Introduction

This guideline is designed to be used by EBRD Financial Intermediaries (FIs) to understand the nature of environmental and social (E&S) risks associated with this sector and suggested actions for businesses to manage these E&S risks. It also provides guidance for FIs on potential due diligence questions to raise with management to understand how their business is managing these E&S risks.¹ This guideline focuses on material E&S risks; it is not an exhaustive list. In managing E&S risks, all businesses should be compliant with relevant E&S laws and regulations. Where applicable, this includes European Union legislation, which may also be taken as a benchmark for good practice.

This guideline covers the manufacture of natural and synthetic rubber products.

Reference NACE codes:
- 20.17 Manufacture of synthetic rubber in primary forms
- 22.19 Manufacture of other rubber products

Material risks

Below is an overview of the material risks present in the manufacture of natural and synthetic rubber products.

¹This guideline outlines some relevant legislation but does not provide an exhaustive list of applicable laws and regulations.
<table>
<thead>
<tr>
<th>Environmental &amp; Social Risk Category</th>
<th>Environment</th>
<th>Health and safety</th>
<th>Labour</th>
<th>Community</th>
<th>Page no.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Key Environmental &amp; Social Risks</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>(In order of materiality)</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wastewater and Water Use</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>✓</td>
<td>5</td>
</tr>
<tr>
<td>Hazardous Materials and Chemicals</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>6</td>
</tr>
<tr>
<td>Fire/Explosion risk</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>7</td>
</tr>
<tr>
<td>Solid Waste</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td>✓</td>
<td>8</td>
</tr>
<tr>
<td>Air Emissions</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>8</td>
</tr>
<tr>
<td>Energy Consumption</td>
<td>✓</td>
<td></td>
<td></td>
<td></td>
<td>9</td>
</tr>
<tr>
<td>Occupational Health and Safety</td>
<td>✓</td>
<td>✓</td>
<td></td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Process description</strong></td>
<td>4</td>
</tr>
<tr>
<td>2. <strong>Key E&amp;S Risks</strong></td>
<td>5</td>
</tr>
<tr>
<td>3. <strong>Financial implications</strong></td>
<td>12</td>
</tr>
<tr>
<td>4. <strong>Suggested due diligence questions</strong></td>
<td>12</td>
</tr>
<tr>
<td>5. <strong>References and additional sources</strong></td>
<td>17</td>
</tr>
</tbody>
</table>
1. Process description

This guideline covers the production of rubber products, derived from both natural and synthetic latex. Most types of rubber derive from latex, which is a polymer—a chain of repeating units (monomers) which link together and make up plastics, rubber and many other materials.

Natural rubber comes from the rubber tree (Hevea brasiliensis). Latex is tapped from a diagonal incision in the tree trunk and solidified by adding acid, which causes it to coagulate. Synthetic rubber (which comprises 70% of rubber) is made by mixing two gaseous by-products of the crude oil cracking process with chemicals, to make latex (see Petroleum Refining and Manufacture of Petroleum and Coal Products guidelines).

Rubber product manufacturing is very diverse, but there are several basic processes. There are two main types of operation: dry and wet.

Dry process

This is used to make hard rubber for products such as tyres. The dry process is shown in the diagram below; some or all of the stages may be used.

- Mixing: Polymers (natural or synthetic), carbon black, oils and other chemicals are weighed and loaded in the compounding area into a mixer. The additives determine the properties of the final rubber produced;
- Milling: The mixed rubber is formed into a long strip or sheet;
- Calendering: Rubber from the milling process is squeezed into reinforcing fibres or fibre matrices to form thin sheets of rubber-coated materials;
- Extruding: Rubber is forced through dies by a rotating screw to form various shapes or profiles. This process heats the rubber;
- Building: Extruded and calendered rubber components are layered with other reinforcing materials such as wire and polyester. Adhesives are sometimes used to enhance the bonding of the layers;
- Vulcanising: All rubber products are vulcanised, where the assembled product is heated to cure the rubber and sulphur and catalysts are added. The polymer chains in the rubber matrix cross-link to form durable, elastic, thermoset rubber (which does not soften on heating);
- Finishing: Operations to prepare the product for delivery to the end user, e.g. grinding, printing, washing, wiping, buffing, balancing.
Wet process

This process uses latex dipping to make thin, flexible items such as surgical gloves.

