

Comments on DTSC's Proposed Hazardous Waste Classification Approach

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Dr. Jim Carlisle
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Dear Jim:

I wish to follow up on the DTSC Regulatory Structure Update (RSU) waste classification information meeting that was held on Friday, March 20, to bring to your attention copies of several papers which discuss the ability of organic solvents to pass through intact (no holes) flexible membrane liners of the type that are being used today in municipal landfills. At the meeting DTSC RSU staff indicated that permeation of solvents through HDPE liners would only occur with pure solvents. That statement is incorrect. It has been known for many years that organic solvents in dilute aqueous solutions can pass through an HDPE liner in a short period of time. My 1992 review, "Municipal Solid Waste Management in Lined, 'Dry Tomb' Landfills: A Technologically Flawed Approach for Protection of Groundwater Quality" which was sent to several members of your DTSC hazardous waste classification group discussed this problem. Enclosed are two papers,

Park, J.K., Sakti, J.P. and Hoopes, J.A. "Transport of Organic Compounds in Thermoplastic Geomembranes. I: Mathematical Model," *Journal of Environ. Engr.*, 122(9):800-806(1996).

Park, J.K., Sakti, J.P. and Hoopes, J.A., "Transport of Organic Compounds in Thermoplastic Geomembranes. II: Mass Flux Estimates and Practical Implications," *Journal of Environ. Engr.*, 122(9):807-813(1996)

by University of Wisconsin faculty members which demonstrates that permeation of solvents through liners readily occurs.

I have also enclosed a review paper by Buss et al. (1995) that discusses this issue as well. As I indicated in my comments in the meeting, regulatory agencies throughout the

country are ignoring this problem, not because it is not important, but because they do not know what to do about it. It is relatively easy to show that when a one gallon can of several solvents that can be purchased at a hardware or paint store when discarded in municipal solid waste, can when the container rusts out pass through the liner system within a few days and potentially pollute large amounts of groundwater above drinking water MCLs.

I have also enclosed a recently completed update of my 1992 flawed technology paper which discusses the fact that ultimately today's Subtitle D landfills will not prevent significant off site groundwater pollution. This discussion includes about 90 references of the literature pertinent to the flawed technology associated with "dry tomb" landfills. This paper will be presented this June in a national Air and Waste Management meeting and will be published in the proceedings of that meeting. It has been extensively peer reviewed prior to acceptance for publication.

I have previously indicated to you and other members of your group that I have significant problems with your proposed approach for estimating the potential for landfilled waste to pollute groundwaters for as long as the waste in the landfill represent a threat. The current Subtitle C and D landfills at best only postpone when groundwater pollution will occur. The waste in these landfills will be a threat effectively forever. The liner systems have finite periods of time during which they can be expected to function as an effective barrier to preventing leachate from passing out of the landfill into the underlying groundwater system. The groundwater monitoring systems that are used are highly unreliable in detecting leachate polluted groundwaters at the point of compliance before off site groundwater pollution occurs. There is growing consensus that Subtitle D "dry tomb" landfills is a flawed technology for protecting groundwater quality for as long as the waste in the landfill will be a threat. I find that the DTSC approach toward addressing liner leakage rates is unreliable. This area needs to be redone to more properly reflect the characteristics of the waste in an MSW landfill, the properties of the liner systems as well as the reliability of the groundwater monitoring systems.

Another area in which I have great difficulties with DTSC's proposed approach for hazardous waste classification is with respect to the incorporation of ecological factors in establishing whether a waste should be classified as a hazardous waste. I have repeatedly informed you that the past and current DTSC approach is not technically valid. I have worked in the impact of chemicals on water quality field for over 38 years. For 30 of these years I held university professorial positions where I taught graduate level environmental engineering and environmental science courses at several major US universities. The thrust of my teaching and research career has been on evaluating the water quality significance of chemical constituents in aquatic and terrestrial systems. I have also been active throughout this period in solid and hazardous waste management research and consulting. I have conducted over five million dollars in research on this topic and have published over 500 professional papers and reports based on this research and my work as an advisor to governmental agencies, industry, environmental groups and others.

