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Prepared by ESC for the Asian Development Bank

supremeenergy

PT. SE ML/RB/RD

SHE Procedure
Job Safety Analysis

October 2014

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Content

1. Introduction

Many incidents have been related to the personnel not understanding the risk and hazards of the work they were performing. A key tool to identify these risks and hazards is the Job Safety Analysis JSA (also called Job Hazard Analysis or Task Risk Assessment).

This procedure uses the comprehensive safety process to describe the JSA implementation. The safety process itself covers five general areas:

- Purpose, Scope and Objectives
- Procedures
- Resources, Roles, and Responsibilities
- Measurement and Verification
- Continual Improvement

2. Purpose, Scope and Objectives

2.1 Purpose

Job Safety Analysis (JSA) is the foundation that supports Incident Free Operations. It is a behavioral tool used to identify and minimize risk associated with routine and non-routine job tasks. When used in conjunction with the site processes, a JSA enables workers to minimize exposure to conditions that may cause injuries.

The JSA is an analysis of hazards associated with a specific job. To determine which jobs/tasks should be analyzed first, priority should be given to jobs with the highest rate of injuries or where "near misses" have occurred. Ultimately, a JSA should be conducted and made available for all jobs in the workplace.

A JSA studies each step of a specific job or procedure, identifying existing or potential job hazards, and determines the best way to perform the activity to reduce or eliminate these hazards.

2.2 Scope

This process is intended to discuss how to complete a Job Safety Analysis properly and thoroughly.

This JSA Process applies to company-owned facilities. Contractors on company property shall follow the Company JSA or, upon approval from the Company, may use their own JSA processes.

A quality JSA should assess each aspect of the task and identify items that could result in injury to personnel, pose a threat to the environment, or damage to equipment.

The basic steps for conducting the JSA are:

- Outline the sequence of events
- Identify hazards associated with those events
- Document steps to be taken to mitigate the identified hazards.
- Identify the person responsible to ensure mitigation steps are taken

To enhance the effectiveness of the JSA and for each analysis that takes place, the site observation is recommended to ensure that the plan outline is being followed. If events or conditions change from the original plan, the job shall be suspended until all parties involved review / revise the plan. Additionally, if new personnel arrive at the site once the job or activities have begun; those personnel shall review the JSA before beginning work and document such review.

2.3 Objectives

The intent of a JSA is to proactively identify and eliminate potential hazards and to help implement controls to eliminate or reduce the hazards, therefore helping to create a safe working area.

3. Geothermal and Power Requirements

To comply with this process, the following requirements must be met:

1. Employees and business partners will be trained in Job Safety Analysis (JSA)
2. Understand basic safety health and environment
3. Understand JSA requirements

4. Procedure

The JSA process falls into five sequential and important steps:

- Choosing the Job
- Selecting the Team
- Breaking the Job Into Component Tasks
- Identifying Hazards
- Developing Solutions

Each step should be completed before moving onto the next step.

4.1 Choosing the Job

Determining when and where a JSA is needed should follow a written guideline set up beforehand by a responsible person within the facility.

Jobs to be analyzed include any of the following conditions:

- Historical high rate of incidents or near misses - these jobs pose the greatest risk to the workers at that site and in adjacent areas. Close-calls and near misses indicate a problem in the procedure or the existence of some other unidentified hazard.
- New jobs or jobs that have received a recent change in their operating procedures - in this situation, workers may not be familiar with the new procedure or may not fully understand the conditions in which they are working.
- Jobs that are done on an infrequent basis - as evidence of the examples in the beginning of this document, these types of jobs are often not understood or possible risks not recognized.
- Jobs identified as needing a procedural review

It is important to recognize that these may not be the only situations where a JSA may be required. Other situations may arise where it will be necessary to complete an analysis of the job before conducting work. Some examples of work requiring a JSA include vessel entry and cleaning, hot work on process equipment, special procedures on process equipment, or entry into an inert atmosphere.

4.2 Selecting the Team

In order to fully understand the work being analyzed, it is very important to select the proper team members. Having the right people on the team is as important as doing the analysis itself.

Groups conducting a JSA should include :

- The person doing the job (controller or employee) - few people understand the details of a job like the person doing the work. The expertise and understanding brought forth by the worker in this case is invaluable.
- The supervisor of the area and workers in adjacent areas to the work being analyzed - including these workers is important for two reasons. They are able to demonstrate how the work fits into the entire process, and, any the hazards of one location can greatly impact the safety of other areas in the facility, especially areas that are near the hazardous location.
- Safety personnel - often times this person will facilitate the review.
- Specialists (such as mechanical / electrical / instrument / chemical engineers) - their function is to provide technical assistance to the group, as well as a dynamic approach to problem solving.

Team members should:

- Be experienced and knowledgeable about the job.

- Have credibility with the work group.
- Understand the JSA process.
- Be persistent in finding solutions to bring about a safe workplace.

The size of the group will usually depend on the size of the facility and the nature of the work. The number of people is not as important as having the right people to conduct a thorough analysis. This procedure discusses Resources, Roles and Responsibilities of the team members.

4.3 Breaking the Job Down

Once the group has been formed, the job being analyzed should be broken down and organized into its component parts. Each task necessary for the completion of the job should be identified and included in the JSA. The entire job needs to be considered from preparation through clean-up and turnover back to operation. Where it is possible, the facilitator of the group should perform this task in advance.

When describing these tasks, use action words to describe "what" is being done; avoid statements that tell "how" the work is done. Be sure to include the item to which the action applies (for example, "lift the box," "remove the extinguisher," etc.).

Determining the steps of the job is best done by observing the workers performing the job and paying close attention to each step. The understanding of the job and the experience the worker brings is particularly important in this step.

Other areas the team should be sure to consider are plant layout information and equipment specifications. Supervisors and workers in adjacent areas bring much value to this process.

Once the team identifies the steps of the job, they should place the steps in the proper order and determine if any steps will be performed in parallel (i.e. gas testing while hot work is proceeding). It is a good idea to consult the workers performing the job, and the operator on the team in this step to ensure accuracy.

4.4 Identifying the Hazards

Identifying hazards requires close observations and knowledge of the particular job being looked at. This part of the process looks at the steps of the job to search for all potential and existing hazards. "What if" questions should be asked to identify possible hazards and their causes. The focus here is what could go wrong with this step.

For example:

- What if there are still flammable vapors inside the vessel?
- What if employees are exposed to the inert gas?

Both physical conditions (chemicals, tools, work space, etc.) and environmental factors (heat, cold, noise, lighting, etc.) as well as human actions or behaviors (need to stand on a slippery or unstable surface, extended reach to operate a valve, lifting bulky objects) are looked at during this stage of the process.

The group should take time to look back on similar work, or working conditions where an accident or near miss has occurred and consider the similarities between the jobs. It may be helpful in identifying hazards that are not obvious if the group takes into account what controls were in place or should have been in place.

The group should also consider where in the job the accident or near miss occurred, if the same hazard exists in this job, and what controls may be in place to prevent such an event.

4.5 Developing Solutions

In this step of the process it becomes very important to follow the tasks of the job in order they are performed in and work down the list of hazards that were identified. Creating a solution or control for a step out of order can cause new, unidentified hazards in previous steps. When a control is put into place, the process may be altered, thus creating new hazards that may need to be considered. Any change made in the process could possibly change part of, or the entire process. It is also important not to move to the next task in the job until the hazard has been eliminated or controlled.

Generally the methods for controlling a hazard are:

- Elimination of the Hazard: This is the most desirable method of hazard control. There are a few ways hazards can be eliminated:
  - Choose another process or modifying the existing process: (for example, can cold work be performed instead of hot work?)
  - Substitute a less hazardous material: If a harmful substance such as a strong acid or base is used, can a less dangerous substance be used?
  - Adding or increasing ventilation: helps to eliminate the hazard of a flammable or explosive atmosphere.
  - Isolate the area: separate the work area with a temporary fire wall or similar device, or shutdown nearby operations if that is not possible.
  - Substitute tools or equipment: (for example, should pneumatic tools be used instead of electrical tools?)
- Engineering controls: These types of controls usually include enclosures or guards to restrict access to the hazardous area. A good example is welding screens or enclosures. A properly engineered control can nearly eliminate a hazard.

- **Administrative controls**: Examples of this type of controls include such things as procedures for conducting work safely, personal protective equipment (PPE), managing the length of exposures or reducing frequency of the job, and/or written requirements to be completed before work is started (i.e. checklists).

- **Raise awareness in the area of the job**: Be sure other workers in the area are aware of the work taking place and understand not only the dangers associated with the work, but also the emergency procedures if something were to go wrong.

- **Provide emergency response facilities**: This includes primarily having materials and supplies (eye wash, safety showers, fire suppression equipment) on-site and available in case of an accident.

* It is important to note that raising awareness and emergency facilities are not controls and do nothing to remove or mitigate the risk involved with the work. In practice, these methods should always be in place regardless of the working conditions.

5. Roles and Responsibilities

This part of the process identifies the roles, responsibilities and authorities of those in the group to ensure a quality JSA are completed. Here the team needs to define the necessary skills, experience and training group members require. Examples of responsibilities include the person(s) who will make sure that the hazards identified and the controls deemed necessary are given proper attention, it may also outline who is responsible to implement the control.

This section should also include the process owner in the facility who should monitor the job for changes in the procedure or other changes rendering the JSA obsolete.

5.1 Performing Authority

Performing authority is the personnel who has a job task to accomplish i.e. foremen, supervisors, pushers etc. to do the work as follows:

- Initiates need for JSA
- Facilitates the development and completion thereof
- Involves all involved in the job task JSA & documents such
- Makes written JSA available at job task site
- Files Permit to Work (if applicable) and provides accompanying JSA
- Cognizant of any changing conditions and utilizes "Stop Work Authority" (SWA) as mandated by any such changes
- Performs job task

5.2 *Accompanying Workers (if applicable)*

- Actively participates in defining specific JSA for job task at-hand
- Cognizant of changing conditions and utilizes SWA where deemed necessary

5.3 *Non-accompanying Workers (if applicable)*

- Provide review and/or oversight into JSA development (Desk-top Review Process may be used as checklist tool)
- Apply a Behavior Based Safety approach to the job task
- Reinforce desired behaviors for the applicable use of the JSA process.

5.4 *JSA Process Sponsor*

- Ensures the process administration responsibilities are understood and executed
- Gathers data on the process performance
- Coordinates process reviews
- Approves changes, after consultation with JSA Process Advisor / Subject Matter Expert (SME)

5.5 *JSA Process Advisor (Subject Matter Experts - SME) (if applicable)*

- Maintains the process documentation
- Conducts the evaluation of "measurement and verification" parameters
- Develops and recommends process improvements
- Coordinates / tracks assessment findings
- Informs field personnel of process changes
- Makes recommendations for continuous improvement
- Coach field personnel in properly performing JSAs
- Review JSAs to ensure quality
- Ensure conformance with written JSA while work is being performed.