- A suitably shaped former is dipped into natural or synthetic latex, withdrawn, dried and vulcanised. Dipped goods are usually leached to remove water-soluble materials. Some products may be subjected to chlorination after vulcanisation.

Ancillary activities include steam generation, water-based cooling, electricity generation and primary wastewater treatment.

2. Key E&S Risks

The manufacture of rubber products faces a number of potential E&S risks. Most of these risks come from harmful substances which are used in the chemical reactions as part of the manufacturing process, as well as hazards arising from waste rubber and emissions.

Rubber producers may need permits, licences or authorisation to prevent their activities from causing pollution or harming human health. Rubber production processes in the EU are subject to national regulations under the Integrated Pollution Prevention and Control Directive (2008/1/EC). Operations outside the EU will still be subject to local regulation.

Legal entities in the EU manufacturing, importing or using certain chemical substances may be subject to an EU regulation called the Registration, Evaluation and Authorisation of Chemicals (REACH) (1907/2006). This regulation places requirements on “users/manufacturers” to evaluate and control the health and environmental risks associated with certain substances.

Below are the material E&S risks associated with this sector and key measures available to manage them. Where gaps are found in the management of key E&S risks, the E&S risk management measures described should form part of a corrective E&S action plan agreed with your customer.

Wastewater and Water Use

Wastewater from cooling, heating, vulcanising and cleaning operations may be contaminated due to direct contact with the product and may contain suspended solids, oil, grease and trace metals such as zinc. Wastewater from the latex dipping process may be contaminated with additives used in the process. The most significant contaminants are BOD (biochemical oxygen demand), COD (chemical oxygen demand) and SS (suspended solids), along with acidic effluent, ammonia, nitrogen compounds and sulphate. BOD and COD can consume oxygen in waterways, while the other pollutants are toxic – therefore all pose hazards to aquatic animals.

Risks are also posed to human health, e.g. ammonia is not only malodours, it is highly toxic and corrosive when inhaled or comes in contact with skin or eyes.

Most facilities will have been issued with an effluent permit from the local regulatory authorities which specifies limits for various contaminants.

Significant quantities of fresh water may be consumed for cleaning, cooling and steam generation.
**How can a business manage this risk?**

- Ensure that the minimum concentration of acid required for the latex coagulation process is not exceeded significantly;
- Rubber in wastewater should be removed with a rubber trap and recycled or reused in the process. Some further pre-treatment for solids settling, pH adjustment or oil removal may be required before the water can be discharged to a water treatment plant either onsite or at a municipal water treatment works;
- Use biological treatment to reduce the quantity of pollutants (especially BOD and suspended solids) in the wastewater;
- A closed-loop water cooling or heating system should be employed in order to reduce the use of freshwater;
- Ensure untreated wastewater does not discharge to watercourses;
- Use dry cleaning methods wherever practicable for solids, (e.g. vacuum extraction, wipe down equipment that is accessible) rather than washing and rinsing them.

**Hazardous materials and Chemicals**

Considerable quantities of hazardous raw materials and chemicals may be used in rubber and rubber products manufacture. Hazardous properties relating to these substances are many and varied and include flammability, toxicity from carcinogens and persistent organic pollutants, corrosive potential and oxidising potential. Some chemicals may only possess a hazard potential if they have the opportunity to react with other compounds.

Key hazardous chemicals are:

- Acids, used in coagulation of latex, which can burn the skin;
- Ammonia, used in washing of latex products, which can be hazardous when inhaled;
- Sulphur, added during vulcanisation. Sulphur can burn the skin in high concentrations, and inhalation can cause respiratory problems;
- Process catalysts, which may be toxic.

