



All photographs courtesy of Corinne de Kock

An investigation by the Department of Water Affairs & Forestry (DWAF) has uncovered a ticking health time-bomb in the Free State as dozens of mismanaged sewage treatment systems are discharging disease-causing pollutants into the surrounding environment.

Lani Holtzhausen reports.

In the Free State, a significant proportion of the municipal wastewater systems are pond based (60), with some 47 using so-called waste stabilisation ponds alone. These are usually located in the smaller towns, several of which still use bucket sanitation.

Waste stabilisation ponds, known locally as oxidation ponds, are internationally accepted low unit cost wastewater treatment systems suited especially to smaller communities. The ponds are large shallow basins enclosed by earthen embankments wherein the raw sewage is treated by entirely natural processes involving bacteria and algae. Such a

wastewater treatment system would consist of several ponds. The ponds are closed systems and according to South African laws are not allowed to discharge into the environment.

HEALTH HAZARD

Recently, complaints from communities living close to some of these systems prompted DWAF to investigate the state of these systems in the Free State. What they uncovered is quite disconcerting. More than half of the 47 systems are illegally discharging disease-carrying water into the environment, either the open veldt or nearby streams and rivers. This was revealed at the EnviroWater

conference, held in Stellenbosch in February. In addition, 13% of the ponds are used for irrigation, in many cases, illegally.

DWAF water pollution control officer Corinne de Kock told delegates that grab samples collected at the final ponds revealed that the water would definitely have an impact on human health as all of the samples tested for faecal coliforms exceeded maximum allowable South African standards. In addition, 66% of the samples tested for ammonia exceeded the maximum allowable standards of 2 mg/l while levels of up to 170 mg/l of nitrate were measured. "It is clear that in many instances, these pond systems

are an unacceptable risk to human life and the environment,” said De Kock.

DISREGARD TO MAINTENANCE

In all of the cases, no fault could be found with the design of the systems. In fact, 70% of the pond systems were found to be well designed. Rather the poor water quality and poor state of the systems stemmed mainly from poor operation and maintenance as well as poor community awareness.

“In the worst cases, trucks merely dumped raw sewage, mostly the contents of the sanitation buckets, into the ponds and drove away. There were no operators on site, and no fencing or secure access, allowing free access to the ponds.”

This while oxidation pond systems are not traditionally difficult to operate and maintain. “It is quite simple really. Screenings both at the inlet and within the ponds need to be cleared and then either burned or taken to an appropriate dumping site. In addition, vegetation needs to be cleared from the embankments,” explained De Kock. “On-site operators need protective clothing and, most importantly, the systems have to be fenced off to prevent nearby communities from close contact with the ponds.”

In many cases, however, this was not the case. While there are exemplary pond systems, maintenance was sorely lacking in many cases. “In the worst cases, trucks merely dumped raw sewage, mostly the contents of the sanitation buckets, into the ponds



When maintained properly oxidation ponds are acceptable low unit cost ways of treating domestic sewage.

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People were found walking on the embankments, while children played in the water. Animals, like cattle were found to be deliberately kept on some of the sites to graze and drink. Most communities were not aware of the potential hazard of these systems.

In the cases where there were operators, they were poorly resourced in terms of operational equipment and the necessary protective clothing. One operator was found clearing screenings from the ponds with his bare hands. Furthermore, operator facilities were sorely lacking at most pond sites.

“This assessment has shown that while waste stabilisation ponds play a very important role and appropriate waste treatment function in the Free State, they are in many instances failing in their primary objective of effective abatement of environmental pollution,” said De Kock. “In fact, some of these systems



An investigation of oxidation ponds in the Free State has revealed that more than half are illegally discharging disease-carrying water into the environment.

are ticking health time-bombs. They are endangering surface water and groundwater resources on which many people depend for drinking water. In some water-scarce areas the communities are dependent on one or two boreholes. It is the only water they have got.”

“In many cases, the managers of the local authorities in question either seemed unaware of the problems or apathetic. There seems to be a severe lack of capacity and finances to deal with these issues.”

Will anything be done to rectify the situation? “In many cases, the managers of the local authorities in question either seemed unaware of the problems or apathetic. There seems to be a severe lack of capacity and finances to deal with these issues,” noted De Kock. Some local authorities told the investigating team that they were waiting to upgrade to conventional sewage treatment systems. “However, if they cannot even manage a supposedly simple system, how will they manage a more complex one?” asks De Kock.

DWAF has offered its assistance to the municipalities in question in an effort to rectify the situation. A basic operations and maintenance manual for oxidation systems has also been compiled to assist municipalities in this regard.

Top right: Animals, like cattle, were found to be deliberately kept on some of the sites to graze and drink.

Middle right: All of the pond samples tested for faecal coliforms exceeded maximum allowable South African standards.

Bottom right: At the sites where there were operators they were often poorly resourced in terms of operational equipment and the necessary protective clothing. This operator was found cleaning the scum of the ponds with his bare hands. 🛠️

