

**TECHNICAL BRIEFING – 2013 ANNUAL MONITORING  
REPORT AREA E (PICA 077) GROUNDWATER AND SURFACE WATER – JANUARY 2014**

The document reviewed was an annual groundwater monitoring report for Area E (PICA 077) groundwater and surface-water sampling completed in August and September 2013. The response action for the site is Monitored Natural Attenuation (MNA) and implementation of land use controls (LUCs).

Site Background

The MNA program is to evaluate long-term plume behavior. The groundwater plume consists of chlorinated volatile organic compounds (VOCs). The contaminants of concern (COC) are as follows: tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-dichloroethene (1,1-DCE), and vinyl chloride (VC).

2013 Groundwater and Surface Water Sampling

Eighteen monitoring wells and three surface-water sampling locations were included in the biennial sampling conducted in August and September 2013. There are two categories of monitoring wells listed in Table 1 – Monitoring Program Schedule of the report: “MNA VOC groundwater sampling” and “biennial.” There is overlap between the two categories. The purpose of the MNA category wells is to “evaluate MNA for groundwater remedy across Area E” whereas the purpose of the biennial category wells is “comprehensive” and notes to “include these locations with MNA VOC.” A total of 18 wells in the “MNA network” were sampled (Table 3 provides results for samples collected in August and September 2013) and those wells appear to be primarily from the category described as “biennial” (with the exception of E-MW-01 and E-MW-02; see below for list).

The MNA VOC groundwater sampling category includes ten wells as follows:

E-80-3, E-82-1, E-95-3, E-MW-12H, E-MW-12L, E-70-4, E-3WG-2, E-11WG-1, E-1, and E-2. The biennial category includes 17 wells as follows: **E-80-3**, **E-82-1**, E-82-2, **E-95-3**, E-MW-11, E-MW-12D, **E-MW-12H**, **E-MW-12L**, E-70-2, E-70-3, **E-70-4**, E-3WG-1, **E-3WG-2**, E-3WG-3, E-11WG-1, **E-11WG-1**, and E-11WG2 (wells denoted in bold print also belong to the first category). Water levels were measured prior to sampling. Well samples were collected using passive diffusion bags (PDBs) for VOC analysis. Field

parameters including pH, conductivity, temperature, dissolved oxygen, and oxidation-reduction potential were measured with a downhole probe.

#### Analytical Results

Data were subjected to limited data validation in accordance with the 2007 Final Quality Assurance Project Plan. The report stated that no major deficiencies were found.

Groundwater elevation data were used to prepared a contour map. The groundwater flow direction is toward the southeast and is reported to be consistent with previous observations.

PCE: Three wells had concentrations of PCE exceeding the New Jersey Groundwater Quality Standard (NJGWQS) of 1 microgram per liter (ug/L) as follows: E-WG3-2 – 9.8 ug/L, E-WG-11-1 – 6.27 ug/L, and E-95-3 - 13.3 ug/L .

TCE: Eight wells had concentrations of TCE exceeding the NJGWQS of 1 ug/L as follows: E-WG3-2 – 15.6 ug/L, E-MW-11 - 2.11 ug/L, E-MW-12D – 12.8 ug/L, E-MW-01 - 1.62 ug/L, E-MW-12L - 14.3 ug/L, E-WG11-2 - 2.26 ug/L, E-95-3 E-WG11-1 - 7.88 ug/L .

cis-1,2-DCE: None of the wells sampled had concentrations in excess of the NJGWQS of 70 ug/L in the August/September 2013 round.

1,1-DCE: Five wells had concentrations of 1,1-DCE that exceeded the NJGWQS of 2 ug/L as follows: E-80-3 - 2.15 ug/L, E-82-1 - 7.13 ug/L, E-82-2 – 3.54 ug/L, E-WG11-1 - 3.81 ug/L, and E-WG3-2 -2.08 ug/L.

VC: Three wells had concentrations of VC that exceeded the NJGWQS of 1 ug/L as follows: E-70-3 - 1.92 ug/L, E-70-4 - 4.51 ug/L, and E-WG3-2 – 3.47 ug/L.

## Data Trends

Appendix C provides data trend plots (concentration versus time) for the three surface-water sampling locations and for 10 wells including the following: E-MW-01, E-MW-02, E-WG3-2, E-WG11-1, E-12-H, E-12-L, E-70-4, E-80-3, E-82-1, and E-95-3. These wells comprise the “MNA VOC Groundwater Sampling” category.

Monitoring wells that are downgradient of the plume or at the plume fringes tend to have the more consistently stable and lower constituent concentrations than those wells at the center or near the source area as would be expected. Even though some of the downgradient and/or fringe wells may have exceedances, the concentrations tend to remain within a fairly narrow range of concentrations. The wells within the plume and near the source areas have constituent concentrations that fluctuate more widely and do not have readily apparent decreasing trends although the report notes a decline of PCE concentrations in Wells E-WG11-1 and E-12-L. A more discriminating approach is required to identify whether the trend is significant.

## Future Monitoring

The predicted time frame to achieve groundwater standards was 45 years. The report states the following: “Based on the observed decline of TCE concentrations at E-12-L it is estimated TCE will reach groundwater standards in approximately 24 years.” The report does not state the basis for the assertion. It is noted that additional monitoring data is required to estimate a remedial time frame at E-WG-2; the basis is the increase of daughter product concentrations in the past two years but the occurrence of those detections below historical maximums. The report concludes no evidence is found for an expansion of the plume or significant impacts to groundwater. It also notes that “the remedy remains protective, continues to meet all the Remedial Action Objectives, and overall the selected remedy (MNA) is effective.”

## Comments

The next sampling event is scheduled for the third quarter of 2014. That sampling will include the 10 “MNA VOC Groundwater Sampling” category of wells and the three surface-water sampling locations. A

lengthier monitoring period will be required to more accurately discern the potential remedial time frame.