



Occupational HSE Management Plan

For

**IEFCL-Train2
Fertilizer Project**

**INDORAMA ELEME FERTILIZER & CHEMICALS
LIMITED**

1.0	INTRODUCTION.....	4
1.1	Project Environment, Health & Safety Management Plan.....	4
1.2	Project description	5
2.0	VISION & POLICY	5
3.0	PLAN	8
3.1	Risk management, identifying impacts and hazards	8
3.2	Legal and other requirements	8
3.3	Site EHS Rules	9
3.4	Objectives and targets	9
3.4.1	EHS Performance monitoring	9
3.5	Project specific environment health and safety initiatives	10
4.0	IMPLEMENTATION	10
4.1	Structure, responsibility and accountability	10
4.2	Learning and development	11
4.2.1	Environment, health and safety learning and development matrix	11
4.2.2	Records of Learning & Development	11
4.2.3	Workmen induction and security controls.....	12
4.2.4	Visitor induction.....	12
4.3	EHS awareness and communication.....	12
4.3.1	Toolbox talks and pre-start talks	13
4.3.2	EHS reporting.....	13
4.4	Impacts/hazards identification, risk assessment and risk control.....	15
4.4.1	Management of Subcontractor EHS	15
4.4.2	Permit to work.....	15
4.4.3	Impacts/hazards identification, control and monitoring.....	15
4.5	Emergency response and evacuation	16
5.0	IMPROVEMENT	18
5.1	Monitoring of the Construction Site	18
5.2	Monitoring of plant, goods, equipment and processes.....	19
5.3	Incidents at workplace	19

APPENDIX	21
APPENDIX 1 EHS SUB PLANS.....	21
APPENDIX 2 OBJECTIVES AND TARGETS (Project)	22
APPENDIX 3 ORGANISATIONAL CHART	24
APPENDIX 4 EHS RESPONSIBILITY/ACCOUNTABILITY MATRIX	25
APPENDIX 5 CONSULTATION ARRANGEMENTS	27
APPENDIX 6 PLANT, EQUIPMENT AND PROCESSES INSPECTION AND TESTING SCHEDULE	28
APPENDIX 7 IMPACT AND HAZARD RISK ASSESSMENT.....	30

ANNEXURES

ANNEXURE 1: HEALTH MANAGEMENT	
ANNEXURE 2: TRAINING SCHEDULES.....	
ANNEXURE 3: TOOLBOX TALK	
ANNEXURE 4: CONTRACTOR INCIDENT REPORTING	
ANNEXURE 5: EHS REPORTS	
ANNEXURE 6: PTW PROCEDURE.....	
ANNEXURE 7: SIMOPS PROCEDURE.....	
ANNEXURE 8: LOTO PROCEDURE.....	
ANNEXURE 9: CONTRACTOR EMERGENCY MANAGEMENT PLAN.....	
ANNEXURE 10: INDORAMA ON SITE EMERGENCY PLAN.....	
ANNEXURE 11: INDORAMA INCIDENT REPORT.....	

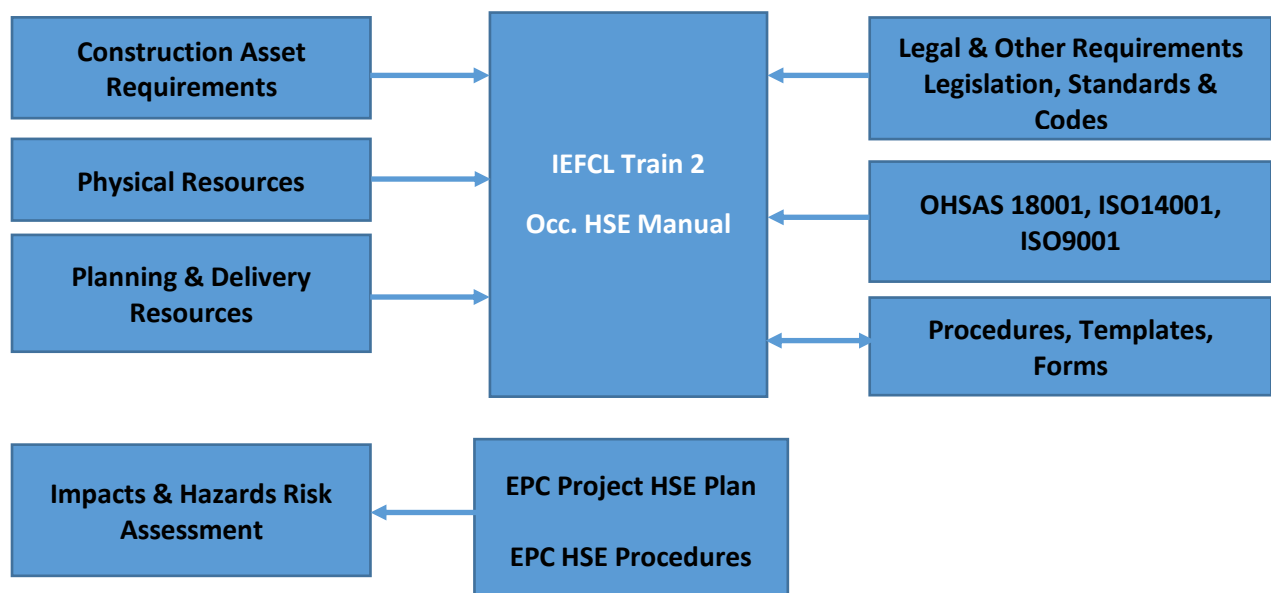
1.0 INTRODUCTION

1.1 Project Environment, Health & Safety Management Plan

Indorama Eleme Fertilizer & Chemicals Limited (IEFCL) – Train 1 operates an integrated management system for environmental management and workplace health and safety management. The IEFCL Environment, Health & Safety Management System (EHS MS) Manual and related procedure, forms and templates, which have been developed for IEFCL-Train1, are contained in this document, as a reference. As appropriate, and as indicated below, these will be updated to include IEFCL-Train2 operations.

The IEFCL Environment Health & Safety Management System (EHS MS) Manual provides the overall framework for the EHS management at the IEFCL workplaces for construction projects. This document outlines the management practices for the key risks affecting environment, health and safety (EHS) aspects of this project and has been prepared in line with IFC requirements, such as PS1 – PS3.

The structure of the EHS management system framework is outlined as:



This management Plan sets the agenda and expectations for EHS Management Plan. This document shall be the guiding document for the construction Contractor. Construction contractor will be submitting their EHS Plan and Procedures as applicable for the IEFCL Train 2 project prior commencement of construction. All such documents shall be reviewed and

approved by the Indorama EHS Department for implementation.

This document exclusively caters to EHS aspects for construction activities for IEFCL Train-2.

The operational EHS plan is part of safety case (Annexure 4 of ESIA). Pl refer Annexure 17 HSEF Manual as attachment to Annexure 4 – Safety Case of ESIA document).

1.2 Project Description

The Indorama management proposes to set up another fertilizer manufacturing plant within the Indorama complex adjacent to the current fertilizer plant. The production capacities shall be identical to the current operating facility namely 2300MTPD Ammonia and 4000MTPD Granular Urea.

The project shall be a 'copy and paste' of current fertilizer plant (IEFCL-Train1). Hence, the technology, engineering, construction & operations philosophy shall be same as the present one. Imperatively, the process documentation shall be complete with all the changes / feedbacks / learnings incorporated from current plant. The construction timelines shall be roughly the same as in previous plant and reputed construction contractor shall be hired for same.

The sketch below depicts the site layout (artist's impression) of IEFCL-Train2. Orange to Yellow color shaded is the proposed fertilizer facility to be set up.



2.0 VISION & POLICY

Indorama is committed to a vision of Incident & Injury Free (IIF) workplaces at all the operating and project sites. Our vision is supported by an uncompromising culture which holds the safety of people and the protection of the environment as first in all our business reviews and decisions.

The Indorama Environment Health & Safety Policy, which outlines key objectives to deliver

our IIF vision, shall be clearly displayed in a prominent location(s) at workplaces, including the project site so that this is accessible to all employees, and other workers or visitors to the project. The policies and their objectives shall be clearly communicated through induction to all persons working at and visiting the site.


QHSE Policy Document:

**The current QHSE policy for Train 1, included below, will be extended verbatim to IEFCL
-Train 2**

QHSE POLICY

We, at IEFCL are committed to total customer satisfaction & continual improvement in Quality, Health, Safety and Environment practices through:

- Improving the business processes by adopting innovative approaches & best practices.
- Implementing effective quality management system across the entire supply chain ensuring highest standards of quality and Services.
- Commitment to prevention of injury and ill health by ensuring safe operational and occupational health practices in all facilities involving all employees, Contractors & other associates.
- Protecting & preserving the environment by implementing effective environment management system and control on emission and discharge.
- Continual review of quality, health, safety & environment objectives, procedures & practices for attaining highest level of operational efficiency and excellence.
- Commitment to comply with all applicable statutory, regulatory and legal requirements on QHSE and position as a responsible corporate entity.
- Creating lasting partnership with customers and associates by providing quality products & services at all times.


Munish Jindal
Chief Executive Officer

Rev.: 00

Date: 15th Dec- 2016

3.0 PLAN

3.1 Risk Management, Identifying Impacts and Hazards

The Construction Manager (or nominated representative) in consultation with the Project Manager and members of the project team completes a project Impacts & Hazards Risk Assessment (IHRA), prior to commencement of the construction of the project based on early engineering or detailed engineering

In addition, to further assess associated risks, they shall be evaluated through the various tools given below.

1. QRA
2. HAZOP
3. SIL

The project Impacts and Hazards Risk Assessment (IHRA) is also used to identify the need for additional specific management sub plans such as, Crane Management Plan, Drugs & Alcohol Testing Plan, Incident & Injury Free Implementation Plan, among others; as identified in Appendix 1 and already in implementation for Train 1. These subplans will be updated as needed for Train 2, documented & communicated.

The IHRA shall be reviewed by the Construction Manager, or a nominated representative:

- Design or update those which have the potential to affect EHS aspects
- Documented Non-Conformances and establish Corrective / Preventive Actions
- In addition, the Impact and Hazards Risk Assessment shall be developed with attendance from all stakeholders such as construction contractors involved in the delivery of the project.
- The Construction Contractor representative shall be included in all such reviews to ensure systematic dissemination of information for quick action

3.2 Legal and Other Requirements

Nigerian Factories Laws (Local), Regulations of Federal & State Ministry of Environment and IFC guidelines (International) shall be the basis to be adhered towards the occupational health and safety, and environmental protection aspects and other legal or applicable requirements.

The codes of practice and standards that apply to this workplace are listed in the project

Impacts & Hazards Risk Assessment in Appendix 7.

3.3 Site EHS Rules

The Contractor will be required to develop site specific EHS rules and procedures that shall be displayed on entry to the project site and in other prominent locations that are consistent with the Indorama's vision of an Incident and Injury Free workplace. The objectives of the rules are to:

- Meet the site specific needs towards the management of hazards and risks and environmental aspects and impacts,
- Address any specific client, legislative and regulatory requirements,
- Meet the standards outlined by the agencies / authorities for EHS practices;
- Ensure visitors to the project are recorded; and
- Prevent material harm or the risk of material harm to the environment and its surrounding community and other project stakeholders.

The detailed site EHS rules are appended in Appendix 7.

3.4 Objective and Targets

Objectives and targets specific to the project, including lead indicators (i.e. the measurement of processes, activities and conditions that define specific performance and predict future results) and lag indicators (i.e. the measurement of processes linked to the outcomes of past events that provide data on past performance.) are outlined in Appendix 2. They measure progress against the objectives and targets, which is reported on periodical basis by the Construction Manager.

