TRADE WASTE INFORMATION SHEET

29. PUMPED SEWAGE

Background

Sewage stored for periods in a privately owned pump well or rising main is susceptible to rapid depletion of oxygen, thus becoming anaerobic. Anaerobic waste is defined as waste containing less than 1mg/litre of dissolved oxygen and is corrosive and damaging to the network mains. Anaerobic waste may also cause unpleasant and unwanted odours to be emitted from network vents. For these reasons, domestic sewage is deemed to be trade-waste once it is pumped or detained in a pit or well.

Waste becomes anaerobic due to bacteria feeding on nutrients in the waste and using up the available dissolved oxygen. Once this occurs bacteria scavenge oxygen from other sources including sulphur compounds. This process liberates the sulphur and allows the formation of hydrogen sulphide gas (H2S), which is given off to the surrounding air. A concentration of H2S greater than 10ppm in air may present an occupational health and safety hazard. High levels can be fatal. H2S can also oxidise to form sulphuric acid and cause corrosion, particularly to the concrete structures such as pipes and manholes.

Design

Persons making application to discharge pumped sewage from a privately owned pumpwell to the network must demonstrate that the various elements of the designed pumped sewage system will not contribute to the discharge of anaerobic waste. The dilution of pumped sewage using drinking water is not permitted as a means of meeting the acceptance limits.

Sewage should be detained in the pump well and rising main for the minimum practicable time possible. The detention of fresh sewage for a period of up to two hours should not present a problem.

However, for trade-waste and sewage with low oxygen content or at elevated temperatures, problems may develop even with detention times of less than one hour.

Designers should bear in mind that the waste from fixtures accepting human waste such as toilets and urinals, food waste such as kitchen sinks and dishwashers or some trade-waste discharges will be susceptible to becoming anaerobic. By comparison condensate or wastewater from fixtures such as cooling towers, boilers, silt traps in car parks and garbage compounds etc. has less chance of becoming anaerobic. Parameters on which the generation of H2S depends include:

- Temperature
- Biochemical oxygen demand (BOD)
- Sulphate availability
- Detention time in the pump well and rising main
- Velocity and turbulence conditions
- pH
- Ventilation within the collection system and pump well.

Some measures that may be employed to avoid the discharge of anaerobic waste include:

- reducing the quantity of sewage discharging to the pump well
- restricting the type of fixtures discharging to the pump well
- reducing the volume contained in the rising main
- reducing the length of time wastewater is detained in the pump well and rising main
- reducing the volume of wastewater remaining in the pump well following a pumping phase
- ensuring a slime stripping velocity (at least 1m/sec) of flow through the rising main
- flushing the pump well and rising main with clean or relatively clean water
- aerating the wastewater in the pump well and/or rising main
- chemical dosing of the wastewater in the pump well and/or rising main with oxidising agents such as hydrogen peroxide, chlorine or other proprietary sewage conditioning agents.

Innovative designs such as using recycled and/or rainwater to flush pump systems rather than drinking water from the network are encouraged. For example, the wastewater from a large cooling tower plant could be collected and used to flush the pump system.

Assessment

The various elements of the design should be compiled in a list and attached to the application along with details and dimensions for the approving officer to make a proper assessment of the proposed system.

The application should at least detail the following information:

- the rising main dimensions and volume;
- the designed velocity and flow rate of the rising main and pump combination;
- the volume of wastewater that will remain in the pump well following a pumping phase;
- the volume of wastewater that will be contained in the pump well when the pumps switch on;
- the maximum period likely to occur between pumping phases (provide reasoning).

Approval

WRC will not approve designs for pump systems but will accept the waste from systems that are capable of meeting our acceptance criteria. Designs that demonstrate a capability of meeting our acceptance criteria will be exempt from a formal testing program. However, we reserve the right to take samples from time to time to test the discharge for compliance. Failure to meet acceptance criteria will result in a re-evaluation of the trade-waste agreement.

Where the applicant cannot demonstrate that the installation will prevent the discharge of anaerobic waste, the acceptance of the waste will be conditional to an agreed sampling and testing program to ensure that the waste is compliant.

In all cases it is the customer's responsibility to ensure that their pump systems are designed, operated and maintained to ensure that anaerobic waste is not discharged to our network.

Trade-waste agreements

All customers wishing to discharge domestic sewage or trade-waste from a pumped system must enter into a trade-waste agreement with us. The terms and conditions of trade-waste agreements depend upon the nature of the discharge and the ability of the customer to pre-treat and/or control the discharge. We recommend that the customer consult with our trade-waste representative early in the design process to ensure that the project is not delayed. We are not responsible for costs incurred or disruption resulting from the failure of the customer or their agent to provide adequate information about the discharge.