One of the areas of particular concern in my work is the classification of waste with respect to whether they are "hazardous waste" or not. I plan as time permits to submit additional comments on the significant problems on DTSC's proposed approach for hazardous waste classification. With few exceptions my comments will be a repeat of what I have previously submitted to your group. The one area I wish to comment on at this time that is new is the proposed lowering of the critical concentration of lead in soils and sediments that become a waste to a lower threshold total concentration of 700 mg/kg. When I questioned the validity of this approach at the meeting, you indicated that this approach was based on information provided by some Oak Ridge group where they had found a report in the literature that soil lead above these concentrations was adverse to soil organisms. You indicated that you had not seen the original article but would send me the information developed by the Oak Ridge group that you used to conclude that a lead lower hazardous waste classification threshold of 700 mg/kg should be adopted in the state of California. Since I have not received this information I request again that it be sent to me. I also want to obtain a copy of the original paper which caused the Oak Ridge group to conclude that 700 mg/kg of lead in soils were adverse to soil organisms.

This area is of particular concern to me since it could readily mean that the state of California is becoming saddled with another technically invalid approach for regulating lead in contaminated soils. As you may recall from my previous comments, I have been concerned about soil lead public health and water quality issues since the late 1960's. I am also concerned about appropriate regulation of urban area and highway stormwater runoff. As I have indicated to you and other members of your group, Caltrans has been trapped into spending large amounts of public funds in cleaning out highway stormwater runoff conveyance structures because some of the sediments in these structures are classified as a hazardous waste based on the original DHS 1000 mg/kg for lead. The judge in a NRDC vs. Caltrans lawsuit stated in his opinion that since DHS had classified sediments or soils that become waste as a hazardous waste when the concentrations were above 1000 mg/kg that the L.A. area stormwater structure conveyance sediments with lead above this amount must be bad for Santa Monica Bay.

Until a week ago, I understood that DTSC was proceeding to correct the significant overregulation of soil lead that arises out of the 1000 mg/kg value. With the introduction of the proposed 700 mg/kg value, DTSC will be creating a massive economic burden on California that is likely unjustified. There are many urban area and near highway soils that contain lead above 700 mg/kg. Certainly before the 700 mg/kg value was proposed it should have been independently critically reviewed. Further, to my knowledge this is the first time any agency has proposed to classify a soil/sediment that becomes a waste as a hazardous waste based on impacts on soil organisms. There can be no doubt that there are many forms of lead in soils that are not adverse to soil organisms. There may be some forms of lead in soils that are adverse to some soil organisms at some locations. The ecological significance of such situations needs to be carefully evaluated in light of the tremendous economic burden that could develop from the state of California adopting 700 mg/kg lead in waste soils and sediments as a threshold value requiring special management.

During our discussions I mentioned that the US EPA had developed a guideline value for soil lead at Superfund sites that considers the potential for pregnant women to ingest dust in a home that was derived from soil that had entered the home from outdoors. At an ASTM Superfund Risk Assessment conference that was held last January, M Madiloni, a US EPA staff member from Region 2 (New York) presented a review of the US EPA report that was released in December 1996, "Recommendations of the Technical Review Workgroup for Lead for an Interim Approach to Assessing Risks Associated with Adult Exposures to Lead in Soil." This is a 36 page report that is available from the web at (http://www.epa.gov/oerrpage/superfund/web/oerr/ini_pro/lead/txtprods.htm). The US EPA report is a consensus report that was developed by representatives from each of the US EPA regions.

The bottom line from this report is that according to the US EPA, at Superfund sites, lead above about 750 mg/kg would be considered a threat to adults. The basis for this value is an empirical model that indicates that lead above about these concentrations can cause blood lead levels in women and fetuses above the 10 µg/dl, which is the critical value that the Center for Disease Control (CDC) has established for children. The issue of concern is not women eating dirt, per se, like children playing with dirt, but rather women who are exposed to dust in the household which contains lead above these levels. It is the US EPA's position that exterior soil lead at these concentrations can be carried into the house and lead to household dust which contains lead above critical levels for protection of fetuses.