3.4.1 EHS performance monitoring

The EHS performance is monitored and recorded as:

- EHS Monthly Report by the Project EHS Team
- Internal six monthly audit by Project EHS Team
- Independent six monthly EHS audit by third party auditor
- Annual audit by lenders' consultants
- Contractor's own EHS audit reports covering including performance against near miss, unsafe acts & conditions
- Project EHS team undertake review of compliance by the contractor on checks on tools & tackles, lifting equipment, portable electrical equipment, material handling

equipment etc.

- Project EHS team undertake compliance audits to ensure that contractor's waste management practices are fully functional against the waste management plan
- Close out checks on all incident investigations including near miss, Incident reporting, investigation and effective communication and evaluation of implemented corrective action;
- Reporting of EHS KPIs against targets as presented in Appendix 2.0.

3.5 Project Specific Environment, Health and Safety Initiatives

In addition, as currently, the project will ensure:

1. A Chief medical officer who keeps track of epidemics (i.e., Malaria, etc.) and undertakes suitable corrections in fumigation schedules.
2. Every employee of Indorama undertakes annual medical checkup.
3. Each contract employee is inducted after medical checkup and shall undergo annual medical checkup.

Reports of such practices are submitted to Indorama as part of compliance. They are presented in the Health Management Plan included as Annexure 1

4.0 Implementation

4.1 Structure, Responsibility and Accountability

The Project Manager prepares a project specific IEFCL EHS organizational chart to define lines of reporting and key names and positions or roles with EHS responsibilities. The chart is outlined in Appendix 3. The construction contractor shall form his own EHS organization.

The philosophy of EHS organization in IEFCL Train-1 is appended in Appendix 3. The construction contractor's EHS team consist of 37 personnel. The IEFCL EHS team consist of four dedicated EHS professionals, besides the personnel who will be recruited on short term basis. Detailed responsibilities against each role is defined in Appendix 4.

An EHS Organization on the same line as above shall be formed by the construction contractor for IEFCL Train-2.

All EHS activities between the Indorama & Contractor shall be coordinated between the EHS

Leads of each organization.

Besides, IEPL & IEFCL operating EHS team consisting of 68 personnel shall provide additional support For IEFCL Train-2 project.

Construction Contractor / subcontractors (if any), vendor's personnel and other personnel shall comply with the project EHS guidelines including PPE compliances which will be coordinated by contractor EHS Lead.

4.2 Learning and Development

The Construction Manager has overall accountability for project specific learning and development.

4.2.1 Environment, health and safety learning and development matrix

The contractor's training management system consists of:

1. Monthly & yearly training calendar
2. The training needs against a specific skill / competency is developed
3. Training is conducted in batches. The training plan, as well as a sample calendar and training subjects, which are currently conducted in IEFCL Train 1, are appended as Annexure 2.

During the project, 30 man hours per person per annum of training is expected to be conducted based on the IEFCL-Train1 project experience.

Indorama's own training systems & practices shall be used for the training of project personnel. As was done in IEFCL-Train1 project, licensor's training, Operation training simulator, training in IEFCL operating plant for on the job training and training at OEMs end are envisaged. It is expected that 10 man hours per person per annum of training shall be conducted.

4.2.2 Records of Learning & Development

Records of employee training will be retained by the Construction Contractor as follows:

- Course outline or content;
- Completed attendance records

- Completed training evaluation form
- Assessment of results and associated certificates of completion

4.2.3 Workmen induction & security controls

All workmen entering the site pass through the security checks. These include background checking; trade certificate authenticity checks and safety induction at security outpost (turnstile) by competent person. After the endorsement by safety personnel, each person is issued with biometric ID. On a day to day basis, each workman enters thru a turnstile activated by his biometric ID.

The contractor shall have its own induction system for all workmen entering the construction site. This shall be controlled by its security and administration department.

4.2.4 Visitor induction

Visitors entering the site in non-plant areas such as administration building do not require to undergo safety induction. However, those visitors who shall visit any plants shall undergo mandatory safety induction at safety office. They shall follow PPE discipline as applicable for site visit. Visitors who shall visit the project construction site shall undergo safety induction at construction safety office. They shall follow the mandatory PPE as specified in the induction.

4.3 EHS awareness & Communication

To ensure all workers can view, discuss and take note of EHS information, the contractor EHS team shall communicate / display the following information at a prominent location(s) at the site, including notice board(s):

- Contractor EHS Policy
- Drugs & Alcohol Policy
- Smoking Hazards Awareness and Smoke Kiosks locations
- Traffic & Parking rules
- Bullying & Harassment Prevention Communique
- Display and training of emergency escape routes and muster points
- Site general rules
- PPEs requirements

- First aid kit locations
- Emergency contact numbers of important site personnel
- EHS alerts / safety beacons
- Safety suggestions

4.3.1 Toolbox talks and pre-start talks

Indorama's project EHS team shall conduct daily toolbox talk before starting the job. The work progress, hazards, safety precautions are discussed by all the participants.

Contractor workers and their supervisors of respective areas conduct daily toolbox talk, pre-start talks and record the attendance on the toolbox Template. A sample toolbox talk template used at IEFCL Train 1 is appended as Annexure 3. Activities discussed during toolbox/pre-start talks covers EHS aspects from previous day(s), the current day's activities, interfacing trade activities, changes to emergency access and related control measures. Contractor EHS Team also explains the safety topic applicable for the job such as PTW, PPE and Work at height etc.

4.3.2 EHS reporting

The contractor EHS team shall undertake recording of EHS activities and report to his Indorama counterpart. All reports and records are collated by project EHS team to provide EHS statistics to track progress against the KPIs.

The Contractor's Construction Manager is accountable for review and update of project EHS documentation based on following parameters:

- Incident reporting. Annexure 4 presents a sample format currently used at IEFCL Train 1. Daily, weekly and monthly inspections and monitoring of EHS aspects, which are currently used at IEFCL Train 1 are presented in Annexure 5.
- Monitoring the effectiveness of corrective and preventive actions and Close out status of incidents
- Interact with Project EHS Team for any external / statutory audits and compliance
- Ensuring the availability of Materials Safety Data Sheet.
- Conduct site meetings and reviews to discuss project EHS performance

- Presenting the consolidated monthly data at project reviews to Indorama senior management.
- Recording and reporting non-conformities such as near miss / Unsafe Acts / Unsafe Conditions in accordance with the following reporting table:

Incident Reporting

Incident reporting and related management of events and corrective and preventative actions are carried out in accordance to the Table provided below:

Occurrence/Incident/Report	Initiator	Action	Closing Responsibility
All incidents of injury, near miss, environmental harm or potential harm, plant or property damage	Project Team Members	Report immediately to the Construction Manager	Construction Manager (CM)
EHS Events/EHS Incident Reports	EHS Team	All incidents are to be reported. Incident Investigation Report Form to be filled and close outs monitored	CM
EHS Observations	EHS Observations	All good/bad observations to be reported	CM
First Aid Injury	First Aider	Register of Injuries completed by the First Aid personnel and reported to Indorama Project EHS Team	First Aider (F)
Medical Treatment Injury (an injury where treatment is provided by a medical practitioner and returns to work without losing 03days).	First Aider	Shall be reported by Construction Contractor's First Aider to Indorama Safety Project EHS Team and then investigation completed.	F/CM
Lost Time Injury (an injury where a person reports to work after 03 working days due to a work related injury)	First Aider	Shall be reported by Construction Contractor's First Aider to Indorama Safety Project EHS Team and then investigation completed.	F/CM

4.4 Impacts /Hazards Identification, Risk Assessment and Risk Control

The Impact/Hazards and Risk Assessment guideline template is appended as Appendix 7 for contractor to refer and follow. The contractor shall prepare corresponding plans and procedures accordingly and submit to the Project EHS Team for review. The same shall be signed off and implemented.

4.4.1 Management of Subcontractor EHS

The site works shall be carried out by the construction contractor and subcontractors shall be minimal. Except NDTs (nondestructive testing), all other personnel shall be on direct hire basis. The site EHS rules shall be ensured by the construction contractor for the subcontractors. The subcontractor shall also follow the construction contractor's site safety protocols.

4.4.2 Permit to work

For all the construction activities, the contractor shall have its own PTW procedure. The PTW procedure as well as a sample PTW format, which are currently used at IEFCL Train 1 are presented in Annexure 6. These shall be implemented and monitored by contractor EHS team.

The following PTW philosophy shall be in force:

Activity	PTW	Responsibility
All construction works	Contractor PTW procedure	Contractor
Pre-commissioning works (before Hydrocarbon input)	Contractor PTW procedure	Contractor
Commissioning works (After Hydrocarbon input and onward)	Indorama PTW procedure	Indorama

Area where simultaneous project and operations shall be taking place, Indorama SIMOPS procedure shall be applicable. The SIMOPS Procedure currently used at IEFCL Train 1 is presented in Annexure 7..

4.4.3 Impacts/hazards identification, control and monitoring

Workers shall be encouraged through the workplace specific induction, tool box/pre-start talks and forums to identify and control health and safety hazards and risks and environment

aspects and impacts on a 'see and fix' basis where reasonably practicable to do so and to immediately report these impacts and hazards or aspects and impacts to their contractor supervisor. Formal impacts and hazards observations of high risk construction work activities are conducted daily by Supervisors to verify the implementation of control measures and identify safe behaviors. The observations are recorded. In addition, other EHS related matters can be recorded as a daily diary entry.

Where high risk impacts or hazards are identified that specifically relate to a work area or work task under the control of a subcontractor or other worker due to ineffective or inadequate control measures, the work in the area shall be stopped. Consultation must then be undertaken with key stakeholders including relevant workers involved the task to achieve the required control measures.

When faulty or defective plant and equipment is identified, which has the potential to impact on health and safety or the environment it shall be isolated from use and physically locked out to prevent unauthorized or inadvertent use and as a secondary measure an Out of Service Tag /Danger Tag shall be applied. Isolation Procedure (Lock Out Tag Out procedure currently used at IEFCL Train 1 is attached as Annexure 8) shall be applicable in such cases.

4.5 Emergency Response and Evacuation

The contractor, in conjunction with Project EHS Team, shall develop an Emergency Response Plan (ERP) for the construction site. Periodic drills shall be carried out to check the ERP efficacy. Regular trainings shall also be provided by the contractor to all personnel working at project site.

A sample Emergency Response Plan is appended as Annexure 9. This plan was developed for IEFCL Train 1 project. Similar plans for the construction and operation phases shall be developed for the IEFCL-Train2 project.

The current Indorama On Site and Emergency Plan (ONSEMP) shall be amended to include the IEFCL Train 2 operations. This shall be done as part of commissioning works and training shall be imparted to all personnel at site. Similar practice was followed in IEFCL-Train1 and shall be adopted here too. The present ONSEM is appended as Annexure 10.

