Pollution Prevention Technical Information note

Major pipelines June 2011.

These guidelines have been written for those operators who construct, manage and maintain major pipelines. They give advice and guidance on how to minimise the risks to the environment and human health. They don't cover decommissioning. For detailed pollution prevention advice during the construction phase, read our guidance in reference 1.

1. General

We're responsible for preventing pollution of the water environment and controlling waste management activities which may harm human health and damage local amenity.

The water environment includes all watercourses, lakes and coastal waters and groundwater. Groundwater is defined as all water below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil and, whilst out of sight, shouldn't be out of mind. It's an offence to pollute surface or groundwater, either deliberately or accidentally. You must have our formal permission before you can discharge any potentially polluting substances to surface waters or groundwater (directly or indirectly), and permits – where they are granted – are subject to conditions and aren't issued automatically.

It's your responsibility to make sure you know what your legal obligations are and that you have all the necessary permissions and permits in place before you start your project. These include:

- For discharges into surface water or discharges of pollutants that might lead to direct or indirect inputs to groundwater (including discharges to ground), you must have a permit under the Environmental Permitting Regulations (EPR) 2010.
- Waste produced during construction or operation of your pipeline must be treated according to the Duty of Care, under the Environmental Protection Act 1990.
- Activities that produce hazardous wastes are controlled by the Waste (England and Wales) Regulations 2011 and the Waste (Miscellaneous Provisions) (Wales) 2011 Regulations; if you produce hazardous waste, you need to register as a hazardous waste producer.

For more details on your legal obligations, see our website or the government on-line business advice and support service, see useful websites, and reference 2.

The most frequent pollution problems involving pipelines occur during the construction and initial commissioning, or decommissioning of old pipelines. Leaks and pipeline failures are rare, but can have a massive environmental impact.

2. Planning and pipeline design - what should you consider?

The route you choose for a pipeline can have a significant influence on the risk of pollution both as it's constructed and during its operation. We recommend you discuss your route options with us as soon as possible when you're planning a pipeline. You need to consider a range of environmental receptors before the final route is agreed; these include:

- sensitive watercourses
- vulnerable groundwater
- proximity of existing abstractions
- groundwater Source Protection Zones (SPZs)
- sites of special scientific interest and other designated sites
- contaminated land and old landfill sites
- flood risk.

Your route should avoid these receptors; if this isn't possible, you should agree appropriate pollution prevention measures with us to minimise the risk of pollution and environmental damage. In some circumstances, we may oppose the route of a pipeline due to the risk of groundwater pollution; reference 3 gives more detail.

At some river crossings, we may not allow in-river work and you'll need to find an alternative route. To reduce the pollution risk, your pipeline design should consider:

i. The thickness of the pipe wall, which may have to be increased in sensitive areas, or the use of double skinned pipes to minimise the risk of product loss due to damage or corrosion.

ii. The depth of the pipe, which should take into account environmental sensitivity, depth to groundwater, land use and the potential for damage due to excavation, construction or agricultural activities.

iii. Installing monitoring equipment to identify leaks and facilities to stop leaks; for example stop valves at river crossings.

iv. Maintenance and inspection programmes for operational pipelines may need to cover more details in sensitive areas; you'll need to monitor development along the route.

v. Emergency procedures for dealing with leaks or damage to the pipeline will need to take into account the time taken to reach the site, respond to the incident and repair the pipeline.

In most cases, you'll need to plan on-site treatment for contaminated water during construction and commissioning. This may mean you need additional land for settlement lagoons or grass plots. You must take this into account during your planning. If the pipeline crosses or passes under vital flood defences, you'll need to liaise with us as early as possible and work closely with us to avoid compromising them.

You should check for other pipelines in the area when you're planning your route. We recommend you use the Linewatch website, (in the useful web site list) which records the location of major cross country oil and gas pipelines and gives advice on safe working in proximity to high pressure pipelines. The Linesearch website holds records of the location of 27,000km of pipelines and fibre optic cables.

We recommend that you contact the local utility companies before you start work to check the location of any gas, electric, (particularly fluid filled cables) phone lines, water or sewage pipes along the line of your route. You may need permission from the relevant utility company for excavations near these.

3. Construction

Construction activities can pose a significant risk to the water environment. These include:

a) silty run-off from bare soil and stockpiles;
b) wheel washing;
c) dewatering excavations;
d) concrete and cement use;
e) oil and chemical storage and use;
f) sewage disposal;
g) poor waste management practices.

Another common cause of pollution from construction sites is vandalism and theft. Your equipment and storage facilities should be protected by secure fences and locked where possible.

You should consider pre construction drainage plans to identify, intercept and divert surface water from your construction area. This will reduce the risk of clean uncontaminated water running through the site and becoming polluted. You must talk to us before any interception or diversions are carried out as this could affect abstractions or other downstream users.

See references 1, 4, 5 and 6 for more detailed advice and guidance to help you prevent pollution during construction.

