



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 existing operations in 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 discuss with management to understand how their business is managing these E&S risks. This guideline focuses on material E&S risks; it is not an exhaustive list of E&S risks. In managing E&S risks, all businesses should be compliant with relevant E&S laws and regulations.¹ Where applicable, this includes European Union legislation, which may also be taken as a benchmark for good practice.

This guideline covers the manufacture, storage and distribution of organic and inorganic chemicals. Specific and niche chemical products, including plastics, agrochemicals and rubber products are not covered by this guideline. (See “Manufacture of Paints and Related Products”, “Pharmaceuticals and Biotechnology”, “Manufacture of Agrochemicals”, “Manufacture of Soap, Detergents and Non-edible Oil Products”, “Petroleum Refining”, “Manufacture of Plastics and Synthetics”, “Manufacture of Rubber Products” and “Manufacture of Textiles and Wearing Apparel”).

Reference NACE codes:

- 20.1 Manufacture of basic chemicals, fertilisers and nitrogen compounds, plastics and synthetic rubber in primary forms.
 - 20.11 Manufacture of industrial gases; 20.12 Manufacture of dyes and pigments; 20.13 Manufacture of other inorganic basic chemicals; 20.14 Manufacture of other organic basic chemicals
- 20.5 Manufacture of other chemical products.
 - 20.51 Manufacture of explosives; 20.52 Manufacture of glues; 20.53 Manufacture of essential oils; 20.59 Manufacture of other chemical products

Material risks

Below is an overview of the material risks present in the manufacture, storage and distribution of chemicals.

¹This guideline outlines some relevant legislation but does not provide an exhaustive list of applicable laws and regulations.

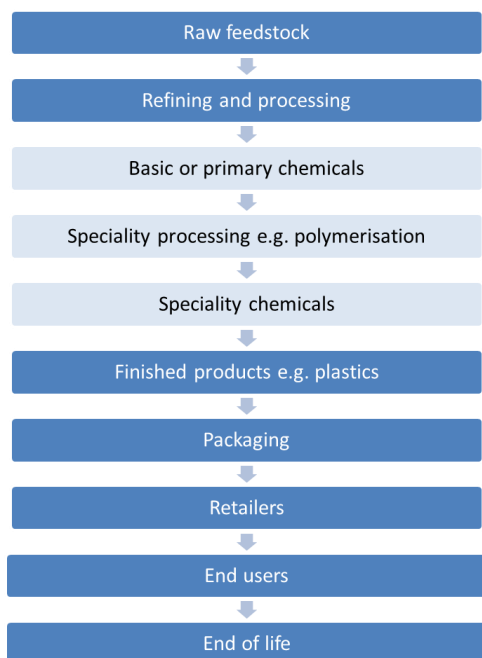
E&S Risk Category	Environment 	Health and safety 	Labour 	Community 	Page no.
Key E&S Risks (In order of materiality)	Affect the natural environment	Affect the health or safety of employees	Affect workplace conditions and the treatment of employees	Affect the health and safety, livelihoods, and environment of the community and wider public	
Air Emissions	✓	✓		✓	4
Hazardous materials and chemicals	✓	✓		✓	5
Energy Consumption	✓				7
Water management and wastewater	✓			✓	7
Solid Wastes	✓				7
Occupational Health and Safety		✓	✓		8
Labour rights			✓		9

Contents

Section	Page No.
<i>1. Process description</i>	<i>4</i>
<i>2. Key E&S Risks</i>	<i>4</i>
<i>3. Financial implications</i>	<i>11</i>
<i>4. Suggested due diligence questions</i>	<i>12</i>
<i>5. References and additional sources</i>	<i>17</i>

1. Process description

This guideline covers the manufacture, storage and distribution of a large range of chemicals. See the light blue steps in the diagram below.



Manufacture of these chemicals involves the conversion of organic and inorganic raw materials, or chemical intermediates, to active chemical substances through several stages of synthetic chemistry. This sector comprises a large number of different installations. The larger processes are continuous and are often co-located on large integrated sites, so that they can exchange/reuse raw materials, products, by-products and wastes. Ancillary activities may include boilers, refrigeration equipment, wastewater treatment and storage facilities for raw materials and finished products.

