Global Social Compliance Programme

Environmental Implementation Guidelines

The GSCP is facilitated by

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The Global Social Compliance Programme

The Global Social Compliance Programme is a business-driven programme for companies whose vision is to harmonise existing efforts in order to deliver a shared, global and sustainable approach for the continuous improvement of working and environmental conditions across categories and sectors in the global supply chain.

It offers a global platform to promote knowledge exchange and best practices in order to build comparability and transparency between existing systems.

To this effect, GSCP is developing a set of **reference tools** and processes that describe best practices and provide a common interpretation of working and environmental requirements and their implementation.

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Introduction

The Global Social Compliance Programme (the GSCP)

GSCP objectives and scope:

The Global Social Compliance Programme is a business-driven programme for the continuous improvement of working and environmental conditions in global supply chains. The GSCP was created by and for global buying companies wanting to work collaboratively on improving the sustainability (ethical, social and environmental) of their often-shared supply base. To this end, these companies seek to harmonize existing efforts to deliver a shared, global and sustainable approach.

The scope of the Programme encompasses:

- social and labour practices
- site-specific environmental practices (not product related)

At all levels of the supply chain.

The Programme is neither a monitoring initiative, nor a substitute to existing systems. **The GSCP will not undertake accreditation or certification activities** as it must remain a non-aligned, neutral reference framework.

The GSCP Reference tools:

To drive convergence, the GSCP has developed a set of Reference tools and processes that provide a common interpretation, based on best existing practice, of fair labour/social and environmental requirements and their implementation in the supply chain.

Users & Usage:

These tools are openly available for all to use. Users can include GSCP member and non-member companies. Multi-Stakeholder Initiatives, auditing bodies and other scheme owners are also able and encouraged to use the GSCP Reference tools.

The Reference tools can voluntarily either be:

- integrated by users into their respective systems; or
- utilised by users as a reference against which to compare their existing tools through the GSCP Equivalence Process[1]

Responsibility:

The GSCP does not monitor nor audit in any way the compliance by a user's supply chain with the GSCP reference tools or any standards.

[1] The Equivalence Process is a mechanism by which a social compliance scheme and/or an environmental compliance scheme are objectively benchmarked against the requirements defined in one or more GSCP reference tools, to determine their level of equivalence. Through the Equivalence Process, the GSCP enables the comparison of various standards and schemes against the GSCP reference tools, aiming at bringing back convergence in requirements and approaches

The adoption of part or all of one or more Reference tools cannot be put forward as a proof of adequate due diligence. The responsibility of the implementation of these tools, of the monitoring of the user's supply chain's compliance and of any due diligence linked to it, resides with the user.

Any use of the GSCP name or logo has to follow the terms established by the GSCP. These terms are available on the GSCP website (www.gscpnet.com).

The GSCP Environmental Implementation Guidelines

The Implementation Guidelines complement the **GSCP environmental Reference Requirements** by giving guidance to sites as to how to reach the required level. It is designed for sites to support improvement in their environmental performance and gradually progress from Level 1 through to Level 3 by meeting the requirements described at each level.

Please note that this document is not intended to be, nor should it be construed as, legal guidance, given that specific legal requirements will differ globally. Further, the Reference Requirements which the Implementation Guidelines refer to do not prescribe the approach that companies have to take.

The implementation guidelines' structure follows that of the GSCP environmental reference requirements i.e. are structured by level and, for each level, by performance area.

This document comprises 4 sections:

- Section 1 - Starting out - How to work towards Level 1
- Section 2 - How to reach Level 1 requirements. It also provides explanation for each of the topic areas, some benefits of improving environmental performance, and some ideas around 'where to start'.
- Section 3 - How to reach Level 2 requirements
- Section 4 - How to reach Level 3 requirements

Please note that Level 3 does not *prescribe* specific technologies or practices because what is considered to be 'leading practice' at a point in time may rapidly become outdated. However, guidance is provided on some key considerations and sources of information on leading practices.

Note on the examples
Several examples are provided, which are not to be seen as exhaustive. Rather, they aim to provide guidance on *a possible way* to implement the requirements. The examples are intended to be applicable across sectors and industries. For more detailed sector-specific guidance and examples, please refer to the additional sources of information provided at various points throughout the document and in the annexes (e.g. existing initiatives and programmes working on sector-specific environmental issues).

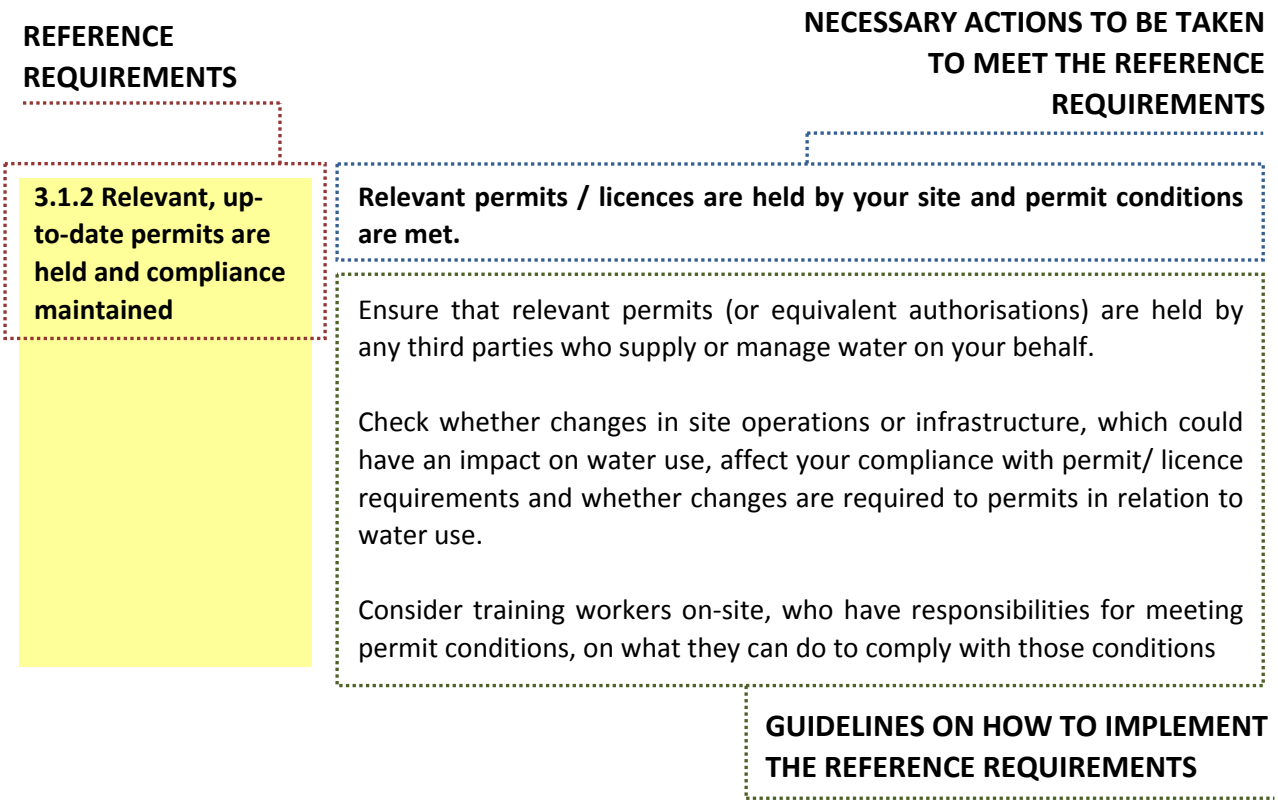
In any case, when following the suggestion as proposed in the examples, care must be taken that this is done in a responsible way which does not create health or safety hazards for workers or cause the deterioration of working conditions at the site.

How to Read this Document

The Implementation Guidelines are structured as follows:

- Text in bold in the left column: reference requirements to comply with
- Text in bold in the right column: necessary actions to be taken to meet the reference requirements
- Other text: guidelines on how to implement the reference requirements

As per example below:



Starting out - how to work towards level 1

STARTING OUT: HOW TO WORK TOWARDS LEVEL 1

A. Introduction

For a site at the very early stages of developing its environmental management programmes and systems, this section provides guidance on where to start to work towards meeting the Level 1 requirements. Additional information on developing environmental management systems and programmes can be found be in the Level 1 section on Environmental Management Systems, in section 3 of this document.

From the outset, there are a number of steps that a site or company can take to improve its environmental management and performance. What follows are some examples; they are not requirements or expectations.

B. Identify Roles & Responsibilities and Set Up a Team

Everybody on-site has a responsibility for protecting the environment and ensuring that the site continuously improves its environmental performance. However, it is also important to identify roles and responsibilities for environmental *management* at your site. Although the site manager or owner retains overall accountability for environmental performance, it may also be appropriate to nominate an individual to coordinate the site's efforts to improve environmental performance. Where possible, this person should be on the site's management team. You may also wish to nominate individuals to drive improvement at a departmental or building level and there may be individuals with responsibilities for monitoring performance, reporting, auditing and considering environmental issues associated with new projects. Somebody on-site should also have the responsibility to prevent or stop any work or activity that could have adverse environmental impacts. Where individuals have roles and responsibilities for environmental issues, it is important to formalise these into their performance targets or objectives.

Look to establish a cross-functional team to address environmental issues and to drive environmental improvement across the business. It would be a good idea to involve people from different sections of the business, including production, procurement (purchasing), engineering/maintenance, quality, marketing, distribution and other functions, and who represent different (and preferably all) levels in the business.

It is also important to engage the workers through communication and training in the improvement of environmental conditions on the site.

Depending on the scale and nature of operations (and the site as a whole) it may be appropriate to identify a 'champion' for different performance areas (energy, water, waste etc.) to co-ordinate efforts, communicate and raise awareness, and to generally drive improvement. It may also be necessary and/or appropriate to train these individuals in their responsibilities and performance areas.

C. Identify the Environmental Issues for the Site

Identify what is being used, produced and generated in each area of the site, whether by location or by function. Wherever possible, you need to be able to measure what you use, produce and generate, so that opportunities for reduction and management can be established. This gives you a baseline so that you can measure and communicate change and improvement.

Consider energy use, water use, raw material use, emissions to air, waste generation, wastewater generation etc. and, where data exist, quantify them (in terms of volume/quantity). This can be useful for establishing your baseline, justifying investment (in terms of time and cost) and for prioritising (*see below*). Identify the environmental impacts of your site and the controls already in place to reduce these impacts. Also remember that, very often, environmental benefits represent cost reduction opportunities as well; this is reflected in some of the detailed guidance elsewhere in this document.

You might want to consider informal meetings or workshop sessions with site personnel to identify both environmental impacts and controls in place. This is a quick way of gathering valuable information and involves people across the site in what you are trying to do.

D. Prioritise Your Efforts

You cannot address all environmental issues at once. Rather you should prioritise your efforts and address high priority issues first. If there are environmental issues that could have potentially catastrophic or significant consequences within the site and/or for the environment, these should be addressed as a priority.

However, do not be afraid to implement “quick wins”. These may not be priority issues, but may be easily addressed, e.g. segregating hazardous and non-hazardous wastes; switching off lights and equipment when not in use; turning off a permanently running tap. Such quick wins can reduce costs and also encourage interest from managers and personnel, justify additional efforts in other performance areas, and allow other opportunities to be considered that require more investment.

When implementing “quick wins” care must be taken that this is done in a responsible way which does not create health or safety hazards for workers or cause the deterioration of working conditions on site.

E. Develop and Deliver a Plan to Address Issues and Improve Performance

Develop and maintain an action plan (or similar) to record, track and close-out environmental actions. Individual actions can be clearly defined, achievable and measurable. They can be prioritised and have an indication of the level of investment required (if cost estimates are not available, at least try and classify as “no”, “low”, “significant” cost requiring). For each action include a time deadline and allocate responsibility to individuals for completing the action… and make sure they know what actions they are responsible for!

F. Monitor and Review Progress

Regularly review progress and implementation of the action plan. Where actions have been successfully and adequately addressed, make sure they are signed-off on the Action Plan (or similar) and the results/successes communicated across the site. This will help to maintain interest and enthusiasm and also reassure managers, workers and other interested stakeholders that progress is being made. Regularly review the Action Plan with the team (at least every six months in the initial stages).

At various stages, you will need to revisit the site's potential environmental impacts, reassess those impacts, and potentially reprioritise your areas for improvement and/or individual actions.

Remember: Environmental improvement is a continual process. There may not be continuous improvement day-on-day, but there can be a general trend and step-wise improvement over time.

Even the best environmentally performing companies are still improving and they continue to look for ways to better their performance every year.

LEVEL 1

Awareness and Compliance

LEVEL 1 – AWARENESS AND COMPLIANCE

1.1 Environmental Management System

What are we Talking About?
An environmental management system (an "EMS") enables a site to identify, monitor and control its impacts on the environment.

Some companies obtain certification for their environmental management systems against an internationally-recognised standard, e.g. ISO14001 or Eco-Management and Audit Scheme (EMAS). The GSCP Framework does not require that your site has its environmental management system certified to one of these standards.

What are the Benefits of Developing an Environmental Management System?
An effective management system can benefit a site by, for example:

- reducing environmental impacts and improving the state of the local environment;
- promoting efficient use of resources and, hence, also reducing costs;
- reducing wastage, e.g. energy, water and raw material consumption, also reducing costs;
- raising awareness of environmental issues across the site;
- providing confidence to stakeholders that environmental issues are being effectively managed;
- complying with buyer and end customer expectations regarding environmental issues and providing competitive advantage

Where Could You Start?
Start by doing a site walk-around and look at how the site could impact the environment through:

- inputs to the site e.g., electricity, gas, oil, diesel, water;
- site activities e.g., farming/spraying land, storing chemicals; and
- outputs from the site e.g. wastewater, waste, release of chemicals to the air through chimneys, vents or directly from equipment or vehicles.

Then, assess the damage that the site could cause to the environment and what you need to do to prevent your activities from causing this damage (for example: to stop using a particular chemical which is damaging the environment, reduce the packaging around materials that you produce and distribute, install equipment that will reduce the amount of dust being discharged into the air etc.).

1.1.1 Understanding and awareness of significant environmental aspects and impacts (negative and positive)

An 'environmental aspect' is a site activity (or element of an activity) which interacts with the environment and can cause it to change. A change to the environment is called an 'impact'. To understand how the site activities impact the environment, the site could conduct a simple environmental impact assessment (although the site may wish to have the assistance of an expert). This could be done by:

- listing all the site's environmental aspects;
- identifying which of these aspects could/does cause impacts to the

environment; and

- identifying which of the impacts are 'significant', in that they could cause the most damage to the environment (and which may also represent potentially significant hazards to the health & safety of individuals). 'Significant' impacts are generally those which need to be prioritised for management action to reduce the impact.

The assessment could consider environmental aspects and impacts associated with:

- routine activities (e.g. manufacturing processes);
- non-routine activities (e.g. annual maintenance shutdown); and
- emergency situations (e.g. unplanned release to air, fire/explosion, flood etc.).

1.1.2 Understanding and awareness of applicable legal requirements

To understand and remain up-to-date with applicable legal requirements (including international, national, regional and local), the site could:

- conduct regular web searches;
- subscribe to updates from official sources (e.g. legislative publications or legislation tracking services); and/or
- seek expert advice.

1.1.3 Mechanism to remain up-to-date with applicable legal requirements

To ensure that personnel know how to comply with legal requirements, the site could provide general awareness training, on the job training, display posters or communicate the requirements at meetings. The site could also maintain a legal register which includes a list of the applicable legislation, together with an assessment of its relevance to the site and its specific requirements.

1.1.4 Basic management controls in place

Management controls are required to eliminate or reduce the site's potentially significant aspects and impacts.

Basic management controls include technical (engineering) controls e.g. installing a scrubber to reduce air emissions, and/or procedural controls e.g. waste management procedures.

1.1.5 Member of management responsible for coordination of environmental management activities

The individual manager nominated as being responsible for environmental management activities may be selected based on previous experience, technical knowledge and/or environmental awareness. The individual may require additional environmental training to allow them to perform their role effectively.

1.1.6 Informing and training on environmental impact and issues

Information and training should be provided to all employees on-site, in relation to potential environmental impacts, how they are managed and how they, as individuals, can influence the environmental performance of the site. Such environmental training would not replace the need to train employees on health & safety matters (both in terms of general health & safety hazards and specific training on, e.g., emergency procedures, first aider training etc.). Rather it is important to demonstrate to employees the need to consider the potential interactions between environmental and health & safety issues. Training may also be required in relation to the specific environmental performance areas, and this is discussed elsewhere in this document.

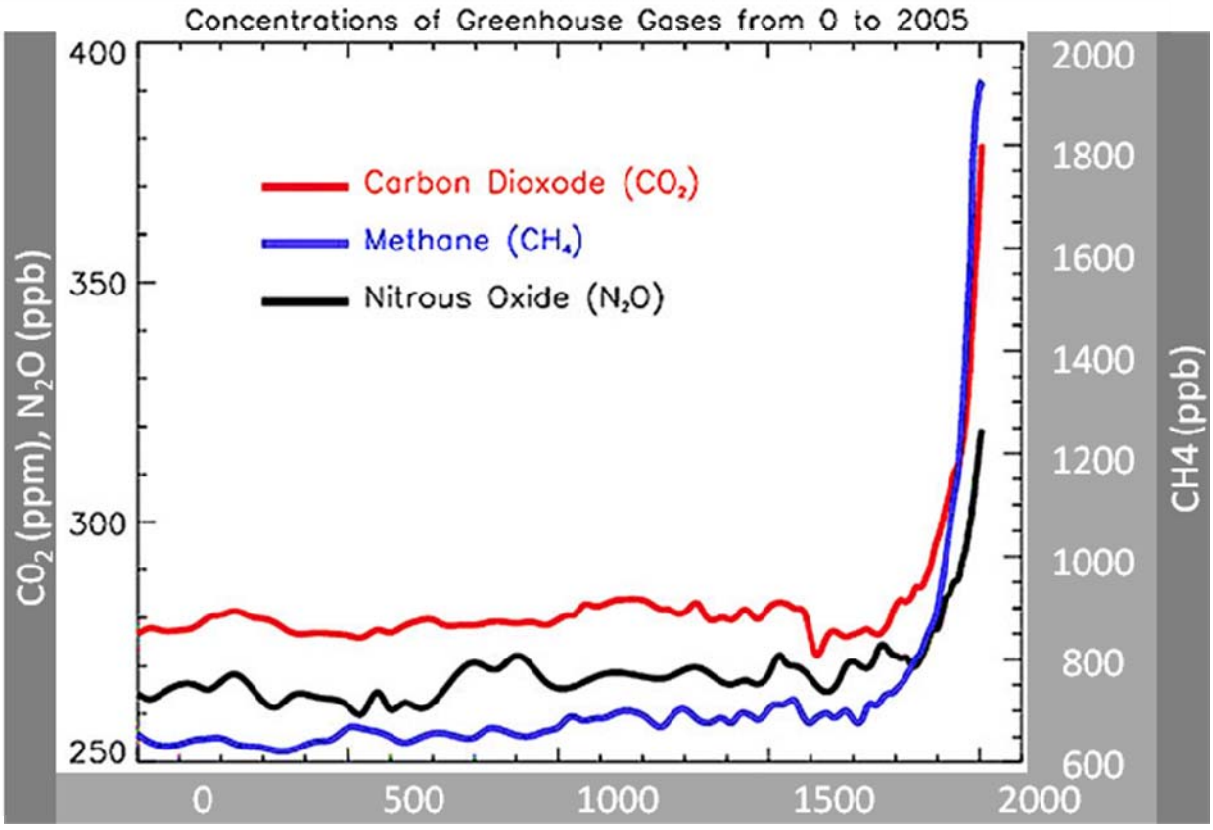
2.1 Energy Use, Transport and Greenhouse Gases (GHGs)

What are we Talking About?

Energy use can have a significant impact on the environment through carbon generation and can also represent significant operating costs. However, as energy prices continue to increase it can be easy to justify projects that can save energy.

Greenhouse Gases (GHGs)

Greenhouse gases (GHGs) are gases in the Earth's atmosphere that absorb/trap some of the earth's outgoing radiation, causing the atmosphere to warm up (called the 'greenhouse effect'). This process is the main cause of the change in the earth's weather, called 'climate change'.



Graphic: Increase in Greenhouse Gases over Time

Key GHG emission sources include agricultural activity (e.g. land cultivation and livestock farming), energy generation and use, transportation, use of refrigeration gases and also the biodegradation of waste. The main GHGs are carbon dioxide (CO_2) from burning of fuels, methane (CH_4) from agriculture, landfill sites), nitrogen dioxide (N_2O) associated with fertiliser production and use and fluorinated (F) gases, e.g. refrigerants.

The most significant environmental impact of energy use is the generation of GHGs (which are released when fossil fuels such as coal, gas and oil are burnt to produce energy) and their contribution to climate change.

Transport

Vehicle use can also contribute significantly to environmental damage. For example, vehicle emissions include carbon dioxide (CO_2) and carbon monoxide (CO), which can contribute to the level of GHGs in the atmosphere and, hence, to climate change. Dust and other air pollutants can also lead to poor air quality and ill health (see also *Section 5.1 Emissions to Air*).

Please note that within this document, Levels 1 and 2 consider emissions associated with on-site transport; Level 3 also considers emissions associated with off-site transport, where the site has influence over the off-site transport.

What are The Benefits of Reducing Energy Usage and GHG Emissions?

Reducing energy usage and GHGs and/or increasing the proportion of energy obtained from renewable sources can have a number of benefits:

- improvement in overall environmental performance;
- improvement in local air quality;
- reduction in the quantity of GHGs being emitted to the atmosphere and hence a reduction in the contribution to climate change;
- acting as a responsible operator towards site neighbours and stakeholders; and
- reduction in operating costs.

Improving environmental performance in relation to energy use can be achieved by:

- taking advantage of opportunities to reduce absolute energy consumption (i.e. the total quantity of energy consumed) and improving overall energy efficiency;
- switching to renewable energy sources (e.g. solar, hydropower, wind turbines, geothermal and energy from biomass e.g. from wood, animal manure, crop residues and waste); or
- using co-generation through, for example, Combined Heat and Power (CHP).

Where Could You Start?

Start by identifying the types of energy you use on-site, what the energy is used for, and where it is supplied from. If possible, try to record how much energy you use and then look for ways to reduce this. Even if you do not have the equipment installed to measure how much energy you use, there are some easy steps to reduce the energy you use, as described below.

Some Examples of Simple Measures to Reduce Energy Usage

When reducing energy usage, care must be taken that this is done in a responsible way, which does not create health or safety hazards or cause the deterioration of working conditions at the site.

Machinery and equipment

- Only switch equipment on when it is going to be used
- Switch off conveyor systems, machine tools and other equipment when not in use
- Ensure preventative maintenance and servicing is performed
- Consider options for equipment which uses less energy
- Install higher efficiency motors
- Consider whether it is possible to reduce the operating pressure of compressed air
- Regularly check for, and repair, compressed air leaks
- Remove redundant sections of compressed air distribution system

Heating / Cooling / Refrigeration

- Insulate cavity walls and roof areas
- Insulate pipe-work
- Ensure doors and windows appropriately sealed
- Use natural ventilation instead of air conditioning
- Use radiant heaters rather than hot air heaters
- Ensure heating systems are correctly sized
- Replace old boilers with modern efficient ones
- Manage temperature control and time switches so heating/cooling times match building occupancy
- Ensure level of heating/cooling is appropriate to the activities within different areas of the building
- Reuse heat from production processes for space heating or further process heating
- Consider use of heating systems with heat exchangers
- Energy efficiency of cooling systems can be improved through better compressors, different types of refrigerants, preventative maintenance, and improved insulation

Lighting

- Encourage staff to only switch lights on if they need to be switched on
- Switch lights off when leaving unoccupied areas
- Switch lights off at the end of your shift
- Use low energy lighting, timer switches, daylight sensors
- Use natural daylight (rather than artificial lighting/ heating)
- Use flat and brightly coloured walls and ceilings to reflect more light into shaded areas

Other

- Reconcile meter readings and energy consumption data with the data provided on suppliers' invoices (or other charging scheme)
- If you share a common energy supply with a neighbour, tenant or third party, ensure that the meter positioning is such that it is recording your consumption and not yours and somebody else's
- Ensure that any energy meters are regularly checked, maintained and calibrated
- Use cold water rather than heated water, where possible, to reduce energy use associated with heating

2.1.1 Meet legal requirements

2.1.2 Relevant, up-to-date permits are held and compliance maintained

Your site may have legal obligations in relation to energy use, energy efficiency, transport-related emissions and generation of GHGs (see *Section 1.1* on how to identify and understand legal requirements).
Ensure that you have ways to maintain compliance and to stay up-to-date with any changes in energy-related legislation (see *Section 1.1* on how to identify and understand legal requirements).

