SECTION D: ENVIRONMENTAL AND SOCIAL CONSTRUCTION MANAGEMENT PLANS

CHAPTER D3: NOISE AND VIBRATION CONSTRUCTION MANAGEMENT PLAN

Contents

Tables

3 NOISE AND VIBRATION

3.1 INTRODUCTION

This Noise and Vibration Construction Management Plan (the 'Management Plan') is designed to ensure the control and limitation of potential sources of noise and vibration during the construction of the Oyu Tolgoi Project (the 'Project' or 'Oyu Tolgoi'). The plan describes measures proposed to be taken to protect people and animals (domestic and wild) from nuisance and disturbance associated with vibration and airborne noise. While the generation of some noise emissions and vibration is inevitable in the context of a mining project, this plan sets out a systematic approach for noise and vibration control through the implementation of good practice procedures. This Management Plan also includes the schedule for noise and vibration monitoring during the construction phase.

The plan establishes guidelines for the management of noise and vibration, including identification of applicable project standards, mitigation controls and monitoring programmes.

During the construction phase occupational noise and vibration protection is addressed separately under the Construction Health and Safety Management System (for further details see *Chapter D1: Environmental and Social Management Plan Framework*).

3.2 OBJECTIVES

The objectives of this Construction Management Plan are to:

- Outline the applicable standards with regards to noise and vibration control;
- Identify potential sources of noise and vibration impact;
- Define the operational procedures for noise and vibration control;
- Define roles and responsibilities;
- Define monitoring and reporting procedures; and
- Define training requirements.

3.3 SCOPE

The Oyu Tolgoi Project is committed to comply with various environmental standards which are managed through a suite of topic specific Management Plans as described in *Chapter D1: Environmental and Social Management Plan Framework* (the' ESMP Framework'). The ESMP Framework sets out the management framework for Management Plans for the following phases of the Project (see the ESMP Framework for the definition of these phases):

1. Construction Phase
2. Operations Phase

This Management Plan is part of the suite of construction phase Management Plans. The plan covers all Construction Phase activities that have the potential to generate noise and vibration (see Section 4 for further details). Particular reference is made here to the following EMPs that have direct cross-linkages to noise and/or vibration impacts:

- The Construction Transport Management Plan (D11) (e.g. in relation of vehicle-generated noise and vibration);
- The Construction Flora and Fauna Protection Management Plan (D6) (e.g. in relation to noise disturbance to wildlife);
- Construction Community Health, Safety & Security Management Plan (D18) (noise and vibration disturbance in residential areas and other non-project areas);
- The Stakeholder Engagement Plan (D14); and
- Plans within the Oyu Tolgoi Health and Safety Management System (e.g. exposure to occupational noise and vibration).

3.4 SOURCES OF IMPACT

Noise and vibration sources during the Construction Phase relate primarily to plant use and vehicle movements, equipment use, materials haulage (both on site and off site), the use of generators, drilling, blasting and aircraft. These noise and vibration sources will be generated within the Mine Licence Area, roads used by the Project, the borefield and water supply pipeline, the infrastructure corridor between the Mine Licence Area and the Mongolia/China border and the temporary domestic airport.

Noise and vibration sources are also described in *Chapter C3: Noise and Vibration Impact Assessment* of the ESIA. *Table 3.1* provides a more detailed list of the primary sources of noise and vibration associated with the Construction Phase.

Table 3.1: Key Noise and Vibration Sources

Source	Emissions of Primary Concern	Comments
On site vehicle movements	Noise	Movement of vehicles throughout the Mine Licence Area and other Project work areas, including road construction areas.
Construction plant	Noise and Vibration	Crushers, conveyors, pumps, compressors, concrete mixers, impact equipment etc. used during construction
Earth works	Noise	Loading and movement of heavy machinery throughout the Mine Licence Area, roads. pipeline and airport construction
Power generation	Noise	Noise from temporary generators. Temporary generators to be replaced and relocated (and ultimately replaced once long-term power is available).
Drilling	Noise and vibration	Drilling associated with the opening of shafts 1 and 2, and boreholes.
Blasting	Noise and Vibration	Associated with early construction works e.g. associated with the primary crusher and thickener area.
Offsite vehicle movements	Noise and vibration	Movement of vehicles, particularly haulage or heavy equipment vehicles in proximity to residential and commercial properties
Airport operations	Noise	Associated with arrival and departure of aeroplanes

Potential impacts associated with noise and vibration, include:

- Nuisance/loss of sleep and potentially stress induced illness (community health issue);
- Impacts on worker accommodation and sleep patterns;
- Building damage;
- Disturbance to wild life and domestic herd animals; and
- Safety impacts (related to inability to hear warning signals).