Storage of these chemicals subsequent to manufacture is in warehouses or tank farms for high volume product, typically in:

- Fixed bulk storage tanks (gases and liquids) or silos (powders).
- Transportable containers, such as, cylinders (gases), intermediate bulk containers (IBCs)

and drums (liquids, solids), and bags (solids).

Receiving warehouses require suitable off-loading equipment, such as pumps, hoses and forklifts, and bulk storage facilities and adequate space for transportable containers.

Distribution of chemicals includes the delivery from the site of manufacture to the warehouse, repackaging or loading and onward distribution from warehouse. Transportation may be undertaken by road, rail or sea.

2. Key E&S Risks

The chemicals industry is a high hazard industry facing a number of potential E&S risks. These are likely to be associated with process safety, occupational health and safety, and impacts to the local environment and community.

Chemical manufacturers may need permits or licences which will set out the limits to adhere to in terms of pollution and harm to human health. An environmental permit from a national or local authority may be required where an installation is producing and/or disposing of certain chemicals or chemical products, including radioactive substances. Water use and discharge and trade effluent permits may also be required.

Specific legislation that may apply to the chemicals sector may include, but is not limited to, the following:

Chemical production facilities and large chemical storage facilities in the EU may be subject to national regulations under the Industrial Emissions Directive (IED) (2010/75/EU). For qualifying facilities, the IED is explicit in its description of what mitigation methods are required and the emission/discharge limits that apply. Some large energy consumers in the chemicals sector

may be captured by emissions trading schemes (ETS), such as the EU ETS, which requires members to purchase sufficient carbon allowances to cover their emissions.

Large chemical production and storage facilities in the EU which have dangerous substances above a certain qualifying quantity or volume threshold may be subject to national regulations under the Seveso III Directive (2012/18/EU) which aims to control the major accident hazard from dangerous substances². The Seveso Directive obliges Member States to ensure that operators that store and use substantial quantities of dangerous substances have controls in place to prevent major accidents and make information electronically available to the public, regarding the nature of hazards and safety measures being undertaken. Operations outside the EU will be subject to local regulations.

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). If the products are manufactured, imported or distributed within the EU they may need to be registered under the REACH regulation. Failure to register obligated products under REACH may prevent import of products into the EU, with significant financial implications.

Exports from and imports to production facilities in the EU may be subject to the EU regulation concerning the export and import of hazardous chemicals (EU/649/2012). Notification of hazardous chemical exports to the importing country may be required, and in some instances Prior Informed Consent (PIC)

² Installations can be obligated under the Seveso Directive as a lower-tier establishment or an upper-tier establishment dependent on the quantity of dangerous substances. Note that the qualifying quantities / thresholds vary by substance.

may also be needed from the importing country.

Facilities supplying chemical products to electrical and electronic equipment manufacturers may face market limitations in the EU due to the Restriction of the Use of Certain Hazardous Substances (RoHS) in Electrical and Electronic Equipment (EEE) Directive (2011/65/EU).

The transportation of hazardous materials is subject to the EU Directive 2008/68/EC which covers the inland transport of dangerous goods within the EU.

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

Air emissions



Possible sources of air emissions include gases, vapours or dusts from raw materials and final products, combustion products (sulphur oxides, nitrogen oxides and carbon oxides) and odours. Particular examples of air emissions include:

- Fugitive releases of dust and small particulates from joints in conveyor systems, from stock-piles, and from packaging.
- Where gases or liquids with moderately high vapour pressures are stored and handled, there is the potential for releases of acid gases, ammonia, volatile organic compounds (VOCs) or volatile inorganic compounds from flanges, pumps, agitators and valves with seals, storage tanks, tanker connections, and sample points.
- Significant quantities of acid gases, and/or volatile inorganic or organic compounds, dust, fumes or wet particulates (some

containing toxic substances, such as heavy metal compounds) may be released from process vents, storage vessels and abatement system exhausts.