3a. Run-off from soil stockpiles and excavations

After the route has been fenced, the first phase of pipeline construction usually involves removing top soil from the line of the pipe to a linear stockpile on one side. Soil stockpiles and the exposed excavation area can generate contaminated silty run-off. This run-off can have a severe impact on the plants, fish and animals in the water environment. Silt can coat plants, directly harm fish by damaging their gills, cover and kill fish eggs. Once settled on the stream bed, silt can reduce productivity, suffocate and kill bottom dwelling creatures that fish feed on.

You should identify discharge points for stockpile run-off and excavation dewatering and get a permit from us before you start work. This may take up to four months, so you need to apply early or your work could be delayed. You will probably need to treat the run-off using settlement facilities and, depending on local sensitive environmental areas, you may need further treatment. You should also take other actions to reduce silt run-off, such as:

- minimise topsoil stripping to sites where actual construction activities are taking place;
- cover existing stockpiles;
- use silt fences or cut off ditches.

Whatever pollution control measures you put in place, they must be regularly maintained throughout the construction phase.

3b. Wheel wash facilities

We recommend you use wheel washes to prevent silt and mud being left on roads or at crossings. These should be securely constructed using a water re-circulation system with no overflow. The effluent should be contained for proper treatment and disposal. See references 1 and 7 for more advice and our website for our regulatory position statement on wheel wash facilities.

3c. De-watering

You'll normally need to de-water the trench, valve pits and excavations for thrust blocks and anchor points during construction. As above, you'll need our permission to discharge this water to surface waters or groundwater and you may need some form of treatment such as a settlement lagoon or a grass plot to remove silt. If you carry out work in contaminated land, trench liquors will need chemical analysis before you decide how to dispose it. The water may need more specialised treatment or even disposal off-site by a specialist contractor. In all cases, you need to agree dewatering operations with us while you're planning your construction. See references 1 and 5.

3d. Concrete and cement

Water contaminated with cement is highly alkaline and can cause severe pollution. If you put concrete in, or close to, any watercourse, it must be controlled to minimise the risk of contaminated water reaching watercourses.

Effluent produced from washing out any concrete mixing plant or ready mix concrete lorries mustn't be allowed to flow into any drain, watercourse or to ground (groundwater). See references 1 and 5.

3e. Oil and chemical storage

Above ground tanks and any tank not wholly underground in England must comply with the Control of Pollution (Oil Storage) (England) Regulations 2001 (OSR); in Wales we expect similar standards.

Detailed guidelines for above ground oil storage tanks is available from us see reference 6.

In summary:

- Any oil storage tank or oil stored in drums must be sited on an impervious base within a secondary containment system.
- No damp course should be provided in secondary containment walls and there must be no drainage outlet.

- The secondary containment must be capable of containing at least 110% of a single tank, 110% of the largest tank or 25% of the total tank volume for multiple tanks or 25% of the total drum volume.
- Any fill or draw-off pipes and sight gauges must be enclosed within the secondary containment. If the pipe isn't in the secondary containment, it must have a drip tray used during delivery. Any tank vent pipes should be directed downwards into the secondary containment.
- Mobile bowsers must also have secondary containment to avoid the risk of spills entering surface waters or groundwater and have a drip tray to prevent minor spills entering the ground. Vandalism and theft are frequently a problem, from construction sites so bowsers should be secured to prevent unauthorised access and stored within a security compound with an impermeable surface when not in use.

The storage of chemicals is not covered by the OSR but we strongly recommend that the same technical standards are applied. Further advice can be found at our website.

Keep a supply of sorbent materials at refuelling points appropriate for the volume of materials stored.

3f. Site sewage effluent disposal

You must provide a means to collect, treat and dispose of sewage effluent from site offices and accommodation. For more details, see our guidance reference 7.

If you're planning to discharge sewage effluent to either surface waters or to groundwater, you'll need a permit from us. You should apply for the permit at least 4 months in advance; see our website on how to apply.

3g. Waste management

We suggest you carry out a waste minimisation review and consider how to reduce the volume of waste you produce. This can reduce your raw material use and make your processes more efficient, saving you money and reducing your impact on the environment. The Waste and Resource Action Programme (WRAP) provides detailed advice on construction waste reduction and recycling.

Waste management is subject to strict control and we recommend that you check the government's Business Link website for up to date legal requirements and what you must do to comply with waste legislation.

You have a legal responsibility to make sure that you, store, transport and dispose of your business waste without harming the environment. This is called your Duty of Care. Everyone has a Duty of Care under the Environmental Protection Act 1990 to make sure that all waste is stored, transported and disposed of safely and legally and that it doesn't escape the control of the waste producer.

4. River crossings

River crossings pose a high risk of pollution. You should use techniques which avoid in-river work such as thrust bores and directional drilling where possible.

If you can't avoid in-river work, you'll need to take action to minimise the risk using oil sorbent booms and straw bales downstream, temporary over-pumping or diversion of flow.

Using machinery in the river can cause silt and oil pollution and will damage the river bed and banks. Concrete and cement are potentially highly polluting due to their alkaline nature, and release oils on shuttering should be contained; see reference 5 for further advice and guidance.