3.5 PROJECT STANDARDS

Applicable noise and vibration standards will be complied with for all Project activities. These standards specify maximum permissible levels at a particular location or receptor, typically the facade of a building.

- The applicable provisions of Mongolian Law on permissible ambient noise levels are specified in MNS 4585:2007;
- The International Finance Corporation ('IFC') noise limits are specified in the General EHS guidelines, Noise Management, April 2007;

- IFC EHS Guidelines for Airports and International Civil Aviation Organization (ICAO), Resolution A33/7, Balanced Approach to Aircraft Noise Management referenced therein; and
- World Health Organisation (WHO) Guidelines for Community Noise, 1999.

A comparison of selected applicable standards for the control of key emissions sources is provided in *Table 3.2*. below, together with the identification of the standards to be used in the Oyu Tolgoi Project (the Project Standards).

Table 3.2: Noise and Vibration Standards

Pollutant/ source	Receptor	Standard[2] (dB(A)Leq 1 h) unless stated otherwise				Comments
		IFC[1]	WHO	Mongolian	Project (most stringent)	
Noise	Boundary fence	NA	NA	NA	**75 dB(A)**	Oyu Tolgoi has adopted a noise limit of 75 dB(A) at the boundary fence during normal operations
Noise (off site receptors)	Industrial/ Commercial (day and night time)	70	-	60	**60 dB(A)**	
	Residential (day time)	55	55	60	**55 dB(A)**	Mongolian standards stipulate a maximum day time environmental noise exposure of 60 dB(A).
	Residential (night time)	45	45	45	**45 dB(A)**	Mongolian standards stipulate a maximum night time environmental noise exposure of 45 dB(A).
Noise (airport)	Residential (day time)	-	-	-	**65dB**	The Federal Aviation Administration defines areas of 'significant noise exposure' as locations where noise meets or exceeds DNL 65 dB.
Vibration	Non workforce (blast related vibration)			None specified	See comment	There are no Mongolian standards for vibration. The Project has adopted the following guidelines for blasting: Australian and New Zealand Environmental Council, Technical basis for guidelines to minimise Annoyance Due to Blasting Overpressure and Ground Vibration, 1990. 5mm/sec (PPV) which can be exceeded for 5% of blasts over a 12 month period 10mm/sec not to be exceeded at any time
Vibration	Non workforce (vibration from sources other than blasting)					British Standard 6472 – Evaluation of Peak Particle velocity (PPV) vibration levels of 1.12mm/sec at residential properties is generally considered acceptable within dwellings during the day time. Ref. NV6 - Applicable Standards, Policy and Guidance.doc NV6 - Applicable Standards, Policy and Guidance British Standard 5228 - Noise Control on Construction and Open Sites

Notes
[1] IFC requires that the Project does not result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.
[2] The EU Noise Directive does not specify equivalent numeric threshold standards.

Mongolian law provides guidance on environmental noise limits for industrial and residential areas, which are broadly comparable to international standards. However for residential areas, the IFC - and the identical World Health Organization ('WHO') guidelines - will apply. The European Bank for Reconstruction and Development ('EBRD') is also required to apply EU noise limits, however, the EU Noise Directive does not specify equivalent numeric threshold limits, and therefore the IFC guidelines provide the applicable international standard. As described in the table above, the Project Standards are in certain respects more stringent than the applicable international standards.