Check whether changes in site operations or infrastructure, which could have an impact on energy use and the release of GHGs, affect your compliance with permit requirements and whether changes are required to permits in relation to energy use or GHG emissions.

Your permit (or other legal requirement or voluntary agreement) may require that you comply with limits relating to energy consumption, GHG generation, and F-gas emissions. If so, it would be good practice to record monitoring results and calculations of emissions used to demonstrate compliance.

If you exceed the conditions of your permit (or other legal requirement or voluntary agreement), you may need to record, report and/or investigate this.

Consider training workers on-site, who have responsibilities for meeting permit conditions, on what they can do to comply with those conditions.

2.1.3 Tracking of energy consumption / calculation of GHG

Your site may need to have an energy meter (or meters) installed (particularly for gas and electricity) to accurately track your energy consumption. You (or perhaps your energy supplier) need to take meter

emissions including fuel use for on-site transport

readings. Other forms of energy (e.g. solid fuels, cylinder gas, diesel etc.) may require different measurements to track use (e.g. weighing coal used, taking gauge readings on cylinders or tanks etc.).

To be comprehensive, you should track all sources of energy including fuel used for on-site transport (e.g. gas-oil, diesel, liquefied petroleum gas); for supply to equipment and boilers (e.g. coal, coke, wood, fuel-oil, propane, LPG); and other forms of energy (e.g. steam and compressed air).

Assessment of GHG generation may include records of leaks and additions to equipment (in the case of F gases), calculation of the equivalent of CO2 (using total energy consumption figures and an approved/reliable conversion factor), monitoring results or mass balancing for methane and N2O.
It would be good practice to record air emission monitoring results as well as calculations of consumption and emissions (e.g. of GHGs, F-gases etc.).
There are various internet-based tools available for calculating GHG emissions in-line with the existing standards (such as the ISO14064:2006). An example of these tools is provided by the World Resources Institute (WRI) GHG Protocol and can be found at http://www.wri.org/project/ghg-protocol

3.1 Water Use

What are we Talking About?

Water used by companies may come from a number of sources, including:

- Drinking water supplied direct by the municipal mains;
- Non-drinking water supplied direct by the municipal mains;
- Abstracted groundwater;
- Abstracted surface water (river, stream, lake, pond etc.);
- Diverted surface water (river, stream etc.);
- Collected rainwater; and/or
- Recycled “grey water”.

You may use the water in the form that it is provided or you may need to treat the water.

What are the Benefits of Effectively Managing Water Use?

Water is a very valuable resource and, in certain parts of the World where water is scarce, is the single most important resource. Less than 1% of all the water on Earth can be used by humans; the rest is either salt water or is permanently frozen so we cannot use it, drink it or wash with it.

As the World's population continues to grow, more and more people are using this limited resource and there is increasing scarcity of potable (drinking) water. Available water resources are shrinking in some regions and pressure to effectively and efficiently manage water resources is only going to increase.

There are also a number of costs associated with water use:

- costs of abstraction (taking water from its source) and supply;
- local treatment and costs of running treatment equipment, maintenance of equipment, storage, heating/cooling, distribution, and the costs of treating/disposing of wastewater (*see Section 6 Wastewater Effluent*) etc.;
- costs associated with disruptions to supply and/or having to stop operations due to lack of supply; and
- carbon cost (given energy requirements) associated with the supply, transfer, treatment and disposal of water, which will contribute to the carbon footprint of your organisation.

Reducing water use can reduce your environmental impact *and* your costs and help you to act as a responsible operator towards site neighbours and stakeholders. There are a range of techniques for reducing water use, ranging from simple management measures to the installation of new equipment and infrastructure.

In addition, where a water meter is installed for your site, always check meter readings (whether yours or a third party's) with the data provided on water invoices (or other charging scheme). If you share a common water supply with a neighbour, tenant or other third party, ensure that the meter is positioned such that it is recording your consumption and not yours and somebody else's. Ensure that the meter is regularly checked, maintained and calibrated.

Water Reduction

There are usually water reduction opportunities associated with: processing, cleaning / rinsing, cooling, steam production, use as raw material, preventing or stopping spills and leaks; washrooms and toilets; showers; food preparation and washing; washing vehicles; and water treatment, amongst many others.

There is much published information in relation to water minimisation opportunities. Many of these opportunities can be employed at relatively low cost. Some simple no-cost or low-cost opportunities for reducing water consumption are presented in the box below.

When reducing water consumption, care must be taken that that this is done in a responsible way, which does not create health or safety hazards or cause the deterioration of working conditions at the site.

A Note about Water Treatment

Water treatment requirements will be dependent on a number of factors, including (but not limited to):

- the quality of the raw water;
- the required use (and hence quality) of the end water; and
- the prevailing climate/temperature in an area (e.g. will a particular process or approach work in extremes of cold or heat, will rainfall levels influence treatment options etc.).

Water can vary in terms of physical quality (e.g. silt content, temperature etc.), chemical quality (e.g. salt content) and/or biological quality (e.g. bacteria content). Variations in water quality will influence what water treatment is required before you can use it.

Where Could You Start?

You need to understand where you use water on your site, for what uses, the quantity that you use, the source of the water (and its location) and the type of water (e.g. mains water, drinking quality water, groundwater (well water), river water etc.)). This will enable you to identify opportunities for managing water more effectively, and reducing your water consumption. Some simple measures to reduce water consumption are described below.

Some Examples of Simple Measures to Reduce Water Consumption and Wastewater Generation

When reducing Water Consumption, care must be taken that this is done in a responsible way, which does not create health or safety hazards or cause the deterioration of working conditions at the site.

- Educate site personnel and contractors about what they need to do to manage water more effectively
- Turn off taps and hoses when not in use
- Install automatic switch-off trigger guns on hoses
- Check supply pipework (e.g. diameters, avoid extremes of temperature, check for leaks etc.)
- Fix leaks quickly
- Only switch on water-using equipment when it is required
- Install relatively cheap water-minimising controls e.g. piston taps, low-flush toilets, flow regulators, 'cistern misers' etc.
- Closed-loop cooling water systems, rather than open-loop system

3.1.1 Meet legal requirements	You need to understand your legal requirements in relation to: • water provision; • abstraction; • storage; • transfer; • treatment; • use; • contamination; • water supply infrastructure; and • local plumbing (e.g. backflow prevention arrangements). Ensure that you have ways to maintain compliance and to stay up-to-date with any changes in water-related legislation (see *Section 1.1* on how to identify and understand legal requirements).
3.1.2 Relevant, up-to-date permits are held and compliance maintained	**Relevant permits / licences are held by your site and permit conditions are met.** **Ensure that relevant permits (or equivalent authorisations) are held by any third parties who supply or manage water on your behalf.** Check whether changes in site operations or infrastructure, which could have an impact on water use, affect your compliance with permit/ licence requirements and whether changes are required to permits in relation to water use. Consider training workers on-site, who have responsibilities for meeting permit conditions, on what they can do to comply with those conditions.
3.1.3 Measurement of water consumption is undertaken	Depending on, for example, the complexity of the supply system and overall water consumption, you may only require a single meter. Multiple buildings may require multiple meters.

4.1 Wastewater / Effluent

What are we Talking About?

Wastewater / effluent can take a number of forms:

- process (or "trade") effluents arising from various stages of an industrial, agricultural or commercial process;
- cooling wastewater or other non-contact wastewater (e.g. flushing chillers);
- blow-down (e.g. from compressors, boilers);
- stormwater run-off (sometimes referred to as surface water run-off) from roofs, hardstanding, yards, car parks, vegetated areas etc.);

- firewater; and
- sanitary / domestic wastewater (e.g. from toilets, sinks etc.).

Wastewater can be a significant cause of pollution if not handled, stored, transferred, treated and/or disposed of appropriately.

Wastewater from a site can vary in both quality and quantity. Decisions about the most appropriate or efficient options for managing wastewater (e.g. on-site treatment, off-site treatment options for reuse etc.) will depend on a number of factors, including:

- the volume of wastewater generated;
- the composition of the wastewater generated;
- the location of the site and its environs;
- available treatment/disposal options in the area of the site;
- potential options for on-site (or off-site) reuse of treated wastewater; and
- cost.

The quantity and quality/ constituents of the wastewater to be treated will influence/govern the treatment or disposal options for that wastewater stream. For example, there can be significant differences in:

- the volume and rate (flow) at which the wastewater is generated;
- suspended solids content;
- biological oxygen demand (BOD);
- chemical oxygen demand (COD);
- toxicity (e.g. from chemicals, medicines/antibiotics etc.);
- heavy metal content;
- pH (acidity / alkalinity);
- colour;
- temperature;
- foam;
- nitrogen and phosphorous content; and
- oil and grease, amongst others.

It is also important to remember that the volume and constituents in wastewater can vary greatly. Wastewater volume and constituents will differ between companies in the same sector, between sites within a single company, between processes on a single site, and between different production runs within the same process. The magnitude of the variation will depend on the products manufactured, the length of the production runs, the various processes contributing to a site's overall wastewater discharge and on whether production is continuous or 'batch'. It is therefore important to understand variability of wastewater before deciding on a particular treatment/disposal option.

What are the Benefits of Effectively Managing Wastewater?

By managing wastewater effectively, you can:

- reduce volume of wastewater and quantity of pollutants being discharged back into environment;
- reduce the risk of pollution accidents which can prove both damaging for the environment and for humans and which can also be costly for sites that cause them and their owners/operators;
- reduce costs of wastewater discharge/treatment;
- act as a responsible operator towards site neighbours and stakeholders; and
- potentially use wastewater as another source of water (either on-site or elsewhere).

Some simple measures to reduce water consumption and, hence, wastewater generation are presented in *Section 3.1 Water*.

Where Could You Start?

Confirm where wastewater is generated on-site and from which activities and processes. Assess the volume of wastewater generated; what the wastewater contains in terms of solid material, chemicals etc.; and where and how it is discharged. Identify options for managing the wastewater generated.

4.1.1 Meet legal requirements

You need to understand your legal requirements in relation to wastewater including:

- generation;
- handling;
- transfer;
- treatment;
- disposal;
- reuse;
- etc.

Ensure that you have ways to maintain compliance and to stay up-to-date with any changes in legislation relating to wastewater (see *Section 1.1* on how to identify and understand legal requirements).

4.1.2 Relevant, up-to-date permits are held and compliance maintained

Relevant permits / licenses are held by your site and permit conditions are met.

Ensure that relevant permits / licenses are also held by any third parties who supply or manage waste water on your behalf.

Your permit might require that you monitor your wastewater discharges. If this is the case, it would be good practice to record monitoring results and calculations of discharges (as appropriate). If you exceed the permit limits/conditions, then you may be required or may need to record,

report and/or investigate them.

Check whether changes in site operations or infrastructure, which could have an impact on wastewater generation, affect your compliance with permit (or similar) requirements and whether changes are required to permits in relation to water use.

Ensure that you understand what wastewater sampling and testing is required, where the samples need to be taken from (e.g. at point of generation, at point of final discharge etc) and what they need to be tested for in terms of constituents.

If you are need to send your samples to a laboratory for testing, ensure that the laboratory is competent (accredited) to perform the analysis that you require and that it is reputable. You may want to talk with other companies or sites to identify a suitable testing laboratory.
Consider training workers on-site who have responsibilities for meeting permit conditions, on what they can do to comply with those conditions.

Picture: Colour-Coded Drain Covers

4.1.3 Drainage plan in place with a general understanding of wastewater flow

A drainage plan will help you identify:

- where potentially contaminated wastewater may be present on-site;
- where a spill or leak could end up;
- where additional controls may need to be installed; and
- to highlight gaps in a site's understanding of its drainage system, which

direction and discharge points

may require further investigation.

On the drainage plan it is helpful to show which drains are used for:

- process effluent;
- sanitary/domestic effluent; and
- surface water.

You can also include points where wastewater is generated; drains and pipework; access points to the drains; any treatment or storage; and flow directions. As part of developing a drainage plan, it may be helpful to conduct a drainage survey. This involves checking to make sure that drains are not damaged (which may be a legal requirement in some jurisdictions) and checking on where drains start and end and which other drains they connect with.

It is recommended that any work requiring entry into drains is performed only by trained and properly protected persons. Drains can be dangerous in terms of gas build-up, fast-flowing water, hazardous substances etc.

4.1.4 Identification of the contaminants, their flow direction and potential impact

Once you have identified the type of wastewater that a drain carries, it can be useful to colour-code (paint) the drain covers associated with that drainage run to show the type of wastewater and the direction of the flow (e.g. with a painted directional arrow). One example of colour coding would be:

- red for foul effluent (sewage);
- green for process wastewaters; and
- blue for surface water (stormwater).

Rather than try to identify all individual contaminants, you can identify potential sources of wastewater and the *types* of contaminants (e.g. solvents, oils/greases, solid matter etc.) that may be generated by that source. Where appropriate, you can include wastewater and its contaminants in the organisation's/site's environmental aspects and impacts (see *Section 1.0 Environmental Management Systems*).

5.1 Emissions to Air

What are we Talking About?

Emissions to air refer to the release of pollutants into the air. Emissions to air generated by a site typically include:

- both point source emissions (those discharged into the air from a single point such as a stack/chimney, vent, etc.) and fugitive emissions (those which are not discharged from a stack/chimney/vent, including those arising from open tanks, transport, handling and moving dusty materials, and some solvent applications); and

- emissions generated by the site's main activities (e.g. related to the process) and those from ancillary (non-core) activities and equipment (e.g. boilers, generators, cooling towers etc.).

Such emissions can be subject to regulations and, hence, routine monitoring and permitting requirements, although this is not always the case.

Emissions to air are also generated by energy generation, burning of fuels and transport. These are covered in more detail in *Section 2.1 Energy Use, Transport and Greenhouse Gases (GHGs).*

A number of constituents (and potential pollutants), which can be damaging to both the environmental and human health, can be found in emissions to air which, in turn, govern how the emissions need to be managed / treated / discharged, for example:

- dust/particulates;
- various oxides of nitrogen ("NO_x");
- various oxides of sulphur ("SO_x");
- volatile organic compounds ("VOCs");
- other chemical compounds;
- biological content (e.g. *Legionella* bacteria); and
- water vapour / steam.

Ozone Depleting Substances (ODS)

ODS are substances that damage and reduce the ozone layer in the Earth's upper atmosphere. The ozone layer absorbs the majority of the sun's ultraviolet light, which is potentially damaging to life on Earth. Less protection from the ozone layer and more exposure to ultraviolet light could negatively impact on human health, the environment, agricultural productivity (as it can cause crop damage), and reduce fish stocks.

ODS are commonly used as:
- refrigerants and refrigerant blends;
- fire extinguishing agents, e.g. halons;
- certain types of chlorinated solvents;
- foam blowing agents;
- pesticides (e.g. methyl bromide); and
- as a raw material in certain manufacturing processes (e.g. pharmaceuticals, aerosol propellants, foam production).

A useful general source of information relating to ODS is the Ozone Secretariat of the United Nations

Environment Programme (http://ozone.unep.org/).

In addition to damaging or depleting the ozone layer, some chemicals can lead to an increase in ozone in the lower levels of the atmosphere, much closer to the Earth, which can lead to poor air quality and smog (a mix of chemical pollutants and fog).

For requirements in relation to Greenhouse Gas (GHG) emissions please refer to Section 2.0 Energy use and GHG emissions

What are the Benefits of Effectively Managing Emissions to Air?

By effectively managing emissions to air you can:

- minimise your impacts on local, and, potentially, regional and global air quality;
- reduce the risks to the health of all employees, contractors and site visitors, as well as site neighbours;
- reduce the risk of pollution incidents, which can prove both damaging for the environment and for humans and which can also be costly for sites that cause them and their owners/operators; and
- act as a responsible operator towards site neighbours and stakeholders.

What are the Benefits of Effectively Managing ODS?

By effectively managing ODS you can:

- reduce your potential impact on the ozone layer;
- minimise your impacts on local air quality;
- reduce the risk of accidents which can prove both damaging for the environment and for humans and which can also be costly for sites that cause them and their owners/operators; and
- act as a responsible operator towards site neighbours and stakeholders.

Where Could You Start with General Emissions to Air?

- understand the emissions to air that you generate (where they are, and which types of contaminants they contain (e.g. chemicals, metals, heat etc.);
- look at what controls are already in place to reduce emissions to air;
- review what equipment is used on-site to control emissions to air (e.g. bag filters, wet scrubber, solvent recovery unit etc.) and who is responsible for maintaining/ servicing the equipment; and
- consider options for additional controls / new equipment which might help to reduce emissions to air.

Where Could You Start with ODS?

- review what equipment or processes on-site may contain or use ODS (e.g. chillers, refrigeration/freezer units, air conditioning units, fire suppression equipment / fire extinguishers);
- confirm the type and quantity of ODS contained in the equipment or used in processes;
- identify who is responsible for maintaining/ servicing equipment containing ODS; and

- confirm the phase-out dates (if applicable) for the ODS you are using on-site.

Picture: Example of ODS-Containing Equipment

General

5.1.1 Meet legal requirements (including monitoring)

Your site may need to have a permit for its emissions to air. The permit might require that you monitor your emissions to air. If this is the case, it would be good practice to record monitoring results and calculations of emissions. If you exceed the permit limits/conditions, then you may be required or may need to record, report and/or investigate them (see *Section 1.1* on how to identify and understand legal requirements).

5.1.2 Relevant, up-to-date permits are held and compliance maintained

Check whether changes in site operations equipment etc, which could have an impact on emissions to air, means that you need a permit or that your existing permit needs to be amended.

5.1.3 An inventory of main point source emissions to air is maintained and site has considered potential for fugitive emissions

An inventory of emissions to air is a detailed list of the emissions and their sources. When preparing an inventory of emissions to air, try to include emissions from all processes, ancillary activities and equipment, during routine and non-routine operations. This inventory can be regularly reviewed to make sure it is up-to-date. It would be good practice to include the following information for each emission source,

- the pollutants known or likely to be present;
- the quantity emitted (if known or estimated);
- the location of, for example, the stack, vent etc.;
- any control devices (e.g. abatement equipment) installed;
- frequency of monitoring; and
- whether the particular emission is legally regulated.

In addition to the inventory, information on emissions to air that might

prove dangerous for the personnel at the site are kept easily available, with advice on how to deal with them and their effects in any emergency situations.

For ODS

5.1.4 Meet legal requirements

Many ODS are now legally banned. To meet legal requirements you may need to ensure that no banned substances remain on-site and assess whether some substances still in use or present on-site may be phased-out or banned in the future, in which case you may need to have an ODS replacement programme in place to, for example, replace equipment which produces ODS. It is helpful to track phase-out dates for ODS, as these can change.

5.1.5 Relevant, up-to-date permits are held and compliance maintained

If your site uses ODS for processes or has ODS-containing equipment, you may need to have a permit. You may be required to monitor the quantity of ODS used or to check for leaks. If this is the case, it is good practice to record monitoring results.

5.1.6 An inventory of ozone-depleting substances (ODS) is maintained

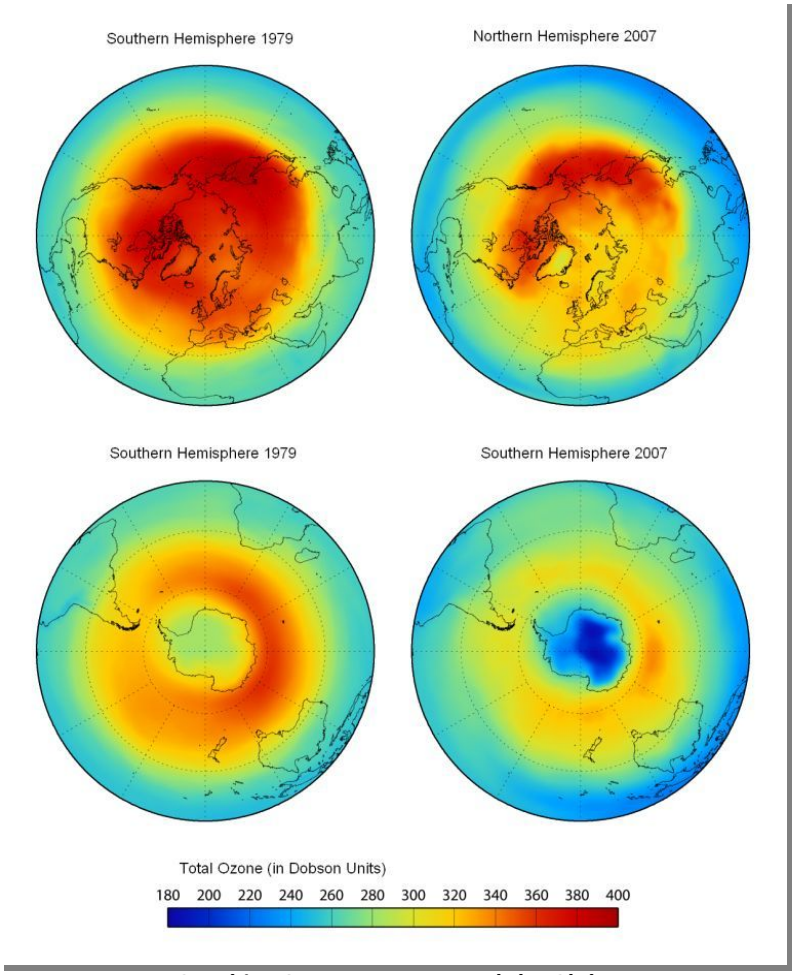
An inventory of ODS is a detailed list of the ozone depleting substances on site and the equipment in which they are present or the processes in which they are used. When preparing an ODS inventory it is useful to include:

- all sources of ODS, irrespective of their size;
- the type and name of the ODS;
- its use (e.g. refrigerant, process use, or the equipment in which it is contained);
- the quantities present; and
- the frequency of leak detection (if required).

5.1.7 Regular maintenance of ODS containing equipment

Regular maintenance and inspection reduces the potential for leaks to occur or remain undetected. Maintenance and inspection may need to be performed by a specialised contractor, and include leak detection (if required by applicable legislation). It is good practice to retain records of maintenance and leak detection, which can be easily retrieved.

Picture: Water Spraying to Reduce Dust Creation



Graphic: Ozone Layer around the Globe

(http://commons.wikimedia.org/wiki/File:Ozone_layer_gmt_de.png#globalusage)

Emission Point and Reference Number	Pollutant/ Emission Type / Parameter	Source / Equipment	Emission Limit (and units)	Monitoring Frequency
Examples only				
Stack #1	*Particulates*	*Boiler*	*10mg/Nm^3*	*Annual*
Process Vent #A22	*Sulphur dioxide*	*Process Vessel 22*	*25,000mg/Nm^3*	*Hourly mean*

ODS-containing Equipment	Location	Ozone-Depleting Substance in Unit	Quantity of ODS in equipment	Phase-out dates for use of ODS?	Servicing / maintenance frequency of Equipment
Example only					
Air Conditioning Unit, Serial Number xxxx	*Main office building*	*R22*	*4.5kg*	*31/12/2014*	*Annual*

Graphic: Extracts from an Emissions to Air Inventory and ODS Inventory

6.1 Waste Management

What are we Talking About?

Waste is any substance or object which is discarded, intended to be discarded or is required to be discarded. Wastes can include expired raw materials, materials generated from a process for which there is no further use on-site, expired finished products, process by-products, customer returns, redundant equipment etc.

Hazardous / Non-hazardous Wastes

A hazardous waste is a waste that could cause harm to public health and/or the environment because of its chemical, physical or biological characteristics (e.g., it is flammable, explosive, toxic, radioactive, or infectious). However, your local legislation may define 'waste', and may explain the difference between hazardous and non-hazardous wastes. Usually, the requirements for managing hazardous wastes are more detailed and strict than for non-hazardous wastes.

What are the Benefits of Effective Waste Management?

By managing waste effectively, you can:

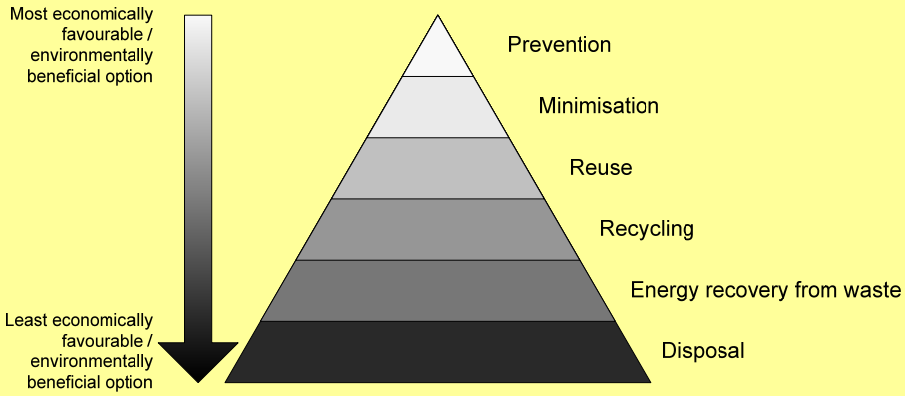
- reduce your volume of waste and potential for harmful pollutants being discharged back into the environment;
- reduce the risk of accidents which can prove both damaging for the environment and for humans and which can also be costly for sites that cause them and their owners/operators;reduce costs of waste disposal/treatment;

- act as a responsible operator towards site neighbours and stakeholders; and
- potentially reuse, recycle, or recover waste (either on-site or elsewhere).

