



**Environmental and Social Impact
Assessment for the Seismic
Survey and Workover Activities
of Block IOR-6, Myanmar**

ESIA Summary Report

Environmental and Social Impact Assessment for the Seismic Survey and Workover Activities of Block IOR-6, Myanmar




Environmental and Social Impact Assessment Report

Document Code:

0267078_ESHIA IOR6_v0_20150513.docx

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Client:		Project No:			
MPRL E&P		0267078			
Summary:		Date:			
<p>This document presents the Environmental and Social Impact Assessment Report and the Environmental and Social Management Plan for the proposed seismic survey and workover activities at Block IOR-6.</p>		15 th May 2015			
		Approved by:			
					
		Craig A Reid Partner			
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Revision	Description	By	Checked	Approved	Date
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1. EXECUTIVE SUMMARY

MPRL E&P Pte Ltd. (MPRL E&P) was awarded the Exploration Block IOR-6 (a.k.a. Myanaung) in October 2014 to jointly operate with Myanmar Oil & Gas Enterprise (MOGE) under Improved Petroleum Recovery (IPR) Contract. Following the contract award, MPRL E&P is planning to conduct seismic exploration activities, possibly consisting of 2-Dimensional (2D) and 3-Dimensional (3D) surveys, across Block IOR-6. MPRL E&P is also planning to undertake work over activities at selected existing wells within the Block (“the Project”).

Pursuant to Section 7 of the Environmental Conservation Law and Articles 52 and 53 of the Environmental Conservation Rules of the Republic of the Union of Myanmar, all Projects undertaken in Myanmar which have the potential to cause significant environmental and social impacts are required to undertake an Initial Environmental Examination (IEE) or an Environmental Impact Assessment (EIA) and to obtain an Environmental Compliance Certificate (ECC) in accordance with the Environmental Impact Assessment (EIA) Procedures (“the Procedures”).

In relation to the above, MPRL E&P has commissioned Environmental Resources Management (ERM), supported by local specialists from Resource and Environment Myanmar (REM), to undertake an Environmental and Social Impact Assessment (ESIA) Study for the Project in accordance with the requirements of the Procedures.

The overall purpose of the Study is to complete a robust ESIA to meet requirements of the EIA Procedures for the ESIA to be approved by the Ministry of Environmental Conservation and Forestry (MOECF).

1.1. KEY ENVIRONMENTAL AND SOCIAL FEATURES

An overview of environmental and social baseline features for Block IOR-6 is presented in the ESIA Study. The main parameters described include:

- Physical environment, including climate and meteorology, geology, noise, air, surface water, groundwater and soil quality;
- Biological environment, including terrestrial habitats as well as the associated flora and fauna including avifauna, butterflies, herpetofauna, mammals and aquatic fauna; and
- Socio-economic environment, including baseline information of the concerned Project Area, the region and the overall country profile.

Information on the above parameters has been collected through desktop review of publicly available information. Primary data collection has also been undertaken in December 2014 to establish the baseline biological, physical and socio-economic environment of the Project Area. The baseline data obtained have been used to characterize the Project Area and inform the assessment of potential environmental and social impacts from the proposed seismic surveys and work over activities at Block IOR-6.

1.2. IMPACT ASSESSMENT AND ENVIRONMENTAL AND SOCIAL MANAGEMENT

During the impact assessment, potential impacts have firstly been identified through a systematic scoping process whereby the activities (both planned and unplanned)

associated with the Project have been considered with respect to their potential to interact with environmental and social resources or receptors. Interactions which may generate potentially significant environmental and social impacts ranging from those associated with the land accessibility phase (e.g. loss of access to land by the community), through the preparation / mobilization phase (e.g. site preparation and clearance impacts to terrestrial habitat and flora and fauna), subsequent seismic survey phase (e.g. impacts of detonation of explosives) and eventually to the close-out phase (e.g. positive impacts from rehabilitation of habitats) of the seismic surveys as well as the well work over activities within Block IOR-6.

The potentially significant environmental and social impacts are further assessed in the ESIA Study, with appropriate mitigation and enhancement measures recommended for alleviating potential negative impacts or enhancing potential positive impacts from the Project. With proper implementation of the mitigation measures, it is predicted that the potential environmental and social impacts caused by the proposed seismic survey and work over activities of Block IOR-6 would be of Negligible, Minor or Moderate significance.

1.3. CUMULATIVE IMPACTS

Cumulative impacts of the proposed seismic survey and work over activities at Block IOR-6 with other potential development in the vicinity are also assessed in the ESIA Study. Cumulative impact refers to that generated by other developments or activities in the vicinity of the Project Area, which when added to the impacts of the proposed seismic survey and work over activities combine to cause a greater impact.

Block IOR-6 is surrounded by other onshore blocks including Block IOR-4 and Block IOR-7. It is understood that seismic surveys may be carried out concurrently at these blocks and their seismic survey areas may overlap slightly with that of Block IOR-6 at the boundary between the blocks. However, it is expected that the environmental and social impacts from seismic surveys and well work over activities, if properly mitigated, will be localized within the onshore blocks and restricted to environment /communities within them. As such, it is not expected that seismic surveys at adjacent blocks, if undertaken concurrently, will lead to cumulative impacts to the physical, biological or human environment within Block IOR-6.

1.4. PROJECT OVERVIEW

MPRL E&P Pte Ltd (MPRL E&P) was awarded the Exploration Block IOR-6 (a.k.a. Myanaung) in October 2014 to jointly operate with Myanmar Oil & Gas Enterprise (MOGE) under Improved Petroleum Recovery (IPR) Contract. Following the contract award, MPRL E&P is planning to conduct seismic exploration activities, possibly consisting of 2-Dimensional (2D) and 3-Dimensional (3D) surveys, across Block IOR-6. MPRL E&P is also planning to undertake workover activities at selected existing wells within the Block (“the Project”).

1.5. PROJECT PROPONENT

The proponent of the Project is MPRL E&P Pte Ltd. (MPRL E&P) is an independent oil and gas exploration and production company, headquartered in Yangon with operations in various offshore and onshore blocks in Myanmar. Further information about the company is available at the website <http://mprlexp.com/>.

1.6. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

Pursuant to Section 7 of the Environmental Conservation Law and Articles 52 and 53 of the Environmental Conservation Rules of the Republic of the Union of Myanmar, all Projects undertaken in Myanmar which have the potential to cause significant environmental and social impacts are required to undertake an Initial Environmental Examination (IEE) or an Environmental Impact Assessment (EIA) and to obtain an Environmental Compliance Certificate (ECC) in accordance with the Environmental Impact Assessment (EIA) Procedures (“the Procedures”).

In relation to the above, MPRL E&P has commissioned Environmental Resources Management (ERM), supported by local specialists from Resource and Environment Myanmar (REM), to undertake an Environmental and Social Impact Assessment (ESIA) Study for the Project in accordance with the requirements of the Procedure. This ESIA Report has been prepared for MPRL E&P by ERM and presents the objectives, methodology and outcome of the IA in accordance with the EIA Procedures.

1.7. STUDY LIMITATIONS

This IA is based on the Project description obtained from MPRL E&P at the time of the Study. Any future changes to the Project description, upon which this report is based or additional relevant information revealed as Project design, equipment and service procurement proceed may affect the analysis, assessment and conclusions contained in this report. Should significant changes occur, they would be the subject of further study to verify that the conclusions of this ESIA do not change and to determine whether any additional mitigation, management or monitoring measures are warranted.

2. SOCIAL AND PHYSICAL INFRASTRUCTURE

Figure 1. Map of Block IOR 6

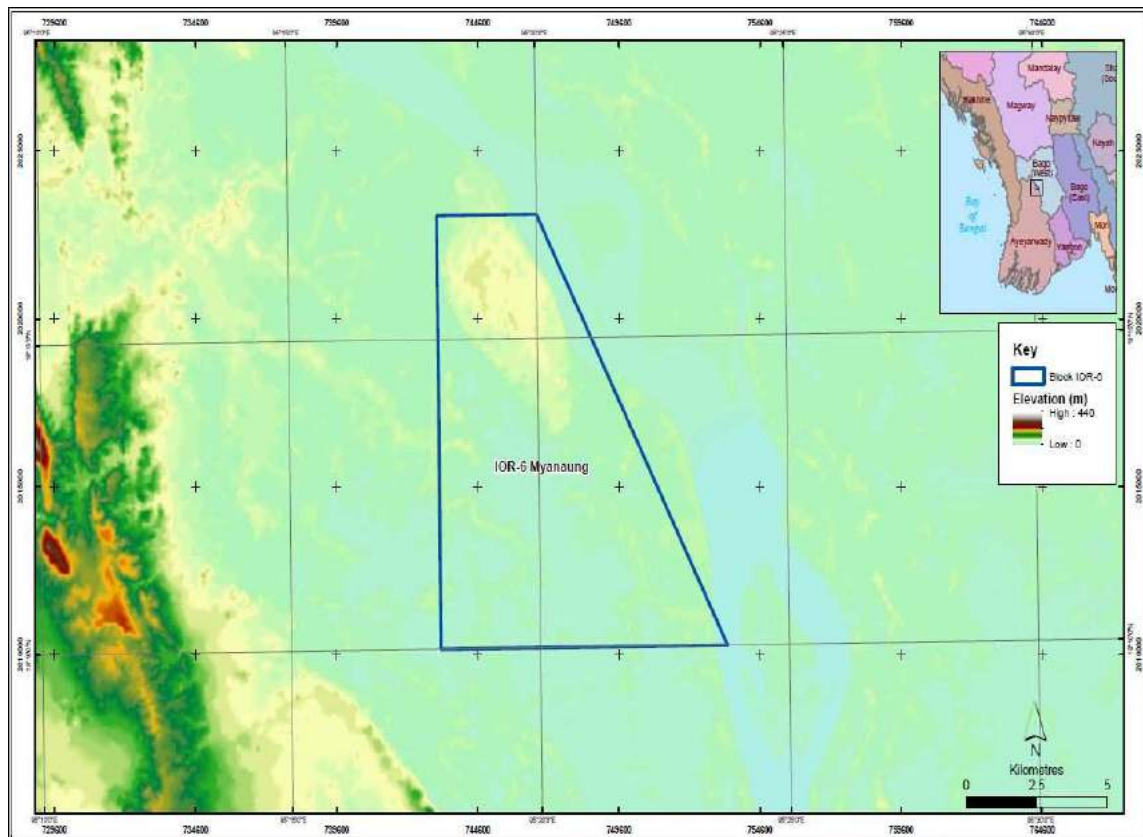


Figure 2. Photos of existing GOCS within Block IOR 6 taken during the scoping exercise