The European Commission will require all major airports in the European Union to use the Lden/Lnight noise metrics for noise mapping and specifies the 65 Lden (day evening night level) and 55 Lnight (22.00 – 0700h) levels as being of interest for mapping. These broadly equate to noise levels and metrics generally regarded as marking the onset of significant disturbance around airports. Values similar to these are used for planning restrictions on residential development. The 'Balanced Approach' has been incorporated into European Community legislation as Directive EC/2002/30 on the establishment of rules and procedures with regard to the introduction of noise-related operating restrictions at community airports. A similar noise level is set by the Federal Aviation Administration which defines areas of 'significant noise exposure' as locations where noise meets or exceeds DNL (Day Night Average Sound Level) 65 dB.

The ESIA concludes that there will be no significant noise or vibration impacts from activities, including blasting undertaken from within the Mine Licence Area (i.e. Project Standards will not be exceeded). However it does acknowledge that road traffic will potentially affect a small number of herders located in close proximity to roads used by the Project. Residents of villages located along key transport routes may also be adversely impacted from time to time by noise or vibration impacts.

Despite the anticipated minimal impact from noise and vibration, the Project will implement a number of mitigation and monitoring measures to further reduce the potential for adverse effect.

3.6 ROLES & RESPONSIBILITIES

In addition to the specific responsibilities identified on in Section 7 below, general responsibilities for noise and vibration control are defined below.

Overall lines of responsibility between Oyu Tolgoi and its contractors are described in the ESMP framework document. More specifically for noise the following roles and responsibilities apply.

Oyu Tolgoi Environment Department:

- Overall responsibility for the implementation of this Management Plan shall rest with the Oyu Tolgoi Environment Department;
- Provide guidance to contractors on the applicable standards and appropriate mitigation controls;
- Ensure principal contractors (and their sub contractors) meet the requirements outlined in this plan through a programme of periodic audits and inspections; and
- Implement a noise and vibration monitoring programme.

Principal Contractor (contracted directly by Oyu Tolgoi):

- Coordinate and manage all noise and vibration control measures to ensure standards are met;
- Minimise worker exposure to noise and vibration;
- Provide supervisors and operators with the applicable information (maps, guidelines, training etc);
- Develop job specific noise and vibration management plans prior to the commencement of works where noise and/or vibration issues can be expected; and
- Conduct job-specific training for machinery and heavy vehicle operators to cover the importance of noise control and available noise reduction measures.

Workplace supervisors (typically a nominated contractor representative overseeing a particular task):

- Provide oversight to ensure noise and vibration controls measures are in place;
- Adjust operation schedule, where possible, to prevent or reduce noise and vibration; and
- Prevent practices that might lead to environmental or safety incidents.

3.7 MITIGATION MEASURES AND MANAGEMENT CONTROLS

The mitigation measures and management controls that are to be implemented during the construction phase to minimise noise and vibration impacts are described in the table below. Contractors are required to incorporate the measures outlined in the table below within their own working procedures.