6. Measurement and Verification

Metrics help determine the effectiveness of the process and confirms that objectives are being met. The JSA process needs to include these metrics.

Examples include:

- The number of JSAs performed
- The number of JSAs to be audited

This would be to make certain that hazards are being identified and set quotas for auditing.

Verification determines the critical steps of the process and how effectively the system is working to reduce risk. The prime example of this section is the actual audit process. A team or process owner should specify how the auditing process will work, what it will look at and how ratings will be assigned. This area is instrumental in assuring safety is long-term, and should help to recognize changing conditions in the job process.

7. Continual Improvement

Evaluation

Based on the findings of the Measurement and Verification process, changes may need to be made in the JSA process. An evaluation should be made on the effectiveness of the current JSA program at least annually.

Improvement

The result of the evaluation needs to be cycled through the business planning process to implement the needed improvements. At this point the owner of the process would design and implement the change.

8. Incorporating the JSA into the Job

After the JSA is created, the conditions of the JSA need to be implemented before the work begins.

This should be done in a variety of places:

- Pre-Job Planning - the JSA is the principle tool that should be used when planning work. Only after the JSA has been completed and reviewed in this planning session should a work order be formulated or a permit issued.

- Pre-Job Communication - reviewing the JSA with those performing the work is vital. The workers must understand the process, hazards and controls in place in order for them to work safely and effectively.

- Safety Meetings - similar to Pre-Job Communication, the JSA should also be reviewed during a Pre-Job safety meeting and daily "tail-gate talks" so that others in the area including process workers, operators and/or supervisors are all fully aware of the process, hazards and controls. This should be part of raising awareness around the work-site.

- Auditing - the JSA outlines how the work should be done, the hazards of each step and the controls necessary to eliminate or mitigate the hazard. The JSA is an excellent audit tool to ensure that each step is being completed in the manner it is intended in the procedure.

9. Using the JSA Effectively

Similar to the above section regarding incorporating the JSA into the job, using the JSA effectively requires the JSA to be included in everyday work operations. The JSA should be used for training both new and existing employees.

Training New Employees

The JSA is an effective tool for training new employees. It should be used in the following ways:

- Use the JSA to teach new employees how to do a job safely.
- The JSA helps workers to recognize hazards and understand controls that are in place or will be in place.
- The JSA is a good outline for workplace safety observations and/or coaching.

Training Existing Employees

All employees should have the same training on all workplace operations. After the above training has been implemented, these other areas should also be covered:

- Review the JSA during pre-job briefings to help employees work safely on jobs that are done on an irregular / infrequent basis.
- When a near miss or accident occurs due to failure to follow a procedure covered in an existing JSA, review the facts with everyone involved to prevent recurrence.
- In pre-job briefings and safety meetings be sure to cover these points:
  - Details of activities involved in completing the work (including individual actions and responsibilities at various stages of the job).
  - All potential hazards identified.
  - Control measures in place or to be in place.

Pre-Job Briefings and Safety Meetings

Utilizing the JSA at pre-job briefings and safety meetings does the following things:

- Creates a common understanding about what it takes to do the job safely.
- Identifies the need for further training.
- Provides those involved with the job the opportunity to identify further hazards and control measures, as well as gain understanding about existing hazards and controls.

It is very important at this stage that is made clear that if conditions or personnel should change or any assumptions in planning be proven false, work should stop until conditions are re-assessed and judged safe.

Appendix A
JSA Form

Job / Task Title :		**Date :**	
Dept :		**Performing Authority :**	
Section / Location :		**Process Sponsor :**	
PPE to be used :			

Instructions:

1. Write the name of the job or task in the space provided. **2.** Write the steps of the task in a safe sequence. **3.** List all possible hazards involved in each step as well as reaction to failure. **4.** In the Safe Plan / Control column, provide the corrective actions that will be taken to prevent the hazards and injury from reaction to failure. **5.** In the Resources column, list the resources that are needed to achieve the "Safe Plan" to overcome the hazards and stop reaction to failure such as reaching in when something moves, etc. **6.** In resources column list tools needed to do the job, additional safety equipment, etc. **7.** Have each team member that helped develop and will use this JSA sign in the spaces provided at the bottom. **8.** Review the JSA at the end of the task for improvements.

(NOTE THE WORK SHALL STOP IF CONDITIONS CHANGE, JOB CHANGES, OR DEFICIENCY IN PLAN IS NOTED.)

Steps of Task	Hazard / Reaction to Failure	Safe Plan / Control	Resources

Diagram of worksite (draw in equipment, wind direction, and identify hazards e.g. power lines, tripping hazards, energy sources, hot surfaces, roadways, etc.)

JSA Checklist Review

Review the following after the Job Safety Analysis has been completed to ensure all hazards have been noted.

	Required Permits		Head, Eye & Face Protection		Hand & Arms Protection		Foot Protection
	Hot Work		Hard Hat		Work Gloves		Sturdy Work Boots
	Utility Clearance		Safety Glasses		Cut Resistant Gloves		Safety Steel Toed Boots
	Confined Space		Face Shield		Nytrel Gloves		Rubber Boots
	Critical Lift		Goggles / Chemical		Surgical Gloves		Rubber Boot Covers
	Lock Out/Tag Out		Welding Hood		Rubber Gloves	**Body Protection**	
	Soil Disturbance				Long Arm Sleeves		Cotton Coveralls
	General Work	**Respiratory Protection**			Welding Gloves		Tyvek / Poly Coated Tyvek
	Vehicle Entry		Dusk Mask	**Monitors**			Safety Vest
			Air Purifying		Quad or Tri-cell		Full Body Harness & Lanyard
			Supplied Air /SCBA		Individual		Saranex

EMERGENCY CONTACTS AND ACTION PLAN

Supervisor : _____

Safety Rep : _____

Other : _____

Assembly Area : _____

TEAM MEMBER SIGNATURES

_____ _____

_____ _____

_____ _____

PERFORMING SUPERVISOR SIGNATURE

certifies the completion of the Hazard Assessment site review.

Supervisor's Signature : _____

Date : _____

Appendix B
What to Look for During a JSA

Environmental Conditions - are there conditions that may be hazardous to safety or health?

- Are there any gases, vapors, mists, fumes, or dust in the area?
- Is the ventilation adequate to remove any air contaminants?
- Are there any sources of heat or cold?
- Are there any radiation sources?
- Is there adequate lighting to see the complete job?

Injurious Contact - is there a danger of striking against, being struck by, caught between, caught on, caught in, or otherwise making harmful contact with an object?

- Can people come in contact with, be struck by, or snagged by moving parts of equipment?
- Are there any in-running nip points between two moving parts (e.g. belt & pulley)?
- Is there sufficient room to work? To stay out of the line-of-fire? Out of traffic?
- Is there any material (water, mud, oil, rocks, etc.) or part which could strike people?
- Are energy sources controlled (by way of a Lock-out / Tag-out program)?
- Are machine controls safeguarded?

Overexertion - can a strain be caused by pushing, pulling, lifting, bending, twisting, or by repetitive motions?

- Does the employee have good body position or placement?
- Does job require lifting an excessive amount of weight?
- Does employee twist while lifting?
- Does this job have repetitive motions?

Slips, Trips, & Falls - is there a potential for this type of occurrence?

- Are there spills of water, oil, or other slick material on the floor?
- Are there any lowered or elevated surfaces?
- Are there any tripping hazards on the floor?
- Is the area picked-up?
- Is there any chance of a fall to another level?

Other Key Safety Behaviors

- Do employees wear the proper PPE for the job?
- Do employees use the correct tools for the job?
- Do employees lift heavy or awkward objects with equipment rated for load?
- Is communication good on jobs involving several people or work crews?
- Does someone assure that equipment receives regular maintenance?

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PT. SE ML/RB/RD

SHE Procedure
First Aid and Medical Care

October 2014

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The procedure describe first aid and medical care that covers a variety of SUPREME ENERGY working locations and conditions, includes first aid and medical facilities and associated equipment. It examines the medical surveillance provided for all staff and particularly those involved in the Medical Surveillance Program by virtue of the potentially hazardous nature of the tasks they perform.

This procedure shall be revised as necessary to fit local conditions and regulatory requirements and, as a result, introduce a higher standard of care than suggested here.

2. Staff and Facilities in Field Operations

2.1 General

Medical staffs - the numbers of medical personnel and their qualifications - should be based on the following factors:

- The total number of personnel employed in the particular location
- The availability of medical service to contractors' and employees' dependents
- The hazardous nature of the operation
- The location of the operation in relation to distance from medical clinics and hospitals
- The qualifications of staff in local medical clinics and hospitals

2.2 For Exploration / Isolated Drilling Operations

At least one each of the following qualified personnel - equipped with a suitable field kit - should accompany each producing, construction, drilling, surveying, seismic recording or base camp operation.

- For operations near population centers (where the patient can be transported to a qualified doctor and medical facility in less than four hours), both:
  - A person with certified, advanced, first aid training
  - A person with an occupational first aid certificate

- For operations in remote areas (where the patient cannot be transported to a qualified doctor and medical facility within four hours), both:
  - A qualified physician's assistant or equivalent (e.g. a nurse practitioner) experienced in handling industrial injuries
  - A person with certified advanced first aid training

- For jungle / desert (or equivalent) operations with fly camps:
  - Base Camp
    - At least one qualified physician's assistant or the equivalent at all times.
    - Over 300 People: A suitably qualified doctor at all times
    - Under 300 People: A suitably qualified doctor on a monthly visit schedule
  - Fly Camp of 20 People or More

    Ideally, a suitably qualified nurse or physician's assistant; or, if that is impractical due to local conditions, a person with certified first aid training.

2.3 For Large Producing Operations

Most established producing operations have medical support facilities consisting of Company medical staff or contract medical care in an on-site clinic.

The staff's size and facilities' complexity varies. SUPREME ENERGY's Medical Staff has not established staffing and facility criteria for large operations but will provide assistance with establishing and periodically confirming the adequacy of staffing of facilities.

All vehicles, aircraft, and watercraft should be equipped with suitable first aid kits; workshops and offices with larger kits.

3. Paramedic Station

- Paramedic stations are located at specific points at the site. The location of the facilities will be identified on a site plan.
- There should, where possible, be a wash hand basin in the vicinity.
- In buildings where a sick room is provided, a first aid box should be available at that location.
- The paramedic station area should always be maintained in a tidy and clean condition. Always clean up after using any items from the station.
- Employees should ensure they obtain first aid treatment for all injuries, no matter how small.
- Each major work location should maintain at least one first aid box.

The number of first aid boxes for a site is related to the number of persons working at the site, and the number of separate buildings and work areas. Each distinct work area shall have a first aid box e.g. workshops, control room, office area. First aid boxes will be located at key points throughout the work area (water pumping station, well heads) or at key road junctions.