Where Could You Start?

Understand where you generate waste on-site (i.e. from which activities and processes); the type of waste and its hazard(s); the quantity of waste; and how the waste needs to be managed. With this understanding, you can consider measures to reduce waste (some examples are described below).

The Waste Hierarchy and the True Cost of Waste



The waste hierarchy provides a range of waste management techniques which should be considered in order of preference, based on both environmental and economic considerations. The most environmentally and economically beneficial option is to try and prevent the waste from being generated in the first place. The least environmentally and economically beneficial option is to dispose of the waste (e.g. to landfill).

The 'True Cost of Waste'

The actual (or true) costs associated with a waste stream are not restricted to the costs of storage, handling, removal, transfer, treatment and/or disposal. Additional 'hidden' costs (which together with the actual costs equates to the 'true cost') are associated with the process that went into generating the waste initially: raw materials, utilities, people's time, quality assurance and re-work costs, administration costs, loss of viable product and the revenue associated with the product, monitoring costs, environmental liabilities etc.

6.1.1 Meet legal requirements

You need to ensure you understand legal requirements in relation to waste generation, storage, transportation, treatment, disposal etc., both for your company and third parties that handle waste on your behalf (see *Section 1.1* on how to identify and understand legal requirements).

To show that you are meeting legal requirement you may need to retain waste documentation for both non-hazardous and hazardous wastes leaving your site (e.g. waste manifests/transfer/ consignment notes). This documentation usually includes information on the nature and quantity of the waste, the date of removal from site, the contractor handling the waste, and its intended destination and treatment/disposal route.
Routine checks to check whether such waste documentation is correctly

completed can help to ensure that it remains accurate and up-to-date.

6.1.2 Relevant, up-to-date permits are held and compliance maintained

Relevant waste permits / licenses are held by your site and permit conditions are met.
Ensure that relevant permits / licenses are also held by any third parties who manage waste on your behalf.

6.1.3 Regular checks that waste contractors have appropriate permits are undertaken

It would be good practice to regularly check that wastes are being properly handled and are being treated/ disposed of at the intended facility.
It is usually the waste generator's responsibility to ensure that its waste is handled by licensed contractors. Whether or not a legal requirement, it would be recommended that your site holds copies of its waste contractors' licences and permits.

6.1.4 Hazardous and non-hazardous waste is segregated and employee awareness and training provided on handling and segregation of wastes

Hazardous wastes are segregated from non-hazardous wastes and from other hazardous wastes to:

- prevent unwanted reactions between the waste streams;
- help reduce costs (mixing wastes can increase the volume of waste classified as hazardous which is more expensive to dispose of); and
- prevent unwanted exposure for personnel.

Train employees on how to manage hazardous *and* non-hazardous waste, make sure that they use proper tools and protective equipment when handling waste and are aware of what the waste contains and how to react to any incidents that may happen, It may also prove useful to cover the legal requirements as well as the environmental consequences of poor handling and management of waste.

6.1.5 Inventory / management / storage /transportation procedures for hazardous waste streams in place

When compiling an inventory of waste, it is helpful to include:

- a description of the waste;
- the type of waste (hazardous/non-hazardous);
- the physical form of the waste (solid, liquid etc.);
- the quantity of waste disposed of/treated;
- the disposal/treatment method;
- where it was disposed of/treated.

Procedures for the management, storage and transportation of hazardous waste can be designed to prevent:

- damage to waste containers;
- spillage or leaking of waste materials;
- rainwater getting into waste containers;
- vehicle collision with waste containers;

- waste/litter blowing out of the container or storage area;
- overfilling of waste containers; and
- actions of unauthorized persons (vandals, thieves, children, trespassers) and/or animals which may disturb waste.

6.1.6 Records of on-site and off-site waste disposal/ treatment maintained

Keep records of waste disposal and treatment (this may be a legal requirement) on-site and store them for a number of years (or for the length of time legally required

6.1.7 No on-site waste burning/or uncontrolled waste landfilling is undertaken

On-site landfilling or burning of waste can increase levels of contamination in the soil and groundwater, increase emissions of smoke into the air and cause health hazards. Waste burning includes bonfires for wood, paper, card etc. Uncontrolled waste landfilling means landfilling without the appropriate licence/permit.

A number of constituents (and potential pollutants) which can be damaging to both the environmental and human health can be released when burning waste.

Information on such substances that might prove dangerous for workers at the site are kept easily available, with advice on how to deal with them and their effects in any emergency situations.

Picture: Good Waste Segregation

Picture: Good Waste Segregation **Waste Stream**	**Source of Waste**	**Annual Quantity - tonnes**	**European Waste Classification (EWC) code**	**Waste Classification ('Inert', 'Non-Hazardous', 'Hazardous')**	**On-site Treatment (Biological, Chemical, Physical)**	**Handling and Storage Arrangements**	**Approved Waste Contractor**	**Waste Disposal Route (Recycled, Landfill, Incineration)**	**Date of last Duty of Care Audit**
Examples only									
General waste	*Canteen, offices, general waste locations around the site*	*250*	*20-03-01*	*Non-Hazardous*	*No*	*Skips located on-site for general waste*	*Company X*	*Landfill*	*June 2008*
Wood	*Pallets and other packaging materials*	*1.5*	*20-01-38*	*Non-Hazardous*	*No*	*Disposed of via dedicated skips*	*Company X*	*Landfill*	*January 2007*
Glass	*Primarily canteen and offices*	*0.5*	*20-01-02*	*Non-H*	*No*	*Disposed of via dedicated skips*	*Company X*	*Recycled*	*January 2007*
Plastic	*General packaging, canteen and offices.*	*0.8*	*20-01-39*	*Non-Hazardous*	*No*	*Stored in bins (green)*	*Company X*	*Recycled*	*January 2007*
Oil contaminated rags, gloves, clothing	*Maintenance workshop*	*0.2*	*15-02-02*	*Hazardous*	*No*	*Dedicated container (205 litre drum)*	*Company B*	*Recycled*	*June 2008*
Waste electronic and electrical equipment	*Offices and IT server room*	*0.1*	*20-01-36*	*Hazardous*	*No*	*Collected separately in a designated area*	*Company B*	*Recycling*	*June 2008*
Scrap metal	*General metal workings and redundant equipment*	*25*	*17-04-07*	*Non-Hazardous*	*No*	*Dedicated skip*	*Company C*	*Recycling*	*June 2008*

Graphic: Extract from a Waste Inventory

Some Examples of Simple Measures to Reduce Waste

When reducing Waste, care must be taken that this is done in a responsible way, which does not create health or safety hazards or cause the deterioration of working conditions at the site.

- Try to purchase materials in bulk, to avoid excessive packaging
- Work with suppliers to reduce packaging on materials they supply you with
- Try to obtain materials in reusable or recyclable containers and, where beneficial, ask that your supplier takes the containers back
- When preparing food in canteens (for example), only prepare and cook what is necessary
- Consider composting food and other biodegradable waste
- If you pay for waste removal by the container load (e.g. per skip/dumpster) (regardless of weight of the waste in the container) try to compact the waste, or bale it to maximise the amount in the skip, recognising that this could be construed as a waste management activity and may require licensing
- Avoid rainwater getting into waste storage containers (e.g. drums, skips etc.) - you may be paying extra waste costs because of the weight of the water
- Segregate wastes to promote their reuse, recycling etc.
- In offices, avoid printing wherever possible
- Set printers to default to double-side printing
- Re-use non confidential paper where possible

7.1 Pollution Prevention / Hazardous and Potentially Hazardous Substances

What are we Talking About?

For the purposes of this document, we are referring to all types of substances that are hazardous (or are potentially hazardous) to the environment. The term "substance" is not intended to have any legal definition nor is it to be confused with the use of the term "substance" in certain regulatory regimes and legislation (e.g. the European REACH regulations, which contain a specific definition of "substance"). As such, in the context of this document, a substance can, for example, be a pure chemical, a mixture of chemicals, an alloy of metals etc.

Substances can be classified in terms of their hazards or hazard descriptions (e.g. explosive, flammable, carcinogenic, toxic, corrosive, dangerous to the environment etc.). The box below provides additional information on the classification of hazardous substances. However, not all substances potentially hazardous to the environment are specifically classified as such. For example, under certain conditions many dusts can be explosive (e.g. flour, some metals). Some foods designed for human consumption e.g. edible food oil and milk can be damaging to the environment if released uncontrolled into the ground or water. Also, hazardous substances can be generated by the processes on-site, either as a product, a by-product or an emission; it may not be possible to classify these as a single "hazardous substance", but they may still be hazardous and may need to be managed as such.

It is important to transport, handle, store, transfer and use hazardous substances responsibly, to make sure that personnel are not exposed to them, and to prevent their release to the environment.

This module addresses pollution prevention associated with the handling, storage and use of hazardous substances, rather than their emission/discharge[2].

It is important to consider the nature and amount of pollutant potentially released and the frequency with which this release may occur. For example, a small amount of a pollutant discharged into the ground over many years can be more (or equally) damaging than a large amount released on a single occasion or every few years.

What are the Benefits of Effectively Managing Hazardous Substances?

By managing hazardous substances effectively, you can:

- reduce spills or leaks, which can be damaging to the environment, costly to clean up, and provide negative publicity for the site;
- reduce the risks to the health of all employees, contractors and site visitors, as well as site neighbours;
- reduce the risk of pollution incidents, which can prove both damaging for the environment and for humans and which can also be costly for sites that cause them and their owners/operators;
- act as a responsible operator towards site neighbours and stakeholders; and
- reduce costs by not wasting raw materials and minimising waste materials to be disposed of (e.g. spilt material, used spill kits etc.).

Where Could You Start?

Identify hazardous substances that you use, store, handle or generate on-site. Understand the risks associated with them and how you need to manage them. Identify whether you can substitute hazardous substances with less hazardous substances. Then you need to look at what controls are in place to manage the hazardous substances and whether any additional controls are required to reduce the risks presented by those substances.

[2] *Further information on preventing releases of hazardous substances to wastewater and air is provided in Section 4.1 Wastewater Effluent and Section 5.1 Emissions to Air. In addition, Section 8.1 Major Incident Management includes additional background and detail to potentially more severe environmental incidents.*

Classification of Hazardous Substances

The regulatory requirements on substance classification (hazard descriptions) differ globally, as do the requirements for providing information to persons handling/using the substances (e.g. labels, safety data sheets etc.). This can lead to confusion, as the same substance can have different classifications in different countries. For example, a chemical could be labelled as 'toxic' in one country, but not in another. To address these differences, the United Nations (UN) has created the Globally Harmonized System of Classification and Labelling of Chemicals (referred to as "GHS"). The aim of the GHS is promote global consistency by having the same:

- criteria for classifying chemicals, according to their health, environmental and physical hazards; and
- hazard communication requirements for substance labelling and safety data sheets.

It should be noted that the GHS is not a formal treaty. Rather, it is an international *agreement* which is not legally binding or enforceable. This means that countries are required to implement the GHS via national legislation. As such, it is recommended that you consider national legislation applicable to your site, as well as the requirements of the GHS. In addition to the GHS, the UN has also introduced the *UN Recommendations on the Transport of Dangerous Goods, Model Regulations* ("the UN Regulations"). The UN Regulations contain symbols to be used when transporting the substances (e.g. on tankers) which may be slightly different to those included in the GHS for similar classifications.

The following table includes some examples of classifications from both the GHS and the UN Regulations, which you may see on tanks/ packaging/ vehicles containing or handling hazardous substances. It should be noted that, under the GHS, the same symbol (pictogram) may be used for a number of different hazards through the inclusion of additional text ('signal word' and 'hazard statement'). The full list of classifications, categories, categories, symbols, signal words and hazard statements from the GHS can be found at the following link: http://www.unece.org/trans/danger/publi/ghs/ghs_rev02/English/05e_annex1.pdf; the full text of the GHS can be found at: http://www.unece.org/trans/danger/publi/ghs/ghs_rev02/02files_e.html.

Classification	Acute Toxicity: Oral	Acute Toxicity: Skin	Aquatic Toxicity (Acute)	Aquatic Toxicity (Chronic)
Category	Category 1	Category 1	Category 1	Category 1
GHS Symbol				
GHS Signal Word	Danger	Danger	Warning	Warning
GHS Hazard Statement	Fatal if Swallowed	Fatal in contact with skin	Very toxic to aquatic life	Very toxic to aquatic life with long lasting effects
UN Regulations Symbol			Not currently specifically included in the UN Regulation	Not currently specifically included in the UN Regulation
Classification	Corrosive to Metals	Skin Corrosion/ Irritation	Flammable Gas	Flammable Liquid

Category	Category 1	Category 1A	Category 1	Category 1
GHS Symbol				
GHS Signal Word	Warning	Danger	Danger	Danger
GHS Hazard Statement	May be corrosive to metals	Causes severe skin burns and eye damage	Extremely flammable gas	Extremely flammable liquid and vapour
UN Regulations Symbol				

7.1.1 Meet legal requirements

There may be legal requirements in relation to the *substances used*, *stored* or *generated* on-site, and also in relation to *processes or activities* on-site that could *generate* hazardous substances. Legal requirements may limit the amount of a substance that can be stored or used, or how they are used.

7.1.2 Compliance with prohibited chemicals list (e.g. for agrichemicals from the World Health Organisation, WHO)

Identify sources of information on prohibited chemicals (e.g. legislation tracking systems/companies, the World Health Organisation http://www.who.int/en/) and either subscribe to regular updates, or check with the source of information on a regular basis.

Depending on your type of production, compliance with the prohibited substance list may mean one or more of the following:

- **not storing or using hazardous substances which are prohibited and/or**
- **employing hazardous substances for uses which are prohibited and/or**
- **storing or use the hazardous substances above legally-prescribed limits.**

Confirm whether PCBs (polychlorinated biphenyls) are present in equipment on-site, e.g. in transformers, capacitors, lighting ballasts etc. and confirm the removal, ongoing management and labelling requirements for the PCB containing equipment.

7.1.3 Relevant, up-to-date permits are held and compliance maintained

The site may be required to hold a permit in relation to the volume or use of hazardous substances, or the type or scale of processes using or generating hazardous substances. Those with on-site responsibilities for meeting permit conditions may need to be trained how to meet those conditions.

You may need to review the quantities stored or used on-site to ensure that you maintain compliance with limits prescribed in its permit. If changes occur to substances stored or used on-site or the processes employed on-site, check whether these affect your permit status.

7.1.4 An inventory of hazardous substances used and stored is maintained together with relevant up-to-date Material Safety Data Sheets (MSDS)

An inventory of hazardous substances is a detailed list of the hazardous substances used and stored on site. The inventory can be used to provide information to people handling substances to enable them to understand the labelling protocol for substances, risks and how to manage the risk to prevent harm to the environment or human health.

For each hazardous substance, it is good practice to include in your inventory at least:

- the formal name (and other names) of the hazardous substance;
- its CAS registry number, EINECS number, or EC Number (see *Annex A Explanation of Terms*);
- whether it is a single substance or a mixture of substances (for example);
- its hazard characteristics / risk phrases;
- where and how the substance is stored on-site; and
- specific control measures in relation to its storage or handling.

Material Safety Data Sheets (MSDS) (sometimes referred to just as "Safety Data Sheets") are documents provided by the manufacturer or supplier of a chemical. They include information about the substance's composition, its safe storage, handling and use, what action to take in the event of a spill etc. MSDS are important documents which provide practical (and often legal) information on hazardous substances. You can obtain copies of MSDS from your supplier or direct from the manufacturer. Always make them readily available to users (at the point of delivery, storage, use etc.).

7.1.5 Specific procedures/controls in place for the management / storage /transportation of all hazardous substances, minimising potential for air, water, soil and groundwater impacts

Procedures for the safe handling, storage and transportation of hazardous substances could include:

- delivery and off-load of the substance;
- storage of the substance;
- allowed uses of the substance;
- action to be taken in the event of a spill or release of the substance;
- collection and disposal of the substance; and
- how to handle and dispose of packaging associated with the substance.

You can provide storage containment to prevent a spill or release entering

the ground, water or air. Containment measures include both primary containment (e.g. a storage tank) as well as secondary containment (e.g. a bund or berm around the storage tank, sump pallets for drums). Provision of spill kits around site enables quick response if a spill occurs.

Consider how to prevent, for example, rainwater getting into the secondary containment. Rainwater in bunds can result in overflow if there is a release or spill into the bund. Also, if the rainwater becomes contaminated it can increase the volume of water which may need to be disposed of as 'contaminated' and hence increase costs of disposal.

A tank inventory (which is a list of tanks and their typical contents) is also a useful tool for managing hazardous substances. It could include:

- the types of tank (aboveground/underground) on-site;
- their location;
- their volume
- their intended contents
- records of any leak checks or maintenance; and
- a record of the controls installed on the tanks / around the tanks to reduce the potential for leaks/spills.

7.1.6 Pollution prevention and response training is delivered to all relevant employees

Provide information to persons transporting hazardous substances on your behalf on the physical, chemical and environmental hazards of those substances to enable safe and legal transportation.

Training can include:

- an overview of legal requirements relating to hazardous substances which they handle or may come into contact with;
- specific procedures relating to the management/ storage/ transportation of hazardous substances; and

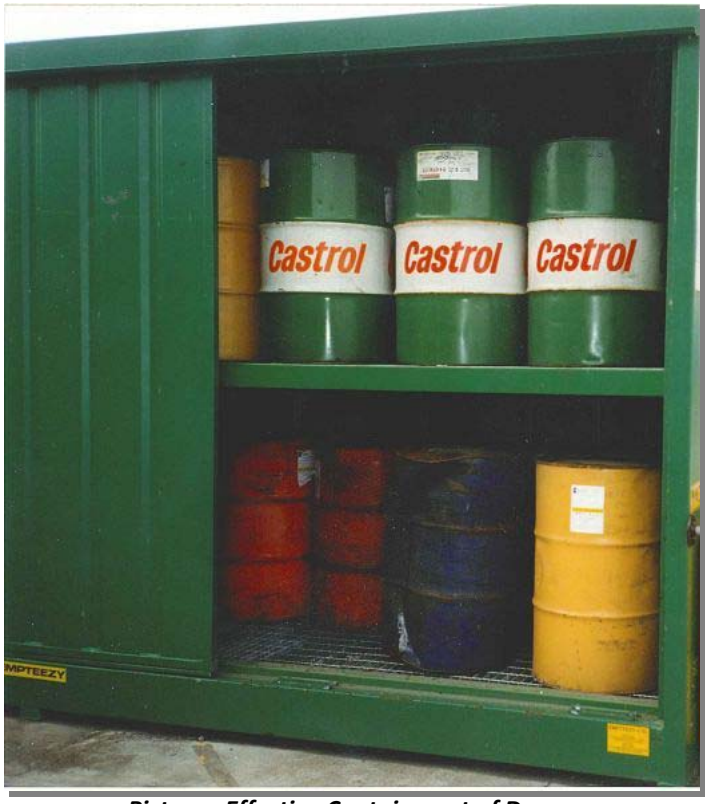
spill response plans (including the correct methodology for containing and then disposing of the spilt material).

Such environmental training would not replace the need to train employees on health & safety matters relating to pollution prevention (both in terms of general health & safety hazards and specific training on, e.g., emergency procedures, first aider training etc.)

7.1.7 Incidents are notified to the authorities as required by applicable permits/ legislation

Legislation and permits may include requirements relating to the notification of incidents (e.g., spills, uncontrolled emissions to the environment etc.). They may also prescribe the procedure for recording, reporting and investigating such incidents. Having a formal procedure in place for recording, reporting and investigating incidents is helpful to ensure compliance with notification requirements.

Picture: Effective Containment of a Tank



Picture: Effective Containment of Drums

8.1 Major Incident Prevention and Management

What are we Talking About?

Whereas Performance Area #7 considers ways of preventing pollution from hazardous and potentially hazardous substances, Performance Area #8 considers ways of managing (i.e. preventing and responding to) major environmental incidents, e.g. explosion, major fire, toxic gas release, significant pollution release to a watercourse (e.g. river, lake, sea etc.).

It should be noted that sites with the potential for major environmental incidents may be formally regulated. However, this is not always the case.

If it is established that your site does not have the potential to cause or be the subject of a major environmental incident, Performance Area #8 may not be relevant.

Although Performance Area #8 deals predominantly with environmental effects of major incidents, it is important to remember that often such incidents can seriously impact the health, safety and welfare of site personnel and persons off-site, property, operations and continued existence of the site.

Although various definitions exist, an incident would usually be considered 'major' if it causes (amongst others):

- persistent and extensive effect on the quality of the air, land or water environment;
- significant harm to the environment;
- closure (temporary or permanent) of a drinking (potable) water abstraction point;
- significant impact on property;
- significant damage to agriculture and/or commerce; or
- serious impact on humans (via air, land or water).

Significant harm to the environment can include (but not necessarily be limited to):

- the death of, or adverse effects on, local species;
- widespread damage to habitats or specific ecosystems;
- significant contamination of water supplies, soil or groundwater;
- damage to residential areas, communities, farmland and other human living and working environments;
- damage to historic buildings, landscape, heritage sites, recreations areas; and
- loss of utility/resource e.g. fishing grounds in a river, an area for recreation or leisure.

The impact of a major incident will not only relate to the cause and the substances involved, but also to the environment in which it occurs, proximity of other land uses, people, sensitive habitats etc.

An uncontrolled situation (incident) may arise due to on-site or off-site events or factors which the site is unable to influence or which it has lost the opportunity to influence or control. Such off-site factors could include adverse weather conditions (e.g. flooding).

The important consideration here is the *identification* of possible causes of major incidents and the potential for such major incidents to occur.

The guidance in *Section 8.2* includes an approach to the assessment and management of potential major incidents.

What are the Benefits of Reducing the Potential for Major Incidents?

The benefits of reducing the potential for major incidents to occur include:

- reducing the potential for significant damage to the environment or significant harm to site personnel and avoiding costs for the site / its owners;
- avoiding potential negative publicity for the site;
- avoiding costs that are always associated with recovery and remediation following an incident;
- reducing the potential for regulator intervention due to a major incident;

maintaining good relations with site neighbours, authorities and other stakeholders by demonstrating a serious approach to environmental responsibility.

Where Could You Start?

Check whether the potential for major incidents means that you are legally regulated. Identify possible causes of major incidents associated with your operations and activities. You may also need to undertake a preliminary assessment of the potential for major incidents associated with your site. You may need specialist third party help in undertaking the preliminary assessment. Once you have identified the potential for major incidents, you need to consider what additional controls may be required (including technical controls and procedural controls) to reduce the potential of those incidents occurring.

It should be noted that this section builds on Section 7 Pollution Prevention/ Hazardous and Potentially Hazardous Substances. As such, if the potential for a major incident exists on your site, you should consider both Sections 7 and 8 of this document.

8.1.1 Meet legal requirements

You need to understand your legal requirements in relation to major incidents, i.e. whether there are substances used or stored on-site or processes employed that represent the potential for such incidents which have legislative requirements. In relation to hazardous substances (e.g. their storage, use, handling, processing and/or disposal), there may be specific legal requirements that limit the amount stored, the amount used and/or the nature of the uses to which they are put (see *Section 1.1* on how to identify and understand legal requirements).

Stay up-to-date with changes in pollution prevention and hazardous substances legislation which could alter the status of the site in relation to its classification for major incidents. Check also whether changes in, for example, the type or quantity of substances used, their storage location, their use etc. affect the site's legal obligations.

8.1.2 Relevant, up-to-date permits are held and compliance maintained

There are various considerations when assessing whether you need a permit (or similar) and the potential for major incidents. These include the:

- specific substances, or their generic 'type';
- quantity of hazardous substances stored on-site;
- location of storage; and
- local environs of the site (and hence the potential for impact).

The emergency plan could consider two elements:

- the proactive (planning) elements, e.g. an accident prevention plan (or similar), which outlines the measures taken to prevent a major incident; and
- the reactive (or response) elements, e.g. a plan presenting measures to take if the accident/incident occurs.

