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July 30, 2004

Kenneth A. Lovelace, Jr., P.E., P.G.
Office of Superfund Remediation and Technology Innovation (5202G)
Environmental Protection Agency
1200 Pennsylvania Avenue, N.W.
Washington, D.C. 20460

Re: Groundwater Task Force Discussion Paper:
“Cleanup Goals Appropriate for DNAPL Source Zones”

Dear Mr. Lovelace:

On behalf of the TCE Issues Group, a consortium of companies responsible for remediation of sites contaminated with trichloroethylene (TCE), we submit the following comments on the referenced Discussion Paper dated May 10, 2004.

TCE is one of the dense nonaqueous phase liquids (DNAPLs) that, as the Discussion Paper accurately notes, are among the most prevalent and most difficult to remediate, particularly where remediation seeks to achieve the Maximum Contaminant Level (MCL) for drinking water under the Safe Drinking Water Act. The TCE Issues Group supports the Task Force’s efforts to develop new approaches to determining appropriate cleanup goals for DNAPLs in groundwater.

The TCE Issues Group believes that, among the eight options for addressing this problem under existing laws and regulations, two related alternatives are especially promising. The first would make it EPA policy to set cleanup goals that are achievable “in a reasonable time frame” and would recognize that achievement of the MCL for DNAPL contaminants should not be required if it cannot be achieved within such reasonable time. A related promising option would standardize the use of certain indicators of decreasing effectiveness of pump-and-treat systems (*e.g.*, declining mass removal rates) to provide an agreed metric for when further reductions are not technically feasible.

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Taken together, these common-sense initiatives would provide appropriate time limits on groundwater treatment, with consistent criteria for suspending pump-and-treat remedies that have become cost-ineffective as points of diminishing returns are reached. The TCE Issues Group strongly supports these and other options that could provide a consistent and predictable methodology to ensure that, where pump-and-treat remedies are selected, they will be tied to realistic expectations about mass-reduction and will be deactivated when contaminant recovery is no longer effective.

For all of its strengths, however, the Discussion Paper lacks an analysis of the implications of EPA's vapor intrusion policy for DNAPL-driven cleanups. Some EPA regions, citing the vapor intrusion policy, have discussed setting screening levels for chlorinated organic compounds in groundwater at Superfund sites to protect indoor air quality from perceived risks. Some of these screening levels would require treatment to achieve contaminant concentrations that are as much as two orders of magnitude below the applicable MCL. EPA should clarify that, as a matter of policy, remediation of groundwater to standards more stringent than drinking water quality will not be required. Absent such clarification, the Task Force's other recommendations could become irrelevant at many DNAPL sites.

To illustrate the need for this clarification, we note that one EPA region reportedly directed responsible parties at a Superfund site to design a remedy that would prevent modeled indoor air concentrations of TCE from exceeding 0.017 ug/m^3 in impacted residences. Under the standard Johnson and Ettinger model for predicting vapor transport from groundwater and intrusion into overlying buildings for purposes of risk assessments,¹ and using standard assumptions about the model parameters, the initial value would have required cleanup of groundwater to a maximum TCE concentration of 0.085 ug/l – two orders of magnitude below the MCL (5.0 ug/l) and clearly an impossible level to attain.² Ultimately, we understand, the region adopted a “bright line” indoor air

¹ http://www.epa.gov/superfund/programs/risk/airmodel/johnson_ettinger.htm

² Thus, using a screening scenario incorporating conservative assumptions (*i.e.*, sandy soil, groundwater at a depth of 400 cm (13 feet), distance from bottom of foundation to top of water table (Lf) of 200 cm, and generic Qsoil (airflow into building) of 5 liters/minute), the Johnson-Ettinger spreadsheet model produces an *alpha* (attenuation) factor of 10^{-3} (the same attenuation factor as EPA's RCRA corrective action environmental indicator default value). For TCE, this means that a measured concentration of 0.085 ug/l in groundwater would predict an indoor air concentration of 0.017 ug/m^3 .

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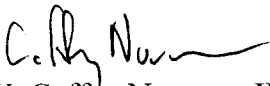
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standard of 1.0 ug/m^3 . Using EPA's default assumptions, this standard corresponds to a groundwater cleanup at or near the 5.0 ug/l MCL. We understand that vapor intrusion risks may be mitigated by measures other than groundwater cleanup (*e.g.*, vapor barriers and venting systems); however, we recommend that the DNAPL Discussion Paper should clearly state that vapor intrusion pathways are not to be used to drive groundwater cleanup efforts below the MCL.

The Discussion Paper indicates that DNAPLs are found at perhaps upwards of 60% of Superfund sites. Because of their density, insolubility, and mobility in groundwater, DNAPLs tend to be exceedingly difficult to capture and remove. Few if any groundwater cleanups involving elevated concentrations of chlorinated solvents have achieved the applicable MCL on a site-wide basis. As the Discussion Paper observes, "sites where DNAPLs are present in the subsurface are very difficult to clean up to drinking water standards." In order to avoid the setting of wholly unrealistic cleanup targets for DNAPLs at sites where residential or commercial structures are located, the Task Force should recommend that EPA adopt a policy affirming that groundwater need not be remediated to better-than-drinking-water quality. Under the recommended policy, the MCL for a given compound would constitute a "floor" for remediation. To the extent that residual health risks are associated with potential vapor intrusion, such risks should be addressed more directly (*e.g.*, by means of indoor air purification systems or institutional controls).

In conclusion, recent experience at TCE-contaminated sites indicates that, unless the Task Force recommends (and EPA implements) reforms that unambiguously apply to all DNAPL cleanups for all purposes and pathways, the benefits of the current initiative may be illusory. These reforms should include a policy under which cleanup goals for DNAPL will be achievable "in a reasonable time frame" and in no case require active remediation to sub-MCL concentrations.

Respectfully submitted,


W. Caffey Norman, III