Each company vehicle will have a fully equipped first aid box.

Work teams will also carry a first aid box with them, e.g. grass cutting gang, etc.

4. First Aid Boxes

- First aid equipment should be stored in a suitable cabinet of wood or metal with a tightly closing lid or door.
- The box should be clearly marked 'First Aid' and will be green in color. The location of first aid boxes will be shown on a site layout plan.
- If the box is locked there must be several keys and the names and locations of key holders shown on the outside of the box.
- Nothing other than standard first aid equipment should be kept in the box.

Table 4.1: *Minimum Scale of First Aid Requisitions* gives a guideline of the basic requirements that should be provided in first aid boxes, dependent on the number of personnel at the site.

- The first aid box should be customized to suit its location and the type of injuries that may be expected.
- Every first aid box will have a list indicating the contents of the box and the first aid person responsible for that box. This person should be contacted to obtain any supplies. (alternatively a first aid box will have a register and this is to be completed when items are taken from the box.)
- It is the responsibility of the first aid person to periodically check (once a month) their first aid station and re-planes supplies.
- The first aid box shall contain a first aid manual.

Some non-prescription medications like analgesics, pain relievers, antacids, cold and hay-fever remedies will also be available at the paramedic station. These are designed to keep people on the job and allow them to work more safely and efficiently than if they were in discomfort. Most of these medications are unit-dosed with directions and cautions in self-dispensing boxes to reduce or eliminate any liabilities associated with dispensing from a bottle. The paramedic will advise on dose rates, etc.

The development that have influenced the contents of first aid kits in recent years are increased concerns about infectious and contagious diseases such as HIV, hepatitis and tuberculosis, and a heightened awareness of lost-time injuries. As diseases become more prevalent, many people, even those trained in CPR (Cardio Pulmonary Resuscitation), are reluctant to give first aid to strangers. For that reason, first aid kits now contain latex gloves, antimicrobial solutions, wipes and sprays to protect against pathogens, and one-way valve airway masks.

Table 4.1: Minimum Scale of First Aid Requisitions

	Number of Employees						
	Up to 5	6 - 25	26 - 50	51 - 75	76 - 100	101 - 250	Over 250
30g cotton wool	2	3	4	5	6	7	8
225g cotton wool		1	1	1	1	1	1
25mm bandages, open wove	2	3	4	5	6	8	12
50mm bandages, open wove	1	2	3	4	6	8	12
Triangular bandages	2	2	2	4	4	6	6
Sterile dressings - large	2	2	6	9	12	18	24
Sterile dressings - small	2	3	12	18	24	36	36
Adhesive wound dressings (assorted)	6	6	18	30	48	72	96
Solution of 3% cetrimide and 0.3% chlorhexidine	100ml	200ml	400ml	400ml	400ml	2 x 400ml	2 x 400ml
Scissors	small	small	small	small	125mm	125mm	125mm
Safety pins	1 card	1 card	1 card	1 card	1 card	2 cards	2 cards
Fine-pointed tweezers or splinter forceps	1	1	1	1	1	1	1
Forceps, non-toothed			1	1	1	2	4
Antiseptic cream (tube)			1 small	1 small	1 small	1 large	1 large
Clinical thermometer						1	1
First aid manual (Red Cross or St. John)	1	1	1	1	1	1	1
Accident register forms and pencil	1 pad	1 pad	1 pad	1 pad	1 pad	1 pad	1 pad
Kidney bowl 125mm					1	2	2
Splints (leg)						1	1
Sterilizer							1
Dressing drum (if Paramedic employed)							1
Receptacle for soiled dressings				1	1	1	1

	Number of Employees						
	Up to 5	6 - 25	26 - 50	51 - 75	76 - 100	101 - 250	Over 250
Where wet work is carried on in a Workplace: Waterproof adhesive plaster (reels)	1	1	1	1	1	1	2
Disposal gloves (large multi fitting)	2prs	4prs	4prs	8prs	8prs	12prs	12prs
Antimicrobial Wipes	1	2	3	4	6	8	12
One way valve air-way mask	1	2	2	3	3	4	4

5. First Aiders

Management must ensure that a sufficient number of personnel throughout the organization are trained in first aid. Employees should be encouraged to volunteer for training in first aid techniques.

- First aid courses will be arranged and time will be given to attend courses.
- First aiders will hold an appropriate first aid certificate.
- First aid certificates will be issued by a recognized training body, e.g. Red Cross, etc.
- Trained first aiders will be easily identifiable at the site with the words 'First Aider' fixed to cloth above the breast pocket.
- Each area or group of workers has an assigned first aider and to be contacted when any accidents or near-misses occur.
- It is the responsibility of the SHE Representative to ensure that a register of first aiders is maintained and that training and refresher courses are undertaken to ensure that qualifications are kept current.

Duties of first aiders include:

- maintenance of the first aid boxes and stations
- attendance at any accidents or near-misses in their area or as required
- checking the accident register is completed when an accident or near-miss occurs and provide action according to the prescribed procedure
- vigilance for any unsafe conditions or hazards in their area and reporting these to supervisors.

6. Emergency Preparedness

When an emergency occurs:

- Report the nature and location of the emergency to the appropriate control (fire, police, health and safety, or medical (paramedics)). Give name, phone number, location and estimation of hazard (number of people, if unconscious, trapped, burned, chemical, electrical, etc.).
- Contact group's first aider.
- Notify others in the area and supervisor.
- Wait for response personnel or send someone else.
- Leave communication lines open, do not make other phone calls unless emergency related.

Do what is necessary to protect life while waiting for assistance. KEEP CALM. First aid personnel and/or paramedics should be available immediately. If not, the following general comments are made.

- **Safeguard injured personnel**. Do not remove unless in further danger. Keep them warm. Unnecessary movement can severely complicate neck injuries or fractures.
- **Remove contamination**, if possible. If chemicals are spilled on someone get them to the shower or eyewash immediately. Remove any clothing contaminated with chemicals with care to avoid further contamination of skin or eyes. Find out what chemicals are involved.
- **CPR (Cardio Pulmonary Resuscitation).** If an injured person is not breathing, provide mouth to mouth resuscitation. The following procedure is recommended: Place the person face up, clear the mouth of any obstruction, and loosen tight clothing. Lift the neck and tilt the head back, so the chin is pointed upward. Insert your thumb in the mouth, grasp the lower jaw and lift it forcibly upward and forward. Pinch the nose and blow vigorously through the mouth to make the chest expand. Repeat every four to five seconds. If the victim's chest does not expand recheck the mouth for any obstruction, tilt the head back and resume blowing into the mouth. **CPR is not to be undertaken unless training has been given.**
- **Control bleeding** by elevating the injury above the heart, if possible. If blood is spurting place a sterile pad on the wound and apply firm pressure. Wrap the injured person to avoid shock. Tourniquets should be applied only by persons trained in first aid.
- Do not touch a person in contact with a live electrical circuit. **Disconnect the power** first or the rescuer may become seriously injured.

Refer to First Aid Manual with first aid box for more specific first aid treatment measures.

7. Emergency Showers and Eye Washes

Eyewash and shower stations should be available to all employees whose faces or bodies may come into contact with hazardous material.

- Emergency flushing / irrigating equipment should be located within 30 meters (or 10 seconds travel time) of the hazard.
- Emergency irrigating equipment should be identified by a highly visible sign.
- Emergency / irrigating equipment should be connected to a source of potable water.
- A minimum area of 0.9 meters in diameter should remain free of obstruction immediately below the flushing / irrigating equipment.

- The flushing / irrigating equipment valves should be designed to allow constant water flow without the use of the operator's hand. The valve should remain open until it is intentionally closed.
- Safety showers and eyewashes should be activated weekly to flush lines and to verify proper operation.
- Emergency showers should deliver a minimum of 75 liters (20 gallons) per minute for 15 minutes.
- Emergency eyewash stations should deliver a minimum of 1.5 liters (0.4 gallons) per minute for 15 minutes.
- Emergency drench hoses should deliver a minimum of 11.4 liters (3 gallons) per minute for 15 minutes.
- All employees who may be potentially exposed to splashes of hazardous substances shall be trained in the proper use of flushing/irrigating equipment.

8. Medical Surveillance

8.1 Medical Surveillance

(See Figure 8.1: *Medical Surveillance Process*)

- Employees engaged in potentially dangerous occupations and those working with certain hazardous substances will be enrolled in the Medical Surveillance Program.
- The program will be operated under the surveillance of a registered medical practitioner trained in the requisite testing or medical examinations for the substances in question.
- The requirements for the program will be derived from numerous sources including OSHA, NIOSH and other approved guidelines and standards.
- The employer is responsible for the costs of the Medical Surveillance Program.
- Medical surveillance information will not be used for employment purposes such as hiring and firing.

Where the employee is undergoing medical surveillance the medical practitioner shall ensure, as soon as practicable, that:

- the employee is notified of results, together with an explanation of the results
- the employee is notified of the outcome and of the need for remedial action
- medical records obtained during the medical surveillance are confidential
- medical records are made available to the employee or to his representative, with written permission from that person

- the informed written consent of the employee shall be obtained before the medical records which identify that person are provided to a third party not covered by professional confidentiality.

8.2 Inoculations

As part of pre-employment assessment it will be determined whether a person has the required inoculations to work safely at the site. This could include whooping cough, tuberculosis, measles, diphtheria, polio, tetanus, hepatitis B.

8.3 Hearing Conservation

Prolonged exposure to excessively loud noise can cause noise-induced deafness. The purpose of having a hearing conservation program is to prevent deafness by controlling the noise hazard involving all personnel in the company.

The Hearing Conservation Program (HCP) targets those most at risk, that is, those workers who are exposed to an average noise level of 85dBA or more for eight hours per day or 40 hours per week. In addition, if the average noise level is 85dBA or more, engineering noise control measures should be implemented.

Where employees are to be placed in a job requiring participation in the HCP the following will be undertaken:

- baseline audiogram and medical history to determine pre-existing medical pathology of the ear
- work history taken to determine past noise exposures and also non-work exposures
- annual examination to include annual history of work exposures, use of personal protective equipment and other work-related or non-work-related exposures to noise
- provision of hearing protectors and instructions in their care and use
- health education on the importance and necessity of using hearing protectors
- a final audiometric examination of all employees in the HCP before termination of employment.

Audiograms must follow 14 hours of no known exposure to sound levels in excess of 85dBA. This interval should be sufficient to allow recovery from noise induced temporary threshold shift.

Personnel suffering acute diseases of the ear should not be placed in hazardous noise areas until the condition has abated.

In association with the annual medical examination and audiometric testing it may be determined that further clinical audiological evaluation or ontological examination is necessary. This may be the case if it is suspected that medical pathology of the ear is caused

or aggravated by the wearing of hearing protectors or if further general concerns are held by paramedics. The cost of this will be covered by the company.

