

DISCUSSION OF "Ground-Water Pollution of the Madras Urban Aquifer, India," by M. V. Somasundaram, G. Ravindran, and J. H. Tellam, January-February 1993 issue, v. 31, no. 1, pp. 4-11

by *Thangadurai P. Clement, Department of Civil Engineering, Auburn University, Auburn, AL 36849*

Somasundaram et al. (1993) present an excellent comprehensive study on the status of ground-water pollution in the Madras urban aquifer, India. Their study clearly points out the immediate need for enforcing ground-water legislation in developing countries like India. Though their survey is comprehensive and extensive in terms of metal pollution and conventional-pollution parameters (such as BOD, TDS, NO_3 , etc.), it will be worthwhile to extend this study to assess the organic chemical contamination. Several industrial activities and underground storage tanks in and around Madras city have grossly polluted its shallow ground-water table with chemical contaminants. Residential areas within Madras city use this shallow unconfined ground water for drinking water. Consequently, a detailed assessment of organic chemical contamination in ground water would be useful in expediting governmental regulations on storage facilities, which could prevent further deterioration of the ground water.

The purpose of this discussion is to point out the importance of monitoring and regulating organic chemical contaminants in the Madras urban aquifer, based on a preliminary site survey done on an abandoned petroleum products storage site in Royapuram area in Madras. The Royapuram area is located in the northern part of Madras city. The northern part of the Madras metropolitan area began to develop a century ago and is used for both industrial and residential purposes. Figure 1 shows approximate site location in the Royapuram area. About 30 years ago this petrochemical storage site was closed, and within a few years this area was sold to private owners as residential plots. Most of the people who live in this area own a small scale industrial unit to process various food grains. Presently, ground water in this area is grossly contaminated with petrochemical products due to the spills and leaks from past storage activities. As pointed out in Somasundaram et al.'s (1993) study, due to insufficient municipal water supply, residents in this area have been using this contaminated ground water for drinking as well as for processing food grains for the past 20 years. A preliminary survey done in the area showed a strong petrochemical odor problem in the ground water (personal observations). The residents have also reported observing physical separation of oil products from the ground water in recent years. Over time, contaminants must have been dissolved and then advected by the ground water and diffused into a larger area, hence the physical presence of oil has not been observed lately. Preliminary analysis of a recent ground-water sample indicated presence of BETX compounds, which shows probable oil pollution in the ground water. Further detailed survey is needed in this area to identify all the chemical pollutants, the extent of pollution, and the sources of pollution.

Organic pollution due to oil and chemical spills is severely detrimental to health. There are important health effects

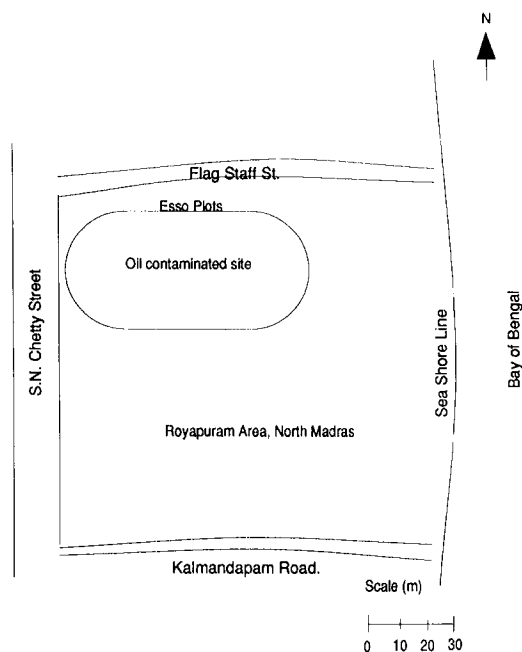


Fig. 1. Site location.

related to drinking water contaminated by organic compounds. In this particular site, contaminated ground water has been used for several years for drinking and for processing food grains. Organic contaminants can cause cancer and other major health problems including liver damage, impairment of cardiovascular functions, depression of the nervous system, brain disorders, and various kinds of lesions (Craun, 1984). Further, there is clearly a lack of information about the combined chronic effects of various organic chemicals on the health of epidemiology population consuming water contaminated by organic chemicals. The site discussed in this note may be used as a potential location for further studying the health impacts of petrochemical contaminants.

Madras, India is a typical urban area in a developing country where there are absolutely no regulations on ground water, in spite of its use as drinking water. Since there are no ground-water monitoring requirements, the public is not informed of leaks from underground storage facilities in industrial areas and/or petrol (gas)/diesel pumping stations. Unless there is an immediate enforcement of ground-water protection laws, the entire ground-water resource within the urban area might be irreversibly damaged. Though ground-water laws will pose short-term economic burdens on industries, they will save a precious resource for future generations. Moreover, if ignored, the amount of resources needed to remediate contaminated aquifers will be several times the present monitoring and prevention costs, as in several ground-water remediation projects in developed countries. Organic pollution due to oil spills and chemical wastes is not a problem confined to Madras city; rather, several major industrial areas and cities in developing countries are confronted with this problem. Hence, strict ground-water legislation is required in developing countries to prevent further deterioration of ground water, an invaluable resource.

References

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