

### ***PROCESS DESCRIPTION***

This guidance note applies to retail fuel stations where petrol (gasoline) and other automotive fuels such as diesel, biofuels and liquefied petroleum gas (LPG) are sold. Such facilities may range in size from single dispensing pumps to more than 20. These facilities will commonly include a convenience store but may also include automobile repair services, a car wash, refreshments, water and air refill facilities. Of these ancillary activities only the carwash is covered within this guideline. (See Food Retail, Automotive Dealers, Vehicle Repair Services)

The typical layout of a fuel station would include:

- Underground Storage Tanks (USTs) and sometimes Aboveground Storage Tanks (ASTs) for fuel;
- Pump island where one or more fuel dispensers are located;
- Enclosed office for a cashier;
- Concrete hardstanding area surrounding the pumps.

Fuel is delivered from bulk storage depots by road tanker and unloaded into the storage tanks at the fuel station by the tanker driver. Fuel is piped from the storage tanks to the dispensing pumps.

Historically, automotive fuels were dispensed by a trained operator employed by the facility. However, the trend in developed and developing countries is towards self-service customer operation.

### ***KEY ENVIRONMENTAL, HEALTH AND SAFETY RISK/LIABILITY ISSUES***

#### ***Fire/Explosion Risk***

Vehicle fuels are highly flammable and if stored or handled incorrectly severe fire or explosion may result, with potential for severe injury, loss of life and damage or destruction of the site and locality. Sources of ignition include static electricity, lightning, open flames and use of electronic equipment such as mobile phones.

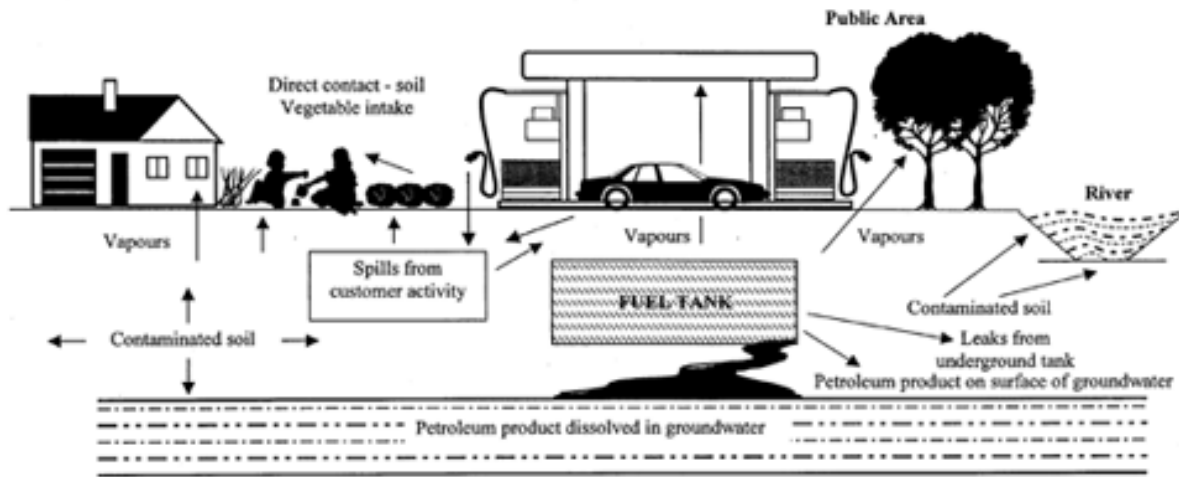
The site should be designed, constructed and operated according to relevant national and international standards. This will include:

- Separation from nearby buildings, design and quality of fuel tanks, petrol pumps, underground pipework and tanker offloading points;
- Appropriately engineered forecourt to prevent accidental damage of underground pipework by heavy vehicles;
- Protection of tanks, pumps and staff from accidental damage/injury by vehicles or fire. For this reason, fuel tanks are usually placed underground. ASTs, pipes and valves should be protected by barriers or walls;
- Provision and placement of emergency equipment, e.g. spill kits, fire extinguishers;
- Enforcement of health and safety requirements e.g. no smoking, no mobile phones, switch off engines;
- Emergency contingency plans with regular training and practice in their use. These are normally regulated by the state and/or fire service.