The construction contractor's Emergency Response Plan (ERP) shall be reviewed and tested as follows:

Item	Action required & pass/fail requirement	Frequency					Record
		Weekly	Monthly	Quarterly	Yearly	5 yearly	
Emergency Response Plan (ERP)	Check content and continued relevance to facility/ workplace/ site including assessment of Evacuation Assembly Area		<input checked="" type="checkbox"/>				Review maximum quarterly intervals with revision updates. Quarterly Independent Audit review
Fire equipment	Fire extinguishers, hose reel or other. Attached compliance tags. Inspection and maintenance by service provider			<input checked="" type="checkbox"/>			EHS inspections, monthly self-assessments and independent quarterly audits. Register of Fire Extinguishers maintained in the workplace where 10 or more extinguishers exist.
Fire equipment	Fire extinguishers, hose reel or other. Seals intact. Charged extinguishers in place at relevant locations	<input checked="" type="checkbox"/>					Workplace EHS Inspection. MOM.
Evacuation equipment	Emergency lighting		<input checked="" type="checkbox"/>				Logbook maintained by Construction Contractor
Evacuation equipment	Emergency Warning and Intercommunication System (EWIS)		<input checked="" type="checkbox"/>				Logbook maintained by service provider Monthly test recorded in record or MOM
Evacuation exercise	Compliance with the emergency response plan (ERP).			<input checked="" type="checkbox"/>			EHS Committee Minutes, Mock Drill Reports
Emergency Drill	Emergency scenario response (taken from ERP Identified Emergencies)			<input checked="" type="checkbox"/>			Completed Emergency Drill Report
Training	All personnel inducted, and training up to date			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		Training records

Evacuation Assembly area(s)	Nominated areas checked suitable and relevant to ERP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Weekly EHS Inspection
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5.0 IMPROVEMENT

5.1 Monitoring of the Construction Site

A formal weekly inspection shall be carried out by the Construction Contractor. Monitoring shall be done as outlined in the table below.

Any non-conformities observed by a worker shall be recorded and investigated. The corrective/preventative actions implemented shall be ensured.

Construction Site Inspection Schedule				
Task	Type of Inspection	Inspection By	Frequency	Record
Specific work area	Hazard Inspection	All Area respective Supervisors	Daily	Diary entry of any significant issues., EHS Non-Conformity,
All general work areas including plant and equipment	Weekly EHS Inspection	EHS Coordinator, EHS Committee/ EHS Consultation Group	Weekly	Weekly Record with illustration Minutes of Meeting record
All general work areas including plant & equipment	EHS Inspection	Construction Manager	Minimum Monthly	Site Assessment Checklist
EHS Monitoring	EHS monitoring identified by the IHRA e.g. noise, water quality or other.	Competent person	As required	Noise Monitoring / Water Testing Record.
Calibration of EHS Monitoring equipment	Manufacturer's calibration	Competent person	As required	Calibration Certificate
General work area	EHS Inspection	Construction Manager/ EHS Coordinator/Manager	Monthly	Completed EHS Monthly Review Checklist to inform the completion of the Monthly Self-Assessment
High risk construction work/ permit to work	Task observation	Supervisor	Daily	Completed High Rise Inspection Checklist
Subcontractor work activities	Work Activity EHS Inspection	Subcontractor Area Foreman/Supervisor	Daily	Completed Subcontractor's EHS Inspection Checklist

High risk construction work activities by subcontractors or employees	EHS Plan/WMS implementation review	Construction Manager/ Nominated Representative	Within 6 weeks of commencement and thereafter minimum 10% sample of high risk subcontractors at max. 90 day intervals	Completed Review of Subcontractor documentation Completed Subcontractor Implementation Review Schedule
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5.2 Monitoring of Plant, Goods, Equipment and Process

The compliance of plant, equipment and processes at project site is assessed in accordance with a set schedule. Appendix 6 presents the schedule currently used at IEFCL Train 1. An equivalent schedule will be developed for IEFCL Train 2.

Plant goods and equipment are divided as follows:

1. Portable Equipment and hand operating tools: Tagging shall be applicable and recorded. Suitable color coding systems shall also be applied for visual indication.
2. Powered plant and equipment: Checking is undertaken by a competent person prior to use at project site and as per the manufacturer's specification. In addition, a daily before use pre-start is carried out for relevant items of plant and equipment by the Operator. This pre-start check is recorded.
3. Fixed installations such as cranes and hoists: Inspection and certification by qualified personnel.

Defective equipment shall be taken out and quarantined with visual markings at a separate location. These, upon rectification, shall be recertified and put to use.

It may be noted that the contractor owns and operates almost all of the construction equipment including large cranes (1300 MT) and has a robust organization to maintain each equipment against breakdowns, preventive, predictive maintenance & various inspections and checks.

5.3 Incidents at the workplace

Project site EHS incidents ought to be reported immediately not later than 24 hours after the incident Information. Incidents involving injury, near miss, damage to plant and equipment, and actual or potential harm to the environment are immediately addressed.

All incidents shall be reported by Indorama Management to the regulator. This notification must occur in a timely manner as required by legislation.

Relevant formats for both Contractors incident reporting and of Indorama, which are currently used for IEFCL Train 1, are included as Annexure 4 and Annexure11 respectively. Equivalent formats will be developed for IEFCL Train 2.

This document exclusively caters to EHS aspects for construction activities for IEFCL Train-2.

The operational EHS plan is part of safety case (Annexure 4 of ESIA). Pl refer Annexure 17 HSEF Manual as attachment to Annexure 4 – Safety Case of ESIA document).

APPENDIX

APPENDIX 1: EHS SUB PLANS

Sub Plan
Air Quality Management Plan
Asbestos & Hazardous Building Materials Management Plan
Concrete Waste Management Plan
Contaminated Soil & Water Management Plan
Crane Management Plan
Emergency Response Plan
Drugs & Alcohol Testing Plan
Hazardous Substances/Dangerous Goods Management Plan
Incident & Injury Free Implementation Plan
Storm water & Erosion Management Plan
Traffic & Parking Management Plan
Waste Minimization & Materials Recycling Management Plan
Water Resource Management Plan

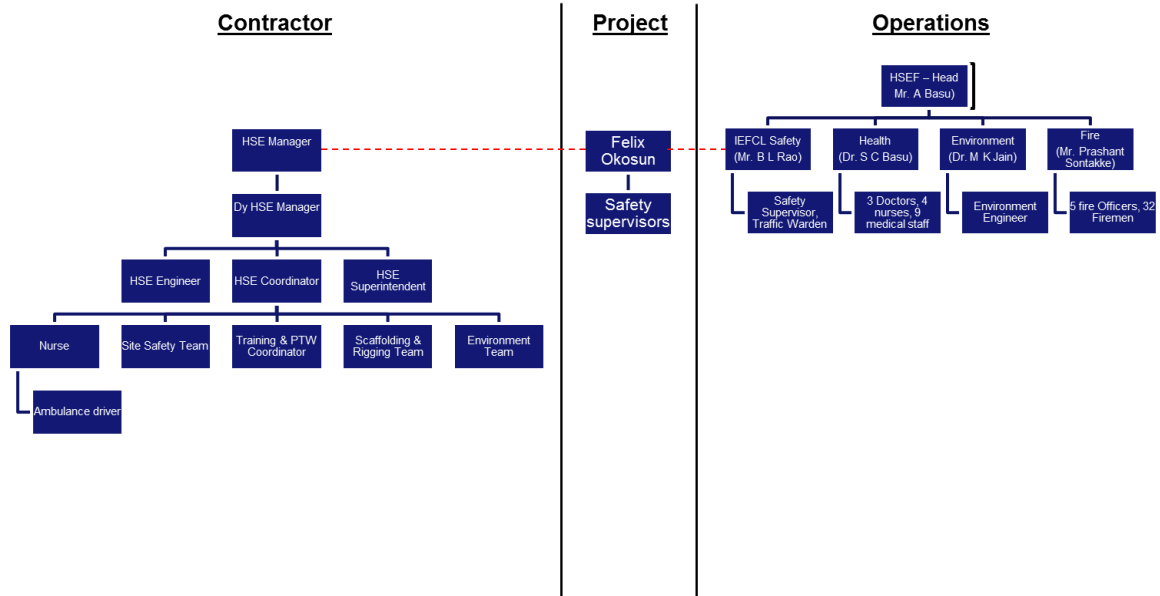
APPENDIX 2: OBJECTIVES AND TARGETS (PROJECT)

Indorama Train 2 Project Performance Objectives	Indorama Train 2 Project Performance Targets
LEAD INDICATORS (i.e. the measurement of processes, activities and conditions that define specific performance and predict future results)	
<p>Recognition & Rewards</p> <p>New project to implement a recognition and rewards program for EHS to drive positive reinforcement of good/leading practices at a Project level with employee/contractor/worker awards based on task observations, performance sampling and inspections, initiatives or other developed improvements to EHS performance outcomes.</p>	Max Quarterly Intervals by Project
<p>Task Observation High Risk Activities</p> <p>New project to implement formal daily task observations of randomly selected high risk work activities in their area(s) under management to verify task specific EHS compliance.</p>	Daily
<p>Health and Wellbeing</p> <p>To implement a health and well-being initiative and evaluate its outcomes; e.g. healthy eating; medical assessments; skin checks, exercise or other initiative</p>	Periodical Medical Examination
<p>Learning & Development</p> <p>Implement Supervisory Training selected for development.</p>	>90% nominated supervisors
<p>Implement EHS MS Awareness Training ALL new projects.</p>	100%; new project
<p>Implementation of spill management training to key personnel all projects</p>	Spill Management Training
<p>Implementation of local risk control (risk assessment), issue work permit and first attack all project PTW Officers and Fire watch</p>	100%; PTW Officers + Fire Watch
<p>Risk Assessment to be conducted by key EHS personnel / Project team</p>	By all Stakeholders

Indorama Train 2 Project Performance Objectives		Indorama Train 2 Project Performance Targets
LAG INDICATORS (i.e. the measurement of processes linked to the outcomes of past events that provide data on past performance.)		
Fatalities emanating directly from construction operations		0
Injuries to public emanating directly from construction operations		0
Reduction in Lost Time Injury Incidents across construction operations per million hours worked		≥50%
Reduction in all incidents related to people/plant impact per million hours worked		≥50%
Logging of Near Misses/Unsafe act/Unsafe condition		100/month
EHS Managers - Lessons Learnt issued to all critical incidents		100%
All incident investigations/related reports completed and closed out on average within 30 days		≤28 days
Total Recordable Incident Frequency Rate (TRIFR)		≤10
ENVIRONMENT		
Environment Incident Frequency Rate (EIFR) 12 month rolling average/million hours worked		≤0.8
Waste All projects implement waste minimization, material recycling and reuse initiatives to promote resource recovery and divert waste from landfill		≥90% by volume
Water All projects meter 'potable' water use to establish benchmarks. Initiatives implemented to reduce potable water use.		≥90% metered

APPENDIX 3 ORGANISATIONAL CHART

Project EHS Structure



APPENDIX 4: EHS RESPONSIBILITY/ACCOUNTABILITY MATRIX

	Project EHS Coordinator	Project Manager	Construction Manager	Project Engineer	Site Manager	Supervisor	Subcontractor	EHS Consultation Group	Construction Worker	First Aid
EHS Management System	I	I	I	I	I	-	I	-	-	I
QHSE Policy	I	I	I	I	I	I	I	I	I	I
Project EHS Management Plan	C	I	R	I	I	I	I	I	I	I
Risk Assessment Review	C	A/R	C	C	C	I	I	-	-	-
Impacts & Hazards Risk Assessment	C	C	R	C	C	C	I	I	I	I
EHS Sub Plans	C	C	R	C	C	I	I	I	I	I
Legislation and Regulatory Changes	C	C	R	C	C	I	I	I	I	I
EHS Site Rules	C	-	A/R	C	C	C	I	I	I	I
Indorama EHS Objectives & Targets	I	-	I	I	I	I	I	I	-	-
Project EHS Objectives and Targets & Initiatives	C	-	R	C	C	I	I	I	-	-
MSA including Monthly EHS Checklist	C	-	A/R	-	-	-	-	-	-	-
IQA	C	-	A	-	-	-	-	-	-	-
Organizational Chart	-	-	A/R	C	C	I	I	I	-	-
EHS Roles and Responsibilities	I	-	A/R	C	C	I	-	-	-	-
EHS Learning & Development	I	I	I	I	I	I	-	-	-	-
EHS Learning & Development Planner	C	-	R	I	C	I	-	-	-	-
Subcontractor EHS Plan	C	-	C	R	I	-	A	-	-	
EPC Safe Work Method Statements	C	-	I	R	C/A	C	-	-	-	-
Subcontractor Safe Work Method Statements	C	-	-	A	C	C	R	-	-	-
Worker Induction	R	-	A	-	-	-	-	-	-	-
Visitor Induction	R	R	A	R	R	R	R	-	-	-
EHS Consultation	C	-	A	I	I	I	I	R	I	-

