TECHNICAL ASSISTANCE REPORT

Brunswick Wood Preserving 2006 Groundwater Sampling Report

Overview

We received for review the "Report 2006 Monitoring Well Sampling Event, Brunswick Wood Preserving Superfund Site, May 2006" document on groundwater sampling at the site. This report details new wells added to the site, describes recent sampling activities, and reviews historical sampling. The BWP site is an Environmental Protection Agency led cleanup of a long-abandoned wood processing plant. The EPA-funded report describes lax security breaches that may have compromised the data, potential contamination of samples from failure to follow EPA sampling guidelines, and possible seepage through a semi-confining layer that is an essential part of the remedy. Overall, these data cannot be trusted without a complete purge of the wells, resampling, and reanalysis.

Background

The Brunswick Wood Preserving Superfund Site in western Glynn County is a region of contaminated soils, groundwater, and creek sediments. The toxic areas include the former plant site where logs were waterproofed with creosote and antimicrobial agents, plus surrounding areas where contamination spread by groundwater and runoff. Plumes extend under the adjacent Perry Lane Road, and site chemicals are found downstream in Burnett Creek. Major toxins include carcinogenic hydrocarbons from the creosote, and chromium and arsenic from the wood treatment.

EPA's remedy for this site includes building underground slurry walls of groundwater-inhibiting materials to prevent further off-site migration of water soluble chemicals. Also, containment areas on-site would prevent further movement of toxins, or at least reduce erosion. The slurry wall barriers would be entrenched within a layer of limestone beneath the site to form a buried walled enclosure, then contaminated soils placed on top and clean soils above that.

Success of this cleanup scenario is entirely dependent on the limestone "floor" preventing the downward movement of toxins for at least several thousand years.

Discussion

The central questions at this site at this time are: "Are the contaminants spreading and if so, how fast?" The current data set agrees with past studies showing site chemicals that dissolve in water have moved as plumes off-site towards the northwest. Also, heavier-than-water chemicals continue to move downward, toward the limestone layer that is to form the floor of the proposed impoundments. Whether the furthest northwestern boundaries of the contamination are still moving cannot be answered from these or past studies. There are two ways to precisely locate the edge of contaminate plumes. One way is to place a series of wells along the contamination path and intercept the plume, another method is to precisely measure contaminant levels in existing wells and use computer modeling to determine if the contaminants are increasing or in steady-state.

Since the plumes are already off-site the EPA has limited ability to place multiple wells on private land; accordingly, only a few studies from a few wells are available. We cannot draw any conclusions on toxin mobility from such a limited set. Further, there are too few observations from existing wells to make

predictions. There are always some fluctuations in measurements of well data, due to the large number of "variables" that occur during testing events. For accuracy, multiple sampling events and test "replications" are needed to define the phenomena at each well.

EPA concludes there is no change in the plume boundaries and composition: "*Although plume boundaries may appear somewhat different for some constituents in certain sampling intervals, these differences are generally very minor and do not appear to be indicative of any new or significantly different conditions, compared to historical data"* [Page 4, second line of the summary]. However, the "historical data" shows chemical concentrations are dynamic rather than static-- these are either very active plumes or there are far too few observations to make reliable predictions.

Lack of chemical mobility can come from several sources: a steady-state from dilution with natural groundwater, underground geological barriers to further migration, or changes at the source of the plume are the usual defining factors. Since sampling events at the site have been yearly or less, and few duplicates were taken of the water for testing, the data is "too little, too late" to conclude that this site is stable.

One well data set shows contaminants below the limestone layer. Data from the "D" well set shows site chemicals. The wells are drilled in clusters of several wells; each of which has an opening at different depths from shallower to deeper. The "D" set are below the limestone layer EPA wants to use to contain the toxins and keep them from entering the lower groundwater. Finding site chemicals in the D wells during this sampling is a worse-case scenario for the selected remedy since it demonstrates that the limestone layer is not a floor and site chemicals can move and have moved through the layer into the drinking water aquifer below. These toxins at those concentrations are a very serious problem, not only for the remedy, but for the long-term health of the aquifer.

Incredibly, EPA disputes their own findings, essentially calling them unscientific and the result of incompetence:

"*Of particular concern are the results from the D wells, screened below the weathered limestone bedrock, which indicates that contaminants may be present in the aquifer used for drinking water in the site vicinity. For several reasons, it is thought that the results found in these D wells are not representative of actual conditions beneath the bedrock:*

-- None of these contaminants were detected in these wells when they were first sampled in 2003;

-- The levels found on the MW-18D and MW-21D wells are very low and could easily be attributable to sampling activities;

-- The ten contaminants found in MW-17D well mirror closely the contaminated well MW-17B, with similar ratios for each. Since

The ponds containing chemical wastes

creosote consists of more than 250 compounds, this is a line of evidence or cross-contamination;

overflowed and flooded nearby homes.

-- When EPA mobilized to the site, it was found that locks were missing on the six wells at the MW-17 and MW-21 cluster locations, including MW-17B and MW-17D. It is therefore possible that these wells could have been tampered with prior to sampling" [Page 4, Summary, third paragraph].

First, that the finding of contaminants "…could easily be the result of sampling error…" is an astonishing claim. If procedures are followed then there is no chance at all of sample cross contamination. This statement indicates very poor quality work and questions the scientific validity of all the samples, not just a few. Secondly, the remarks in EPA's bulleted summary points one and two that the contaminants were not found in 2003 and are now noted in 2006 at low levels is a strong indication of leakage of the aquifer. Note that we would not expect the compound ratios to differ significantly in a confining layer leak, only if the constituents were being selectively retarded by a complete layer would there be changes in the chemical fingerprint. The data as presented show a hole is present in the layer. Lastly, lack of locks and security leading to vandalism is obviously gross negligence.

Deep monitoring wells were installed in 2003.

Conclusions

The weathered limestone layer is leaking, according to the testing data in this report. While EPA is retesting the "D" well set this is insufficient given their statements of incompetent sampling and lack of security. It is not logical or intelligently feasible that only the D well samples would have been intentionally vandalized or inadvertently contaminated. The entire set of wells needs to be resampled, preferably by a third-party that understands the need for scientific methodology.

BRUNSWICK WOOD PRESERVING SUPERFUND SITE - TECHNICAL ASSISTANCE REPORT

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