8.1.3 Site emergency plan in place with detailed guidelines / training for major incident response, as needed and reflecting the risks of activities undertaken on-site

The emergency plan could include:

- the substances and their hazard characteristics;
- locations of the materials and potential emissions (whether to air, water and/or land);
- what or who might be affected by a release/discharge/accident etc.;
- roles and responsibilities of the emergency response team members and those of relevant external parties;
- a communications plan explaining who (internally and externally) should be communicated with in the event of an incident;
- the specific actions to be taken;
- the equipment to be used and the personal protective equipment (PPE) to be used by the team and any personnel remaining on site;
- evacuation procedures (for both the site and areas around the site); and
- remedial measures to clean-up after a major incident etc.

Appropriate training on how to respond to major incidents should be associated with the site emergency plan, reflecting the risks of activities undertaken on-site and adapted to the different job-roles of the site's personnel, according to their responsibilities.

8.1.4 Emergency response plan communicated to local authorities, emergency services and local communities, as required

The Emergency Response Plan will need to be understood by local authorities and emergency services, which may be required to act or assist in the event of an emergency, and to any local communities who could be harmed. The site can hold meetings with representatives from these groups to explain the emergency response plan, what happens in the event of an emergency, and what each group should do.

9.1 Contaminated Land / Soil and Groundwater Pollution Prevention

What are we Talking About?

The term "contaminated land" can have a number of definitions and you may need to confirm the specific definition of "contaminated land" in your local or national legislation.

Contamination generally means the introduction of hazardous substances above the levels which these substances occur naturally. This may be to levels (or concentrations) which could cause harm to the environment, human health or property.

Harm to human health can include death, disease, serious injury, genetic mutation, birth defects or impairment of reproductive functions.

Common causes of soil and groundwater contamination include:

- spills or leaks of chemicals from storage areas (including aboveground storage tanks (ASTs) and underground storage tanks (USTs) or from equipment;
- contaminated run-off or rainwater entering the ground;
- contaminated fire water entering the ground;
- dumping of materials on or in the ground (including waste materials);
- leaking drains carrying hazardous substances or wastewater etc.; or
- accidents when transporting the substance, e.g. by forklift truck, by road transport, by train etc.

Three things need to be present for contamination to cause harm:

- a source of the contamination (e.g. a spill, a leaking tank, hazardous dusts being released into the air etc.);
- a receptor (i.e. something that could be impacted by the contamination) for the contamination (e.g. the soil, plants, a river, humans etc.); and
- a pathway for the contamination to move from the source to the receptor (e.g. a damaged drainage channel, drainage directly through the soil into the rocks below, hazardous dusts being blown through the air and then settling on the ground).

These are explained in greater detail in *Level 2*.

Some common terms used in relation to soil and groundwater contamination are:

- vulnerability – the potential or likelihood for contaminants to reach a particular receptor;
- sensitivity – the potential impact of contaminants reaching that receptor; and
- risk assessment – an assessment of the likelihood of contamination reaching receptors and the potential consequences of the contamination reaching the receptor.

Different countries, regions and areas have different requirements and expectations in relation to contaminated soil and groundwater. This guidance does not attempt to explain all the various options that there may be associated with soil and groundwater contamination, investigation or remediation.

What are the Benefits of Preventing Soil and Groundwater Contamination?

The benefits of preventing soil and groundwater contamination include:

- avoiding damage to the environment and to humans;
- reducing the potential for regulator intervention due to soil or groundwater contamination;
- acting as a responsible operator towards site neighbours and stakeholders ; and
- avoiding potential costs that would likely be required to clean up the soil, groundwater, rivers, ponds etc.

Where Could You Start?

You can start by assessing where and how your site may release materials to the environment and what those materials might be. Remember that these may be to air, to land or to water. You need to consider where your site is located and what is in the vicinity of the site (e.g. sensitive habitats, rivers, lakes, the sea, housing, farming etc.) and how what you may release into the environmental could affect them. You then need to consider how your site could prevent or reduce the potential for contamination. Some simple measures that can be taken to reduce the potential for contamination are presented in the box below.

Simple Measures to Reduce the Potential for Soil and Groundwater Contamination

When reducing the potential for soil and groundwater contamination, care must be taken that this is done in a responsible way, which does not create health or safety hazards or cause the deterioration of working conditions at the site.

- Ensure full and partially full drums and tanks are provided with secondary containment
- Repair damage to secondary containment
- Keep lids on drums and containers
- Ensure empty drums are stored in contained areas or away from grassed or non-vegetated areas
- Store wastes (especially liquids) in good condition containers, away from grassed/ non-vegetated areas
- Fix leaks quickly and clean-up material that has leaked
- Clean-up spills quickly (and make sure that spill kits are replaced once used)
- Repair damaged drains and drainage channels
- Perform regular site walkovers and look out for leaks and spills; poor drum and tank storage; damaged drains and drainage channels; and check on outfalls to rivers, lakes and other watercourses to ensure that there is no contamination leaving the site
- Keep spill kits at various points around the site

9.1.1 Meet legal requirements

You need to understand your legal requirements in relation to contaminated land, including assessment, investigation and remediation and soil & groundwater pollution prevention (see *Section 1.1* on how to identify and understand legal requirements).

9.1.2 Relevant, up-to-date permits are held and compliance maintained

Your site may hold an integrated permit (which addresses potential discharges to the air, water and land) or it may have a permit (or similar) that references potential or existing soil or groundwater contamination. The permit might require that you monitor soil and groundwater conditions beneath (or in the area around) your site or it might require a plan to prevent contamination or to investigate, manage and potentially remediate contamination. Where this is the case, it would be good practice to record monitoring results and associated information (e.g. changes to the risk assessment for your site, and changes to the plan etc.).

9.1.3 Understanding and awareness of site setting/sensitive receptors in site's vicinity

The 'site setting' means where the site is located, what it is used for, what is beneath the site (e.g. type of rocks, their formation, whether they contain groundwater etc.) and what is around the site (the site's 'receptors'), e.g. neighbours, surrounding land uses, location of rivers, lakes, the sea etc. This is important when considering the risk of soil and groundwater pollution and the controls that may need to be put in place. For example, if a drain leads directly from a site (that stores large volumes of hazardous substances) to the land or a river, it may be necessary to install a valve in the drain, which can be closed if a leak or spill occurs into the drain; it may be necessary to install additional containment on a site that is close to a residential area or which could potentially impact a drinking water supply to the local area.

Level 2 talks more about how to gather information on the site setting and potential receptors in the vicinity of the site.

9.1.4 Not causing or knowingly permitting contamination of soil and groundwater

"Not causing or knowingly permitting contamination" means that a site must implement measures to prevent contamination from occurring in the first place and also that it reacts to stop contamination from occurring as soon as a potential source of contamination is identified, e.g. that it addresses a leak/spill, repairs damage to a bund wall, cleans-up leaks or spills, that if contamination is identified, that it is investigated and the cause identified and addressed. The site could also give consideration to removing underground storage tanks (USTs) and replacing them with above ground storage tanks, which are double-skinned or provided with secondary containment.

10.1 Land Use and Biodiversity

What are we Talking About?

Land use is just that: how you use the land on which your site is located and what your site is used for. Different land uses can impact the environment (negatively and positively) in various ways and need to be managed accordingly. Biodiversity is the variety of all living things - the different plants, animals and the ecosystems they form. Land use, amongst other factors, can impact biodiversity.

In the context of this document, Level 1 considers land use and biodiversity of the site only and focuses on legal compliance and ensuring that the site does not have negative impacts on designated protected areas. Level 2 considers on-site land use and biodiversity and the impacts of sourcing materials in the local environment. Level 2 focuses on managing land use and biodiversity, and improving land use, biodiversity performance and conservation. Level 3 encourages the site to look off-site, to consider broader land use and biodiversity impacts, and to engage with stakeholders through the value chain to reduce potential impacts on biodiversity and to promote leading practice land use and management.

The concept of an 'ecosystem' is important to the understanding of biodiversity. An ecosystem is a natural unit consisting of all plants, animals (including, possibly, humans) and micro-organisms in an area, which function together with all of the non-living physical factors of the environment (e.g. a river or a stretch of river can be considered as an ecosystem, with interaction of the rocks/soil on which the river is located, the water, the plants, insects, fish etc. in the river, and the humans using the river). An impact on one area of an ecosystem can impact on many of the other areas, if not all. A sustainable ecosystem is one which can be maintained in a particular condition or state indefinitely, i.e. it is not altered negatively or significantly. Ecosystems rely on biodiversity for their survival and an ecosystem will influence the biodiversity within it. For example, certain insects rely on particular types of plants for food and, in turn, these insects pollinate other plants; certain plants may need other plants which provide shade, moist conditions, decaying leaf matter for growth etc. If one part of an ecosystem is damaged by a site's activities (e.g., an insect) this can damage the wider ecosystem and its biodiversity (e.g. the plants it pollinates).

The main threats to biodiversity are associated with human activities causing loss of the land on which plants and animals live, feed and breed/reproduce.

Land use and biodiversity impacts

Site operations and activities (including raw material use, production activities, emissions, waste generation, transport etc.) have the potential to negatively impact biodiversity, causing, for example:

- *Species loss (extinction) or decline* – associated with pollution of air, water and ground; land use change e.g. through loss of habitat;
- *Habitat loss* – associated with the removal of habitat for construction of facilities;
- *Disturbance to ecosystems* – associated with construction or operational activities e.g. soil

erosion in agricultural production; and
- *Unsustainable use of biodiversity* – for example through the use of natural materials for construction.

What are the Benefits of Minimising Impacts to Land and Biodiversity?

The benefits of minimising impacts to land and biodiversity include:
- maintaining biodiversity on the site or upon which the site relies to support goods and services it offers (e.g. ensuring that the various cereal crops that are required to produce foodstuffs can still be grown, ensuring that locally available timber resources include the types needed etc.);
- avoiding damage to sensitive ecosystems;
- preserving species which are important for food or for agricultural productivity (e.g. insects which aid crop pollination);
- reducing the risk of regulator action against the site;
- acting as a responsible operator towards neighbours; and
- continued access to financial backing and insurance for a business' activities.

Where Could You Start?

You could start by considering how your site uses the land on which it is located, for example:
- for crops/timber;
- for industrial activities (and the nature of operations);
- for the storage of water/wastewater (e.g. pond or lagoon);
- whether areas of the site, which are not currently developed, provide habitats for particular species;

Confirm whether there are legal requirements relating to land use (planning and development) and whether your site is located in, or forms part of, a protected area. The guidance below provides more information on both.

You could consider how your site operations may impact land use and biodiversity, for example, whether:
- if your site continues to remove trees for timber without replanting new trees it could adversely impact the local environment;
- if your site exhausts one crop type, it could adversely affect continued operation of the site; and
- the site could be affecting the type and number of plant or animal species present in certain areas of the site.

Identify those processes and controls already in place to reduce or manage impacts on land and biodiversity and consider what additional controls may be required.

10.1.1 Meet legal requirements relating to planning and development

Your site may have legal obligations in relation to land use and biodiversity and also in relation to planning and development (see *Section 1.1* on how to identify and understand legal requirements).

The site's land use may need to meet local, regional, national and international planning and development legislation and regulations, for example: land use zoning / classification, environmental impact assessment and land conservation requirements, rehabilitation and restoration requirements.

When planning for new operations or expansion of existing operations you need to understand how the changes may impact on biodiversity and land use management, and how best these impacts can be managed.

10.1.2 Relevant, up-to-date permits are held and compliance maintained

There may be legal requirements on the types of operations you can undertake on site. For example, there may be planning laws that control the types of activities that can be undertaken (e.g. agricultural, extraction, commercial, retail, industrial etc.). Permits may contain requirements relating to specific uses and the protection of biodiversity.

10.1.3 No negative impact on designated protection areas or species

Try to understand what legally protected species and areas are close to or within the site. Information on protected areas and species may be found in, for example, national laws, the United Nations Red Book and the United Nations List of Protected Areas. You can then establish if the site is negatively impacting on these species or areas (through, for example, conducting an environmental impact assessment, explained in *Section 1.1*), and assess if there are adequate controls in place to limit or prevent this impact.

11.1 Nuisances

What are we Talking About?

A nuisance is a disturbance to the right to use and enjoy land. Nuisances include noise, dust, odour, vibration, smoke and fumes, visual impact (e.g. trees obstructing a view), traffic, sleep disturbance, fly tipping (illegal disposal of waste materials), disturbance caused by animals and vermin (e.g. rats and mice), poor state of repair of a premises, foul, stagnant or obstructed water etc.

Nuisances can affect a site's neighbours (e.g. properties used for residential, retail, commercial or industrial purposes), specific individuals ('private nuisance') or a wider community ('public nuisance'). Certain types of nuisance can become safety and/or health hazards.
Nuisance can result in a breakdown of good relations with a site neighbour, between sites or companies, or can result in legal action being taken against the person or company causing the

nuisance. Depending on the legislation in a particular region or country, a person (or company) causing a nuisance may be subject to legal action by the individual (or company) affected by the nuisance and/or by a regulator. This could result in a formal warning, a fine, restriction of activities on-site, stopping a building or demolition project etc.

What are the Benefits of Preventing Nuisances?

By preventing nuisances you can:

- avoid regulatory action and potential impact on site activities / additional costs to the site;
- avoid negative publicity and attention;
- act as a responsible operator towards site neighbours and stakeholders; and
- promote a good working environment.

Where Could You Start?

Understand who may be affected by nuisances from your site's operations; try to assess where nuisance could be caused by operations or activities associated with your site; and identify what additional control measures may be required to minimise the potential for nuisance.

11.1.1 Meet legal requirements	There may be legal requirements in relation to nuisance at the national, regional and even local level. Permissions and consents to develop a site or to build or demolish buildings may contain requirements to avoid nuisance to site neighbours (see *Section 1.1* on how to identify and understand legal requirements).
11.1.2 Relevant, up-to-date permits are held and compliance maintained	Often, a permit can include requirements to avoid nuisance. A permit may also require monitoring of noise, emissions to air etc. Staying within the limits prescribed in the permit may avoid nuisance to others, or provide some defence if a nuisance claim is received by the site. Check whether changes in site operations or infrastructure, could cause nuisance or which may require changes to permits held or the requirement for a new permit.
11.1.3 Understanding and awareness of nuisance levels from site activities and associated impacts (including odour, noise, visual and general housekeeping)	To understand the nuisance your site might cause, you need to understand who may be affected by nuisance from your site. For example, it may not be just immediate neighbours who are affected by nuisance from your site. It could be persons living along traffic routes to your site, persons across a valley who are affected by lighting at night, persons at a distance from the site where dusts generated by your activities are settling on the ground. Also, vibration can travel long distances through the ground and may affect persons at a distance from your site. It is helpful to walk around the site boundary and to view the site from outside. You may identify potential causes of nuisance from your site,

which were not noticeable on-site. Also check whether noise, odours, dust, litter etc. are being generated by your site, which may cause a nuisance to others.

Consider potential nuisances at different times of the day, when, for example, background noise levels are less and noise from your site may be more noticeable. Lighting at night can also be a cause of nuisance, so it is helpful to check on the location, angle and brightness of on-site lighting. The prevailing wind direction can also influence which site neighbours may be affected by nuisance from your site, and wind direction can frequently change.

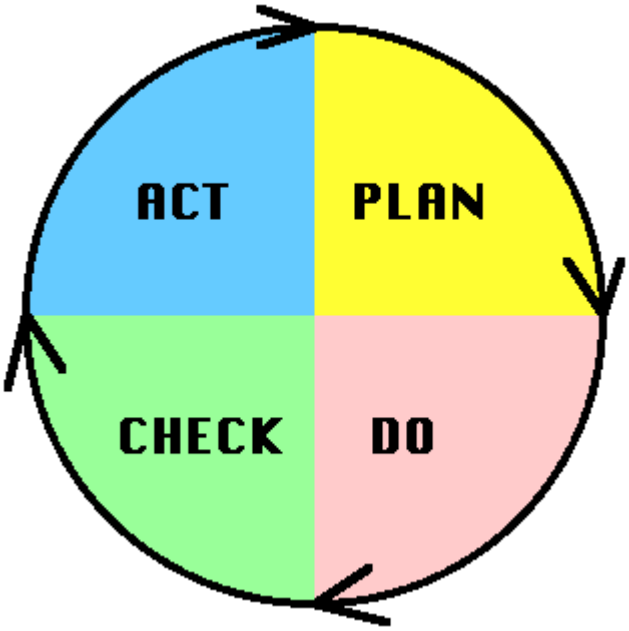
It is important to communicate potential causes of nuisance to people on-site so that they understand what those might be and how to avoid them.

LEVEL 2

Proactive Management and Performance Improvement

LEVEL 2 PROACTIVE MANAGEMENT AND PERFORMANCE IMPROVEMENT

1.2 Environmental Management System



Graphic: The Plan-Do-Check-Act Cycle

1.2.1 Environmental Management System (EMS) is established, documented, implemented, maintained and continually reviewed/improved

The Plan-Do-Check-Act Cycle presented above explains how an EMS works and how the components of the EMS fit together. Where not already a legal requirement, the development, implementation and maintenance of a formal EMS would be considered as a Level 2 requirement.

1.2.2 The EMS includes:

a - Environmental Policy

An Environmental Policy is in place describing the site's activities, products and services including a commitment to continual improvement and prevention of pollution, as well as a commitment to comply with legal and other requirements that relate to the significant environmental aspects identified for the site.
The policy may relate to environmental management only, or may be integrated (as may the whole management system) with social and/or health and/or safety issues.

b - Planning: environmental risk assessment, setting objectives and targets

The policy should set out the framework for setting and reviewing environmental objectives and targets. Where appropriate, the Policy is documented and communicated to all persons working for or on behalf of the organisation, which are required to comply with the Policy; and made publicly available. It is good practice to review the Policy on a regular basis (at least annually) and revise it when required.

c- *Implementation and operation*

Documented environmental objectives and targets (goals) could be established for all relevant functions and levels of the organisation; these typically align with the objectives and targets outlined in the Policy. It is helpful to get a number of people involved in objective and target setting, so that they are not established in isolation and to ensure that they reflect the operations across site.

It is important to prioritise environmental risks, so that the highest priority risks can be addressed first and so that, potentially limited, resources can be allocated to where they are most needed (in terms of eliminating environmental hazards and managing those risks where the hazards cannot be eliminated). Environmental aspects and impacts analysis is an important tool here (see below).

It is important that the objectives and targets are measurable, achievable and reflect performance (these might be in relation to, e.g., energy use, waste generation, water use, pollution incidents, material use, packaging use etc.). When setting objectives it is useful to consider a range of factors, including the most significant aspects and impacts, as well as financial, operational and business requirements. This can help to ensure that the objectives and targets are realistic in terms of broader operation of the business.

As part of the planning process, it is important to identify how the objectives and targets will be met (in terms of the process that will be followed to achieve them, and who will be responsible for their achievement).

In addition to Level 1 requirements:

- the environmental aspects and impacts identification goes beyond direct air/waste/water discharges, to include other topics including (but not necessarily limited to): design & development, raw material use, packaging use, transportation, distribution, use and end-of-life products, biodiversity etc.; and

- the legal register need not be limited solely to 'legal' requirements, but could also consider, for example: corporate requirements, non-

regulatory guidelines, voluntary codes of practice, trade association requirements, agreements with community groups etc.

Operational procedures

Formal procedures may need to be developed to address the broader range of environmental aspects identified and not solely the 'significant' aspects, and include those associated with the activities of contractors on-site.

Formal procedures typically include an Emergency Plan (further details on Emergency Plans are provided in Performance Areas 7 and 8).

Adequate training

Training can include awareness training on the environmental policy, procedures and the EMS as a whole, and potential consequences of departure from procedures. It is useful to identify what training people require and to record this (often called a training needs analysis) and also to record what training people have received. This type of training goes beyond awareness raising in relation to environmental (and also safety and health) issues, which was considered at Level 1.

Documentation and its control

In addition to the documentation described in Level 1, the documentation established and maintained in relation to the EMS may include a description of the scope of the EMS (including the Policy, an organisation chart, the aspects and impacts analysis, the objectives and targets, a summary of the key operational controls used to manage environmental issues, an overview of the training provided, how the EMS is communicated to suppliers/contractors); a description of the main elements of the EMS; and monitoring data and calibration records, audit results and Management Reviews (see below for more detail).

Document control processes include the identification, storage, protection, retrieval, retention and disposal of documents and records. Document control is important to ensure that the most up to date documentation and information is available to people and that obsolete versions of documents are removed from circulation and to help demonstrate that the management system is maintained up to date.

d - Checking: monitoring and measurement, audit and inspections

"Monitoring" refers to the process of monitoring and measuring key aspects of operations that can have a significant environmental impact. This might include monitoring environmental performance (for example, tracking tonnes of material used, measuring emissions to air, ensuring that waste reduction targets are being met etc.), applicable operational controls, and conformity with the organisation's objectives and targets. Monitoring equipment may need to be calibrated. If calibration is required, you need to confirm the calibration frequency and whether calibration is required to be carried out by an accredited third party. Calibration records should be retained on-site.

EMS audits ensure that the site is implementing, maintaining and confirming with the EMS. You may need to develop a process to assess the compliance status of the site (with legal and other requirements). This may take the form of an audit (performed either internally or by an external third party).

e - Management Review

The management review is the formal review of the implementation and effectiveness of the EMS, as a whole. The outputs of management reviews typically include decisions and actions related to changes to the environmental policy, objectives, targets, and other elements of the EMS.

A corrective action programme could be developed, which would typically include actual and potential non-conformances, and both corrective and preventive action. The determination of root causes of non-conformities and identification of action required to avoid recurrence are important.

Although the individual company will plan its schedule of management reviews and define their frequency, at a minimum, management reviews should be undertaken annually.

1.2.3 All personnel (management, workers and their representatives, contractors) is engaged in the management of environmental issues accoding to their function.

It is not enough for a site to have only documented its EMS, it must be implemented, known and understood by all managers, workers and contractors on the site, maintained, reviewed and revised (where the review indicates that changes need to be made).

Everyone on site (management, workers and their representatives, contractors) should be engaged in the management of environmental issues, i.e. effective environmental management and ensuring good environmental performance is seen as a joint concern and not only as being the responsibility of certain individuals.

1.2.4 Information on environmental performance is made available to appropriate internal and external stakeholders

Information on environmental performance is made available, as appropriate, to internal stakeholders (e.g. workers) and external stakeholders (e.g. neighbouring communities, the general public). The site could maintain a procedure outlining how it communicates its environmental impacts and disseminates the information externally (e.g. if the site decides to make the information available to the public). Procedures for internal and external communication can include the process for receiving, documenting and responding to relevant communications from external interested parties, environmental/ sustainability reports, newsletters).

2.2 Energy Use, Transport and Greenhouse Gases (GHGs)

2.2.1 Formal systems and processes in place to manage and audit energy use and GHG emissions as per the site EMS

The site's Environmental Management System includes aspects of energy use and efficiency, transport and release of GHGs; objectives & targets relating to energy use/ efficiency; inclusion of legislation relating to energy and climate change; and review of energy KPIs / objectives & targets as part of the annual review.

The site may establish procedures in relation to energy use and efficiency for the site as a whole as well as procedures in relation to particular buildings or areas of the site, specific pieces of equipment considered to be large energy users (e.g. large motors, cooling and heating equipment, dryers, air compressors, ovens), or particular processes. Care should be exercised to ensure that energy efficiency measures adopted do not adversely impact the health and safety of people on-site. In addition, if on-site transport is a significant aspect for the site, a transport policy and associated procedures could be developed.

In addition to general energy awareness training, it may be appropriate to train relevant personnel in relation to operational and maintenance procedures for equipment which are high energy users (e.g. maintenance team), operational controls for processes that are high energy users, the transport policy and more detailed training on opportunities to reduce energy consumption and increase efficiency (e.g. training the purchasing department, R&D etc.).

2.2.2 Energy consumption and greenhouse gas emissions (including on-site vehicle emissions) are made available to appropriate internal and external stakeholders

One way of driving improvement might be to appoint energy (or carbon) champions. These individuals can have defined responsibilities to promote programmes to manage and minimise energy use. They can provide coaching on how improvements can be made, as well as track actual changes in usage.

Communication of energy consumption and GHG emissions may be achieved through formal reporting, use of notice boards, newsletters, annual company environmental/sustainability reports, postings on company websites etc.

2.2.3 Renewable energy use targets and GHG emission reduction targets (normalised) are established/reviewed at least on an annual basis to drive

Management review of the EMS includes a review of performance against energy use targets and GHG emission reduction targets.