# *Sub-sectoral Environmental Guidelines*

## *PETROL/GASOLINE RETAILING*

### *Fuel Leaks and Spills*



Source: DEFRA 2000

Accidental release of fuel from the site may occur due to:

- Leaks from storage tanks and connecting pipework arising from damage, aging or improper installation;
- Small spills during unloading or vehicle filling which are not cleaned up;
- Failure or absence of oil/water separators on drainage systems;
- Failure to control rainwater run-off by appropriate drainage;
- Failure to drain tanks and pipework adequately prior to maintenance and repair work;
- A major spill, such as a tank failure or overfilling.

Released fuel will enter the soil directly beneath the site or around its perimeter. Petroleum floats on water surfaces and can be transported over long distances via drainage channels and other watercourses. Petroleum (and its

associated additives) is toxic to flora and fauna and can pollute significant volumes of water. Liquid product can flow downwards through soil towards the water table, where it can either float or dissolve. A large percentage of drinking water comes from groundwater resources (aquifers).

The damage caused by the release depends on the amount of material released, the local geology (i.e. how easily the leak can pass through the underlying soil and rock) and the proximity of the facility to sensitive environmental receptors such as watercourses, groundwater wells, building structures and underground services.

Leak prevention and detection systems should be adopted to minimise the risk of fuel leakage or spills.

Spill kits should be readily available and staff trained in their deployment.

During site upgrade and or decommissioning of equipment, contaminated soils and waters may be discovered and petrol station operators

## ***Sub-sectoral Environmental Guidelines PETROL/GASOLINE RETAILING***

should have formal procedures in place to manage this situation.

### ***Wastewater***

If a car wash is present, high volumes of wastewater may be produced containing detergents, oil and road dirt. The detergents will prevent oil/water separators working effectively so the water must not be discharged to these but should be sent for treatment, e.g. at a municipal wastewater treatment works.

Where no car wash exists the principal source of wastewater will be rainwater runoff from delivery and dispensing areas. The volume of rainwater falling on contaminated areas should be minimised by installing roofs and any fuel contaminated water should pass through appropriately designed, operated and maintained oil/water separators prior to discharge.

### ***VOC Emissions***

The main emissions to air are volatile organic compounds (VOCs) i.e. fuel that evaporates, particularly during delivery and dispensing operations.

VOCs can cause dizziness, asphyxiation and are potentially carcinogenic. VOCs are also a primary component of smog, with major health impacts in urban areas. VOC emissions can be reduced with the use of special fuel filter nozzles incorporating vapour recovery systems. VOC control is a major focus of EU legislation, with the main Directive being 94/63/EC.

### ***Collision***

There is a risk of collision between vehicles using the fuel station and pedestrian traffic both on the site and passing by its entrance and exit points. The layout of the site should be designed to provide clear lines of sight wherever possible and to minimise the need for vehicles and pedestrians routes to cross.

## ***OTHER ENVIRONMENTAL, HEALTH AND SAFETY RISK/LIABILITY ISSUES***

### ***Waste***

Petrol stations may generate a variety of waste types including oily waste, which must be disposed of in accordance with national law. Waste types may include:

- Waste engine oil;
- Other oily waste related to customer vehicle maintenance;
- Contaminated spill cleanup materials;
- Oily sludge from oil tank cleaning and oil/water separators,
- Contaminated soils;
- Equipment from the replacement and decommissioning of tanks and pipe work;
- General waste from any retail outlet such as packaging waste.

