description of activity type and operator information; - A responsible person, detailing job role and contact details; - Notification requirements; - Clear 	S1	Periodic reviews of the risk assessment throughout the lifetime of the project.	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		<p>distinctions of severity of spills, according to the size and nature of the spill, using a clearly defined tiered approach;</p> <ul style="list-style-type: none"> - Spill response frameworks based on site specific risk assessments include location volume, type of spill and environmental sensitivity; - Strategies and equipment for managing spills; - Procedures to mobilise external resources for responding to large spills; - A full list and the location of on-site and off-site spill response equipment and the response time estimates for deploying the equipment; - A plan of the surrounding area showing topography, drainage flow paths, ground and surface water resources, sensitive and protected areas, community and cultural sensitivities; - Clean up strategies and handling instructions for 			

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		<p>recovered oil, chemicals and fuels. To include transportation, temporary storage and treatment / disposal (see Waste Management Plan);</p> <ul style="list-style-type: none"> - Identification and evaluation of potential discharge detection procedures and equipment; - Facility response self-inspection, training, exercises, drills and logs; - Security measures, including fences, lighting guards etc. <p>Risk assessments will be updated as necessary to incorporate the changes throughout the project. The mitigation measures will also need to be updated as a result of the updated risk assessment; these will be incorporated into the Contractor's Spill Prevention and Response Plan.</p>			
		<p>Fuel and chemical storage facilities shall be purpose-built, located in designated aboveground areas away from watercourses and provided with secondary containment. Where</p>	S2	Document the findings of the inspections	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		<p>liquid waste is stored in volumes greater than 220 litres, secondary containment should be implemented. The available volume of secondary containment should be at least 110% of the largest storage container of 25% of the total storage capacity.</p> <p>The integrity of all storage tanks and bunds will be inspected for leaks.</p>			
		<p>Ensure appropriate spill kits are available at each work site as necessary. All vehicles transporting hazardous materials will carry appropriate spill kits.</p> <p>Identify appropriate location for the spill kits and ensure they contain the necessary spill response equipment. Carry out regular inspections of the kits to ensure they are fully stocked.</p> <p>Ensure relevant personnel are trained in spill response and emergency situations. Training sessions should be both desk based and practical.</p>	S3	<p>Record in inspection logs the findings.</p> <p>Training records should be maintained and refresher training carried out periodically.</p>	Contractor
		<p>Operational practices for vehicle/equipment refuelling, which includes the prevention of spillage and the use of spill containment and response equipment, are to be in place. Include a requirement for fuel delivery vehicles and equipment to be routinely inspected so as to ensure the tank, pumps, pipework and</p>	S4	<p>Review the operational procedures throughout the lifetime of the project and update these periodically.</p> <p>Document the findings of the inspections.</p>	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		<p>the vehicle itself are free from leaks and fit for purpose.</p> <p>Refuelling should not be performed within 30m of surface water and any drainage systems.</p>			
		<p>Material Safety Data Sheets (MSDS) should be kept within each storage area where substances are stored and at the site office.</p>	S5	See Hazardous Materials Management Plan	Contractor
		<p>Vehicles and equipment are to be maintained and inspected to a high level of safety with respects to leaks.</p>	S6	On-going	Contractor
		<p>Equipment and vehicles will not be washed near to watercourses.</p>	S7	On-going	Contractor
		<p>Immediately notify the BT20/ PMU 7 of significant spills, the notification should include:</p> <ul style="list-style-type: none"> - Whether the spill was contained or uncontained - Material released - The volume - Location - Cause - Proposed corrective measures - Response time - Clean up required - Initial assessment of environmental and social impact. 	S8	Incident logs to be maintained and reviewed for learning outcomes.	Contractor
		<p>Inspect and evaluate the</p>	S9	Maintain inspection	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		presence and performance of spill prevention measures. Record the findings in an inspection log.		logs.	
		In the event of significant spillage, assess the need for remediation of water/ground. This will require sampling water/ground to assess the impacts.	S10	Monitoring regime to be developed depending on the nature of the spillage.	Contractor
		Carry out an initial inspection of fuels and hydrocarbon storage areas to identify any non-conformances with IFC Performance Standards and EHS guidelines. Where non-conformances are observed (e.g. the fuel and tar storage tanks at the asphalt plant near KM-43), develop an action plan with corrective actions and a responsible person.	S11	Regular inspections of the storage areas with documented findings.	
		Where there is evidence of spillage present at the site, assess the activities carried out on site and review the operational procedures in place. Modify these where appropriate. Ensure relevant personnel are trained and carry out refresher training where necessary.	S12		Contractor
Bentonite Spillage	Pollution of nearby receptors (i.e. controlled waters)	Bentonite mixed mud will not be discharged into the river. Bentonite mixed mud will be stored in the temporary storage yard, see the Waste Management Plan for storage and disposal	S13	Regular visual inspections	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		<p>arrangements.</p> <p>The temporary storage yard will not be within 30m of surface water.</p>			
Construction of bridges and working near water	Pollution of nearby receptors (i.e. controlled waters)	<p>During the design phase of the project ensure that measures are developed and implemented to minimise the potential for spillage and pollution of surface water, ensure these measures are implemented (e.g. using a grating net with geotextile material during construction of the upper bridge to minimise pollution of the river.)</p> <p>Develop operational procedures where tasks are being carried out in or nearby water, this should also include maintenance of equipment and the use of spill containment booms in the water during active works.</p>	S14	Carry out regular visual inspections to ensure compliance.	Contractor
Underground storage tanks	Contamination of ground and groundwater	<p>Evaluate the risk of existing USTs to determine if upgrades are required, including replacement with new systems or closure.</p> <p>Ensure underground storage tanks (UST) and associated pipework are double-walled and a leak detection system is in place.</p> <p>Avoid the use of USTs for storage of highly soluble organic materials</p> <p>Regularly test the integrity of the USTs.</p>	S15	<p>Regularly monitor the surface above the tank for indications of soil movement.</p> <p>Consider monitoring of groundwater down gradient of USTs.</p>	

Spill Response

The level of spill response will be dependent on the nature of the spill. Clear distinctions of severity of spills, according to the size and nature of the spill, using a clearly defined tiered approach will be developed as part of the Contract risk assessment; this will indicate whether the contractor will be capable of responding to the spill or whether an external resource will be required. The spill categorisation and response will be subject to the Company's approval.

Where water/ground contamination has occurred, remediation should be carried out. A specific risk assessment should be developed to identify human health and environmental risks. A remediation plan should also be developed for the works. This should include target levels for contaminants of relevance and shall detail the need for a post remediation site assessment in order to verify successful remediation and, if required, any on-going monitoring.

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Spill Prevention and Response Plan.

Contractor's Spill Prevention and Response Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

Company shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of Company's responsibilities in the Spill Prevention and Response Plan.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Spill Prevention and Response Plan are competent on the basis of education, training and experience.

Contractor's Spill Prevention and Response Plan shall describe the training and awareness requirements necessary for its effective implementation.

Contractor's training activity associated with the Spill Prevention and Response Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Company shall ensure that all Company personnel responsible for the execution of Company's tasks and requirements in the Spill Prevention and Response Plan are competent on the basis of education, training and experience.

Company's training activity associated with the Spill Prevention and Response Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall report to the Project Environmental Department the results of the risk assessment and include any additional mitigation and management measures as agreed with Company in the Spill Prevention and Response Plan.

Contractor shall immediately notify Company and the Bank of all spills as detailed above.

Contractor's quarterly report to company should include:

- The number of contained and uncontained releases;
- Number of spill prevention and response drills / toolbox talks / training;
- Results of the inspections carried out;
- Results of any sampling undertaken (where applicable).

Appendix A: Legal and Other Requirements

Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree 21/2008/NĐ-CP dated 28/02/2008 on amending, supplementing some articles of Decree 80/2006/NĐ-CP dated 09/08/2006 of the Government regarding detailed regulations and guidance of implementation of some articles of the law on environment protection;
- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;
- Decision No. 23/2006/QĐ-BTNMT dated 26/12/2006 of the Ministry of Natural Resources and Environment on promulgating the list of hazardous wastes.
- Circular No. 12/2011/TT-BTNMT dated 14/4/2011 of the Ministry of Natural Resources and Environment on stipulating the hazardous waste management.

IFC Performance Standards

The following IFC Performance Standards apply to spill prevention and response during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts* (2012) which establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring and reporting.
- IFC Performance Standard 3: *Resource Efficiency and Pollution Prevention* (2012), which refers to the need for the client to be prepared to respond to process upset, accidental, and emergency situations in a manner appropriate to the operational risks and the need to prevent their potential negative consequences. This preparation will include a plan that addresses the training, resources, responsibilities, communication, procedures and other aspects required to effectively respond to emergencies associated with project hazards.
- IFC Performance Standard 4: *Community Health, Safety and Security* the following points are relevant to spill prevention and response:

“Where the project poses risks to or adverse impacts on the health and safety of affected communities, the client will disclose the Action Plan and any other relevant project-related information to enable the

affected communities and relevant government agencies to understand these risks and impacts, and will engage the affected communities and agencies on an on-going basis consistent with the requirements of Performance Standard 1.”

“Where the consequences of emergency events are likely to extend beyond the project property boundary or originate outside of the project property boundary (e.g. hazardous material spill during transportation in public roadways), the client is required to design emergency response plans based on the risks to community health and safety identified during the process of Social and Environmental Assessment. When projects need to develop such plans, the proposed actions and measures should be included in the client’s Action Plan. Emergency plans should be developed in close collaboration and consultation with potentially affected communities and should include detailed preparation to safeguard the health and safety of workers and the communities in the event of an emergency.”

The client should provide relevant local authorities, emergency services and the local community with information on the nature and extent of environmental and human health effects that may result from routine operations or unplanned emergencies at the project facility. Information campaigns should describe appropriate behaviour and safety measures in the event of an accident involving project facilities, as well as actively seek community views concerning risk management and associated community preparedness. In addition, clients should consider including the community in regular training exercises (e.g. simulations drill and debriefs of exercises and actual events) to familiarise them with proper procedures in the event of an emergency. Emergency plans should address the following aspects of emergency response and preparedness:

- Specific emergency response procedures
 - Trained emergency response teams
 - Emergency contacts and communication systems / protocols
 - Procedures for interaction with local and regional emergency and health authorities
 - Permanently stationed emergency equipment and facilities
 - Protocols for fire truck, ambulance and other emergency vehicle services
 - Evacuation routes and meeting points
 - Drills
-
- IFC EHS General Guidelines (April 2007), section 3.7, which advocated the Emergency Preparedness and Response Plan that is commensurate with the risks of the facility or activity and that it includes the following elements:
 - Administration (policy, purpose, distribution, definitions, etc.)
 - Roles and responsibilities
 - Communication systems
 - Emergency response procedures
 - Emergency resources
 - Training and updating
 - Checklists (role and action list and equipment checklist)
 - Business continuity and contingency.
-
- IFC EHS Guidelines, *Industry Sector Guidelines, Toll Roads*

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 8: HAZARDOUS MATERIALS MANAGEMENT

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

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Date	19 th April 2013			
Prepared by	Ian Williams			
Signature				
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Signature				
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Signature				
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Environmental and Social Management Plan Appendix 8: Hazardous Materials Management

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Hazardous Materials Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objective of this plan is to:

- Prevent uncontrolled releases of hazardous materials during transportation, handling, storage and use;
- Ensuring that any chemicals or materials subject to national or international bans or phase-outs are not utilised

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Waste Management Plan;
- Water Management Plan;
- Spill Prevention and Response Plan; and
- Program of Environmental Monitoring and Quality Supervision

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A. As a general requirement, the transportation, handling and use of all hazardous materials should be undertaken in accordance with the requirements of the IFC EHS General Guidelines (April 2007), Section 1.5 – Hazardous Material Management.