9. Pre-Employment Checks

A comprehensive and confidential medical examination is required of all new employees and temporary employees hired for three months or more. Medical examinations may be offered periodically during employment and at the time of termination or retirement.

Woman who are, or plan to become pregnant should consult the medical service facility about their work environment.

10. Paramedics

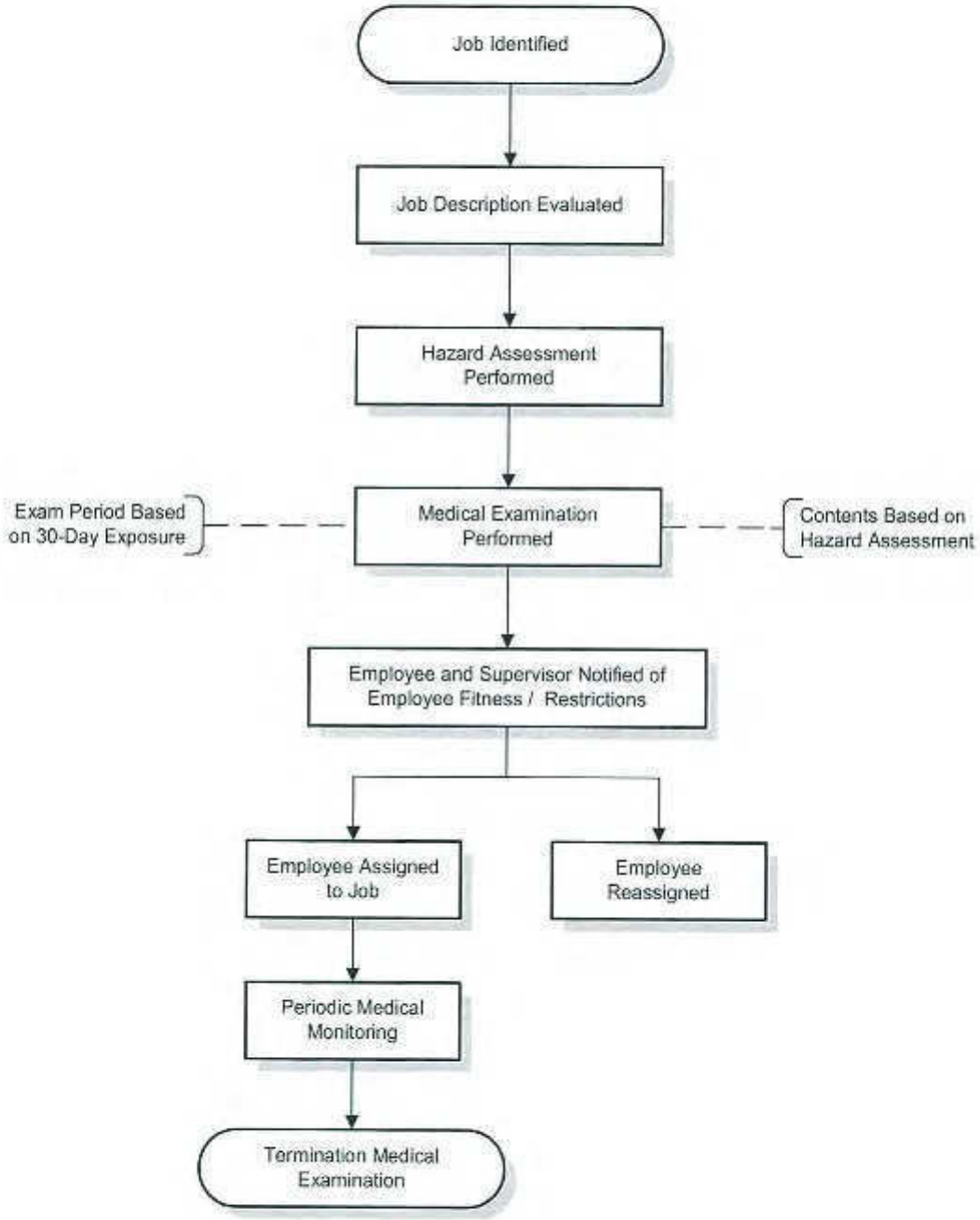
A medical service facility is maintained at SUPREME ENERGY facilities and is staffed with paramedics. They are available to treat injuries and minor illnesses and to advise employees of medical conditions that should be discussed with or treated by an outside personal physician. Supervisors shall require their employees to report as soon as possible all illnesses and injuries that occur at work so that medical evaluation and treatment may be provided promptly and effectively. On returning to work after a work-related illness or injury resulting in lost time, employees should report to the medical service facility for an evaluation of their condition and ability to resume normal duties. For non-occupational health problems requiring an absence of three or more consecutive work days the medical service facility should be contacted and an explanation from a personal physician may be required.

11. Training

A scaled system of training in first aid will be provided.

- As part of the new employee or contractor induction course, personnel will be made aware of the location of first aid boxes, how to identify and summon first aiders and paramedics, and the emergency procedures to follow.
- Basic first aid training course for staff. How to deal with cuts, abrasions, burns, etc. until a trained first aider arrives.
- CPR training to first aiders and supervisory staff.
- First aid certificate training for first aiders.
- Health awareness courses by paramedic.

Figure 8.1 Medical Surveillance Process



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PT. SE ML/RB/RD

SHE Procedure
Motorcycle Riding

October 2014

ML/RB/RD-RSH/SHE-MAN-SOP26-Rev 0

Confidential, for internal use only

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Content

1. Introduction

It is widely known that motorcycle riding is one of the most dangerous activity and has contributed to accidents within the Company work areas.

A proper vehicle shall be used to transport employees. Employees shall not be transported on the back of a pick-up vehicle (refer to SHE Procedure for Motor Vehicle Safety & Heavy Equipment).

All Supreme Energy and its contractors employees are not allowed to use motorcycle within Company working area where the road is accessible by light vehicle. Exception to this procedure only can be given through approval from Kepala Teknik Panas Bumi (KTPB).

It is Company policy to provide a safe working environment and expect safe motorcycle driving practices from its drivers or passengers. This procedure outlines a general guidance for motorcycle safety.

Motorcycling is a skill for life and any skill needs to be practiced and developed by getting further on-road experience to deal with any situation and training if possible.

Management and Supervisors are responsible for maintaining a safe motorcycle driving environment and must lead by example.

Supervisors must ensure drivers and passengers are aware of and follow safe motorcycle driving practices in their respective work area.

All personnel entitle to drive motorcycle or become "a passenger of a rental motorcycle / ojek" share the responsibility for motorcycle driving safety. The effectiveness of Motorcycle Safe Driving Program depends on all personnel accepting safe driving as part of their job.

2. Safe Work Practices

The most common motorcycle incidents are:

- Failure to negotiate bend road
- Collision at junction
- Collision while overtaking
- Loss of control on slippery and muddy road
- Loss of control on a steep uphill / downhill road
- Loss of concentration on hazardous road condition

Speed limit is very important in Safe Motorcycle Driving Program and it is designed to increase safety for all road users. It is essential that drivers shall never go faster than the speed limit, both for their own safety and that of other road users.

Maximum speed limits are (except where stated otherwise):

- All Site Roads : 30 km/hrs
- Passing Pedestrians / Groups of People : 20 km/hrs
- Access Road : 40 km/hrs

A motorcycle rider shall always observe speed limits and drive below the speed limit when necessary. This means slowing down :

- when the weather is bad, for example in rain or fog
- during the hours of darkness
- where there are a lot of pedestrians
- on narrow or winding roads
- when there are other hazards such as road works.

Do not overtake when approaching:

- Bends
- Junction
- Pedestrian crossing
- Hills or dips in the road

To improve the safety of all road users and to consider the requirements of the local communities providing ojek service to employees, below are the points that shall be followed:

- Anyone who use motorcycle to perform their work and to reach their workplace e.g. Security Patrols on-duty or others, shall get approval from Kepala Teknik Panas Bumi to be able to do so.
- Only dedicated and assigned motorcycle ojek is allowed to be riden. Company will appoint certain motorcycle ojek to be used within the work area. Employee shall not use un-registered ojek.
- All motorcycle shall pass regular and pre-use inspection.
- Passenger of a motorcycle shall not be more than 1 person.
- Both motorcycle driver and passenger shall wear personal protective equipment e.g. standard helmet for motorcycle, knee and elbow protector.

- Motorcycle are not permitted to overtake other vehicles on the left hand shoulder of any road.
- Drivers should be aware of the nuisance created by dust when passing pedestrians during the dry season and adjust their speed accordingly.

3. Motorcycle Safety Inspection

As motorcycles are used, parts of them become worn. Tires and brake pads get thinner, joints in the steering mechanism wear and become loose. All these things affect motorcycle performance and safety. A motorcycle which has worn brake pads takes much longer to stop. A motorcycle with worn tires takes longer to stop and is much more likely to skid when stopping or cornering.

For all these reasons, it is essential that all motorcycles are checked regularly and before use (pre-use) to make sure they are fit to be on the road.

Daily Inspections

- For Company motorcycles : all drivers should inspect their motorcycles daily. Any major or safety-related defects must be reported and corrected before the motorcycle is used. Minor items not affecting safe operation of the motorcycle can be corrected during regularly scheduled preventive maintenance.
- For Company, Contractor and rental motorcycles (ojek) : a formal pre-use inspection should be performed and documented by the driver (for Company and Contractor motorcycle) or by the Site SHE Representative (for ojek).

  The following items should be inspected:

  - Brakes should be well-functioning
  - Headlight should function properly
  - All stop light, turn lights and rear light shall function properly
  - Tires should be inflated to recommended pressures, have adequate tread, and should be free of cuts, breaks or other defects
  - Steering rod should be free from excessive play. Front wheel should be properly aligned
  - Horn should be functional
  - All instruments should work properly
  - Where practical to do so, the motorcycle should also be equipped with a spare spark-plug and essential tools for road repairs

Preventive Maintenance

In addition to a driver's daily inspection of a motorcycle, a periodic preventive maintenance is essential. A preventive maintenance program based on either mileage or operating hours of the equipment (as recommended by the manufacturer or Company procedure) should be implemented to determine when to perform routine motorcycle maintenance.

A motorcycle safety inspection checklist is given at the appendix of this section (Appendix-1 : Form A1.1 Motorcycle Safety Checklist).

While it takes a trained mechanic to carry out a proper motorcycle inspection, any driver can do a few simple checks to make sure their motorcycle is fit to use. If the steering feels "wobbly", if the brakes take a long time to work, or there are other obvious problems, this should be reported immediately and the motorcycle should not be used until it has been checked.

Before taking a motorcycle out, the driver should carry out a few simple checks by walking around and check the motorcycle :

- tires do not look worn or flat
- lights (including indicators) are working properly
- equipment such as horn are working properly
- never drive a motorcycle which appears to be unsafe
- report any faults to the motorcycle maintenance supervisor.

