The Environmental Corner

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Conducting Site Characterizations

In past articles, we discussed the difference between Phase I and Phase II investigations. A Phase I generally refers to a due diligence evaluation that addresses the past land uses of a property or group of properties. A Phase II generally includes an initial or preliminary investigation to determine whether or not the soil, soil gas or groundwater beneath the subject site is contaminated with metals, petroleum hydrocarbons, chlorinated hydrocarbons (solvents) or other chemicals of concern, based on the past land uses.

If, during the Phase II investigation, contamination is detected in soil, soil gas or groundwater samples the regulatory agency conducting oversight (e.g. Regional Water Quality Control Board, California Department of Toxic Substances, or local county agencies) will likely require the responsible party to fully delineate the vertical and horizontal extent of the contamination.

For dry cleaning sites, defining the horizontal and vertical extent of the contamination can be broken into several steps. The first step would be to determine how far the contamination has spread away from the likely source area(s). Source areas are the location or locations where dry cleaning solvents have entered the subsurface. Typically these source areas are the location of the existing and former dry cleaning machines, the waste storage areas and the sewer system, but can also include storm drain systems, delivery bays or roof downspouts.

The second step is to determine how deep the contamination has migrated. In cases where the groundwater is very deep, groundwater samples may not be required, but soil gas samples may be collected to a depth of around 30 to 50 feet below ground surface.

In California, the regulatory agencies typically prefer that soil gas samples be collected instead of soil samples. This is because the soil gas samples can more easily be used in determining whether indoor vapors are present and may be migrating into businesses or

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As Seen In...

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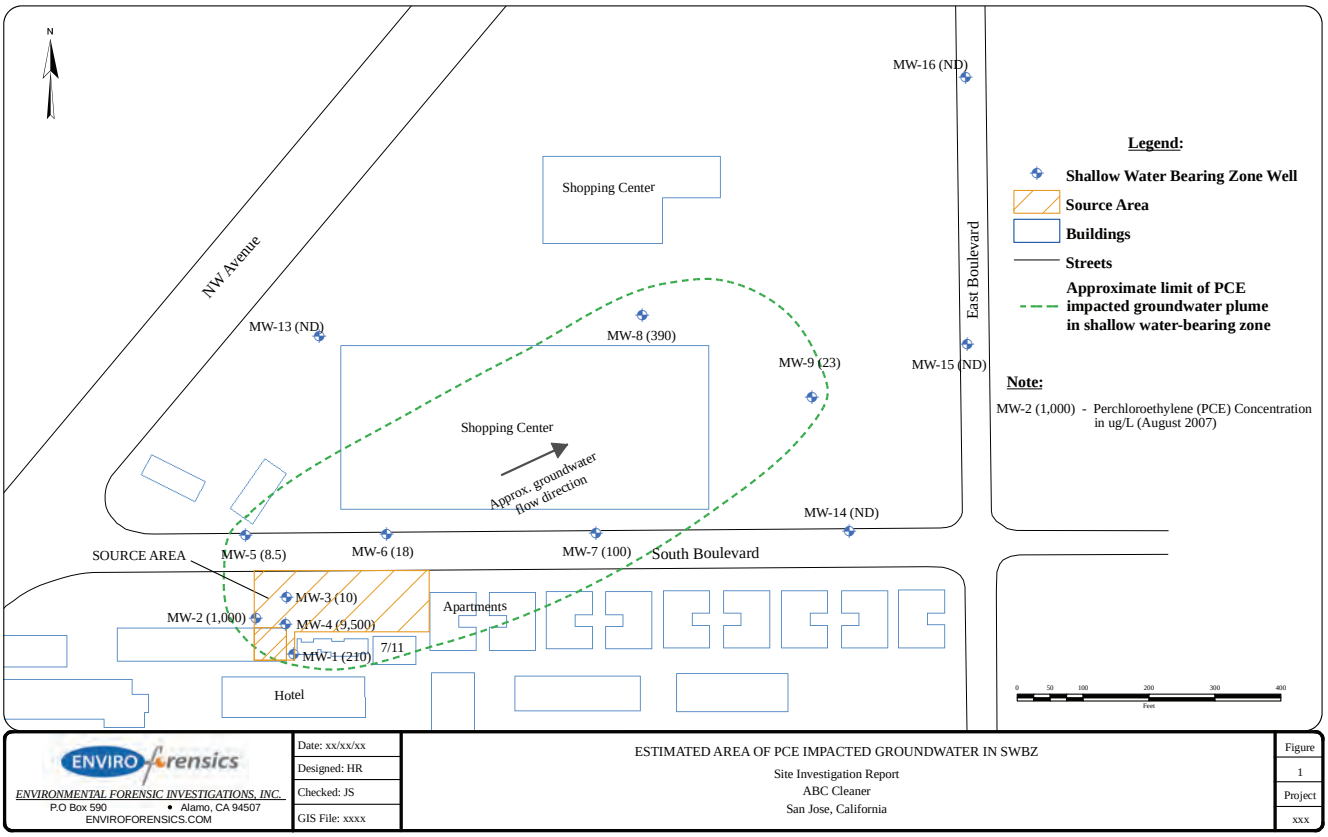

residential dwellings, whereas soil samples do not always indicate contamination even though contamination is present on the site. This may be because the soil samples are sandy and the contamination has vaporized or because the contamination did not come into contact with the sample, but a problem may still exist.