Surveys

Contractor shall undertake routine audits and inspections of all hazardous materials transportation, handling and use procedures and of storage facilities.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related transportation, handling, storage and use of hazardous materials, together with mitigation and management measures to avoid or reduce these impacts. Contractor shall develop a hazardous materials management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Consultant commissioned by BT20 will be responsible for reviewing the Hazardous Materials Management Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

This plan relates specifically to the transportation, handling, storage and use of hazardous materials. The requirement for to monitor and report information on hazardous wastes including the quantities generated by the project is included in the Waste Management Plan (ESMP Appendix 4).

Table A: Management and Monitoring

Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Transport, handling, storage and use of hazardous materials	Potential loss of hazardous material to air, soil, groundwater and surface waters	Avoid the use of hazardous materials	HM1	On-going	Contractor
		Prepare a register of all hazardous materials used on site, along with appropriate Material Data Safety Sheets.	HM2	Prior to construction and maintain	Contractor
		Undertake hazardous materials assessments for all materials. The level of risk should be established through an on-going assessment process based on the criteria defined in IFC EHS General Guidelines (April 2007) (provided in Appendix A). Ensure that results of assessment are incorporated into Spill Prevention and Response Plan: Appendix 7.	HM4	On-going	Contractor
		Prepare spill management and response plans appropriate to all hazardous materials utilised on site (See ESMP Appendix 7: Spill Prevention and Response Plan).	HM5	Prior to use and on-going if new materials used	Contractor

Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		Ensure that all hazardous materials are transported in an appropriate manner (relates to container and vehicle) (in accordance with IFC EHS General Guidelines (April 2007), Section 3.5)	HM	On-going	Contractor
		Ensure that all hazardous materials are stored in appropriate containers/ areas with appropriate control systems (bundling, automatic alarms and shut-off systems). Avoid use of below ground storage tanks.	HM6	Prior to construction and on-going	Contractor
		All fuel and chemical storage facilities should be located away from watercourses and with appropriate secondary containment (bundling with a capacity of 110% of largest container and double-skinned tanks). This includes all temporary fuel stores.	HM7	Prior to construction and on-going	Contractor
		Ensure that all storage facilities/tanks are clearly labelled.	HM8	On-going	Contractor
		Ensure that all storage facilities are fitted with locking systems to prevent unauthorised access.	HM9	On-going	Contractor
		Ensure that all deliveries are supervised by appropriately trained personnel and they are undertaken in accordance with formalised Standard Operating Procedures (SOP).	HM10	On-going	Contractor
		Ensure that all site personnel with access to hazardous materials are appropriately trained in their transportation, handling, storage and use and in spill response	HM11	On-going	Contractor

Source	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		procedures.			
		Ensure that appropriate spill response equipment is located in storage areas.	HM12	On-going	Contractor
		Undertake regular audits and inspections of hazardous materials transportation, transfer and use procedures and operations and ensure that the requirement for any additional measures are addressed with both the Hazardous Materials and Spill Prevention and Response Plans.	HM13	On-going	Contractor/Independent Environmental Consultant
		Undertake regular audits and inspections of storage facilities and tanks and ensure that the requirement for any additional measures are addressed with both the Hazardous Materials and Spill Prevention and Response Plans.	HM14	On-going	Contractor/Independent Environmental Consultant
		Avoid use of hazardous materials subject to international bans and phase-outs.	HM15	On-going	Contractor

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Hazardous Materials Management Plan.

The Contractor's Hazardous Materials Management Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Hazardous Materials Management Plan are competent on the basis of education, training and experience.

The Contractor's Hazardous Materials Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

All training activity associated with the Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall report to the Project Environmental Department the results of the audits/inspections undertaken in accordance with the relevant components of the Hazardous Materials and Spill Prevention and Response Plans and integrate the results, including additional mitigation and management measures as agreed with PNU 7, within the Hazardous Materials Management Plan.

Contractor's monthly report to Company shall include:

- Number and results of verification inspections prescribed in Table A (HM13 and HM14)

The Independent Environmental Consultant will also undertake verification audits/ inspections and will submit routine reports to the PMU 7's Project Environmental Department.

Appendix A: Legal and Other Requirements

The Contractor shall comply with all applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions.

Vietnam Laws and Regulations

The Contractor shall comply with all applicable Vietnam Laws and Regulations.

- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;
- Circular No.29/2011/TT-BTNMT on technical procedure of continental surface water monitoring;
- Circular 30/2011/TT-BTNMT on technical procedure of ground water monitoring
- Circular 33/2011/TT-BTNMT on technical procedure of soil environment monitoring;
- QCVN 05: 2009 Air quality – Surrounding air quality standard
- QCVN 06: 2009 Air quality – Permitted maximum content of toxic substances in surrounding air
- QCVN 03:2008 National technical standard on permitted limit of heavy metal in soil
- QCVN 15:2008 National technical standard on residue of plant protection chemicals in soil
- TCVN 6696:2000 Solid waste, hygienic landfill, common requirements on environment protection
- QCVN 07: 2009/BTNMT - National technical standard on toxic waste thresholds
- QCVN 08:2008 National technical standard on surface water
- QCVN 09:2008 National technical standard on ground water
- QCVN 25: 2009/BTNMT - National technical standard on sewage from solid waste landfill
- QCVN 40:2011: National technical standard on industrial sewage

IFC Requirements

The following International Finance Corporation (IFC) Performance Standards are applicable to the use of hazardous materials:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts (2012)*, which establishes requirements for assessment, management, organizational capability, training, community engagement, monitoring, and reporting
- IFC Performance Standard 4 and Guidance Note 4: *Community Health, Safety and Security (2012)*, and include the following provisions which are relevant to community safety and transportation, including the transportation of hazardous materials:

“Where the project poses risks to or adverse impacts on the health and safety of affected communities, the client will disclose the Action Plan and any other relevant project-related information to enable the affected communities and relevant government agencies to understand these risks and impacts, and will engage the

affected communities and agencies on an on-going basis consistent with the requirements of Performance Standard 1.”

“The client should design its community engagement process so that it reflects communities’ capacities to understand and act on health and safety information. Communication will be effective when it starts early and is frequently maintained throughout the project life-cycle. Community health and safety management is more than a technical issue. It also requires a sound understanding of the social and cultural processes through which communities experience, perceive and respond to risks and impacts. Community perceptions are often conditioned less by technical or quantitative assessments, and more by the ways in which community members experience change in their environments. They are, for example, likely to have greater perception of risk where it is involuntary, complex, beyond their personal control, or where the distribution of risks and benefits is considered inequitable.”

“The client will design, construct, operate and decommission the structural elements or components of the project in accordance with good international industry practice”

“The client will exercise commercially reasonable efforts to control the safety of deliveries of raw materials and of transportation and disposal of wastes.”

“Even in situations where the client cannot exert direct control over the actions of its Contractor and subcontractors, clients should use commercially reasonable means to investigate their capacity to address safety issues, communicate its expectations of safety performance, and otherwise influence the safety behaviour of Contractor, especially those involved in the transportation of hazardous materials to and from the project site.”

“Where the consequences of emergency events are likely to extend beyond the project property boundary or originate outside of the project property boundary (e.g. hazardous material release during transportation in public roadways), the client is required to design emergency response plans based on the risks to community health and safety identified during the process of Social and Environmental Assessment. When projects need to develop such plans, the proposed actions and measures should be included in the client’s Action Plan. Emergency plans should be developed in close collaboration and consultation with potentially affected communities and should include detailed preparation to safeguard the health and safety of workers and the communities in the event of an emergency.”

“The client should provide relevant local authorities, emergency services, and the affected community with information on the nature and extent of environmental and human health effects that may result from routine operations or unplanned emergencies at the project facility. Information campaigns should describe appropriate behaviour and safety measures in the event of an accident involving project facilities, as well as actively seek community views concerning risk management and associated community preparedness. In addition, clients should consider including the community in regular training exercises (e.g. simulations, drills, and debriefs of exercises and actual events) to familiarize them with proper procedures in the event of an emergency. Emergency plans should address the following aspects of emergency response and preparedness:

- Specific emergency response procedures;
- Trained emergency response teams;
- Emergency contacts and communication systems / protocols;
- Procedures for interaction with local and regional emergency & health authorities;
- Permanently stationed emergency equipment & facilities (e.g. first aid stations, fire extinguishers/hoses, sprinkler systems);
- Protocols for fire truck, ambulance and other emergency vehicle services;
- Evacuation routes and meeting points; and
- Drills (annual or more frequently as necessary)

The following IFC Guidelines are applicable to the use of hazardous materials. Contractor shall meet the intent of these guidelines:

- IFC EHS General Guidelines (April 2007), Section 1.5 which, in brief, advocate the following: Hazard Assessment

The level of risk should be established through an on-going assessment process based on:

- The types and amounts of hazardous materials present in the project. This information should be recorded and should include a summary table with the following information:
 - Name and description (e.g. composition of a mixture) of the Hazardous Material (Hazmat);
 - Classification (e.g. code, class or division) of the Hazmat;
 - Internationally accepted regulatory reporting threshold quantity or national equivalent⁴⁰ of the Hazmat;
 - Quantity of Hazmat used per month; and
 - Characteristic(s) that make(s) the Hazmat hazardous (e.g. flammability, toxicity)
- Analysis of potential spill and release scenarios using available industry statistics on spills and accidents where available
- Analysis of the potential for uncontrolled reactions such as fire and explosions
- Analysis of potential consequences based on the physical-geographical characteristics of the project site, including aspects such as its distance to settlements, water resources, and other environmentally sensitive areas.

Hazard assessment should be performed by specialized professionals using internationally-accepted methodologies such as Hazardous Operations Analysis (HAZOP), Failure Mode and Effects Analysis (FMEA), and Hazard Identification (HAZID).

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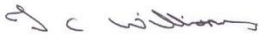




ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 9: RAW MATERIALS MANAGEMENT PLAN

Rehabilitation and Improvement of National Highway No. 20 – Section from
Dong Nai to Lam Dong Province

19/04/2013

Quality Management

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Date	19 th April 2013			
Prepared by	Ian Williams			
Signature				
Checked by	Barry Cowell			
Signature				
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File reference	009			

Environmental and Social Management Plan Appendix 9: Raw Materials Management Plan

Rehabilitation and Improvement of Natural Highway No. 20 – Section from
Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Raw Materials Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objective of this plan is to:

- Extract aggregate/ sands from sustainable, Company approved locations;
- Encourage the local procurement of construction materials (iron, steel, concrete).