Many of these emissions may be harmful to the environment.

Dust created in the process 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.

For large installations or those close to/adjacent to borders, the risk of transboundary pollution must be considered.

How can a business manage this risk?

- Aim to minimise fugitive releases of liquid and 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 and leak proof valve and pump design for pipework.
- Install or upgrade abatement technology to minimise the release of emissions, e.g. baghouses, cyclones, filters, and wet scrubbers to control the release of volatile or dust emissions, enclosure of equipment, appropriate ventilation with filters, vapour recovery, and activated carbon/carbon adsorption for VOCs.
- Optimise operational practices to control emissions to air e.g. conveyors rather than manual handling to reduce dust emissions; enclose conveyors and storage areas to reduce dust.
- 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) is 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.

Hazardous Materials and Chemicals



Hazardous properties relating to chemicals are many and varied and include flammability, combustion potential, toxicity, corrosive potential and oxidising potential.

Inadequate control, or accidental releases, of hazardous substances on site or in transit could impact the workers, the local community and the environment as outlined below.

- **Fire/Explosions** - Major explosions or fires at chemical storage facilities have resulted in widespread contamination and destruction, impacting not only the immediate site but surrounding land, rivers and communities. The release of hazardous gases which may travel many kilometres from the site is of particular concern. Compensation costs for such incidents are high and widespread remediation and rebuilding may be necessary.
- **Air pollution** - Releases of hazardous substances to the air could impact the local environment including human health, potentially leading to large compensation claims.
- **Explosive atmospheres** – Significant amounts of dust mixed with oxygen can form a combustible dust/air mix which can explode if ignited. The force of an explosion can mobilise more dust which in turn can also ignite. Chain reactions of further dust explosions can sweep through entire buildings and facilities causing widespread destruction.
- **Contamination of soil, groundwater and surface waters (on or off site, potentially also in transit)** - Significant environmental impacts can occur through acute incidents and accidents such as a major spillage or via gradual or repeated leakage of contaminants in to 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. These are of particular concern where heavy metals and other persistent organic and inorganic pollutants are released. 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.

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.

Carrying dangerous goods (e.g. road, rail, inland waterway, and sea) involves the risk of an incident such as spillage of the goods, leading to hazards such as fire, explosion, chemical exposure or environmental damage. When transported, these goods need to be packaged correctly as laid out in the various international and national regulations for each mode of transport to ensure that they are carried safely to minimise the risk of an incident. EU Directive 2008/68/EC covers the inland transport of dangerous goods within the EU.

How can a business manage this risk?

Storage

- Label chemicals with appropriate, internationally recognised, diamond shaped hazard symbols. This range of symbols is explained by the European Regulation on Classification, Labelling and Packaging of Substances and Mixtures (European Regulation No 1272/2008), known as the CLP Regulation.
- 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 Sheet (MSDS) which should be readily available from the manufacturer and on site.

- Store chemicals in a dedicated, enclosed and secure facility with a roof and a paved/concrete floor. Chemical tanks should be completely contained within secondary containment such as bunding.
- Inspect tanks routinely to prevent overfilling or filling with incompatible materials. Gas storage tanks should be regularly tested for integrity and may require licensing under local regulatory regimes.

Groundwater contamination

- Install devices to prevent spills and overfills, e.g. alarms to warn of overfilling and automatic shut-off devices.
- Install a layer of hardstanding in all areas at high risk of contamination to prevent ground infiltration by pollutants. Delivery, handling and transfer or decanting areas should be impermeable to the raw materials and products handled, and should be designated, visibly marked and isolated from the surface water drainage system, e.g. with ramps, sumps or drainage shut-off valves.
- Maintain and inspect storage units regularly.
- Consider installation and use of groundwater monitoring points on site to check for contamination.