Renewable energy use could be from solar power, wind power or energy derived from other renewable sources. Targets may be in relation to renewable energy generated by the site, or in relation to energy supplied by its utility supplier, which is generated from renewable sources. Renewable targets will be dependent on the source/type of renewable energy available, for example, in the local area or which are already

continuous improvement	adopted by the supplier. When target setting, variables against which energy use can be compared include energy used against production hours, unit use of raw material etc. Variables for energy use targets include energy used against production hours, unit use of raw material etc. It is useful to compare use of energy and refrigerant gases, together with the impact of transport, between fixed periods so that unusual patterns in consumption can be identified
2.2.4 Demonstrable reduction in energy (normalised)	Changes to the season/ambient temperature, processes, process volumes, duration of production runs, changes in personnel numbers etc. can all influence energy consumed. As such, examples of variables against which to normalise energy use/reduction include: units/volume of production, headcount, production hours, unit use of a raw material etc.
2.2.5 Targets include on-site vehicle emissions reduction which are reviewed on an annual basis to drive continuous improvement	**Management review of the EMS includes performance against transport indicators (air emissions from vehicles etc.) and overall impact of on-site transport.** Targets could relate to the introduction of alternative fuels for on-site vehicles, e.g. electrical forklift trucks rather than diesel or gas-powered trucks , regular vehicle maintenance, emissions testing etc.

3.2 Water Use

3.2.1 Formal systems and processes in place to manage and audit water consumption as per the site EMS	**The site's Environmental Management System includes water consumption, such as: a commitment to responsible and efficient water management and use in the policy (this might be grouped with other utilities); objectives and targets relating to water use; inclusion of legislation relating to water consumption, treatment, use etc.; procedures relating to the abstraction, storage, treatment and use of water (as appropriate); and review of water KPIs / objectives & targets as part of the annual review.** It is important to train people on why water needs to be managed (both in terms of volume and quality), water reduction opportunities, and how to achieve efficiencies. When reducing water consumption, care must be taken that that this is done in a responsible way, which does not create health or safety hazards or cause the deterioration or working conditions at the site. Awareness raising could include poster or other communication campaigns, and a suggestion or reward scheme to promote water efficiency could be considered. Training may also communicate the importance of not contaminating water supplies, both

in terms of drinking water, but also process uses.

A water 'monitor' could be appointed to undertake periodic site walkovers to identify opportunities for improved water management and efficiency.

Relevant staff, e.g. those involved in purchasing, engineering, design etc. of equipment, may need to be trained to take account of water efficiency when purchasing new equipment or refurbishing existing equipment. It may be more expensive to buy water efficient equipment, but it may have a short payback period due to the water savings achieved.

3.2.2 Water consumption data are made available to relevant internal and external stakeholders

The site could maintain a procedure outlining how it communicates its environmental impacts and how it disseminates the information externally (e.g. if the site decides to make the information available to the public). Communication of water consumption data (and source(s) of water) may be achieved through formal reporting, use of notice boards, newsletters, annual environmental or sustainability reports, posting on company websites etc.

3.2.3 Water consumption efficiency targets are reviewed on an annual basis to drive continuous improvement

Management review of the site's EMS includes a review of performance against water use reduction, reuse and/or recycling targets

Targets need to be based on meaningful variables and also on the source of water used (mains, surface water, groundwater, recycled water etc.).

3.2.4 Demonstrable achievement of water efficiency targets (normalised)

Water use can be compared between fixed periods so that unusual patterns in consumption can be identified.

Changes to the season/ambient temperature, processes, process volumes, duration of production runs, changes in personnel numbers etc. can influence quantities of water used. As such, examples of variables against which to normalise water use include: units/volume of production, headcount, production hours, unit use of a raw material etc.

4.2 Wastewater Effluent

4.2.1 Formal systems and processes in place to manage wastewater effluent as per the site EMS

The site's Environmental Management System includes wastewater generation, together with a commitment to responsible wastewater management in the policy (this may be grouped with other utilities); objectives and targets relating to wastewater generation; inclusion of legislation relating to wastewater generation, discharge and/or on-site treatment; procedures relating to the discharge, on-site storage, treatment, re-use of wastewater (as appropriate); and review of wastewater KPIs / objectives & targets as part of the annual review.

4.2.2 Basic on-site wastewater treatment in place to achieve improvements in wastewater quality or connection to off-site wastewater treatment system

'Basic on-site wastewater treatment' is taken to mean that level of treatment necessary to ensure that the wastewater discharged on or from the site does not adversely affect the environment or the receiving infrastructure (drains, treatment plant, vehicle etc.). The specific techniques implemented will be dependent on the quality and volume of wastewater generated, available technology, economic feasibility etc. It is important to remember that the introduction of on-site wastewater treatment can introduce additional health and safety hazards and risks for people on-site.

If neither on-site nor off-site wastewater treatment is feasible, then the wastewater may need to be disposed of as a 'waste' material (either non-hazardous, or hazardous, depending on its constituents).

4.2.3 Regular wastewater quality testing/ monitoring is undertaken to ensure ongoing compliance with permitted effluent limits and as per the site's EMS

Wastewater quality testing/monitoring requirements (type of testing, frequency, means of sampling etc.) will depend on the wastewater generated in terms of volume, potential constituents, variability etc.

The chosen sampling and analysis methods may include consideration of what constituents are likely to be present in the wastewater. Some samples can be taken continuously, some as composite samples, some as single samples; some samples can be stored before testing, others have to be tested almost immediately.

If routine and/or periodic monitoring of wastewater is required, procedures could be established. The procedures may explain:

- what monitoring is required;
- what parameters need to be monitored and at which points;
- when the monitoring is required;
- how and where the results are to be recorded; and
- the action to be taken if the monitoring indicates that one or more parameters are not in compliance with the parameters prescribed.

It is important to remember that the sampling and analysis of wastewater can present additional health and safety hazards and risks for those people undertaking the sampling and/or to persons close-by. Persons involved in the sampling and analysis of wastewater must be suitably trained in the correct techniques, but also in the potential hazards and risks to which they may be exposed.

4.2.4 Wastewater quality data are made available to relevant internal and external stakeholders

The site could maintain a procedure outlining how it communicates its environmental impacts and disseminates the information externally (e.g. if the site decides to make the information available to the public). Summary wastewater generation data (and data relating to the quantity disposed of versus quantity reused/recycled/recovered) could be produced and made available to internal and external stakeholders, e.g. through internal reporting, annual company reports (e.g. environmental/ sustainability reports) etc.

4.2.5 Wastewater quality and volume improvement targets are reviewed on an annual basis to drive continuous improvement

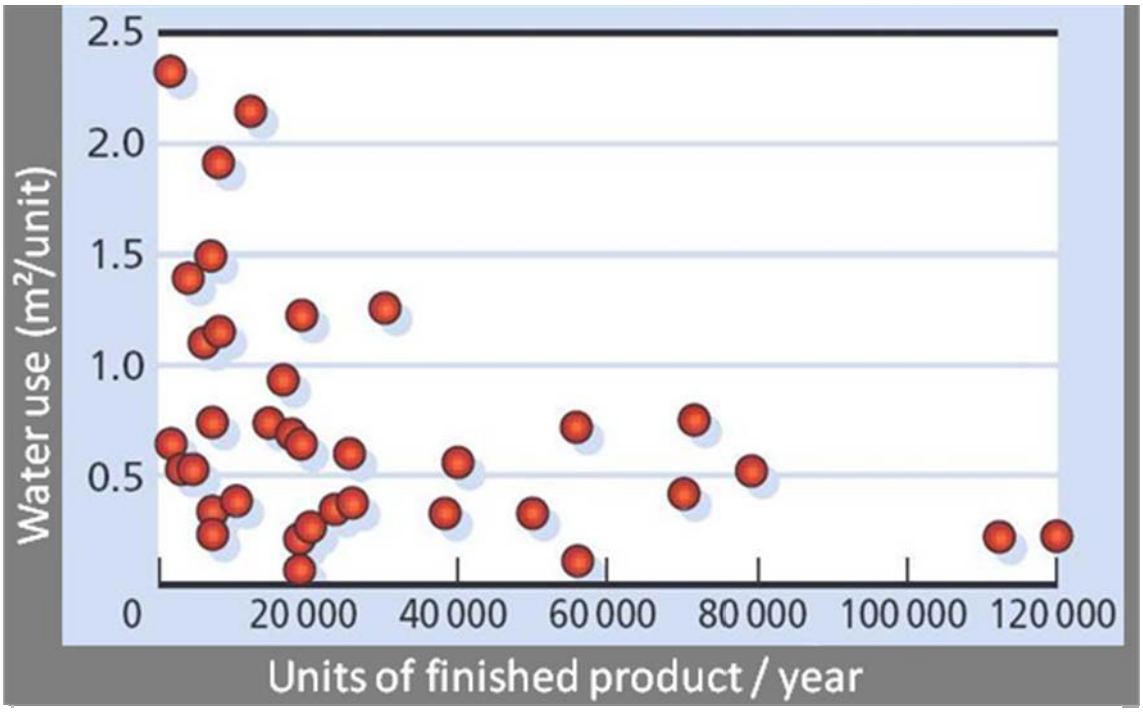
Management review of the site's EMS includes review of performance against wastewater volume and quality targets

Targets need to be based on meaningful variables for the site and also on the sources of wastewater (process, cooling water, domestic use etc.).

Wastewater generation can be compared between fixed periods so that unusual patterns in generation can be identified.

4.2.6 Demonstrable improvement in wastewater quality

As noted above, improvements in wastewater quality may be achieved in suspended solids, reduced biological oxygen demand (BOD) or chemical oxygen demand (COD), metals content, oil/grease content, temperature, pH etc. The required improvements will be dependent on the drivers for improvement (e.g. ability to treat on-site, reduced off-site treatment costs, reduced environmental impact etc.). As such, demonstration of improvement may include the 'starting point', the drivers for improvement, and whether the drivers have been met.



Graphic: An Example of a Wastewater Generation Graph Against a Variable

5.2 Emissions to Air

General

5.2.1 Formal systems and processes in place to manage emissions to air as per the site EMS

The site's Environmental Management System includes emissions to air and takes into account: a commitment to effective management and reduction of emissions to air in the policy; objectives and targets relating to air emissions; roles and responsibilities defined for management of air emissions (e.g. in relation to maintenance of equipment, monitoring etc.); inclusion of legislation and other requirements in relation to emissions to air; and review of air emission KPIs as part of the annual review.

Emission abatement equipment (e.g. dust collection and extraction units (DCE), scrubbers, incinerator, solvent recovery unit etc.) may need to be included in the site's preventative maintenance programme (including calibration) and also in the checklists for ongoing visual inspections. This would help to ensure that problems are identified promptly and that remedial action can be taken, where required.

5.2.2 Regular air emissions quality testing/ monitoring is undertaken to ensure ongoing compliance with permitted limits

Testing/monitoring may need to be performed by specialised contractors. In some legal jurisdictions, the testing/monitoring company is required to hold relevant certification/ accreditation.

Monitoring reports and any air emission summary (for example) may need to be retained on-site and be made readily retrievable.

It is important to recognise that one type of monitoring may well not be appropriate to measure both environmental emissions and occupational exposure.

5.2.3 Air emissions quality data are made available to relevant internal and external stakeholders

The site could maintain a procedure outlining how it communicates its environmental impacts and how it disseminates the information externally (e.g. if the site decides to make the information available to the public). Communication of air emissions data may be achieved through formal reporting, use of notice boards, newsletters, annual environmental or sustainability reports, posting on company websites etc.

5.2.4 Air quality improvement targets are reviewed on an annual basis to drive continuous improvement

Management review of the site's EMS includes a review of performance against air emission targets.

It is important to remember that reductions in specific pollutants may not be representative of improved overall performance, e.g. it could be due to the fact that a specific raw material has not been used during that period, or that a specific piece of equipment has not been used. As such, performance against targets should be considered against working and production patterns, raw material changes etc.

Air emission targets can also include targets in relation to operation and availability of equipment employed to abate or control emissions (for examples, hours that the abatement equipment is operational).
However, it is important to ensure that set targets do not promote or encourage the use of unsafe equipment or equipment that requires maintenance.

Changes to processes, process volumes, duration of production runs, raw materials, availability of abatement/control devices etc. can influence emissions to air. As such, pollution *concentrations* could be reported, as well as total emissions.

5.2.5 Demonstrable reduction in emissions to air (normalised)

Examples of variables against which to normalise air emissions data include: production hours, unit use of a raw material, fuel type etc.

Ambient monitoring of background air quality (on-site and/or in the vicinity of the site) for site-generated pollutants against a predefined baseline can be used to demonstrate reduction in emissions to air.

ODSs ***5.2.6 Proactive ODS leak detection and maintenance of ODS-containing equipment***	*Specific examples of ODS include:* • *refrigerants and refrigerant blends, e.g. chlorofluorocarbons (CFCs) e.g. R12-13-113-114-115, R500-502-503, R13B1,hydrochlorofluorocarbons (HCFCs) e.g. R22 and hydrobromofluorocarbons (HBFCs);* • *fire extinguishing agents, e.g. halons (the most commonly encountered ones being Halon 1211 and Halon 1301);* • *solvents, e.g. 1,1,1-trichloroethane ("TCE"), HCFC141B, bromochloromethane, carbon tetrachloride (CCl_4), methyl chloroform;* • *foam blowing agents, e.g. HCFCs, including: HCF22, HCF141B, HCFC142B; and* • *pesticides, e.g. methyl bromide.*
5.2.7 Targets in place to phase-out use of specific types of ODS, such as CFCs, halons, TCE, CCl_4 in line with recognised international standard practice	*Planned preventative maintenance (as opposed to breakdown or fault based maintenance) and a programme of leak detection can help to prevent leaks and/or reduce the length of time for which a leak occurs.* *Continuous leak detection can be installed on pieces of equipment, e.g. equipment containing large volumes of ODS or which could leak.* With reference to its ODS inventory and legal register, the site could confirm when the ODS present on-site are to be phased-out and develop a replacement programme. The site could also look to proactively replace ODS or ODS-containing equipment ahead of the phase-out deadlines.
5.2.8 Demonstrable reduction, control and substitution of ODS	It is useful to keep the ODS inventory, maintenance and leak-detection programme, and ODS replacement programme up-to-date, so they can be used to demonstrate the progress made to reduce, control and substitute ODS. There is published information on common ODS substitutes and these could be included as substitute options in the inventory.

6.2 Waste Management

6.2.1 Formal systems and processes in place to manage waste generation, storage, transportation, and disposal as per the site EMS, including waste minimisation audit and consideration of waste hierarchy principles

The site's Environmental Management System includes waste management as well as a commitment to effective waste management and reduction in the policy; objectives and targets relating to waste; roles and responsibilities defined for waste management; inclusion of legislation and other requirements in relation to waste; procedures relating to the handling, storage, movement of waste materials; and review of waste KPIs and waste management as part of the annual review.

A waste minimisation audit is a systematic assessment of wastes generated on-site and the opportunities to reduce the environmental and cost impacts of the wastes. It can be a standalone audit or it can be combined with consideration of, for example, water, raw material and energy. The waste minimisation audit should be performed by an individual competent and knowledgeable in aspects of waste management and minimisation.

A typical waste minimisation audit would address:

- what is used or generated and where?
- at what cost?
- why is it used or generated (e.g. is the waste generated under normal operating conditions, or only when something 'goes wrong')?
- what are the opportunities for reduction and the benefits/payback (and hence their priorities)?
- how the site makes sure that the solutions implemented are sustainable?
- how are opportunities recorded and tracked?

On some sites, waste minimisation audits physically separate out the various fractions of the waste to identify what wastes have been generated from where. It must be remembered that waste materials can adversely impact peoples' health and safety and care should be exercised when handling and working with hazardous (or potentially hazardous) or dangerous waste materials. Wastes should only be handled by appropriately trained persons.

6.2.2 Evaluation of waste management contractors (suitability, disposal/treatment methods)

It is recognised that waste management contractors do not exist in all jurisdictions. Further, where they do exist, there may be limited choice of contractors. The following section of guidance is intended for those sites that have the opportunity to select the waste management contractors that it uses.

When evaluating waste management contractors you can consider three broad areas:

- legal compliance performance of the contractor;
- their overall environmental performance; and
- cost viability of using the contractor's services.

Typically (where possible), there would be a legal contract in place with the waste contractor. The contract could include (but not be limited to) the following contractor requirements:

- compliance with applicable laws and regulations;
- the use only of specifically approved sites;
- that written confirmation will be provided to your site after treatment/ disposal of the waste, to confirm that the waste has been managed as agreed;
- that it allows the waste generating company (i.e. your site) to conduct periodic audits of it and its premises;
- that it provides prompt notice should any event occur that might adversely affect the contractor's ability to manage the waste as agreed (e.g. loss of licence/permit, spillage/loss of the waste); and
- appropriate liability levels.

Once the contractor is selected and contracted, there could be a programme of assessments of the waste contractor to ensure that it is operating in legal compliance and with the terms of the contract; this may be a desk-based exercise, or may involve site audits.
The assessment frequency may consider:

- the nature and volume of waste managed;
- the applicable disposal/treatment technology used;
- financial viability of the contractor;
- its regulatory compliance history; and
- community and/or public concerns.

Such assessments may be agreed when the contract is placed.

6.2.3 Engagement with suppliers to identify waste avoidance/ reduction/ recycling/ reuse opportunities

There may be potential opportunities for waste avoidance/ reduction/ recycling/ reuse etc. by working with your suppliers of raw materials, packaging (e.g. the suppliers providing materials in bulk, to avoid excessive packaging; reduced packaging on supplied materials; supplying materials in reusable or recyclable containers; suppliers taking back packaging, containers, crates/pallets etc.).

When looking to avoid/reduce/recycle/reuse waste, care must be taken that that this is done in a responsible way, which does not create health or safety hazards (e.g. handling containers that still contain residues of hazardous materials).

6.2.4 Segregation of waste streams in line with recognised international standard practice

In addition to the segregation of individual hazardous waste streams from each other and the segregation of hazardous and non-hazardous wastes, non-hazardous wastes could also be segregated. This may allow for the reuse, recycling, or recovery of the waste and promote cost reduction. For example, recyclable packaging materials segregated from the general waste stream. Care must be taken that segregating wastes from other waste streams after they have already been mixed does not cause health or safety hazards.

6.2.5 Monitoring and measurement of waste generated and recycled, with data available to relevant internal and external stakeholders

The waste inventory could be expanded to include *all* wastes generated on-site (not just hazardous wastes, as required in Level 1). For each waste stream, the inventory could include information on:

- nature of the waste (hazardous/non-hazardous);
- its source (e.g. process, area);
- the physical form of the waste (solid, liquid etc.);
- formal classification code (if applicable);
- specific handling/ storage arrangements;
- the quantity of waste disposed of/treated;
- the disposal/treatment method (biological, chemical, physical), including any on-site treatment;
- details of waste contractors used; and
- disposal/treatment route (recycled, landfill, incineration)

Such an inventory could allow summary waste data to be generated and made available to internal and external stakeholders, e.g. through internal reporting, annual company reports etc. Further, the site could maintain a procedure outlining how it communicates its environmental impacts and disseminates the information externally (e.g. if the site decides to make the information available to the public).

6.2.6 Waste reduction and recycling targets are reviewed at least on an annual basis to drive continuous improvement.

Management review of the site's EMS includes a review of performance against waste reduction and recycling targets.

Performance should be considered against production schedules, changes in processes/ operations and numbers of people on-site and other variables that can influence the quantities of waste generated (see below).

6.2.7 Demonstrable waste reduction (normalised)

Basing recycling performance on cost alone may not be a representative measurement of performance, given the fluctuations that can occur in the value of recyclable materials (e.g. scrap metals, paper, card etc.).

Changes to processes, process volumes, duration of production runs, changes in personnel numbers etc. can influence quantities of waste generated. As such, examples of variables against which to normalise waste data include: units of production, headcount, production hours, unit use of a raw material etc.

7.2 Pollution Prevention / Hazardous and Potentially Hazardous Substances

The sites' Environmental Management System includes a commitment to effective pollution prevention in the policy; objectives and targets relating to pollution prevention; roles and responsibilities defined for pollution prevention; inclusion of legislation and other requirements in relation to pollution prevention / hazardous and potentially hazardous substances; procedures relating to the handling, storage, movement of hazardous and potentially hazardous substances; and review of pollution KPIs and pollution prevention management as part of the annual review.

7.2.1 Formal systems and processes in place for pollution prevention and to reduce the potential for pollution incidents as per the site EMS

When implementing operational controls (including systems and processes) and assessing opportunities to reduce the potential for pollution, the site should consider a hierarchy of control. The hierarchy considers various options with differing levels of risk reduction. The top of the hierarchy gives the greatest risk reduction. There are numerous variations to this hierarchy, but one example is as follows:

- eliminate the process or the hazardous substance used;
- substitute the hazardous with the non-hazardous or less hazardous;
- reduce the length of time that a piece of equipment is used, or a process operates for;
- reduce the quantity of hazardous substances stored on-site and minimise handling of hazardous substances where feasible;
- install engineering or technical controls (e.g. air emissions abatement, secondary containment for storage of hazardous substances etc.);
- implement procedural or technical controls (e.g. process set-up, delivery/offloading procedures, formal procedures, checklists etc.);
- develop formalised responses to environmental incidents (e.g. spill procedures, shut-off for drain valves etc.).

When implementing environmental controls (at whichever level of the hierarchy) care must be taken that this does not create additional health or safety hazards or cause the deterioration of working conditions at the site. Controls implemented to reduce the potential for pollution can be monitored, e.g., operating parameters of abatement or treatment systems.

7.2.2 Dedicated site emergency response team in place to deal with pollution incidents	The site emergency response team responsible for dealing with pollution incidents may be the same as an existing or broader emergency response team, or it may be a specialised team. Some considerations when establishing an emergency response team include: • is the size and skills combination of the team appropriate for the potential nature, scale and consequences of pollution incidents? • are roles and responsibilities within the team clearly defined, including a team leader and deputies, one of whom will be present on-site at all times? • does the team have a clear remit and understand when it is to be deployed and what its overall roles and responsibilities are as a team? • if your site operates multiple shifts, is there representation from all shifts on the emergency response team? • is the team trained in emergency response to the range of pollution incidents to which they would be expected to respond? • do the team leader and deputies understand when to call for external support (e.g. emergency services, regulator etc.)? • is there an incident communications plan for the team? • is equipment provided to the team relevant to the materials stored and/or generated on-site (i.e. those which could be released to the environment)? • Is the emergency response team trained in the hazards and risks to which it may be exposed and in how to manage those hazards and risks? • is the emergency response team provided with the necessary personal protective equipment (PPE) so as not to increase its risk to when dealing with an environmental incident?
7.2.3 Regular practice drills are carried out for pollution incidents	Practice drills can be held "as for real" to test the response of the emergency response team and other relevant persons. There can be debriefs following practice drills to ensure that key learnings are adopted; procedures may need to be revised. Care needs to be taken when performing a drill not to introduce hazards or risks into the work place.
7.2.4 Targets are reviewed on an annual basis to reduce the use of hazardous substances, minimise associated risks and substitute with non-hazardous	**Management review of the site's EMS includes a review of targets relating to the reduction in the use of hazardous substances minimising associated risks and substituting with non-hazardous alternatives where possible** Targets may include usage of hazardous substances; substitution or phase-out rates (e.g. for solvent-containing materials); operation of abatement equipment (e.g. the wastewater treatment plant will be operational for a minimum percentage of time throughout the year).

alternatives where possible	Targets should not introduce additional health & safety hazards into the workplace, e.g. it is important to ensure that targets set do not promote or encourage the use of unsafe equipment or equipment that requires maintenance. The annual management review could consider application of the hierarchy of control described under 7.2.1.
7.2.5 Where relevant, specific pollution prevention mechanisms are considered in agricultural production, including optimisation of agrichemicals input	Agricultural production can be less heavily prescribed in relation to environmental issues than industry. However, agriculture has a high potential to pollute, e.g. through releases to land, water and/or air. Potentially contaminated stormwater run-off can be a significant issue for agriculture and may need to be controlled. Steps can be taken to reduce the potential for contamination by managing the application of pesticides, fungicides and other biocides, through reducing potential for run-off by not removing vegetation (e.g. preventing deforestation) and by protecting streams and other watercourses. The site could be proactive in eliminating, reducing or controlling the type and quantity of agrichemicals used/applied. The site's (or company's) research & development (R&D) function (or similar) could be involved in minimising use and input of agrichemicals. Chemicals and other hazardous substances (including fuel) associated with agricultural activities and processes may need to be stored securely, so as to reduce the risk of spill or release.
7.2.6 Demonstrable reduction in hazardous substances use (normalised) and minimisation of associated risks, as appropriate	Changes to processes, process volumes, duration of production runs, wastes to be treated etc. can all influence the quantities of hazardous substances used. As such, examples of variables against which to normalise hazardous substance data include: units of production, production hours, unit use of a raw material etc., waste tonnages requiring treatment etc. To demonstrate reduction in hazardous substances the site could: • maintain, review and improve a plan to reduce hazardous substances and identify opportunities for reduction; • record and track its use of hazardous substances, both in absolute terms, but also normalised to, for example, production levels; • record steps taken to reduce the risk of pollution and consideration of the hierarchy of control; • record training provided to individuals and emergency response team; • record environmental incidents; • investigate environmental incidents, learn from them and implement corrective actions; and • communicate improvements to relevant stakeholders.