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Ecological Management Plan;
- Air Emissions Management Plan;
- Community Health and Safety Plan;
- Water Management Plan;
- Erosion and Sediment Control Management Plan;
- Noise and Vibration Management Plan; and
- Environmental Monitoring Plan

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Surveys

Contractor shall confirm that all surveys identified in the Management Plans listed in Table A have been completed for existing and any new quarry sites.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to raw materials, together with mitigation and management measures to avoid or reduce these impacts.

Contractor shall develop a Raw Materials Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. The Environmental Supervision Consultant will be responsible for preparing a site-specific Raw Materials Management Plan which the contractor will then have to formally commit to implement.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Quarrying of materials for use in construction	Potential impacts associated with quarrying operations including:	Reduce the number of new quarries/soil/ sand pits required (if applicable) by using existing (appropriately licensed) quarries.	RM1	As required	BT20 and Contractor
	<ul style="list-style-type: none"> Noise and vibration; Loss of vegetation; 	Environmental and social surveys and assessment to be undertaken for new quarry/soil/ sand pit sites.	RM2	As required	BT20 and Contractor
	<ul style="list-style-type: none"> Water quality; Air quality; 	Confirm that quarries/ soil / sandpits utilised have appropriate licenses and permits.	RM3	As required	Contractor
	<ul style="list-style-type: none"> Cultural heritage; Traffic; and Soil erosion. 	Contractors should audit/ monitor management and mitigation measures and performance of the quarries identified to supply the project to ensure that they operate in accordance with the requirements of EHS Guidelines on Construction Materials Extraction.	RM4	Quarterly audit/ monitoring report	Contractor/ Independent Environmental Consultant
		This will specifically include: <ul style="list-style-type: none"> Air emission (fugitive dust); Noise and vibration (blasting and plant 			

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		<p>operation);</p> <ul style="list-style-type: none"> - Water quality (erosion, run-off and water resource management); - Security and management of explosives; - Hazardous material management (transportation, storage and use); - Geotechnical stability (rock-face slopes); and - Emergency preparedness (explosion, fire, landslide, etc). 			
		Should any environmental, health safety issues be identified in the quarterly auditing/ monitoring reports then the contractor should work with the quarry operator to implement appropriate corrective actions/ measures	RM5	On-going	Contractor/ quarry operator
		The contractor will require the quarry operator to provide a copy of the proposed closure and rehabilitation plan prepared for the quarry. Should the operator not have a formalised plan, the contractor should work with the operator to develop an appropriate plan.	RM6	On-going	Contractor/ quarry operator
		If new quarries/ soil / sand pits are required emphasis should be placed on them being located in areas with low ecological and landscape value and close to	RM7	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		existing roads. Avoid, where possible, the extraction of sand from rivers. Where required, undertake baseline assessments of the rivers and implement measures to avoid impacts on river flow, erosion, water quality (turbidity) and biological diversity	RM8	Prior to extraction	Contractor
Procurement of other construction materials	Potential impacts associated with transportation of materials.	Contractors should, where possible, source construction materials (including iron, steel, concrete) from sustainable local suppliers.	RM9	On-going	Contractor

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Raw Materials Management Plan.

Contractor's Raw Materials Management Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

Company shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of Company's responsibilities in the Raw Materials Management Plan.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Raw Materials Management Plan are competent on the basis of education, training and experience.

Contractor's Raw Materials Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

The Contractor's training activity associated with the Raw Materials Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

BT20 shall ensure that all Contractors personnel responsible for the execution of tasks and requirements in the Raw Materials Management Plan are competent on the basis of education, training and experience.

The Contractors training activity associated with the Raw Materials Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

The Contractor shall report to the Project Environmental Department the results of the surveys undertaken in accordance with the relevant components of the Raw Materials Management Plan and integrate the results, including additional mitigation and management measures as agreed with Company, within the Plan.

Contractor's monthly report to Company shall include:

- Number and results of verification inspections prescribed in Table A.

The Independent Environmental Consultant will also undertake verification audits/ inspections and will submit routine reports to the PMU 7's Project Environmental Department.

Appendix A: Legal and Other Requirements

Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree 21/2008/NĐ-CP dated 28/02/2008 on amending, supplementing some articles of Decree 80/2006/NĐ-CP dated 09/08/2006 of the Government regarding detailed regulations and guidance of implementation of some articles of the law on environment protection;
- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;

IFC Performance Standards

The following IFC Performance Standards apply to noise and vibration issues during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts (2012)* which establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring and reporting.
- IFC Performance Standard 3: *Resource Efficiency and Pollution Prevention (2012)*, and includes provisions relating to noise and vibration, air quality and emissions, erosion and sedimentation and waste.
- IFC Performance Standard 4: *Community Health, Safety and Security (2012)*, which stipulates requirement for projects to minimise adverse impacts on soil, water and other natural resources in use by affected communities.
- IFC Performance Standard 6: *Biodiversity Conservation and Sustainable Natural Resource Management (2012)*: relates to the sustainable use of natural resources.
 - The following IFC Guidelines apply to raw materials management. The contractor shall meet the intent of these guidelines:
 - IFC EHS General Guidelines (April 2007), which specifies:
 - The requirement to Identify EHS project hazards and associated risks as early as possible in the facility development or project cycle, including the

incorporation of EHS considerations into the site selection process, facility modification authorizations, or layout and process change plans.

- Prioritizing risk management strategies with the objective of achieving an overall reduction of risk to human health and the environment, focusing on the prevention of irreversible and / or significant impacts.
- When impact avoidance is not feasible, incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences, for example, with the application of pollution controls to reduce the levels of emitted contaminants to workers or environments.
- Preparing workers and nearby communities to respond to accidents, including providing technical and financial resources to effectively and safely control such events, and restoring workplace and community environments to a safe and healthy condition.
- Improving EHS performance through a combination of on-going monitoring of facility performance and effective accountability.
- IFC Environmental, *Health and Safety Guidelines for Construction Materials Extraction*, dated April 2007 the following typical prevention and control measures that will be adopted to mitigate potential impacts to human health from site operations include but may not be limited to the following:
 - developing site specific personnel training on site safety management and ensuring that all site operatives and contractors are adequately trained for their specific work area prior to commencement on site;
 - preparation and implementation of monitoring programs to assess geological / geotechnical integrity of the site;
 - undertaking regular assessments (i.e. via rock scaling) of each rock face exposed to workers to prevent unforeseen rock falls and /or landslide; and
 - provision of appropriate permanent or temporary barriers and / or specific danger signage along rock benches or other pit areas where work is performed.

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 10: CULTURAL HERITAGE MANAGEMENT

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

05/04/2013

Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
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Date	5 th April 2013			
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Report number	Appendix 10			
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Environmental and Social Management Plan Appendix 10: Cultural Heritage Management

Rehabilitation and Improvement of National Highway No. 20 – Section from Dong Nai to Lam Dong Province

05/04/2013

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Introduction

Objectives

BT20 has developed this Cultural Heritage Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objectives of this plan are:

- To avoid impacts on cultural heritage sites (including both archaeological and oral tradition sites) where necessary and practicable; and
- Where avoidance is not possible, manage cultural heritage sites in consultation with the Vietnam Government/ Regulatory Agencies.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Environmental Monitoring Plan; and
- Stakeholder Engagement Plan.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Surveys

Consultation with local regulatory organisations and the review of available records undertaken as part of the EIA process did not identify any known sites of archaeological or cultural heritage value within the development site boundary. As it is not possible to identify all sites or archaeological and heritage significance (with specific reference to below ground features) a Chance Find Procedure has been developed for the construction phase of the project.

Management and Monitoring

BT20's preferred management approach for known archaeological sites is avoidance. Any cultural heritage sites that are discovered as chance finds during construction works will be managed appropriately in accordance with the Cultural Heritage Chance Finds Protocol (Appendix B).

Table A below presents a summary of the potential environmental impacts related to features/locations of archaeological and cultural heritage value, together with mitigation and management measures to avoid or reduce these impacts.

Contractor shall develop a Cultural Heritage Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Consultant commissioned by BT20 will be responsible for reviewing the Ecological Management Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Source of impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Construction works and movement of people and vehicles in road corridor	Damage to or destruction of sites of cultural heritage value or artefacts. Disconnection of communities from cultural sites and loss of sites from oral tradition.	Ensure that all works undertaken in relation to the project are in compliance with Vietnam national legislation and IFC Performance Standard 8: Cultural Heritage (2012).	C1	On-going	BT20/ Contractor
		Undertake cultural heritage survey by systematically recording and mapping cultural heritage sites in all areas where construction works will be required (including road corridor and staging/storage compounds), including any areas that were not surveyed as part of the EIA.	C2	Prior to construction works	BT20/ Contractor
		Undertake further research of appropriate archives (local/national) as part of pre-construction surveys.	C3	Prior to construction	BT20/ Contractor

Source of impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		Should any features of cultural heritage significance be identified in an area where it is likely to be disturbed by the proposed works, consult with community representatives on matters concerning the management of the site.	C4	Prior to construction	BT20/ Contractor
		In accordance with IFC PS: 8 the project should not include should not remove, significantly alter, or damage critical cultural heritage;	C5	On-going	Contractor
		In accordance with IFC PS 8: - Where the contractor has encountered tangible cultural heritage that is replicable and not critical, the client will apply mitigation measures that favour avoidance. Where avoidance is not feasible, apply the appropriate mitigation hierarchy (see Appendix A).	C6	On-going	Contractor
		In accordance IFC Performance Standard 8, assess options to allow continued access to previously accessible cultural heritage sites subject to overriding health, safety, and security considerations;	C7	Prior to construction	BT20/ Contractor
		Consult with appropriate department of Vietnam government to obtain agreement on Chance Find Procedure (See Appendix B1).	C8	Prior to construction works	BT20
		Provide awareness training to all staff to ensure that Chance Finds Procedure is implemented where required.	C9	On-going	Contractor
		Ensure that Chance Find Procedure is implemented	C10	On-going	Contractor

Source of impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		as outlined in Appendix B2.			

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Cultural Heritage Management Plan.

The Contractor's Cultural Heritage Management Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

The Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of Company's responsibilities in the Cultural Heritage Management Plan.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Cultural Heritage Management Plan are competent on the basis of education, training and experience.

The Contractor's Cultural Heritage Management Plan shall describe the training and awareness requirements necessary for its effective implementation.

The Contractor's training activity associated with the Cultural Heritage Management Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

The contractor shall notify PMU 7 (as per the Chance Find Procedure) should any sites be discovered as a chance find.