Fire and Explosion

- Control the effect of fires and explosions by segregating process, storage, and safe areas.
 - Avoid potential sources of ignition including banning smoking in and around facilities.
 - Use explosion-proof/spark-proof equipment and ensure that equipment is grounded (connected to the earth) and bonded (i.e. all exposed metallic items are connected together so that no dangerous electrical potential differences can build up).
 - Introduce accident, fire and explosion precautions and emergency response plans and involve the emergency services and neighbouring community in the creation and implementation of these plans to respond to major incidents at the installation.
 - Provide the local fire department with a list/volume of products stored on the premises.
 - Emergency storage lagoons may be needed to prevent contaminated firewater reaching watercourses.
-

Sale and export

- Register obligated chemicals under the REACH regulation prior to exporting these products to the EU.

Transport and distribution

- Ensure that consignments are accompanied by a transport document, declaring the description and nature of the dangerous goods. Documentation must be in accordance with the specifications set by the dangerous goods regulations applicable to the chosen mode of transport.
 - Ensure that hazardous products and packaged chemicals are labelled with hazard symbols, warnings and safety advice. A range of internationally recognised symbols has been developed so that people handling the goods know the nature of the hazard they present. This is explained by the European Regulation on Classification, Labelling and Packaging of Substances and Mixtures (European Regulation No 1272/2008, known as the CLP Regulation).
 - Establish and implement safety and security measures to include:
 - Screening employees and contractors responsible for transportation, providing regular training to drivers, registering drivers.
 - Ensuring physical safety and security measures (e.g. fences, locked gates, lighting, guards) are in place, restricting access to dangerous goods in temporary storage, selecting low risk transport routes.
 - Develop a safety and security plan (including specific allocation of responsibilities, records of dangerous goods, safety and security incident management plans etc.).
-

Energy consumption



Many of the processes require significant energy input to produce heat, steam and compressed air to drive the reactions. Installations can emit significant greenhouse gas emissions as a result of this energy input. However, some installations in the sector are very significant net generators of energy due to the exothermic nature of the reactions.

Energy consumption is also associated with electrically driven process equipment and utilities such as heating, ventilation, air-conditioning and humidity control.

Some large energy consumers in the chemicals sector may be captured by emissions trading schemes (ETS), such as the EU ETS which requires members to monitor and report their CO₂ emissions, and ensure that enough allowances (either allocated or purchased) are in place to cover their emissions.

How can a business manage this risk?

- Recover heat and energy from processes for use elsewhere on the site or to supply heat and power off site. Combined heat and power (CHP) or trigeneration plants can offer higher efficiencies for energy generation and heating and cooling needs.
 - Improve thermal efficiency to minimise heat loss. For example, provide pipe insulation for process vessels and any heating and cooling systems.
-

Water management and wastewater



Some installations generate wastewaters containing pollutants such as heavy metal compounds or complexes. Where it is not practicable to prevent the generation of these polluted wastewaters, they need to be segregated and treated separately, before being discharged to municipal wastewater treatment facilities.

Many facilities operate wastewater treatment plants which include primary treatment of wastewaters prior to their discharge to the sewerage system. A permit or consent is usually required for this discharge and variations to consents may require changes in the operation of the treatment plant, in order to maintain compliance.

How can a business manage this risk?

- Recycle wastewater where possible back to the processes or to secondary uses such as for cleaning.
- Minimise the consumption of water in the process, including water used on product purification and equipment cleaning.
- Use dry cleaning methods where appropriate to abate particulate and gaseous exhaust streams and solids e.g. vacuum extraction. Wipe down equipment that is accessible rather than washing and rinsing it.
- Segregate process wastewaters, rainwater and indirect cooling water streams to reduce the hydraulic loading to wastewater treatment plants or sewers.
- Eliminate equipment cleaning between batches of the same product unless essential. Where this is not possible, such as at weekend shutdown, consider a reduced level of cleaning.
- Use treatment chemicals, such as corrosion inhibitors, coagulants, flocculants, descaling agents, NaOH and biocides, to minimise the concentration of pollutants in wastewater.
- Maintain on site abatement equipment and wastewater treatment plants.
- Ensure untreated wastewater does not discharge to watercourses.

