



September 4, 2018

**Environmental Quality Advisory Board's (EQAB) findings in re:  
DOE-Environmental Management (EM)'s Proposed Plan for the Disposal  
of Oak Ridge Reservation Comprehensive Environmental Response, Compensation,  
and Liability Act (CERCLA) Waste (hereinafter "Plan") draft dated June 7, 2018**

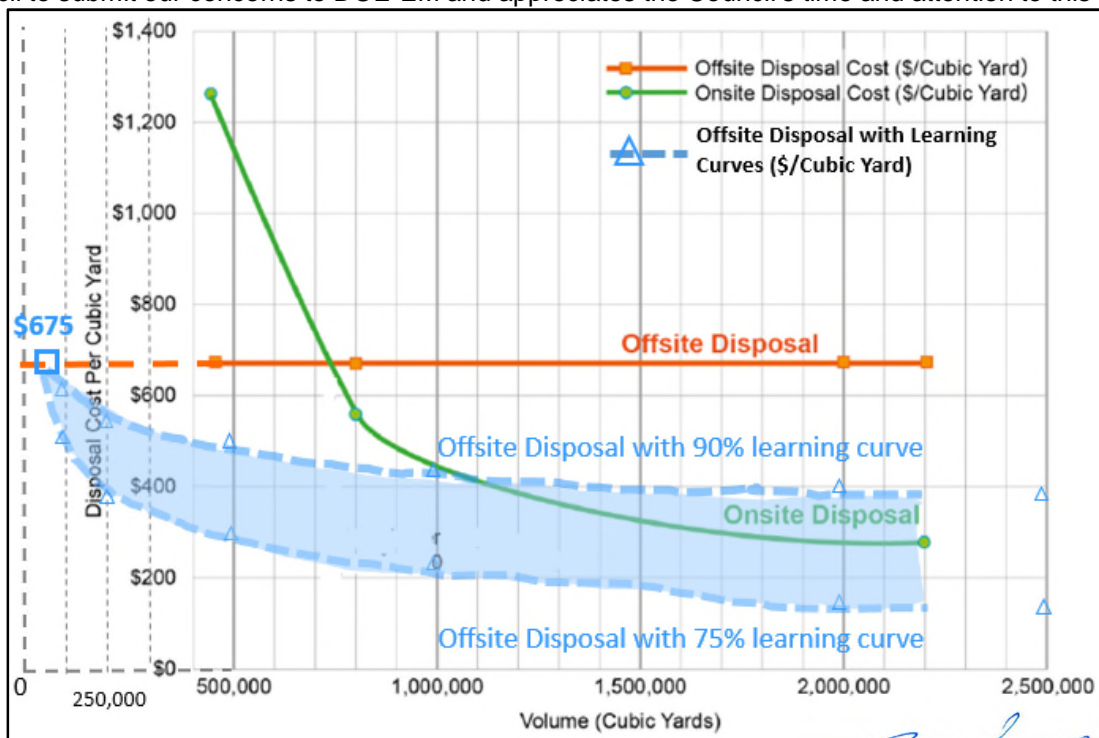
**Summary/Recommendation:** The EQAB resolves that its position of July 7, 2018 remains unchanged. While we thank DOE-EM for providing their Plan for review, it has serious flaws. The concerns we expressed then still apply (attached at bottom for your convenience); now we have identified more issues. We advise City Council that DOE-EM needs to complete its response to the City Manager's July 12 submittal and answer the previous questions, as well as the new concerns we are bringing to light in this letter. EQAB strongly endorses the NEPA process and urges consideration of the City's concerns by DOE-EM in this proposed landfill planning process.