Appendix A: Legal and Other Requirements

Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree 21/2008/NĐ-CP dated 28/02/2008 on amending, supplementing some articles of Decree 80/2006/NĐ-CP dated 09/08/2006 of the Government regarding detailed regulations and guidance of implementation of some articles of the law on environment protection;
- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;

IFC Performance Standards

The following IFC Performance Standard is applicable to cultural heritage management during construction:

- IFC Performance Standard 8: *Cultural Heritage (2012)*. This standard includes the following objectives:
 - To protect cultural heritage from the adverse impacts of project activities and support its preservation; and
 - To promote equitable sharing of benefits from the use of cultural heritage.
- The key provisions provided in the standard area as follows:
 - The requirement to comply with all national legislation and applicable treaties and conventions;
 - The requirement to consider cultural heritage issues as part of the assessment and management systems development for the project;
 - The need to consider both direct and indirect impacts and opportunities for enhancement to cultural heritage;
 - The requirement to consult with experts, government/ regulatory organisations, affected communities and indigenous peoples to identify sites of cultural value;
 - The need to site and design developments to avoid sites/ features of cultural heritage;

- Where the client has encountered tangible cultural heritage that is replicable and not critical, the client will apply mitigation measures that favour avoidance. Where avoidance is not feasible, the client will apply a mitigation hierarchy as follows:
 - Minimize adverse impacts and implement restoration measures, in situ, that ensure maintenance of the value and functionality of the cultural heritage, including maintaining or restoring any ecosystem processes needed to support it;
 - Where restoration in situ is not possible, restore the functionality of the cultural heritage, in a different location, including the ecosystem processes needed to support it; and
 - Only where minimization of adverse impacts and restoration to ensure maintenance of the value and functionality of the cultural heritage are demonstrably not feasible, and where the Affected Communities are using the tangible cultural heritage for long-standing cultural purposes, compensate for loss of that tangible cultural heritage.
- The requirement to preserve sites in situ unless there are no technically or financially feasible alternatives to the project and/ or the benefits of the project outweigh any heritage loss;
- The client should not remove, significantly alter, or damage critical cultural heritage;
- The requirement to allow continued access to previously accessible cultural heritage sites being used by, or that have been used by, Affected Communities within living memory for long-standing cultural purposes or to provide an alternative access route, subject to overriding health, safety, and security considerations;
- The requirement to develop and implement a Chance Find Procedure (See Appendix B);

Appendix B: Chance Finds Procedure

Purpose, Objectives and Scope

The construction works associate with the rehabilitation and Improvement of National Highway No. 20 – Section from Dong Nai to Lam Dong Province has the potential to disturb or alter as yet unknown or unrecorded archaeological sites. These unknown archaeological sites are referred to as chance finds.

BT20 has developed this Chance Finds Protocol, the overall purpose of which is to define the process which governs the management of chance finds during construction works.

The objectives of the Chance Finds Protocol are to:

- Define the processes which must be followed to ensure the management of sites and preservation and appropriate treatment of chance finds while also minimising disruption to the construction schedule
- Enable compliance with all relevant national laws and regulations and other requirements.

A table providing archaeological definitions is presented in Appendix B2.

Chance Finds Work Process

Introduction

The purpose of Chance finds procedure is to address the possibility of archaeological deposits, finds and features becoming exposed during earthmoving and ground altering activities associated with the rehabilitation and Improvement of National Highway No. 20 – Section from Dong Nai to Lam Dong Province and to provide procedures to follow in the event of a chance archaeological find. The objectives of these procedures, agreed with the statutory authorities, are to identify and promote the preservation and recording of any archaeological material that maybe discovered and notify the relevant cultural authorities to resolve any archaeological issue that may arise.

Archaeological Method Statement and Archaeological Monitoring

An archaeological method statement has been submitted and approved by the statutory authorities, as part of a licence application for archaeological monitoring associated with the construction of the Road scheme. This method statement describes in detail the proposed scope of works, construction schedule, and archaeological strategy and details how the archaeological team will function onsite. Archaeological monitoring will be undertaken as set out in conditions for approval by:

As determined by the statutory authorities' interim archaeological monitoring shall be provided, including appropriate reporting and archiving in line with national standards.

2.3. Archaeological Chance Finds Procedure

During the project induction meeting, all contractors will be made aware of the presence of the archaeologist/ appropriately trained person who will monitor earthmoving and excavation activities.

General

The following procedure is to be executed in the event that archaeological material is discovered:

- All construction activity in the vicinity of the find/feature/site will cease immediately.
- Delineate the discovered find/ feature/ site will be delineated.
- Record the find location, and all remains are to be left in place.
- Secure the area to prevent any damage or loss of removable objects.
- The on-site archaeologist will assess, record and photograph the find/feature/ site (See appendix B1 - Initial Chance Finds Report Form).
- The on-site archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.
- The Project Archaeologist, the Vietnam Government contacted.
- In consultation with the statutory authorities the on-site and Project Archaeologist will determine the appropriate course of action to take.
- Finds retrieval strategy: All investigations of archaeological soils will be undertaken by hand, all finds, osteological remains and samples will be kept and submitted to the National Cultural Heritage Authority of the Vietnam government as required. In the event that any artefacts need to be conserved, the relevant licence (Licence to Alter) will be sought from the national cultural heritage authority.
- An on-site office and finds storage area will be provided, allowing storage of any artefacts or other archaeological material recovered during the monitoring process.
- In the case of human remains, in addition to the above, the Vietnam Government will be contacted and the guidelines for the treatment of human remains will be adhered to. If skeletal remains are identified, an osteoarchaeologist will be available to examine the remains.
- Conservation: A conservator is available to the project, if required.
- The on-site archaeologist will complete a report on the findings as part of the licensing agreement in place with the National Cultural Heritage authority
- Once authorisation has been given by the responsible statutory authorities, the client will be informed when works can resume.

Structure or Larger Deposit

Should the archaeological material be deemed to be part of a structure or larger deposit the following will take place:

- The archaeologist will notify the Project Archaeologist, the National Cultural Heritage Authority of the discovery.

BT20 shall consult with all relevant parties, including the Vietnam Government in order to agree this Chance Finds Protocol.

Training and Awareness

BT20 shall develop and issue to each Contractor a Cultural Heritage Training and Awareness Package. This will include basic training in the identification of archaeological materials relevant to the area, including human skeletal remains. Each contractor will be required to deliver the Cultural Heritage Training and Awareness Package to all relevant Contractor personnel prior to their participation in works activity.

Appendix B1: Information required on Initial Chance Finds Report Form

General description of find:

Location:

Date of Find:

Person who identified find:

Description of Initial Find:

Was work stopped in the immediate vicinity of the find (Yes/No)?

Was an archaeologist contacted (Yes/No)?

Archaeological Detail:

Date of inspection:

Reporting Archaeologist:

GPS coordinates:

Photo Record:

Signature

Appendix B2: Definitions

Definitions Archaeological Site	A cultural heritage site with physical evidence of past cultural activity visible on or in the ground
Archaeological Site of Low Significance	Material is common including: <ul style="list-style-type: none"> Pottery Fauna bones Obsidian Shell material Stone artefacts
Archaeological Site of Medium Significance	Materials are found on the surface (no evident stratification); and Material is rare in the region and has not been previously characterised.
Archaeological Site of High Significance	Materials are found beneath the surface (below the topsoil); and Material is rare in the region and has not been characterised previously; and The variety of artefacts is extensive with a large number of artefacts.
Burial Site	A location containing complete or fragmented human skeletal remains excluding isolated teeth
Chance Find	An archaeological site that was unknown prior to discovery during construction.
Cultural Heritage	The tangible and intangible cultural history of a region or of a people; the engagement of people with their customary practices (particularly through specific sites) in the past and in the present; cultural heritage sites are divided into two non-mutually exclusive types: archaeological sites and oral tradition sites.

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ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 11: COMMUNITY IMPACTS MANAGEMENT

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
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Date	19 th April 2013			
Prepared by	Ian Williams			
Signature				
Checked by	Barry Cowell			
Signature				
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Environmental and Social Management Plan Appendix 11: Community Impacts Management

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Community Impacts Management Plan as part of its Environmental and Social Management Plan (ESMP).

The objectives of this plan are to:

- Prevent risk and resulting adverse impacts of the contractors activities on the health, safety and well-being of individuals and communities;
- In the event that damage or harm caused, take action to repair and return to condition comparable to pre-impact condition; and
- Implement a system to maintain communication with communities and raise awareness of proposed construction activities and the potential impacts that they may represent.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Air Emissions Management Plan;
- Noise and Vibration Management Plan;
- Ecological Management Plan;
- Waste Management Plan;
- Water Management Plan;
- Erosion and Sediment Control Plan;
- Spill Prevention and Response Plan;
- Hazardous Materials Management Plan;
- Raw Materials Management Plan; and
- Cultural Heritage Management Plan

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Surveys

There are no specific surveys required in support of the implementation of this plan. However, surveys undertaken/audits undertaken to support the implementation of other plans (as specified in section 1.0 above) are relevant to this plan.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to individuals and communities, together with mitigation and management measures to avoid or reduce these impacts. The contractor shall develop a Community Impacts Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Consultant commissioned by BT20 will be responsible for reviewing the Community Impacts Management Plan prepared by the contractor and for ensuring that it is consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
Land-take for project works	Required resettlement of residents	Ensure that measures outlined in the Resettlement Action Plan for the project are implemented.	C1	Pre-commencement of works	BT20
	Impacts on businesses	Ensure that measures outlined in the Business Impact Management Plan are implemented.	C2	Pre-commencement of works	BT20
Site Hazards – Community interaction with site works	Accidents resulting in injury or death	<p>Where there is a potential for the community (including workers) to be exposed to hazards. The Contractor shall:</p> <ul style="list-style-type: none"> • Identify the hazard; • Inform all individuals/communities as to the presence and nature of the hazard. • Restrict public access to works area including construction areas, staging and storage sites via appropriate security. This will include: <ul style="list-style-type: none"> - Security fencing and appropriate signage; - The presence of security personnel (no security personnel will be armed); - Permitting of site access with a requirement 	C3	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/ Frequency	Responsible Party
		<p>for site induction and the use of appropriate personal protective equipment.</p> <ul style="list-style-type: none"> • Mitigate the hazard by modifying, substituting or eliminating the condition or substance causing the hazard; • If the hazard conditions can't be eliminated, exercise special care to avoid or limit their exposure by restricting access to works and storage areas, erecting appropriate signs, fences and barriers, imposing vehicle speed restrictions, and substituting or eliminating the condition or substance causing the hazards; and • Ensure that all deliveries of movement of hazardous materials on site are undertaken in accordance with written procedures outlined in the Hazardous Materials Management Plan (ESMP Appendix 8). • Consult with local emergency services to agree procedures for accidents/ emergencies relating construction activities; <p>A procedure for the recording of all public health and safety issues/ incidents should be implemented. This should include procedures for recording of issues/ accidents, investigation of the issue/accident and the implementation of corrective actions/</p>			

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		remediation as required.			
Hazard to community from construction traffic-related traffic	Accidents resulting in injury or death	<p>The Contractor will develop a Construction Traffic Management Plan. This will include:</p> <ul style="list-style-type: none"> • Identification and enforcement of haul routes (including avoiding dangerous routes during specific times); • Provision of appropriate barriers and signage to demarcate areas in which construction traffic is active and prevent access to the general public; • Establishment and enforcement of speed limits for all construction-related vehicles; • Improving driving skills and requiring all drivers to hold appropriate licences; • Adopting limits for trip duration and arranging driver rosters to avoid overtiredness; • Provision of training to all drivers on the requirements for safe driving measures, eg, speed limits; • Consult with local emergency services to agree procedures for accidents/ emergencies relating construction traffic; and • A procedure for the recording of all construction related traffic accidents should be implemented. This should include: 			