The Seveso III Directive now requires obligated sites to make information electronically available to the public, regarding the nature of hazards and safety measures being undertaken.

Inadequate control or accidental releases of hazardous substances on site or in transit could impact workers’ health as well as the local community and the environment as outlined below:

- **Contamination of soil, groundwater and surface waters (on or off site)** - Significant environmental impacts can occur through acute incidents and accidents such as a major spillage or via gradual or repeated leakage of raw material contaminants into soil and waters. Surface waters are particularly vulnerable to chemical contamination. Chronic, undetected leakages on site can occur as a result of fractured vessels, seals, valves and pipelines. Remediation costs could be high, particularly if the site is in an area of high environmental sensitivity - for example, if located above a drinking water aquifer. Additional costs may include criminal or civil fines, ecosystem rehabilitation (e.g. fish restocking) and claims from third parties such as nearby landowners or residents.
- **Air pollution** - Releases of hazardous substances such as VOCs/organic solvents to the air could impact the local environment and human health, potentially leading to large compensation claims.
- **Public anxiety** - particularly from neighbouring residents, can be caused by a lack of knowledge regarding the nature of the chemicals being stored on the site, odours from the site, the potential for fires
and explosions and the action that will be taken in the case of an accidental release. This public anxiety can result in significant planning constraints being imposed on this type of facility.

**How can a business manage this risk?**

- Ensure that robust systems are in place to manage process safety-related risks, supported by appropriately qualified staff;
- Maintain an up-to-date inventory of all substances present or likely to be present which could be hazardous to health or the environment;
- Install or upgrade abatement technology to minimise exposure to toxic substances, such as enclosure of equipment, appropriate ventilation with filters, gas balancing systems;
- Regularly inspect and integrity test all bulk containment and infrastructure on site to prevent leakage and product loss;
- Provide secondary spill containment (bunds etc.) for bulk storage tanks;
- Delivery, handling and transfer or decanting areas should be impermeable to the raw materials and products handled. Designate, visibly mark and isolate these areas from the surface water drainage system, e.g. with ramps, sumps or drainage shut-off valves;
- Store chemicals in a dedicated, enclosed and secure facility with a roof and a paved/concrete floor. Chemicals should be stored according to compatibility as outlined in Material Data Sheets;
- Consider installation and use of groundwater monitoring points on site to check for contamination;
- Label chemicals with appropriate, internationally recognised, diamond shaped hazard symbols;
- Chemicals with different hazard symbols should not be stored together - clear guidance on the compatibility of different chemicals can be obtained from the Materials Safety Data Sheets (MSDS) which should be readily available from the manufacturer and on site;
- Involve the emergency services and neighbouring community in the creation and implementation of plans to respond to major incidents at the installation;
- Provide access for citizens to information about risks resulting from the use of hazardous chemicals at the installation.

### Fire/Explosion risk

Several stages of the rubber manufacturing process involve fire and explosion risks, including:

- Fire sensitive rubber compounding additives such as the sulphur used in vulcanisation;
- Flammable solvents used in degreasing and cleaning machinery;
- Dusts, which can cause explosions, for example dust from rolling and grinding processes. This is the most widely reported source of fire in rubber factories.

**How can a business manage this risk?**

- Control the effect of fires and explosions by segregating process, storage, utility and safe areas;
- Avoid potential sources of ignition including banning smoking in and around facilities;
- Use explosion-proof equipment and non-conductive materials. Ensure that equipment is grounded (connecting it to the earth) and bonded (connecting all exposed metallic items together so that no dangerous electrical potential differences can build up);
- Take care not to friction-heat the rubber in certain phases of the process which are prone to a lot of dust production;
- Emergency storage lagoons may be needed to prevent contaminated firewater reaching watercourses;
- The dust collection plant should have explosion relief valves built in.

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2 United Nations 2013 Globally Harmonized System of Classification and Labelling of chemicals (GHS)
Solid waste

The majority of scrap from the process can either be recycled directly into the process, or shredded or ground and recycled into other products. Some waste rubber, e.g. excessively heated polymer parts, is disposed of as waste. Waste rubber should be segregated into cured and uncured rubber.

