HEALTH RISKS OF MICROBES AND CHEMICALS IN SEWAGE SLUDGE APPLIED TO LAND — RECOMMENDATIONS TO THE WORLD HEALTH ORGANISATION

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SUMMARY

The paper summarises the findings of two WHO Advisory Working Groups. These were convened to make recommendations on the risks of pathogens and chemicals present in the sewage sludges applied to land. Whilst the Groups did not favour universal operational guidance and criteria, they identified the main features of concern and made recommendations on the main points which should be taken into account when deriving guidance on safe practices. The Groups also gave some consideration to further work which is needed to develop criteria which are available now.

1. INTRODUCTION

In 1981 and 1984 the Regional Office for Europe World Health Organisation (WHO) convened two Advisory Working Groups to discuss and report on the risk of sewage sludge applied to land. One dealt with the risks of pathogens, and the other dealt with the risk of chemicals present in sludge. In both instances the Working Groups drew heavily on European and North American experiences. This paper summarises the main elements of the two reports.

Providing adequate sanitary facilities is a major responsibility facing communities throughout the world. Hence the WHO has a legitimate and extensive role in providing support and guidance on sewage treatment as an important contribution to the good health of Europe and the rest of the world.
As communities shift in balance from being predominantly rural to being predominantly urban and as social expectations rise, the principal method of dealing with human wastes shifts from essentially domestic, such as privvies and septic tanks, to municipal in which the water-borne wastes are taken away in sewers and treated. The last two or three decades has seen massive investment in sewage treatment facilities in many countries and hence sludge production has risen rapidly; further increases in many countries are still expected.

In Western Europe, current annual production is about 5.5 million tonnes (expressed as dry solids) and this is expected to rise by about 25-50% (EWPCA 1984). In the USA, the flow receiving at least primary sedimentation treatment will rise from 133.4 x 10^3 m^3/d in 1982 to 161.5 x 10^3 m^3/d in 2000 and the volumes receiving only primary treatment will fall from 11.5 x 10^3 m^3/d to 0.8 10^3 m^3/d (US EPA 1983). In Japan, it was estimated that sludge production for disposal would rise from 0.9M dry tonnes in 1980/81 to 1.56M dry tonnes in 1985 (Kurihara 1981).

The safe and economic disposal of these sludges constitutes a problem which is being given urgent attention by many countries. National policies are being developed. The principal options available are agricultural utilisation, marine dispersal, landfill and incineration. The WHO Working Groups were charged with consideration of agricultural utilisation and similar disposal methods, such as use on vegetable plots and gardens.

In disposing of a sludge, all the available disposal and environmental options should be considered. After taking account of any statutory limitations and necessary measures to protect public health and the environment by using differing forms of environmental impact analysis, each option is appraised economically. The cheapest option should then be selected. This approach is known as the "best practicable environmental option". In doing the economic appraisal, the short and long-term costs and benefits should be evaluated.

At the present time the often-made decision to use a particular sludge as a fertiliser or soil conditioner is usually determined within national policies, on the basis that by reference to criteria for safe disposal it is the most economically feasible method of dispersal. The available low cost options of landfill and marine dispersal may not be available for a particular sludge due to geographical factors or specific policies which preclude their use. Although incineration is expensive and destroys what could be a valuable resource, it may be necessary if local conditions prohibit the application of sludge to land.

Sludge may be treated prior to disposal in order to reduce disposal costs and to render it more suitable for disposal. Hence, the choice of treatment, if at all, depends on acceptability of the product and economics.