	Project EHS Coordinator	Project Manager	Construction Manager	Project Engineer	Site Manager	Supervisor	Subcontractor	EHS Consultation Group	Construction Worker	First Aid
EHS Reporting	R	-	A	-	I	-	-	-	-	-
Emergency Management	I	-	R	I	I	I	I	I	I	I
Hazardous Substances and SDS'	R	-	A	I	I	I	I	I	I	I
Plant and Equipment	I		-C	-	A	R	A	-	-	-
Permits to Work	C	-	-	-	A	-	R	-	-	-
Daily High Risk Construction Work Checklist	I	-	I	I	R	R	-	-	-	-
Subcontractor EHS Reporting	-	-	A	R	R	R	R	-	-	-
EHS Weekly Inspection	I	-	I	-	R	-	-	-	-	-
Committee EHS Weekly Inspection	A	-	I	-	I	-	-	R	-	-
Subcontractor Implementation Review & Schedule	I	-	A	R	R	R	-	-	-	-
Non conformities and defects	C	-	A	R	R	R	R	-	-	-
Incident notification, investigation & reporting	C	-	A	R	R	R	R	I	I	-
Site Diary	-	-	A	R	R	R	R	-	-	-
Toolbox meetings	C	-	A	R	R	R	R	-	-	-
Daily pre-start meetings	-	-	A	R	R	R	R	-	-	-
Display EHS Information	A	-	R	-	-	-	-	-	-	-
EHS Monitoring / Calibration	R	-	A	-	-	-	-	-	-	-
Injury Management	C	-	A	R	R	R	A/ R	-	-	I
EHS System Audits	R	-	C	-	-	-	-	-	-	-

Key:

R	Responsible	A	Accountable	C	Consulted	I	Informed
	The person who is assigned to do the work		The person who makes the final decision and has the ultimate ownership		The person who must be consulted before a decision or action is taken		The person who must be informed before a decision or action is taken

APPENDIX 5: CONSULTATION ARRANGEMENTS

Event	Frequency/Requirement	Participants	Record/Evidence
Workplace induction	Prior to commencing work at the workplace	All workplace employees and other workers. Visitors frequenting the workplace more than twice a month.	Induction records on Workplace Induction Register
Construction Brief	Daily intervals including high risk construction work activities and interfacing work activities for the day, changes to emergency egress/ work areas, weather and other.	Issued to Construction Contractor team, subcontractor supervisors, Indorama supervisor	Daily Record
Stand Down	At intervals to be determined by Indorama incident trends, lessons learnt or other	Construction Contractor employees, subcontractors and all workers.	Stand Down Record
Pre-start	Daily intervals including Construction Brief content, high risk construction work activities and interfacing work activities for the day, changes to emergency egress/ work areas, weather and other; and When there is a new or changes to, or out of sequence, work tasks that are classified as high risk construction work.	Subcontractors and other workers including subcontractor supervisors.	Pre-Start record
Toolbox Talks	Subcontractor meeting as required discussing e.g. high risk construction work activities, changes to or out of sequence work tasks that are high risk construction work, alerts and incidents plus changes to legislation and codes of practice.	Subcontractors and other workers including subcontractor supervisors.	Toolbox Talk Record
Project Review meetings	At maximum weekly intervals or as required including upcoming high risk construction work activities, critical and reportable incident outcomes and lessons learnt and management of design or other changes with the potential to significantly affect environment, health and safety.	Project Manager, Construction Manager/Workplace Manager/ Service Providers/ Subcontractors, Client Representative and others.	Minutes of meeting
EHS Committee Meeting / EHS Consultation Group	Weekly meetings as per constitution or other agreed consultative arrangements inclusive of standard agenda item for upcoming high risk construction work activities.	Management representatives / employees, workers, Health & Safety Representative(s) (HSRs).	Notice board(s) Meeting minutes displayed including upcoming high risk construction works. HSRs & Workgroups displayed EHS Committee / EHS Consultation Group members displayed updated and displayed.
Training	Commencement of project; Periodically	Construction Contractor / Subcontractor / Indorama staff	Training plan

APPENDIX 6: PLANT, EQUIPMENT AND PROCESSES INSPECTION AND TESTING SCHEDULE

Item	Inspection by	Inspection/Records/ Other Required
Atmospheric testing and monitoring equipment.	Competent Person	# Prior to each Confined Space entry, #Yearly. **Calibration of equipment required
® Building Maintenance Unit	Competent Person	# Operation and maintenance instruction manual; #pre-operation check; # routine inspection checklist; #maintenance inspection in accordance with manufacturer's logbook.
Concrete Line Pump ® Concrete Boom Pump	Competent Person	# Daily, #Monthly, #Yearly, #6 Yearly.
Confined Space	Competent Person	# Entry permit retained for 1 month, #risk assessment retained for 10 years, #training records for the term of employment.
Crane—mobile<10t ® Crane—mobile>10t ® Crane—tower ® Crane – Self Erecting ® Crane – Gantry >10t	Competent Person	# Daily, #monthly, #yearly, #10 yearly.
Electrical – temporary switchboards and portable electrical equipment	Licensed Electrician	# Indorama Testing Procedure or equivalent
Elevating work platforms ® Boom type EWP	Competent Person	# Daily, #3 Monthly, #yearly, #10 Yearly
Explosive Power Tool	Competent Person	# Daily inspection to the manufacturer's recommendations dismantled and examined for defects weekly, #yearly by manufacturer.
Fire Fighting Equipment	Competent Person	Regular inspection, #6 monthly test; #Where more than 10 extinguishers are installed, details must be kept on a register.
Fixed platforms and stairs	Competent Person	Routine inspection.
Forklift Truck	Competent Person	#Regular inspection & maintenance as per manufacturer.
Formwork	Competent Person	#Regular inspection (Stage 1 – before concrete placement); #Pre-pour checklist; #Independent Engineer's Certificate prior to a pour; #Engineered Drawings for suspended formwork; #Independent Engineer certification back propping
Hazardous Substance Dangerous Goods	Safety Precautions	#Risk Assessment; #Safety Data Sheet; #Register, training.
® Hoist (personnel and materials)	Competent Person	#Daily, #3 monthly, #yearly, #10 yearly.
Laser Level	Competent Person	Warning Signage; **calibration record.
Ladder	Competent Person	When purchased, each time before use, regular intervals. Clearly labelled, e.g. safe working load & industrial use.
® Lifts	Competent Person	#Regular maintenance to manufacturer's specification #Yearly inspection and testing
Lifting Gear Flat synthetic slings Fiber Rope slings Chains	Competent Person	All gear: #Labelled, inspection prior to each use, test certificate to manufacturer's recommendations. #Lifting gear register record of monthly inspection. #Labelled, inspection prior to each use; #monthly, #12 monthly.

Item	Inspection by	Inspection/Records/ Other Required
® Mast-climbing work platforms	Competent Person	#Pre-operation inspection before each use, #3 monthly maintenance inspection, #12 monthly full inspection/service; #major inspection 10 yearly & 5 yearly thereafter; #logbook each climbing drive unit; #logbook for checks, faults, repairs.
Oxy/Acetylene/Flashback arresters	Competent Person	Regular inspection and adequate separation and storage. # Flashback arrester 12 month test #Hoses, gauges and other reticulation items 6 monthly.
Personal Protective Equipment	Competent Person	# Register of Supply
Rope Access	Competent Person	Visual Inspection before each use, # 6 monthly by Competent Person.
Roof safety mesh	Competent Person	#Record of inspection to ensure lapped and tied to Standard.
Safety Harness	Competent Person	Visual Inspection before each use, #6 monthly by competent person.
Safety Lines/fall arrest devices, lanyards (installation)	Competent Person	Visual Inspection before each use, #3 monthly external checks, 6 monthly inspections; #12 monthly full inspection/service.
Safe Work Method Statement	Competent Person	# Record of review by Competent Person # Training or Toolbox Talk Record. # Monitoring by principal contractor to ensure compliance.
® Scaffolding	Competent Person	#Drawing/Elevations; #Handover Certificate, #monthly inspection, Scafftag
Scissor Lift	Competent Person	#Daily, #3 Monthly, #yearly, #10 Yearly.
Swinging Stage	Competent Person	#Handover Certificate, #daily pre-start; #monthly inspection.
Traffic Control	Competent Person	#Traffic Management Plan (Approved)
® Work Box	Competent Person	#Construction and welding inspection & load & stability test. #Yearly re-certification. See 'Lifting Gear'

Key:

® Means items of plant or equipment, which require registration of their design and/or the specific item of plant itself. Plant which requires 'item' registration, i.e. for the specific piece of plant which arrives at a construction project typically; includes: concrete pumps (boom type); mobile cranes > 10 tonnes SWL; tower cranes; air compressors, building maintenance units and boom type elevated work platforms.

(#) Means records required.

** Means calibration of EHS measuring and testing equipment is required in accordance with the requirements

Definition: **Competent Person** for any task means a person who has acquired through training, qualification or experience, or a combination of them, the knowledge and skills to carry out that task.

APPENDIX 7: IMPACT AND HAZARD RISK ASSESSMENT PLAN (Please see next page)

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
1. Exposure of Workers to Project impacts in Construction Phase								
General Facility Design and Operation	<ul style="list-style-type: none">Construction activities	E	X		Mi		<div>1. Prepare and issue the Inclement Weather Mitigation Plan to Employer for review and comment:<ul style="list-style-type: none">Temporary Facilities and Camp will be constructed in safety structure which is provided appropriate protections against the inclement weather conditions.An amount of prefabrication work will be carried out offsite. Construction Contractor shall identify any works to be carried out offsite and describe how it will be managed.Properly provide personal protective equipment (helmet, glasses, gloves, wet-weather clothing, shoes, etc.).Construct adequate surface slopes and drainage ditches to minimize time lost to inclement weather.Prepare pumping system with efficient capacity to pump out rainy water to avoid flooding at the site.Keep the routes from Construction Site to Accommodation Camp safe, clear and open during inclement weather.Properly manage and monitor compliance of safety requirements at the workplace.</div> <div>2. Provide Emergency Evacuation Procedures to ensure the safety for Workers when any risk or hazard happened during the construction. These procedures will be reviewed and updated regularly, and workers will be trained:<ul style="list-style-type: none">Emergency Management Organization.Consider both site and accommodation camp scenarios.Safety signs giving information and instruction about escape routes, assembly points, emergency contact numbers, alarm plans, actions to be taken in an emergency etc. shall be displayed at the offices, meeting rooms.At least two visible emergencies exist for any work area.Firefighting equipment such as fire extinguisher shall be placed as per Fire Hazard Assessment and inspected at least once per month.</div>	HSE Plan & Worksite HSE Plan provided by Construction Contractor.