Scrap rubber may be incinerated, although it is often not allowed under local legislation. Where permitted, incinerators must be designed to manage air emissions, capture contaminants and the generated ash must be analysed, treated and disposed of appropriately. Particular care should be taken if rubber products are burnt due to the hazardous composition of emissions and generated ash. Ultimately, it may not be a cost effective method of waste disposal. In the EU, waste incineration is regulated under the Waste Incineration Directive.

Hazardous emissions from burning waste, along with hazardous waste products, pose a risk to workers, and potentially the wider community, as well as polluting the atmosphere.

Large volumes of waste, if not dealt with appropriately can cause nuisance to the wider community and damage to the environment.

Large quantities of waste going to landfill is an environmental issue. Rubber waste piles are also a fire hazard. Such piles are prone to spontaneous combustion, and burn with an intense heat giving off a black smoke and are difficult to extinguish.

How can a business manage this risk?

- Develop and implement a waste management plan covering all aspects of waste treatment on site. Wherever possible, priority should be given to reduction of wastes generated, and recovery and re-use of raw materials;
- Recondition and reuse solvents (distillation on site or off site) and catalysts, where possible;
- Segregate waste streams (including different types of scrap rubber) to increase recycling and reuse opportunities;
- Recover and re-use raw materials and waste rubber where practicable. Scrap rubber that cannot be recycled into the process can be added to fuel for process boilers.

Air emissions

Emissions from rubber manufacture predominantly take the form of dust and powder, either from additives to the process, or during finishing activities. Air emissions include fugitive emissions from solvents, additives, and mixing processes, as well as particulate matter from surface grinding.

- Fugitive dust emissions can be released from open storage, weighing and loading of powdered materials. Dust can be inhaled and cause respiratory diseases, including asthma, in employees. Dust, vented fumes, smog caused by particulates and odours can be a nuisance to neighbouring residential communities and industrial activities;
- Dust and fine rubber particles may be released during surface grinding activities of finished products;
- Volatile organic compounds (VOC) and other hazardous air pollutants may be generated during each of the processing steps and through the use of solvents, cement and adhesive evaporation. VOCs...
can cause dizziness, asphyxiation and are potentially carcinogenic. VOCs are also a primary component of smog, with major health impacts in urban areas.

- Ammonia, used to treat latex, causes both a strong odour and potential respiratory problems for workers.
- Organic solvents and ozone depleting substances may be used extensively on some sites for cleaning, and in coatings and adhesives. These can cause hazardous air emissions and wastewater contamination.
- Public/environmental health and nuisance issues associated with dust and vented fumes can arise from production activities and may have a significant effect on neighbouring locations.
- Many of the substances produced or used have the potential to create an offensive odour to neighbouring communities. This arises from the handling of malodorous substances such as ammonia, fugitive releases of organic solvents, and wastewater.

Air emissions are normally prescribed in permits which set emission limits to control releases of specific, named chemicals. Limits for carbon black are normally set at a lower level than other particulates.

EU legislation is aiming to reduce the emissions of VOCs, directly and indirectly, in Europe. The Solvents Emissions Directive (1999/13/EC) sets out emission limit values for VOCs in waste gases and maximum levels for fugitive emissions from obligated facilities.

**How can a business manage this risk?**

- Aim to minimise fugitive releases of gaseous substances at the design stage by the specification of high quality equipment and materials of construction which minimise leakage e.g. appropriate corrosive resistant materials;
- Install or upgrade VOC abatement technology to minimise the release of emissions, e.g. thermal or catalytic oxidisers, bio scrubbers or reactors, turbines, reciprocating engines or boilers;
- Minimise dust production and any losses of volatile organic solvents through use of enclosed mixing and storage vessels and extraction and ventilation systems;
- Replace organic process solvents with water, silicon and non-solvent-based alternatives;
- Replace organic cleaning solvents, where possible, by high-pressure water systems or citrus based solvents;
- Conduct indoor air quality monitoring and mark out dedicated areas with signage where there are elevated levels of emissions and personal protective equipment is required;
- Ensure that respiratory hazard control technology, (e.g. respirators) are used when exposure cannot be avoided, e.g. during maintenance;
- Implement a formal Leak Detection and Repair (LDAR) programme and where necessary, replace with higher quality items, any equipment which generates significant fugitive emissions;
- Purchase dry chemicals in small pre-weighed, sealed bags that can be placed directly in mixers without opening;
- Reduce fume levels by controlling compound temperatures to the minimum needed by the process.