Appendix A: Form A1.1 Motorcycle Safety Checklist

SUPREME ENERGY
Motorcycle Safety Inspection Checklist

Date:	Inspector:	Employee #:
Motorcycle No :	Type:	Odometer:

NO	INSPECTION	OK	UNSAFE	REMARKS
Steering and Suspension				
1.	Free play & steering wheel: ..... inches			
2.	Tires (Tread wear, Condition, Inflation)			
3.	Alignment			
Brakes and Hydraulic System				
1.	Pedal Travel			
2.	Fluid Level			
3.	Hand Brake			
Clutch and Transmission Linkage				
1.	Clutch Pedal Free Play			
2.	Clutch Linkage (free and smooth)			
Electrical and Instruments				
1.	Headlights (High/Low Adjustment)			
2.	Tail Lights			
3.	Brake Lights			
4.	Turn Signals			
5.	Instrument Panel Lights			
6.	Horn			
7.	Speedometer			
8.	Fuel Gauge			
9.	Other instrument			
10.	General Wiring Condition			
Engine Compartment				
1.	Tubing / Hoses (General Condition)			
2.	Battery (Secure, Condition)			
3.	Fuel Lines (Routine, Condition)			
Undercarriage				
1.	Fuel Tank (Security and Condition)			
Leaks				
1.	Lines / Hoses			
2.	Engine Oil			
3.	Transmission Oil			
4.	Fuel			

NO	GENERAL VEHICLE CONDITION	OK	UNSAFE	REMARKS
Emergency Equipment				
1.	Tools			
2.	Spark Plugs			
Body				
1.	Body Damage			
2.	Rust			
3.	Paint			
4.	Housekeeping			
Engine				
1.	Starting (cold)			
2.	Starting (hot)			
3.	Idling			
4.	Driving			
Transmission				
1.	Shifting			
2.	Noises			
Steering and Suspension				
1.	Tracks True			
2.	Shimy / Wobble			
3.	Steering Effort			
Brakes				
1.	Stop Straight and True			
2.	Squeal			

Checked by Inspector (sign) :	

Comments :

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PT. SE ML/RB/RD

SHE Procedure
Wild Animal Interference

October 2014

ML/RB/RD-RSH/SHE-MAN-SOP27-Rev 0

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Content

1. Introduction

1.1 Purpose

This document is intended to explain and provide early-warning procedure to wild animal interference that may appear in a working area.

1.2 Scope

This procedure applies to all company, contractor and sub-contractor employees who are working to support SUPREME ENERGY operations.

2. Definitions

The following definitions apply specifically to this procedure:

Table 2.1 : Definitions

Wild Animals	living independently of man; not domesticated or tame

Wild animals may be a tiger, bear, monkey, snake, eagle, bee, etc both protected or not protected by law.

3. Procedures

3.1 Mitigation of Risk associated with Wild Animals

Before commencing the job that indicates on wild animals path, Job Safety Analysis shall be available. Proper First Aid Kit shall be made available which consists of snake-bite kit or bee-stung kit.

Risk categories based on risk matrix in the Hazard Identification Risk Assessment and Risk Control procedure are the basis for deciding whether controls or improved controls are required to reduce the risk from an identified hazard to acceptable levels.

Based on this approach, an inventory of actions, in priority order, to devise, maintain or improve controls, can be developed and implemented.

Some action plans that may be included in the Job Safety Analysis to minimize wild animal attack risk are :

1. Apply a "**buddy system**". Working or walking alone are strictly prohibited,
2. It was allowed to bring self-defense weapon (knife / long stick) in the location suspected as wild animal path.

3. Always inform your supervisor by updating the condition through radio communication when you work in a remote area.
4. Depart and return home together in remote area location.
5. Strictly prohibited to dump left-over food in the work location. All left-over food shall be collected and brought back to the main camp for disposal.
6. To deploy enough lighting in the flying camp (if any) and certain spot of the work location.
7. Prepare stand-by vehicle for emergency condition.
8. Strictly forbidden to catch or hunt animals that we know the animal is a wild animal from the food chain

3.2 Job Safety Analysis Communication

After the risks are mitigated and the control plan is in place, the JSA shall be communicated to all workers involved. The objectives are to ensure all the workers involved are fully informed and have adequate knowledge regarding the locations, hazard of wild animals and how to protect themselves from wild animal attack.

3.3 Additional Precaution and Mitigation

3.3.1 Tigers

1. **Make yourself appear as large as possible**
   Make yourself appear larger by picking up your children, leashing pets in, and standing close to other adults. Open your jacket. Raise your arms. Wave your raised arms slowly.

2. **Make noise**
   - Yell, shout, bang your walking stick against a tree. Make any loud sound that cannot be confused by the tiger as the sound of prey. Speak slowly, firmly and loudly to disrupt and discourage predatory behavior.
   - Other advice was shouting to scare. There is a possibility he will be away, and that's when we ran in the opposite direction as soon as possible. Do not run when it was wary / targeting us, many wild animals are much faster than us.

3. **Act like a predator yourself**
   Maintain eye contact. Never run past or from a wild animal. Never bend over or crouch down. Aggressively wave your raised arms, throw stones or branches, all without turning away.

4. **Slowly create distance**
   - Assess the situation. Consider whether you may be between the wild animal and its kittens, or between the wild animal and its prey or cache. Back slowly to a spot that

gives the wild animal a path to get away, never turning away from the animal. Give a wild animal the time and ability to move away.

- If the wild animal decided to sleep near where we are, wait until we are sure it actually slept soundly, and then we move away slowly.

5. **Do not run away**
   Many animals chase prey that runs. If you do come face to face with a wild animal, do not turn and run, but instead back away slowly, without turning your back on the wild animal. If you turn your head, you are inviting an unexpected attack.

6. **Never feed animals**
   While it may seem tempting to feed the seemingly hungry animals, doing so can result in injury. Also, feeding animals hurts their overall survival ability, as they lose the skills necessary to hunt and begin instead to depend upon people to feed them.

7. **Avoid approaching cubs**
   Avoid approaching cubs, as mother wild animals can be defensive to their young.

8. **Store Food Properly**
   Keep all food at your camp in a high location in tightly close container or locked within your car. If animals smell food, they may be drawn to your camp. Pick up any food waste after your meals to ensure that animals are not inadvertently drawn to the tasty scraps.

9. **Protect yourself**
   - If attacked, fight back. Protect your neck and throat. People have utilized rocks, jackets, garden tools, tree branches, walking sticks, and even bare hands to turn away the wild animal.
   - If attacked, use a big stick or stone to fight. Be aggressive and loud as you can. Many wild animals do not like to hunt animals that can fight back, and are very aggressive.
   - The other suggestion is to climb a tree if there is. Some of wild animals can not climb (e.g. mostly tigers cannot climb).

10. **Seek Medical Attention**
    You should always seek medical attention if bitten by any animal. While the animal may seem healthy, many wild animals carry diseases that, if left unchecked, could lead to serious health problems for bite victims.

3.3.2 Bees

1. **Do not wear perfumes or colognes**
   In other words, do not smell like a flower. Bees can detect and follow strong scents, and wearing perfumes or colognes will attract nectar-seeking bees and wasps from a distance. Once they find the source of the flower smell (you), they are likely to investigate by landing on you or buzzing around your body.

2. **Avoid wearing brightly colored clothing, especially floral prints**
   This goes along with #1 - do not look like a flower, either. There is a reason beekeepers wear white. If you're wearing bright colors, you are just asking bees to land on you. Keep your outdoor wear limited to khaki, white, beige, or other light colors if you do not want to attract bees.

3. **Be careful what you eat outdoors**
   Sugary foods and drinks will attract bees and wasps for sure. Before you take a sip of your soda, look inside the can or glass and make sure a wasp hasn't gone in for a taste. Fruits also attract the stinging crowd, so pay attention when snacking on ripe fruits outdoors. Don't leave your peach pits or orange

4. **Do not walk barefoot**
   Bees may be present inside small flowers and some wasps make their nests in the ground. If you step on or near a bee, it is going to try to protect itself and sting you. But if you are wearing shoes, it is only going to hurt itself, not you.

5. **Try not to wear loose-fitting clothes**
   Bees and wasps might just find their way up your pant leg or into your shirt if you give them an easy opening. Once inside, they will be trapped against your skin. And what is your first impulse when you feel something crawling around inside your clothing? You slap at it, right? That's a recipe for disaster. Opt for clothing with tighter cuffs, and keep baggy shirts tucked in.

6. **Stay still**
   If a bee, wasp, or hornet comes near you, just take a deep breath and stay calm. It is just trying to determine if you are a flower or some other item useful to it, and once it realizes you are just a person, it will fly away.

7. **Keep your car windows rolled up.**
   Bees and wasps may get into cars, so keep the windows rolled up whenever possible. If you do find yourself giving a ride to an unwanted stinging insect, pull over when it's safe to do so and roll your windows down. Don't try to swat at it while you are driving.

8. **Rinse your garbage and recycling cans and keep lids on them.**
   Wasps love empty soda and beer bottles, and will check out any food waste in your garbage, too. Do not let food residue build up on your garbage cans. Rinse them well now and then, and always put tight-fitting lids on them to keep wasps away from your garbage. This can substantially cut down on the number of wasps hanging around your yard.

9. **Do not hang out in the flower garden.**
   The chances of being stung while admiring the flowers are small, but if you are really worried about bee stings, do not hang out where the bees are most numerous. Bees spend most of their time and energy collecting nectar and pollen from flowers. Do not get in their way. Keep an eye out for bees and wait until they have moved on to another flower.

10. **Call a professional to have unwanted bees, wasps, or hornets removed.**
    Nothing makes a stinging insect angrier than when someone disturbs or destroys its home. Professional beekeepers or pest control experts can remove wasp or hornet nests or bee swarms safely, without putting you at risk for stings.

3.3.3 Snake

1. If you see a snake, stop and keep your distance. Give the snake plenty of room to get away.
2. Always watch where you step and be sure to look for snakes in areas of high brush, under logs and when stepping over logs, or fallen trees.
3. Never try to touch a snake or scare it away; give the snake its space and back away to a safe place.
4. Wear safety boots that are at least four inches above the ankle, and long pants when working.
5. Be observant for snakes sunning on rocks or trails, especially in the cooler times of day.
6. NEVER try to catch it.

supremeenergy	SAFETY HEALTH & ENVIRONMENT WORK RULES	PROCEDURE
CORPORATE	CULTURAL HERITAGE AND ARCHAEOLOGICAL CHANCE FINDS PROCEDURE	SE-MSHE-PRO-GUI-0028 Revision: A

APPROVAL

	POSITION	NAME	SIGNATURE	DATE
Prepared by	Sr. SHE Manager	M. Arief Tarunaprawira		
Reviewed By	SEML Project Manager	Paul Taylor		
	SEML Field Manager	Yoza Jamal		
	SERD Project Manager	Ralph Hoellman		
	SERB Project Manager	--		
Approved By	VP Relations & SHE	Prijandaru Effendi		

REVISION HISTORY

REV	DATE	BY	REVIEWED	APPROVED	DESCRIPTION
A	18/11/16	AWA	MAT		Final Draft

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1 PURPOSE

Unlike most other environmental resources, direct impact to heritage is typically localized to the areas of the project construction activity, making a project's area of influence more geographically limited than for other resources such as critical habitat, a natural water supply, or endangered species. Thus, it is often possible to avoid impacts to heritage by minor project design changes.

