

July 21, 2008

To: Members of the Municipal Solid Waste Advisory Committee

Solid waste reform is under consideration by the Advisory Committee and the Solid Waste Reduction Task Force. When developing your reform recommendations, I encourage you to consider that solid waste is also a water issue because landfills can and routinely do leak. The impacts from leaking landfills can affect our water resources for decades. Reform of Tennessee solid waste policy must consider the past results of our landfills and the impact on groundwater and surface waters.

This letter summarizes key points that illustrate examples of how the Tennessee Department of Environment and Conservation (TDEC) procedures for permitting and monitoring landfills sometimes fall short of protecting our groundwater and surface water resources. Groundwater and surface water impacts are important considerations when determining needed actions associated with long-range solid waste planning and waste reduction goals.

The public is becoming increasingly aware of the importance of clean surface water and groundwater. As drought conditions worsen, our groundwater is again being relied upon more by the public and municipal users for such purposes as drinking water and irrigation. Our surface waters are at risk because shallow groundwater typically discharges into streams.

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## **General Conclusion**

To-date, TDEC's data show that landfills have and routinely contaminate our groundwater. Further, landfill permits are being issued at sites that TDEC determined to be unsuitable for land disposal. These conclusions are based on a review of TDEC files for representative middle Tennessee landfills and from actual conclusions made by TDEC staff.

## **Widespread Landfill Effects on Groundwater**

A database provided by the TDEC's Division of Solid Waste Management that shows the status of all permitted landfill groundwater monitoring programs indicates that landfills are leaking in all regions of Tennessee. Leaking landfills include municipal solid waste landfills, industrial landfills, and those used for disposal of such materials as construction / demolition debris. Even some landfills with state-of-art liners have evidence of leakage.

Of the 221 closed and active landfills in Tennessee with required groundwater monitoring programs as of January 1, 2008, 74 (or 34 percent) have groundwater contamination in at least one well. Of those, approximately 30 percent of active municipal solid waste landfills have groundwater contamination high enough to require corrective action according to

TDEC and U.S. EPA rules. Of those landfills required to initiate a corrective action, the action rarely includes any real efforts to cleanup the groundwater – just restrictions on its use and providing potable water to the affected residents (at a cost to the resident). A landfill owner / operator therefore has plenty of reason to be confident that no restoration of groundwater to usable conditions will be required by TDEC in the foreseeable future based on the past regulatory actions.

Delaying cleaning up contaminated groundwater when it is first identified runs the risk of putting that burden on the public in the future. One case in point is the Dickson County Landfill. Contaminated groundwater has been present for decades and most of the responsible parties have now filed for bankruptcy protection. Recently, the Natural Resources Defense Council (NRDC) filed a lawsuit against the City of Dickson and Dickson County to force a proper investigation and cleanup of the contamination. Had the responsible parties that disposed of the wastes been held accountable by TDEC before filing for bankruptcy, public entities and funds would have never been put at risk to clean up someone else's contamination.

### **Landfills Commonly Located Next to Sensitive Waterways**

Landfills are commonly located immediately adjacent to waterways – even some that are used for public drinking water. Allied Waste's Middle Point Landfill in Rutherford County is located along the floodplain of the Stones River, which is used for drinking water by Smyrna, Murfreesboro, and Consolidated Utilities of Rutherford County. The Smith County Landfill is located along the floodplain of the Cumberland River. Waste Management's Cedar Ridge Landfill is located adjacent to the East Fork Globe Creek. In each case above, there has been a release of landfill leachate to the groundwater that eventually discharges to springs that feed those surface waterways.

### **Public Water Testing is Not Reflective of Risks from Landfills**

TDEC's Division of Water Supply only requires that treated water be tested once per year for contaminants that are typical of landfill leachate – even though landfills are located upstream and along rivers with public water intakes. Sampling of groundwater monitoring wells (and springs) at landfills is only required once every 6 months. Therefore, contaminated water could be provided to consumers in the event of a landfill release without the public or the water utility even knowing about it. Most water treatment plants have no ability whatsoever to remove volatile or semi-volatile organic compounds. An example of this problem is the Dickson County Landfill. Trichloroethene was found in the treated water sent to tens of thousands of Dickson County residents during routine end-of-the-year sampling. Also, the former Rutherford County Landfill (with no liner) is located immediately across the Stones River from the Murfreesboro intake and upgradient from intakes owned by Consolidated Utilities and Smyrna.

## Landfills Are Sometimes Un-Monitored for Contamination

The list of 225 permitted landfills provided by TDEC does not include old former dumps that never received a permit and do not to this day have a groundwater monitoring system. History and common sense say that these too are leaking because they have no constructed liner. These old dumps too would be expected to contain industrial chemicals and therefore represent substantial, unrecognized, and undetermined risks.

Even though permitted landfills may have groundwater monitoring program, their monitoring programs may not always include analytical tests that can even detect the expected wastes that were disposed in the landfill. For example, even though thousands of tons of low-level radioactive wastes were disposed of for years in Class I landfills, those landfills never had to monitor the groundwater for radioactive isotopes. For example, the Allied Waste Middle Point Landfill located along the Stones River in Rutherford County received such waste and never had to monitor radioactivity of groundwater or the Stones River. Further, the Waste Management Southern Services Class III / IV landfill in Davidson County does not have to monitor for volatile organic or semi-volatile organic compounds even though industrial wastes are routinely disposed of as “special wastes”. Industrial wastes disposed of at the Southern Services Class III / IV landfill (by definition, these landfill categories should not include industrial waste) includes thousands of tons of industrial wastes such as uncured rubber (semi-volatile organic compounds), refractory bricks (that commonly have high levels of heavy metals), fiberglass (adhesives and resins), and asbestos.