**Energy consumption**

Rubber production requires significant heat, steam and pressure generation capacity. Many rubber manufacturing sites have large on site boilers to meet the high temperature and pressure requirements. The emissions from the boilers will be dependent on the fuel used (coal, oil or gas). Large coal fired boilers may emit high concentrations of pollutants, for example sulphur dioxide, nitrogen oxides, and...
particulates. Greenhouse gases pose a climate risk, and particulates, while not greenhouse gases, can exacerbate the effects of global warming, as well as causing smog.

**How can a business manage this risk?**

- Consider cleaner (low carbon) fuel sources;
- Recover heat and energy from processes for use elsewhere on the site or to supply heat and power off site;
- Improve thermal efficiency to minimise heat loss. For example, provide pipe insulation for process vessels and any heating and cooling systems.

**Occupational Health and Safety**

**Chemical exposure – see also asbestos**
Dust and fumes generated during the production process are hazardous to health in the form of asthma, lung disease and cancer. Emissions from rubber processing are a complex mixture of substances, the main constituents being volatile organic compounds (VOCs), particulates and certain carcinogenic compounds. Many of these risks can be reduced by eliminating known carcinogens e.g. 2-napthylamine (which is known to cause bladder cancer) and related products. Contact dermatitis has been reported frequently among rubber manufacturing workers.

**Slips, trips and falls**
These are primarily caused by uneven surfaces, inappropriate footwear, poor lighting, weather conditions, trailing cables and pipe work, especially during unblocking, maintenance and cleaning activities.

Drivers and workers could fall from large vehicles and tankers during loading and unloading processes.

**Noise**
Noise levels at heavy mixing machinery can be high. Significant noise exposure may also occur from equipment such as mills, braiders, belt grinders, air-exhausts, and from compressed air and steam leaks.

**Burns and heat stress**
Working at high temperatures can increase the temperature of the working environment which can lead to heat stress for those working in the vicinity. Contact burns can result from contact with hot equipment especially during maintenance activities.

**Machinery**
The industry uses very powerful machinery with the potential to cause serious, even fatal, injury. Moving parts of machinery can result in entanglement and entrapment. Particular attention should be paid to mills, mixers and cyinders.

**Collision**
This can take the form of people being hit by vehicles, or moving or falling loads. Collisions between vehicles can also occur.

**Confined Spaces**
Storage silos are dangerous confined spaces and entry to them must be strictly controlled and avoided wherever possible.

**Manual Handling and Repetitive Work**
Lifting and carrying heavy or awkwardly shaped objects, such as bags, can result in manual handling injuries.
**Working hours**
Long hours or night shifts can lead to fatigue, decreased wellbeing and inability to concentrate.

**Asbestos**
Asbestos (a carcinogen when in the form of inhalable dust) has been used on a large scale for many years as a fire proofing and insulation material. The organisation should identify the presence of asbestos, confirm its condition and, where necessary, encapsulate or remove it. Particular attention should be given to buildings constructed between 1950 and 2000 when asbestos use was at its most extensive.

**How can a business manage these risks?**

**Chemical exposure**
- Provide personal protective equipment (PPE) that is fit for the task to prevent injury and maintain hygiene standards. Train staff in the correct selection, use and maintenance of PPE, and put in place measures to encourage/mandate its use;
- Install automatic alarms and shut off systems and ensure that these are subject to frequent and proper inspection;
- Implement a programme of routine monitoring of worker health;
- Reduce fume levels by controlling compound temperatures to the minimum needed by the process.