8.2 Major Incident Prevention and Management

As stated in Level 1, the potential for major incidents may not be present at all sites. If your assessment has indicated that they are not present at your site, then this section may not be applicable.
In addition, requirements describe what is generally expected. Their relevance must be verified case per case.

8.2.1 Formal systems and processes in place to manage emergency response as per the site EMS

The assessment of, planning for, and response to major incidents is part of the site's EMS or its safety management system.

EMS includes planning and response in relation to major incidents including: a commitment to the prevention of hazards and risks in its policy and objectives & targets; roles and responsibilities defined for emergency response; inclusion of legislation relating to the management of dangerous substances, major incident response in its register of legal and other requirements; and emergency response procedures included as part of the annual review.

8.2.2 Reduction in potential occurrence and impacts of major incidents (e.g. explosions, fires, major spills etc.)

Measures are implemented to reduce the potential likelihood and consequences (i.e. 'the risk') of a major incident. Arrangements are established for the effective planning, organisation, control, monitoring and review of the preventive and protective measures implemented.

Managers and other key personnel are trained in the implications of major incidents.

Opportunities for reducing the risk of major incidents are considered against the hierarchy of control described in *Section 7.2*. The first consideration is usually whether the hazard can be eliminated altogether. Then various options are worked through for reducing the risks associated with that hazard if it cannot be eliminated.
As with any assessment of hazard and risk, basic steps are considered:

- identify the hazards and see if these can be eliminated;
- identify the risks associated with the hazards that cannot be eliminated;
- decide who may or what may be affected;
- identify and assess the adequacy of existing controls;
- decide what additional control measures are required (e.g. technical controls, procedural controls, work organisation, training etc);
- implement and monitor the controls; and
- train relevant persons in the hazards and risks and the implemented control measures.

An accident prevention plan (or similar) describes the controls in place to reduce the potential for an accident to occur (e.g. how materials should be stored/ handled, systems in place to warn of an incident (or a change in conditions on-site that could result in an incident), which draws from the assessment described above. This is signed by a senior individual within site management (to demonstrate senior commitment to the plan) and made available to managers, workers, contractors and other relevant parties (both on and off site).

Accidents and incidents, including major incidents, often arise from 'organisational' and 'human failings'. As such, in addition to technical and procedural controls the organisation/site reviews the culture and behaviours on-site, and look to promote a change in culture and behaviour, which is supported by robust procedures and systems.

When changes occur to substances present on-site, policy, plans, procedures etc. are reviewed and revised.

Training of managers and other key personnel includes an understanding of the implications of such events, in terms of loss of control, consequences, publicity, regulatory intervention etc.

8.2.3 Regular Quantitative Risk Assessment (QRA) reviews

In terms of reviewing its QRA, the site reviews and revises its risk assessment when there is reason to believe that the risk assessment is no longer valid, e.g. if something has changed on-site that could influence that risk assessment

Information on quantitative risk assessment (QRA) is provided in the box below. It would be recommended that risk assessments relating to major incidents are reviewed on (at least) an annual basis.

8.2.4 Major incidents reported to relevant stakeholders

If a major incident occurs, the site proactively communicates to relevant stakeholders what happened, what caused it, the consequences and, importantly, the actions taken to prevent its recurrence.

Despite the fact that such incidents may already be known to stakeholders (e.g. through the press, word of mouth etc.) the site still considers to communicate directly with stakeholders. This may be via formal reporting or letter, use of notice boards, posting on company websites etc.
Timing of the communication is important. Also It is important to include some definition around the term major incident and ensure that stakeholders are provided with the facts and enough detail to understand, not only what happened, but also the implications of the incident, both to your site (or company) and to the stakeholder

themselves.
If the facts have not been confirmed, then it may be necessary to issue a preliminary communication and then follow this with further communications as and when information becomes available.

8.2.5 Dedicated site emergency response team in place

Although a site emergency response team needs to be in place, it may still be necessary to employ the services of external third parties. Further details on emergency response teams are provided in Section 7.2 *Pollution Prevention / Hazardous and Potentially Hazardous Substances*.

8.2.6 Regular practice drills are carried out for all emergency scenarios

Where applicable, practice drills involve relevant third parties (if they are included in emergency response procedures): e.g. on-site contractors, emergency services, regulators etc.

Risk Assessment for Major Incidents

There are five basic steps to risk assessment:

- Step 1 – Identify/assess what/who can be harmed and how
- Step 2 - Evaluate the risks and decide whether (and what) additional control measures are required to reduce/manage the risk
- Step 3 - Record the findings and required control measures and implement the control measures, as appropriate (including the communication of risks and controls to relevant individuals)
- Step 4 - Review the assessment and revise, as appropriate

Step 1 - Identify/assess what/who can be harmed and how

The starting point is to identify what hazards there are on-site (e.g. presence of dangerous substances) that could lead to a major incident. In the absence of local regulations, the European Seveso Directive and the UK Control of Major Accident Hazard Regulations both provide useful definitions and lists of 'dangerous substances'. Additional information on hazard characteristics can be obtained from Material Safety Data Sheets.

The quantities of these substances and the activities with which they are associated need to be considered. This estimate may consider variations which may occur because of e.g. seasonal changes in demand, fluctuations in business activity, temporary presence of bulk delivery/haulage vehicles etc.

If your site involved in storage of materials (e.g. warehousing) or batch manufacturing you may have significant and frequent fluctuations in the quantities of dangerous substances on-site and may have short lead times in relation to the delivery of substances. Where this is the case, it would be prudent to consider the maximum quantities of substances that may be present on-site. If your site is involved in the storage of raw materials and/or finished products (e.g. warehousing), it is important to calculate the quantities of dangerous substances likely to be stored there. For example, an individual pack or container may contain only small quantities of a dangerous substance, but when aggregated large volumes are actually present.

'Harm' may be to the environment and/or people. You may also need to consider the various elements of the environment that may be affected (air, water, land, habitat, ecosystem etc.), how the environmental could be impacted, and the scale of the potential impact. This is consistent with the 'source-receptor-pathway' model for assessing risk and potential impact, i.e. for damage or harm to occur there has to be a source of the hazard (e.g. a ruptured bulk storage tank containing heavy fuel of fuel), an entity (the receptor) that may be damaged or harmed (e.g. groundwater), and a means of that hazard reaching the receptor (a pathway), e.g. no secondary containment to the tank, unprotected ground and permeable rock strata containing groundwater. You may need to consider the *number* of people who could be affected by an accident or incident as well as *how* they may be affected (e.g. killed, seriously injured, injured etc.).

Step 2 - Evaluate the risks and decide whether (and what) additional control measures are required

Risk assessment typically considers the likelihood and consequence (or frequency and severity) of a particular hazard manifesting itself. Typically, the overall risk is the combination of likelihood and consequence.

Qualitative risk assessment typically seeks to classify both the likelihood and consequence in terms of categories, for example, 'high', 'medium' and 'low' (or similar terms). Such qualitative approaches do not usually provide the level of rigour required in relation to large-scale/consequence events. As such, quantitative risk assessment methodologies are typically used.

Quantitative risk assessment (QRA) uses a numerical classification for both the likelihood and the consequence, with the overall 'risk' being a combination of the two. This provides a range of risk estimates, which themselves can be used to decide whether a particular risk is significant or warrants further assessment or control measures.

Step 3 - Record the findings and required control measures and implement the control measures

It is useful (or sometimes required) to document the risk assessment and the significant findings of the assessment (in terms of both risks and the control measures implemented to mitigate/manage the risks) may need to be communicated to relevant persons. The findings of the risk assessment will inform the management system, and the accident prevention and emergency response plans.

Step 4 - Review the assessment and revise, as appropriate.

The risk assessment may need to be reviewed on a periodic basis, but also if there is reason to believe that the assessment is no longer valid.

9.2 Contaminated Land / Soil and Groundwater Pollution Prevention

9.2.1 Formal systems and processes in place to manage contaminated soil and groundwater as per the site EMS

The sites' Environmental Management System includes contaminated land management and soil & groundwater pollution prevention, among which: a commitment to never knowingly causing soil and groundwater contamination; inclusion of potential or known soil/ groundwater contamination in the site's aspects and impacts; objectives and targets relating to monitoring and/or investigation relation to potential contamination; inclusion of legislation relating to contaminated land, soil and groundwater; procedures relating to the risk assessment, monitoring, management or investigation of contaminated land; and review of contaminated land objectives & targets as part of the annual review.

9.2.2 Qualitative, desk-based (as appropriate) soil and groundwater risk assessment completed including:

A soil and groundwater risk assessment is an interpretation of site conditions to identify potential sources of contamination, the controls in place to prevent soil/groundwater contamination, and, hence, the risk of harm or pollution occurring. A risk assessment can be either quantitative (with numerical risk ratings or probabilities for release and/or scale of the impact) or qualitative in terms of low, medium and high ratings. The risk assessment allows for a determination of the significance of the concentrations identified and what further action may need to be taken in terms of investigation, remediation or management of the contamination. For Level 2 the requirement is for a qualitative risk assessment to be carried out.

a - All potential current and historical on-site sources of potential soil and groundwater impact

A typical risk assessment would consider potential sources of contamination, the presence of a receptor (or receptors) which may be impacted by the contamination, and a pathway allows the contamination from the source to reach the receptor. *Figure 3.1* provides a graphical representation of the source-receptor-pathway concept.

b - All potential current and historical off-site sources of potential soil and groundwater impact

Sources of contamination are usually classified as 'on-site' sources or 'off-site' sources. On-site sources of contamination of soil/groundwater include: processes and ancillary activities undertaken at the site, materials stored/used, wastes disposed of, accidents and incidents etc.

Off-site sources of contamination to soil/groundwater on-site (or beneath the site) include: neighbouring processes and ancillary activities, materials stored/used, wastes disposed of, and accidents and incidents etc.

Useful sources of information to identify on-site and off-site sources include previous audit reports and other site documents, historical maps and photographs, aerial photographs, anecdotal evidence from site personnel (and former site personnel) or persons living in the vicinity of the site, publicly-available information such as regulatory databases, trade

directories, landfill information etc., observations from site walkovers, historical pollution incidents / prosecutions, permits/licences/consents etc.
Not all off-site sources have the potential to cause soil and groundwater impact, and considerations such as distance, slope of the land, prevailing wind direction, and groundwater flow direction will (amongst others) affect the potential for on-site contamination from off-site sources.

c - Mapping of all receptors and pathways

Once you have identified potential sources of contamination, identify what or who may be affected by the contamination (i.e. 'receptors.) The receptors will likely include environmental receptors (e.g. groundwater, plants, rivers etc.) and also humans and will consider the potential adverse impacts on their health, e.g. through inhalation of contaminants, eating contaminated food etc. Considerations include:

- the underlying and surrounding geology and hydrogeology;
- the local hydrology, e.g. presence of watercourses (rivers, streams, lakes, coastal waters etc.) and the direction and distance to the watercourses (these can also be indicative of groundwater flow direction);
- soil type (although this needs to be considered with caution as it can be further affected by very localised factors);
- site workers, contractors and visitors;
- site neighbours (people);
- surrounding land uses, ecological systems, property (e.g. in the form of crops, domestic produce, livestock etc.); and
- property, in the form of buildings.

Hydrological, geological and hydrogeological maps may be useful in identifying potential receptors.

In terms of how contamination from sources can reach receptors (i.e. 'pathways'), these can be many and varied.

Vertical migration to groundwater requires consideration as to how that migration may occur and the factors that may influence it, e.g.:

- ground conditions on-site (e.g. good condition concrete hardstanding is going to provide a better barrier than vegetated ground);
- permeable rock strata;
- drainage infrastructure, e.g. closed drain pipes, open drainage channels or drainage ditches that discharge into surface waters;
- drainage soakaways, lagoons, pits etc. discharging directly to ground;
- the condition of drainage infrastructure (e.g., a cracked drainage channel can discharge contamination into the surrounding ground);
- groundwater abstraction wells, which provide a direct pathway into

the geology and groundwater beneath the site;

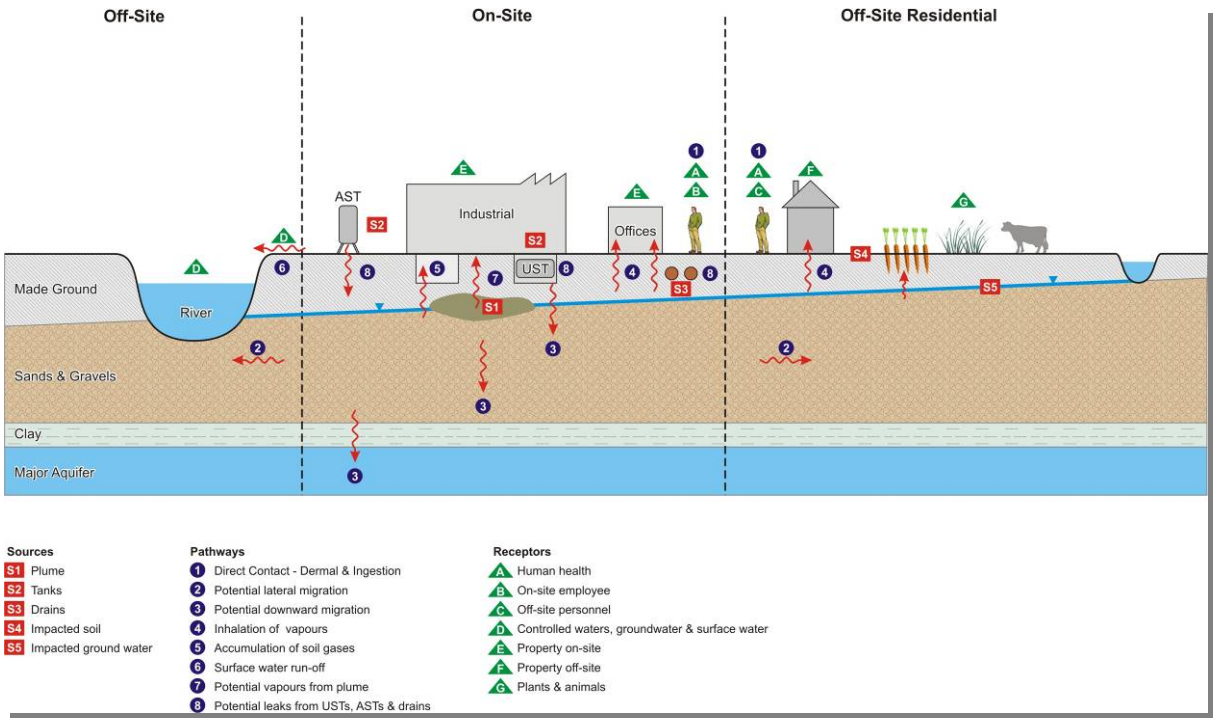
- cracked or damaged secondary containment structures can provide direct ingress to the ground for potential contaminants;
- pipe runs on-site, particularly those that are sub-surface; and
- underground storage tanks.

Lateral migration to surface waters (e.g. rivers/streams, ponds, land drains) requires consideration as to how that lateral migration may occur and the factors that may influence it, e.g. ground coverage, drainage infrastructure (pipes, channels etc.); service conduits etc.

Human contact can also be a pathway (e.g. skin contact, ingestion of soils, groundwater, dusts etc., inhalation of windblown soil particles/ dust/ asbestos etc., inhalation of gases/vapours).

d - Assessment of risk of soil and groundwater impact

The existing soil and water quality needs to be taken into account when assessing the potential impacts from contamination reaching a particular receptor. This includes both groundwater quality and surface water quality. Some countries have published data on water quality by region/area; other information may be available from local educational or research institutions, the local water company, the regulator etc. Previous soil and groundwater investigations may have included an assessment of water quality. Typically, the higher the quality of the receiving water, the greater the potential impact of contamination.



Graphic: An example of a Source-Receptor-Pathway Model

9.2.3 All actions completed following results for soil and groundwater risk assessment, e.g. and as required:

An intrusive (Phase II) investigation it typically designed to gather more information on the potential extent of contamination. It could require consideration of the purpose of the risk assessment (e.g. what controls are required, what are the potential impacts if a change of use were to occur for the site), the findings of the risk assessment, the purpose of the investigation, and regulatory or permit requirements.

a - Focused Phase II investigation

It would be recommended that expert third party assistance be sought when scoping and performing an intrusive soil and groundwater investigation. It is also worth remembering that additional health and safety hazards can be introduced when performing an intrusive investigation, potentially exposing people to contaminants / hazardous substances.

b - Appropriate and efficient remediation of soil and/or groundwater contamination performed

Actual soil and/or groundwater contamination may be identified from the qualitative desk-based risk assessment or the Phase II investigation. Even if there is no legal requirement to remediate contamination, your site has a responsibility to prevent damage to the environment and contamination should be cleaned-up and remediated, as appropriate. It would be recommended that specialist third party expertise be sought to support the site with remediation design, planning and implementation.

9.2.4 Any soil and groundwater contamination is communicated to relevant stakeholders, as required	Soil and groundwater contamination can be a contentious and emotive issue. As such, it is important that interested stakeholders are provided with fact and context. This may be via formal reporting or letter, use of notice boards, posting on company websites etc.

10.2 Land Use and Biodiversity

10.2.1 Formal systems and processes in place to manage land use and biodiversity as per the site EMS

The site's Environmental Management System includes systems to identify aspects of the operations that could directly or indirectly negatively impact the natural environment including land, biodiversity, habitats and ecosystem services, e.g. flood control.

There may be a Biodiversity Policy in place in addition to the generic Environmental Policy. Processes for the management of biodiversity could include engagement with relevant stakeholders, as successful biodiversity management usually requires the combined efforts of numerous groups (e.g. other industries causing impact, NGOs/ community groups focussed on biodiversity conservation, regulators etc.).

The EMS could also include:

- programmes to minimise significant negative impacts on biodiversity including species and habitat loss, to protect designated biological resources and to rehabilitate/ restore damaged ecosystems;
- regular review of land use and biodiversity aspects, in particular in relation to planned land use change or operations expansion and potential risks; and
- KPIs and targets to drive performance in relation to land use and biodiversity impacts identified, for example: deforestation, rehabilitation and conservation activities. The targets may need to be reviewed on an annual basis to drive continuous improvement.

10.2.2 In agricultural production, proactive management to maintain soil fertility, avoid soil erosion and promote soil and biodiversity recovery

The site can look to implement sustainable agriculture and farm management practices, in conformance with recognised sector standards. It can proactively identify where damage has been caused to the land and where biodiversity may have been negatively impacted and seek to treat or manage the land to enable it to recover.

Soil recovery may be promoted by growing certain crops or leaving areas unplanted for periods of time. Biodiversity recovery could be promoted

by planting similar species to those that were damaged or removed, or by planting species that will encourage the natural reintroduction of others.

10.2.3 Where appropriate, demonstrable improvement in land use and biodiversity performance including deforestation, rehabilitation and conservation activities

Where relevant to the site' activities, the site may be able to demonstrate positive outcomes in relation to land use and biodiversity, for example in relation to:

- deforestation and habitat loss (e.g. no net loss);
- rehabilitation (e.g. percentage (%) rehabilitation in accordance with local biodiversity and community requirements); and
- conservation (e.g. species protection and/or habitat protection).

11.2 Nuisances

11.2.1 Formal systems and processes in place to manage nuisances (including odour, noise, visual and general housekeeping) and complaints as per the site EMS

The site's Site Environmental Management System includes (where appropriate) operating procedures in relation to avoiding or minimising the potential for nuisances (e.g. from noise, lighting, vehicle movements).

The site's complaints procedure may need to consider both internal complaints (e.g. from site personnel, on-site contractors, company representatives etc.) and external complaints (e.g. from neighbours, from other members of the public, regulators etc.). Such a procedure would typically include how complaints are to be recorded, tracked and closed out, including details on corrective actions implemented.

11.2.2 Impacts and complaints data are made available to relevant internal and external stakeholders

The site's impact analysis should also consider the potential for nuisance from a particular aspect of the site's activities or operations. Further, it is good practice to maintain a complaints register or log, which includes details on the complaint (nature of the complaint, details of the person who is complaining (the complainant), a copy of the letter if applicable, date, time, etc.), together with details on how the complaint was investigated, the root cause (if identified) and how the issue was resolved (including final communication with the complainant to close out the matter).

11.2.3 Impacts and complaints reduction targets are reviewed on an annual basis to drive continuous improvement

One way to make impacts and complaints data available to stakeholders is to provide access to the complaints register and/or make the impacts analysis publicly available. However, confidentiality issues need to be considered here, e.g. making potentially confidential or sensitive company information available, issuing details of complainants etc. As such, it may be necessary to edit the data prior to making it publicly available. Other ways could include providing a summary of complaints in annual reports, posting on notice boards, or posting on the site's website.

Management review of the site's EMS includes a review of performance against impact and complaints reduction targets.

These may need to be considered against working and production patterns, changes in neighbouring land uses, raw material changes etc.

The site may also need to review (and if necessary establish) targets based on proposed changes or projects on-site, which may affect the potential for nuisance (e.g. demolition work, planned maintenance during the summer, reduced production during the last quarter, etc).

11.2.4 Demonstrable reduction in nuisance impacts and complaints

Confirmatory testing (e.g. noise levels along the site boundary, local air quality testing) or site inspections (e.g. for litter, settled dust etc.) can be used to demonstrate reduction in the potential for nuisance and/or to confirm the effectiveness of remedial measures implemented following complaints.

LEVEL 3

Leading Practice

1.3 Environmental Management System

1.3.1 Forward looking environmental strategy to drive leading practice

The Environmental Strategy for the site includes all environmental aspects and impacts over which the organisation can exert (at least some) control or influence, both up and down the supply chain. The Environmental Strategy is focussed on environmental performance improvement, rather than solely managing existing aspects and impacts and requires the assessment of alternative processes, products and services, to reduce the site's overall environmental impact.

The site's EMS requires the site to check the environmental performance of its subcontractors, service providers and suppliers of materials, packaging, utilities and other raw and ancillary materials and to work with these parties to improve overall environmental performance through the supply chain (recognising that the site should also be checking the social, ethical and health & safety performance of its contractors).

The EMS can be integrated into the way business is managed and with other key aspects of business management, e.g. integrated into an environmental, health, safety, social and quality management system (or a combination of these), the compliance programme or the operating management system and ensure that the EMS does not conflict with existing policies/codes of conduct relating to, for example, social and labour aspects.

A robust management of change process can be established which supports the proactive identification of environmental aspects and impacts (and their required control) ahead of changes being made. Once again, a management of change process should also consider potential impacts on social/labour aspects, as well as health & safety and quality.

1.3.2 Environmental management and environmental performance targets are designed to improve or sustain the environment and local ecosystem, or global when appropriate

Environmental objectives and targets can take into account, not only what the site believes it can achieve, but also all relevant external constraints and opportunities. For example:

- reducing annual water consumption by 5% may not be an option if local resources are reducing at an annual rate >10%;
- limiting the amount of waste to landfill by 50% may not be possible if the local landfills are to close within one year;
- reducing raw material extraction by 50% over the next five years may not be an option if it is recognised that continuing raw material extraction in the local area will destroy a particular habitat; and
- the planned introduction of more renewable energy through the national grid could provide an opportunity to increase the proportion of energy generated from renewable sources.

1.3.3 Proactive engagement with relevant stakeholders to achieve significant performance improvement

It is also important to ensure that environmental performance targets do not encourage actions or behaviours that could be detrimental to worker protection (including to their health & safety).

You can communicate your significant aspects and impacts externally, but it may be appropriate to put these into context, so that persons not familiar with your site or your operations understand the aspects and impacts and what you are doing to address them.

You can exert (at least some) control over the environmental performance of your contract / toll manufacturers and over off-site contractor activities undertaken on behalf of your organisation.

To promote proactive engagement with stakeholders, you could organise meetings with those stakeholders (e.g. 'town hall' sessions with the public, roundtable discussions with shareholders, invite site visits by interested parties etc.) to:

- encourage two-way dialogue on environmental performance; and
- discuss where stakeholders have concerns or would like to see additional improvement, etc.

