

## **Subtitle D Municipal Landfills vs Classical Sanitary Landfills: Are Subtitle D Landfills a Real Improvement?**

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In 1993, the League of Women Voters' book entitled, "The Garbage Primer: A Handbook for Citizens" (Murphy, 1993) included a chapter devoted to landfills. In its discussion of "state-of-the-art" landfills entitled, "How Safe Is State-of-Art?" it was stated with reference to the lined, dry-tomb-type, municipal solid waste (MSW) landfills prescribed by US EPA's Subtitle D,

*"The term `state-of-the-art' evokes unequivocal faith in current science and technology. However, even the best liners will eventually degrade, tear, or crack. Landfills are designed to accept waste for 10-40 years, and the new EPA regulations require owners to maintain and monitor their landfills for at least 30 years after closure. The questions remain. What happens after 30 years? Who will need protection then? Who will pay for cleaning up ground and surface water sources when leaks occur?"*

*State-of-the-art landfills may not be a cure, but they are a tremendous improvement over their predecessors."*

The concerns expressed about reliance on so-called "state-of-the-art" landfills for protection of groundwater resources are justified. However, the concluding statement quoted, regarding the comparative safety of classical unlined sanitary landfills and Subtitle D landfills, deserves further examination.

### **Impact of MSW Landfills**

Lee and Jones-Lee (1993, 1994a,b,c, 1996) discussed impacts of municipal solid waste (MSW) landfills on public health, air and groundwater resources, and the welfare of those who own or use properties within the sphere of influence of the landfill. Areas of impact concerns and reasons for concern included:

- Groundwater and surface water quality; leachate migration and disposal - public health, economics, aquatic life, aesthetics
- Migration of methane and VOC's - public health, explosions, toxicity to plants
- Illegal roadside dumping and litter near landfill - aesthetics, public health, economics
- Truck traffic - congestion, air pollution, aesthetics, public health and safety
- Noise - aesthetics, public health
- Odors - dumping and landfill gas - aesthetics, public health
- Dust and wind-blown litter - aesthetics, public health
- Vectors, insects, rodents, birds - public health, nuisance, aircraft hazard
- Impaired view/viewshed - aesthetics
- Decreased property values - condemn future uses of nearby properties

Lee and Jones-Lee (1994a,b) noted that the adverse impacts of landfills should be considered for two distinct periods: the active life and the post-closure period. Essentially all of the potential impacts listed above are associated with the active life of landfills. After the landfill is closed, the adverse impacts are commonly reduced to those associated with landfill gas and leachate releases from the landfill, view/viewshed impairment, and diminished value and use of nearby properties.

While the US EPA asserted in its Subtitle D municipal landfill regulations that the opposition to landfills should be significantly diminished as a result of the adoption of those regulations, examination of Subtitle D landfilling practice and landfills shows that the US EPA did not address many of the significant near-term problems associated with the active life of a landfill. The Subtitle D regulations did place some restrictions on the siting of landfills, such as within flood plains, on top of or immediately adjacent to earthquake fault lines, immediately next to airports, etc. However, even under Subtitle D, landfills can be sited very close to adjacent property owners' land without sufficient buffer lands between the area of deposition of the wastes and adjacent properties. Odors, and essentially all of the other problems associated with the active life of landfills, can still occur at Subtitle D landfills and comply with regulatory requirements. About the only "improvement" over classical sanitary landfills offered by Subtitle D landfills is that the liner system required postpones the occurrence of groundwater pollution by tens of years to possibly a hundred years or so (Lee and Jones-Lee 1996).

Is the postponement achieved by institution of Subtitle D requirements really an advantage? Without the development of an adequate, failsafe, perpetual funding mechanism developed from disposal fees today, the postponement of the realization of ramifications of the landfilling approach shifts the burden of dealing with those impacts from those who generated the garbage, to future generations (Lee and Jones-Lee 1993, 1995a). It is appropriate for those who generate the waste in this generation to have to pay the *total costs* associated with the "disposal" of their wastes.

### **Monitoring of Landfill Liner Leakage**

Another factor that needs to be considered is that the manner and pattern of leachate leakage from a lined Subtitle D landfill is substantially different from that of a classical unlined sanitary landfill (Jones-Lee and Lee, 1993, Lee and Jones-Lee 1994c). Because of these differences, while a groundwater monitoring program of the type prescribed by Subtitle D may allow ready detection of groundwater pollution by leachate from an unlined landfill, the likelihood of its detecting groundwater pollution by leachate from a lined landfill before widespread groundwater pollution has occurred, is remote. Thus, not only will the leakage of leachate from a Subtitle D landfill be delayed owing to the liner system, but also the detection of groundwater pollution by that leakage will not likely be detected until widespread pollution has occurred. These postponements will result in future generations' having to bear the adverse impacts and the expenses for groundwater clean-up, lost resources, waste exhumation, proper treatment, etc. in Superfund-type programs, that will result from the short-sighted, stop-gap approach that the US EPA adopted in Subtitle D.