Some waste types e.g. engine oil and packaging may be suitable for recovery for energy purposes or recycling.

### ***Polychlorinated Biphenyls (PCBs) and***

- PCBs are a group of substances which are good electrical insulators. Typically, PCBs may be present as constituents of hydraulic oils or dielectric fluids in electrical switchgear, transformers and fluorescent light starters;
- Asbestos has been used on a large scale for many years as a fire proofing and insulation material and may be encountered in a wide range of forms including asbestos cement boards, as fire retardant gaskets in pipework and as fire retardant insulation around boilers and furnaces.

## ***Sub-sectoral Environmental Guidelines***

### ***PETROL/GASOLINE RETAILING***

Particular attention should be given to buildings constructed before the 1980s as these could contain PCBs and asbestos.

#### ***Permitting***

Fuel stations in the EU with a throughput greater than 100m<sup>3</sup> per year are subject to the requirements of the Petrol Vapour Recovery Directive (94/63/EC). This Directive requires that any VOC emissions arising from unloading fuel at the fuel stations be captured.

Some countries may have international obligations under the UNECE 1991 VOC Protocol<sup>1</sup> and the EU National Emission Ceiling Directive (2001/81/EC), which may be implemented through their national permitting regimes.

Operators responsible for unloading mobile containers at fuel stations may also require a permit.

Under National or EU legislation, an environmental impact assessment (EIA) may be required before a new petrol station can be constructed, depending on the capacity of the station.

#### ***Slips***

Diesel spills may make the floor surface slippery and cause a hazard. Any spills should be quickly cleaned.

#### ***Confined Spaces***

Workers involved in tank repair and maintenance work, in the excavation of tank areas and decommissioning may be required to enter confined spaces where there is a risk of entrapment and asphyxiation.

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<sup>1</sup> The UNECE 1991 VOC Protocol obliges signatory states to apply measures to control emissions of VOCs from motor vehicle refuelling operations. The aim is to reduce emissions of VOCs and ground level ozone concentrations resulting from VOC emissions.

#### ***Exposure to Hazardous Substances***

Direct contact with fuels, contaminated soils and cleaning fluids can cause skin irritation.

Inhalation of vapours can cause dizziness, asphyxiation and potentially cancer.

### ***KEY SOCIAL, LABOUR AND COMMUNITY RISK/LIABILITY ISSUES***

#### ***Violence & Security issues***

Some fuel stations may be open 24 hours a day or open late at night and be vulnerable to robbery potentially with violence and verbal abuse. Suitable measures should be provided to protect vulnerable workers. Night workers can be particularly vulnerable.

Where necessary, security personnel should be used to establish and control access to restricted areas and other vulnerable or sensitive key points, locations, functions or operations without endangering themselves or others. Security practices should be in line with the voluntary principles on security and human rights<sup>2</sup>

#### ***Alternative Fuels***

The production and use of hydrocarbon fuels such as petrol and diesel have major local and global environmental impacts including climate change and impact on local communities. Therefore, fuel production and supply may be subject to extensive media and regulatory attention and taxation. Consumer demand for fuel will be affected by these factors and this will affect the profitability of fuel retailing.

A major fuel retail chain should be aware of these strategic issues and plan, as far as possible, for their impact on their business. Possible responses include expansion or diversification of the overall business or sale of new low impact

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<sup>2</sup> Voluntary Principles 2000

## ***Sub-sectoral Environmental Guidelines***

### ***PETROL/GASOLINE RETAILING***

fuels, especially in relevant locations such as cities, e.g. Low or Ultra Low Sulphur diesel.

#### ***OTHER SOCIAL, LABOUR AND COMMUNITY RISK/LIABILITY ISSUES***

##### ***Nuisance***

Nuisance to the immediate area surrounding a petrol station may be caused by:

- Vehicle movements to and from the station causing noise, congestion and air emissions;
- Petrol smells and related public health concerns;
- The glare of lighting.

