

## **Pollution Prevention: drinking water treatment and supply**

These guidelines are designed to minimise the risk of pollution of surface or groundwater from activities associated with water treatment and distribution, by setting out practices which will reduce the chance of incidents. Any process or operations not covered in these guidelines should be the subject of appropriate consultation to ensure this objective is achieved.

### **1. INTRODUCTION**

Under the Water Industry Act 1991 (S165(3)) a water undertaker must take all necessary steps to minimise pollution from any discharge. Some discharges from water supply operations require consent under Section 166 of the Water Industry Act, 1991. Other discharges of trade effluent to controlled waters will require the consent of the Agency under the Water Resources Act, 1991. For intermittent or one-off discharges prior notification or approval of the Agency may be appropriate. See Appendix 1 for details.

### **2. WATER TREATMENT WORKS**

#### **a. TRADE EFFLUENT**

The sludge produced during water treatment must be contained for treatment and disposal either on or off site. It must not be discharged to a watercourse. The volume of sludge can be reduced by dewatering using centrifuge or pressing equipment. However, the resultant liquors can be highly polluting and should be handled carefully. These liquors, supernatant water and washwaters may be pumped to the inlet for recirculation or disposed of safely to land, providing that groundwater contamination is avoided. In some cases, given adequate treatment, a discharge to controlled waters may be acceptable, subject to a consent from the Agency.

#### **b. CHEMICAL AND OIL STORAGE FACILITIES**

Chemicals used in water treatment are potentially dangerous to the environment and need careful handling and storage. Consideration should be given to the need to store chemicals and oil on water treatment works, particularly those with boreholes on site. There may be a lower risk of causing pollution to the source by only bringing materials on site when needed.

- i. Where it is safe to do so, liquids should be stored securely above ground. Bulk tanks and storage areas should be covered.
- ii. All liquid storage tanks, drums and containers should be situated within bunded areas constructed to contain a minimum of 110% of the tank capacity, in order to contain fully any spillage. Tanks should be clearly marked with their contents and volume and bund walls must not have drainage holes. Detailed guidance on above ground oil storage is available from the Agency (PPG2 – Reference 1).
- iii. Appropriately sized and constructed tanks or containers that will not leak or corrode should always be used and they should be inspected regularly.
- iv. Stand-by generators and their associated oil storage tanks and pipework should be bunded and subject to regular inspection and testing to ensure their integrity, as should any temporary fuelling facilities.

#### **c. EMERGENCY PROVISIONS**

In view of the sensitive location of most water supply sites, the pollution risks should be assessed in co-operation with Agency staff and appropriate emergency procedures developed. The risk assessment should identify the route which spillage from storage and process areas would take, the consequences of worst case incidents and appropriate improvements where problems are identified. Stocks of adsorbent materials or spill kits should be held to deal with any chemical or oil on site and it is essential that staff are properly trained and carry out regular exercises to test the effectiveness of the procedures. Where possible valves should be fitted to allow the isolation of site drainage or the diversion of flows to a holding tank.

### **3. WATER MAINS**

Water mains themselves do not normally pose a risk of pollution. However, there is a potential for pollution during their construction, maintenance, repair or relining. Special precautions will be required near watercourses and ecologically sensitive habitats. Specific guidance on working in or near rivers is available from the Environment Agency (PPG5 – Reference 2)

#### **a. STERILISATION**

When new mains are installed or a water main is repaired or relined, it is normal practice to ensure sterilisation of the pipeline using superchlorination. This water must be dechlorinated prior to being discharged if the effluent is to pass to a watercourse. Before any discharge is made to a watercourse the Agency should be notified and the appropriate approval sought.

#### **b. PERMETHRIN DOSING**

Occasionally, due to infestation of water mains with insects, dosing with permethrin is carried out. This material is highly toxic to fish and its discharge must be carefully controlled and may only occur with the consent of the Agency. The permethrin concentration must not exceed 10ng/l in 95% of all samples taken from the receiving watercourse. This applies for discharges made directly to the watercourse or via a sewage works. See Reference 3 for details

#### **c. CLEANING**

A number of techniques are in use for mains cleaning. These include air scouring, swabbing, sponging and water jetting. See 3a. above for discharge requirements.

#### **d. SCRAPING AND RELINING**

The waste produced during scraping and relining is highly polluting and should not be discharged to a watercourse or surface water sewer. It should be contained for removal by an authorised waste disposal contractor or disposed of to the foul sewer with the prior approval of the sewerage undertaker. If cement relining has been carried out, pH adjustment may be required. Where possible, such water should be returned to supply or discharged onto land or to the foul sewer. Relining with epoxy resin can produce wash-waters containing solvents, which should be disposed of according to the toxicity of the chemicals involved.