Some currently permitted landfills do not even have a groundwater monitoring program, even though the wastes present a risk, the landfill is located adjacent to an important waterway, and the landfill has no liner. The Central Pike Class IV construction / demolition debris landfill located along the Stones River in Hermitage has no monitoring wells or groundwater monitoring program at all. TDEC concluded in 1998 during the permit application that they “*do not believe that groundwater beneath this site can be effectively monitored, by TDWM regulations, using monitoring wells ...*”, yet the permit was issued anyway. In fact, TDEC approved a vertical expansion of the landfill in 2003 that allowed for longer-term waste disposal at the site.

The U.S. EPA has determined that construction / demolition debris is not “inert” and present significant hazards. However, no such groundwater monitoring testing requirements for volatile and semi-volatile organic compounds exist for the Southern Services Class III / IV landfill located along the Cumberland River nor the Central Pike Class IV demolition debris landfill adjacent to the Stones River. The U.S EPA identified these problematic components in construction / demolition waste: 1.) Containers with excess liquids such as adhesives, coatings, solvents, paints, and pesticides, 2.) Machinery lubricants and fuel, 3.) Inseparable bulk items such as asbestos and formaldehyde in carpet, 4.) Pressure treated wood, 5.) Roofing tar, 6.) Sulfates in drywall, 7.) Paints and coatings on wood, 8.) Arsenic, chromium, and creosote wood preservatives, 9.) Naphthalene, 10.) PCBs in transformers and capacitors, and 11.) Mercury in light switches and bulbs.

## **Landfills are Commonly Permitted in Extreme Karst Conditions**

Karst geologic conditions of sinkholes, sinking streams, and shallow bedrock conduit flow are commonly found in middle and eastern Tennessee. Even though such conditions exist, TDEC's minimum landfill design standards still apply as they would for any other landfill located in a more stable geologic environment. Recent conclusions at the Cedar Ridge Landfill near Lewisburg, as an example, suggest that more stringent standards are needed in karst environments.

According to Mr. James Clark, chief geologist for TDEC's Division of Solid Waste Management, the karst conditions at the Cedar Ridge preclude the site from meeting basic site suitability and monitoring standards. TDEC concluded in June 2005 "*... the Site is not monitorable inside the permitted compliance boundary. At this time, it is obvious that groundwater that has been impacted from Cedar Ridge Landfill is moving offsite before it can be detected under the current monitoring system*". Recently, even with this determination, Waste Management applied for a major expansion. Since the initial permit was issued, sinkhole collapses in the disposal cell areas have occurred, a significant cave system was identified beneath the landfill, and springs have been contaminated by landfill leachate.

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TDEC often allows use of springs as an early warning detection system in lieu of wells. As an example, only one (1) groundwater monitoring well even exists at the Cedar Ridge Landfill, and that well is an upgradient well. All other downgradient monitoring points are springs that represent no early warning detection system whatsoever. Once contamination is detected in a spring, the surface water off-site has already been impaired, and there is no time to correct the problem before it migrates further downstream. As problematic as this policy is, landfill owners and operators continue to use springs as a main, and sometimes sole component of an early warning detection system. These example middle Tennessee landfills rely on spring monitoring: Cedar Ridge Landfill, Middle Point Landfill, Williamson County Landfill, and the Smith County Landfill.

## **Problem Wastes Require Better Design Standards and Disposal Alternatives**

Current TDEC rules require liners for industrial waste landfills to meet the same technical standards as municipal solid waste landfills. Sometimes, the waste characteristics should require that TDEC implement more stringent standards. For example, Mr. James Clark of TDEC concluded in May 2002 that aluminum smelter waste from Tennessee Aluminum Processors facility in Maury County contaminated groundwater in "*all facilities in our region where this type of waste has been accepted, analytical results show higher than background concentrations for chlorides in the groundwater, even in new lined landfills*". Therefore, even landfills lined with state-of-art composite liners that received this waste can and often do leak.



## Landfill Gas Mitigation Requires More Aggressive Approach

Obvious hazards associated with gas migration include the obvious explosive hazard, but it also serves as a way to contaminate groundwater when the gas comes into contact with wells and the groundwater table. Any landfill that receives organic wastes is subject to the formation of landfill gas, which includes methane and sometimes volatile organic compounds. Although TDEC rules require an active gas recovery system to remove the gas when unsafe levels reach the explosive limit, that requirement is not always met and substantial dangers can persist. As an example, two (2) occupancies adjacent to the Dickson County Landfill inexplicably burned to the ground. Explosive concentrations of methane gas are commonly found along the perimeter of the Dickson County landfill yet no active gas recovery system has ever been required by TDEC.

## Class III / IV Landfills are Used to Meet Waste Reduction Goals

Landfills that are used for the disposal of landscaping, yard wastes, and construction / demolition debris landfills are commonly used to divert wastes from Class I municipal solid waste landfills in order to achieve the 25 percent waste reduction goal. While such disposal diverts waste from Class I landfills, the procedure results in no real waste reduction at all – just the creation of more landfills that are less protective to hold the waste that was diverted from Class I landfills. Class III / IV landfills operate with less stringent design and operational standards, have no liners to protect groundwater, and have less stringent monitoring requirements – yet they represent significant hazards to the environment.

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I encourage the Solid Waste Advisory Committee to consider these facts when considering waste reduction goals in the future. Wastes that are placed in the ground can represent decades of threats to our water supply. Once in the groundwater, the problems cannot be easily fixed and can persist for decades. The goal should be to prevent the contamination in the first place. I ask that the Committee consider taking an aggressive stance developing meaningful waste reduction goals and rules, to enact rules that further protect our water resources, and to act now before the problem worsens.

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