Figure 3. Cultivated area recorded within Block IOR 6 during the site visit as part of the scoping exercise in October 2014



Figure 4. Photo of medical facility in Myanaung taken during the site visit as part of the scoping exercise in October 2014



Figure 5. Photos of water supply facilities in Myanaung taken during the site visit as part of the scoping exercise in October 2014



Figure 6. Photos of representative plant species



↑ *Bambusa siamensis* Kz.



↑ *Lantana camara* Houtt. Merr.

Figure 7. Representative photo of agricultural land habitat type



Figure 8. Representative photo of cultivated land/ village habitat type



Figure 9. Representative photo of developed area



Figure 10. Representative photo of shrubland habitat type



Figure 11. Representative photo of river habitat type



Figure 12. Photo records of identified bird species



Burmese Shrike (Lanius colurioides)



Asian Green Bee-eater (Merops orientalis)

Figure 13. Photo records of identified herpetofauna species



Skin of Checkered Keelback (*Xenochrophis piscator*)



Common Garden Lizard *Calotes versicolor*

Figure 14. Domestic Ox (*Bos Taurus*) observed in the study area



Figure 15. Photo of identified butterfly species



Figure 16. Photo records of identified aquatic fauna species



Clarias batrachus



Villagers catching fishes in river

2.1. STAKEHOLDER IDENTIFICATION

A stakeholder is “a person, group, or organization that has a direct or indirect stake in a project/organization because it can affect or be affected by the Project/organization’s actions, objectives, and policies”. As part of this subsection, an attempt has also been made to identify and analysis the stakeholder groups likely to be impacted due to the activities for the Project, which are listed below.

Table 1. Stakeholder Groups

Primary Stakeholders	Secondary Stakeholders
<ul style="list-style-type: none">• Local Community• Farmers• Vulnerable Groups, including women, elderly, handicapped etc.• Fishing Groups	<ul style="list-style-type: none">• Government Ministries• Local Authorities• Village Level Institutions• NGOs and Civil Society Organizations• Local Media• Political Parties

2.2. STAKEHOLDER MAPPING

“Stakeholder mapping” is a process of examining the relative influence that different individuals and groups have over a Project as well as the influence of the Project over them. The purpose of a stakeholder mapping is to:

- Identify each stakeholder group;
- Study their profile and the nature of the stakes;
- Understand each group’s specific issues, concerns as well as expectations from the Project; and
- Gauge their influence on the Project.

On the basis of such an understanding, the stakeholders are categorized into High Influence/Priority, Medium Influence/ Priority and Low Influence/Priority. The stakeholders who are categorized as high influence are those who have a high influence on the Project or are likely to be heavily impacted by the Project activities, and are thus high up on the Project proponent’s priority list for engagement and consultation. Similarly, the stakeholders categorized as medium influence are those who have a moderate influence on the Project or even though they are to be impacted by the Project, it is unlikely to be substantial and these stakeholders are thus neither high nor low in the Project proponent’s list for engagement. On the other hand, the stakeholders with low influences are those who have a minimal influence on the decision making process or are to be minimally impacted by the Project and are thus low in the Project proponent’s engagement list.

The following table provides a brief profile of the various stakeholders identified with their key concerns in terms of the Project activities and their degree of influence.

Table 2. Stakeholder Mapping

Stakeholders	Stakeholder Profile	Level of Influence
Primary Stakeholders		
Local Community	Comprised of the local community in the project, as identified in the social baseline. This group is comprised of the community in the seven villages in the area.	High
Vulnerable Groups, including women, elderly, handicapped	Comprised of those members of the community who due to their socio-economic status are perceived to be more susceptible to the impact from the project and will require special considerations.	High
Fishing groups	Comprised of those individuals and households who undertake fishing in Ayerwaddy river and the other surface water bodies in the area	High
Farmers	Comprised of individuals and households who undertake agriculture in the Project Area and its surroundings	Medium
Secondary Stakeholders		
Government Ministries	This stakeholder group is comprised of the central and region level government departments. These authorities may influence the project in terms of establishing policies, and implementation of the project.	High
Local Authorities	This stakeholder group is comprised of the local government bodies, who have the power to regulate or otherwise influence the Project in terms of establishing policy, granting permits and approvals for the Project, monitoring and enforcing compliance with the applicable rules and regulations and making available the necessary infrastructure and resources for the Project.	High
Local Media		High
Members of Parliament	Comprised of the representatives of the Ayerwaddy region in the parliament. It is important to engage with these stakeholders from an early stage of the Project.	High
NGOs and Civil Society Organizations	Includes all other people in society who may have an interest in the project and its social and environmental aspects and non-governmental organizations representing their interests.	Medium
Village Level Institutions	Comprised of institutions including the health and education institutions at the village level.	Low

On the basis of the understanding thus developed, the process of public consultation and disclosure for the Project was undertaken, as part of the ESIA Study, as is discussed below.

2.3. SUMMARY OF CONSULTATIONS AND ACTIVITIES UNDERTAKEN

As part of the ESIA for the Project, meetings were undertaken with the ministry and the local authorities including the MOGE. As part of these meetings, an understanding was provided of the proposed Project activities and the impact assessment process for the same. In these meetings the local stakeholders who need to be engaged with as part of the impact assessment process were identified. The following table provides the schedule of the meetings and consultations undertaken as part of the ESIA Study.

It is understood that the land required for the Project has already been taken control over by the MOGE. In keeping with this, during the engagement with the MOGE, an understanding was developed of the land availability for the Project and the manner in which the engagement with the local community is to be undertaken regarding possible compensation, if any.

In consultation with the MOGE, prior to the commencement of the consultations, Project information was disclosed to the local community through pamphlets containing project information.

Post this, disclosure of information consultations were undertaken amongst the local community in three (3) village tracts from the Myanaung Township. The consultations were undertaken as per the guidance of the MOGE representative, township administrators, and were only carried out in villages where the tract leaders are living. For the purpose of these consultations, an MOGE representative was also present with the field team.

Figure 17. Photo records of stakeholder consultation for Block IOR 4



Photo 1: Interview with villagers at Myanaung accompanied by MOGE Representative



Photo 2: Stakeholder Consultation Meeting for Block IOR 6 at Myanaung



Photo 2: Q&A Section in Stakeholder Consultation Meeting for Block IOR 6 at Myanaung



Photo 4: Women Focus Group Survey for Block IOR 6 at Myanaung



Photo 5: Farmers Focus Group Survey for Block IOR 6 at Myanaung

Table 3. Schedule of meetings and consultations as taken part of the ESIA study

Date	Activity	Purpose
18-12-2014	Meet with MPRL E&P and MOGE	Kick off meeting with MOGE
19-12-2014	Meet with MOGE	Permission of stakeholder meeting at Myanaung Township
	Meet with U Min Min Tun, Administrator, General Administrative Department Myanaung Township	
20-12-2014	Meet with U Min Min Tun, Administrator, General Administrative Department Myanaung Township	Secondary Data Collection
	Meet with MOGE	Stakeholder Meeting and Fieldwork Planning
	Meet with Head of Village and villagers of Shar Taw and Htan Kone villages	Undertaking community household surveys across a sample population of the community
	Meet with villagers of Oh Kone and Tae Kone villages	Undertaking community and household surveys across a sample population of the community.
21-12-2014	Meeting with stakeholders	Stakeholder meetings and FGDs with a sample population.
	Meet with villagers of Sat Pyar Kone and Pan Bae Kone villages	Undertaking community and households surveys across a sample population of the community.
22-12-2014	Meet with villagers of Ka Sun Kone, Tha Pyay Seik and Zee Taw villagers	Undertaking community household surveys across a sample population of the community.
	Meet with villagers of Kone Ta lone, Ywar Thit Seik, and Hmone Taing villagers	

Through these engagement activities an attempt was made to develop an understanding of the socio-economic profile, including the livelihood profile, the agricultural patterns in the area, access to health services, water supply and transportation and the village development plans and presence of local civil society organizations in the area. These concerns and expectations were then taken into account while assessing the impacts from the Project activities and the identification of the proposed mitigation measures.

As part of these engagement activities, a verbal understanding was also provided to the local community representatives of the proposed Project and its activities and the purpose of the engagement activities.

For the purpose of the primary data collection, household and community surveys were undertaken in the seven (7) villages. A total of 61 household surveys and seven (7) community surveys were undertaken across the seven (7) villages. Apart from this, two (2) focus group discussions were undertaken for farmers and women's group in the Myanaung Township.