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<ul style="list-style-type: none"> • Evacuation Interfaces and Communications with key Local Authorities and Agencies. • Regular review and confirmation of the continuing validity of the Emergency Evacuation Procedures, consistent with the Project dynamic. • A Site and Accommodation Camp Audible Alarm System. • Primary and secondary methods of evacuation logistics. <p>3. Supply adequate lavatory facilities that are suitable for the number of workers in the Site to ensure sanitary conditions for Workers:</p> <ul style="list-style-type: none"> • Toilet facilities, showers and wash hand basins shall be provided. Proper and sufficient lights and ventilation shall be provided. • All toilets and other sanitary facilities shall be kept clean and in working order. The floors, walls and ceilings of sanitary conveniences shall be of a finish that can be easily cleaned. • All sanitary conveniences and washrooms shall have window openings to the outside air. • Showers and lavatories shall be provided with an adequate supply of water and liquid soap in dispensing containers shall be supplied to all communal sanitary conveniences. • All waste water including floor washing water shall be connected to a disposal drain. • Men's and ladies' facilities shall be separated. • All septic tank and sewage treatment waste shall be disposed of in accordance with the National Local Standards, Codes of Practice, International Standards, and/or Regulations, whichever is the most stringent. Waste disposal shall only be carried out by a registered/certified Disposal Operator. <p>4. Follow the requirements on drinking water quality standards / Directive on Drinking Water Safety and Environmental Sanitation, to ensure potable water supply for Employees during the construction period.</p> <ul style="list-style-type: none"> • The potable water system is taken directly from the raw water supply line; a small potable water buffer storage tank is 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<p>provided prior to distribution. Chlorination facilities are provided to ensure quality.</p> <ul style="list-style-type: none"> The Potable water supply shall provide the needs of the personnel working in the EPC organization and the site contractors. <p>5. Food preparation areas will be constructed from materials that are hygienic and easily wiped/scrubbed clean. Food preparation areas shall contain the following:</p> <ul style="list-style-type: none"> Floor shall be non-absorbent, non-slip and with minimal joints and crevices in which dirt, bacteria and insects can lodge. Angles and junctions between floor and wall shall be covered; Walls shall be smooth, light in color and durable from floor to ceiling; A ceiling shall be provided which is smooth, fire resistant, light colored, covered at wall joints and easy to clean; A hood shall be fixed over cooking ranges and extractor fan of a suitable size; the food preparation area shall have adequate lighting. The walls, floors and ceilings in all premises where food is stored, prepared, or served shall be of a finish that can be cleaned easily; Equipment or furnishings which come into contact with food, or are likely to come into contact with food, shall be made of materials to which facilitate cleansing, to prevent contamination of food; Doors shall be tight fitting and self-closing. Swing doors shall have sight panels; Food preparation areas shall be fitted with an adequate number of suitable sinks and such sinks shall be provided with a sufficient supply of hot and cold water for the requirements of clean catering; Food preparation areas shall have a pantry for storing day to day items. The storing dry food items or alternatively plastic/metal bins with tight fitting lids shall be provided; 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<ul style="list-style-type: none"> Sufficient refrigerators and freezers shall be provided and temperature monitored to monitor accidental defrosting; Frozen food, especially meat and chicken, shall not be defrosted on sinks or at room temperature; Food shall be stored in such a way as to ensure good stock rotation, viz: "First in", "First Out" practice shall be observed; All dry food shall be stored on benches of at least 30cm height. Metal or plastic bins with tight fitting covers may be used for loose grains, flour, etc. Wooden pallets shall not be used for keeping food off the floor; As far as possible the walls shall be left clear of stored foodstuff. Nothing shall be stored underneath benches; Shelves shall have a non-absorbent clean finishing. Tubular mobile racking made of non-corroding metal is recommended. Cupboards shall be avoided; Cleaning chemicals, detergents, mops and brushes and shall not be kept in food stores; A store shall always be kept in a clean and tidy condition and free of any spillages and pests; Suitable and adequate cold storage and refrigerated equipment shall be provided to keep food stuff as follows: <ul style="list-style-type: none"> Frozen food at -18°C (0°F) Chilled food at -3°C to 1°C (26.6°F to 33.8°F) Refrigerated food from 1°C to 4°C (33.8°F to 39.2°F) It is very important that these temperatures are maintained at all times. All cooked food shall be kept separate from uncooked foodstuff to prevent cross-contamination; Fish and fish products shall be stored in a separate freezer; No smoking shall be allowed in the food preparation areas; Sufficient fire extinguishers in food preparation areas and mess rooms shall be available. Employer shall use Contractors food preparation facilities for the supply of hot and cold meals, snacks, beverages etc. to be taken away and consumed in the Employer mess rooms. 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<p>6. Recognized gangways and access ways must not be blocked unless a clear, safe diversion has been provided. All pedestrian walkways shall be clearly delineated and guarded against moving vehicles and mobile plant, particular attention shall be made at entrances and exits.</p> <ul style="list-style-type: none"> Access ways, roadways, muster points, entrances / exits to buildings, vehicle unloading areas, car parks etc. shall be illuminated during hours of darkness and during inclement weather. Illumination levels shall be 50 lux minimum. Only authorized routes must be used to and from the Worksite. Guardrails or barriers must not be removed until associated hazards and risks are removed. A standby guard shall be positioned to warn others of the temporary removal of guardrails or barriers Only suitable, sound and properly maintained access equipment shall be used to reach work positions. No road shall be closed off without agreement from the Contractor and the issue of a road closure permit. <p>7. Construction Site vehicular and pedestrian traffic shall be separated to avoid the potential for traffic accidents. Provision for bus drop-off and pick-up areas shall be provided adjacent to the main construction Site access for the mass transport of labor. The Site Traffic Plan shall ensure the efficient movement of vehicular and pedestrian traffic at peak periods.</p> <p>8. Provide professional medical staff, including paramedics and a fully equipped ambulance capable of responding to, and dealing with, critical medical emergencies. Contractor shall present details of the health risk assessment and plans for medical facilities, Personnel, equipment, supplies and proposed occupational and environmental health program to the Employer for Approval prior to commencement of any activities on the Worksites.</p> <ul style="list-style-type: none"> Guidance for medical Personnel is one advanced First Aid staff per 50 workers. Medical resources provided by the Contractor shall align with the applicable standards for local medical support services. 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<ul style="list-style-type: none"> • Waiting / reception area, consultation / examination area, treatment area, sick bay / observation area, sanitary facilities, secure storage for drugs and medical equipment and confidential storage of medical records; • Comprehensive list of medical equipment and supplies necessary to provide first aid, immediate treatment and stabilization of major illness and injury arising out of or during the course of the Works. At a minimum this shall include a bed, stretcher, chair, table, heating, lighting, sink with water supply, cabinets, and first aid equipment including a portable defibrillator. • Medical Oxygen shall be provided if any asphyxiation gas such CO2 or nitrogen is used in the Works; • Detailed inventory of medicines and drugs. • Plans for medical transport/evacuation of injured or ill Personnel including detailed specifications for a dedicated ambulance and arrangements for ongoing care. <p>9. Provide the following minimum First Aid Facilities:</p> <ul style="list-style-type: none"> • A first aid treatment room that shall be equipped with a bed, stretcher, chair, table, heating, lighting, sink with water supply, cabinets, and first aid equipment including a portable defibrillator. • First Aid boxes for emergency use only. Contractor shall supply a sufficient number of First Aid boxes to suit the size of the workforce, and locate them in close proximity to the work areas. • Ensure that at least 1 in every 50 of his employees is trained in First Aid. First Aiders shall be competent people, trained in First Aid at Work. Principal First Aiders shall have attended a 4 day course resulting in the award of a First Aider at Work Certificate. <p>First Aiders shall be recognized by posted photographs, detailing name, location, company and contact number. First Aider's safety helmets shall have a self-adhesive green cross sticker affixed to each side. First Aiders high visibility jacket or vest shall also have a green cross on the back.</p>	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
Communication and Training	Workforce	E	X			Mi	<p>1. Ensure that all Personnel attend an HSES induction course prior to accessing the construction site.</p> <p>2. Provide interpreters to assist when inductions are held for non-English speaking Personnel.</p> <p>3. Subjects to be covered in the HSES induction course shall include, but not limited to the following:</p> <ul style="list-style-type: none"> • The nature and overview of the Worksite and the Works • Locations of facilities, offices, toilets, eating area, parking area, smoking area, etc. • Overview of hazards and risks – Project and Worksite specific • Overview of risk assessment and method statements • Emergency Evacuation Procedures (siren/alarm plan, escape routes and exits, assembly points, first aid providers) • The locations of first aid kits, medical facilities, firefighting equipment and safety shower equipment, etc. • Traffic & Driving rules • Basic PPEs, minimum site requirements and legal considerations • Site security and access rules • Reporting of incidents (especially, Near-Miss Reporting) • Fire Prevention and Suppression • Control of Work / Permit to Work Systems including lockout and tag out system • Drug and Alcohol Policy • Environmental requirements • Overview of behavioral safety program • Housekeeping <p>4. In addition to the basic HSES induction, all Contractor and Subcontractor supervision shall attend a further induction. Subjects covered in this induction shall be:</p> <ul style="list-style-type: none"> • Risk assessment and management (TRA, JSA) • Conducting Tool Box Talks or team talks • Accident/incident investigations • Behavioral safety program (SOC's or equivalent) 	HSE Plan & Worksite HSE Plan provided by Construction Contractor.

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<ul style="list-style-type: none"> • HSES Inspection • Permit to work (administration) • HSES Plan/HSES Instructions • HSES Management System <p>5. Develop and implement the following measures applied for visitors to the Worksite:</p> <ul style="list-style-type: none"> • All visitors to the Worksite shall require the approval of Contractor Construction Site management. • Contractor shall ensure that any visitors receive an HSES briefing prior to entering any Worksite, meet all aspects of applicable Worksite HSES rules and are escorted at all times by a responsible person from the Contractor. The safety briefing shall include at a minimum key HSES expectations, location of muster points and types of emergency siren. • Any visitor on the Worksite for longer than one day shall undergo a formal safety induction. • Contractor shall ensure that all visitors shall be given an information card or leaflet stating the Worksite HSES rules and that visitors shall be provided with basic safety equipment - helmet, safety shoes, safety glasses/spectacles etc., and additional safety equipment shall be provided based on hazards associated with the location to be visited. • All visitors shall register with security and obtain a visitor's pass before entering the Worksite. This pass shall be worn at all times and returned upon completion of the visit. • Contractors' host shall ensure that visitors comply with all site safety rules and that visitors are accompanied by the host all the time. <p>1. Comply with all notices on Worksite:</p> <ul style="list-style-type: none"> • Ensure that all necessary barriers, warning signs and notices are posted at prominent locations around the Worksite. • Such signs and notices shall include, but not be limited to, the following: <ul style="list-style-type: none"> - 'DANGER' - 'NO ENTRY' 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<ul style="list-style-type: none"> - 'RESTRICTED AREA' - 'NO SMOKING' - 'NO NAKED LIGHT' - 'DANGER HIGH VOLTAGE' - 'X-RAY IN PROGRESS' - 'TOXIC SUBSTANCE' - 'HYDROTEST IN PROGRESS' - 'EYE PROTECTION AREA' - 'HEATING PROTECTION AREA' - 'NO MOBILE PHONES' • All signs and notices displayed at the Worksite shall be in English language. It is the responsibility and obligation of any Personnel entering the Worksite to abide by warnings. • All signs and notices shall be sufficiently large to be seen by Personnel and shall be composed of robust, durable, high visibility material. • Posters, notices and HSES Policies shall be posted in key locations around the Worksite to maintain safety awareness. HSES bulletins shall be issued to inform Personnel about particular issues and about progress in achieving objectives, results of inspections and accident investigation findings. 	
Physical Hazards	High density of earthmoving construction equipment Noise working at height, scaffolds	E	X		Ma		1. Develop and implement procedures to prevent and control the impacts of risks and hazards from Moving Equipment and Noise: <ul style="list-style-type: none"> • Develop a traffic management system to reduce the risk of accidents such as segregating the location of vehicle traffic, speed limits, one-way traffic routes, etc. • Ensure the visibility of personnel when working in or walking through heavy equipment operating areas as well as training workers to verify eye contact. • Ensure that the moving equipment have audio/visual alarms. • Inspect and well-maintain lifting devices such as cranes. • Contractor shall advise the Employer if they anticipate excessive noise levels from their work so that all reasonable 	HSE Plan & Worksite HSE Plan provided by Construction Contractor.