In an effort to conduct the site investigation in the most cost effective manner, soil gas samples can assist in providing a general understanding as to how contaminated the site is and how far it has migrated both horizontally and vertically. If groundwater samples are to be collected, the cost effective approach is to collect "grab" samples. Grab samples are samples collected one time and at specific locations and depths. They provide an inexpensive snapshot of the groundwater quality. Grab samples are typically collected through a steel rod that has been advanced from a drilling rig or percussion drilling device. Make certain that appropriate quality control samples (split or duplicate samples, blind sample numbering, equipment samples, and trip samples) are collected during the sampling activities.

The data for both soil gas and groundwater samples are then placed on a map as shown on Figure 1 (above) and on a cross-sectional diagram, as shown on Figure 2 (please see page 3). If groundwater has been impacted, you may be required to install permanent monitoring wells where groundwater samples can be collected over the course of a year or two to get a baseline understanding as to the groundwater quality. Groundwater levels are also collected to determine the groundwater flow direction and tests can be conducted by removing water from the monitoring wells to develop an understanding of the hydraulic conductivity of the water bearing unit. These results assist in determining the groundwater velocity and how fast the contaminated groundwater moves over time.

While it may not be necessary to have the site fully characterized before implementing remedial activities, it is uncommon for the regulatory agencies to not require a full site characterization before the site can be closed.

In summary, collect data cost ef-

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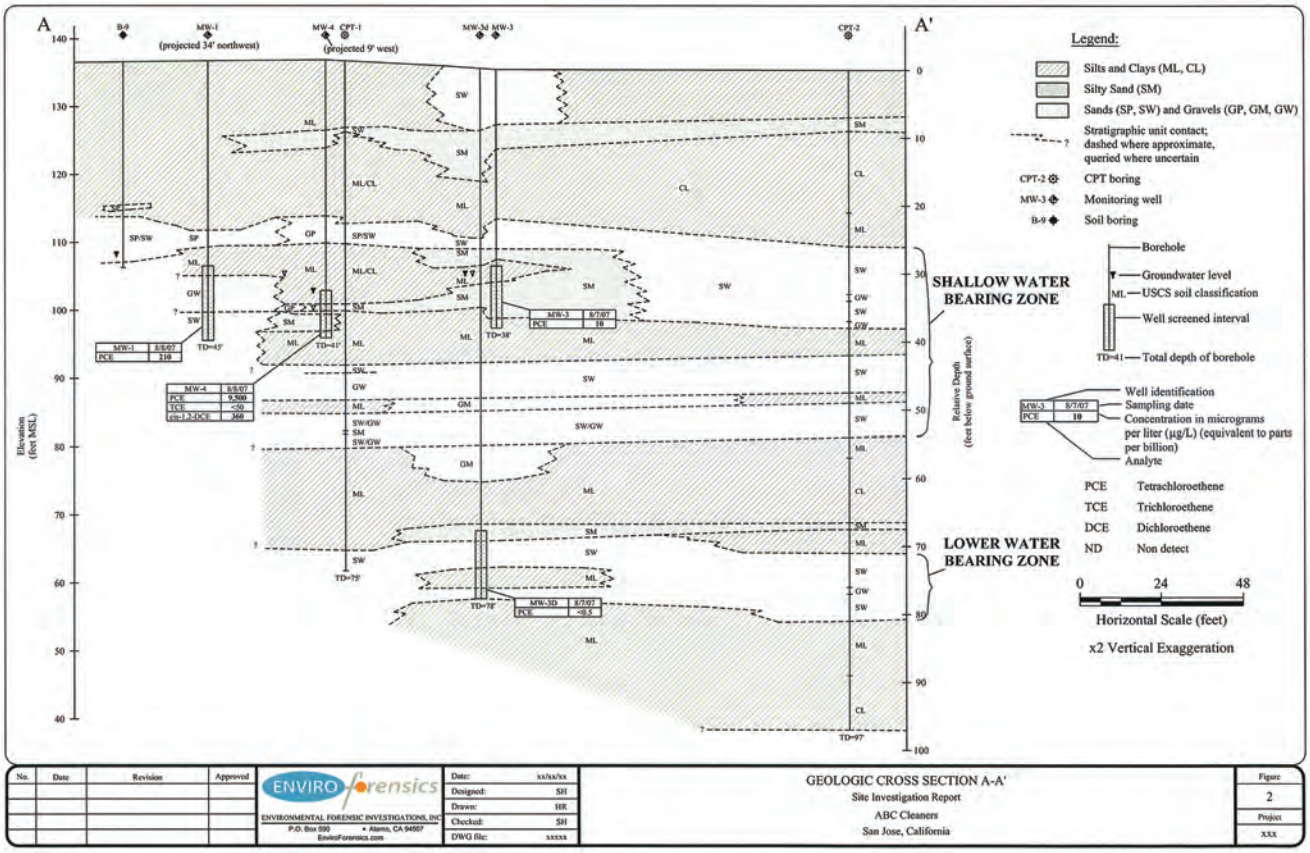

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fectively and use protocol accepted by the regulatory agencies. Cheapest should not be construed as cost effective and if you choose the cheapest, understand that the regulatory agencies may throw your data out because it did not meet the quality control requirements. Make sure that the data collected will be valid and can be verifiable and that quality assurance standards are being met (e.g. duplicate samples, equipment and trip blanks). Make certain that the laboratory detection limits are acceptable to the regulatory agencies and that the laboratory analyzing the samples is State Certified and has a good track record. Note that analyzing soil gas samples is a relatively new procedure and many laboratories are having problems getting good quality assurance results from soil gas samples.

If you have questions or would like our thoughts, please call (866) 888-7911 or contact us through our blog by registering at www.Enviroforensics.com.

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