#### **e. DEWATERING**

Dewatering water from excavations may contain high levels of suspended solids and as such may be unsuitable for direct discharge to a watercourse. Where possible such water should be discharged onto land or to the foul sewer. If a discharge to a surface water sewer or watercourse is unavoidable, the Agency should be notified and the appropriate approval sought. In these circumstances adequately sized settlement lagoons will be required and the discharge should be carefully monitored to ensure pollution does not occur. Similar provisions will also apply where well point techniques are used for the lowering of the water table prior to excavation.

#### **f. MICROTUNNELING**

Microtunneling operations may use Bentonite or other drilling muds. The effluent produced contains very high levels of suspended solids and additives from the drilling materials. This must not be discharged directly to watercourse (See 3.d for disposal details).

### **4. WASHOUTS AND HYDRANTS**

Where possible, washout points should be sited so that water can be discharged overland, to the foul sewer or to a site where pre-treatment can be carried out. A consent to discharge may be required and notice should be given to the Agency of the intention to discharge to any watercourse.

## **5. SERVICE RESERVOIRS**

The draining down and cleaning of service reservoirs can cause difficulties due to rapid increases in flow in small streams, resulting in scouring of the bed and banks and consequential unacceptably high levels of suspended solids. The presence of chlorine and high levels of ochreous solids in the final wash out may also cause pollution. In some cases a consent to discharge may be appropriate. However, the Agency should always be notified in advance of such activities and a rate of discharge agreed. It should be noted that a restriction in the rate of discharge will lengthen the draindown time and this will need to be taken into account in work schedules. Early consultation with the Environment Agency is therefore recommended.

### **a. CLEANING**

Cleaning of service reservoirs was traditionally carried out using chlorinated water and brushes. High pressure hoses, stabilised hydrogen peroxide and specialist acid mixtures are now more widespread. They are all designed to improve the removal of bacterial deposits, some of which may contain high levels of manganese and iron. Such effluent is not suitable for discharge to a watercourse and should be collected and removed from site by a licensed contractor or discharged to the foul sewer.

### **b. STERILISATION**

When a service reservoir is to be brought into use or recommissioned, it is normal practice to sterilise it using superchlorination. This water must be dechlorinated prior to being discharged if the effluent is to pass to a watercourse. An additional problem related to high pH can occur where new concrete structures are involved and pH adjustment may be required for discharges passing to watercourse. Where possible, such water should be discharged onto land or to the foul sewer. Before any discharge is made to a watercourse the Agency should be notified and the appropriate approval sought.

### **c. DRAINDOWN**

The waste produced during the final draindown and cleaning can be highly polluting and should not be discharged to a watercourse or surface water sewer. It should be contained for removal by an authorised waste disposal contractor or disposed of to the foul sewer with the approval of the sewerage undertaker.

## **6. BOREHOLES**

Clearance and test pumping of new or rehabilitated boreholes can result in a discharge containing initially very high levels of suspended solids and/or chlorides. This water should be pumped overland rather than directly to watercourse. The Agency should be notified of such activity and the appropriate approval sought.

## **7. GENERAL**

Early consultation with the Environment Agency is essential before construction of water treatment works, service reservoirs or mains route planning. In general, consent under the Water Resources Act 1991 or the Water Industry Act 1991 is required for all discharges.

## **8. REFERENCES**

1. PPG2: Above ground oil storage tanks: Environment Agency
2. PPG5: Working in or near watercourses: Environment Agency
3. Substances, Products & Processes Approved for use in connection with the supply of water for drinking etc Dec 1992DWI/DOE/WO
4. AMP2 Guidelines for Water Treatment Works: Environment Agency

## Appendix 1

<b>ACTIVITY</b>	<b>CONSENT REQUIREMENT</b>	<b>DETERMINATION PERIOD</b>
One-off discharge from pipes less than 229mm diameter	Not Required W I Act 1991 S165/166	Not applicable See Notes 1 & 3
One-off discharges from pipes greater than 229mm diameter	Required W I Act 1991 S165/166	7 Days If not, deemed granted See Note 2
Planned discharge from pipes less than 229mm diameter	Not Required W I Act 1991 S165/166	Not applicable See Note 3
Planned discharge from pipes greater than 229mm diameter	Required W I Act 1991 S165/166	3 Months If not deemed refused
Fixed plant ie Water treatment plant, reservoir	Water Resources Act consent	4 months

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### Note 1

The undertaker must take all necessary steps to ensure the water discharged is as free as may be reasonably practical from:

- a. mud and silt
- b. solid, polluting or injurious substances
- c. any substances prejudicial to fish or spawn, or to the spawning beds or food of fish

Failure to do so is an offence.

### Note 2

A consent is not required in the event of an emergency discharge. Notice must be served on the Agency as soon as is practicable stating:

- a. that the discharge has been made
- b. such particulars of the discharge and the emergency as the persons served with the notice may reasonably require

### Note 3

For discharges from pipes of less than 229mm prior notification to the Agency cannot be insisted upon. Nevertheless, it is reasonable to expect WSPLC's to advise the Agency as a matter of courtesy where such discharges are pre-planned, to ensure that appropriate consultation occurs to minimise the risk of environmental damage from such discharges.