

Green New World

By Lisa Alexander

At the May BWSC Advisory Committee meeting, Rose Knox spoke about promoting sustainable remediation practices in the 21E program. This article looks back at historic industrial and disposal practices to put “Green Remediation” within a broader context.

Old Ways Were Not Always the Best Ways

The history of New England is closely tied to the rise – and fall - of industries, such as tanneries and felt-making. In those early times, waste products were typically disposed in dumps at the property boundary, into a nearby stream, or used as fill in “swamps” to expand usable land. Not much changed in the way of disposal practices as new technologies were developed, such as creosote wood treatments, metal-based paints and preservatives, mercury-silver dental fillings and coal gasification for lighting. In Massachusetts, very few areas are untouched by past human activities and “background” is often far from pristine.

The 20th century could be called the chemistry century. The discovery of the vast array of products and benefits that could be derived from petroleum led to its widespread distribution and use. Other chemical-based products, such as plastics, pesticides, polychlorinated biphenyls (PCBs) and perchloroethylene (PCE) were hailed as wonder products to make life easier for an increasingly prosperous population. Unfortunately innovations in disposal practices did not keep pace, resulting in a then-unseen environmental cost associated with these materials.

The Reckoning

My great grandmother, born in 1891, had a saying: “Use it up or wear it out, make it do or do without.” And we did. We used up land and resources and wore them out as if they were unlimited. For centuries, dilution was truly the solution, and waste that was out of site remained out of mind..

As it turned out, many of the wonder-chemicals didn’t break down or disappear when they hit the water or sat in the ground. But when rivers caught on fire, and the links between various illnesses and those environmental contaminants became clearer, *everyone* understood something was wrong and something had to be done. And thus the remediation industry was born.

Eventually, it became clear that not all contaminated sites could be “completely” cleaned up and that the best approach for some may be to encapsulate and isolate them. Questions arose whether some widely used chemicals were needed at all – leaded gasoline and PCBs in transformers. Ironically, some of the “new and improved” substitutes (e.g., MtBE for lead), came with new environmental problems. Our understanding of the risks posed by environmental contaminants also developed. A chemical might not cause cancer, but might subtly affect thyroid function. Or something deemed “safe” or beneficial when evaluated one way may be damaging when looked at another way, (e.g., recent findings on sunscreen and coral reefs). The more we learn, the

more complex the issues seem to become. For over two decades now, regulators and the private sector have shared this road of learning, together.

Environmental Remediation – Precursor of “Sustainability”?

It is now obvious that even the “worn out, used up” contaminated properties are too valuable to “do without.” They are often situated in desirable commercial or business locations, in population centers, accessible to amenities and transportation, on scenic waterways, or in economically depressed areas in need of new industry. We also don’t want to “do without” increasingly shrinking and remote wild areas either. Both private and public sector asked of the contaminated lands - was there a way to “make them do”?

Long before “smart growth” was a talking point, remediation professionals were intuitively creating it. Contaminated land – Brownfields - *could* be cleaned up and reused. MassDEP has highlighted a number of successful Brownfields projects at <http://www.mass.gov/dep/cleanup/brsuc.htm>. It makes sense that cleaning up contaminated sites to reuse them is smarter – environmentally and economically – than digging up additional rural areas or (relatively) pristine lands. How much smarter? The Audubon Society recently published a study showing that building in already developed urban areas has one-half to one-eighth the “footprint” as developing the same size project as new construction in a rural area (see [http://www.massaudubon.org/losingground/.](http://www.massaudubon.org/losingground/))

Even some grossly contaminated lands can be managed in new and beneficial ways, such as a recent decision to manage a 40 acre Superfund cap as meadowlands to replace habitat being lost by ground nesting birds. Other sites have been converted into use for alternative energy generation, such as the Brockton Brightfields location, which generates 450 kilowatts of solar power.

Within the relatively modern history of environmental remediation, is a subtext of our own evolving understanding of the limitations of the environment to absorb the past damage we did, and can still do, and the slow timeframes within which it may (or may not) recover. The problems that were not easily “solvable” showed us there were limits to our ecological means. And that we needed to find better ways to do things.

Where To Now?

So now we’re hearing talk about “green” remediation? Isn’t the industry already green by cleaning up sites? Well, yes... and no...or at least, not necessarily.

”Greener” cleanups take into account subtle considerations that may have been invisible before. Within the existing MCP requirements, there is flexibility to consider not just the traditional cost of the remedy, but also the broader health and environmental impacts of the remedial action itself. For example, the greenhouse gas emissions associated with the long-term operation of a treatment system may mean that letting contaminants degrade in place over time is, overall, a “greener” option. A “greener” cleanup might include retrofitting excavation equipment and trucks to eliminate risks associated with diesel emissions, or powering a low flow recovery system with solar panels. “Greening” a remediation can be as simple and cost-effective as employing methods to conserve water

and power; it may be as complex as quantifying and factoring in the lifecycle energy inputs needed to manufacture granular activated carbon. Such evaluations represent a more sophisticated and complex step in evolving understanding of how to live within our ecologic means.

We're the Government, and We're Here To Help

The Bureau of Waste Site Cleanup is creating a new section within the MassDEP website to address this evolving topic. The Department does not regulate how “green” remediation needs to be, and the current regulations already have flexibility for LSPs to add that dimension to their feasibility studies. DEP is looking forward to working with the LSPA and other interested parties to develop an online clearinghouse of resources and real world examples of “green” remediation. We invite those of you already knowledgeable in this new phase of the remediation industry to share your experiences with us and with your peers. The site will list commonly asked questions, link to groups working on standards and protocols, spotlight different technologies, describe detailed case studies, and provide a forum (a blog?) for LSPs to share their own green remediation stories. Stay tuned.