3. KEY FINDING OF CONSULTATIONS

As has been mentioned above, as part of the ESIA process a public meeting was undertaken in the Myanaung Township. As part of these meetings, REM and MOGE provided an understanding of the Project and its proposed activities, as well as provided clarifications on any queries of the community.

Apart from these meetings, engagement was undertaken with the local stakeholders in the form of focus group discussions during the impact assessment process, certain key concerns and expectations of the local community were identified during the impact assessment process:

- *Impact on Land Availability*
 - One of the key concerns of the local community was in terms of the impact of the project activities on the availability of land in the area and the agriculture undertaken by the community. From the information made available it is understood that agriculture is the primary source of livelihood for a majority of the local community. Thus the project activities are likely to result in a reduction of the land available for agriculture, which in turn would impact the income and livelihood sources for the community.
- *Payment of Crop Compensation*
 - According to the information made available by the local community, it is understood that while a number of households have lost their land to the project (19 out of the 61 households), few have received compensation for the loss (7 of the 61 households). Furthermore, the compensation received has been in the form of crop compensation provided by the previous project developers or the government (MOGE). While the exact information pertaining to the number of households compensated and the amount of compensation paid was unavailable, one of the key expectations of the community from the project was the provisioning of adequate compensation for the loss of land and crop due to the project. However, it is understood, that according to the discussions undertaken with the government, no further compensations is to be paid for this project.
- *Community Development Activities*
 - In keeping with this understanding of the impact of the project activities on the livelihood of the community, the community identified certain areas of expectations from the project in terms of financial and/or technical assistance for undertaking agricultural and other livelihood activities, especially in terms of providing irrigation facilities.

4. IMPACT ASSESSMENT

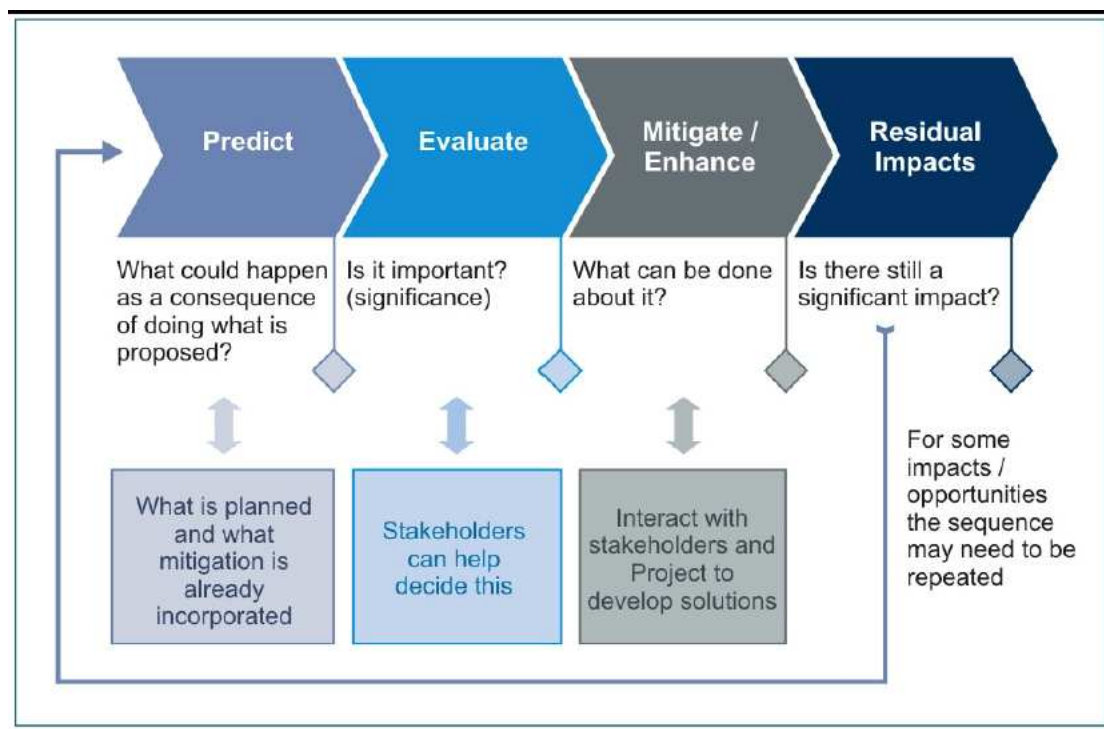
4.1. IMPACT ASSESSMENT METHODOLOGY AND APPROACH

Impact identification and assessment starts with scoping and continues through the remainder of the impact assessment process (IAP). The principal impact assessment (IA) steps comprise:

- Impact prediction: to determine what could potentially happen to resources/receptors as a consequence of the Project and its associated activities.

- Impact evaluation: to evaluate the significance of the predicted impacts by considering their magnitude and likelihood of occurrence, and the sensitivity, value and/or importance of the affected resource/receptor.
- Mitigation and enhancement: to identify appropriate and justified measures to mitigate negative impacts and enhance positive impacts.
- Residual impact evaluation: to evaluate the significance of impacts assuming effective implementation of mitigation and enhancement measures.

Figure 18. Impact assessment process



Prediction of Impacts

Prediction of impacts is essentially an objective exercise to determine what could potentially happen to the environment as a consequence of the Project and its associated activities. This is essentially a repeat of the process undertaken in scoping, whereby the potential interactions between the Project and the Baseline environment are identified. In the impact assessment stage, these potential interactions are updated based on additional Project and Baseline information. From these potential interactions, the potential impacts to the various resources/receptors are identified, and are elaborated to the extent possible. The diverse range of potential impacts considered in the IA process typically results in a wide range of prediction methods being used including quantitative, semi-quantitative and qualitative techniques.

Evaluation of Impacts

Once the prediction of impacts is complete, each impact is described in terms of its various relevant characteristics (i.e., type, scale, duration, frequency, extent).

Impact of Significance

It is important to note that impact prediction and evaluation take into account any embedded controls (i.e., physical or procedural controls that are already planned as part of the Project design, regardless of the results of the IA Process). An example of an embedded control is a standard acoustic enclosure that is designed to be installed around a piece of major equipment. This avoids the situation where an impact is assigned a magnitude based on a hypothetical version of the Project that considers none of the embedded controls.

Table 4. Impact significances

		Severity/Vulnerability/Importance of Resource/Receptor		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The matrix applies universally to all resources/receptors, and all impacts to these resources/receptors, as the resource/receptor-specific considerations are factored into the assignment of magnitude and sensitivity/vulnerability/importance designations that enter into the matrix.

Management and Monitoring

The final stage in the IA Process is definition of the management and monitoring measures that are needed to identify whether: a) impacts or their associated Project components remain in conformance with applicable standards; and b) mitigation measures are effectively addressing impacts and compensatory measures and offsets are reducing effects to the extent predicted.

A Environmental Management Plan, which is a summary of all actions which the Project Proponent has committed to executing with respect to environmental/social/health performance for the Project, is also included as part of the EIA report. The Environmental Management Plan includes mitigation measures, compensatory measures and offsets and management and monitoring activities.

5. ENVIRONMENTAL AND SOCIAL MANAGEMENT ORGANIZATION

This document provides the Environmental and Social Management Plan (ESMP) for the planning, construction and operation of the project. This ESMP provides the procedures and processes, which will be applied to the project activities to check and monitor compliance, and effectiveness of the mitigation measures to which MPRL E&P Pte Ltd. (MPRL E&P) has committed. In addition, this ESMP is used to ensure compliance with statutory requirements and corporate safety and environmental policies.

5.1. PROJECT DESCRIPTION

MPRL E&P was awarded the Exploration Block IOR-6 (a.k.a. Myanaung) in October 2014 to jointly operate with Myanmar Oil & Gas Enterprise (MOGE) under Improved Petroleum Recovery (IPR) Contract. Following the contract award, MPRL E&P is planning to conduct seismic exploration activities, possibly consisting of 2-Dimensional (2D) and 3-Dimensional (3D) surveys, across Block IOR-6. MPRL E&P is also planning to undertake workover activities at selected existing wells within the Block (“the Project”).

6. SUMMARY OF IMPACTS/CONTROL MITIGATION

Through the Project development and the ESIA process, MPRL E&P has made commitments to actions to ensure or improve environmental and social performance. These commitments are not recommendations, but are binding commitments on the part of the Project.

A summary of the Project impacts and the committed mitigation measures are presented in Table below. Schedule and responsibility of implementation of these mitigation measures are identified as necessary. Additional details on the key elements for the overall environmental and social management of the Project are also presented below.

