



## **Remediation can be effective, inexpensive and energy-efficient so let's stop avoiding it in the name of sustainability.**

### **Transcript of a presentation to the Australian Contaminated Land Consultants Association (ACLCA)**

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Could I start by asking for a show of hands to indicate who has attended an Ecoforum or CleanUp conference in the last 12 months? Keep your hand up if you attended a session on the topic of Sustainable Remediation. And finally, did anybody give one of those presentations? The conclusion that I anticipated is that it is clear that "Sustainable Remediation" is the flavour of the month. In fact as I speak, there is an ALGA NSW forum on this very topic happening in Sydney.

My objective is not to denigrate the term. In fact as a philosophy, Sustainable Remediation is self-evidently a good thing. But, at the risk of being accused of cynicism, it seems to me at least that it has become a sophisticated term to justify doing nothing or as little as possible, and therefore spending less on cleaning up contaminated land.

I'd like to explore from a remediation contractor's perspective, how Sustainable Remediation came to be flavour of the month, and to offer an alternative paradigm to supersede it that might just achieve more real remediation. I hope to provide some challenging ideas to stimulate discussion in a slightly tongue in cheek fashion so please don't take me too seriously and I'll try to do the same.

#### **Sustainable Remediation: How did we get here?**

To answer this question requires an historical look at how the different players in the remediation sector have responded to contamination over time. By players I'm referring to the developers/landowner/polluters such as the oil majors, consultants, regulators and remediation contractors.

The oil majors, have, or at least had (you be the judge), a reputation for responding to instances of contamination with denial in the form of "What contamination?" and if pressed "Oh that contamination; it wasn't me Gov. It was the other bloke across the road". It is not unreasonable to suggest that beyond denial and blame shifting they gave delaying tactics a fair work out as well.

#### **Turning liabilities into assets**

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Their motivation for engaging consultants seems to have been primarily a need for assistance in the execution of these avoidance strategies. In situations where such strategies were unsuccessful, they were required to clean up their mess by virtue of clean up notices, for example. So the brief for the failed consultants was extended to help with the design and implementation of a remediation system.

There is nothing new about all of this so far, for an audience of consultants I am sure. But how did the environmental consultant firms respond? It is around about now that I am expecting some first class heckling from the back row or possibly some knowing chuckles. See how familiar the following sounds.

They started, understandably, by collecting lots of site data and set about the task of selecting a treatment strategy, using all sorts of matrices until they hit upon the “one shot in the locker” that would presumably do the trick. If that strategy happened to be Soil Vapour Extraction, for example, they would then face the task of designing such a system. If they were from a large enough consulting firm, they could search internally to enlist the guru who had done these things before.

Alternatively, they could convince themselves as qualified engineers that they could design and build it themselves, or at least find a similar project in the company files and copy and paste at will. I am sure it is not only me that is amazed at how many sites seem to have the exact same requirements for a 300 scfm blower with matching electrically heated catox. I am yet to find the original site, but it is responsible for a lot of systems. For their part, remediation contractors were happy to accept orders to build such systems along with the designs knowing that, as long as they stuck to the specification, they were not responsible for any system shortcomings.

Such systems were deployed and invariably suffered from installation and operational issues. If these were overcome, the system would run for a period of time until the question arose as to when it could be turned off; something that was often not clearly defined at the start. No doubt some systems only served to demonstrate that SVE or whatever strategy the matrices threw up, by itself was only partially effective.

Undiminished, some inventive consultants argued that such effort and expenditure, albeit with limited success, constituted *Clean Up to The Extent Practicable*. Some auditors were convinced while others argued that “As it has achieved something, you can keep running it until I say stop.” Flogging a dead horse comes to mind. So does over invoicing and covering one’s backside.

With the inevitable capital and operational cost overruns, it is not hard to have sympathy with the oil majors who, by this stage, were seriously in need of a cheaper alternative to remediation of this sort.

**And so was born Natural Attenuation (NA).** The treatment strategy that involved doing nothing, secure in the knowledge that contamination would simply go away of its own accord over time; fantastic. Fantastic - for the oil major that is.

However, some wise consultants hit upon a couple of key revelations simultaneously. One is that the only commodity a consultant has to sell is their time at rates commensurate with their expertise; the other revelation is that in order to confirm that Natural Attenuation is occurring you have to do a lot of monitoring and reporting.

**And so was born Monitored Natural Attenuation (MNA).** A seemingly perfect treatment strategy that, like NA had none of the technical risks of mechanical systems and yet required many hours of work, from Field Technicians, Project Managers and so on all the way up the chain.

Meanwhile some other free thinkers came up with the cunning strategy of shifting the onus of proof from demonstrating clean up, to demonstrating that the level of risk was sufficiently low or could be managed so as to render any requirements that the polluter actually clean up their mess as absurd. "Brilliant, why didn't we think of that" said the oil majors, "what are you calling it?" "**Risk Based Assessment,**" chorused the consultants.