Nuisance issues will be greatest for stations located in residential areas.

#### ***FINANCIAL IMPLICATIONS***

- If contamination affects neighbouring property, water supplies or public health, the regulatory authorities may require remediation of the contamination or financial compensation. Similarly, private litigation may be taken to gain compensation. The cost of clean up of contamination may be high, potentially exceeding the value of the site;
- Injuries may lead to increased payroll costs to replaced workers;
- Fines, penalties and third party claims may be incurred for non-compliance with environment, health and safety regulations.
- Legislation to require Stage 2 Petrol Vapour Recovery equipment<sup>3</sup> may be introduced by national or EU legislation requiring significant investment. This is currently the

<sup>3</sup> Equipment to recover petrol vapour displaced from the fuel tank of a motor vehicle during refuelling and transfer it to an UST or back to the petrol dispenser for resale

subject of an EU proposal and has already been introduced by the majority of EU countries.

- Other complex investment may be required to comply with new hygiene health, safety and environmental regulations;

#### ***IMPROVEMENTS***

It should be noted that many of the precautions implemented primarily to prevent fire and explosion will minimise accidental release to the environment.

##### ***Environmental Improvements***

- Provide secondary containment for storage tanks, such as double skinned tanks, vaults or membranes;
- Install leak detection systems on tanks and pipework;
- Install devices to prevent spills and overfills, e.g.
  - Alarms to warn of overfilling;
  - Automatic shut-off devices;
- Consider use of corrosion protection in steel tanks and piping such as coating with suitable material;
- Implement procedures to reconcile fuel deliveries with fuel sales to check for product loss;
- Consider installation and use of groundwater monitoring points on site to check for contamination;
- Replace any bare soil or broken hardstanding in the vicinity of the fuel unloading and dispensing points with unbroken hardstanding engineered to withstand the weight of heavy vehicles;

## ***Sub-sectoral Environmental Guidelines***

### ***PETROL/GASOLINE RETAILING***

- Separate clean and potentially contaminated drainage, the latter should be passed through oil/water separators known as oil/water separators prior to discharge;
- Ensure that the hardstanding directs all rainwater falling on it to drains fitted with oil/water separators;
- Ensure oil/water separators are properly designed, operated and maintained in order to achieve the required level of water treatment;
- Ensure that wastewater from oil/water separators is discharged to the foul sewer system for further treatment at a municipal wastewater treatment works;
- Install roofs or covers to reduce rainwater falling on potentially contaminated hardstanding;
- Ensure interceptors are regularly inspected, cleaned and maintained;
- Implement robust procedures to control storage tank filling;
- Consider automation to switch off pumps when the tank is full;
- Ensure untreated wastewater from a carwash does not discharge to watercourses;
- Prevent carwash wastewater from discharging via oil/water separators because the detergents present would inhibit their operation;
- Recycle carwash water to reduce volumes used and discharged;
- Install silt traps prior to discharge of wastewater. Ensure these are regularly cleaned;
- Implement procedures to ensure that any residual fuel is removed from tanks and connecting pipework prior to their upgrade or removal.
- Restrict access to working in confined spaces through a permit to work system.
- Install protective measures to shield tanks, pumps and staff from damage from vehicles or fire such as barriers or walls around tanks and pumps;
- Provide emergency equipment, e.g. fire suppression equipment, spill kits and review placement of equipment. Train staff in the correct use of this equipment;
- Train staff in health and safety precautions and procedures;
- Improve signage to customers and visitors regarding prohibited activities, i.e. use of mobile phones, no smoking, engines to be switched off;
- Prepare emergency contingency plans for spills and fires. These should include immediate action and calling the emergency services. Provide regular training and practice in their use;
- Consider painting ASTs with white or light coloured paints to reduce heat absorption and reduce risk of VOC emissions;
- Consider use of VOC emissions controls at unloading point. This will be mandatory in some territories under the UNECE VOC Protocol and the EU Directive 94/63/EC on the control of VOCs;
- Consider use of VOC emissions controls at vehicle filling points (known as Stage 2 Petrol Vapour Recovery). This also may be mandatory in some countries.