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Environmental Impacts					
Preparation and Mobilization					
Impacts from construction of workforce camp on terrestrial habitats and associated fauna and flora	<ul style="list-style-type: none"> Footprints of the proposed camp will be minimized during the design stage 	Minor	Compliance audit	Design Phase	N/A
	<ul style="list-style-type: none"> Construction activities will be restricted to areas that will be clearly demarcated Work site boundaries will be regularly checked to ensure that they are not breached and that damage does not occur to surrounding areas It is assumed felling of large perennial vegetation (i.e. large trees such as roadside trees) will be avoided. Work areas in temporarily affected areas would be reinstated with tree/shrub planting after completion of the works, as far as practicable Workforce camp is assumed to be temporary and will be removed in the close-out phase 		Inspection & Compliance Audit	Implementation Phase	N/A
Impacts from labour (including hunting), equipment and services supply on terrestrial and aquatic flora and fauna	<ul style="list-style-type: none"> Oil fields are restricted areas and therefore existing access restrictions will be in place and patrolled within the block. Priority areas for patrolling should be identified within the Environmental Monitoring Plan (e.g secondary forest areas where new access routes are considered) 	Negligible	Inspection & Compliance Audit	Design Phase	Biodiversity Action Plan and Environmental Monitoring Plan

Potential Impacts/Issue	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> Project activities undertaken with sufficient lighting only Minimization of night time driving HSE coordinators will be employed for the duration of the seismic survey. They will be employed by MPRL E&P or a third party and will not be employed by the seismic contractor. Contractors HSE Manager will assist the HSE coordinators in supervising the implementation of mitigation measures. Work areas will be clearly demarcated and any activities outside these areas will be prohibited except under a permit system where necessary. For entry and exit this will occur along designated access routes. Induction training for personnel is recommended to include a mandatory segment on biodiversity. In this induction details of key requirements will be provided to include ban on fishing and hunting. Prohibit workers from uncontrolled interaction and commerce with the local community in terms of buying and selling goods particularly Non-Timber Forest Products (NTFP), bush meat, and wildlife (pets, souvenirs) <p>Prohibit staff from introducing pets, livestock, and other animals</p>		Inspection& Compliance Audit	Implementation Phase	Biodiversity Action Plan and Environmental Monitoring Plan

Potential Impacts/Issue	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> Engagement with local community to convey the message that workers are not allowed to buy Non-Timber Forest Products (NTFP), bush meat and wildlife (pets, souvenirs). Work with local authorities and communities through the stakeholder engagement plan to monitor and control hunting/poaching arising from new access in the Project Area. A monitoring program will be established to ensure mitigation measures are being implemented effectively. 				
Impacts from site preparation/clearance and creation of access routes on terrestrial habitats and associated flora and fauna	<ul style="list-style-type: none"> Minimize footprint of access roads at the design stage (width of any new road should be less than 5m) 	Minor	Compliance Audit	Design Phase	N/A
	<ul style="list-style-type: none"> Teams for deployment of source lines will access areas on foot, as far as practicable and follow/clear a narrow path On the basis that vegetation clearance tracks for tracks to allow access will be by hand, it is assumed felling of large perennial vegetation will be avoided. 		Inspection & Compliance Audit		

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> • Induction training for personnel is recommended to include a mandatory segment on biodiversity. In this induction details of key requirements will be provided to include: <ul style="list-style-type: none"> ○ Outline of vegetation clearance procedures including species not to cut, and the minimum size of tree that should be felled (20cm diameter at breast height (dbh) (i.e. diameter of the tree trunk measured at 1.3m above ground) ○ What to do in the advent of disturbing species (e.g. snakes both from an occupational safety and biodiversity perspective) • Minimize clearing of vegetation along seismic lines i.e leave in place smaller vegetation, topsoil, root stock, seeds. • Minimize clearing of vegetation along seismic lines by selecting the 'path of least resistance' through vegetation • Minimize vegetation cutting at shot hole and receiver station, as far as practicable. • The width of seismic lines will be no greater than 1.5m and limited even narrower to 1m where possible in the forest area. 		Inspection & Compliance Audit	Implementation Phase	Biodiversity Action Plan and Environmental Monitoring Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from mobile power generation on terrestrial fauna	<ul style="list-style-type: none"> Specifications of power generator Project activities undertaken within sufficient lighting only 	Minor	Inspection & Compliance	Implementation Phase	N/A
Impacts from waste disposal on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> Planning material requirements at the design stage to reduce unnecessary generated waste. MPRL E&P HSE Management System requires Waste Management Plan for the project. A Waste Management Plan will be developed by MPRL E&P or a third party separately from but administered under the Environmental and Social Management Plan. The plan will identify and estimate generated volumes of different waste types and set out procedures for responsible management and disposal and will be regularly audited. 	Negligible	Compliance Audit	Design Phase	Waste Management Plan
	<ul style="list-style-type: none"> Induction training for personal (including contracted local workers) is recommended to include: <ul style="list-style-type: none"> Waste Management System 		Inspection & Compliance Audit	Implementation Phase	

Potential Impacts/Issue	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from sewage and wastewater discharge on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> Wastewater treatment facilities will be properly designed and installed Provision of service tank for sewage from toilet facilities Provision of water pit for grey water from kitchen Service tank and water pit are separated from drainage and storm water Wastewater treatment facilities will be well maintained to allow effective operations 	Minor	Inspection & Compliance	Design & Implementation Phase	Waste Management Plan
Seismic Survey					
Impacts from labour (including hunting), equipment and services supply on terrestrial and aquatic flora and fauna	<ul style="list-style-type: none"> Oil fields are restricted areas and therefore existing access restrictions will be in place and patrolled within the block. Priority areas for patrolling should be identified within the Environmental Monitoring Plan (e.g. secondary forest areas where new access routes are created) Project activities in day light working hours Minimization of night-time driving Induction training for personnel is recommended to include a mandatory segment on biodiversity. In this induction details of key requirements will be provided to include a ban on fishing and hunting. Prohibit workers from uncontrolled interaction and commerce with the local and selling goods particularly Non-Timber Forests Products (NTFP), bush meat and wildlife (pets, souvenirs) Prohibit staff from introducing pets, livestock and other animals 		Inspection & Compliance Audit	Implementation Phase	Biodiversity Action Plan and Environmental Monitoring Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from site preparation/clearance and creation of access routes on terrestrial habitats and associated flora and fauna	<ul style="list-style-type: none"> Minimize footprint of access roads at the design stage (width of any new road should be less than 5m) Teams for deployment of source lines will access areas on foot, as far as practicable and follow/clear a narrow path If vegetation clearance is required, tracks will be made by hand. It is assumed felling of large perennial vegetation (i.e. large trees) will be avoided. Induction training for personnel is recommended to include a mandatory segment on biodiversity. In this induction details of key requirements will be provided to include: <ul style="list-style-type: none"> Outline vegetation clearance procedures including species not to cut, and the minimum size of tree that should be felled (20cm diameter at breast height (dbh) (i.e. diameter of the tree trunk measured at 1.3m above ground). What to do in the advent of disturbing species (e.g snakes) (both from an occupational safety and biodiversity perspective) Minimize clearing of vegetation along seismic lines by selecting the 'path of least resistance' through vegetation. Minimize vegetation cutting at shot hole and receiver station, as far as practicable. The width of seismic lines will be no greater than 1.5m and limited even narrower to 1m where possible in the forest area. Use wireless geophones on receiver lines, as far as practicable. 	Minor	Compliance Audit	Design Phase	Biodiversity Action Plan

Potential Impact/Issue	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from mobile power generation on terrestrial fauna	<ul style="list-style-type: none"> Specifications of power generator Project activities limited to day light hours 	Minor	Inspection & Compliance Audit	Implementation Phase	N/A
Impacts from drilling on terrestrial fauna	<ul style="list-style-type: none"> Drilling of shot holes by portable drills Vegetation cutting by hand to minimize disturbance and degradation of the habitats. It is assumed felling of large perennial vegetation (i.e. large trees which typically provide habitat for higher densities of terrestrial fauna) will be avoided. Shot holes will be backfilled after shooting is completed As good site practice, it is recommended the immediate vicinity of shot hole locations is checked for presence of yellow-headed Tortoise and if found relocated to a safe distance away from drilling activity. 	Minor	Inspection & Compliance Audit	Implementation Phases	N/A
Impacts from detonation of explosive on terrestrial fauna	<ul style="list-style-type: none"> Minimize the use of charges as far as possible Shot holes will be backfilled Charges detonated at ~10m below ground level or as deep underground as practicable. Daytime shooting only 	Minor	Inspection & Compliance Audit	Implementation Phase	N/A
Positive impacts from reinstatement on terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> It is recommended a Terrestrial Habitat Reinstatement Plan will be developed in light of detailed plans for locations for seismic survey including temporarily cleared areas. The plan will identify provisions for sourcing native species from nursery and procedures for replanting. It will also identify priority areas for rehabilitation including at, for instance, de-facto protected areas such as near monastery and near cultural heritage location if trees or vegetation are planned to be cleared from these locations. Rehabilitation of vegetation on seismic lines will also be provided. 	Neutral or Positive	Compliance Audit	Design Phase	Terrestrial Habitat Reinstatement Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> MPRL E&P commitment to appropriate reinstatement works for seismic survey MPRL E&P to compensate farmers to reinstate land in cultivated areas Materials introduced by the seismic will be removed at the disturbed areas. Disturbed areas will be monitored before Project commencement and for one year after completion of the Project to track any natural recolonisation by vegetation after the Project completion. If natural recolonisation does not take place or is not ideal (i.e. significantly different from the original condition as determined by monitoring), the disturbed areas will be restored /rehabilitated as much as is practicable to its original condition; this includes replanting areas where vegetation has been cleared including seismic line access routes, etc., using native vegetation. 		Inspection & Compliance Audit	Implementation Phase	Terrestrial Habitat Reinstatement Plan
Impacts from waste disposal on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> Planning material requirements at the design stage to reduce unnecessary generated waste. MPRL E&P HSE Management System requires Waste Management Plan for the project. A Waste Management Plan will be developed by MPRL E&P or a third party separately from but administered under the Environmental and Social Management Plan. The plan will identify and estimate generated volumes of different wastes types and set out procedures for responsible management and disposal and will be regularly audited. 	Negligible	Compliance Audit	Design Phase	Waste Management Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from waste disposal on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> Induction training for personnel (including contracted local workers) is recommended to include: <ul style="list-style-type: none"> Waste management system Available/provided sanitary facilities Seismic team will collect gab wires to dispose or to re-use Seismic team will check the shot hole and collect remaining residues, as far as practicable, to minimize waste in the area. 	Negligible	Inspection & Compliance Audit	Implementation Phase	Waste Management Plan
Impacts from sewage and wastewater discharge on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> Wastewater treatment facilities will be properly designed and installed. Provision of service tank for sewage and toilet facilities Provision of water pit for grey water from kitchen Service tank and water pit for grey water from kitchen Service tank and water pit are separated from drainage and storm water Wastewater treatment facilities will be well maintained to allow effective operation Fluids to shot hole will be limited to use of small quantities of water It is recommended that portable toilet facilities will be provided with collection of resultant sanitary waste to be carried out by an approved contractor for proper disposal 	Minor	Inspection & Compliance Audit	Design & Implementation Phase	Waste Management Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Close Out Phase					
Impacts from Labour (including hunting), equipment and services supply on terrestrial and aquatic flora and fauna.	<ul style="list-style-type: none"> Oilfields are restricted areas and therefore entering existing access restrictions will be in place and patrolled within the block. Priority areas for patrolling should be identified within the Environmental Monitoring Plan Project activities in day light hours Minimization of night-time driving Induction training for personnel is recommended to include a mandatory segment on biodiversity. In this induction details of key requirements will be provided to include a ban on fishing and hunting. Prohibit workers from uncontrolled interaction and commerce with the local community in terms of buying and selling goods i.e. NTFP 	Negligible	Inspection & Compliance Audit	Implementation Phase	Biodiversity Action Plan and Environmental Monitoring Plan
	<ul style="list-style-type: none"> Engagement with local community to convey the message that workers are not allowed to buy NTFP, bush meat and wildlife. Work with local authorities and communities through stakeholder engagement plan to monitor and control hunting and poaching arising from new access in the Project Area A monitoring program will be established to ensure mitigation measures are being implemented effectively. 				