This new information applies only to situations where women of child-bearing age (about age 13 through 40 +) could be exposed to dust containing lead above about 750 mg/kg. At this point, there is no evidence that adult males or females are directly impacted by lead except at very high concentrations above about 5,000 mg/kg.

Some parts of the country, such as the state of Georgia, are lowering the lead clean-up values for Superfund sites to about 250 mg/kg dependent on the drinking water lead concentration of a region. Georgia is attempting to compensate for lead derived from drinking water adding to the lead derived from soil or dust. The 250 mg/kg value would be for a water that meets the drinking water standard (action level) of 15 µg/L. If the lead concentration of drinking water in an area of concern is less, then the soils can have higher lead. The US EPA staff feels that this is an over-compensation for drinking water lead, since the drinking water lead is in part already built into the model as a standard value.

I and I know others feel that DTSC has significantly underestimated the complexity of trying to manage the California only hazardous waste (Special Waste) in municipal Subtitle D-Class III landfills. Regional water boards already have excessive workloads compared to their responsibilities for managing solid waste under Chapter 15. In order for a Class III landfill to accept the DTSC special wastes, it will be necessary for the landfill to obtain revised WDRs from the regional boards. Such revisions could meet with substantial opposition by some public groups. While as I have indicated in the past incorporation of the California only hazardous waste including the special waste into the

municipal solid waste stream as is done in all other states will not significantly change the threat that the leachate produced in these landfills represents the public health and environment, I find the DTSC needs to revisit the handling of the special waste in municipal landfills because of the opposition that will develop to DTSC's proposed approach. Frankly, I feel that California should adopt the same classification of wastes as hazardous wastes as other states and abandon any attempt to develop a Special Waste category as proposed by DTSC. Putting Special Wastes in an Subtitle D landfill that only postpones when groundwater pollution occurs provides little protection from the hazards of the waste over that that is occurring in other states. If ecological and other considerations are to be incorporated into hazardous waste management then a far more sophisticated approach needs to be incorporated into the classification system than that proposed at the March 20th meeting.

While DTSC claims that the RSU approach is a risk based approach for hazardous waste classification such a claim is superficial in many respects. A proper risk based approach would reliably incorporate what is known today about the characteristics of various types of waste and constituents in waste as they may impact public health and the environment as well as the characteristics of the waste management systems that are being used. I have been involved in both public health and water quality risk assessment approach development and implementation since the mid 1970's. I continue to find that DTSC's proposed hazardous waste classification approach does not incorporate key fundamental components of properly conducted hazard/risk assessment. As one example, I have previously commented on the inappropriateness of DTSC ignoring that a chromium III containing waste does not need to be managed with respect to the potential for the chromium in the waste to convert to chromium VI in the environment under various waste management scenarios. This conversion is well documented and needs to be considered in managing chromium III waste.

I wish to mention that my comments are not sponsored by any group. They represent an effort on my part to improve the quality of science and engineering used in California to manage its hazardous waste. I appreciate and support the need to change California's hazardous waste classification approach. Unfortunately I find that the RSU is still far away from formulating an approach that will provide a technically valid, cost effective and appropriately protective management of hazardous waste. If there are questions about my comments on these issues please contact me. As in the past, if I can be of assistance in helping to address these issues in a more appropriate manner, let me know.

Sincerely yours,

Fred

G. Fred Lee, PhD, DEE

copy to J. Huff wo enclosures

R. Stevens wo enclosures

B. Simmons

GFL:rw
Enclosure



Reference as: "Lee, G.F., 'Comments on DTSC's Proposed Hazardous Waste Classification Approach,' letter to J. Carlisle, DTSC, Sacramento, CA March (1998)"

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