**Slips, trips and falls and collision**
- Install walkways to separate people from vehicle movements to reduce risk of collision. Ensure that these walkways are constructed of non-slip materials and route cables and pipework under walkways to prevent slips, trips and falls;
- Introduce a one way system for site traffic and introduce speed limits to reduce the likelihood of traffic accidents.

**Noise**
- Isolate noisy equipment where practicable, rotate tasks to minimise time spent in a noisy area over an eight hour period and provide hearing protection where people have to enter noisy areas.

**Burns and heat stress**
- Cool fuming products as soon as the processing is complete, e.g. using water, air or passing over chilled surfaces;
- Heat stress injuries can be prevented through the implementation of an effective heat stress programme, ensuring that workers are trained to recognise warning signs of heat stress, such as high body temperature, high heart rate and excessive weight loss from sweating. Other warning signs include severe fatigue, nausea, dizziness, or light-headedness.

**Machinery and manual handling**
- Redesign manual processes and rotate work tasks to reduce heavy lifting/repetitive activities, and where possible install mechanical lifting aids;
- Train workers in correct use of machinery and safety devices, and in correct lifting technique;
- Separate people from moving equipment:
  - Ensure that the process layout reduces opportunities for process activities to cross paths;
  - Install safeguards on moving parts of conveyor belts to reduce the risk of entrapment of employees.

**Working hours**
- Record employee hours worked, including overtime, and ensure that staff receive written details of hours worked and payment received;
- Ensure that labour standards, contracting, wages, and working hours, are consistent with the average for the sector and national standards;
- Implement a grievance/dispute resolution mechanism for workers.

**Asbestos**
- Removal of friable asbestos should be undertaken by licensed contractors and in all circumstances should be carried out in controlled conditions to ensure that there is no release of substances or materials to the environment.
3. **Financial implications**

Outlined below are examples of financial implications for businesses due to ineffective management of E&S risks related to this sector. These implications may in turn create issues for FIs.

- Significant capital investment in site infrastructure may be required to comply with planning constraints, permit / consent conditions and new environmental, health and safety requirements, especially if local communities raise concerns regarding the site operations.
- Fines, penalties and third party claims may be incurred for non-compliance with environment, health and safety regulations.
- Reputational risk through poor environment, health and safety performance may impact sales or cause the local community to no longer tolerate the company’s operations (loss of a ‘social licence to operate’).
- Injuries to employees may lead to increased payroll costs, lost production time and employee compensation claims.
- Fire / gas or dust explosions can result in widespread contamination and destruction, impacting surrounding land, rivers and communities. Compensation costs can be high and widespread remediation and rebuilding may be necessary.
- Soil and groundwater contamination from accidental chemical releases e.g. organic solvents, can be costly to remediate, especially if contamination affects neighbouring property, water supplies or public health.
- Compliance with the REACH regulation may incur a substantial cost. Failure to register chemicals under REACH may prevent import of products into the EU, with significant financial implications.
- Many countries are signatories to the Kyoto Protocol and have adopted targets for the reduction of CO2 emissions. Where Governments have set up carbon emission reduction programmes, industrial processes have been required to reduce their CO2 emissions through the setting of targets. This can result in a need for substantial investment in new/clean technologies to achieve the emission targets. These targets may be reflected in environmental permits.

4. **Suggested due diligence questions**

When assessing E&S risks, it is important to discuss with the customer how these risks are being managed. Below are suggested questions that can be used when engaging with management or on site visits. The relevance of these questions may depend upon the type of rubber products being manufactured, stored and distributed.