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from waste disposal on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> Planning material requirements at the design stage to reduce unnecessary generated waste. MPRL E&P HSE Management System requires a Waste Management Plan for the project. The plan will identify and estimate generated waste volumes of different wastes types and set out procedures for responsible management and disposal. 	Negligible	Compliance Audit	Design Phase	Waste Management Plan
	<ul style="list-style-type: none"> Induction training for personnel (including contracted local workers) is recommended to include: <ul style="list-style-type: none"> Waste management system 		Inspection & Compliance Audit	Implementation Phase	
Impacts from sewage and wastewater discharge on surface water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> Wastewater treatment facilities will be properly designed and installed Provision of service tank for sewage from toilet facilities Provision of water pit for grey water from kitchen Service tank and water pit are separated from drainage and storm water 	Minor	Inspection & Compliance Audit	Design and Implementation Phase	Waste Management Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Seismic Survey – Accidental Events					
Impacts from spills/leaks on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> • Drilling fluid for shot hole drilling will be water. • Hazardous materials/chemical will be stored at MOGE warehouse facility. • Fuel and chemical storage area will have appropriate secondary containment and provide procedures for managing the containment systems. All ancillary equipment should be contained securely within the bund when not in use. • Oil interceptors will be provided in the drainage system where necessary and regularly emptied to prevent the release of oil and grease into the storm water drainage system after accidental spillages. • Storage tanks and components will meet international design standards as far as practicable. • Fuel stores should be kept away from vehicle access routes to prevent collisions. • Maintenance of storage tanks, pipes, and components will be carried regularly, including daily inspection of fueling equipment in satisfactory condition. • All construction plants and machinery will be maintained in good working order to avoid leakage or spillage of containments. • Routine servicing of plant and equipment will be carried off-site prior to mobilization within workshop facilities equipped with bunded areas and oil interceptor. • Spill kits and shovels will be available onsite at times for any accidental leakage of fuel or other hazardous substances during project activities; it must be ensured that no such substance enters into groundwater or surface water resources. 		Inspection & Compliance Audit	Implementation Phase	

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> If emergency servicing of equipment is required in the field, soil kits and drip trays will be available. Any contaminated soil will be removed from site and disposed of in accordance with the waste management plan. Oils and other service fluids will be removed off-site by the Seismic team and disposed in accordance with the waste management plan. The location, type and quantity of any fuel or chemical spill will be reported to HSE coordinator immediately. Shot holes will not be located within 50m of a watercourse or water body 				
Impacts from fires and explosions on air quality, ground water quality, surface water quality, landscape and visual character, use of natural resources, terrestrial habitats and aquatic habitats as well as their associated flora and fauna.	<ul style="list-style-type: none"> Induction training for personnel is recommended to include a mandatory segment on fire safety and actions in the event of a fire. All seismic teams will carry first-attack fire-fighting equipment such as fire extinguisher, shovel, and communication equipment to respond to small spot fires and communicate with the operations headquarters in the event of a fire. HSE induction will be undertaken at the site before work commencement, which should include proper use of fire-fighting equipment and communication protocol in case of fire. It will be of key importance to that explosives are kept in a safe manner and no uncontrolled explosions occur. Implement all required safety and management requirements relating to the transportation, storage, and handling of explosives. Misfired charges form shot holes. Restrict smoking to designated areas only. Conduct fire training and response drills 	Minor	Inspection & Compliance Audit	Implementation Phase	

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Workover Activities – Planned Events					
Impacts from operation of mechanical equipment required for workover activities on ambient air and noise conditions	<ul style="list-style-type: none"> Activities carried out at existing well sites in existing oil field with separation from sensitive receptors. Project activities undertaken with sufficient lighting only. Well-maintained equipment will be used. Noise suppression box will be fabricated over the engine for the PME's being operated nearby the NSRs (e.g. villages). Appropriate PPE e.g. ear protection will be used for MPRL E&P personnel. Workers not involved with the works will need to be at least 100m away from the wellhead if practicable. Well-maintained equipment to be operated on site. Regular maintenance of equipment such as lubricating moving parts, tightening loose part and replacing worn out components. Shut down or throttled down between work periods for machines and construction plant items that may be intermittent use. Shut down generators, compressors, and other equipment when not in use. Reduce the number of equipment operating simultaneously as far as practicable. Implement control measures, where applicable. The type of control measure that can be applied will be determined based on conditions and constraints. 	Negligible for noise and minor for air	Inspection & Compliance Audit	Implementation Phase	N/A

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from disposal of waste from workover activities on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none">A Waste Management Plan will be developed by MPRL E&P or a third party to be administered under the Environmental and Social Management Plan. The plan will identify and estimate generated volumes of different waste type and set out procedures for responsible management and disposal and will be regularly audited.Careful selection of the fluid system to minimize environmental hazards related to chemical additives.Careful selection of fluid additives taking into account technical requirements, chemical additive concentration, toxicity, bioavailability and bioaccumulation potential.	Minor	Compliance Audit	Implementation Phase	Waste Management Plan
	<ul style="list-style-type: none">Drilling mud used will be WMB and KCI polymer mud and will be recycled and treated for future use.Monitoring and minimizing the concentration of heavy metal impurities in barite stock used in the fluid formation, if used.		Inspection & Compliance Audit	Implementation Phase	
Work over Activities – Accidental Events					
Impacts from spills/leaks on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none">Develop an Emergency Preparedness and Spill Response Plan to document communication procedures and actions to take in the event of uncontrolled well fluid release.Carefully plan drilling operation by identifying shallow hazards, using standard materials for well construction/modification, using standard drilling and well control standard operating procedures, and using proper drilling mud formulation with additives if necessary.Develop water treatment and injection facilities, if practicable.Competent and well-trained work over crews.	Minor	Inspection & Compliance Audit	Design Phase	Emergency Preparedness Plan and Spill Response Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> Well-planned, well-supervised and standard workover/drilling procedures will be used at the wells to maintain well control Implementation of maintenance and inspection procedures. Undertake drilling with international best practice safety procedures. Test safety devices prior to start up for function and integrity. Continuously monitor pressure in the well and recycled mud drilling Train employees on emergency procedures Spill kits and shovels at well sites or appropriate locations for any accidental leakage of fuel or other hazardous substances during project activities; it must be ensured that no such substance enters into groundwater or surface water resources. If emergency servicing of equipment is required in the field, spill its and drip trays will be available. Any contaminated soil will be removed from site and disposed of in accordance with the waste management plan. The location, type, quantity of any fuel or chemical or mud spill will be reported to HSE coordinator immediately. Improve cellars with double cellars for new and reactivated wells. Regularly pump out cellars oil and water separators and treatment water for injection. 		Inspection & Compliance Audit	Implementation Phase	Emergency Preparedness

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from fires and explosives on air quality, ground water quality, surface water quality, landscape and visual character, use of natural resources, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	•	Minor	Inspection & Compliance Audit	Implementation Phase	N/A
Workover Activities – Accidental Events					
Impacts from spills/leaks on surface water quality, ground water quality, soil, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none"> Develop an Emergency Preparedness and Spill Response Plan to document communication procedures and actions to take in the event of uncontrolled well fluid release. Carefully plan drilling operation by identifying shallow hazards, using standard materials for well construction/modification, using standard drilling and well control standard operating procedures, and using proper drilling mud formulation with additives if necessary. Develop water treatment and injection facilities if practicable. 	Minor	Injection and Compliance Audit	Design Phase	Emergency Preparedness Plan and Spill Response Plan
	<ul style="list-style-type: none"> Competent and well-trained workover crews Well-planned, well-supervised and standard workover/drilling procedures will be used at the wells to maintain well control Implementation of maintenance and inspection procedures. 		Inspection & Compliance Audit	Implementation Phase	