Table 3.3: Mitigation Measures and Management Controls - Noise and Vibration

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
NV01 - a	Noise and Vibration	General procedures and stakeholder engagement	Prior to commencement of particularly noisy operations (which are considered likely or possible to exceed Project Standards at sensitive receptors), environmental procedures detailing the work process, program of work, predicted noise levels and manufacturers specifications for equipment and machinery will be submitted by the contractor to Oyu Tolgoi for acceptance.	Principal Contractors Oyu Tolgoi Environmental Department Oyu Tolgoi CSP Department	Audit of noise monitoring programme Audit of grievance mechanism	Includes a requirement from the Oyu Tolgoi Environmental Management Plan, 2006. (Ref A2MW 653 8122)
NV01 - b	Noise and Vibration	General procedures and stakeholder engagement	Oyu Tolgoi will conduct noise monitoring throughout the construction phase. Notification will be given to nearby residents of any exceptional mining activity planned which might create noise near to sensitive receptors in excess of Project Standards.	Oyu Tolgoi Health & Safety Department (for occupational noise exposure) Oyu Tolgoi Environmental Department (for environmental noise exposure) Oyu Tolgoi CSP Department	Audit of noise monitoring programme Audit of grievance mechanism	Includes a requirement from the Oyu Tolgoi Environmental Management Plan, 2006. (Ref A2MW 653 8122)
NV01 - c	Noise and Vibration	General procedures and stakeholder engagement	Oyu Tolgoi will maintain, and require contractors to maintain as appropriate, a grievance mechanism to record and respond, to noise or vibration related complaints (see the Stakeholder Engagement Plan).	Principal Contractors Oyu Tolgoi Environmental Department Oyu Tolgoi CSP Department	Audit of noise monitoring programme Audit of grievance mechanism	Includes a requirement from the Oyu Tolgoi Environmental Management Plan, 2006. (Ref A2MW 653 8122)
NV02 - a	Noise and Vibration	Noise mitigation (general)	**Use of noisy equipment** Oyu Tolgoi will schedule noisy construction activities for normal daytime working hours (0700-2200) and restrict the hours of operation for specific pieces of equipment, especially mobile sources operating through community areas which are considered likely or possible to create noise in excess of Project Standards.	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - b	Noise and Vibration	Noise mitigation (general)	Only have necessary equipment operating on-site	Principal Contractors All Supervisors	Contractor audits and noise monitoring	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
NV02 - c	Noise and Vibration	Noise mitigation (general)	Where practicable, particularly noisy equipment such as generators, crushers, grinders, compressor, pumps, gearboxes etc. which has the potential to exceed the Project Standards, will be fitted with noise barriers, baffles, sound insulation or enclosures.	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - d	Noise and Vibration	Noise mitigation (general)	Avoid operating numerous pneumatic tools at the same time and spread operations throughout working periods	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - e	Noise and Vibration	Noise mitigation (general)	Keep equipment in good condition and turn off when not in use	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - f	Noise and Vibration	Noise mitigation (general)	Where practicable, mobile equipment will have exhaust muffling maintained at manufacturer's specifications	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - g	Noise and Vibration	Noise mitigation (general)	Where practicable select equipment with lower sound power levels	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - h	Noise and Vibration	Noise mitigation (general)	Shielding and separation where necessary and practicable	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - i	Noise and Vibration	Noise mitigation (general)	Maximise distances between noisy equipment items and the identified sensitive receptors	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - j	Noise and Vibration	Noise mitigation (general)	Position noisy equipment in sheltered locations where practicable, e.g. behind an earth berm if practicable	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - k	Noise and Vibration	Noise mitigation (general)	Place crushers behind engineered or natural berms where practicable	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - l	Noise and Vibration	Noise mitigation (general)	Install suitable mufflers on engine exhausts and compressor components where practicable.	Principal Contractors All Supervisors	Contractor audits and noise monitoring	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
NV02 - m	Noise and Vibration	Noise mitigation (general)	Install acoustic enclosures for equipment causing radiating noise if identified as necessary by a risk assessment	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - n	Noise and Vibration	Noise mitigation (general)	Re-locate noise sources to less sensitive areas to take advantage of distance and shielding, where considered necessary based on a risk assessment	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV02 - o	Noise and Vibration	Noise mitigation (general)	Acoustic monitoring of the ore processing facility will be undertaken to confirm that operations will not exceed Project Standards for the applicable time of day.	Oyu Tolgoi Health & Safety Department (for occupational noise exposure) Oyu Tolgoi Environmental Department (for environmental noise exposure)	Noise monitoring	
NV02 - p	Noise and Vibration	Noise mitigation (general)	Install silencers for fans where required based on a risk assessment	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV03	Noise and Vibration	Noise mitigation (accommodation)	Decisions on siting of staff accommodation will take into account of Project Standards	Principal Contractors		
NV04	Noise and Vibration	Noise reduction (airports)	Avoid low altitude flights where feasible (it is noted that aerial biodiversity survey will require low-level flying) and restrict air traffic to daytime hours.	Principal Contractor	Review of flight schedules	
NV05	Noise and vibration	Noise reduction (vehicles /road transport) See also Transport Management Plan (Construction)	Job-specific training for machinery and heavy vehicle operators will cover the importance of noise control and available noise reduction measures	Principal Contractors Oyu Tolgoi Environmental Department	Contractor audits	
NV06 - a	Noise and vibration	Blasting (if applicable during construction)	Blasting activities shall be restricted to day time (should this take place during the construction phase) and will take place, other than in exceptional circumstances, between the hours of 09:00 and 17:00 in line with Mongolian industry regulations	Principal Contractors All supervisors	Contractor audits and noise monitoring	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
NV06 - b	Noise and vibration	Blasting (if applicable during construction)	Monitor blasts and revise blast design, as required	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06 – c	Noise and vibration	Blasting (if applicable during construction)	Provide adequate stemming of blast holes	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06 – d	Noise and vibration	Blasting (if applicable during construction)	Ensure the correct blasting ratio is obtained; the blasting ratio is a measure of the amount of work expected per unit volume of explosives i.e. tonnes/kg	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06 – e	Noise and vibration	Blasting (if applicable during construction)	Reasonable attempts will be made to notify known residences (if present) that a likely to be affected by activities prior to the commencement of blasting.	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06 – f	Noise and vibration	Blasting (if applicable during construction)	Restrict blasts to favourable weather conditions (wind and temperature gradient) where practicable	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06 – g	Noise and vibration	Blasting (if applicable during construction)	Blasting will be controlled using delayed sequences and will be previously simulated and tested as appropriate.	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06 – h	Noise and vibration	Blasting (if applicable during construction)	Split the explosives charge column into discrete charges fired on separate delays as appropriate	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06 – i	Noise and vibration	Blasting (if applicable during construction)	To the extent practicable, avoid the use of exposed explosives.	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06-j	Noise and vibration	Blasting (if applicable during construction)	Confinement of explosives to minimise vibration and noise from blasting, as appropriate.	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV06 – k	Noise and vibration	Blasting (if applicable during construction)	Preparation of a blasting plan, optimised by using best techniques in the blasting pattern design and explained to the community, as appropriate.	Principal Contractors All Supervisors	Contractor audits and noise monitoring	