5. Pipeline commissioning

Pipeline testing and commissioning can potentially cause pollution if not carried out correctly. You should do initial pipeline tests using water or gas and not with product. If you plan to use

water from surface waters or groundwater, you may need an abstraction licence from us. If you will need more than 20m^3/d you should apply for the licence at least six months in advance.

If the pipeline needs to be cleaned before use with solvents, all product should be recovered and treated as hazardous waste; see the government on-line business advice and support service for advice.

Drinking water pipelines need to be sterilised before they're brought into service so you will need to neutralise any biocide used before it can be discharged to a watercourse. In some cases, the test water may have a low level of dissolved oxygen or may contain solids or oil and will need appropriate treatment before it's discharged, for example oxygenation. This activity may require a permit; please refer to our website for more information.

6. Operation

6a. Inspection and batching

Pipeline inspection gauges (pigs) are used for testing new pipes, for routine maintenance or for the batching of different products through the pipeline. They can be contaminated after use and, if removed for cleaning, should be stored in a contained area to prevent pollution. The effluent must be treated as hazardous waste or disposed of to the foul sewer with the permission of your local sewer provider.

6b. Failures and leakage

Depending on the product carried in your pipe and the operating pressure, a leak or failure could result in a significant pollution incident. Thousands of litres could be lost in a very short time. The design and operation of the pipeline must minimise the risk of failure. Automatic shutdown and isolation facilities should be installed and all systems monitored and properly maintained and tested. You should prepare emergency plans in consultation with us and the local emergency services. We recommend you run joint emergency exercises with all the main responders at regular intervals.

6c. Use of herbicides

If you need to use herbicides to control weeds for fire precaution and maintenance, you should only use non-persistent herbicides. You must have our permission before you use herbicides near a watercourse. The safe storage and appropriate disposal of waste herbicides must also be a consideration.

7. Contacting the Environment Agency

If you contact us early in your pipeline planning process, it can save you time and resources. Where you need an abstraction licence or an environmental permit from us, you should apply well in advance to avoid delays as it can take over 4 months to issue. Contact the Region where the majority of the work you're planning will be carried out or where your project management office is based. Call us on 03708 506 506 to find your local office.

Report any pollution incidents to us immediately on our Incident Hotline number 0800 80 70 60.

8. Emergencies

Make sure you write a pollution incident response plan for your pipeline. This may need to be different for the construction and operating phases. Detailed guidance on how to produce a plan is available in reference 8.

You should send a draft of your response plan to us and the Fire and Rescue Services (FRS) along your pipeline route as they will need to respond if you have an incident and may be able to suggest improvements. You should also make your final plan available to us, the FRS and any other responders identified in the plan e.g. local authority Emergency Planning Departments. The FRS will need supplies of pollution control equipment suitable for use with the products your pipeline carries. You may need to provide suitable equipment because an incident involving a pipeline leak could very quickly use up all the resources the FRS have available. Liaise with the

FRS and us to see where this equipment would be best located, if there is any other specialist equipment you may need for effective incident response and how it should be deployed. You will find more information on incident response references 9 and 10.

If you have a potentially polluting discharge, contain the material if possible and safe to do so. You should notify us immediately on the Incident Hotline number 0800 807060.

9. References

1. Working at construction and demolition sites: PPG6
2. Waste management – The Duty of care – A code of practice: ISBN 0-11-753210-X: The Stationery Office Tel 0171 873 9090
3. GP3 Groundwater protection: Principle and practice, parts 1 – 4
4. Environmental Handbook for civil engineering projects – Construction Phase CIRIA special publication 98. ISBN 0 86017 378X. Tel: 0171 222 8891 www.ciria.org
5. Works and maintenance in or near water: PPG 5
6. Above ground oil storage tanks: PPG2
7. Sewage disposal at sites where no foul sewer is available: PPG4
8. Incident response planning: PPG 21
9. Fire Service Manual Vol2 Fire Service Operations Environment Protection (Version 1 2008) the Stationery Office ISBN 978 0 11 341316 4
10. Dealing with spills: PPG 22

The Pollution Prevention Guidelines (PPGs) are available free by calling our enquiry line on 03708 506 506 or from our website www.environment-agency.gov.uk/ppg

Useful websites:

Linewatch, for advice on location and working near high pressure pipelines: www.linewatch.co.uk

Linsearch, for underground utilities search: www.linesearch.org

The government on-line business advice and support service:

- For England – Business Link www.businesslink.gov.uk
- For Wales - FS4B www.fs4b.wales.gov.uk

Waste and Resource Action Programme (WRAP) www.wrap.org.uk

Phone our Incident Hotline **0800 80 70 60** free to report any pollution incidents.

We welcome any questions or comments about this guidance, or suggestions on how we could improve it; please email us at pollution.prevention@environment-agency.gov.uk, phone us on 08708 506 506 or write to us at:

Environment Agency
99 Parkway Avenue
Sheffield
S9 4WG.

If you have any queries, call us on 08708 506 506, e-mail us at enquiries@environment-agency.gov.uk or write to the address above.