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
		<ul style="list-style-type: none"> - Date/time; - Location; and - Reason for accident. <p>The procedure should also include actions for investigation of the accident and the implementation of corrective actions as required.</p>			
Air Quality – emissions from site works and plant, vehicle movements	Degraded air quality and potential impact on human health/vegetation	Ensure that all measures outlined in Air Emissions Management Plan (ESMP Appendix 2) are implemented	C4	On-going	Contractor
Noise and vibration – emissions from site works, plant and vehicle movements	Increased background noise levels and disruption to residents/businesses	Ensure that all measures outlined in Noise and Vibration Management Plan (ESMP Appendix 2) are implemented	C5	On-going	Contractor
Inundation of agricultural land with soil from excavations	Reduced agricultural production	Ensure that all measures outlined in the Erosion and Sediment Management Plan (ESMP Appendix 6) are implemented.	C6	On-going	Contractor
Land Contamination from spillages/leaks of hazardous materials on construction sites	Reduced soil quality, harm to human health, reduced agricultural production	Ensure that all measures outlined in Hazardous Materials Management Plan and Spill Prevention and Response plan (ESMP Appendices 8 and 7 respectively) are implemented.	C7	On-going	Contractor
Contamination of Watercourses due spillages/leaks from construction site and sedimentation	Degraded water quality and increased turbidity resulting in reduced biodiversity and potential impacts on	Ensure that all measures outlined in the Hazardous Materials Management Plan, Spill Response Plan, Erosion and Sediment Control Plan and Water Management Plan (ESMP, Appendices 8, 7, 6 and 5 respectively)	C8	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/Frequency	Responsible Party
	fisheries	are implemented.			
Waste generation/deposition	Ground/surface water contamination, harm to human health and land-use	Ensure that all measures outlined in the Waste Management Plan (ESMP Appendix 4) are implemented	C9	On-going	Contractor
Improvement in road conditions	Increased volumes of traffic and traffic speed resulting in accidents	Incorporation of appropriate signage and safety measures (barriers, formalised crossing points) to reduce the risk of accidents.	C10	On-going	BT20/ Vietnam Government
General work activities	Impacts/nuisance to individuals and the community	<p>The contractor shall ensure that the grievance/complaint reporting procedure identified in the project Stakeholder Engagement Plan is appropriately implemented and all submissions received managed using the following mechanism:</p> <ul style="list-style-type: none"> - Grievance received; - Grievance recorded in a register; - For an immediate action to satisfy the complaint, the complainant will be informed of corrective action; - Implement corrective action, record the date and close case; - For a long corrective action, the complainant will be informed of proposed action; and - Implement corrective action, record the date and close case. 	C11	On-going	Contractor/ Independent Environmental Consultant

Source of Impact	Potential Impact	Mitigation/Management	Ref No.	Monitoring/ Frequency	Responsible Party

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Community Impacts Management Plan.

The Contractor's Community Impacts Management Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Community Impacts Management Plan are competent on the basis of education, training and experience.

The Contractor's Community Impacts Plan shall describe the training and awareness requirements necessary for its effective implementation.

All training activity associated with the Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

The contractor shall submit to the BT20/PMU 7 a monthly report.

Contractor's monthly report to Company shall include:

- Information on any complaints received from individuals and communities; and
- A summary of the Contractors response to the complaint and any residual impacts.

The Independent Environmental Consultant will also undertake verification audits/ inspections and will submit routine reports to the PMU 7's Project Environmental Department.

Appendix A: Legal and Other Requirements

Legal and Other Requirements

The Contractor shall comply with all applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions.

Vietnam Laws and Regulations

The Contractor shall comply with all applicable Vietnam Laws and Regulations.

- Environmental Protection Law of the XIth National Assembly of the Socialist Republic of Vietnam, at 8th session, passed on 29/11/2005.
- Decree No. 80/2006/NĐ-CP dated 09/8/2006 of the Government on detailing and guiding the implementation of a number of articles of the Law on environmental protection.
- Decree No. 21/2008/NĐ-CP dated 28/02/2008 of the Government on amendment of and supplement to several Articles of the Decree No. 80/2006/NĐ-CP.
- Decree No. 29/2011/NĐ-CP dated 18/04/2011 of the Government on stipulating the strategic environmental assessment, environmental impact assessment and environmental protection commitment.
- Decree No. 140/2006/NĐ-CP dated 22/11/2006 of the Government on stipulating the environmental protection at stages of elaboration, evaluation, approval and implementation of development strategies, planning, plans, programs and projects.
 - Decree No. 81/2006/NĐ-CP dated 09/8/2006 of the Government on sanctioning of administrative violations in the domain of environmental protection.
 - Decree No. 117/2009/NĐ-CP dated 31/12/2009 of the Government on the handling of law violations in the domain of environmental protection.
- - Circular No. 26/2011/TT- BTNMT dated 18/7/2011 of the Ministry of Natural Resources and Environment on detailing a number of articles of the Government's Decree No. 29/2011/NĐ-CP stipulating the strategic environmental assessment, environmental impact assessment and environmental protection commitment.
- - Decision No. 22/2006/QĐ-BTNMT dated 18/12/2006 of the Ministry of Natural Resources and Environment on the compulsory application of Vietnam environmental standards.

IFC Requirements

The following International Finance Corporation (IFC) Performance Standards are applicable to ecology during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts (2012)*, which establishes requirements for assessment, management, organizational capability, training, community engagement, monitoring, and reporting. Specifically it includes the following objectives:
 - To avoid, or where avoidance is not possible, minimise, mitigate or compensate for adverse impacts on workers, affected communities and the environment; and
 - To ensure that affected communities are appropriately engaged on issues that could potentially affect them.

-
- IFC Performance Standard 3 Resource Efficiency and Pollution Prevention (2012) which includes an objective to:
 - To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities.
 - IFC Performance Standard 4 and Guidance Note 4: *Community Health, Safety and Security (2012)*, which includes the objectives to:
 - To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances;
 - To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.
 - IFC Performance Standard 5: *Land Acquisition and Involuntary Resettlement (2012)* which includes objectives to:
 - To avoid, and when avoidance is not possible, minimise displacement by exploring alternatives project designs;
 - To avoid forced evictions;
 - To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use;
 - To improve, or restore, the livelihoods and standards of living of displaced persons; and
 - To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites

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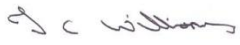




ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN APPENDIX 12: ENVIRONMENTAL MONITORING PLAN

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

Quality Management

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Signature				
Checked by	Barry Cowell			
Signature				
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Signature				
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Report number	Appendix 12			
File reference	012			

Environmental and Social Management Plan appendix 12: Environmental Monitoring Plan

Rehabilitation and Improvement of National Highway No. 20 – Section
from Dong Nai to Lam Dong Province

19/04/2013

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Introduction

Objectives

BT20 has developed this Environmental Monitoring Plan as part of its Environmental and Social Management Plan (ESMP).

The objective of this plan is to outline the environmental monitoring requirements associated with the rehabilitation and improvement works on National Highway No. 20 - Section between Dong Nai to Lam Dong Province. Potential receptors to environmental impacts on the route could include local residents and businesses and specific fauna.

This plan should be read in-conjunction with other Management plans prepared for the scheme, namely:

- Air Emissions Management Plan;
- Noise and Vibration Management Plan;
- Ecological Management Plan;
- Waste Management Plan;
- Water Management Plan;
- Erosion and Sediment Control Plan;
- Hazardous Materials Management Plan;
- Raw Materials Management Plan;
- Cultural Heritage Management Plan; and
- Community Impacts Plan; and
- Stakeholder Engagement Plan.

Legal and Other Requirements

Legal and other requirements applicable to this plan are identified in Appendix A.

Management and Monitoring

Table A below presents a summary of the potential environmental impacts related to the project, together with the monitoring measures required to inform the Management Plans and associated mitigation measures to avoid or reduce their impact.

The contractor shall develop an Environmental Monitoring Plans in accordance with the requirement of this document and the ESMP, which will as a minimum incorporate the monitoring requirements, described in Table A, but shall not be limited to these requirements. An Independent Environmental Consultant commissioned by BT20 will be responsible for reviewing the Environmental Monitoring Plans prepared by the contractor and for ensuring that the monitoring programmes provided are consistent with this document.

Contractors responsible for multiple sections of the highway improvement scheme may utilise the same plan for each section providing that it is reviewed and revised to account for any site specific issues.

Table A: Management and Monitoring

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
Air Emissions Management (Appendix 1 of ESMP)					
Air emissions from vehicles, plant and site works	Disturbance to residents, business and local ecology	Monitoring to be undertaken at established monitoring sites (See Appendix B and at nearest sensitive receptors (including those identified in Appendix C) as agreed with independent Environmental Consultant) in accordance with the requirements of the IFC EHS General Guidelines (April 2007) (see Appendix A) and Vietnam Standard QCVN 05:2009/BTNMT."	A2	On-going	Contractor/Independent Environmental consultant
		Undertake periodic monitoring in the vicinity of plant/activities with the potential for significant emissions (e.g, hot asphalt batching plants, soil storage compounds, etc).	A3	On-going	Contractor/Independent Environmental consultant

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
		Undertake air monitoring at locations with persistent air quality complaints	A4	On-going	Contractor/ Independent Environmental consultant
Noise and Vibration (Appendix 2 of ESMP)					
		<p>The Contractor shall undertake background noise monitoring at the locations previously monitored (as identified in the EIA and presented in Appendix B of this document) in order to confirm general compliance with the requirements of Vietnamese national legislation QCVN 26:2010 and IFC EHS General Guidelines (April 2007).</p> <p>The contractor will also identify additional work locations, including haul routes and construction compounds, which represent a noise and vibration risk to community dwellings and other sensitive receptors (including schools, medical centres etc, as identified in Appendix C).</p> <p>The contractor shall then agree with the Independent Environmental Consultant, site specific noise and vibration monitoring requirements at the location of the nearest sensitive receptors and mitigation measures to be implemented at such</p>	N1	On-going	Contractor/ Independent Environmental consultant