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> Undertake drilling with international best practice safety procedures. Test safety devices prior to start-up for function and integrity. Continuously monitor pressure in the well and recycle mud during drilling. Train employees on emergency procedures. Spill kits and shovels at well sites or appropriate locations for any accidental leakage of fuel or other hazardous substances during Project activities; it must be ensured that no such substances enters into groundwater or surface water resources. If emergency servicing of equipment is required in the field, spill lots and drip trays will be available. Any contaminated soil will be removed from site and disposed of in accordance with the waste management plan. The location type, and quantity of any fuel or chemical, or mud spill will be reported to the HSE Coordinator immediately. Improve cellars with double cellars for new and reactivated wells. Regularly pump out cellars oil and water separators and treatment water for injection. 		Inspection & Compliance Audit	Implementation Phase	Emergency Preparedness Plan and Spill Response Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts from fires and explosions on air quality, ground water quality, surface water quality, landscape and visual character, use of natural resources, terrestrial habitats and aquatic habitats as well as their associated flora and fauna	<ul style="list-style-type: none">Assign designated smoking areas.Smoking is only allowed away from the wellhead of more than 100 feet, up wind, with appropriate ask trays to contain any hot ashes.As administered under the Emergency Preparedness Plan, a Fire Risk Management Plan will be developed including communication protocols and measures to control any fires that do arise.	Minor	Compliance Audit	Design Phase	Emergency Preparedness Plan and Fire Risk Management Plan
	<ul style="list-style-type: none">Fire control equipment should be located at the well site or appropriate locations.Induction training for personnel is recommended to include a mandatory segment on fire safety and actions in the event of a fire.It will be of key importance that explosives used for re-perforation activities are kept in a safe manner and no uncontrollable explosions occur. Implement all required safety and management requirements relating to the transportation, storage, and handling of explosives.Misfired charges from re-perforation activities will be disabled and destroyed.Restrict smoking to designated areas only.Conduct fire training and response drills.		Inspection & Compliance Audit	Implementation Phase	
Social Impacts					
Land Accessibility Phase					
Impact regarding loss of access to land	<ul style="list-style-type: none">A Livelihood Restoration Plan (LRP) for the Project should be developed based on the assessment of various livelihood restoration options available and preferred by the community, reflective of the needs of the community. The LRP should also have clear reporting and monitoring indicators.	Moderate		Design Phase	Livelihood Restoration plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impact regarding loss of access to land	<ul style="list-style-type: none"> • Compensation for the crop loss should be provided and livelihood restoration facilities should be provided, however, this has to be done keeping cognizance of the local laws and regulations. • In case of any new land requirement, the compensation amount and any livelihood restoration options should be identified in consultation with the local community and local authorities. • In case of landlessness due to Project, preference should be given for employment in various works depending upon the skill levels. Livelihood restoration options or support could be considered for these families. 	Moderate	Compliance Audit	Design Phase	Livelihood Restoration Plan
	<ul style="list-style-type: none"> • Preference to land owners for employment and sub-contractor works. 		Employment Records	Quarterly	N/A
	<ul style="list-style-type: none"> • Preference to land owners in community development and community investment activities. 		Community development activity records	Six Monthly	N/A
Community and Occupational Health and Safety	<ul style="list-style-type: none"> • A Traffic Management Plan will be developed for the Project and will implemented by the HSE team. 	Minor	Compliance Audit	Design Phase	Traffic Management Plan
	<ul style="list-style-type: none"> • Adopt proper road safety. 		Road Safety Policy	Prior to the commencement of the planning and mobilization phase	N/A
	<ul style="list-style-type: none"> • Synchronize traffic movements with the local community needs. 		N/A	Monthly	Traffic Management Plan
	<ul style="list-style-type: none"> • Immediate repair of any damage to existing main roads, which are caused by Project activities. 		Visual Inspection/records of repair	Monthly	N/A

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> Ensure availability of break services of heavy vehicles 		Visual Inspection	Monthly	N/A
	<ul style="list-style-type: none"> In case of at fault accidents, pay compensation to the affected family or next of kin in keeping with the applicable rules. 		Records of accidents and compensation paid/grievance records	Monthly	N/A
	<ul style="list-style-type: none"> Undertake a root cause analysis of any accidents which take place 		Root cause analysis reports	Monthly	N/A
	<ul style="list-style-type: none"> Develop a policy for safety measures to be undertaken while driving 		Road safety policy	Prior to the commencement of the planning and mobilization phase	N/A
	The labor camps should be placed at a distance from the village settlements.		Visual Inspection	Prior to the commencement of the planning and mobilization phase	N/A
	<ul style="list-style-type: none"> Undertake pre-employment medical check-ups for all workers. 		Medical Records	Quarterly	Traffic Management Plan
	<ul style="list-style-type: none"> Undertake regular health check-ups and health survey of the community 		Health Survey Reports	Quarterly	N/A
Impact on livelihood profile of the community	<ul style="list-style-type: none"> Preference to the vulnerable groups according to the skill requirements of the project. 	Positive	Employment Records	Quarterly	
Impact on transport and infrastructure services	<ul style="list-style-type: none"> Adopt proper road safety measures 	Negligible	Road Safety Policy	Prior to the commencement of the planning and mobilization phase	
	<ul style="list-style-type: none"> Synchronize traffic movements with the local community needs 		N/A	Monthly	Traffic Management Plan

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> Immediate repair of any damage to existing main roads, which are caused by Project activities. 		Visual Inspection/Records of Repairs	Monthly	N/A
	<ul style="list-style-type: none"> Ensure availability of break services of heavy vehicles 		Visual Inspection	Monthly	N/A
Impact on source water vulnerability	<ul style="list-style-type: none"> As part of project design, the requirements of acceptable water quality standards and wastewater discharge standards will be maintained. 	Minor	Compliance Audit	Design Phase	Waste Management Plan
	<ul style="list-style-type: none"> The local community will be engaged and a water use agreement will be formulated, which would minimize the pressure on the source water and ensure adequate water availability for the community. 		Compliance Audit	Design Phase	N/A
Impacts on cultural heritage	<ul style="list-style-type: none"> As part of the project design, project facilities/activities will be located away from sensitive cultural heritage resources. A proper protocol or standard operating procedure may be developed and people at the project site located are trained to act suitably in consonance with the regulatory requirement and beliefs and faith of the community, if any. 	Minor	Compliance Audit	Design Phase	Cultural Heritage SOP
	<ul style="list-style-type: none"> The project will meet the international best practice for the documentation and protection of the cultural heritage and in case of chance finds. The project will consider retaining professionals to assist in the identification and protection of cultural heritage. In case the removal of nonreplicable cultural heritage is required, the same will be undertaken in consultation with the affected communities and in keeping with the regulatory requirement for the same; 		Inspection & Compliance Audit	Implementation Phase	Cultural Heritage SOP

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> The project will ensure that the access to cultural heritage by the local community is not disrupted, and if disrupted, and if required, alternative access routes will be provided. 		Inspection & Compliance Audit	Implementation Phase	Cultural Heritage SOP
Seismic Survey					
Community and Occupational Health & Safety	<ul style="list-style-type: none"> A Traffic Management Plan will be developed for the project and will be implemented by the HSE team. 	Minor	Compliance Audit	Design Phase	Traffic Management Plan
	<ul style="list-style-type: none"> Adopt proper road safety measures 		Road Safety Policy	Prior to the commencement of the planning and mobilization phase	N/A
	<ul style="list-style-type: none"> Synchronize traffic movements with the local community needs. 		N/A	Monthly	N/A
	<ul style="list-style-type: none"> Immediate repair of any damage to existing main roads, which are caused by project activities. 		Visual Inspection/Records of Repairs	Monthly	N/A
	<ul style="list-style-type: none"> Ensure availability of break services of heavy vehicles 		Visual Inspection	Monthly	N/A
	<ul style="list-style-type: none"> In case of at-fault accidents, pay compensation to the affected family or next of kin in keeping with the applicable rules 		Records of accidents and compensation paid/grievance records		N/A
	<ul style="list-style-type: none"> Undertake a root cause analysis of any accidents which take place 		Root cause analysis report	Monthly	N/A
	<ul style="list-style-type: none"> Develop a policy for safety measures to be undertaken while driving 		Road safety policy	Prior to the commencement of the planning and mobilization phase	N/A

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> The Labor camps should be placed at a distance from the village settlements. 		Visual Inspection	Prior to the commencement of planning and mobilization phase	N/A
	<ul style="list-style-type: none"> Undertake pre-employment medical check-ups for all workers 		Medical Records	Quarterly	N/A
	<ul style="list-style-type: none"> Undertake regular health check-ups for all workers 		Health Survey Reports	Quarterly	N/A
Impact on livelihood profile of the community	<ul style="list-style-type: none"> Preference to the vulnerable groups according to the skill requirements of the project. 	Positive	Employment Records	Quarterly	N/A
Impact on transport and infrastructure services	<ul style="list-style-type: none"> Maintain minimum offset distance from surrounding infrastructure 	Negligible	Visual Inspection	Daily	N/A
	<ul style="list-style-type: none"> Adopt proper road safety measures 		Road Safety Policy	Prior to the commencement of planning and mobilization phase	N/A
	<ul style="list-style-type: none"> Synchronize traffic movements with local communities 		N/A	Monthly	Traffic Management Plan
	<ul style="list-style-type: none"> Immediate repair of any damage to existing main roads, which are caused by project activities. 		Visual Inspection/Records of Repairs	Monthly	N/A
	<ul style="list-style-type: none"> Ensure availability of break services 		Visual Inspection	Monthly	N/A
Impacts on source water vulnerability	<ul style="list-style-type: none"> As part of project design, the requirements of acceptable water quality standards and wastewater discharge standards will be maintained. 		Compliance Audit	Design Phase	Waste Management Plan
	<ul style="list-style-type: none"> The local community will be engaged and a water use agreement will be formulated, ensure adequate water availability for the community. 		Compliance Audit	Design Phase	N/A