## ***Sub-sectoral Environmental Guidelines***

### ***PETROL/GASOLINE RETAILING***

- Provide proper grounding to avoid static electricity;
- Consider security features to protect staff working alone at night.

#### ***Social, Labour and Community Improvements***

- The main risks to the community arise from spills, fires and explosions. Well run facilities pose little risk but an emergency response plan should be prepared that considers the role of communities and community infrastructure in the case of an incident.

#### ***GUIDE TO INITIAL DUE DILIGENCE SITE VISITS***

During the initial site visit, the issues will vary according to the size of fuel station, the range of other facilities provided on the site and on the level of environment, health and safety management already introduced. While visiting the site it is important to discuss and review the following:

#### ***Environmental, Health and Safety Improvements***

- Confirm organisational responsibilities and systems for environment, health and safety;
- Check the proximity of other property, particularly if in a residential area;
- Check the distance to the nearest watercourse. Is there evidence of a petrol sheen on the surface of the water?
- What is the standard of “house-keeping” on site? Do areas look clean and tidy? Look for evidence of old spills that have not been removed, leaking pipes, petrol sheen on puddles etc;
- Check signage around the site. Does it convey the health and safety risks?

- Is fire fighting, first aid and spill kit equipment readily available?
- Check whether the site has a system of product inventory control to monitor for system leaks?
- Check the age and condition of buildings, tanks, equipment and hardstanding;
- Check whether the site has leak detection alarms;
- Check that there is a documented history of tank maintenance and testing;
- Check that waste storage areas are clear of debris and that containers are covered to prevent waste escaping, for example, check that waste containers have lids or are stored in an area with a roof;
- Has the company any other insurances and have there been any claims against these policies?
- Have there been any recent (within last three years) incidents on site such as injuries, fires/explosions, spills?
- Does the site have an emergency response plan for spills, fires etc? When was the last practice?
- Have the premises been inspected recently (within the past 2 years) by the regulatory authorities e.g. for fire safety and environment? What were their findings?
- Does the business plan have line items for Environment, Health and Safety improvements?
- Check the conditions and duration of validity for all permits.

## ***Sub-sectoral Environmental Guidelines*** ***PETROL/GASOLINE RETAILING***

### ***Social, Labour and Community***

- Check that labour standards, contracting and remuneration are in line with national law and are consistent with the average for the sector.
  - Check that hours worked, including overtime, are recorded and staff should receive written details of hours worked and payment received.
  - Has the Company received inspections from the local labour inspectorate in the previous three years? Have these resulted in any penalties, fines, major recommendations or corrective action plans?
  - Does the organisation have a grievance mechanism which allows employees to raise workplace concerns?
  - Are employees free to form, or join, a worker's organisation of their choosing?
- Improvement objectives, targets and project plans;
  - Training for personnel;
  - Regular inspections, checks and audits with records to demonstrate achievement of the required level of performance against legal requirements and improvement action;
  - Emergency plans for environment, health and safety accidents;
  - Management review/demonstrated involvement in environment, health and safety management.

Take note/ask questions relating to any activities that address the improvements listed in the improvements section of this document.

It may be appropriate to request a site survey to assess contamination status and testing of the tanks to check for leakage.

### ***ACTION PLANS***

Dependent on the individual business, select appropriate improvements from the list above to include in the action plan. As a minimum, any business should be required to have the following in place:

- Operational procedures to manage environmental, health, safety and hygiene risks;
- Monitoring programmes;



## ***Sub-sectoral Environmental Guidelines*** ***PETROL/GASOLINE RETAILING***

### ***REFERENCES AND ADDITIONAL SOURCES***

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