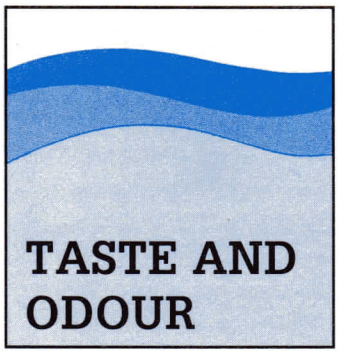


increased relative to pigment content.

The effect of inhibitors of the intermediate stages in the synthetic pathway were also investigated to assess the regulation of geosmin production in relation to pigment synthesis. Geosmin seemed to function as an overflow metabolite.

Due to only modest changes in geosmin production per dry weight, compared to changes in biomass levels during light-limited or nutrient-limited growth, contamination of eutrophic fresh waters with geosmin appears to depend mainly on the species present and its biomass level, and only to a limited extent on nutrient enhanced synthesis.

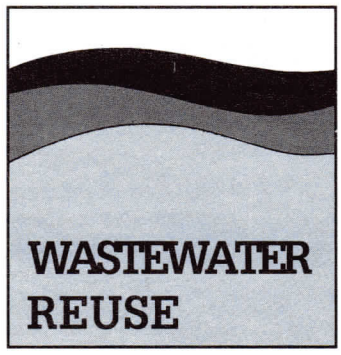
Aldehydes spoil spring thaw

Potent odour-causing chemicals arising from drinking water disinfection, by Steve Hrudley, Alina Gac & Susan A Daignault, Environmental Engineering & Sciences, Department of Civil Engineering, University of Edmonton, Alberta, Canada.

Circumstantial observations on transient but bad odours and tastes during the spring thaw in Edmonton, Canada, suggested that a group of low molecular weight aldehydes may have been to blame. The literature indicated that these compounds had low detection thresholds and, as such, should have been readily detected in water supplies. The literature also suggested that some common amino acids could have provided the precursor for the aldehydes by reaction with oxidants used for disinfection.

Experiments confirm the ability of chlorine and chloramines to produce the odourous aldehydes. Unfortunately, no data was collected at the time to determine amino acids concentrations in the raw water.

However, a single sample of treated water at the time of the peak odour intensity showed a total Kjehldahl nitrogen of 1.45 mg/l, which is abnormally high for the North Saskatchewan River. The nature of the rural runoff would also be expected to rich in amino acids. Amino acids concentration of 2µg/l-400µg/l have been found in French water treatment plants. These concentrations, would be enough to produce odour problems



Wastewater reuse cuts down waste

Global water consumption is rising rapidly, making wastewater reclamation and reuse increasingly important in developing and industrialised countries. This trend has led to the establishment of a new IAWPRC specialist group which will be inaugurated at the 14th Biennial Conference, Brighton, England, in July. This article by Professor Takashi Asano, California State Water Resources Board, sets the scene.

AVAILABILITY OF high quality effluents, increasing fresh water costs, the need for comprehensive water resource planning, and avoidance of stringent water pollution control requirements are the important motivations for wastewater reclamation and reuse projects (RR) in industrialised countries.

The drive for RR is reinforced by water shortages occurring in various parts of the world for different reasons, including drought, contamination of well fields. Probably the main cause of water shortage is uneven distribution of people. Continued population in semi-arid and arid regions of the world has forced water suppliers into more difficult development.

To meet the demands caused by contamination, drought and population growth, water suppliers are faced with three

New group born in Brighton

The new IAWPRC specialist group on wastewater reclamation and reuse (RR) was proposed at the last Brazil biennial conference in 1986. The group was approved by the Executive Committee at its meeting in Portugal the following year.

The following objectives were established for the group in consultation with many individuals in the field:

- To study wastewater RR technologies, reliability and appropriate technologies for industrial and developing countries
- To study quality requirements and health considerations associated with non-potable and potable reuse
- To identify research needs for the future implementation of water reuse including water reclamation technologies and analytical and toxicological monitoring techniques
- To exchange information and to develop international technology transfer related to the above subjects.

More than 60 people from over 20 countries are in the group, which will hold its inaugural meeting at 2 o'clock in the afternoon of 19 July 1988 in the Lancaster room of the Brighton Metropole hotel during the 14th Biennial Conference.

Agenda for the inaugural meeting includes the election of management committee members, discussion of a proposed one day seminar on wastewater reuse at the 15th Biennial Conference in Kyoto, Japan, and a specialised conference on RR in 1991 either in Israel or Spain.

major tasks. They have to develop new sources, protect existing ones and implement conservation measures such as RR.

RR is the process of making wastewater usable again for a number of applications. It implies the existence of a pipe or other conveyance for delivering reclaimed water to the point of use. Indirect reuse through discharge into rivers and withdrawal downstream is important, but does not fall into the RR category. Nor does wastewater recycling, which normally involves only one use with the effluent being captured and sent back into the system.

General factors affecting reuse decisions include existing water supply conditions and the quality requirements of the intended use. Also influential are the existing or planned wastewater treatment plants and the degrees of process reliability. Potential health risk mitigation and public acceptability are important too, as are the financial aspects of reuse facilities.

A wastewater RR scheme may be justified on the basis of the cheapest alternative to water pollution control projects. But much of the effort in RR is focused on market assessment or actual marketing of the reclaimed water. Planning for RR should include a preliminary market assessment followed by a detailed analysis. There should also be engineering and economic analyses, all followed by an implementation plan.

These steps should result in the development of a recommended facilities plan for a given RR project. They should also address the following questions:

- What are the suitable local effluent sources?
- What are the local reuse markets?
- What are the health risks and how can they be mitigated?
- How would reuse fit in with other regional water resources?
- What are the relevant existing or proposed laws?
- What local or central government agencies need to review and approve the RR scheme?
- What are the legal liabilities of selling reuse water?
- What sources of project funding are available?

- What RR project would attract public interest and support?

Municipal wastewater must receive treatment before it can be used for agriculture or landscaping. Treatment is necessary to protect public health, and to prevent nuisance during storage and damage to crops. The degree of treatment is an important factor in the planning, design and management of wastewater treatment systems. Treatment and process reliability will depend on the categories of planned reuse. These include landscaping, industrial processes and cooling, groundwater recharge, impounding for recreational use, streamflow augmentation and direct potable use.

Regulatory agencies often require wastewater earmarked for irrigation to be treated to a level suitable for discharge to receiving waters, or less. Additional treatment to remove wastewater constituents that may be toxic or harmful to certain crops is technically possible, but normally cannot be justified economically. Crops must be carefully selected to tolerate harmful constituents, and the system should be managed to mitigate harmful effects.