

Chloroform Maximum Contaminant Levels for Polluted Groundwaters

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It has been found that a significant error is being made by environmental consultants, PRP's for groundwater quality remediation projects and regulatory agencies in stating the MCL (maximum contaminant level) for chloroform in polluted groundwaters. Contrary to the statements made, there is no MCL for chloroform at either the state or federal level. This error is causing significant problems in properly investigating and potentially remediating chloroform polluted groundwaters. A specific instance of this error is occurring at the University of California, Davis West Landfill which has polluted the groundwaters in the vicinity of the landfill by chloroform that was placed in the landfill as a waste.

UCD and its consultants have developed documents which list the MCL for chloroform as 100 ug/L. For example, page 4-34 of the Revised Draft EIR for the UC Davis Landfill Expansion dated April 1995, states, "...the maximum contaminant level (MCL) for chloroform in drinking water is 100 ug/l." This statement was made even though the authors pointed out in their comments on the 1994 initial Draft EIR that 100 ug/L is not an appropriate standard to judge pollution of groundwaters by chloroform.

A similar error has repeatedly been made by Department of Energy (DOE) staff and consultants for the UCD - DOE LEHR national Superfund site. This site has extensive groundwater pollution due to chloroform. The regulatory agencies at the federal and state levels have not pointed out these errors where the PRP and its consultants were required to change documents that listed the chloroform MCL as 100 ug/L. For example, the DOE 1994 Annual Water Monitoring Report for the LEHR national Superfund site dated July 1995 states in the second paragraph of the executive summary, page xii, "*The chloroform concentrations reported at the site perimeter are lower than the MCL, but present.*" Further, Table 5.1 of this same report which was reviewed and approved by the US EPA, Cal EPA DTSC, and the Central Valley Regional Water Quality Control Board staff lists the MCL for chloroform as 100 ug/L.

It has been known since the late 1980's that chloroform was present at readily measurable amounts at the LEHR site perimeter which means that chloroform derived from waste disposal practices at the LEHR site has for many years been polluting groundwaters under adjacent properties. At this time, the full extent of the chloroform pollution plume that represents a hazard to those who utilize this water for domestic water supply purposes is unknown. This off-site chloroform pollution of groundwater was not considered significant until the error that has occurred in stating that the MCL for chloroform is 100 ug/L was pointed out by the authors this past summer.

Because of this type of situation which has been repeated each year for many years in DOE documents, the monitoring of nearby neighbors' wells for chloroform that has been conducted by UCD was discontinued because the concentrations apparently did not exceed or approach the "MCL." As a result of the authors finding this error, recently chloroform has again become one of the monitoring parameters for the nearby neighbors' wells monitored quarterly by UCD and DOE.

It remains to be seen whether the error that was made in establishing the so-called MCL for chloroform at 100 ug/L has led the off LEHR site public who utilize the groundwaters within the potential sphere of influence of the LEHR site groundwater pollution plume to be exposed to potentially hazardous levels of chloroform.

The origin of this error is that it was assumed that the MCL for total trihalomethanes is the MCL for chloroform. Those familiar with how the MCL for total trihalomethanes was developed understand that this is a value that is based on balancing the hazards of inadequate domestic water supply disinfection vs. the risk of a group of carcinogens.

The 100 ug/L value that is allowed for total trihalomethanes has a cancer risk of about one additional cancer in 10,000 people who consume 2 liters of water per day for 70 years. The total trihalomethane MCL risk is balanced against disinfection efficacy where it was decided in the early 1980's that the US EPA did not want water utilities cutting back on the efficacy of disinfection in order to keep the total trihalomethanes at lower levels.

In the case of the UCD West Landfill pollution of groundwaters, UCD - DOE LEHR national Superfund site and other similar situations, there is no balancing of disinfection vs. cancer risk. The pollution of the groundwaters by chloroform near the UCD West Landfill and at the LEHR national Superfund site was the result of inappropriate waste management practices in which chloroform was placed in a landfill as a waste. It has been known since the late 1950's, as discussed in the ASCE Sanitary Landfill manual and within the Central Valley Regional Water Quality Control Board, that chlorinated solvents such as chloroform represent a significant threat to groundwater pollution.

Many waste dischargers chose to ignore what was well-known in the environmental engineering, then called sanitary engineering, literature on the landfilling of wastes. This has led to substantial groundwater pollution around virtually all sanitary landfills. One of the pollutants of concern is chloroform. Waste dischargers, such as the University of California, Davis have been allowed by the Regional Board staff and Board to use chloroform concentrations of 100 ug/L in which this concentration is alleged to be the MCL for chloroform as part of the groundwater pollution investigation. Those familiar with drinking water MCL's for VOC's and the total THM MCL know that this is obviously a significant error and results in inadequate investigation of the groundwater pollution at sites where chloroform is a pollutant.

Rather than using a chloroform concentration of 100 ug/L in assessing the pollution of groundwaters by chloroform, what should be used is a risk-based clean-up objective

which corresponds to a cancer risk of one additional cancer in a million people who consume two liters per day for 70 years. This is the approach that is used for other chlorinated solvents, and for that matter, other constituents that are potential carcinogens. So long as these chemicals' cancer risk is regulated by this approach, chloroform should be regulated using the same approach. There is no justification to treat chloroform polluted groundwaters where the pollution arose from waste management practices differently than from pollution by the other chlorinated solvents which are also of concern for their potential to cause cancer in people.

This matter has been discussed with D. Spath, Chief of the Drinking Water Branch of the California Department of Health Services, who confirmed that the Department does not have a 100 ug/L "MCL" for chloroform. He indicated that, in his opinion, the appropriate approach for developing clean-up objectives for chloroform where chloroform has been disposed of as a waste is to establish a clean-up objective using the same risk-based approach as for other chlorinated solvents. According to the information that has been recently obtained, the appropriate risk-based polluted groundwater clean-up objective for chloroform is about 1 ug/L. This value is based on the latest estimates of the cancer potency of chloroform.

This issue is of importance with respect to the UCD West Landfill and UCD - DOE LEHR national Superfund site polluted groundwater clean-up programs. The size of the hazardous groundwater plume due to chloroform at these sites could be much larger than what has been reported. The work at these sites needs to focus on defining the extent of the chloroform plume down to less than 1 ug/L and proceed with cleaning up this plume to the maximum extent practicable which would certainly be no less than about 1 ug/L, i.e. the current risk-based value for chloroform.

Reference as: "Lee, G. F., 'Chloroform Maximum Contaminant Levels for Polluted Groundwaters,' Report to the Davis South Campus Superfund Oversight Committee, Davis, CA, October (1995)."