Because cultural heritage is non-renewable, its protection is best accomplished by "reservation-in place." This method is generally preferred over removal, which is an expensive and partially destructive process. (IFC, 2012 (Annex B: Process Guidance Note, Performance Standard 8, Cultural Heritage)).

The purpose of this guideline is to address the possibility of archaeological and other cultural heritage finds and features (including human remains) becoming exposed during earth moving and ground altering activities associated with the construction of a Geothermal Power Plant and its supporting facilities.

It is further intended to provide appropriate procedures for Supreme Energy and its contractors and sub-contractors to follow in the event of a chance cultural heritage or archeological find.

2 OBJECTIVE

The objectives of these procedures, in line with the IFC Performance Standard 8 (PS 8), are to identify and promote the preservation and proper management of archeological, tangible cultural resources or human remains. This Chance Finds Procedure will be included in the Company's Environmental and Social Management System as per IFC PS 1.

3 SCOPE

This process applies to all activities under the operational control of Supreme Energy.

4 RESPONSIBILITY

Company and or the contractor	• Stop any Project construction activities in the immediate vicinity of the chance find; • Delineate the discovered site or area; • Secure the site to prevent any damage or loss of removable objects. • Consider a night guard if deemed necessary until the responsible local authorities take over; • Immediately report the discovery to the responsible site manager.

Site Support Manager	Contacts the relevant officer / Safety, Health and Environmental (SHE) representative within the Company who will arrange for expert assistance. Contact details of the person to be contacted are included in this Chance Finds Procedure and are to be regularly updated. File a report to Company Management that includes: • Date and time of discovery • Precise location of discovery • Description of the discovered item/site (including photographs) • Estimated size/weight/dimensions • Temporary protection implemented.
Site SHE Representative or other responsible Company responsible for chance finds response	Contact and request assistance and advice from the relevant authorities or expert.

5 REFERENCES

None

6 DEFINITIONS

Not required

7 PROCEDURE

7.1 TYPES OF TANGIBLE CULTURAL HERITAGE RESOURCES

Most of the chance finds that may be made are likely to be replicable. Tangible Cultural Heritage is replicable if it can be moved to another location or be replaced by a similar structure or natural features to which cultural values can be transferred by appropriate measures. Archaeological sites are considered replicable if particular eras and cultural values that they represent are well represented by other sites and/or structures.

The Replicability of tangible cultural heritage determines removal and other mitigation strategies.

The following list describes the type of tangible cultural heritage resources that may possibly be encountered in the construction site of the Project:

- Archaeological Sites: Concentrated and patterned physical remains of past human activity, especially human settlements, possibly including artifacts, plant and animal remains, structural remains, and soil features. Note that the cultural importance of such sites cannot be identified based on surface examination alone.

- Artifacts: Portable objects that are created by past human activity and become part of an archaeological site or isolated archaeological find. Importantly, most artifacts lose substantial cultural value when removed from their 'context' in the ground.

- Human remains: individual graves, graveyards, or mass burial sites.

7.2 OWNERSHIP

All findings belong to the government of Indonesia and must be reported to the Ministry of Education and Culture as the relevant regulatory authority, or to the Police, within 30 (thirty) days. The relevant authorities will determine the final destination of any artifact or object found by chance during the construction process.

7.3 IDENTIFICATION AND PROTECTION PRACTICES

The Company will ensure that internationally recognized practices for the protection and documentation of cultural heritage are implemented at all times.

7.4 EXPERT AND TRAINING ASSISTANCE

The Company will work with the Ministry of Education and Culture or the relevant local authorities, and with the local branch of the Indonesian Heritage Trust (IHT) to support the implementation of this chance finds procedure, and for the identification and protection of cultural heritage.

The Company or the contractor that will carry out Project construction will train all workers, especially those working on excavations and earthmoving, in identifying cultural and archaeological artifacts, features, or sites. The information contained in this document, although not exhaustive, should include a description (and illustration) of the most common criteria and site indicators that may signal the presence of an archaeological or burial site. Relevant authorities or the IHT may provide suitable expert assistance to conduct this training.

7.5 INITIAL RESPONSE

1. If intact or disturbed archaeological and historical sites, remains, and objects including graves are encountered, the Company and or the contractor are to:
    - Stop any Project construction activities in the immediate vicinity of the chance find;
    - Delineate the discovered site or area;
    - Secure the site to prevent any damage or loss of removable objects;
    - Consider a night guard if deemed necessary until the responsible local authorities take over;
    - Immediately report the discovery to the responsible Site Manager.

2. The responsible Site Manager contacts the relevant officer / Safety, Health and Environmental (SHE) representative within the Company who will arrange for expert assistance. Contact details of the person to be contacted are included in this Chance Finds Procedure and are to be regularly updated.

3. The SHE representative or other responsible Company responsible for chance finds response will contact and request assistance from the relevant authorities or IHT.

4. The Site Manager will file a report to Company Management that includes
    - Date and time of discovery;
    - Precise location of discovery;
    - Description of the discovered item/site (including photographs);
    - Estimated size/weight/dimensions;
    - Temporary protection implemented.

5. The work must be put on hold during investigation of the importance of the chance find.

It is recommended the Company works out a time deadline/schedule with the relevant authorities for response time and clarifies contractor rights in terms of compensation claims for work suspension, and consequences, if these guidelines are not uphold by the contractor.

7.6 FURTHER ACTION BY EXPERT ASSISTANCE

Depending on the nature of the chance find, determined either by telephone conversation, submitted report or field visit, decision is taken by the expert assistance if construction can continue as planned or has to be put on hold.

In the case of a chance find of human remains, the local policing authority must be informed in addition to the expert assistance.

Further specific expert assistance will be sought if deemed necessary, depending on the nature of the chance find.

An appropriate procedure will be determined by the expert in agreement with the Company for the removal, if applicable, of the artifact or human remains. In the case of human remains, the policing authority is involved in the decision on removal.

It is recommended that site visits by external expert assistance, if deemed necessary, occur within the time frame of the first 24 to 48 hours after the discovery.

7.7 MANAGEMENT OPTIONS FOR CHANCE FINDS

The following options should be considered in the event there is an identified presence of an intact or disturbed archeological site by the appointed external expert in collaboration with the Company and any other relevant authority:

7.7.1 Option 1 – Avoidance through partial project redesign or relocation:

This is the preferred option from a cultural resource management perspective (in line with IFC PS 8) as it results in minimal impact to the cultural heritage find. It can also be the least expensive option from a construction perspective. A site investigation may be required to define site limits.

7.7.2 Option 2 - Salvage or emergency excavation if necessary:

If restoration or preservation in situ is not possible, removal can be considered as long as the cultural heritage is considered replicable and non-critical. This option will require a site investigation prior to the excavation. Precautions should be taken to minimize

damage/destruction of the chance find. The permanent removal of archaeological artifacts and structures should be carried out according to internationally recognized practices and with the support of appropriate expert assistance. It should be noted that the recovery can lead to delays in constructions by up to several weeks.

7.7.3 Option 3 - Application of site protection measures:

Site protection measures include both temporary and long term strategies, such as fencing, and other protective barriers. Appropriate protection measures should be identified on a site-specific basis and decided by the expert assistance in collaboration with the Company and the contractor.

7.8 SUSPENSION OR CONTINUATION OF CONSTRUCTION WORKS

Suspension or continuation of construction work will be determined by expert assistance in collaboration with the Company and the contractor.

7.9 CONTACT DETAILS

Positions to be contacted in the case of a chance find:

TITLE
• Site Support Manager
• Site Manager
Relevant Officer for chance finds occurrences:
• Project Manager
• Sr. SHE Manager
• Field Relation Manager
• Business Relation Manager
• VP Relation & SHE

8 RECORDS

Not required

APPENDIX 1 CONTACT PERSONS

Persons to be contacted in the case of a chance find:

TITLE	SEML	
	NAME	CONTACT NUMBER & EMAIL
Site Support Manager	Asharry Sofyan	021-29341021 0811-150995 Asharry-sofyan@supreme-energy.com
Site Manager	Christian Pintea	Christian-Pintea@supreme-energy.com
Relevant Officer for chance finds occurrences:		
Project Manager	Paul Taylor	021-29342076 Paul-taylor@supreme-energy.com
Sr. SHE Manager	M. Arief Tarunaprawira	021-29342091 Arief-tarunaprawira@supreme-energy.com
Field Relations Manager	Yulnofrins Napilus	021-29342028 Yulnofrins-napilus@supreme-energy.com
Business Relations Manager	Ismoyo Argo	021-29342022 Ismoyo-argo@supreme-energy.com
VP Relations & SHE	Priyandaru Effendi	021-29342021 effendi@supreme-energy.com

TITLE	SERD	
	NAME	CONTACT NUMBER & EMAIL
Site Support Manager	TBA	
Site Manager (acting)	Erwin Guminda	021-29342131 0812-8935813 Erwin-guminda@supreme-energy.com
Relevant Officer for chance finds occurrences:		
Project Manager	Ralph Hoellman	021-29342077 0812-1124371 ralph-hoellmann@supreme-energy.com
Sr. SHE Manager	M. Arief Tarunaprawira	021-29342091 Arief-tarunaprawira@supreme-energy.com
Field Relations Manager	Yulnofrins Napilus	021-29342028 Yulnofrins-napilus@supreme-energy.com
Business Relations Manager	Ismoyo Argo	021-29342022 Ismoyo-argo@supreme-energy.com
VP Relations & SHE	Priyandaru Effendi	021-29342021 effendi@supreme-energy.com

1. Safety, Health and Environmental Manual
2. Contractor Safety, Health and Environmental Management System (CSMS)
3. SHE Procedure: Jakarta Office Emergency Procedure
4. SHE Standard Waste Management
5. Travel/Journey Management
6. Project Execution Planning
7. Guidance for Contractor SHE Management Plan
8. Excavations and Shoring
9. Emergency Response Plan
10. Incident Command System – Emergency Management and Crisis Management Plan
11. Accident/Incident Reporting and Investigation
12. Confined Space Entry
13. Hot Work
14. Personal Protective Equipment
15. Drilling Preparation, Operations and Production Testing
16. Hydrogen Sulphide (H_2S)
17. Permit-to-Work System
18. Lifting and Lifting Equipment
19. SHE Procedure: Working at Height
20. SHE Procedure: Motor Vehicle Safety and Heavy Equipment
21. SHE Procedure: Energy Isolation – LOTO
22. SHE Procedure: Hazard Identification Risk Assessment and Risk Control
23. SHE Procedure: Job Safety Analysis
24. SHE Procedure: First Aid and Medical Care
25. SHE Procedure: Motorcycle Riding
26. SHE Procedure: Wild Animal Interference
27. SHE Standard General Environmental Requirements for Project Design and Operational Activities
28. Employee Exit Process
29. Hiring
30. Land Procurement and Certification Guidelines

1. Scope and Applicability

1.1 Scope

The purpose of this document is to set the environmental design requirements applicable to all the phases of Supreme Energy (SE) projects and activities, starting with the Preliminary and Conceptual studies, continuing on through Pre-project, Basic and Detailed engineering, Construction and Commissioning phases until Start Up. These requirements are also applicable to the Decommissioning project, at the end of the field life.