Solid wastes



The chemicals sector is diverse and the wastes are very process-specific. Some parts of the sector do generate significant quantities of waste for disposal to landfill. These wastes may contain hazardous materials or non-hazardous materials including wastes and impurities from the feedstock, insoluble precipitated salts, wastes generated during the neutralisation of process streams and losses raw materials during handling. Hazardous wastes require disposal by licensed specialist contractors.

Damaged product (including packaging), particularly if hazardous in nature, will require appropriate storage and disposal. If waste is disposed of on-site, the site should comply

with the regulatory requirements for the storage and disposal of solid and hazardous wastes.

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.
- Ensure that hazardous wastes are disposed of by licensed or approved specialist contractors and authorised waste transport is used.
- Consider adoption of pre-treatment processes to purify raw materials to reduce the amount of waste produced during the manufacturing process.
- Explore manufacturer willingness/capability to “take-back” damaged products.
- Increase use of reusable and recyclable containers for raw materials and finished product.

Occupational Health and Safety



Chemical exposure – see also asbestos

Chemicals involved in the manufacture process and final product chemicals may be toxins, carcinogens or highly corrosive upon skin contact. Direct skin and eye exposure to and/or inhalation of hazardous chemicals can result in health impacts for workers.

Noise and Vibration

Noise and vibration from compressors and other machinery, steam relief valves, large combustion units, flares are constant features of most large volume chemical plants. This can lead to noise induced hearing loss and result in nuisance to neighbours.

Machinery

Moving parts of machinery can result in entanglement and entrapment. Poorly designed workstations can require awkward postures,

twisting, bending or reaching motions that could cause musculoskeletal disorders.

Manual Handling and Repetitive Work

Lifting and carrying heavy or awkwardly shaped objects, such as bags, can result in manual handling injuries.

Collision

This can take the form of people being hit by vehicles, or moving or falling loads. Collisions between vehicles can also occur. Heavy loads lifted and moved at elevated heights using hydraulic platforms and cranes present a serious safety hazard.

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.

Slips, trips and falls in a chemical manufacturing plant may result in more serious injuries if skin comes into contact with toxic or hazardous materials.

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

Confined Spaces

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

Working hours

Long hours or night shifts can lead to fatigue, decrease wellbeing and ability 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.

Security

Chemical plants, storage warehouses and distribution networks could be targets for criminal attack due to chemical and materials stored onsite.

How can a business manage this risk?

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.
- Implement a programme of assessment of routine monitoring of worker health.

Noise and vibration

- Conduct a noise survey and mark out dedicated areas with signage where there are elevated noise levels and PPE is required.
- Enclose noisy machines to isolate people from the noise where practicable.
- Rotate tasks to minimise time spent in a noisy area over an eight hour period.

Machinery

- Install automatic alarms and shut off systems and ensure that these are subject to frequent and proper inspection.
- Train workers in correct use of machinery and safety devices.

Manual handling and repetitive work

- Redesign manual processes and rotate work tasks to reduce heavy lifting/repetitive activities, and where possible install mechanical lifting aids.
- Train workers in correct lifting technique.

Collision

- 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 risk of entrapment of employees.
- Install walkways to separate people from vehicle movements to reduce risk of collision.

- Introduce a one way system for site traffic and introduce speed limits to reduce the likelihood of traffic accidents.

Slips, trips and falls

- Ensure that walkways are constructed of non-slip materials and route cables and pipework under walkways.

Confined spaces

- Control entry into confined spaces and avoid it wherever possible.

Working hours

- Implement a grievance/dispute resolution mechanism for workers.

Asbestos

- Remove friable asbestos using licensed contractors. This should be carried out in controlled conditions to ensure that there is no release of substances or materials to the environment.

Security

- Undertake a security vulnerability assessment and consider the need for upgrades to existing security measures.

Labour rights



Labour standards are rules that govern working conditions and industrial relations. They may be formal, such as national level regulation and international agreements, or informal, expressed through norms and values.

Worker dissent and unrest can manifest if workers feel unfairly treated, overworked or unable to raise concerns regarding the work environment to management.

How can a business manage this risk?