- The Superfund law (CERCLA) is designed for cleaning up contaminated property, but DOE-EM's Preferred Choice is to contaminate a clean site, Central Bear Creek Valley (CBCV). **Forever sacrificing 70 green acres is not "remediation"; it is the exact opposite.** It is unreasonable to put the entire ORR (most of which is clean) into one basket (1 monolithic site on the National Priorities List) just in order to shuffle hazardous waste around it. In this situation, RCRA is the correct process, not CERCLA.
- **The more DOE-EM's Preferred Choice is looked at, the worse it looks.** Recent well sampling indicates the groundwater table does not meet TDEC and EPA requirements, as noted by EPA on August 16.
- DOE says onsite disposal "creates jobs". (1) Those jobs would be created no matter where the waste ultimately ends up, and (2) **trashing Tennessee's future is not a viable worthy "jobs program" for us.**
- In other forums, DOE has stated that it will not publish its waste acceptance criteria (WAC) before the record of decision (RoD). This is unacceptable for a problem that our descendants must live with for centuries. **The WAC must be publicly disclosed before the RoD.**
- DOE-EM's analysis neglects Central Bear Creek Valley's substantial long-term future value to the City as greenspace, hence it is not a proper full cost:benefit analysis as defined by NEPA. It should also factor in that ecosystem services provided by the greenfield as-is (forested) to the community, which EQAB estimates are worth roughly \$0.5M/year, or ~\$30M present value. DOE grossly undervalues this greenfield at less than 1/10th of that. (EQAB notes this problem of undervaluing ORR land applies to PILT, too.)
- **Onsite disposal is not safer.** DOE-EM's Preferred Choice is predicated on the idea onsite disposal is safer than offsite (but they didn't provide backup). EQAB disputes this proposition. Transportation of every kind has gotten much safer with time. In 1990-2009, overall US motor vehicle deaths dropped by *half* (corrected for population growth), from 2 fatalities per 100 million miles, to 1. At the same time, heavy truck fatalities dropped by a quarter, from 571 to 422, i.e., about 1.3 per year per million people. Source: *Statistical Abstract of the United States*, 2012 ed., p.694. DOE has a good transportation record, e.g., reporting **zero** transit incidents (i.e., **accidents**) sending extremely hazardous waste 1300 miles away to the WIPP in Carlsbad, NM. Compared to the toxic hazards to residents from the ongoing leaching of mercury into our underground aquifers in rainy east Tennessee, offsite disposal at a dry unpopulated site is safer.
- **Onsite disposal is not cheaper.** DOE-EM's Preferred Choice is also predicated on the proposition that onsite disposal is cheaper than offsite. EQAB disputes this, and performed some independent research. There are three *appropriate landfills out West right now*, in Utah, Nevada, and Texas, *far away from water and people, ready, willing, and able to take all the waste we can send.* EQAB does not agree with DOE-

EM's conclusion (their cost analysis was not provided to us). We challenge them to justify their conclusion. DOE claims for itself a very generous aggressive cost reduction per unit as Onsite Disposal ramps up. The claimed reduction is especially steep in the early years. However, DOE states that the unit cost of the Alternative Offsite Disposal will remain flat for decades, no matter the volume. Not only is this unwarranted / unproven, it goes against every principle of economics and industrial engineering. If the usual customary benefits of learning curve, economy of scale, and mechanization/automation (not to mention robotics in the future) are applied to Offsite Disposal, we should expect cost to decline in the long run:

1. Learning Curve: Most any process gets significantly cheaper per unit as people get more productive and efficient. Just about every industry falls somewhere between the 75% (rapid process improvement) and the 90% (slower process improvement) experience curves (in blue) below.
2. Economy of Scale: Every process gets cheaper per unit as the total enterprise gets larger.
3. Bulk transportation tends to get more mechanized and automated over time.
4. Therefore, bulk transportation tends to get cheaper in constant dollars over time. Look how containerized shipping has revolutionized the global economy. According to the *Economist*, during the container shipping price wars in 2015-2016, the price to send a Conex box across the Pacific Ocean (half the world) dropped from over \$1000 to only \$300, a 70% reduction.
5. This phenomenon also occurs in construction, esp. bulk work like earthmoving. Simple cut and fill operations can be less than \$1 per cubic yard, according to *R.S.Means Construction Cost Data* handbook, which is orders of magnitude less than the \$675 per cubic yard cited in the Plan.
6. It costs the same money to package waste, load, and unload it, regardless how far it goes. Variable costs like mileage and fuel are only a minor component of the total, amounting to pennies per cubic yard per mile, according to *R.S.Means Construction Cost Data* handbook.
7. Therefore, **EQAB's assessment is that it is reasonable to expect continuing volume discounts from the 3 offsite western facilities** in exchange for the steady predictable work.

EQAB examined Figure 10 on page 15 of DOE's Plan. DOE had omitted the origin of their original figure, so we adapted the figure for EQAB's use by extending the chart all the way to the left (dotted gray lines) and overlaying experience curves (blue). Using DOE's own data and applying the learning curves, you can see that **offsite disposal would likely be cheaper, immediately and in the future, than onsite disposal**. This is without factoring in the future value of an unspoiled CBCV to the City. EQAB encourages City Council to submit our concerns to DOE-EM and appreciates the Council's time and attention to this matter.



*Robert Kennedy*  
 Robert Kennedy, EQAB Chair