ID	Topic/ Aspect	Applicability/ Activity	Control Description	Responsible Parties	Means of verification	Comments
NV06 – l	Noise and vibration	Blasting (if applicable during construction)	Blasting monitoring in the vicinity of sensitive receptors, where necessary	Principal Contractors All Supervisors	Contractor audits and noise monitoring	
NV07 - a	Noise and Vibration	Vibration	Adherence to applicable Project Standards	Principal Contractors All Supervisors	Contractor audits	
NV07 - b	Noise and Vibration	Vibration	Installation of vibration isolation for mechanical equipment as appropriate.	Principal Contractors All Supervisors	Contractor audits	
NV07 - c	Noise and Vibration	Vibration	Pre-construction building condition assessments along principal transport routes for buildings (not *gers*) considered to be at potential risk from transportation vibration, and for other culturally sensitive buildings and structures adjacent to principal transport routes.	Principal Contractors All Supervisors	Contractor audits	
NV08	Noise and Vibration	Flora & Fauna Protection Measures - Noise	Management of noisy activities (which are considered likely to create noise levels at sensitive receptors in excess of Project Standards) including road traffic and noisy equipment to minimise potential disturbance to wildlife. ▪ Noisy construction activities will be limited to normal working hours. ▪ No stationary noisy equipment to be located within 500 m of a spring or other wildlife focal point. ▪ Noisy equipment in the mine will be located in areas where there is natural screening of the equipment. ▪ Noise abatement equipment such as noise barriers, baffles, sound insulation or enclosures will be implemented for particularly noisy equipment. ▪ Speed limits < 80km/hr.	Principal Contractor	Contractor audits and noise monitoring	

3.8 TRAINING

Applicable employees of Oyu Tolgoi and Contractors to Oyu Tolgoi will be provided with training in noise management. Site inductions will cover the importance of noise control and available noise reduction measures.

Additional specialist training will be provided to plant operators and key personnel involved in activities which involve noisy operations.

Job-specific training for machinery and heavy vehicle operators will cover the importance of noise control and available noise reduction measures.

See also Transport Management Plan *(Chapter D11)* for driver standards in close proximity of built up areas.