1.3.4 Where relevant, commitment to voluntary standards

Voluntary projects to improve the local environment could include local clean-up events, environmental road-shows, school visits etc. You could also sponsor local initiatives or donate to voluntary or charitable bodies which promote environmental improvement.
Sector bodies, trade associations, governmental bodies, client networks, UN programmes (and many others) may initiate or coordinate voluntary standards for elements of environmental performance. You could proactively seek to identify such voluntary standards and to commit to those that you believe to be appropriate for your site/activities.

Other examples of sources of information on EMS include:

- Brazilian Association for Technical Standardization (ABNT) http://www.abnt.org.br/default.asp?resolucao=1024X768
- China State Environmental Protection Administration http://www.sepa.gov.cn/
- Environment Canada http://www.mb.ec.gc.ca/index.en.html
- Hong Kong Environmental Protection Department http://www.epd.gov.hk/epd/eindex.html
- Japan Ministry of the Environment http://www.env.go.jp/en/index.html

2.3 Energy Use, Transport and Greenhouse Gases (GHG)

2.3.1 Leading practice mechanisms in place to reduce greenhouse gas (GHG) intensity

In order to enhance energy efficiency and identify potential alternative energy sources, you could perform (possibly with assistance from a specialised sub-contractor) a detailed energy audit, to identify energy consumption and emissions of GHGs by process and activity and to identify opportunities for further energy efficiency.

2.3.2 Use of energy sources with lower greenhouse gas intensity

There are numerous sources of information in relation to energy and greenhouse gases, including efficiency and reduction opportunities, as well as leading practices, for example:

- Australian Government Department of Climate Change http://www.climatechange.gov.au/
- Australian Department of Resources, Energy and Tourism http://www.ret.gov.au/
- Council for Scientific and Industrial Research (CSIR) (South Africa) http://www.csir.co.za/nre/energy_futures/index.html;
- International Energy Agency http://www.iea.org/;
- UK Carbon Trust http://www.carbontrust.co.uk/default.ct
- United Nations Energy site http://esa.un.org/un-energy/; and
- World Energy Outlook from the International Energy Agency (produces databases on energy policy and measures) http://www.worldenergyoutlook.org/index.asp.

On larger sites, one way to encourage focus on energy reduction is to allocate energy use and efficiency targets to responsible individuals**.** Ssuch individuals would have some control over processes and activities, e.g. area managers, functional managers (e.g. maintenance manager, production manager). Performance targets for those individuals could include energy reduction targets. The most stretching targets can be allocated to the largest energy users.

The site may be able to obtain some funding for energy improvement opportunities from local bodies, such as ADEME in France: http://www2.ademe.fr/servlet/getDoc?id=11433&m=3&cid=96.

By Level 3 you may be:

- promoting the use of renewable forms of energy and increasing their use;
- promoting sustainable forms of agriculture and forestry to reduce GHG emissions; and/or
- adopting ways to minimise your methane and other GHG emissions.

You could develop and implement a programme to design-out the use of refrigerants and other GHGs, rather than solely phasing-out their use. Although it does not have global coverage, the UK's Carbon Trust has a number of using publications relating to climate change and GHGs.

a - Energy consumption level is sustainable within availability of local energy resources

When considering *sustainability*, it is important to consider the *rate* at which you are consuming resources (or may consume if you switch to an alternative energy source). Try to consider this not only against remaining resources but also whether there are any alternatives for you or persons coming after you. It is also important to remember that the availability and quality of renewable sources of energy can very variable depending on where you are.

b - Demonstrable achievement of stretching energy and fuel efficiency and GHG emission targets beyond recognised international standard practice

You could assess the risks of physical climate change associated with your supply chain, as well as your site's activities and operations.
You should confirm the performance targets that may be achievable through the implementation of leading practices, and set stretching targets for GHG emission reduction and efficiency in fuel and energy use. You could proactively seek to implement leading practices to achieve these.
One way to proactively identify what are considered realistic, but stretching, targets in relation to GHG/energy/transport would be through consultation with, for example, sector groups / trade associations / research bodies etc.

2.3.3 Engagement with appropriate stakeholders down the value chain identifying ways to reduce GHG emissions

You could work with:

- your site's suppliers and transport contractors to identify energy and transport efficiency opportunities at supplier sites; and
- your site's energy supplier(s) to identify the potential to switch to renewable energy sources. There may be opportunities for co-funding energy infrastructure provision in an area which would benefit the supplier, your organisation, and other consumers.

2.3.4 Carbon accounting in business system

Carbon can be assigned a monetary value to facilitate investment decisions by incorporating carbon costs into the balance sheet. Once you have established your carbon footprint (the total quantity of GHG emissions associated with all or pre-defined parts of your site, activities, operations or products), you can engage in 'carbon neutral programmes' in order to off-set your carbon emissions.

2.3.5 Specification of the most environmentally efficient combinations of vehicle types, fuels and technologies for distribution fleet

Green travel plans could be established for your site. Helping all employees to plan their journeys effectively and encouraging them to drive safely and efficiently can help reduce fuel costs and also improve the environmental and safety performance of the business. Eco-friendly driving courses also exist, encouraging employees to use alternative modes of transport to the car where possible e.g. train, staff car share scheme.

Green travel policies can be developed for both employees and the distribution fleet. These can include the selection of low-emission vehicles, diesel-engine for vehicles used over long distances or alternatively-powered vehicles. Vehicles which are newer and/or smaller will tend to use less fuel and emit fewer damaging emissions.

2.3.6 Fuel consumption and vehicle emission reduction targets are reviewed on an annual basis to drive continuous improvement for the entire fleet

Where appropriate, the site can perform a cost-benefit analysis of using low-emission vehicles and alternatively-powered vehicles and document decisions on which combination of vehicle types, fuels and technologies it is going to encourage. It is worth noting that, although alternatively-powered vehicles may initially be more expensive than diesel or petrol-fuelled models, they may provide long-term cost savings in fuel consumption.

Vehicle emission reduction targets could, for example, relate to the use of alternative transport types, the introduction or replacement of certain types of vehicle(s), reducing the total mileage of vehicles, alternative fuel types etc.

3.3 Water Use

3.3.1 Where relevant, water consumption level is sustainable within local ecosystem limits and water catchment area

When assessing water consumption, you should consider the area and environment in which you operate. Water availability and quality are very variable (both spatially and with time) and need to be taken into account when considering sustainability, i.e. whether the quality and volume of water available can be maintained given current abstraction/use rates.

3.3.2 Investigation of and use, if relevant, of alternative water sources with lower ecosystem impact

When looking to change to a more sustainable source of water, your site may need to consider the use of a lower quality water source but with additional treatment to ensure the required quality of the end water.

3.3.3 Demonstrable achievement of stretching water efficiency targets beyond recognised international standard practice

There are a number of aspects that may need to be considered, including (but not limited to) the location, safety and quality (and hence treatment requirements) of the alternative source and hence the economics of using such an alternative (i.e. you need to consider the safety and economics as well as environmental impacts of alternative water sources).

There are various sources which provide information on leading practices in mechanisms and processes to improve water efficiency, and assist you to achieve stretching water efficiency targets. These include, but are not limited to:

- Sector bodies; trade associations; international awards;
- Australian Department of the Environment, Water, Heritage and the Arts http://www.environment.gov.au/
- Brazil National Water Agency (ANA) http://www.ana.gov.br/;
- EU BREF documents http://eippcb.jrc.ec.europa.eu/;
- China Ministry of Water Resources http://www.mwr.gov.cn/;
- Council for Scientific and Industrial Research (CSIR) (South Africa) http://www.csir.co.za/nre/energy_futures/index.html;
- Hong Kong Water supply department: http://sc.info.gov.hk/gb/www.wsd.gov.hk/tc/html/aboutus/new.htm;
- South African Water Research Commission http://www.wrc.org.za/
- TAPPI (Paper and pulp trade association) http://www.tappi.org/s_tappi/index.asp?pid=;
- UK Envirowise 'programme' http://www.envirowise.gov.uk;
- US EPA http://www.epa.gov/owm/;
- Water Environment Federation (WEF) http://www.wef.org/Home.

The UNGC CEO Water Mandate may be a useful source of information. The Mandate is structured as a collection of pledges concerning: management in operations, supply chain, links between organisations, influencing public policy, supporting communities and reporting (http://www.unglobalcompact.org/Issues/Environment/Water_sustainability/index.html). The mandate was developed to build an international movement of committed companies; it is open to companies of all sizes, from all sectors and all geographies. Companies can endorse the mandate by indicating the company's endorsement on-line through http://www.unglobalcompact.org/. It is noted that the endorsement needs to be from the company's CEO, or equivalent.

3.3.4 Leading practice water efficiency mechanisms in place, including re-use, recovery and recycling

The viability and economic feasibility of water/wastewater reuse, recovery and recycling may include (but not be limited to) the following considerations in relation to the water /wastewater generated: safety considerations, quality, volume, location, temperature, treatment requirements, costs of raw water (and hence the economics of re-use/recovery/recycling when compared to raw water).

3.3.5 Engagement with appropriate stakeholders down the value chain to improve water efficiency

You may be able to work with your suppliers along the supply chain to identify water efficiency opportunities at the suppliers' sites. You may also be able to engage the local water supplier in this opportunity identification exercise.

You may be able to work with your water supplier to identify efficiency opportunities associated with volume of supply, the infrastructure supplying the water and the quality of the water supplied. There may be opportunities for co-funding infrastructure provision in an area which would benefit the supplier, your organisation, and other consumers, e.g. new mains, additional water treatment etc.

4.3 Wastewater Effluent

4.3.1 Wastewater effluent quality and Effluent discharge volume are sustainable in the context of local receptors and ecosystem limits

In assessing whether the quality and volume of wastewater discharged is sustainable, you should consider whether it is degrading the utility, e.g. the receiving watercourse (river, stream, lake, inshore area etc.) or facility, to ensure that the receiving watercourse or facility remains fit for purpose (e.g. for potable supply, leisure use, irrigation, process use, etc).

If you are transferring wastewater across, e.g. a sensitive habitat or ecosystem, there may be additional measures required to prevent leakage from pipes etc. You may need to implement additional on-site treatment to reduce potential impacts on local receptors or ecosystems.

4.3.2 Leading practice wastewater treatment in place

When considering leading practice, it is important to remember that different countries and different regions have different economic structures and there can be great variability in locally-available expertise, materials, equipment and labour, as well as costs of these. Further, raw water quality, seasonal variations, changes in the catchment area, different physical climates and political regimes can influence what may be leading practice for a particular area, region or country.

If deterioration of raw water quality is foreseeable, you should select the treatment option on the reasonable worst case scenario and/or include a provision for future upgrades and/or increase in treatment capacity. You could periodically review available information to inform your

wastewater management decisions.

The site's (or company's) research & development (R&D) function (or similar) could be involved in wastewater management. You may actively seek to design-out wastewater from a process, identify chemical substitutes that would reduce the potential impacts of the wastewater generated, reduce the need for treatment prior to disposal, and seek to promote reuse/recycling of the wastewater generated. However, such changes should not be detrimental to the protection or health & safety of workers.

4.3.3 Leading practice mechanisms in place to improve quality of wastewater discharged to local environment, including reuse of grey water

There are various sources which provide information on leading practices in mechanisms and processes to improve the quality of wastewater (as well as on-site wastewater treatment as discussed above). These include:

- Sector bodies; trade associations; international awards
- Council for Scientific and Industrial Research (CSIR) (South Africa
- http://www.csir.co.za/nre/energy_futures/index.html
- EU BREF documents http://eippcb.jrc.ec.europa.eu/
- UK Envirowise 'programme' http://www.envirowise.gov.uk
- US EPA http://www.epa.gov/owm/
- Water Environment Federation (WEF) http://www.wef.org/Home

4.3.4 Demonstrable achievement of stretching wastewater effluent quality improvement and volume reduction targets (normalised) beyond recognised international standard practice

You could confirm the performance targets that may be achievable through implementation of leading practices, and set stretching wastewater reduction targets and employ leading practices to achieve these.

It may be appropriate to proactively seek to identify what are considered to be realistic, but stretching, targets in relation to wastewater, e.g. through consultation with sector groups / trade associations / research bodies etc.

4.3.5 Engagement with appropriate stakeholders down the value chain to improve wastewater effluent quality

You can encourage parties in the supply chain (including suppliers, contractors and customers) to minimise wastewater generation and to develop or adopt innovative mechanisms to manage wastewater. You can engage with suppliers and customers (as appropriate, e.g. key accounts) in relation to wastewater, e.g. to promote the identification of opportunities to reduce volumes generated and improve wastewater quality and assessment of wastewater treatment/ disposal options.

5.3 Emissions to Air

General

5.3.1 Emissions to air are sustainable within local ecosystem limits

Your site could proactively seek information (e.g. from local research bodies, the local regulator etc.) on background pollutant levels, to understand your site's activities and emissions against that background. This could provide some information to assess whether your emissions to air are sustainable or whether your emissions are impacting the background levels to such an extent that air quality presents a health risk to humans or could cause damage to the environment (or specific ecosystems).

The site could monitor local general air quality and communicate/liaise with relevant third parties on general air quality issues and proactively seek to identify opportunities to reduce its emissions to improve local air quality.

5.3.2 Leading practice abatement technologies in place to minimise emissions to air or efforts to reduce emissions at source

There are various sources which provide information on leading practices in management of emissions to air. These include, but are not limited to:

- Australian Department of the Environment, Water, Heritage and the Arts http://www.environment.gov.au/
- China Ministry of Environmental Protection http://www.zhb.gov.cn/cont/dq/
- Council for Scientific and Industrial Research (CSIR) (South Africa) http://www.csir.co.za/nre/energy_futures/index.html
- EU BREF documents http://eippcb.jrc.ec.europa.eu/
- French Association for Atmospheric Pollution Prevention http://www.appa.asso.fr/
- Malaysian Department of Environment (virtual centre on Cleaner Production) http://cp.doe.gov.my/cpvc/index.php?option=com_content&task=view&id=41&Itemid=88
- UN Division for Sustainable Development has programmes to protect the atmosphere (e.g. on ODS and trans-boundary air pollution) http://www.un.org/esa/dsd/susdevtopics/sdt_atmosphere.shtml
- US Environmental Protection Agency (EPA) http://www.epa.gov

Feasibility studies could be performed to identify and assess whether it is possible to go beyond meeting permit requirements (e.g. by replacing equipment, modifying existing equipment, further optimising abatement equipment etc.) to reduce emissions. However, changes to equipment and processes must not be detrimental to the protection or health & safety of workers

You could proactively identify improvements in reagents used within abatement processes to improve the efficiency of treatment/ abatement.

You could proactively seek to identify alternative raw materials which have lower emissions (e.g. newly introduced low solvent content or aqueous materials, low dust materials etc.). Once again, you must ensure that changes to raw materials are not at the detriment of the health & safety of workers.

The organisation's research & development (R&D) function (or similar) could be involved in reducing emissions to air. For example, it actively seeks to design-out certain stages or materials from the process, to identify substitutes that would reduce the pollutant load emitted.

5.3.3 Demonstrable achievement of stretching air quality improvement targets beyond recognised international standard practice

You could confirm the performance targets that may be achievable through the implementation of leading practices, sets stretching air emission reduction targets and employs leading practices (see above) to achieve these.

You may actively seek to identify what are considered to be realistic, but stretching, targets in relation to air emission reduction, through consultation with e.g. sector groups / trade associations / research bodies etc.

5.3.4 Engagement with appropriate stakeholders down the value chain to reduce emissions to air

You could encourage parties in the supply chain to minimise emissions to air and may 'lead by example'.

You could also encourage your raw material suppliers to develop / supply 'low emission' materials. Further, you could seek to identify alternative suppliers of alternative materials which have reduced emissions.

You could engage with key/major suppliers in relation to emissions to air and could be working with suppliers to identify opportunities for reducing emissions.

5.3.5 Additional and proactive emissions monitoring performed

Although formal monitoring may be required and may be performed by external parties, a site may choose to perform confirmatory and quality check testing or monitoring on a periodic basis to ensure that monitoring results are representative. Alternatively, the site may wish to perform more frequent monitoring than that legally required. For example, a permit might require annual monitoring but a site could choose to perform quarterly monitoring to better track its performance.

Boiler efficiency can be checked on a regular basis, not only for maintenance purposes, but also so that the results of the checks can be recorded and used as part of the site's air monitoring programme (i.e. the results can be incorporated into documented monitoring reports/

results).

The site could establish continuous monitoring on both emissions and abatement equipment operation, wherever feasible and maintains real-time emissions and performance data.

ODSs

5.3.6 Complete phase-out of all ODS (beyond legal requirements)

The site may be able to demonstrate that all ODSs present on-site were removed ahead of legal replacement or phase-out requirements and that all resulting waste materials (substances and containers) have been disposed of using the best available technology/option.

6.3 Waste Management

6.3.1 Waste disposal method and volume is sustainable within local operating environment and availability of waste treatment and disposal facilities

You could proactively review your site's waste streams on (at least) an annual basis and review the most appropriate and sustainable options for managing its waste streams. When considering alternatives for its waste streams, you could reference the waste hierarchy diagram (see *Section 6.1 Waste Management*) and also consider the 'true cost of waste'. Wherever feasible, look to adopt a waste management option that is near the top of the waste hierarchy, but balance this with other environmental impacts, such as avoiding transporting wastes over long distances and ensuring that the waste management option chosen does not negatively impact the health & safety of workers.

You can formally record the approach taken and decisions made to identify the most sustainable waste treatment or disposal option, so that these can be referred to at a later date when a similar (or the next) assessment is required.

When required to dispose of waste (rather than adopt a management option higher up the hierarchy), you may need to consider the "proximity principle" to determine the location of the nearest option that provides the highest degree of environmental protection, but that does not adversely impact the welfare, protection or health & safety of workers and/or external stakeholders, e.g. site neighbours.

6.3.2 Leading practices in place to minimise resource/ virgin material use and achieve waste reduction / recycling / energy from waste

There are various sources which provide information on leading practices in waste management. These include, but are not limited to:

- Sector bodies; Trade associations; International awards;
- China Environmental Protection Foundation http://www.cepf.org.cn/en/index.htm;
- Council for Scientific and Industrial Research (CSIR) (South Africa) http://www.csir.co.za/nre/energy_futures/index.html
- EU BREF documents http://eippcb.jrc.ec.europa.eu/;
- Japan Ministry of Environment http://www.env.go.jp/en/recycle/;
- Malaysian Department of Environment (virtual centre on Cleaner Production): http://cp.doe.gov.my/cpvc/index.php?option=com_content&task=view&id=41&Itemid=88;
- UK Envirowise 'programme' http://www.envirowise.gov.uk;
- United Nations Environment Programme http://www.unep.org/hazardoussubstances/

You can encourage parties in the supply chain to minimise resource use and waste generation and to develop or adopt innovative mechanisms to manage waste.

Even if it is not possible to reduce, reuse or recycle waste, there may be options for using the waste to generate energy, either on-site or by supplying your waste to companies involved in obtaining energy from waste (EfW) (sometimes referred to as Waste to Energy, WtE). EfW techniques include combusting methanol generated from anaerobic composting of waste, heat recovery from waste incinerators, or using waste as a fuel in boilers. There can be significant legal,-economic, social and health & safety considerations when considering EfW and the process may need to be licensed

The site's (or company's) research & development (R&D) function (or similar) could be involved in waste management issues at the site. Your site may actively seek to design-out wastes from the process, identify substitutes that would reduce the impacts of the wastes generated, and look to ensure that materials and articles in products made by the organisation promote reuse/recycling or reduce the impacts of the wastes if disposed of.

6.3.3 Demonstrable achievement of stretching waste reduction/ recycling targets beyond recognised international

You could:

- confirm the performance targets that may be achievable through the implementation of leading practices, sets stretching waste reduction targets and employs leading practices (outlined above) to achieve these; and
- proactively identify what are considered to be realistic, but

standard practice	stretching, targets in relation to waste reduction, e.g., through consultation with sector groups / trade associations / research bodies etc.
6.3.4 Engagement with appropriate stakeholders down the value chain to identify waste avoidance/ reduction/ recycling/ reuse/ energy from waste measures	There may be potential opportunities for waste avoidance/ reduction/ recycling/ reuse etc. by bringing together suppliers, customers, and potential users of waste streams to look at waste opportunities up and down the supply chain. This could be through a formal waste 'club', an 'environment exchange' or similar, or informal discussions which look to bring together potential users of waste streams with waste generators; this may be within- or cross-sector.

7.3 Pollution Prevention / Hazardous and Potentially Hazardous Substances

7.3.1 'Zero pollution incident' target and policy in place	'Zero pollution incident' means just that: zero environmental pollution incidents, regardless of nature and scale. A Zero Pollution Incident Policy would explain how the target is to be achieved, would typically be signed by the most senior manager on site and could be communicated both internally to employees and externally to relevant and interested stakeholders. Site/company personnel may need to be trained in what "zero incidents" means, and the part they play in achieving this target. A site should try not to categorise incidents to which the "zero incident" definition applies (i.e. it all environmental incidents, not, for example, incidents involving the spill/release above a certain volume of a substance). You should actively discourage a culture of hiding or not reporting incidents and seek to encourage and reward positive behaviours, rather than solely punishing negative or poor behaviours
7.3.2 Detailed pollution prevention inspections are conducted	Pollution prevention inspections may be performed internally (i.e. rather than being inspections performed by regulators). For sites holding legal permits, such inspections could include consideration of further process optimisation and/or optimisation of control or abatement technologies. The site can engage with parties in the supply chain to look at opportunities to reduce potential for pollution. By Level 3, rather than being reactive to incidents, you may have developed a proactive inspection regime which seek to identify whether:

- all technical (engineering) controls are in place and are optimised in terms of performance; and
- control parameters are checked and overall efficiency of control is monitored (as well as emissions).

Options for further optimisation of pollution prevention options could be assessed, although these may need to be the subject to feasibility assessment and cost benefit analysis.

There are various sources which provide information on leading practices in pollution prevention. These include, but are not limited to:

- Council for Scientific and Industrial Research (CSIR) (South Africa) http://www.csir.co.za/nre/energy_futures/index.html;
- EU BREF documents http://eippcb.jrc.ec.europa.eu/;
- Working Groups who establish/review EU BREF documents;
- Sector bodies; trade associations; international awards; educational establishments (e.g. universities); and
- United Nations Environment Programme http://www.unep.org/hazardoussubstances/.

7.3.3 Promote the use of non-hazardous and non-toxic alternative substances

You can lead by example in the adoption and promotion of less polluting alternative substances and you can proactively research alternative substances and works with existing and potential suppliers to identify alternative substances. You could seek to work with peer companies, sector associations etc. to identify, pilot/test and adopt such alternative substances.

The site's (or company's) research & development (R&D) function (or similar) could also involved in the search for / development of alternative substances.

7.3.4 Demonstrable achievement of stretching hazardous substances reduction / substitution targets beyond recognised international standard practice

You could confirm the performance targets that may be achievable through the implementation of leading practices, set stretching reduction and substitution targets for hazardous substances and employ leading practices to achieve these. You could proactively seek to identify what are considered to be realistic, but stretching, targets in relation to hazardous substance substitution, usage etc., for example through consultation with sector groups / trade associations / research bodies etc.

The site could fund, sponsor, support or utilise agricultural testing stations (or similar) which assess optimal agrichemical use and input.

The site may review its product design/ specification to assess options for reducing hazardous substance use down the value chain. You could take

account of hazardous substance use for new process design and specification and seek to identify opportunities to eliminate or reduce use of hazardous substances.

7.3.5 Engagement with appropriate stakeholders down the value chain to improve hazardous substance use

- You could encourage and work with parties in the supply chain to minimise their use of hazardous substances, for example: work with raw material suppliers to develop / supply less hazardous substances. Where appropriate, seek to identify different or additional suppliers of alternative materials which are less hazardous;
- work with key/major suppliers in relation to pollution prevention and hazardous substance use/generation and look to work with the suppliers to identify opportunities for improving pollution prevention and/or reducing the type and quantity of hazardous substances that they use/generate.

8.3 Major Incident Prevention and Management

As stated in Level 1 and Level 2, the potential for major incidents may not be present at all sites. If your assessment has indicated that they are not present at your site, then this section may not be applicable to your site.

8.3.1 'Zero major incident' target and policy in place

You may wish to liaise with the local community to:

- better understand the vicinity, local environment and nearby land uses in which the site operates (this information can be used in your site's risk assessment, management systems and plans etc.); and
- ensure that the local community is aware of potential major incidents associated with site activities and which they could be impacted by, and the measures and response procedures in place in relation to these.

8.3.2 Proactive engagement with local community to ensure awareness of risks of major incidents and emergency response procedures

To facilitate proactive engagement with the local community, the site could hold regular meetings (e.g. small group meetings or 'town hall' meetings) with representation from the local community or invite representatives from the local community to the site to discuss the potential for accidents and incidents and the procedures and systems in place to eliminate the risk of major incidents.