These requirements, in line with the Commitment of the Company on Sustainable Development, are based on the applicable government regulations, Company policy, International Standards, Geothermal and Oil and Gas Best Practices, and professional reference documents.

1.2 Applicability

This environmental specification applies to all projects managed by SE and affiliates, and to companies of which SE is a shareholder and which have decided to apply this Company standard.

2. Reference documents

The reference documents listed below form an integral part of this General Environmental Requirements. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of a contract.

Standards and References

- Government :
    - Act no 32/2009 (was no 23/1997) regarding Environmental Protection and Management
    - Act no 27/2003 regarding Geothermal
    - Act no 18/2008 regarding Solid Waste Management
    - Government Regulation No. 18 of 1999 Regarding Hazardous and Toxic Waste Management.
    - Government Regulation No. 85 of 1999 regarding Hazardous and Toxic Waste Management.
    - Government Regulation No. 27 of 2002 Concerning Radioactive Waste Management.
    - PerMen ESDM no 45/2006 – Regulation of Ministry of Energy and Mineral Resources of Republic Indonesia regarding Drilling Sludge, Sludge Waste, and Drilling Cutting in oil and gas activity.
    - Kepmen LH no 19/2010 (was no 4/2007) regarding Standard for Liquid Waste Discharge for Oil & Gas and Geothermal activity
    - Kepmen LH no no 112/MENLH/2003 regarding Standard for the Domestic Liquid Waste.
    - PerMen LH no 129/2003 regarding Standard for Air Emission for Oil and Gas Activity
    - PerMen LH no 13/2007 regarding Requirement and Guidelines for Effluent Management from Oil and Gas Activity and Geothermal by Injection
    - Kepmen LH no 128/2003 regarding Standard Procedure and Technical Requirement for Management of Oily Waste and Contaminated Soil through a Biological Method.
    - Decree of the Head of BAPEDAL KEP-01/BAPEDAL/09/1995 regarding the Use of Technical Conditions on Storage and Collection of Hazardous Waste.
    - Decree of the Head of BAPEDAL KEP-02/BAPEDAL/09/1995 regarding Guidelines to Prepare Hazardous Waste Documents.

- Decree of the Head of BAPEDAL KEP-03/BAPEDAL/09/1995 regarding Technical Requirements for Processing Hazardous Waste.
- Decree of the Head of BAPEDAL KEP-05/BAPEDAL/09/1995 regarding Hazardous Waste Symbols and Labels
-

- World Bank / IFC :
  - World Bank and IFC Environmental Directives and Standards

- Company :
  - SE Vision and Values
  - SE Company Statement and Policy
  - SE Safety, Health and Environment Manual

3. Environmental Regulation and Standards

Referring to SHE Policy, Company in all operations, acts in compliance with national and international legislation and regulations as well as with the applicable industry standards and Company requirements.

Local regulations and standards relevant to Environmental preservation in Geothermal activities shall be applied.

Where no specific regulations exist, Company will define applicable standards in the Specific Project documentation.

In any case this specification will supersede pre-existing less stringent local standards.

4. Environmental requirements for Project Design and Operational Activities

During the early stage of any project, the Project Team ensures that an Environmental Impact Assessment (EIA) is carried out.

This study, performed by a competent third party, will be provided to the Design Contractor by Company.

One of the aims of the EIA study is to identify any significant impact of future activities on the natural and human environment. Mitigation measures, identified and selected according to the Best Available Technologies (BAT) concept - which indicate the practical suitability of a particular measure for limiting discharges, emissions and waste - shall be approved by Company.

4.1 Environmental Footprint

Minimizing the environmental footprint of the project shall be systematically achieved.

Each area shall be deeply investigated. Project SHE Team may consider that some areas of which biological diversity, i.e. biodiversity, is particularly rich or sensitive require a specific attention. The EIA study shall include these analyses of ecologically sensitive zones and social aspects (water intake points, natural

reserves, pristine rain forest, archaeology, rock art, community settlements, culture, aquaculture, tourist areas, etc.).

Investigations shall help determine the following:

- Site selection, land use, installation layout, safety and security distances, pipeline RoW width limitation, pipe route selection in sensitive areas, visual impact limitation, clearing limitation, landscaping and site conservation, erosion control, etc.

Note:
Site selection and location shall also take into account natural risks (flooding, seismic events, soil erosion, ground stability and other geohazards, etc.).

4.2. Atmospheric emissions

Gaseous emissions control must comply with the following principles:

- Reducing Greenhouse Gas emissions (GHG) responsible for possible effects on climate changes.
- Reducing the emission of any gaseous or solid compounds affecting air quality (H_2S, SO_2, NOx, VOC, CO, ammonia, particulates, etc.).
- Monitoring the flow and characteristics of significant emissions before release to the atmosphere.

4.2.1 Greenhouse Gas (GHG)

Greenhouse gas minimization including, but not limited to, venting shall be sought in all phases of the life of the installations:

- Greenhouse gas emission sources shall be identified in the frame of the EIA study and relevant potential emissions are quantified according to the Company's approved methodology.
- Reduction measures shall be proposed and their effectiveness assessed in term of GHG gain to take into account Company objectives and commitments.

The following basic principles shall be applied:
- **No continuous venting** of associated gas, unless there is no feasible alternative**.**

These principles do not apply to emergency, safety, temporary operational upsets and start-up periods.

If the steam cannot be used, re-injection either into producing reservoirs or into adequate other reservoirs shall be considered as a preferred option.

In addition, further emission reduction measures shall be assessed in terms of GHG effectiveness, as for example:
- Selection of the most energy efficient equipment,
- Low pressure / temperature steam / gas recovery,
- Heat recovery e.g. Waste Heat Recovery Unit (WHRU),
- Process optimization to minimize emission,
- Use of Nitrogen or flue gas for storage blanketing.

Moreover, if applicable, the reinjection of CO_2 from decarbonation units (amine, membranes, etc) shall be systematically considered.

4.2.2 Other gaseous emissions (NOx, SOx, VOC, etc)

- Emission sources shall be designed so that ground level concentrations meet ambient air quality standards.
- Dispersion studies should be undertaken on a case by case basis in order to assess the potential impact on air quality.

4.2.2.1 NOx emissions

Diesel machines shall be chosen with NOx emissions as low as possible.

The NO_X emissions target shall be 75 microgram/Nm3 or less. In any case it shall not exceed 150 microgram/Nm3.

This point should be an important criterion in the Contractors' selection process.

4.2.2.2 H_2S and SO_2 emissions

Utility fuels shall be selected with the lowest possible sulphur content.

Due consideration shall be given to acid gases. Where relevant, H_2S removal and disposal system shall be installed in order to avoid H_2S emissions. In case of SO_2 emissions, a dispersion study shall be carried out to verify the compliance with the applicable air quality standards.

4.2.2.3 Volatile Organic Compunds (VOC) emissions

Facilities shall be designed in order to minimize VOC emissions which are mainly associated with fuel / oil storage and Oily Water Treatment Unit (OWTU).

Whenever it is technically and safely possible, oil storage tanks shall be fitted with a floating roof. Recovery of VOC from fixed roof oil storage tanks and OWTU shall be studied.

4.2.3 Emissions and Air quality monitoring

Gaseous emissions: appropriate flow measurement systems shall be installed to quantify any significant gaseous emissions streams to atmosphere. In addition, if applicable, sampling points shall be installed on main stacks to perform monitoring of flue gas emissions.

Meteorological station: a meteorological station shall be systematically installed and maintained all along the installations life to measure, as a minimum, temperature, wind, and rainfall.

Air quality monitoring: in sensitive areas, a measurement station and/or detectors/monitors may be required to ensure a permanent monitoring control of air quality.

4.3 Liquid effluents

4.3.1 Liquid effluents management and water resources preservation

The main categories of liquid effluents to be considered are the following: produced / brine water, drainage water, any chemically treated water (e.g. for pipeline hydrotesting, etc), sanitary effluents, cooling water, workover fluids, and well test fluids.

All installations shall be designed to avoid any risk of leak i.e. the site and the facilities shall be watertight and fitted with adequate retention ponds, process skid base plates and drip pans connected to relevant drainage system or periodically collected for proper elimination.

Water resources shall be protected and managed through a Sustainable Development approach taking into account the local environmental and socio-economic constraints.

Any pumping from potable water aquifers for industrial purposes (e.g. cooling water, etc.) shall be avoided.

In case of pumping fresh waters from aquifers, rivers, etc., for domestic use, the pumping station shall systematically be equipped with sampling point(s) and a flow meter to record the quality and volume of pumped waters.

Any injection of used water (including produced water) to potable water aquifers, shall be strictly prohibited.

4.3.2 Produced / Brine waters

Produced / brine waters shall be characterised in terms of volumes, physical parameters (temperature, pH, salinity, suspended matters, etc.) and chemical characteristics (heavy metals, total hydrocarbon, dissolved components - including ammonia, arsen, Hg, sulfide, etc.).

The disposal options for the produced waters shall be studied with the following priority:

1. **Re-injection into the reservoir, to be studied as the base case.**
2. Injection to other adequate geological formation (injection into deep geological layers other than the reservoir will be considered).
3. Treatment and discharge to the natural environment :
   - In any case, particular care shall be taken to preserve the natural water resources. A surface dispersion modelling study could be required by Company, in particular for thermal or chemicals effects.
   - The total oil-in-water content in produced water discharge shall not exceed **10 mg/l.** Additional requirements may be defined by taking into account the local conditions.

To allow for injection failure for a short period (downgraded situation, injection system shut down, etc.), a back-up system shall be designed to ensure reasonable oil content in water discharged to the surface environment.

Measures ensuring reduction / separation at source (water shut-off, down hole disposal, when applicable) shall be considered.

4.3.3 Drainage

The total oil content in Open Drain discharge **shall not exceed 10 mg/l.**

In any case, recovered oil shall be sent back to the process or collected and stored in an approved container for further proper disposal.

4.3.4 Hydrotesting effluents and cleaning operations

Chemical products shall be carefully selected and used at the adequate minimum concentration.