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts on cultural heritage	<ul style="list-style-type: none">As part of the project design, project facilities/activities will be located away from sensitive cultural heritage resources.A proper protocol or standard operating procedure may be developed and people at the project site located are trained to act suitably in consonance with the regulatory requirement and beliefs and faith of the community, if any.	Minor	Compliance Audit	Design Phase	Cultural Heritage SOP
	<ul style="list-style-type: none">The project will meet the international best practice for the documentation and protection of the cultural heritage and in case of chance finds.The project will consider retaining professionals to assist in the identification and protection of cultural heritage.In case the removal of nonreplicable cultural heritage is required, the same will be undertaken in consultation with the affected communities and in keeping with the regulatory requirement for the same;The project will ensure that the access to cultural heritage by the local community is not disrupted, and if disrupted, and if required, alternative access routes will be provided.		Inspection & Compliance Audit	Implementation Phase	Cultural Heritage SOP
Close Out Phase					
Community and occupational health and safety	<ul style="list-style-type: none">A Traffic Management Plan will be developed for the project and will be implemented by the HSE team.	Minor	Compliance Audit	Design Phase	Traffic Management Plan
	<ul style="list-style-type: none">Adopt proper road safety measures		Road Safety Policy	Prior to the commencement of the planning and mobilization phase	N/A

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Community and occupational health and safety	<ul style="list-style-type: none"> Synchronize traffic movements with the local 	Minor	N/A	Monthly	N/A
	<ul style="list-style-type: none"> Immediate repair of any damage to existing main roads, which are caused by project activities. 		Visual Inspection/Records of Repairs	Monthly	N/A
	<ul style="list-style-type: none"> Ensure availability of break services of heavy vehicles 		Visual Inspection	Monthly	N/A
	<ul style="list-style-type: none"> In case of at-fault accidents, pay compensation to the affected family or next of kin in keeping with the applicable rules 		Records of accidents and compensation paid/grievance records		N/A
	<ul style="list-style-type: none"> Undertake a root cause analysis of any accidents which take place 		Root cause analysis report	Monthly	N/A
	<ul style="list-style-type: none"> Develop a policy for safety measures to be undertaken while driving 		Road safety policy	Prior to the commencement of the planning and mobilization phase	N/A
	<ul style="list-style-type: none"> The Labor camps should be placed at a distance from the village settlements. 		Visual Inspection	Prior to the commencement of planning and mobilization phase	N/A
	<ul style="list-style-type: none"> Undertake pre-employment medical check-ups for all workers 		Medical Records	Quarterly	N/A
	<ul style="list-style-type: none"> Undertake regular health check-ups for all workers 		Health Survey Reports	Quarterly	N/A

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impact on livelihood profile of the community	<ul style="list-style-type: none"> Preference to the vulnerable groups according to the skill requirements of the project. 	Positive	Employment Records	Quarterly	N/A
Impact on transport and infrastructure services	<ul style="list-style-type: none"> Maintain minimum offset distance from surrounding infrastructure 	Negligible	Visual Inspection	Daily	N/A
	<ul style="list-style-type: none"> Adopt proper road safety measures 		Road Safety Policy	Prior to the commencement of planning and mobilization phase	N/A
	<ul style="list-style-type: none"> Synchronize traffic movements with local communities 		N/A	Monthly	Traffic Management Plan
	<ul style="list-style-type: none"> Immediate repair of any damage to existing main roads, which are caused by project activities. 		Visual Inspection/Records of Repairs	Monthly	N/A
	<ul style="list-style-type: none"> Ensure availability of break services 		Visual Inspection	Monthly	N/A
Impacts on source water vulnerability	<ul style="list-style-type: none"> As part of project design, the requirements of acceptable water quality standards and wastewater discharge standards will be maintained. 	Minor	Compliance Audit	Design Phase	Waste Management Plan
	<ul style="list-style-type: none"> The local community will be engaged and a water use agreement will be formulated, ensure adequate water availability for the community. 		Compliance Audit	Design Phase	N/A
Impacts on cultural heritage	<ul style="list-style-type: none"> As part of the project design, project facilities/activities will be located away from sensitive cultural heritage resources. A proper protocol or standard operating procedure may be developed and people at the project site are trained to act suitably in consonance with the regulatory requirement, beliefs and faith of the community, if any. 	Minor	Compliance Audit	Design Phase	Cultural Heritage SOP

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> The project will meet the international best practice for the documentation and protection of the cultural heritage and in case of chance finds. The project will consider retaining professionals to assist in the identification and protection of cultural heritage. In case the removal of nonreplicable cultural heritage is required, the same will be undertaken in consultation with the affected communities and in keeping with the regulatory requirement for the same; The project will ensure that the access to cultural heritage by the local community is not disrupted, and if disrupted, and if required, alternative access routes will be provided. 		Inspection & Compliance Audit	Implementation Phase	Cultural Heritage SOP
Workover Activities					
Community and occupational health and safety	<ul style="list-style-type: none"> A Traffic Management Plan will be developed for the project and will be implemented by the HSE team. 	Minor	Compliance Audit	Design Phase	Traffic Management Plan
	<ul style="list-style-type: none"> Adopt proper road safety measures 		Road Safety Policy	Prior to the commencement of the planning and mobilization phase	N/A
	<ul style="list-style-type: none"> Synchronize traffic movements with the local 	Minor	N/A	Monthly	N/A
	<ul style="list-style-type: none"> Immediate repair of any damage to existing main roads, which are caused by project activities. 		Visual Inspection/Records of Repairs	Monthly	N/A
	<ul style="list-style-type: none"> Ensure availability of break services of heavy vehicles 		Visual Inspection	Monthly	N/A

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
	<ul style="list-style-type: none"> In case of at-fault accidents, pay compensation to the affected family or next of kin in keeping with the applicable rules 		Records of accidents and compensation paid/grievance records		N/A
	<ul style="list-style-type: none"> Undertake a root cause analysis of any accidents which take place 		Root cause analysis report	Monthly	N/A
	<ul style="list-style-type: none"> Develop a policy for safety measures to be undertaken while driving 		Road safety policy	Prior to the commencement of the planning and mobilization phase	N/A
	<ul style="list-style-type: none"> The Labor camps should be placed at a distance from the village settlements. 		Visual Inspection	Prior to the commencement of planning and mobilization phase	N/A
	<ul style="list-style-type: none"> Undertake pre-employment medical check-ups for all workers 		Medical Records	Quarterly	N/A
	<ul style="list-style-type: none"> Undertake regular health check-ups for all workers 		Health Survey Reports	Quarterly	N/A
Impacts on source water vulnerability	<ul style="list-style-type: none"> As part of project design, the requirements of acceptable water quality standards and wastewater discharge standards will be maintained. 	Minor	Compliance Audit	Design Phase	Waste Management Plan
	<ul style="list-style-type: none"> The local community will be engaged and a water use agreement will be formulated, ensure adequate water availability for the community. 		Compliance Audit	Design Phase	N/A
Impacts on cultural heritage	<ul style="list-style-type: none"> As part of the project design, project facilities/activities will be located away from sensitive cultural heritage resources. 	Minor	Compliance Audit	Design Phase	Cultural Heritage SOP

Potential Impacts/Issues	Control/Mitigation Measures	Significance of Residual Impacts	Monitoring	Timing/Frequency	Related Plans
Impacts on cultural heritage	<ul style="list-style-type: none"> A proper protocol or standard operating procedure may be developed and people at the project site are trained to act suitably in consonance with the regulatory requirement, beliefs and faith of the community, if any. 				
	<ul style="list-style-type: none"> As part of the project design, project facilities/activities will be located away from sensitive cultural heritage resources. A proper protocol or standard operating procedure may be developed and people at the project site located are trained to act suitably in consonance with the regulatory requirement and beliefs and faith of the community, if any. 	Minor	Compliance Audit	Design Phase	Cultural Heritage SOP
	<ul style="list-style-type: none"> The project will meet the international best practice for the documentation and protection of the cultural heritage and in case of chance finds. The project will consider retaining professionals to assist in the identification and protection of cultural heritage. In case the removal of nonreplicable cultural heritage is required, the same will be undertaken in consultation with the affected communities and in keeping with the regulatory requirement for the same; The project will ensure that the access to cultural heritage by the local community is not disrupted, and if disrupted, and if required, alternative access routes will be provided. 		Inspection & Compliance Audit	Implementation Phase	Cultural Heritage SOP

6.1. MANAGEMENT PLANS

The goal of this ESMP is to ensure full compliance with the Project's policies and with mitigation, monitoring and other commitments made in the ESIA Report. While this ESMP should also be treated as a high-level, framework document, it is linked to a number of detailed management plans as described below which will be developed to lay out the specifications for compliance with specific environmental and social elements.