3.9 MONITORING

The monitoring measures that are to be implemented during the construction phase to ensure compliance with the Project Standards (see Section 3.5) are described in the table below. In the event that any monitoring results identify exceedances of any Project Standards, these will be investigated and corrective actions identified (see the ESMP Framework Document for further details).

The Project will develop and implement a Noise and Vibration Monitoring Plan to verify compliance with applicable Project Standards outlined in Section 3.5. Specific monitoring requirements are further detailed below.

Table 3.4: Monitoring Measures - Noise and vibration

ID	Topic/ Aspects	Parameters	Methods	Periodicity	Location	Comments
NVM1	Noise	Leq dB(A)	Calibrated noise meter e.g. model numbers CEM DT-8820 or B&K Mediator 2238.	One 24hour period every month	Airport perimeter fence	The methodology applied during baseline noise monitoring will be applied to ongoing monitoring to ensure like for like comparison of results. The methodology is provided within a baseline noise report entitled 'Baseline Noise monitoring Program for Copper-Gold mine (Sustainability 2010).
NVM2	Noise	Leq dB(A)	Calibrated noise meter (see above)	One 24hour period every month	Winter herder camps, including those located in proximity of Project roads	See above
NVM3	Noise	Leq dB(A)	Calibrated noise meter (see above)	One 24hour period every month	Nearest residential areas	See above
NVM4	Noise	Leq dB(A)	Calibrated noise meter (see above)	One 24hour period every month	Mine Licence Area boundary fence	See above
NVM5	Vibration	PPV (potential damage to buildings)	Vibration Levels at the site boundary and sensitive receptors - vibration monitoring will be undertaken inside rooms when assessing for nuisance and measured on the structure outside when assessing for damage. For sensitive structures, visual monitoring and the measurement of crack widths will be undertaken to determine whether damage is being caused.	During heavy traffic periods For sensitive structures, visual monitoring for cracks will be made, prior to the increase in road traffic or at the earliest opportunity.	In community locations potentially affected by heavy construction traffic.	Oyu Tolgoi Environmental Management Plan, 2006. (Ref A2MW 653 8122) See also NV07, *Table 3.3*, pre-construction building inspections.
NVM6	Vibration	PPV (disturbance threshold)	Vibration meter	Upon receipt of a vibration complaint	Complainant's residence/ source of complaint.	Ref. NV6 - Applicable Standards, Policy and Guidance.doc NV6 - Applicable Standards, Policy and Guidance British Standard 5228 - Noise Control on Construction and Open Sites

For Occupational Health related monitoring see the Construction Health and Safety Management System (further details provided in *Chapter D1: ESMP Framework*).

Consultation with stakeholder communities will be held regularly to determine the success and effectiveness of noise and vibration management practices and to seek to address any community concerns. This will help to ensure that the amenity of the community is recognised and taken into account by the company (see the Stakeholder Engagement and the Community Health, Safety and Security Plans for further details).

3.10 KEY PERFORMANCE INDICATORS

Oyu Tolgoi will continue to evaluate noise and vibration impacts within and at the Mine Licence Area boundary and along key Project transport routes in order to ensure that noise levels are minimised. Noise monitoring will include work place monitoring and accommodation monitoring.

Specific monitoring provisions are detailed in Section 9 above. Key Performance Indicators (KPIs) for noise and vibration impacts are presented in *Table 3.5.*

Table 3.5: Key Performance Indicators

ID	KPI	Target/	Monitoring measure
NV-KPI 01	Number of reported non-compliances with the mitigation controls identified in this EMP (*Table 3.3*).	Minimise and continued improvement in number of reported non-compliances	See 'means of verification' column in *Table 3.3.*
NV-KPI 02	Number of exceedances of the standards outlined in Section 5	Target zero and, if instances occur, assess need for corrective action and target continued improvement	Noise and vibration monitoring records (see NVM1 – NVM6)
NV-KPI 03	Number of noise or vibration related complaints.	Aim for zero noise & vibration related grievances and, if instances occur, assess need for corrective action and target continued improvement	Noise and vibration related complaints captured by the grievance procedure