**General**

- Does the site have all the required permits in place?
- What processes are undertaken and are any hazardous chemicals containing VOCs/organic solvents used? How hazardous are the materials and have associated risks been documented and addressed in appropriate systems?
- If on a site visit, note signs of poor housekeeping and inadequate/untidy storage areas. Look for evidence of any recent spills or releases of raw materials/product.
**Management systems**
Confirm that the business has put in place at a minimum, the following items in its E&S risk management systems:

- Operational policies and procedures for managing environmental, health, safety, labour and community matters. These systems should cover both employees and contractors;
- Accountability and responsibility for environmental, health and safety, and labour matters. Is there evidence of management review/demonstrated involvement in environment, health, safety and hygiene management? This should include senior management oversight;
- Improvement objectives, targets, project plans and monitoring programmes;
- Training for personnel, including ensuring that personnel are trained in the risk associated with their job and the correct use of personal protective equipment;
- Regular inspections, checks and audits with records to demonstrate achievement of the required level of performance against legal requirements;
- Energy conservation schemes and development of programmes to reduce greenhouse gas emissions;
- Emergency plans for environment, health and safety accidents or hygiene non-compliance incidents;
- Waste management plan (waste minimisation, re-use, recycling, monitoring);
- Stakeholder engagement plans / programmes;
- Product stewardship plan;
- Safety and security plan for the transportation of dangerous goods / products;
- Financial investment plans directly or indirectly related to management of environment, health and safety and labour issues.

**Air emissions management**
- Are there any dust control measures? Are they used and effective? Is there any build-up of dust on machinery or other surfaces?
- Is there a management policy and procedures for the transfer of dry materials?
- Are there any VOC abatement technologies or measures in place? Is there a Leak Detection and Repair (LDAR) programme?
- Is there an indoor air quality monitoring programme? Is there clear signage where there are elevated levels of emissions?

**Wastewater management**
- What liquid effluents are produced? What discharge control measures are employed?
- Is effluent and wastewater treated before discharge? If so, does the wastewater treatment plant discharge to a local watercourse or the municipal wastewater treatment works? Higher environmental risks will be associated with facilities discharging to water courses without adequate treatment;
- Is the wastewater quality tested and if so, for what? Where are the samples taken from, and how often? Do the discharges have to meet set standards?
- Check regulatory compliance - are all necessary licences/permits/discharge consents in place?
• Will the presence of the installation lead to change in the type or volume of waste-water produced? Will the existing waste water infrastructure be able to treat expected future volumes?
• If on a site visit, check the condition of the treatment plant and location of discharge points for effluent and wastewater from the facility. What does the quality of these discharges look like? Note the colour and appearance of adjacent watercourses.

**Solid waste management**
• What is the nature of solid waste disposal?
• Are measures in place to minimise, re-use or recycle waste products?
• How is hazardous waste removed? How are appropriate contractors selected and monitored to ensure that the waste is being taken to an appropriate waste disposal facility?
• If on a site visit, check that solid waste storage equipment is in a good condition, that waste storage areas are clear of debris and that skips are covered to prevent waste escaping. For example, check that waste containers have lids or are stored in an area with a roof. Check for flora/vegetation zones near storage sites that are not growing very well as this will indicate the possibility of pollution.

**Transport of raw materials and finished products on and off the site**
• How are materials and products transported (e.g. road, water or rail), and what are their potential impacts?
• Where are the areas for loading/unloading of material located? Are they located near any water bodies or other possibly sensitive features? Is there any containment to prevent run-off of contaminated water?
• Is there a labelling and documentation process in place for all consignments of dangerous goods?
• Does road haulage cause excessive traffic through any neighbouring residential areas?
• If on a site visit, check the age and condition of equipment and vehicles. Look for signs of wear and tear, degradation, leaks and breaks.

**Storage**
• What is the potential for spillages and leakages to enter soil or storm-water drainage systems? Are surface tanks and usage areas hard surfaced and bunded? Are they regularly cleaned and inspected and tested for leakages? Are alarms installed to detect leaks from storage areas?
• If on a site visit, check the condition of storage facilities for raw materials, finished products and solid wastes. Check whether surface tanks and usage areas are in good condition and whether the volume of the bunded area is adequate to contain the stored materials.