- Adhere to national government legal requirements.
- Ensure business meets good practice standards for managing labour issues and working conditions, in particular those set out in the International Labour Organisation conventions.
- 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.
- Permit the formation of unions and the use of collective bargaining.

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 license 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 and will be particularly significant to manufacturers producing small quantities of a large range of chemicals. 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.
- Under the EU Emissions Trading Scheme (ETS) Member States allocate allowances for carbon emissions to industrial sites, including chemical manufacturers. The scheme can create both financial assets and liabilities and entities can trade their carbon allowances.

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. You may wish to engage a specialist consultant to support you with this. The relevance of these questions may depend upon the type of chemical product being manufactured, stored and distributed.

General

- Does the site have all the required permits and product licences in place? Are all required registrations and approvals in place and up-to-date?
- What processes are undertaken and are any hazardous chemicals used? How hazardous are the materials and have associated risks been documented and addressed in appropriate risk assessments?
- Are there any planned changes which could affect the potential impacts on environment, health and safety and labour, either at the facility or in the wider community? Have these been considered and assessed by the company? Will any planned changes require revisions to permits or require new consents?
- 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 minimum, the following items in its E&S risk management systems, and whether any of these management systems are certified to relevant standards such as ISO14001 (environment), OHSAS 18001 (health and safety), ISO9001 (quality) and SA8000 (social/labour):

- 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.
- Financial investment plans directly or indirectly related to management of environment, health and safety and labour issues.
- Internal reporting system, including the reporting of near misses.

Air emissions management (including noise)

- What levels of air emissions are permitted? Have permitted levels of emissions been exceeded in the past?
- Has pollution abatement technology been installed to reduce atmospheric emissions? Are there any VOC abatement technologies or measures in place? Is there a Leak Detection and Repair (LDAR) programme?
- Has employee exposure to potentially harmful gases been assessed and controlled?
- Is there a management policy and procedures for the transfer of dry materials?
- Is there an indoor air quality monitoring programme? Is there clear signage where there are elevated levels of emissions?
- Are there any dust control measures? Are they used and effective?

- If on a site visit, note the noise and dust levels and any odours at the site. Is there any build-up of dust on machinery or other surfaces? Is there any evidence of deployment of noise/dust/odour abatement measures or a requirement for such measures (e.g. hearing protection)?

Water abstraction & management

- What volumes and quality of water are required? Where is the water obtained from?
- Are measures in place to recycle water or reduce water use? Will there be any planned changes which may affect the demand for water? Will existing resources be able to meet demand?
- Check regulatory compliance - are all necessary licences/permits/discharge consents in place?

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, what are the waters tested for? 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?
- 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/water ingress. For example, check that waste containers have lids or are stored in an area with a roof to prevent water ingress. Check for flora/vegetation zones near storage sites that are not growing very well as this will indicate the possibility of pollution.

Energy management

- Is there a back-up emergency power generation source on-site? If so, what is the fuel source and how is this stored? (see Storage below).

Transport of chemicals off the site

- How are raw materials and final 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?
- 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 fuels and materials are stored in bulk on site?

- What is the potential for spillages and leakages to enter soil or stormwater 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? Is there signage to inform staff where PPE should be worn?
- 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:
 - Does it convey the health and safety risks?
 - Are fire exits and/or evacuation routes clearly marked?
 - 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

- 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 cover in place for 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.
- If on a site visit, note if safety equipment is 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?

Inspections & regulation

- Check the conditions and duration of validity for all permits.
- 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 environmental fines. If appropriate, it may be useful to contact local regulatory agencies to determine compliance and whether complaints have been made by the public.

Investment

- Where are the organisation's main markets? Are they manufacturing in or exporting to the EU? Will the REACH regulation be relevant? Could the organisation's 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 EHS improvements as well as asset management and maintenance?