The site's procedures could include the action that needs to be taken by the local community in the event of certain incidents. Such requirements may need to be communicated to the local community and may need to be updated when arrangements change.

8.3.3 Local community is involved in site's emergency response drill and has been contacted by the emergency response team, as relevant

Representative from the local community could be included in:

- the external communications plan which includes a summary of the information that needs to be provided to the community in the event of a major incident; and
- in debriefs (or receive a copy of debrief information) following the emergency response drills.

The roles and names, responsibilities and contact details of the local community representatives could be included in site emergency response procedures, as appropriate.

8.3.4 Leading practice mechanisms in place to reduce risk of major incidents e.g. process changes

There are various sources which provide information on leading practices and current thinking on the prevention of major incidents. These include, but are not limited to:

- American Institute of Chemical Engineers Center for Chemical Process Safety (CCPS) http://www.aiche.org/ccps/;
- European Major Accident Hazards Bureau (MAHB) http://mahbsrv.jrc.it/;
- European Process Safety Centre (EPSC) http://www.epsc.org/;
- Malaysian National Institute of Occupational Safety and Health http://www.niosh.gov.my/;
- UK Health & Safety Executive (HSE) http://www.hse.gov.uk;
- US Chemical Safety and Hazard Identification Board http://www.chemsafety.gov/.
- United States Department of Labor, Occupational Safety and Health Administration http://www.osha.gov/

9.3 Contaminated Land / Soil and Groundwater Pollution Prevention

9.3.1 'Zero contamination' target and policy in place

'Zero contamination' means just that: zero contamination of soil or groundwater, regardless of nature and scale. A Zero Contamination Policy would explain how the target is to be achieved, would typically be signed by the most senior manager on site and could be communicated both internally to employees and externally to relevant and interested stakeholders.

9.3.2 Proactive management of soil and groundwater quality

Your site could proactively assess, investigate and remediate (if so required) soil and groundwater contamination, rather than in response to regulatory or regulator pressures.

The site could take steps to proactively identify whether it is included on any formal lists or registers of contaminated land and whether there is the potential for the site to be required to remediate known contamination.

You may wish to review current activities, processes and materials that have the potential to impact soil and groundwater quality and substitute with less polluting alternatives.

You may need to consider commissioning, and reporting on, a voluntary assessment of the land condition of the site.

9.3.3 Leading practice techniques in place to prevent further/ future soil and/or groundwater contamination and in relation to remediation

There are various sources which provide information on leading practices and current thinking in relation to pollution prevention, soil & groundwater protection, soil & groundwater investigation and remediation, and contamination assessment. These include, but are not limited to:

- Australian Department of the Environment, Water, Heritage and the Arts http://www.environment.gov.au/
- CABERNET (Concerted Action on Brownfield and Economic Regeneration Network): European Expert Network http://www.cabernet.org.uk;
- European portal for soil and groundwater management http://www.eugris.info;
- Network for Industrially Contaminated Land in Europe http://www.nicole.org;
- UK Contaminated Land: Applications in Real Environments http://www.claire.co.uk;
- US Environmental Protection Agency (EPA) (internationally relevant data and good practice http://www.epa.gov.

9.3.4 Proactive engagement with stakeholders in the local community to ensure awareness of potential soil and/or groundwater contamination

The site could work with stakeholders in the local community (e.g. residents, committees, interest groups, authorities/councils, regulators etc.) to ensure that any changes in potential pathways are identified and, in particular, that receptors are evaluated, assessed and monitored and remain relevant to information held by the site in relation to sources, pathways and receptors.

It is likely that the site will need to consider the area and environment in which it operates. Liaising with neighbouring operational sites or companies can reduce the potential impact to soil and groundwater in the area, through having similar approaches to environmental management and adopting good environmental practices.

9.3.5 Engagement with appropriate stakeholders down the value chain in relation to the prevention and management of soil and groundwater contamination

You could work with suppliers and contractors to:

- understand and discuss how they are preventing soil and groundwater contamination (including management/procedural and technical controls);
- discuss how they are managing known contamination;
- discuss plans for remediation; and
- exchange information on leading practice in relation to pollution prevention, soil and groundwater investigation, and remediation.

10.3 Land Use Biodiversity

10.3.1 Land use is sustainable within local ecosystem context

You could assess operational impact on biodiversity and ecosystem services by conducting baseline studies of biodiversity within the site's zone of influence (the area on which it impacts). Programmes could then be implemented to ensure that there is no net negative impact on biodiversity and ecosystem services from site (or site-related) activities.

Priorities and targets can be established which contribute to international, regional, national and local policy targets and biodiversity action plans.

10.3.2 Leadership role in biodiversity conservation, for example partnership with relevant local organisations

You could support initiatives to communicate, educate and promote biodiversity conservation within the local community; including support to external projects and programmes that contribute to the conservation of biodiversity.

The site could engage proactively and effectively with the local community and other stakeholders in connection with biodiversity conservation.

You could contribute to 'roundtables' and sector/ industry groups relating to biodiversity and land use management practices and seek opportunities for enhancement of biological resources.

10.3.3 Leading practice mechanisms in place to promote biodiversity and leading practice land management

There are various sources which provide information on leading practices in land use and biodiversity management. These include, but are not limited to:

- International Institutions, e.g. United Nations Environment Programme (UNEP) http://www.unep.org/;
- International Union for Conservation of Nature (IUCN) http://www.iucn.org/;
- Non-governmental organisation (NGOs), e.g. Flora & Fauna International http://www.fauna-flora.org/;
- South African National Biodiversity Institute http://www.sanbi.org/;
- Australian Department of the Environment, Water, Heritage and the Arts http://www.environment.gov.au/
- National Governments and regulatory agencies.

You may need to periodically review available information to inform your decisions.

10.3.4 Engagement with appropriate stakeholders down the value chain to improve land use and biodiversity performance, within and beyond site boundaries

You can look to promote similar standards and principles towards biodiversity conservation from third parties (suppliers, vendors and contractors) as with your own business. For example, you could implement a purchasing policy that favours products and services that have the least impact on biodiversity, but which also maintain the health & safety of workers and customers.

10.3.5 Demonstrable achievement of stretching targets beyond recognised international standard practice

You could confirm the performance targets that may be achievable through the implementation of leading practices, set stretching targets and employ leading practices (outlined above) to achieve these. You could proactively seek to identify what are considered to be realistic, but stretching, targets in relation to land use and biodiversity through consultation with e.g. NGOs/ local communities/ government agencies / research bodies etc.

The site could report its approach to biodiversity management in its annual company report and look to enhance its internal capacity and capability and understanding in relation to biodiversity issues.

11.3 Nuisances

11.3.1 'Zero complaints' target and policy in place

'Zero complaints' means zero complaints in relation to environmental nuisance, regardless of nature and scale. The policy should be signed by the most senior manager on-site and communicated both internally to employees and externally to relevant and interested stakeholders.

Site personnel may need to be trained in what "zero incidents" means and in the role they play in achieving this target.

Care needs to be taken not to categorise incidents to which the "zero incident" definition applies (e.g. it may be all environmental nuisances, irrespective of their severity or scale).

11.3.2 Proactive engagement with local community/ stakeholders to reduce impacts

The site could run a 'helpline', through which the local community and immediate neighbours can communicate nuisance issues generated, or perceived to be generated, by the site, or to raise potential concerns about site operations. It is important to ensure that any submissions through the helpline are responded to promptly and comprehensively. If adopted, the site can formalise the procedures for handling communications submitted via the helpline.

Another option would be to hold regular town hall meetings or site visits for the local community and neighbours, to promote two-way communication.

1.3.3 Leading practice mechanisms in place to ensure reduction of impacts e.g. process changes

There are various sources of information on leading practices in relation to nuisance avoidance and abatement. However, given that nuisance is highly subjective and is very specific to a particular site or topic, it would be prudent to proactively research information in relation to that topic and the nuisance caused (if any). It may be necessary to change a process, replace equipment, install abatement or use a different material to reduce the potential for nuisance, but not at the detriment of the protection of workers and their health & safety.

Some more generic sources of information in relation to nuisance include:

- European Commission http://ec.europa.eu/environment/ and EU BREF documents http://eippcb.jrc.ec.europa.eu/reference/;
- US Environmental Protection Agency (EPA) www.epa.gov.

11.3.4 Demonstrable achievement of stretching performance targets beyond recognised international standard practice

You could confirm the performance targets that may be achievable through the implementation of leading practices, sets stretching impacts and complaints reduction targets and employs leading practices (see above) to achieve these. You could also proactively identify what are considered to be realistic, but stretching, targets in relation to nuisances and complaints reduction, through, for example, consultation with sector groups / trade associations / research bodies etc.

ANNEXES

ANNEX A

Glossary of Terms

Glossary of Terms Used in the Document

Absolute Data	Absolute data comprise totals or usage data without comparison to any variables, e.g. total kWh of electricity used, total tonnes of hazardous waste produced in a month etc. An organisation can decide whether absolute or normalised data are going to be the most appropriate and representative data to collate/report. Within each of the performance areas discussed in this document there are examples of variables against which data can be normalised.
Assurance	"The methods and processes employed to evaluate an organisation's disclosures about its performance as well as underlying systems, data and processes against suitable criteria and standards…" AA1000 Assurance Standard 2008
Best Available Techniques (BAT)	'Techniques' shall include both the technology used and the way in which the installation is designed, built, maintained, operated and decommissioned; 'Available' techniques shall mean those developed on a scale which allows implementation in the relevant industrial sector, under economically and technically viable conditions, taking into consideration the costs and advantages, whether or not the techniques are used or produced inside the country in question, as long as they are reasonably accessible to the operator; and 'Best' shall mean those most effective in achieving a high general level of protection of the environment as a whole. Definitions adapted from Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control, Art. 2(11)
Biological Oxygen Demand (BOD)	Biological Oxygen Demand (or Biochemical Oxygen Demand) (BOD) is an indicator of the level of organic matter in the water and, hence, the rate at which oxygen in the water is used up as the organic matter is consumed by organisms in the water. Generally, the lower the BOD, the better the water/ wastewater quality.
Carbon footprint	According to the UK Carbon Trust, a 'carbon footprint' is "the total set of greenhouse gases (GHG) emissions caused by an organization, event or product
CAS and CAS Numbers	The Chemical Abstracts Service (CAS), which is a division of the American Chemical Society, establishes "CAS registry numbers" (or "CAS numbers"). There are unique number sequences used internationally to identify chemicals, chemical compounds, mixtures, alloys, and other substances. A CAS number is separated by hyphens into three parts, the first consisting of up to 7 digits, the second consisting of two digits, and the third consisting of a single digit. The numbers are assigned in increasing order and do not have any specific meaning.

Chemical Oxygen Demand (COD)	Chemical Oxygen Demand (COD) is an indicator of the level of organic matter and chemicals in the water and, hence, the rate at which oxygen in the water is used up as the organic matter and chemicals are consumed. Generally, the lower the COD the better the water/ wastewater quality.
Climate Change	A long-term, measurable, change in the expected climate or weather for the Earth as a whole or in a particular region, as a result of human activity.
Continual Improvement	The recurring process of enhancing the environmental management system in order to achieve improvements in overall environmental performance consistent with an organisation's environmental policy. ISO14001:2004
EINECS Numbers	EINECS ("European Inventory of Existing Commercial chemical Substances") numbers are an alternative to CAS numbers for the classification of chemicals. . EINECS numbers are used for substances (excluding polymers) that were commercially available in the EU from 1st January 1971 to 18 September 1981. The EINECS number is made up of seven digits (xxx-xxx-x). There are other European-based numbering systems (including ELINCS and NLP numbers), however, EINECS numbers are the more commonly used system.
EMS – Environmental Management System	A management system is a set of interrelated elements used to establish policy and objectives and to achieve those objectives. ISO14001:2004
Environmental aspect	An element of an organisation's activities or products or services that can interact with the environment ISO14001:2004
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's environmental aspects ISO14001:2004
Environmental Impact Assessment (EIA)	An assessment of the potential impact(s), either positive or negative, that an operation, activity or project has or could have on the natural environment.
Key Performance Indicator (KPI)	"A quantifiable metric that reflects the environmental performance of a business, in the context of achieving its wider goals and objectives" DTI Environmental KPIs - Reporting Guidelines for UK Business

Legionella Bacteria	Legionella bacteria are responsible for Legionnaire's Disease. Symptoms of Legionnaires' disease include high fever, chills, headache, muscle pain, dry cough, difficulty with breathing, and diarrhoea or vomiting. About half of sufferers become confused or delirious. Legionnaires' disease can be treated effectively with appropriate antibiotics. However, infection with Legionella bacteria has been fatal in approximately 12% of reported cases. Legionnaires Disease is normally contracted by inhaling Legionella bacteria, either in very small water droplets (aerosols), or in the nuclei of such droplets (i.e. the particles left after the water has evaporated) contaminated with Legionella bacteria, deep into the lungs. Legionella bacteria are commonly encountered in naturally occurring water bodies (e.g. rivers, lakes and reservoirs). However, they also colonise manufactured water systems and be found in cooling tower systems, hot and cold water systems and other equipment which uses, transfers or stores water.
Management	People who identify and achieve organizational objectives through the deployment of appropriate resources. A manager can have responsibilities in one or more of five key areas: managing activities; managing resources; managing information; managing people; and managing him- or herself, at the same time as working within the context of the organizational, political, and economic business environments.
Monitoring framework	Types of monitoring and assurance processes that a company implements to, for example, assess environmental performance. This could comprise detailed monitoring regimes to evaluate compliance with performance limits (e.g. emissions to air), a detailed audit process to assess compliance with, for example, the Framework Requirements, or a self-assessment questionnaire to assess improvement in performance. A detailed audit process could range from internal self-assessment inspections to detailed third party compliance audits.
Normalised Data	Normalised data includes a comparison of totals or usage data against a predefined variable (or set of variables), e.g. kWh of electricity used per employee on-site, kg of hazardous waste per unit of production etc. An organisation can decide whether absolute or normalised data are going to be the most appropriate and representative data to collate/report. Within each of the performance areas discussed in this document there are examples of variables against which data can be normalised.

NO_x	"NO_x" is the collective term for various oxides of nitrogen, including: nitrous oxide (N_2O) which is a colourless gas, formed by soil bacteria when decomposing certain organic material, which reacts with ozone in the upper atmosphere; nitric oxide (NO) which is a colourless gas formed during high temperature combustion of fuels and which is oxidised by ozone; and nitrogen dioxide (NO_2) which is a highly toxic reddish-brown gas formed, for example, during the reaction of other oxides of nitrogen with ozone and which can also act as a retardant to plant-growth.
"Phase I"	Phase I" is commonly used in reference to soil and groundwater investigation as the initial phase of review and assessment. Typically, a Phase I study would be desk-based and would comprise a review of the site setting in terms of the site's activities and operations, surrounding land uses to the site, the underlying geology and hydrogeology (groundwater), hydrology (surface waters – rivers, streams, lakes, reservoirs, seas etc.), soil type (potentially) and other receptors.
"Phase II"	"Phase II" is commonly used, in reference to soil and groundwater investigation, as the intrusive stage of investigation work. The intrusive work may include trial pits, boreholes or other excavations, together with sampling and analysis of soil and/or groundwater.
"Phase III"	"Phase III" is commonly used, in reference to soil and groundwater contamination, as the remediation stage of the work (i.e. clean-up of contaminated soil and/or groundwater to a pre-defined quality / level). Phase III may include additional sampling and analysis of soil and/or groundwater, as well as the actual remediation work.
Pollution prevention	In the context of this document, "pollution prevention" relates to the controls and measures adopted to reduce the likelihood and/or impact of a release of a substance to the environment and the associated potential for pollution to occur.
Renewable Energy	This relates to energy generated by a renewable source (i.e. source which is not depleted or used up as it is naturally replenished. Renewable sources can either be managed so that they last forever, or so that their supply is not significantly impacted. Unlike fossil fuels, most renewable energy sources do not release carbon dioxide and other air pollutants as by-products into the atmosphere. As the amount of fossil fuel resources on Earth decreases, it is becoming increasingly important to find and utilise renewable energy sources. Examples include: solar, biofuels, wind, hydro-electric, geothermal, tidal and wave.

SO_x	"SO_x" is the collective term for various oxides of sulphur, including: sulphur dioxide (SO_2) and sulphur trioxide (SO_3). Sulphur oxides exist and are produced naturally. In addition, human activities can increase SO_x levels, e.g. through combustion of sulphur-containing fuels. SO_x can contribute to acid rain, smog, can affect breathing and can adversely impact vegetation.
Stakeholder	A person with an interest or concern in the organisation, site or project. Stakeholders can include (but not necessarily be limited to): site workers and management, trade unions, the Board, non-executive directors, shareholders, other financial backers (private equity house, venture capitalist etc.), regulators, customers, suppliers, the local community etc.
Sustainability / Sustainable Development	"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs". AA1000 Assurance Standard 2008
Target [Environmental)	A detailed performance requirement (quantified where possible and applicable to all or parts of the organisation), that arises from the setting of environmental objectives and which needs to be set and met in order to achieve those objectives. A specific task in the achievement of an environmental objective. Environmental targets must be stated in a measurable and quantifiable manner. ISO14001:2004 Targets can be based on absolute data or normalised data.
Volatile organic compounds (VOCs)	Organic compounds (i.e. typically those containing carbon) (e.g. ethylene, propylene, acetone, dichloromethane, benzene, xylene, toluene, styrene) that readily evaporate and which contribute to air pollution, either directly or through other chemical reactions producing 'secondary pollutants'. Examples of materials containing VOCs include solvents, paints, thinners, petroleum fuels etc.
Worker	A person working on an employment site, in any capacity.

ANNEX B

Sources of Additional Information

INTRODUCTION

Although these Implementation Guidelines, along with the GSCP Environmental Reference Requirements, are developed so as to be used on their own, this annex provides a number of additional sources of information which may be useful in relation to cross-sector or sector-specific requirements, standards, guidance and leading practice.

Caution should be exercised when using various sources of information to make sure that they do not contradict the Reference Requirements or these Guidelines.

EXAMPLES OF GLOBALLY APPLICABLE CROSS-SECTOR STANDARDS OR GUIDANCE

IFC Performance Standards on Social and Environmental Sustainability
http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvSocStandards

IFC Environmental Health and Safety Guidelines
http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines

United Nations Environment Programme Governance and Law
http://www.unep.org/tools/default.asp?ct=govlaw

World Bank Pollution, Prevention and Abatement handbook
http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&siteName=WDS&entityID=000094946_99040905052283

World Business Council for Sustainable Development (WBCSD)
http://www.wbcsd.org/templates/TemplateWBCSD5/layout.asp?MenuID=1

EXAMPLES OF SECTOR SPECIFIC STANDARDS OR GUIDANCE

Agriculture

Sustainable Agriculture Standard and associated Rainforest Alliance Farm Certification Scheme
http://www.rainforest-alliance.org/agriculture/documents/SAN_Sustainable_Agriculture_Standard_%20February2008.pdf

LEAF
http://www.leafmarque.com/leafuk/producers/join.asp?id=4030602

Organic Exchange
http://www.organicexchange.org/

Better Cotton Initiative
http://www.bettercotton.org/site.php

UNEP Agriculture
http://www.unep.org/tools/default.asp?ct=agric

Dairy Management Inc. (US site, incorporating the American Dairy Association, National Dairy Council, and US Dairy Export Council)
http://www.dairyinfo.com/

Renewable Citrus Products Association
http://renewablecitrus.org/

Food and Agriculture Organization of the UN
http://www.fao.org/

IFC
http://www.ifc.org/

The Better Sugar Cane Initiative
http://www.bettersugarcane.org/

Roundtable on Sustainable Oil Palm Production
http://www.rspo.org/

International Cotton Association
http://www.ica-ltd.org/

Forest Stewardship Council
http://www.fsc.org/

US Agency for International Development - Agriculture
http://www.usaid.gov/our_work/agriculture/sustainable_ag.htm

Pesticide Action Network (PAN) is a global coalition of citizen's groups and individuals who oppose the misuse and overuse of pesticides, and support the reliance on safe and sustainable alternatives. PAN links over 300 groups in 50 countries. The following three PAN sites provide information about various PAN campaigns and resources.
PAN Asia and Pacific
www.poptel.org.uk/panap/
PAN North America
www.panna.org/panna/
PAN UK (formerly The Pesticides Trust)
www.pan-uk.org/

Community Integrated Pest Management (IPM) Program - more focused on food security and health protection from pesticides. They are typically funded by UN FAO.
http://communityipm.org/links.html#Sustainable%20Agriculture

US Environmental Protection Agency - agriculture
http://www.epa.gov/agriculture/

Consultative Group on International Agricultural Research
http://www.cgiar.org/

Extractives

Oil and Gas

IPIECA (International Petroleum Industry Environmental Conservation Association) Guidelines on Biodiversity and climate Change
http://www.ipieca.org/activities/activities_home.php

IFC EHS Guidelines for the oil and gas sector
http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines

Mining and Minerals

ICMM Sustainable Development Framework
http://www.icmm.com/our-work/sustainable-development-framework

IFC EHS Mining Guidelines
http://www.ifc.org/ifcext/sustainability.nsf/Content/EnvironmentalGuidelines

World Bank Pollution Prevention and Abatement Handbook (Nickel smelting and refining; coal mining and production)
http://www-wds.worldbank.org/external/default/main?pagePK=64193027&piPK=64187937&theSitePK=523679&menuPK=64187510&searchMenuPK=64187283&siteName=WDS&entityID=000094946_99040905052283

World Bank Environment, Health and Safety Guidelines (Mining and milling – open pit and underground)
http://www.natural-resources.org/minerals/CD/docs/twb/EHS_open_pit.pdf

Chemicals

International Council of Chemical Associations Responsible Care
http://www.responsiblecare.org/page.asp?p=6341&l=1

Cement Industry (WBCSD – Cement Sustainability Initiative)
http://www.wbcsdcement.org/

European Vinyl Chloride Manufacturers
http://www.pvc.org/PVC.org/The-PVC-Industry/ECVM

Cefic, the European Chemical Industry Council
http://www.cefic.be/

Textiles

The British Textiles Technology Group
http://www.bttg.co.uk/

IMO – Textile Inspection & Certification
http://www.imo.ch/imo_services_textile_en,1729,998.html

International Association Natural Textile Industry
http://www.naturtextil.com/portal/rili_kurz_en,1756,1535.html

GreenBlue – Sustainable Textiles Standard
http://www.greenblue.org/activities_stm.html

Pulp & Paper

International Council of Forest & Paper Associations
http://www.icfpa.org/index.php

International Pulp & Paper Industry Online magazine
http://www.ipwonline.de/

Confederation of European Forest Owners (CEPF)
http://www.cepf-eu.org/

Confederation of European Paper Industries
http://www.cepi.org/Content/Default.asp?PageID=2

KCL (Industry research)
http://www.kcl.fi/page.php

American Forest & Paper Association
http://www.afandpa.org/

CFPA
http://www.chlorinefreeproducts.org/

Energy Sector

International Energy Agency
http://www.iea.org/

World Energy Council
http://www.worldenergy.org/

World Energy Source
http://worldenergysource.com/

International Sustainable Energy Organisation for Renewable Energy & Energy Efficiency
http://www.uniseo.org/

The European Biomass Industry Association
http://www.eubia.org/

European Renewable Energy Centres Agency
http://www.eurec.be/

European Union of the Natural Gas Industry
http://www.eurogas.org/

Transport Sector

International Air Carriers Association
http://www.iaca.be/

International Union of Combined Road-Rail transport companies
http://www.uirr.com/

International Association of Public Transport
http://www.uitp.org/

The European Rail Industry: UNIFE
http://www.unife.org/

Pharmaceuticals

International Federation of Pharmaceutical Manufacturers & Associations
http://www.ifpma.org/

EFPIA – European Federation of Pharmaceutical Industries & Associations
http://www.efpia.org/content/default.asp?PageID=317

European biopharmaceutical enterprises
http://www.ebe-biopharma.org/

Electronics

Electronic Industry Code of Conduct (EICC)
http://www.eicc.info/

International Electronics Manufacturing Initiative
http://www.nemi.org/cms/

Innovative Electronics Manufacturing Research Centre
http://www.lboro.ac.uk/research/iemrc/

General Manufacturing

Sustainable Manufacturing Group
http://www.ifm.eng.cam.ac.uk/sustainability/

The European Business Network for CSR
http://www.csreurope.org/

The European Organization for Packaging and the Environment
http://www.europen.be/

European Automobile Manufacturers' Association
http://www.acea.be/index.php

Society of Motor Manufacturers and Traders (SMMT)
http://www.smmt.co.uk/home.cfm