**Health & safety**
• Do staff wear PPE? Are staff trained in the correct selection, use and maintenance of PPE?
• Are there automatic safeguards e.g. alarms and shut off systems, on machinery to prevent accidental injury? Have workers been trained in the correct use of machinery and safety devices?
• Is first aid equipment available? Is there a trained and competent first aid resource on site?
• Is there a worker health monitoring programme? What does it check for?

• Have workers been historically exposed to materials that could potentially lead to occupational health illnesses?

• If on a site visit, check signage around the site:
  o Does it convey the health and safety risks?
  o Are fire exits and/or evacuation routes clearly marked?
  o Are there demarcated routes for pedestrians and vehicles?

• If on a site visit, check the age and condition of equipment, look for signs of wear and tear, degradation, leaks and breaks. Check for automatic safeguards on machinery to prevent accidental injury.

Incident management

• Is site safety equipment clearly signed and readily available, e.g. fire extinguisher(s), eye wash, safety shower, first aid equipment, emergency escape routes, emergency stop, decontamination equipment, and absorbent materials? Is there a trained and competent firefighting and first aid resource on site?

• Have any measures been taken to limit potential sources of ignition?

• Have there been any recent incidents on site such as fatalities, fires/explosions, spills? Is insurance in place to cover such incidents?

• Assess emergency responses to fires, major spills and explosions (in some countries it may be a legal requirement to have an emergency response plan). Does the organisation have an emergency response plan which includes an engagement plan to disseminate information to local communities at risk? What evidence is there of active engagement with the community over on-site risks?

• Does the organisation have insurance to cover any significant damage to the environment/ community/operations (this may be covered by public liability insurance or the organisation may be party to an industry insurance scheme). Review the terms of the cover and identify any exclusions relevant to environmental and health and safety matters. Identify the number and type of claims against insurance in the past.

Inspections & regulation

• Check the conditions and duration of validity for all permits. Will any planned changes at the facility require revisions to the permits or require new consents?

• What systems are in place to check and maintain assets and infrastructure?

• Have the premises been inspected recently by the regulatory authorities for health and safety, labour conditions, hygiene and environment? What were their findings?

• Has the organisation been subject to environment, health and safety or quality audits by customers/insurers? What was the outcome of these audits?

• Does the organisation have insurance in place to cover the recall of contaminated/ faulty products? Have there been any recent product recall incidents? If yes, what did these relate to?

• Review historical and projected trends for environmental fees and fines. It is also suggested that contact is made with local regulatory agencies to determine compliance and whether complaints have been made by the public.
**Investment**

- Where are the organisations’ main markets? Are they manufacturing or exporting to the EU? Will product standards such as the REACH regulation be relevant? Could the organisations’ markets and hence revenue be impacted by REACH? Is investment for compliance required?

- Review budgets for capital expenditure and operational expenditure to cover environment, health, safety and labour matters. Does the business plan have line items for improvements in these areas as well as asset management and maintenance?

- If investment or refinancing will lead to restructuring of the organisation, what will be the potential impacts on health and safety at the operation and wider community? Have these been considered and assessed by the company?

- If the company plans to invest in new technology, what will be the impacts and benefits for human resources?

**Social, labour and community**

- Has the company received inspections from the local labour inspectorate in the previous three years? Have these resulted in any penalties, fines, major recommendations or corrective action plans?

- Does the organisation have a grievance mechanism, which allows employees to raise workplace concerns?

- Are employees free to form, or join, a worker’s organisation of their choosing?

Take note of/ask questions relating to any activities that manage risk as listed in the earlier sections of this document.
5. References and additional sources

ETRMA, European Tyre & Rubber Manufacturers’ Association, www.etrma.org


International Organisation for Standardisation (ISO) www.iso.org

UK Department of the Environment 1995, Chemical Works: Rubber Processing Works (Including Works Manufacturing Tyres or Other Rubber Products), Industry Profile

UK Health and Safety Executive (HSE), Health and Safety in the Rubber Industry http://www.hse.gov.uk/rubber/index.htm


US National Institute for Occupational Safety and Health 1993, Rubber Products Manufacturing Industry, Special NIOSH Hazard Review