Meanwhile the cardigan-wearing supporters of the MNA strategy were getting a bit of heat due to the embarrassing possible outcome of the monitoring bit that attenuation was not actually occurring.

**And so on their side of the fence was born Bio-Remediation (BR);** a version of MNA in which the cardigan-wearers actually identified and named the bugs that should be present. Conference organisers had a field day and lots of Johnny-come-latelies sprang up calling themselves Bio-Remediators.

However, for reasons that barely need explanation BR was quickly followed by **Enhanced Bio-Remediation**, a strategy that tries to ensure that the bugs are not only identified but fed and encouraged by changing their environment (O<sub>2</sub> levels, pH, nutrients etc). The problem with Enhanced Bio-Remediation is that unless it is done by people with a knowledge and experience that extends beyond eating yoghurt, it invariably does not achieve clean up within the lifespan of the people involved.

From this precarious predicament, Research Centres and like-minded Forums have emerged like beacons of hope. Polluters and willing consultants can sponsor R&D programs into ever more sophisticated ways of spending the least amount of the polluter's money on cleaning up their mess, while keeping the regulators off their backs, R&D funding rounds successful, and academic tenures secured. You can even get your involvement written up in scientific papers with the help of eager PhD students; fame at last. It even comes with seminars on Environmental Risk Communication workshops this Friday in Melbourne if you are interested. The all encompassing name given to the strategies that arise from such research is of course **Sustainable Remediation.** We have arrived.

Although the official definition according to SuRF Australia is:

*"Sustainable remediation can be defined as the practise of demonstrating, in terms of environmental, economic and social indicators, that an acceptable balance exists between*

*the effects of undertaking the remediation activities and the benefits the same activities will deliver”,*

I should acknowledge a completely different approach that is popular in this part of the world, is to say “bollocks to this all this, just dig up anything that looks vaguely contaminated and dump it somewhere else.”

Having demonstrated a robust level of cynicism (is it only me?) I feel obliged to offer an alternative paradigm. The elements of this approach are as follows:

1. The remediation strategy devised for contaminated sites should involve a range of treatment methods rather than just a “one shot in the locker” approach. For example, on a simplified hypothetical site that has PSH on groundwater, a significant dissolved load and impacted soil, a program of treatment that includes product recovery, followed by some more aggressive pump and treat, soil vapour extraction, and getting as early as possible to enhanced bio-remediation would be the way to go. In general use the least amount of energy and operational time to achieve each target.
2. It involves from the outset all of the relevant stakeholders including the landowner/polluter, the consultant, auditor/regulator, and remediation contractor, to determine a remediation program with a clear understanding of the asymptote triggers for moving from one treatment method to the next and the ultimate end point defined before works commence;
3. Gathering data throughout the program of treatment to support decisions. In the example outlined above this would include product recovery volumes, dissolved load concentrations, gas concentrations including O<sub>2</sub>, CO<sub>2</sub>, and CH<sub>4</sub>. This requires a relatively high level of instrumentation and data management.
4. Using treatment equipment that is as energy efficient as possible with contractual arrangements that include run time expectations; and
5. Working gently at a pace dictated by the site conditions rather than forcing it. (Don't just use suck trucks!)

You may be thinking that such an approach requires multiple treatment systems that would cost a fortune. However, to support this paradigm one company (our company, The Remediation Group) has established a growing number of containerised treatment systems that can be swapped in and out on a rental basis as needed. We prefer to supply these with operational support to accommodate the inevitable connection and operational issues and functionality of the systems. To support the local market here in Perth, we also have a relationship with the ICM Group who provides Electrical and Mechanical services.

With regards to energy efficiency, if you excuse me for blowing my own company's trumpet, on a gas fired thermal oxidiser we deployed on a site in Melbourne, we were able to demonstrate sufficient control mechanisms to satisfy the Office of Gas Safety to allow the unit to run with field gas at 40% of the LEL rather than the standard 20%, thus significantly improving the energy efficiency of the unit.

Using this approach there is a trade off for the oil majors. There is less certainty in the budget costs, because the project will take what it takes to achieve the triggers. Modelling is an option to predict the time and costs but regardless of what the models predict, the treatment stages will still take what they take to achieve those triggers. On the upside though, there is more certainty about achieving the overall outcome and achieving sign off.

For the auditors, there is more certainty and transparency in the process and, thus, less risk for them in signing off. In fact, their input is more in the start of process to ensure that the data that is to be collected will be sufficient to show that clean up has been achieved, rather than the asking for more and more to be done at the end of the process.

Under this approach there is plenty of work for consultants to chalk up the hours. And there is plenty of opportunity and responsibility for the remediation contractor.

The important point is that the emphasis is on actually cleaning up sites rather than finding intricate ways of doing nothing in a hurry.

So the only thing left to do is come up with a snappy title for this paradigm. I may have to refer this to the spin doctors because it is nothing fancy, just **Remediation**. And who better to assist with this than The Remediation Group?

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