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<p>practicable precautions should be done to protect Personnel who may be affected.</p> <ul style="list-style-type: none"> Where noise levels from works exceed 85 db(A), all Personnel involved in the works shall be supplied by the Contractor with suitable, approved hearing protection. <p>2. Develop and implement procedures for ensuring the regular inspection and the safe use of electrical tools and equipment. Electrical equipment includes all fixed, portable and transportable mains and battery operated equipment.</p> <ul style="list-style-type: none"> All temporary electrical installations for Site power distribution shall comply with Local National as well as International Standards, Codes and/or Regulations. High voltage installations shall be safe and secure from the general workforce, with adequate warning signs. Temporary Power Generation and Sub-Stations installations shall be Fit-for-Purpose and suitable for safe operation under extreme wet weather conditions likely to be experienced during the monsoon season. Contractor proposals shall be submitted to Employer for approval prior to commencing any Site temporary electrical installation work. All Equipment must be treated as 'LIVE' unless isolated/locked off and tagged. Repair or installation of any electrical equipment must only be carried out by a competent qualified electrician. The electrical supply to powered hand tools must not exceed 220volts, center tapped giving 55volts to earth. Where this is not possible, due to the type of tool being used, the written Approval of the Employer must be sought. Electrical lighting for use in confined spaces must not exceed 24 VDC. Powered hand tools used in confined spaces should, where possible, be air operated. Unprotected "naked" lamps must not be used for temporary or permanent lighting. Stress-relieving heating apparatus shall be suitable solely for connection to the output terminals of welding sets. 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<ul style="list-style-type: none"> • Portable generators must be earthed via earth roads or structural steel. • Carry out inspection of electrical cables and equipment before they are bought onto the Worksite. Any defective electrical cables or equipment shall be replaced or rectified immediately. • Those electrical items that comply at the time of inspection shall be given a certificate and a label and added to an Electrical Equipment Inspection Report. <p>3. Develop and implement procedures to prevent and control the impacts of Eye Hazards:</p> <ul style="list-style-type: none"> • General eye protection in the form of safety spectacles shall be worn by all persons at all times at the Work Site. General eye protection shall meet either BS, AS, DIN, or ANSI standards and shall be fitted with side shields. No shaded lenses shall be worn in areas of limited light, i.e. on night shift, or within buildings. • Additional eye protection for operations such as welding, burning, grinding, etc, shall meet either BS, AS, DIN or ANSI standard. Where full face visors are supplied, they shall be capable of being fitted to the safety helmet. • When a chemical is involved, safety goggles for chemicals, face shield shall be used. Wearing of Eye Protection shall be mandatory throughout the complete construction Worksite including all Contractors On-Site and Off-Site construction facilities. <p>4. Develop and implement procedures to prevent and control the impacts of risks and hazards from Hot Work. Hot work includes but is not limited to burning, welding, grinding and heat treatment:</p> <ul style="list-style-type: none"> • An adequate number of suitable dry powder fire extinguishers shall be located within close proximity to hot work areas. • In areas of high fire risk a dedicated trained fire watcher shall be positioned at the Worksite or risk area. • All slag and sparks must be contained by fire retardant/fire resistant sheeting within the immediate work area. • Temporary fabrication shelters/habitats must be of flame retardant material. 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<ul style="list-style-type: none"> Welding and burning on certain materials may give rise to hazardous fumes. In certain areas local exhaust ventilation shall be used as agreed between the Contractor and the Employer. In other more open areas respiratory protective equipment shall be worn. Hot work shall not be carried out in office or accommodation areas. Fire extinguishers shall be furnished near and/or under the hot work locations. All flammable materials and debris near and/or under any hot work, such as welding, gas cutting, etc., shall be removed or replaced with noncombustible materials. The person responsible shall always inspect and confirm the work place and conditions whether there is no fire hazard during the work or no remaining fire source after the work. Only proprietary welding blankets shall be used for welding activities. <p>5. Develop and implement procedures to prevent and control the impacts of risks and hazards from Welding:</p> <ul style="list-style-type: none"> Welding sets shall be in good condition, properly maintained, and earthed. Isolation switches on welding sets shall be readily accessible. Terminals and live components shall be adequately protected. Cables shall be frequently inspected to ensure the insulation is intact. Damaged cables or electrical holders shall be properly repaired or replaced. The welding return cable shall be secured onto the work piece. If this is not practical it shall be as near as possible. Proper cable connectors shall be used when connecting runs of cables. Welders shall wear: <ul style="list-style-type: none"> -Face and eye protection with correct grade of filter. 	

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			C	O	ST	LT		
							<p>-Welders' gauntlets. Long sleeved flame retardant overalls.</p> <ul style="list-style-type: none"> Welders shall wear safety helmets at all times, except whilst welding, when it is agreed as impractical, and written permission is granted by Employer subject to mitigation of hazard, i.e. no Works overhead, or shielded from falling objects. Welding areas shall whenever possible be screened off using flame retardant blanket or other suitable material. <p>6. Establish some HSE procedures on Scaffolds to reduce the number of slip and fall:</p> <ul style="list-style-type: none"> Scaffolds shall be inspected at weekly intervals, or after severe weather conditions, or after any event that may affect the integrity of the scaffold, by the authorized scaffold inspector who shall sign and date the "scaffold tag" after each inspection. Scaffolding not considered safe shall have the scaffold tag withdrawn and a prominent "DO NOT USE" sign displayed. All findings and inspections shall be recorded in the Contractors' scaffold inspection register. Scaffolding must not be disturbed or altered by any unauthorized persons. Where alterations are required by the Contractor, they must contact the Authorized Scaffolders who will carry out the work under competent supervision using experienced Scaffolders. Where materials are to be positioned on scaffolding the Contractor supervision must ensure that the scaffolding is not overloaded. Contractor shall install material guards to the scaffolding when storing materials. A scaffold register shall be kept by the authorized Scaffold Inspector. This shall contain: <ul style="list-style-type: none"> Date of first and subsequent weekly inspections. Individual identifications of all scaffolds which shall be cross referenced to the Scaffold Tag identity number. Clear name and signature of the authorized scaffold inspector against each separate scaffold inspected. Details of any defects and corrective actions taken. 	

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							<ul style="list-style-type: none"> No scaffold may be erected which impedes normal access or can be accidentally struck by moving plant. Contractor shall not erect or carry scaffolding near live overhead electrical cables, or equipment because of the danger of tubes making accidental contact with electrically charged apparatus. If there is any doubt about the security of any anchorage, suspension points or ties for a scaffold e.g. strength of existing buildings/structures, or those under construction, the Contractor shall be consulted before proceeding with erection. All scaffolds must be provided with suitable access and where ladders are used for this purpose they must be of an adequate length and properly secured by lashing or fixing to prevent displacement. Action shall be taken to warn personnel against using partly erected or dismantled scaffolds. A prominent "DO NOT USE" sign shall be clearly displayed. Rolling scaffolds shall not be constructed with a height greater than 3 times the minimum base width and shall only be used on level ground. Mobile Elevating Work Platforms shall only be operated by approved, trained operators. <p>7. Establish HSE procedures on Ladders to reduce the number of slip and fall:</p> <ul style="list-style-type: none"> Only CE marked industrial Class 1 & 2 ladders and step ladders or International Standard equivalent shall be used on Site. Site assembled ladders of nailed timbers construction shall not be permitted. Ladders must be in good condition and free from defects i.e. broken rungs, split stiles. Ladders must not be painted. Ladders must: <ul style="list-style-type: none"> Be securely fastened at the top. Be properly positioned at the base. Extend at least 1m above the working platform. 	

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							<ul style="list-style-type: none"> – Be at an angle of 300mm (1') out for every 1.2m (4') vertical drop. • Ladders and step ladders used by electricians (and others working in close proximity of live electrical installations) shall be non-conductive (fiberglass). <p>8. Establish some HSE procedures on Steel Erection to reduce the number of slip and fall.</p> <ul style="list-style-type: none"> • The weight of each component in excess of 500Kg shall be clearly marked with the weight. • Erectors must be fully informed of the correct erection sequence, by their supervisor, prior to each stage of work commencing. • Vertical access provision should whenever possible be fixed to the steel before it is lifted into position. Where this is not possible permanent access i.e. stairways, permanent metal ladders shall be installed as early as possible. • Where horizontal access along structural members is required as much work as possible must be completed before the steel is lifted into position. • Where scaffold tubes (needles) are used they shall not support a working platform wider than three boards, or one lightweight staging without being "picked up" (raked back). • Where no ladder access, permanent stairway, etc, leads onto working platforms, as described above, employees shall use man riding baskets or powered access equipment. <p>9. Develop and implement procedures for any diving works for Working over water conducted for The Project:</p> <ul style="list-style-type: none"> • Provide barriers and any other protective measures to prevent Personnel from falling into water. This shall include for work associated with the cliff strengthening and coastal path. • Provide buoyancy aids to all Personnel working over (or near) water where there is a likelihood of falling in and drowning. • Supply a sufficient number of life buoys to be permanently located at the point(s) of danger. The life buoys shall be attached to a throwing line. 	

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							<ul style="list-style-type: none"> Where rescue, of a person falling into the water, a standby boat crewed by competent boatman, trained in rescue and resuscitation techniques shall be provided. Any requirements concerning need to warn fishermen or shipping of diving activity such as flying of flags and use of other signals shall be provided. <p>10. Good housekeeping (excessive waste debris, loose construction materials, liquid spills, etc) will be a proper measure for safety, whereby:</p> <ul style="list-style-type: none"> Common areas for which Personnel have access to such as lockers, toilets, mess rooms and washrooms shall be maintained in clean and good sanitary conditions at all times. All areas shall be kept free from litter and general refuse at all times and waste skips and garbage bins with suitable covers shall be provided at designated locations. Cleaning up regularly excessive waste debris and liquid spills; all waste disposal points shall be maintained and cleaned regularly. All staircases, passageways, corridors and emergency escape routes shall be kept clear at all times. No materials, finished products, aggregates, plant and construction materials shall block emergency exits or other means of escape at any time. Trade waste shall be promptly removed from the Worksite on completion of the pertinent tasks. Tools shall not be stored on the floor or any location that could potentially cause an accident. All lighting and ventilation facilities shall remain unobstructed at all times. Locating electrical cords and ropes in common areas and marked corridors. Using slip retardant footwear. Putting barriers around deep excavation areas (more than 1.2m depth). Holes in floors should be guarded, and covered. Cover shall be secured and marked "HOLE BELOW". 	