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
		locations, as required.			
		Undertake noise monitoring at locations with persistent noise complaints.	N12	On-going	Contractor
Ecological Management (Appendix 3 of ESMP)					
Dredging of sands from rivers for the production of cement	Impacts on benthic fauna	Undertake ecological surveys at proposed dredging locations prior to the commencement of dredging activities.	EC16	On-going	Contractor
Development of new and existing quarries/ sand and/or soil pits	Loss of habitat	Ensure that ecological surveys are undertaken prior the development of new/extension of existing quarries/ sand pits / soil pits	EC23	Prior to development	Contractor
Waste Management (Appendix 4 of ESMP)					
Pre-construction preparation works.	Increased generation of waste.	Develop a waste inventory; this should detail the different waste streams, classification, quantities, storage requirements, potential use, and treatment and disposal arrangements. Ensure the waste hierarchy is applied.	W1	Undertake audits to demonstrate compliance with local and IFC requirements. Periodically review the waste inventory and update as necessary. Establish recycling objectives and formal tracking of waste generation and	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
				recycling rates.	
	Pollution of nearby receptors (i.e. controlled waters)	Develop procedures and controls to ensure appropriate storage of waste to minimise risk of pollution.	W2	Undertake audits to demonstrate compliance with local and IFC requirements.	Contractor
Waste generation during construction phase	Generation of stone and waste earth, toxic gas, waste oils, domestic waste.	<p>Review waste sources during the planning and designing phases to identify expected waste generation, identify opportunities for source reduction and reuse and recycling.</p> <p>Incorporate into the design the use of recyclable materials.</p> <p>Develop a waste inventory; this should detail the different waste streams, classification, quantities, storage requirements, potential use, and treatment and disposal arrangements. Ensure the waste hierarchy is applied.</p>	W6	<p>Undertake audits to demonstrate compliance with local and IFC requirements.</p> <p>Periodically review the waste inventory and update as necessary.</p> <p>Evidence of waste movements .</p> <p>Establish recycling objectives and formal tracking of waste generation and recycling rates.</p>	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
	Pollution of nearby receptors (i.e. controlled waters)	<p>Develop procedures and controls for on-site storage, minimising the risk of pollution.</p> <p>During the design phase of the project ensure that measures are developed and implemented to minimise pollution to receptors, ensure these measures are implemented (e.g. using a grating net with geo-textile material during construction of the upper bridge to minimise pollution of the river.)</p>	W8	<p>Undertake audits to demonstrate compliance with local and IFC requirements.</p> <p>Establish recycling objectives and formal tracking of waste generation and recycling rates.</p>	Contractor
Generation of hazardous waste	Soil, groundwater and surface water	<p>Establish and implement operational controls for on-site storage of hazardous waste. Store hazardous waste in a secure area on concrete hardstanding. Ensure containers are labelled so contents can be identified (TCV 6707/2000).</p>	W11	<p>Undertake audits to demonstrate compliance with local and IFC requirements.</p>	Contractor
		<p>Where liquid waste is stored in volumes greater than 220 litres, secondary containment should be implemented. The available volume of secondary containment should be at least 110% of the largest storage container of 25% of the total storage capacity.</p>	W12	<p>Conduct regular inspections of waste storage areas and document the findings.</p>	
		<p>When using the floating tank in the river, the waste oil and oily rags will be</p>	W13	<p>Maintain an inventory of hazardous waste generation, to include quantities, storage</p>	

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
		segregated and stored in labelled containers on the barge. This will be replaced when full. The full container will be stored on concrete hardstanding in a secure location		requirements and disposal arrangements. Review this document periodically. Report hazardous waste information to the Company and the Ministry of Natural Resources and Environment	
	Waste contamination	Minimise hazardous waste generation by implementing stringent waste segregation in order to prevent commingling of hazardous and non-hazardous waste.	W14	Periodic checks of hazardous waste storage area	Contractor
Waste management and disposal Including: Waste inventory Waste transfers	Soil, groundwater and surface water contamination.	Establish and implement operational controls for material handling, spill response, storage, transportation and disposal. Develop a waste inventory, detailing waste minimisation, segregation and disposal. Use the inventory to identify opportunities for reuse / recycling.	W16	Periodic reviews of the operational procedures and the waste inventory ensure that all activities and wastes are captured.	Contractor
Waste management	Soil, groundwater	Undertake audits of third party contractors	W17	Documented evidence	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
and disposal Including: Waste inventory Waste transfers	and surface water contamination.	responsible for transporting and disposing of waste.		of waste movements .	
Water Management (Appendix 5 of ESMP)					
		The contractor shall undertake water quality and level monitoring at the locations previously monitored (as identified in the EIA and presented in Appendix D of this document) in order to confirm general compliance with the requirements of Vietnamese national legislation QCVN 08:2008/BTNMT - National technical regulation on surface water quality (see Appendix A).	W6	On-going	Contractor
Water Consumption	Increased water consumption associated with construction camps	The contractor shall develop a Water Management Plan, which will as a minimum incorporate the measures, described in Table A, but shall not be limited to these measures. An Independent Environmental Consultant acting on behalf of BT20 will be responsible for reviewing the Water Resources Management Plan prepared by the contractor and for ensuring that it is consistent with this	W33	On-going	Contractor/ Independent Environmental Consultant

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
framework document.					
Erosion and Sediment Control (Appendix 6 of ESMP)					
Sub-grading, excavating, embanking the road base and road construction	Soil erosion resulting in reduced water quality, flooding, reduced agricultural productivity and impact on reservoir capacity and life expectancy	Assess and establish erosion and sediment control requirements (particularly in relation to site preparation earthworks (soils storage mounds), riverbanks adjacent to bridge works, site drainage), detailing specific erosion and sediment controls to be implemented (e.g., diversion drains, sediment ponds and fabric silt curtains)	ES1	Undertake visual surveys every 3 months in dry season and monthly in wet season as a minimum	Contractor
Spill Prevention and Response (Appendix 7 of ESMP)					
Spillage of oil/fuel/chemicals during transport, storage, handling or refuelling	Pollution of nearby receptors (i.e. controlled waters)	Prior to the commencement of construction activities, Contractor shall undertake a spill risk assessment to establish high risk locations and activities. The risk assessment will identify measures to reduce associated risks to as low as reasonably practical. Site and activity specific response measures will be incorporated into Contractor's Spill Prevention and Response Plan	S1	Periodic reviews of the risk assessment throughout the lifetime of the project.	Contractor
		The integrity of all storage tanks and bunds will be inspected for leaks.	S2	Document the findings of the inspections	Contractor
		Identify appropriate location for the spill kits and ensure they contain	S3	Record in inspection logs the	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
		<p>the necessary spill response equipment. Carry out regular inspections of the kits to ensure they are fully stocked.</p> <p>Inspect and evaluate the presence and performance of spill prevention measures. Record the findings in an inspection log.</p>	S9	<p>findings. Training records should be maintained and refresher training carried out periodically.</p> <p>Maintain inspection logs</p>	Contractor
		<p>In the event of significant spillage, assess the need for remediation of water/ground. This will require sampling water/ground to assess the impacts.</p> <p>Carry out an initial inspection of fuels and hydrocarbon storage areas to identify any non-conformances with IFC Performance Standards and EHS guidelines. Where non-conformances are observed (e.g. the fuel and tar storage tanks at the asphalt plant near KM-43), develop an action plan with corrective actions and a responsible person.</p>	S10	<p>Monitoring regime to be developed depending on the nature of the spillage.</p> <p>Regular inspections of the storage areas with documented findings.</p>	Contractor
Bentonite Spillage	Pollution of nearby receptors (i.e. controlled)	Bentonite mixed mud will be stored in the temporary storage yard, see the Waste Management Plan for storage and disposal	S13	Regular visual inspections	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
Construction of bridges and working near water	waters) Pollution of nearby receptors (i.e. controlled waters)	arrangements. Develop operational procedures where tasks are being carried out in or nearby water, this should also include maintenance of equipment and the use of spill containment booms in the water during active works.	S14	Carry out regular visual inspections to ensure compliance.	Contractor
Underground storage tanks	Contamination of ground and groundwater	Evaluate the risk of existing USTs to determine if upgrades are required, including replacement with new systems or closure. Ensure underground storage tanks (UST) and associated pipework are double-walled and a leak detection system is in place. Avoid the use of USTs for storage of highly soluble organic materials Regularly test the integrity of the USTs.	S15	Regularly monitor the surface above the tank for indications of soil movement. Consider monitoring of groundwater r down gradient of USTs.	Contractor
Hazardous Materials Management (Appendix 8 of ESMP)					
Transport, handling, storage and use of hazardous materials	Potential loss of hazardous material to air, soil, groundwater and surface waters	Undertake hazardous materials assessments for all materials. The level of risk should be established through an on-going assessment process based on the criteria defined in IFC EHS General Guidelines (April 2007) (provided in Appendix A). Ensure that results of assessment are incorporated into Spill	HM4	On-going	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
		Prevention and Response Plan:			
		Prepare spill management and response plans appropriate to all hazardous materials utilised on site (See ESMP Appendix 7: Spill Prevention and Response Plan).	HM5	Prior to use and on-going if new materials used	Contractor
		Undertake regular audits and inspections of hazardous materials transportation, transfer and use procedures and operations and ensure that the requirement for any additional measures are addressed with both the Hazardous Materials and Spill Prevention and Response Plans.	HM13	On-going	Contractor/Independent Environmental Consultant
		Undertake regular audits and inspections of storage facilities and tanks and ensure that the requirement for any additional measures are addressed with both the Hazardous Materials and Spill Prevention and Response Plans.	HM14	On-going	Contractor/Independent Environmental Consultant
Raw Materials Management (Appendix 9 of ESMP)					
Quarrying of materials for use in construction	Potential impacts associated with quarrying operations	Environmental and social surveys and assessment to be undertaken for new quarry/soil/ sand pit sites.	RM2	As-required	BT20/ Contractor
		Undertake Avoid, where possible, the extraction of sand from rivers. Where required,	RM5	Prior to extraction	Contractor

Source of Impact	Potential Impact	Mitigation/Management	Ref No. (as identified in technical Management Plans – Appendix 1-11)	Monitoring/Frequency	Responsible Party
		undertake baseline assessments of the rivers and implement measures to avoid impacts on river flow, erosion, water quality (turbidity) and biological diversity.			
Cultural Heritage Management (Appendix 10 of ESMP)					
Construction works and movement of people and vehicles in road corridor	Damage to or destruction of sites of cultural heritage value or artefacts. Disconnection of communities from cultural sites and loss of sites from oral tradition.	Undertake cultural heritage survey by systematically recording and mapping cultural heritage sites in all areas where construction works will be required (including road corridor and staging/storage compounds), including any areas that were not surveyed as part of the EIA.	C2	Prior to construction works	BT20/ Contractor
		Undertake further research of appropriate archives (local/national) as part of pre-construction surveys.	C3	Prior to construction	
		Implement a Chance Find Procedure is implemented as outlined in Appendix E.	C10	On-going	Contractor
Community Impact Management (Appendix 11 of ESMP)					
General work activities	Environmental and health and safety, social and economic impacts on individuals and communities	The contractor shall ensure that the grievance/complaint reporting procedure identified in the project Stakeholder Engagement Plan is appropriately implemented	C11	On-going	Independent Environmental Consultant

Roles and Responsibilities

Contractor shall ensure sufficient resources are allocated on an on-going basis to achieve effective implementation of the Environmental Monitoring Plan.

The contractor's Environmental Monitoring Plan shall describe the resources allocated and responsible for the execution of each task and requirement contained therein, and shall describe how their roles and responsibilities are communicated to the relevant personnel.

Training, Awareness and Competency

The contractor shall ensure that all personnel responsible for the execution of the tasks and requirements contained within the Environmental Monitoring Plan are competent on the basis of education, training and experience.

The contractor's Environmental Monitoring Plan shall describe the training and awareness requirements necessary for its effective implementation.