6.2. RELATED MANAGEMENT PLANS

A range of management plans will be developed to provide assurances that the outcomes of the ESIA can be implemented. These management plans will detail the management and mitigation measures required to be implemented, the time frame and responsibilities for their implementation, detailed training requirements, inspections/audits to check implementation, and reporting requirements. Where responsibilities will lay with bodies external to MPRL E&P (e.g. Contractors) the invitations to tender and contracts will contain specific clauses that bind contractors and subcontractors. This will apply to all tiers of contractors, with penalties for noncompliance also set out in the contracts and rigorously enforced by MPRL E&P.

The key management plans are outlined in the Table below with information on how these relate to the activities and impacts being discussed in the ESIA Report, including reference to who has lead responsibility.

Figure 19. ESMP hierarchy of key plans

Plan Name	Includes	Plan Owner
ESMP	Overarching plan linking to other management plans	MPRL E&P
Biodiversity Action Plan	Management and mitigation measures will be described covering all aspects of biodiversity	MPRL E&P or a third party administered under the Environmental and Social Management Plan
Terrestrial Habitat Reinstatement Plan	The plan will identify provisions for sourcing native species from nursery and procedures for replanting. It will also identify priority areas for rehabilitation including for instance de-facto protected areas such as monastery and cultural heritage locations if trees or vegetation should be cleared. Rehabilitation on seismic lines will also be provided.	MPRL E&P or a third party administered under the Environmental and Social Management Plan
Waste Management Plan	Project-related waste handling procedures for hazardous and non-hazardous wastes.	MPRL E&P
Emergency Preparedness Plan (ERP)	Administration (policy, purpose, distribution, definitions, etc.), organization of emergency areas (command centers, medical stations, etc.), roles and responsibilities, communication systems, emergency response procedures, emergency resources, training and updating, checklists, and business continuity and contingency	MPRL E&P
Spill Response Plan	As part of the ERP, spill preventative measures and spill response will be included	MPRL E&P
Fire Risk Management Plan	As part of the ERP, communication protocols and measures to control any fires that do arise as well as identify where fire control measures should be located	
Traffic Management Plan	Controls over prescribed routes, driver training, vehicle maintenance, speed restrictions, appropriate road safety signage, vehicle loading, maintenance measures and vetting procedures	MPRL E&P
Environmental Monitoring Plan	Groundwater monitoring, routine discharge monitoring, air quality monitoring, noise monitoring, terrestrial ecology monitoring etc.	MPRL E&P or a third party administered under the Environmental and Social Management Plan
Cultural Heritage Standard Operating Procedures	Standard Operating Procedures (SOP) to act suitably in consonance with the regulatory requirements, beliefs, and faith of the community, if any, for cultural heritage	MPRL E&P
Livelihood Restoration Plan	Developed based on the assessment of various livelihood restoration options available and preferred by the community and reflects the needs of the community. The LRP should also have clear reporting, monitoring indicators and a supportive implementation mechanism.	MPRL E&P

7. PUBLIC CONSULTATION AND DISCLOSURE

7.1. METHODOLOGY AND APPROACH

It is understood that Myanmar presently has a set of EIA Procedures being drafted by MOECAP for achieving environmental protection. While Version 8 of the procedures is currently under review, the requirements of the latest version publically available (Version 4) since 2013 were taken into account while undertaking the ESIA for the seismic survey. These procedures require the following steps to be undertaken as part of the EIA process in context to stakeholder engagement and disclosure of information:

- Scoping exercise
 - Disclose information about the proposed Project to the public and civil society through local media, including by means of the prominent posting of legible sign boards and advertising boards at the Project site which are visible to the public; and
 - Arrange the required complement of consultation meetings as advised by the Ministry, with local communities, potentially PAPs, local authorities, community based organizations, and civil society.
- EIA process
 - Take into consideration the views; concerns and perceptions of the stakeholders that could be affected by the Project or who otherwise have an interest in the Project.
 - The EIA should include the results of public consultations and negotiations with the affected population on the environmental and social issues.
 - Timely disclosure of all relevant information about the proposed Project and its likely adverse impacts to the public and civil society through the website of the Project Proponent, at public places such as libraries, community halls and signboards at the Project site visible to the public.
 - Arrange consultation meetings at the national, state and local level with PAPs, authorities, community based organizations and civil society.
 - Undertake consultations with concerned government organizations including the Ministry, the concerned sector ministry, regional government authorities, and others alike.
 - Field visits for the Ministry and concerned government organizations

In keeping with these requirements, the engagement activities as part of the scoping and impact assessment process for the Project were undertaken, and are described in the following subsections.

7.2. FURTHER ONGOING CONSULTATIONS

While the above-mentioned engagement has been undertaken as part of the impact assessment process, stakeholder engagement is understood to be a process undertaken throughout the life of the Project. In keeping with this, a stakeholder engagement plan has been prepared, which identifies the engagement activities to be undertaken throughout the remaining life of the Project. The proposed engagement activities are to include focus group discussions, community meetings, individual discussions, surveys, checklists etc.

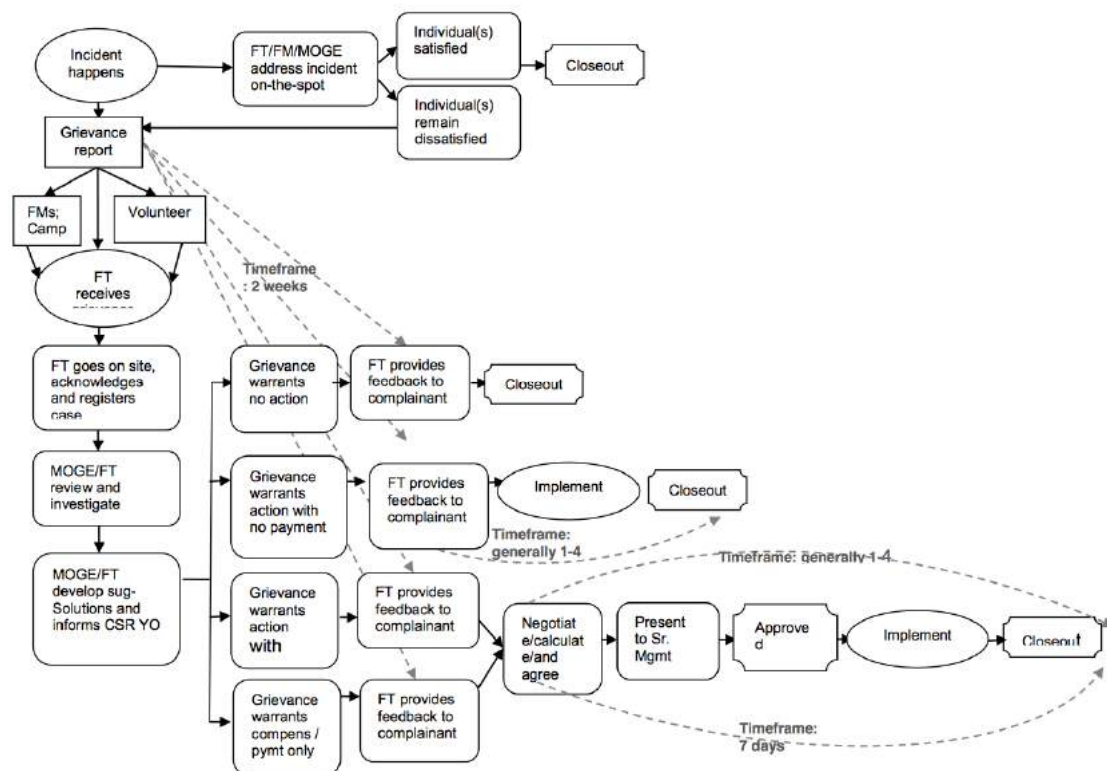
These engagement activities will be undertaken in consultation with MOGE, with the following purpose:

- Allowing the local stakeholders to have an understanding of the Project activities across the various phases.
- To monitor the effectiveness of the mitigation measures for the Project impacts.
- To allow the local stakeholders to provide their feedback on the most desirable manner in which engagement can be undertaken as well as the efficiency of the mitigation measures and the community development activities to be undertaken.

7.3. GRIEVANCE REDRESSAL MECHANISM

In addition to these activities identified, a key form of engagement with the community will be the grievance redressal mechanism (GRM) of MPRL E&P, which will be implemented in the Project Area. The key purpose of the GRM will be to allow for an understanding to be developed of the community's perception towards the Project, especially in regards to the engagement and compensation process. The following figure provides an understanding of the GRM process proposed for the Project.

Figure 20. Grievance redressal process



7.4. DISCLOSURE

In addition to the proposed engagement activities and GRM for the remaining life of the Project, information disclosure will be undertaken through the life of the Project. This information disclosure will be aimed at allowing for the local stakeholders to develop an understanding of the Project activities across the various phases, the implementation of the mitigation measures identified and the community development activities. The relevant information will be disclosed through the life of the project through pamphlets and reports being made available to the local community, through display of information in community areas, the Project Area signboards and verbally during the engagement activities with the local stakeholders.

Apart from this, the ESIA report for this Project will also be disclosed to the community, in keeping with the EIA procedures of Myanmar. This disclosure will be undertaken through the local media, in which a summary of the report will be provided, the website of the Project Proponent where the ESIA report will be uploaded and verbally in consultation meetings with the local community, if instructed by the MOECA. On the basis of the feedback thus received, the ESIA will be reviewed and updated. This updated ESIA will then be finally disclosed to the local stakeholders, if deemed necessary.