Hydrotesting effluents shall be neutralized and/or filtered before disposal and their release process shall be studied taking into account environmental conditions.

The possibility of testing the pipe sections by sections and storing effluents in temporary pits, or recycling in the next section of pipe, shall be studied.

When required, a discharge plan shall be developed for approval by local Authorities.

4.3.5 Domestic and sanitary effluents

These effluents include grey waters (effluents from sinks, showers and laundries) and black waters (sanitary effluents).

Due consideration shall be taken for designing and sizing the sewage treatment of living quarters, including construction camps where the number of workers can significantly increase.

Maintenance of the installation shall be planned as early as the design phase.

Sewage system of living quarters and construction camps shall be designed according to Company requirements.

4.3.6 Well test fluids

Well test duration shall be minimized.

The test equipment shall be correctly designed in order to avoid any liquid overflow or drop-out.

4.3.7 Workover fluids and well clean-up

Production facilities shall be designed to collect, store, treat and eliminate effluents from workover and well operations (clean-up and maintenance) through an adequate system (incinerator, special burners, licensed disposal facilities, etc.). In any case, the discharge of untreated hazardous fluids into the environment is prohibited. Liquid shall be recycled as much possible.

4.3.8 Water intake protection versus discharge

The location of the water discharge points shall be carefully studied in order to avoid any chemical / biological contamination, or adverse thermal effect on existing or projected intake points.

4.3.9 Cooling waters

The base case for cooling system is a close-loop system.

4.3.10 Laboratory effluents

Chemical effluents shall be collected, neutralized / treated separately before further elimination. When possible, oily products shall be returned into the process or collected for further elimination.

4.3.11 Disposal devices

All disposal devices shall be equipped with a sampling point to allow qualitative measurements.

Flow meters shall be installed on all significant disposal points (OWTU outlet as a minimum).

Regardless of the disposal solution considered (reinjection well, outfall pipe, disposal tube, etc.), the system shall be fitted with an observation pond.

4.3.12 Effluents Monitoring

To face Monitoring and Reporting requirements, a monitoring plan shall be implemented during the operation phase.

Two types of monitoring shall be considered:

- Effluent discharge monitoring: punctual sampling or on-line analysers.

  Similar monitoring may be implemented on other effluents.

- Water quality monitoring of the surrounding environment (surface and groundwater, if appropriate), through dedicated monitoring stations. The water table shall be surveyed through adequate monitoring wells (piezometers).

4.4 Waste management

4.4.1 General

Waste generated during the installation life, including construction and operations, shall be clearly identified, classified (as least as non-hazardous or hazardous) and quantified.

The waste management consideration shall take into account the "**5 R**"principle, i.e.: Reduce, Recover, Reuse, Recycle, Residue disposal.

Whenever possible, recycling / reuse of plastic, paper, cardboard, glass, scrap metal, and wood shall be considered.

All the necessary waste treatment and disposal facilities (controlled landfill, incinerator, bio-treatment center) shall be studied and set up to be fully operational for the drilling and production phases, taking into account the existing processes available at local or regional level and appropriate for treating and eliminating the generated waste.

The main elements of waste management defined in the EIA study shall be applied: collection, segregation, labelling, temporary storage means and locations, treatment, elimination or disposal means.

The disposal of non-treated oily effluents and hazardous waste into pits either for burning (burn pits) or burial is prohibited.

Note :
See SHE Standard document no. XXXX Waste Management

4.4.2 Non-Hazardous waste

Non hazardous waste comprises of inert waste, packaging material, woods, cardboard boxes, plastic bottles, cans, kitchen garbage and also construction waste such as leftover materials and non contaminated scrap metals. These shall be appropriately recovered and disposed.

Large installations with living quarters or camps shall be fitted with compactor, grinder and incinerator when necessary.

Regarding the onshore construction camps, which can involve up to several hundreds of workers, a modular approach to the sizing for waste treatment shall be studied.

4.4.3 Hazardous waste

Hazardous waste shall be identified: batteries, spent oils and solvents, contaminated sludges, pigging waste, leftover chemicals, mercury waste, paint residues, NORMs, etc.

Hazardous waste shall be collected in dedicated leak-proof containers, adequately labelled and stored on a skid base plate or a bunded area. Their collection and elimination shall be carried out according to approved procedures.

Hazardous materials (radioactive sources, chemicals, etc) supply contracts should consider the possibility of returning the unused products to the suppliers.

Lubricating oils and spent oils shall be systematically collected. If they cannot be injected into the process stream, these effluents shall be eliminated through dedicated recycling circuits - when locally existing - or in specially designed incinerators or send to an approved processing facility.

Laboratory waste or medical waste shall be collected in special circuits or containers and treated separately.

NORM's (Naturally Occurring Radioactive Materials) waste and contaminated materials shall be collected in special containers, handled and eliminated according to a dedicated specific procedure. This procedure shall be handled on a case by case basis.

4.5 Drilling management

4.5.1 Drilling fluids

All fluid components shall be selected on Best Environmentally friendly criteria.

Diesel oil use in drilling muds is forbidden in any case.

When an oil based mud is used, the content in aromatics of the base fluid should be less than 0.1% and shall be in any case less than 3% by weight (weight of base fluid by weight of dry retorted cuttings ; by UV spectrophotometry method).

Whenever the aromatic content is over than 0.1% weight appropriate Personal Protective Equipment (PPE) shall be provided.

4.5.2 Rig design

Rigs shall be equipped with a fully watertight floor and efficient closed loop systems in order to optimize fluid re-circulation and to reduce losses.

It is forbidden to discharge, oil based fluids to the environment. These fluids shall be recovered to be recycled or eliminated.

4.5.3 Drill cuttings

Disposal options must be systematically studied taking into account the regulatory and environmental context.

Drill cuttings shall be discharged after a mechanical treatment of solids. Drill cuttings shall be quantified and reported.

Drill cuttings treatment shall be selected according to the environmental sensitivity and the fluids composition (e.g. salts, etc.). The most relevant method shall be selected among the following:

- Dewatering, burying and covering by top soil (unsalted Water Base Mud / WBM)
- *Inerting method*: stabilization (mixing cuttings with cement, lime, etc.) or solidification (setting the cuttings in a solid matrix of cement for limiting as possible the leachability).
- *Thermal method*: incineration, thermal desorption.
- *Biological treatment*: composting.
- *Controlled landfilling* (will be evaluated on a case by case basis).

4.6 Chemicals management

4.6.1 Chemicals selection and handling

The chemicals shall be evaluated according to regulations.

The chemicals shall be selected according to the following criteria: lowest toxicity, lowest bioaccumulation potential, highest biodegradation.

Each chemical product shall be supplied with its own **MSDS** (Material Safety Data Sheet) and fitted with **a labelling correctly marked** on the packaging.

MSDS shall include ecotoxicological data.

Prohibited substances:
- Ozone Depleting Substances and all products listed in the Montreal protocol: all use of **CFC**, **HCFC** and **Halons** which contribute to decreasing the ozone layer, is prohibited. Alternatives shall be used.
- Use of any transformer fitted with **PCB**-type fluids is prohibited.
- Use of **Glycol Ether** is prohibited.

Chemical Handling Procedure shall be set up and Personal Protective Equipment (PPE) shall be available on work site. Bulk supply of chemicals via tote tanks or dedicated containers shall be considered to minimize transfer operations and avoid packaging waste.

Chemical stock shall be properly managed to ensure that any over capacity and leftover chemicals is avoided. Chemicals / materials supply contracts should consider the possibility of returning the unused products to the suppliers.

4.6.2 Chemical storage design

Chemical storage shall include secondary containment, either a double walled container or a skid base plate or a bunded area, and an adequate ventilation. The storage should be protected from rainfalls and direct sun radiation.

On logistic bases, large storage areas shall be fitted with an impervious slab (concrete or other) with a slope towards a gutter and a relevant drainage system.

The storage design shall take into account chemicals compatibility.

The storage of laboratory chemicals is subject to specific regulations.

4.7 Noise level

During the construction, all the measures shall be taken for avoiding noise impacts on the neighbourhood by planning the working times.

During operations, three kinds of noise levels have to be taken into account:
- noise emission at facility boundary limit and in residential areas close to the installations,
- noise emissions on work site, offices and living quarters,

- equipment noise emission.

All the noise abatement measures shall be taken for ensuring an adequate acoustical insulation of the drivers / engines, compressors, and steam flow lines and valves (lagging, in-line silencers, etc.).

4.8 Dusts, Odors and Light

Measures must be taken to avoid nuisances to local communities:

Dusts and Odors: All measures shall be taken, during works, for limiting the generation of dust due in particular to the movement area of vehicles / work engines, such as track watering.

The study of the lay out of the process area, in particular the vent / flare and the OWTU, shall take into account the main wind direction and the location of any community settlements.

Light should be directed to limit nuisance to the community.

4.9 Spill and leakage control

Before starting any activity with high risk on site (including drilling and construction works) an **Emergency Response Plan (ERP)** shall be developed.

This plan shall be developed to face a variety of particular spill cases as these arise (diesel, lube oils, chemicals, etc.).

Spill control shall comprise as a minimum the following steps:
- A Preliminary Risk Assessment: to evaluate the main accident scenarios that could generate a chemical / oil spill and define possible impacted areas,
- Define spill response equipment that may be necessary on site in order to allocate adequate storage room on the installation,
- An Action Plan, giving initial response procedures, alert diagrams and decision tree, detailed action plans, etc. shall be ready before starting any activity on site.

An oil spill response equipment storage will be provided and shall be reached easily from the activity area.

4.10 Decommissioning of installations

The site restitution shall be integrated early in the project design and shall be addressed during the EIA process. This study shall be in compliance with the local abandonment regulations, the regional conventions and international rules.

All facilities shall be designed to be removable. The development well architecture shall be designed to facilitate ultimate plugging operations.

At the end of the Activities, the decommissioning shall be treated as a stand alone Project. As early as the Pre-Project phase, the following points shall be considered: cessation plan, well plugging, installation cold phase, cleaning operations, hazardous products elimination, pieces of equipment and facilities which will be dismantled and removed, environmental surveys and impact assessment studies. The site restitution shall include a restoration program if highlighted during the EIA process.

The following points should be as a minimum followed:

- Production sites and tanks should be cleaned and removed totally including infrastructures (foundations) and superstructures.
- Production pads and clusters should be reclaimed.
- Wells should be plugged according to standard procedures.
- Drains and pipelines should be cleaned, flushed and removed.
- Pipelines and pipes (including buried pipes) should be cleaned and flushed then removed, or left in place depending on the future use of the ground and authority approval. If the pipes remain in place, they should not be the source of any possible incident.
- The treatment of contaminated effluents should be designed to fulfil regulatory standards.
- Underground water and contaminated soils should be reclaimed if contaminations are detected during surveys.
- Replantations may be considered to re-insert the site into the environment.