Often cited as a significant benefit of the landfilling approaches of today compared to those of the past is the reduction in input of currently regulated hazardous chemicals. That reduction has nothing to do with Subtitle D requirements, but rather is an outgrowth of RCRA. Substantial

efforts are being made today to reduce the amount of what are known as rodent carcinogens (chemicals which, in high concentrations, cause cancer in rats) in the municipal solid waste (MSW) stream. While it is no longer possible, for example, to dispose of 55-gallon drums of spent solvents in MSW landfills, it is still possible for potentially significant amounts of spent solvents from household or small commercial use to be legally placed in MSW landfills. Further, even if all "hazardous wastes" were excluded from MSW landfills, the leachate that would be produced from such landfills would still be a highly significant threat to groundwater quality; small amounts of leachate could still pollute large amounts of groundwater, rendering it unusable for domestic purposes (Jones-Lee and Lee, 1993).

### **Inadequate Regulatory Approach**

Rather than addressing the solid waste management crisis in a technically valid, appropriate manner, the US EPA and now many states, are continuing to allow the landfilling of solid wastes - industrial, hazardous, and "non-hazardous" wastes - at prices significantly below what it will cost to address the problems that will be caused by those activities. The League (Murphy) is correct in pointing out the significant deficiencies with the short-term, stop-gap approach adopted by the US EPA and the states in landfilling of wastes under Subtitle D regulations. There are significant questions, however, as to whether the League's statement that today's landfills "are a tremendous improvement over their predecessors" is appropriate.

Today's ostensibly "improved" landfilling approach gives the public a false sense of safety - that something better, and more expensive is being done. However, what is being accomplished is a postponement of the manifestation of the problems, an exacerbation of the problems, and the transference of the economic, public health, and other burdens for addressing the problems created, to future generations. It also postpones the pressure on society and regulatory agencies to develop and implement MSW management approaches that provide truly long-term protection of public health and environmental quality, and protection of the interests and welfare of those who live or use properties within the sphere of influence of landfills and other waste management units.

The current landfilling regulations evolved out of efforts by various environmental groups in the early 1980s to improve the landfilling of hazardous wastes in what became Subtitle C landfills. At that time, the environmental groups convinced Congress that Congress should dictate to the US EPA how to design and close hazardous waste landfills. It was at that time that the dry tomb landfilling approach evolved. Dry tomb landfills (Subtitle C and D) attempt to isolate the wastes using plastic sheeting and compacted soil - clay layers to keep the wastes dry and to collect any leachate that is generated within the landfill. At the time that the environmental groups selected plastic sheeting (primarily HDPE liners), the properties of these liners were not well understood. Today, however, it is well known that such liners deteriorate over time and ultimately fail to prevent moisture from entering the landfill and generating leachate as well as to collect any leachate within the landfill. The US EPA, as part of developing Subtitle D regulations, acknowledged this situation when they stated in the Draft Regulations on Solid Waste Disposal Criteria (August 30, 1988a),

*"First, even the best liner and leachate collection system will ultimately fail due to natural deterioration, and recent improvements in MSWLF (municipal solid waste landfill) containment technologies suggest that releases may be delayed by many decades at some landfills."*

The US EPA Criteria for Municipal Solid Waste Landfills (July 1988b) stated,  
*"Once the unit is closed, the bottom layer of the landfill will deteriorate over time and, consequently, will not prevent leachate transport out of the unit."*

Therefore, today's Subtitle C and D landfills at best only postpone when groundwater pollution occurs by municipal solid waste and hazardous waste landfills that conform to current minimum regulatory requirements.

RCRA-based landfilling regulations are badly out-of-date with respect to specifying the minimum design of Subtitle C and D landfills. There is an urgent need to change RCRA from the current landfilling approach to one that will, in fact, protect groundwater resources from pollution by landfill leachate for as long as the wastes in the landfill will be a threat. Effectively, wastes in both types of landfills will be a threat forever.

### **Unreliable Reporting of Landfill Protection**

While this situation has been well known in the field for a number of years, unfortunately, landfill owners/operators and regulatory agencies do not necessarily reliably discuss this situation. Often the public is provided with highly unreliable information on the ability of Subtitle C and D landfills to prevent groundwater pollution by landfill leachate for as long as the wastes in the landfill will be a threat. This issue has been discussed by Lee and Jones-Lee (1995b) in an article entitled, "Practical Environmental Ethics: Is There an Obligation to Tell the Whole Truth?" Lee and Jones-Lee (1995c, 1996) have discussed alternative landfilling approaches which can be readily implemented that would provide for true protection of groundwater resources from pollution by landfill leachate for as long as the wastes in the landfill represent a threat.

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