

Public Health Risks Recklessly Ignored by the Marin Municipal Water District Desalination Plan

The board and staff of the MMWD is committed to a massively expensive corporate driven plan to build a Bay water reverse osmosis desalination (BWRO) plant. In order to show the safety of this reverse osmosis technology a very small scale "pilot plant" was run near the proposed full scale Bay site. This was run for a relatively short period of time. The heavily contaminated, and polluted Bay source water was then tested post reverse osmosis treatment for levels of various chemicals and heavy metals. There was no testing for biologic contaminants. This way of testing for the public health safety, to reassure the public, totally fails to replicate what always happens when a full scale large reverse osmosis desalination plants will operate over a 40 year life expectancy period sucking up Bay water.

The following peer reviewed references document the frequent unpredictable failures of the reverse osmosis membranes that will be the heart of the operating system of the proposed (BWRO). These factual evidence based findings show that all Marin County water users will thus be at increased risk for many chronic and acute diseases. The inevitable intermittent potable water contaminant exposures, and the long lag period before many of these diseases would become evident would mitigate against a fast public health detection of these water pollution induced diseases. Water consuming causation would not be easily accomplished.

1. C Sommariva, et al; Maximum economic design life for desalination plant; the role of auxiliary equipment materials selection and specification in plant reliability. Desalination 153 (2002)199-205

This paper shows in table 3 page 203 that the most frequent cause of failure in these existing plants are membrane failures.

2. E.W.F. de Roever et al; Microscopy as a tool for analysis of membrane failure and fouling. Desalination 207 (2007) 35-44

This paper documents through environmental scanning electron microscopy (SEM) how the process of membrane fouling hampers membrane cleaning, and how sharp particles that are pressed into the micro-ridges caused membrane fissure gaps up to 0.2 mm long. This would have very serious implications for leaks of highly toxic chemical/heavy metal molecules as well as bacterial, viral/ recombinant DNA microscopic particles.

3. J.N. Willard; Identification of surface chemical functional groups correlated to failure of reverse osmosis polymeric membranes. Microscopic Microanalysis 13(Suppl 2), (2007).

This paper details some of the mineral salts, and chemicals responsible for reverse osmosis membrane failures.

4. Development of reverse osmosis desalination membrane composition and configuration: future prospects

This paper discusses how the reverse osmosis membranes might be improved to mitigate against the existing plant frequent failures. Desalination 153 (2003) 295-304

Conclusion

Using the southern Marin County Bay waters as a source of treated potable water is fraught with public risks due to the unreliable functioning of the reverse osmosis plastic membranes manufactured by Dow. The pilot plant experiment conducted by the

MMWD has not adequately replicated the water pollution risks that will occur with a 40 year full scale 5 to 15 million gallons/day BWRO plant.

The well documented public health Bay water/sediment hazards are mainly chemical (e.g. dioxins, pcb's, brominated flame retardants, furans, bunker oil spill products, phenolic ethoxylate detergents, pharmaceuticals, pesticides, and many other toxic molecular combinations from Bay industries, toxic land fills, dredging and road runoff), and heavy metal pollution (e.g. mercury).

A significant biologic hazard exists in the waters of the southern Marin Bay. Frequent raw sewerage spills occur. 6,723 million gallons of partially treated, or totally untreated sewerage spills occurred in 2008. These spills contain parasitic, bacterial, viral, and DNA virulent pathologic microscopic particles that will pass through these frequently failed defective reverse osmosis membranes.

Proceeding with the construction of this reverse osmosis plan without an adequate testing program constitutes reckless public health endangerment.