The contractor's training activity associated with the Environmental Monitoring Plan shall be appropriately documented by means of a training needs assessment, training matrix/plan and records of training undertaken.

Reporting and Notification

Contractor shall report to the Project Environmental Department the results of the surveys undertaken in accordance with the Environmental Monitoring Plan and integrate the results, including additional mitigation and management measures as agreed with Company, with the respective Environmental Management Plans.

Contractor's monthly report to Company shall include:

- Number and results of surveys/verification inspections/audits as prescribed in Table A.

Appendix A: Legal and Other Requirements

Legal and Other Requirements

All contractors and sub-contractors shall comply with applicable Vietnam Laws and Regulations, applicable IFC Performance Standards and international treaties and conventions (where applicable).

Vietnam Laws and Regulations

The following Vietnam Laws and Regulations are applicable:

- The law on Environment Protection 2005;
- Decree 80/2006/NĐ-CP dated 09/8/2006 of the Government on guidance of implementation of the law on environment protection 2005;
- Decree 21/2008/NĐ-CP dated 28/02/2008 on amending, supplementing some articles of Decree 80/2006/NĐ-CP dated 09/08/2006 of the Government regarding detailed regulations and guidance of implementation of some articles of the law on environment protection;
- Decree 29/2011/NĐ-CP dated 18/04/2011 regulating assessments of strategic environment, environment impact and environment protection commitment;
- Circular No.26/2011/TT-BTNMT on 18 July 2011 of Ministry of Natural Resources and Environment regulating in details some articles of Decree 29/2011/NĐ-CP on 18 April 2011 of the Government regarding assessments of strategic environment, environmental impact and environment protection commitment;
- Circular No.21/2012/TT-BTNMT dated 19/12/2012 on quality assurance and control in environment monitoring;
- Circular No.28/2011/TT-BTNMT on technical procedure of air and noise environment monitoring's;
- QCVN 05: 2009 Air Quality – Surrounding air quality standard;
- QCVN 06: 2009 Air Quality – Permitted maximum content of toxic substances in surrounding air.
- QCVN 26: 2010/BTNMT National technical standard on noise.
- QCVN 27:2010/BTNMT National technical standard on vibration.

IFC Performance Standards

The following IFC Performance Standards apply to noise and vibration issues during construction:

- IFC Performance Standard 1: *Assessment and Management of Environmental and Social Risks and Impacts* (2012) which establishes requirements for assessment, management, organisational capability, training, community engagement, monitoring and reporting.
- IFC Performance Standard 3: *Resource Efficiency and Pollution Prevention* (2012), and specifically the following provisions:

“The objectives of pollution prevention are to a) to avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities; and b) to promote the reduction of emissions that contribute to climate change”.

“To achieve these objectives, clients should take into account the potential impact of their emissions on the ambient conditions (such as ambient noise levels) and seek to avoid or minimise these impacts

within the context of the nature and significance of pollutants emitted. Large projects with potentially significant emissions and/ or high impacts may require impacts on the surrounding environment (i.e changes in ambient levels) to be monitored, in addition to the implementation of control measures”

“General requirements. During the design, construction and decommissioning of the project (the project life-cycle) the client will consider ambient conditions and apply pollution prevention and control technologies and practices (techniques) that are best suited to avoid or, where avoidance is not feasible, minimise or reduce adverse impacts on human health and the environment while remaining technically and financially feasible and cost-effective. The project-specific pollution prevention and control techniques applied during the project life-cycle will be tailored to the hazards and risks associated with the project emissions and consistent with good international industry practice, as reflected in various internationally recognised sources including IFC’s Environmental, Health and Safety Guidelines (the EHS General Guidelines).”

“Technical Guidance. The client should refer to the current versions of the EHS Guidelines when evaluating and selecting pollution and prevention and control techniques for the project. These documents contain the performance levels and measures that are normally acceptable to IFC and are generally considered to be achievable at reasonable costs by existing technology.”

“Ambient Considerations. To address adverse project impacts on existing ambient conditions (such as air, surface and groundwater and soils) the client will:

- Consider a number of factors, including the finite assimilative capacity of the environment, existing and future land use, existing ambient conditions, the project’s proximity to ecologically sensitive or protected areas, and the potential for cumulative impacts with uncertain or irreversible consequences: and
- Promote strategies that avoid or, where avoidance is not feasible, minimise or reduce the release of pollutants, including strategies that contribute to the improvement of ambient conditions when the project has the potential to constitute a significant source of emissions in an already degraded area. These strategies include, but are not limited to, evaluation of project location alternatives and emission offsets.”

“If ambient levels are in compliance with relevant ambient quality guidelines and/or standards, projects with potentially significant emissions of pollutants should be designed so as to reduce the potential for significant deterioration and to ensure compliance.”

- IFC Performance Standard 4 and Guidance Note 4: *Community Health, Safety and Security (2012)*, which requires Projects to avoid or minimise adverse impacts due to activities on soil, water and other natural resources in use by affected communities.
- IFC Performance Standard 6: *Biodiversity Conservation and Sustainable Management of Living Natural Resources (2012)*.

IFC Guidelines

The following IFC Guidelines are applicable to air emissions and ambient air quality during construction. Contractor shall meet the intent of these guidelines:

- IFC EHS General Guidelines (April 2007), incorporating WHO Ambient Air Quality Guidelines (1987, 1999 and 2006); Section 1.1 and 4. Relevant provisions include that:
 - Emissions do not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards⁹ by applying national legislated standards, or in their absence, the current WHO Air Quality Guidelines¹⁰ (see Table 1.1.1), or other internationally recognized sources¹¹;

Table 1.1.1: WHO Ambient Air Quality Guidelines^{7,8}

	Averaging Period	Guideline value in µg/m ³
Sulfur dioxide (SO₂)	24-hour	125 (Interim target-1)
	10 minute	50 (Interim target-2)
		20 (guideline)
		500 (guideline)
Nitrogen dioxide (NO₂)	1-year	40 (guideline)
	1-hour	200 (guideline)
Particulate Matter PM₁₀	1-year	70 (Interim target-1)
		50 (Interim target-2)
		30 (Interim target-3)
		20 (guideline)
	24-hour	150 (Interim target-1)
		100 (Interim target-2)
		75 (Interim target-3)
		50 (guideline)
Particulate Matter PM_{2.5}	1-year	35 (Interim target-1)
		25 (Interim target-2)
		15 (Interim target-3)
		10 (guideline)
	24-hour	75 (Interim target-1)
		50 (Interim target-2)
		37.5 (Interim target-3)
		25 (guideline)
	Ozone 8-hour daily maximum	160 (Interim target-
Ozone	8-hour daily maximum	160 (Interim target-1)
		100 (guideline)

- 7) World Health Organization (WHO). Air Quality Guidelines Global Update, 2005. PM 24-hour value is the 99th percentile.
- 8) Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines.

- 9) Ambient air quality standards are ambient air quality levels established and published through national legislative and regulatory processes, and ambient quality guidelines refer to ambient quality levels primarily developed through clinical, toxicological, and epidemiological evidence (such as those published by the World Health Organization).
- 10) Available at World Health Organization (WHO). <http://www.who.int/en>.
- 11) For example the United States National Ambient Air Quality Standards (NAAQS) (<http://www.epa.gov/air/criteria.html>) and the relevant European Council Directives (Council Directive 1999/

The following IFC Guidelines apply to noise and vibration during construction. The contractor shall meet the intent of these guidelines:

- IFC EHS General Guidelines (April 2007), incorporating WHO Guidelines for Community Noise (1999); Section 1.7 and Section 4.1, which specify:
- Noise impacts should not exceed the levels presented in Table 1.1.2 , or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

Table 1.7.1 – Noise Level Guidelines ⁵⁴		
One Hour LAeq (dBA)		
Receptor	Daytime 07:00 – 22:00	Nighttime 22:00 - 07:00
Residential; Institutional; Educational⁵⁵	55	45
Industrial; Commercial	70	70

54 – Guidelines values are for noise levels measured out of doors. Source: Guidelines for Community Noise, World Health Organisation (WHO), 1999.

55 – For acceptable indoor noise levels for residential, institutional and educational settings refer to WHO (1999).

- Planning activities should be undertaken in consultation with local communities so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance.
- The use of noise control devices, such as temporary noise barriers and deflectors for impact and blasting activities, and exhaust muffling devices for construction plant.
- Avoiding or minimising project transportation/plant movements through community areas.

The following IFC Guidelines are applicable to the use of hazardous materials. Contractor shall meet the intent of these guidelines:

- IFC EHS General Guidelines (April 2007), Section 1.5 which, in brief, advocate the following: Hazard Assessment

The level of risk should be established through an on-going assessment process based on:

- The types and amounts of hazardous materials present in the project. This information should be recorded and should include a summary table with the following information:

- Name and description (e.g. composition of a mixture) of the Hazardous Material (Hazmat);
 - Classification (e.g. code, class or division) of the Hazmat;
 - Internationally accepted regulatory reporting threshold quantity or national equivalent⁴⁰ of the Hazmat;
 - Quantity of Hazmat used per month; and
 - Characteristic(s) that make(s) the Hazmat hazardous (e.g. flammability, toxicity)
-
- Analysis of potential spill and release scenarios using available industry statistics on spills and accidents where available
 - Analysis of the potential for uncontrolled reactions such as fire and explosions
 - Analysis of potential consequences based on the physical-geographical characteristics of the project site, including aspects such as its distance to settlements, water resources, and other environmentally sensitive areas.

Hazard assessment should be performed by specialized professionals using internationally-accepted methodologies such as Hazardous Operations Analysis (HAZOP), Failure Mode and Effects Analysis (FMEA), and Hazard Identification (HAZID).

- IFC Environmental, *Health and Safety Guidelines for Construction Materials Extraction*, dated April 2007 the following typical prevention and control measures that will be adopted to mitigate potential impacts to human health from site operations include but may not be limited to the following:
 - developing site specific personnel training on site safety management and ensuring that all site operatives and contractors are adequately trained for their specific work area prior to commencement on site;
 - preparation and implementation of monitoring programs to assess geological / geotechnical integrity of the site;
 - undertaking regular assessments (i.e. via rock scaling) of each rock face exposed to workers to prevent unforeseen rock falls and /or landslide; and
 - provision of appropriate permanent or temporary barriers and / or specific danger signage along rock benches or other pit areas where work is performed.

