Easier Groundwater Remediation

By Stephen E. Fauer
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www.askesa.com
732-469-8888

Environmental consultants agree that the price to remediate contaminated groundwater can be financially ruinous, but there are exceptions. ESA has successfully used a groundwater remediation strategy that saves enormous amounts of time and money...if the conditions are right.

In 1990 ESA employed for the first time a groundwater remediation strategy that relied more on ingenuity than technology or engineering, and we still use it to this day. In this first application, a client had an underground storage tank (UST) that released a large volume of heating oil. The oil was found to be floating upon the shallow groundwater. With the client's approval, ESA was able to circumvent the environmental industry's conventional remedial approach, and instead we successfully used this remedial technique for the first time. Consequently, ESA obviated what could have been a long-term groundwater cleanup and the client spent a modicum when compared to the cost of using the conventional remedial approach. By the way, this client remains a loyal client of ESA - 24 years later.

Three criteria govern the feasibility of this strategy. First, there must be an organic contaminant that floats on water. Typically we are talking about gasoline or heating oil, although this technique can also work with certain non-chlorinated organic solvents. If a chlorinated solvent (which is denser than water) has leaked or spilled, this strategy will not work. The second variable is soil particle size. Typically it is preferable to have smaller-grained soil particles around the tank because finer particle sizes tend to retard the speed of groundwater flow, thereby keeping the product close to the tank. The third variable is time. The less time the product has been on the groundwater, the more likely it is that this technique will work.

Let's examine a typical scenario: upon removing a leaking UST, we find unleaded gasoline floating upon the groundwater. First, I will describe the general procedures followed when using the environmental industry's conventional remedial approach.

1. Upon removing a leaking UST and if groundwater remains in the excavation, the water's surface may be coated with free-floating product.

2. The consultant either skims the product off with a pump or uses sorbent pads to absorb the product. This waste material is then containerized for disposal.

3. Some readily accessible impacted soil that lies above the water table may be excavated and disposed. The excavation is then backfilled with stone and capped with clean fill or sand.

4. Subsequently, at least one groundwater monitor well is installed directly in the former excavation, and ground water sampling begins. (If the consultant has followed these steps to this point, it is probable that three or more wells will have been installed.)

5. After the groundwater impacts have been delineated, one of two things will happen. Either some form of groundwater remediation will begin, or the consultant will apply for a Classification Exception Area (CEA). If the former is necessary, your costs will skyrocket and time for completion will escalate. For budgetary purposes assume that remedial costs will range from $150,000 - $500,000, and the duration can take up to five years. However, if the water quality data lends itself to going the CEA route, your costs should come in well below $100,000 and you should be finished in roughly two years.

It is important to emphasize that there is nothing wrong with the above series of steps. In fact, they conform with standard practices within the environmental industry, and they are consistent with the prescriptive guidance contained within New Jersey's Technical Requirements for Site Remediation (N.J.A.C. 7:26E). But there is another way to address this exact situation.

Here is how ESA routinely handles this identical situation.

a. This first item is as presented, above: upon removing a leaking UST and if groundwater remains in the excavation, the water's surface may be coated with free-floating product.

b. With the client's full consent and understanding, ESA will use a vacuum truck to pump all accumulated water and free product from the excavation. ESA then waits for the groundwater to slowly reinfiltrate the excavation. Almost assuredly additional product will re-enter along with the groundwater. This new volume of water and product is again pumped into the vacuum truck.

c. This procedure is repeated 3-5 times. Pumping ceases when the reinfiltrating groundwater no longer conveys appreciable free product.

d. ESA will then excavate and properly dispose of impacted soil that lies above the water table (in a layer known as the "smear zone"). The point of these efforts (in items b-d) is to immediately remove as much of the free product as possible.

e. The excavation will be backfilled with stone because it is emplaced within a water-filled hole with greater ease versus using finer grained fill materials. Optionally, ESA may simultaneously install a collection sump within the stone backfill to facilitate additional product collection. If desired, the stone can then be capped with soil or sand.

f. At least one monitor well must be installed within the area occupied by the former UST. However, (and this is the secret) ESA will install the well after an appropriate amount of time has elapsed. (ESA will routinely delay the installation of this well for as long as practical.) Simultaneously, while waiting to install this well, the subsurface water quality will naturally attenuate. Because of this protocol, after the well is installed it is likely that the groundwater quality will have improved when compared to the groundwater quality that existed immediately following the UST removal.

g. As a result responsible parties can expect that full compliance will take approximately two years and will cost $60-95,000. This represents a dramatic saving in both time and money.

Why does this method work so well? Using the conventional method groundwater is sampled immediately, meaning that contaminant concentrations that remain in the groundwater are more likely to be above actionable levels. By using this technique, we allow time to elapse before we take the critical and required groundwater samples. This additional time allows the contaminant concentrations to attenuate. This means that the groundwater sample results will more closely favor the best interests of the client. In short, this technique strongly tips the odds of a desirable outcome in favor of the client. After all, I have yet to meet a client who wants to spend more money than is absolutely necessary.

ESA has performed this strategy many times with great success and it has saved each client enormous sums of money and time. And it could work for you as well.

If you have any questions about this e-newsletter, please call me anytime at 732-469-8888 ext. 201.

Thanks. Stephen

Environmental Strategies & Applications, Inc.
495 Union Avenue, Suite 1D
Middlesex, NJ 08846
732-469-8888 x201