Social, labour and community

- Check that labour standards, contracting and remuneration are in line with national law and are consistent with the average for the sector.
- Check that hours worked, including overtime, are recorded and that staff receive written details of hours worked and payment received.
- Check that wages and working hours are consistent with the average for the sector and national standards.
- 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

CEFIC (European Chemical Industry Council) 2009, Best Practice Guidelines in Transport and Logistics Operations 2013 <http://www.cefic.org/Industry-support/Transport--logistics/Best-Practice-Guidelines1/General-Guidelines-/>

European Bank for Reconstruction and Development (EBRD). Environmental and Social Policy 2014. Performance Requirement 2: Labour and Working Conditions. <http://www.ebrd.com/downloads/research/policies/esp-final.pdf>

European Commission, 2003, Reference Document on Best Available Techniques in Common Waste Water and Waste Gas Treatment / Management Systems in the Chemical Sector, February 2003, <http://eippcb.jrc.es/pub/english.cgi/0/733169>

European Commission. 2007. Reference Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals - Solids and Others Industry, August 2007 http://eippcb.jrc.ec.europa.eu/reference/BREF/lvic-s_bref_0907.pdf

European Commission. 2007. Reference Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals – Ammonia, Acids and Fertilisers, August 2007 http://eippcb.jrc.ec.europa.eu/reference/BREF/lvic_aaf.pdf

European Commission. 2007. Reference Document on Best Available Techniques for the Production of Speciality Inorganic Chemicals, August 2007 http://eippcb.jrc.ec.europa.eu/reference/BREF/lvic_aaf.pdf

European Commission 2013, Industry Guidelines for the Security of the Transport of Dangerous Goods by Road http://ec.europa.eu/transport/road_safety/pdf/dangerous_goods/industry_security_guidelines.pdf

European Union 2006, Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2007:136:0003:0280:EN:PDF>

European Union 2008, Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No 1907/2006 <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32008R1272>

European Union 2008, Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods, <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32008L0068>

European Union 2010, Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) Text with EEA relevance <http://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:32010L0075>

European Union 2012, Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:201:0060:0106:EN:PDF>

European Union 2012, Council Directive 2012/18/EU of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2012:197:0001:0037:EN:PDF>

FECC, European Association of Chemical Distributors, www.fecc.org

ILO Declaration on Fundamental Principles and Rights at Work Information available at: <http://www.ilo.org/declaration/lang--en/index.htm>

International Organisation for Standardisation (ISO) ISO14001:2004: Environmental Management Systems – Requirements with Guidance for use. Updated version expected in 2015. www.iso.org

Intergovernmental Organisation for International Carriage by Rail (OTIF) 2011
Appendix C – Regulations concerning the International Carriage of Dangerous Goods by Rail (RID)
http://www.otif.org/fileadmin/user_upload/otif_verlinkte_files/07_veroeff/99_geschuetzt/RID_2011_e/RID_2011_E.pdf

NACE Rev. 2 Statistical classification of economic activities in the European Community
http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-RA-07-015/EN/KS-RA-07-015-EN.PDF

UK Health and Safety Executive <http://www.hse.gov.uk>

UK Environment Agency 2003, Sector Guidance Note IPPC S4.01, Guidance for the Large Volume Organic Chemicals Sector
http://www.sepa.org.uk/air/pollution_prevention__control/uk_technical_guidance/idoc.ashx?docid=26b767c7-9250-4e1c-ad59-3d224b3d2cfe&version=-1

UK Environment Agency 2004, Sector Guidance Note IPPC S4.03, Guidance for the Inorganic Chemicals Sector
http://www.sepa.org.uk/air/process_industry_regulation/pollution_prevention__control/uk_technical_guidance/s4_chemical/idoc.ashx?docid=13936824-d38d-41d2-9dd4-eba1ec7b09b7&version=-1

UK Environment Agency 2013, Environmental permits, licences and exemptions for chemical manufacturing <https://www.gov.uk/environmental-permits-licences-and-exemptions-for-chemical-manufacturing>

United Nations 2013, Globally Harmonized System of Classification and Labelling of chemicals (GHS), Fifth Revised Edition,
http://www.unece.org/fileadmin/DAM/trans/danger/publi/ghs/ghs_rev05/English/ST-SG-AC10-30-Rev5e.pdf

United Nations 2013, European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) <http://www.unece.org/trans/danger/publi/adr/adr2013/13contentse.html>