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							<p>11. Develop/implement the following procedures to prevent Struck by Objects.</p> <ul style="list-style-type: none"> • Safe handling of waste material from upper to lower levels using a designated and restricted waste drop or discharge zones, and/or a chute; • Avoid driving heavy equipment over loose scrap by clearing traffic ways; • Prevent materials from being dislodged such as construction materials by using temporary fall protection measures; • Evacuate work areas during blasting operations; • Wear appropriate protective equipment (safety glasses with side shields, face shields, hard hats, and safety shoes). <p>1. Develop and implement a construction phase Traffic & Parking Management Plan:</p> <ul style="list-style-type: none"> • The Traffic Management Plan shall be taken into consideration to reduce to a minimum potential traffic hazards and risks due to labour and equipment/material movements required for the Works and the impact that will have on increased vehicle accident potential and possible obstruction of the site access for emergency vehicles movement. Other sources of traffic movements due to neighboring facilities and activities in the region shall be also taken into consideration: • The Traffic & Parking Management Plan shall cover road traffic management measures within the Construction Site, road traffic management and mitigation measures outside of the Construction Site and any sea traffic management and mitigation measures. <ul style="list-style-type: none"> – Competency audits shall be conducted on drivers. – Drivers shall accept responsibility for the condition of their vehicle; – Drivers of passenger-carrying vehicles shall be suitably qualified for this type of vehicle and for carrying large numbers of Personnel; – Only licensed, trained, insured, authorized and medically fit Personnel are allowed to drive vehicles; 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
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							<ul style="list-style-type: none"> - Ensure that driving shall not be allowed under the influence of alcohol, drugs or in condition of fatigue, tiredness, etc. - Ensure that safe traffic regulations including parking area, pedestrian routes, barriers, signs, speed limit, height limit, etc. are planned well and strictly implemented; - Only authorized vehicles are permitted to enter the worksite. Motorcycles shall be limited; - Only parking and stop at authorized locations to prevent all foreseen blocks and accidents. • Contractor shall consider the logistics of the mass transport of personnel to and from the Work Site in order to minimize the impacts that such large movements shall have on the overall efficiency of Site construction operations. • Contractor shall monitor Personnel who commute to work on a daily basis and check for signs of fatigue. Contractor shall advise what mitigating measures shall be taken in the event of his workforce showing signs of fatigue. <p>2. Besides implementing controls work processes, following mitigation measures should be used in order to deal with over-exertion:</p> <ul style="list-style-type: none"> • Training workers how to use the equipment (lifting and materials handling techniques, and placement of weight limits) in construction activities. • Minimizing the need for manual transfer of heavy loads by the plan of work site layout. • Selecting tools & designing work stations to reduce force requirements and holding time. <p>3. Set the procedures working at Height, including scaffolding Personnel Protective Equipment, Safety Manuals and Rules for Working, Mobile Cranes and Lifting Equipment, etc.</p> <ul style="list-style-type: none"> • Train workers on how to correctly apply the fall prevention devices anywhere that involves risks as well as to use personal fall arrest systems; • Use control zones & safety monitoring systems to protect workers in all hazard zones. 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
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							<ul style="list-style-type: none"> Any work which results in openings being created where persons can fall through, or removal of side walling/barriers where persons can fall from must be effectively protected to prevent injury and will require a detailed method statement, work permit and designated supervisor. Crawling boards must be used when working on fragile or sloping roofs where personnel can fall through or from the roof. Fall protection barriers must be erected around all roofs, before work commences. Fall protection shall be mandatory when working above 2 meters (6 feet) in height unless a fixed platform is used with guard or hand rails verified by a competent person. Safety netting shall only be considered as protection against dropped objects and not for personal fall protection. All Personnel shall wear an approved full body harness and shock absorbing double lanyard when exposed to fall hazards. Personnel shall make maximum use of primary fall protection systems such as scaffolds, aerial lifts, hoists, etc. These systems shall be equipped with complete working / walking surfaces free of floor openings, standard guard rail systems and a safe means of access. Fall protection devices such as lifelines, safety harnesses / lanyards shall be inspected on a regular basis for damage and deterioration. Defective equipment shall be removed from service and destroyed. Fall protection devices subjected to shock loading imposed during fall arresting shall be removed from service. 	
Influx of Workers	Influx of workers and other economic migrants to the area	E	X		Ma		<ul style="list-style-type: none"> Workers should have health checked before entering work in construction site, especially for workers who will do hard work or work in dangerous places; Provide the accommodation camp with adequate water supply, waste management and drainage infrastructure; Provision of medical facilities and qualified medical Personnel; 	HSE Plan & Worksite HSE Plan provided by Construction Contractor.

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
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							<ul style="list-style-type: none"> • Pre-placement and periodic fitness assessment of Personnel (including special groups such as food-handlers and those employed in safety sensitive positions); • Provision of emergency medical treatment and primary care; • Control of environmental health risks associated with potable water supplies, sanitation, food hygiene and communicable diseases; • A strictly enforced policy on drug and alcohol abuse; • Planned health inspections; • Maintenance of health records, including results of workplace monitoring and the occurrence of both occupational and non-occupational disease; • Periodic inspection of workers accommodation sanitation conditions; • Records of training of workers and awareness campaigns for local community; 	
Exposure to Non-infectious Disease	Stress may be caused by hard work Alcohol and drug abuse and viol Occupational illness	E	X		Ma		<ul style="list-style-type: none"> • Ensure adequate social and recreational provision for workers; • The health care provision for workers should include detailed guidelines; • Provide an effective health education program suitable entertainment and leisure facilities (e.g. organized sports); • Provide high quality occupational health care to cover the possibility of staff becoming too ill to continue in their employment; • Support public health education programs for workers; • Provide and enforce a code of conduct for workers. 	HSE Plan & Worksite HSE Plan provided by Construction Contractor.
Exposure to Infectious Disease	Respiratory Illnesses Vector-borne Diseases Sexually Transmitted and Related Illnesses Gastrointestinal	E	X		Mo		<ul style="list-style-type: none"> • Workers should have a health check before entering work on the construction site, especially for workers who will do hard work or work in dangerous places. • Provide accommodation camps with adequate water supply, waste management and drainage infrastructure. • Provide periodic health checks for all workers as required in Nigerian Labour Law in order to detect any occupational 	HSE Plan & Worksite HSE Plan provided by Construction Contractor.

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
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	Illness						<p>diseases or infectious disease that may occur during construction work.</p> <ul style="list-style-type: none"> • Provide appropriate medical treatment. • Provide workers with all the necessary training on health protection, potential of occurring and spreading infectious disease and how to react to infectious diseases. • Measures to improve food hygiene, water quality, sanitation and waste storage in order to reduce the risks of gastro-intestinal illnesses. • Set up a catering management plan and inspection scheme for site catering facilities. • Propose to local authorities to vaccinate domestic dogs. • Provide a barrier between construction sites and worker accommodation camps. • Provide training and conduct awareness raising campaigns for workers. • Conduct a needs analysis to determine current levels of understanding of HIV/AIDS issues among company management and staff; • Educate workers on HIV/AIDS and other sexually transmitted diseases; • Develop, test and introduce appropriate training materials for managers and employees; • Provide basic medical care at worker's camps. 	
Radiological Hazards	NDT (Non-destructive Testing) for tank, bullet, etc. RT (Radiographic Testing), PT (Liquid Penetrant Testing), MT (Magnetic Particle Testing)	E	X		Mo		<ul style="list-style-type: none"> • Handling and using radioactive sources should strictly comply in accordance with Local legislation: Radiography areas are clearly marked using barrier tapes, notices and flashing lights. • Audible warning (horns) must be sounded before a source is exposed. • Only Classified workers are engaged in radiography work. • All other personnel are clear of the area before radiography takes place. • Radiography work is supervised by a Qualified Radiation Protection Advisor. 	HSE Plan & Worksite HSE Plan provided by Construction Contractor.

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
	and UT (Ultrasonic Testing).						<ul style="list-style-type: none"> Any incidents which may have resulted in over-exposure of any personnel shall be brought to the attention of the Employer for investigation. A written emergency procedure is to be followed in the event of the loss of an isotope or damage or malfunction of associated equipment. This procedure must be submitted to the Employer for approval before commencement. Radiography is carried out only out of the Worksite working hours and that notification is received 24 hours in advance. During Commissioning activities the notification period shall be extended. A valid permit to work must be available. Contractor shall erect notice boards, in prominent positions, prior to the commencement of radiography that shall state the following: <ul style="list-style-type: none"> + Warning! Radiography taking place + Source type and yield + Date and time of shots + Location + Name of operative and contact number + Name of Radiography Senior Person (RSP) and contact number + Contact number of Radiography Protection Agency (RPA) + Emergency contact number for the Contractor Contractor who is not involved in radiography work must ensure that Work Force observe warning signs, alarms and barriers in use where such work is being carried out. Contractor who carries out radiography on the Worksite or off-site must comply with safe systems of work. 	
Personal Protective Equipment (PPE)	Workplace	E	X	X	Mi		<ul style="list-style-type: none"> Develop and maintain a PPE procedure which shall cover the details on how to select, use, inspect and dispose various PPEs. A list of PPEs by each key activity shall be developed as part of Method Statement for each work. Ensure that all Personnel are provided at no charge with all necessary protective equipment and that all Personnel properly wear and store such equipment. 	HSE Plan & Worksite HSE Plan provided by Construction Contractor.

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							<ul style="list-style-type: none"> • All Worksite personnel shall wear the following PPE as a minimum requirement (additional / supplementary PPE shall be worn to suit specific needs as per hazards involved): <ul style="list-style-type: none"> ○ Safety helmet ○ Safety boots ○ Overalls with high visibility straps ○ Eye protection ○ Gloves (Where appropriate) ○ Ear protection (to be carried on the person and used where necessary) • In addition to above, additional PPEs shall be donned by Contractor Personnel as per Material Safety Data Sheet (MSDS) and Risk Assessment. • Ensure that personal protective equipment is properly maintained in good order and replaced at no charge when defective, or lost. • Contractor shall include PPE requirements in Worksite Induction and Safety Training Program. Also, PPE compliance shall be audited periodically. • Personnel shall wear the personal protective equipment required, disciplinary action shall be taken against Personnel not doing so, and where appropriate, their line supervision. • All protective equipment shall be fit for purpose and be comfortable. The use of worn, broken, unusable, or non-standard PPE is not acceptable. • Recommended measures for use of PPE in the workplace include: <ul style="list-style-type: none"> ○ Active use of PPE if alternative technologies, work plans or procedures cannot eliminate, or sufficiently reduce, a hazard or exposure ○ Identification and provision of appropriate PPE that offers adequate protection to the worker, co-workers, and occasional visitors, without incurring unnecessary inconvenience to the individual ○ Proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE should be part of the recurrent training programs 	