Appendix B: Background Air Quality and Noise Monitoring Locations

Symbol	Position	Location on Route	Coordinates
A1	Dau Giay intersection (National Highway 1A Intersection)	Km00	X=733898; Y=1210467
A2	Gia Kiem residential area	Km9	X=737746; Y=1218366
A3	Phu Cuong, Dinh Quan residential area (Phu Cuong market)	Km19	X=738442; Y=1226648
A4	Centre of Phu Cuong commune	Km21+500	X=740931; Y=1226750
A5	La Nga residential area	Km34+600	X=747097; Y=1240093
A6	Dinh Quan town	Km48+150	X=758436; Y=1240456
A7	Tan Phu town	Km58	X=765741; Y=1246955
A8	Phuong Lam residential area (near Phuong Lam market and Phuong Lam)	Km65+500	X=772248; Y=1249196
A9	Madagui residential area (Da Huoai, Lam Dong)	Km76	X=775943; Y=1258487
A10	Damri town, Lam Dong	Km94	X=790342; Y=126796
A11	Loc Chau residential area (near Hai Ba Trung Primary School, Loc Chau market)	Km117	X=804277; Y=1276849
A12	Loc Son residential area (near Loc Son primary school, Hoa lu Kindergarden)	Km123	X=807861; Y=1276626
A13	Loc An residential area (near Loc An B primary school, Loc An high school)	Km131+600	X=816979; Y=1278256
A14	Hoa Ninh residential area (near Le Hong Phong high school, Hoa Ninh market)	Km137+400	X=820972; Y=1277254
A15	Di Linh residential area (near Vo Thi Sau primary school)	Km154	X=835274; Y=1281450
A16	Tan Nghia Town (near Tan Nghia II primary school, Phupc Lac pagoda)	Km160+400	X=838550; Y=1285124
A17	Phu Hiep residential area (near Phu Hiep primary school, Gia Hiep secondary school)	Km170+500	X=846967; Y=1287333
A18	Hiep Thuan residential area, (near Hiep Thuan secondary school)	Km184	X=858989; Y=1287529
A19	City Block 10, Liên Nghĩa town	Km199	X=866619; Y=1297686
A20	Hiep Thanh residential area (Dinh An	Km211	X=873930; Y=1306180

Symbol	Position	Location on Route	Coordinates
	secondary school)		
A21	Dinh An residential area (Dinh An secondary school)	Km218	X=876810; Y=1312324
A22	Residential area of District 9, Da Lat (Tran Phu high school)	Km235	X=877449; Y=1322971
A23	Da Loc residential area, Xuan Tho (Xuan Tho high school)	Km245	X=884835; Y=1321518
A24	Cau Dat residential area, Xuan Truong (Xuan Truong secondary school)	Km254	X=887021; Y=1315705
A25	Don Duong residential area (across National Highway 27)	Km268	X=892143; Y=1311747

Appendix B1: Information required on Initial Chance Finds Report Form

General description of find:

Location:

Date of Find:

Person who identified find:

Description of Initial Find:

Was work stopped in the immediate vicinity of the find (Yes/No)?

Was an archaeologist contacted (Yes/No)?

Archaeological Detail:

Date of inspection:

Reporting Archaeologist:

GPS coordinates:

Photo Record:

Signature

Appendix C: Location of Sensitive Receptors

The location of receptors sensitive to air quality emissions identified on Highway 20 between Dong Nai and Lam Dong Provinces.

Site ref no:	Site	Location on Route	Distance from Road (m)
1	Ninh Phat church	KM6	50
2	Thang Long secondary school	KM9	60
3	Dau Giay secondarys school	KM9+100	80
4	Vo Dong parish, Thanh Son parish	KM10	60
5	Bach Lan parish	KM13+400	50
6	Nguyen Ba Ngoc parish	KM14	50
7	Phu Cuong church	KM17+50	60
8	Phu Cuong market	KM19+100	30
9	Nguyen Du primary school	KM45	50
10	Nguyen Thi Minh Khai secondary	KM45+400	60
11	Thọ Lam parish	KM64	50
12	Phuong Lam market	KM65	30
13	Phuong Lam parish	KM65+500	60

Site ref no:	Site	Location on Route	Distance from Road (m)
14	Phu Trung secondary school	KM69+500	50
15	Phu Lam parish	KM70	50
16	Dại Lao healthy centre	KM110+900	60
17	Loc Chau market	KM116+700	30
18	Hai Ba Trung primary school	KM117+50	50
19	Bao Loc secondary and vocational school	KM119	60
20	Hoa Lu preschool education	KM123	50
21	Loc Son - Bao Loc primary school	KM123+200	45
22	Loc An B primary school	KM13+150	45
23	Loc An secondary school	KM131+800	50
24	Loc An clinic	KM132	60
25	Loc An A primary school	KM132+200	45
26	Le Hong Phong secondary school	KM137+400	50
27	Hoa Ninh market	KM137+450	30

Site ref no:	Site	Location on Route	Distance from Road (m)
28	Vo Thi Sau primary school	KM154	45
29	Tan Nghia II primary school	KM160	50
30	Tan Nghia church	KM160+250	50
31	Phuoc Lac pagoda	KM160+600	60
32	Dinh Lạc market	KM162+300	30
33	Dinh Lạc primary school	KM163	45
34	Tan phu church	KM165+450	45
35	Gia Hiep secondary school	KM170	50
36	Phu Hiep parish	KM170+600	50
37	Phu Hiep secondary school	KM171	45
38	Hiep Thuan primary school	KM184	60
39	Ninh Gia primary school	KM186+700	50
40	Ninh Gia secondary school	KM188+200	50
41	Son Trung secondary school	KM189+500	45

Site ref no:	Site	Location on Route	Distance from Road (m)
42	Nguyen Thai Binh secondary school	KM192+700	45
43	Son Trung primary school	KM196+800	50
44	K'Long primary school	KM214+600	60
45	K'Long church	KM214+700	60
46	Hiep An secondary school	KM216+400	50
47	Dinh An primary school	KM217+600	60
48	Tran Phu high school	KM235	100
49	Phan Chu Trinh secondary school	KM235+300	100
50	Xuan Thọ healthy centre	KM242+800	45
51	Da Loc - Xuan Thọ church	KM243+900	50
52	Xuan Thọ secondary school	KM245+200	70
53	Xuan Truong primary school	KM254+150	80
54	Xuan Truong primary school	KM257+800	80
55	Trạm Hạnh - Xuan Truong protestant church	KM259+300	70

Appendix D: Water Monitoring Locations

Locations for Water Monitoring

Code	Name of bridge	Station	Sampling frequency
W1	Gia Duc	Km1+540	1 time in day /2 water layers/01 section
W2	La Nga	Km35+712	1 time in day /2 water layers/2 section
W3	Phuong Lam bridge	Km65+056	1 time in day/2 water layers/01 section
W4	Da Huoai river	Km87+350	1 time in day /2 water layers/01 section
W5	Suoi Tien	Km96+200	1 time in day /2 water layers/01 section
W6	Dai Nga bridge	Km129+500	1 time in day /2 water layers/01 section
W7	Dinh Trang Hoa bridge	Km139+300	1 time in day /2 water layers/01 section
W8	Lien Dam bridge	Km149+303	1 time in day /2 water layers/01 section
W9	Darle bridge	Km177+800	1 time in day /2 water layers/01 section
W10	Hiep Thuan bridge	Km183+376	1 time in day /2 water layers/01 section
W11	Dai Ninh bridge	Km189+200	1 time in day /2 water layers/01 section
W12	Xom Trung bridge	Km194+771	1 time in day /2 water layers/01 section
W13	Dinh An I bridge	Km217+810	1 time in day /2 water layers /01 section
W14	Dat bridge	Km254+254	1 time in day /2 water layers/01 section
W15	Xeo bridge	Km263+100	1 time in day /2 water layers /01 section

Appendix E: Chance Finds Procedure

Purpose, Objectives and Scope

The construction works associate with the rehabilitation and Improvement of National Highway No. 20 – Section from Dong Nai to Lam Dong Province has the potential to disturb or alter as yet unknown or unrecorded archaeological sites. These unknown archaeological sites are referred to as chance finds.

BT20 has developed this Chance Finds Protocol, the overall purpose of which is to define the process which governs the management of chance finds during construction works.

The objectives of the Chance Finds Protocol are to:

- Define the processes which must be followed to ensure the management of sites and preservation and appropriate treatment of chance finds while also minimising disruption to the construction schedule
- Enable compliance with all relevant national laws and regulations and other requirements.

A table providing archaeological definitions is presented in Appendix B2.

Chance Finds Work Process

Introduction

The purpose of Chance finds procedure is to address the possibility of archaeological deposits, finds and features becoming exposed during earthmoving and ground altering activities associated with the rehabilitation and Improvement of National Highway No. 20 – Section from Dong Nai to Lam Dong Province and to provide procedures to follow in the event of a chance archaeological find. The objectives of these procedures, agreed with the statutory authorities, are to identify and promote the preservation and recording of any archaeological material that maybe discovered and notify the relevant cultural authorities to resolve any archaeological issue that may arise.

Archaeological Method Statement and Archaeological Monitoring

An archaeological method statement has been submitted and approved by the statutory authorities, as part of a licence application for archaeological monitoring associated with the construction of the Road scheme. This method statement describes in detail the proposed scope of works, construction schedule, and archaeological strategy and details how the archaeological team will function onsite. Archaeological monitoring will be undertaken as set out in conditions for approval by:

As determined by the statutory authorities' interim archaeological monitoring shall be provided, including appropriate reporting and archiving in line with national standards.

Archaeological Chance Finds Procedure

During the project induction meeting, all contractors will be made aware of the presence of the archaeologist/ appropriately trained person who will monitor earthmoving and excavation activities.

General

The following procedure is to be executed in the event that archaeological material is discovered:

- All construction activity in the vicinity of the find/feature/site will cease immediately.
- Delineate the discovered find/ feature/ site will be delineated.
- Record the find location, and all remains are to be left in place.

- Secure the area to prevent any damage or loss of removable objects.
- The on-site archaeologist will assess, record and photograph the find/feature/ site (See appendix B1 - Initial Chance Finds Report Form).
- The on-site archaeologist will undertake the inspection process in accordance with all project health and safety protocols under direction of the Health and Safety Officer.
- The Project Archaeologist, the Vietnam Government contacted.
- In consultation with the statutory authorities the on-site and Project Archaeologist will determine the appropriate course of action to take.
- Finds retrieval strategy: All investigations of archaeological soils will be undertaken by hand, all finds, osteological remains and samples will be kept and submitted to the National Cultural Heritage Authority of the Vietnam government as required. In the event that any artefacts need to be conserved, the relevant licence (Licence to Alter) will be sought from the national cultural heritage authority.
- An on-site office and finds storage area will be provided, allowing storage of any artefacts or other archaeological material recovered during the monitoring process.
- In the case of human remains, in addition to the above, the Vietnam Government will be contacted and the guidelines for the treatment of human remains will be adhered to. If skeletal remains are identified, an osteoarchaeologist will be available to examine the remains.
- Conservation: A conservator is available to the project, if required.
- The on-site archaeologist will complete a report on the findings as part of the licensing agreement in place with the National Cultural Heritage authority
- Once authorisation has been given by the responsible statutory authorities, the client will be informed when works can resume.

Structure or Larger Deposit

Should the archaeological material be deemed to be part of a structure or larger deposit the following will take place:

- The archaeologist will notify the Project Archaeologist, the National Cultural Heritage Authority of the discovery.

BT20 shall consult with all relevant parties, including the Vietnam Government in order to agree this Chance Finds Protocol.

Training and Awareness

BT20 shall develop and issue to each Contractor a Cultural Heritage Training and Awareness Package. This will include basic training in the identification of archaeological materials relevant to the area, including human skeletal remains. Each contractor will be required to deliver the Cultural Heritage Training and Awareness Package to all relevant Contractor personnel prior to their participation in works activity.

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