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							<p>for Employees. Selection of PPE should be based on the hazard and risk ranking described earlier in this section, and selected according to criteria on performance and testing established by recognized organizations.</p> <ul style="list-style-type: none"> • Safety Helmets <ul style="list-style-type: none"> ○ Shall meet either BS, AS, DIN or ANSI standards and shall be fitted with a chin strap. ○ The safety helmet should be color coded to identify the following: <ul style="list-style-type: none"> – Employer – Contractor supervisory staff – Contractor workforce – Contractor Scaffolders – HSES reps and First Aiders – Visitors and “New Starts” ○ All safety helmets shall bear the Contractor logo (self-adhesive sticker) on the front of the safety helmet. ○ Safety helmets for First Aiders shall bear a green cross (self-adhesive sticker) on both sides of the safety helmet. ○ Contractor shall note that the wearing of Safety Helmets shall be mandatory throughout the complete Refinery construction Worksite including all Contractors On-Site and Off-Site construction facilities. • Safety Boots <ul style="list-style-type: none"> ○ Shall be to either BS, DIN, AS or ANSI standards. They shall have steel toe caps enclosed within the boot i.e. not on the exterior of the boot and have adequate ankle support. ○ Where Wellington boots are required i.e. pouring concrete, they shall be to BS, DIN, AS or ANSI standards and shall have steel toecaps enclosed within the boot. ○ Boots shall be discarded if the steel toe cap becomes visible. ○ Contractor shall note that the wearing of Safety Boots shall be mandatory throughout the complete Refinery 	

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							<p>construction Worksite including all Contractors On-Site and Off-Site construction facilities.</p> <ul style="list-style-type: none"> • Overalls <ul style="list-style-type: none"> ○ The wearing of loose clothing on the Worksite is not permitted. Within the Worksite fire retardant overalls must be worn. ○ Contractor shall advise the color of the overalls to be worn by Personnel. Contractor shall also advise how the various trade disciplines will be easily visually recognizable (color of overalls). Contractor shall advise how the supervision shall be easily visually recognizable. ○ Overalls shall bear high visibility straps (front, back, arms, and legs). Otherwise, another high visibility jacket shall be donned by all Personnel. • High Visibility Clothing <ul style="list-style-type: none"> ○ Coverall shall bear high visibility straps. ○ Otherwise, high visibility jackets or waistcoats shall be worn at all times whilst on the Worksite. Waistcoats shall conform to EN471 Class 2, and jackets shall conform to EN471 Class 3. ○ Banks men and riggers shall wear high visibility orange color tabards. Contractor shall note that the wearing of High Visibility Clothing shall be mandatory throughout the complete Refinery construction Worksite including all Contractors On-Site and Off-Site construction facilities. • Gloves <ul style="list-style-type: none"> ○ General purpose gloves shall be to either BS, DIN, AS or ANSI standards. They shall have canvas backs and leather hide palms. ○ Welders gauntlets shall be to either BS, DIN, AS or ANSI standards. ○ Rubber, vinyl or nitrile coated gloves, which should be compatible with chemical being handled, issued to Contractor Personnel using hazardous substances shall meet either BS, DIN, AS or ANSI standards. The type of 	

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			C	O	ST	LT		
							<p>glove, appropriate to the substance being handled shall be detailed exactly in the Method Statement.</p> <ul style="list-style-type: none"> ○ Contractor shall note that the wearing of Gloves shall be mandatory throughout the complete Refinery construction Worksite including all Contractors On-Site and Off-Site construction facilities. • Hearing Protection <ul style="list-style-type: none"> ○ Shall consist of disposable ear plugs, ear insert plugs or ear muffs which meet either BS, DIN, AS, or ANSI standards. Attenuation characteristics shall be sufficient to reduce noise levels to below 85 dB(A). • Respiratory Protection <ul style="list-style-type: none"> ○ Respiratory protection equipment must be suitable for the hazard presented by the Works i.e. the potential health problem which could arise. Disposable respirators for nuisance dusts shall comply with either BS, DIN, AS or ANSI standards and shall have a protection factor of at least 10. ○ Respiratory protective equipment for other types of Works i.e. paint spraying, welding galvanized steel, or using other toxic materials, shall be detailed exactly in the method statement. All such RPE shall comply with either BS, DIN or ANSI standards. ○ A test and maintenance schedule shall be put in place for RPE, as required (e.g. BA sets). • Safety Harnesses and lifelines <ul style="list-style-type: none"> ○ Where it is not practicable to provide a standard working platform safety harnesses shall be worn. When working on open steel or erecting/dismantling scaffolding a securely attached safety harness and where appropriate an inertia reel shall be used. ○ Safety harnesses and lifelines, which shall be fitted with snap hooks with locking mechanism, must be approved to BS or ANSI standards and be properly maintained and regularly inspected at monthly intervals. A record of such inspection shall be kept by the Contractor. 	

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							<ul style="list-style-type: none"> Where safety lifelines are not adequate an inertia reel shall be supplied by the Contractor. Six monthly examinations of inertia reels shall be carried out by an independent examiner in addition to the normal monthly checks carried out by the Contractor. Color coding on inertia reels shall be as per lifting equipment. Contractor employees shall not move a distance of more than 3m (10') horizontally away from the inertia reel secure anchorage point. Double lanyards shall be used. Safety belts are not acceptable. Inertia reel shall be to either BS, AS, DIN or ANSI standards. Inertia reel lanyards and webbings shall be made from manmade fibers (natural fibers are not allowed). 	
Confined Space	Paint spraying Preheating (naked flame) Welding Arc air gouging Use of cleaning fluids (solvents) Abrasive blasting	E	X	X	Mi		<ul style="list-style-type: none"> All workers should receive training before entering to work in a confined space; Permits to work will be applied to all workers, supervisor, etc; Use safety precautions (such as self-contained breathing apparatuses, life lines and safety watch workers station with rescue and first aid equipments); Ensure the availability and adequacy of PPE. 	HSE Plan & Worksite HSE Plan provided by Construction Contractor.
2. Exposure of Workers to Project impacts in Operation Phase								
Chemical hazards	New Fertilizer Plant	E		X		Mi to Ma	Reduce Event Likelihood: <ul style="list-style-type: none"> Ensure that the design specifications for all plant include performance standards such that plant failure, and thus hydrocarbon release scenarios, will be minimized through design. Reduce the hazard magnitude through the installation of gas (toxic and flammable) detectors with emergency shutdown (ESD) systems within the critical hazard locations. Emergency shutdown valves to be located outside fire impact zone. If the valve is located inside a 	Loss Prevention Philosophy Emergency Plant Isolation Philosophy HSE Plan

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							<p>fire/explosion zone then fire proofing is necessary to provide protection for a specified period of time in line with API 2001.</p> <ul style="list-style-type: none"> Minimize the presence of ignition sources around the process units Where possible, consider leak point minimization for all equipment (e.g. welded, rather than flanged pipe connections, fail safe valves, spring loaded manual valves, flange covers) Implement a risk-based inspection (RBI) and maintenance process such that the plant items that pose the greatest risk to the plant receive the greatest levels of inspection and maintenance Toxic and vapour cloud events, generally leave the site periphery it is suggested that a plan will need to be in place to alert the populations to either end of the plant limit in the event of a site incident. Such measures will form part of the Site Emergency Response Plan which is to be detailed during the detailed design. Emergency procedures should be put in place and followed if a leak is detected. Good procedures and training for emergency response are essential. <p>Reduce Vulnerability:</p> <ul style="list-style-type: none"> Reduce the vulnerability of the building occupants through the avoidance of windows within buildings located within the process areas. <p>Explosion Recommendations:</p> <ul style="list-style-type: none"> Reduce the vulnerability through relocation of road, provide a barrier between road and plant (not always effective for blast but prevents missiles) and reduce congestion near the site boundary. For buildings with cloud fire frequency $>1E-4$ p.a., positive pressurization and double doors should be provided in the building. LEL detection should also be incorporated into the ventilation inlets & automatically shut down the ventilation system providing alarms on LEL detection For buildings with cloud fire frequency between $1E-4$ & $1E-5$ p.a. self-closing doors with gas tight seals should be provided in addition to LEL detection in the ventilation inlets providing automatic shutdown of the ventilation system and alarms on LEL detection. 	

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							<ul style="list-style-type: none"> For Buildings with cloud fire frequency between 1E-5 & 1E-6 p.a., self-closing doors with gas tight seals and LEL monitors alarms and manual HVASA shutdown should be provided. Buildings should be designed to withstand the 10-4/yr explosion overpressure as a minimum <p>Fire Recommendations:</p> <ul style="list-style-type: none"> Reduce the vulnerability of the buildings to flammable gas ingress through the implementation of flammable gas detection and dampers on the HVAC inlet ducts, self-closing doors with gas tight seals and LEL monitors, alarms and manual HVAC shutdown should be provided. As given for explosion. Reduce risk to building occupants from fire by ensuring building has safe refuge areas in case of fire and /or the building has adequate fire proofing. Reduce BLEVE risk by insulating vessels, improve depressurization and vessel deluge. Depressurized the leaking section using blow down system. <p>Toxic Recommendations</p> <ul style="list-style-type: none"> The ERPG contours are based on gas dispersion modeling for free field flat terrain. Simple consequence assessment models used in QRA are not appropriate for dealing with complex terrain especially for near field effects. It is recommended that a Computational Fluid Dynamics based H₂S dispersion study should be undertaken in the detailed phase of the design to ascertain the toxic risks and if there are any specific areas where high H₂S concentrations might develop due to the presence of the mountain to the west of the site. <p>Reduce Vulnerability</p> <ul style="list-style-type: none"> Reduce the vulnerability by adding a barrier along the high risk part of the plant boundary between the plant and the road to prevent direct fire impingement and to reduce heat flux. Reduce risk to road users by early warning on leak and closure of access. 	

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
Communication and Training		E		X			<ul style="list-style-type: none"> Indorama is responsible for providing OHS orientation training for new workers if they do not have occupational or OHS skills for the work. They are assigned to ensure they are apprised of the basic site rules of work at/on the site and of personal protection and preventing injury to fellow employees. Implementation of training and information dissemination to: <ul style="list-style-type: none"> To disseminate to all levels and to all workers the policies, standards and regulations by the State on OHS and internal rules, regulations, directives by the leaders of the Indorama. To coordinate with labor and personnel department, technical unit, workshop supervisors to conduct training to raise awareness of labor disciplines implementation, machinery operating regulations and skills and safe use of PPE and labor instruments and tools. Training consists of basic hazard awareness, site specific hazards, safe work practices, and emergency procedures for fire, evacuation, and natural disaster, as appropriate. Indorama shall coordinate with the responsible units to measure harmful elements in working environment, to check workers' health, to supervise diseases and to propose measures for taking care of workers' health. Technical units (or technical staff) shall cooperate with responsible units and supervisors to study, propose and implement measures to ensure OHS: <ul style="list-style-type: none"> Safety measures in production units. Safety technical measures and fire prevention and control. Technical measures on hygiene, working conditions improvement. Hazardous areas (electrical rooms, compressor rooms, etc.), installations, materials, safety measures, and emergency exits, etc. should be marked appropriately. Signage should be in accordance with international standards and be well known to, and easily understood by workers as appropriate. 	HSE Plan

Impact	Source	Primary Receptor (1)	Stage		Significance		Mitigation Measures	Management Plan
			C	O	ST	LT		
							<ul style="list-style-type: none"> • Training on field safety will help all workers how to recognize the hazardous area signal, any site-specific conditions, requirements or hazards. • All vessels that may contain substances that are hazardous as a result of chemical or toxicological properties, or temperature or pressure, should be labeled as to the contents and hazard, or appropriately color coded. • Similarly, piping systems that contain hazardous substances should be labeled with the direction of flow and contents of the pipe, or color coded whenever the pipe passing through a wall or floor is interrupted by a valve or junction device. 	

Notes: (1) Primary Receptors: R = Residents, E = Employees

(2) Project Stage: PC= Pre-Construction, C = Construction, O = Operations

(3) Expected Impact Significance Rankings after mitigation: ST= Short-Term; LT= Long-term; Ma= Major; Mo= Moderate; Mi= Minor; - Negative + Positive