

From: sricpaul@gmail.com [mailto:sricpaul@gmail.com] **On Behalf Of** Paul Robinson
Sent: Thursday, February 07, 2013 11:56 AM
To: Kieling, John, NMENV
Cc: Janet; Marlene Quintana; Shean, Frederic; David McCoy
Subject: Submittal as Comment on MWL LTMMP - Summary of Recent SNL Groundwater data showing rising trends in organic pollutants in ground water and the soil column at TAG and TA-V sites

Dear John:

Attached please find a memo summarizing data from the most recent consolidated monitoring report submitted by Sandia National Laboratories to the NMED Hazardous Waste Bureau. The memo identifies significantly higher organic contaminant content in samples from the deeper locations in the vadose zone versus shallower locations below waste sites. This data has significant implications for the Long-term Monitoring and Maintenance Plan for the Mixed Waste Landfill (MWL) current under review by NMED HWB.

Though organic compounds have been detected consistently in the vadose zone below the MWL to the depth of 50 feet however Sandia has not sampled, and NMED HWB has yet to require sampling in, the vadose zone between the 50 foot depth below the surface and the water table the 450 - 500 foot depth below the surface. Detection of organic compounds below the unlined MWL is a demonstration of a release of those contaminants from the MWL. A sampling and monitoring program for organic compounds in the vadose zone between the base of the MWL and the water beneath the site is necessary to determine the extent of the releases identified in the shallower vadose zone samples at the MWL.

The gap in vadose zone monitoring between the 50 foot depth and the water table should be addressed by implementation of a sampling program to determine organic compound contamination in the vadose zone below the MWL similar in scope to the vadose zone monitoring required by NMED of Sandia National Laboratories for the Tech Area Five (TA-V) environmental remediation site.

This email summarizes the discussion in the memo and my statement during the February 6, 2013 public forum on the LTMMP conducted by the Albuquerque Bernalillo County Water Utility Authority and Water Protection Advisory Board.

Thank you for your attention to this important matter. Please don't hesitate to contact me if you or any of your colleagues have any questions or comments regarding this email and the attached memo.

Paul

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**Review of
2011 Monitoring Data for Sandia National Laboratories' TA-V (Tech Area 5) and TAG
(Tijeras Arroyo Groundwater) Environmental Restoration Sites Shows Increasing
Groundwater and Soil Contamination from Trichloroethene (TCE) and Nitrate**

By
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Prepared November 9, 2012

Sandia National Laboratories (SNL) in New Mexico posts annual Groundwater Monitoring Reports presented data on ground water and soil concentrations of contaminants of concern. The most recently posted report, "Annual Groundwater Monitoring Report for Calendar Year 2011 is dated June 2012, SAND2012-4311P, (SNL 2012) is posted at http://www.sandia.gov/news/publications/environmental_reports/. The Report provides recent data for all Environmental Restoration (ER) sites at SNL including TA-V, TAG, the Mixed Waste Landfill, Chemical Waste Landfill, and the Burn Site among others.

This memo summarizes information in SNL 2012 compiled from quarterly monitoring programs required by the New Mexico Environment Department (NMED), the regulatory agency with responsibility for SNL facilities, for the TA-V and TAG environmental restoration sites.

Review of SNL 2012, the most current available groundwater and soil vapor data from SNL for the TA-V and TAG sites, shows a pattern of increasing concentrations for the contaminants of concern at the sites, Trichloroethene (TCE) and Nitrate, in both groundwater and soil vapor samples.

SNL 2012 shows that the amount of contaminants of concern at the TA-V and TAG, Trichloroethene (TCE) and Nitrate, continues to exceed applicable groundwater protection standards and, at most groundwater sampling sites, is rising above levels previously detected.

Most notably, at TA-V the amount of TCE soil vapor found in the soil column above the water table are highest at depths of 400 – 500 feet below ground surface, near the elevation of the regional water table and the amount of TCE soil vapor is rising with each quarterly sample analyzed in most of the soil vapor samples provided.

The NMED does not include the reports and associated correspondence regarding either TA-V or TAG on its Hazardous Waste Bureau (HWB) web page currently, though NMED posts other information on the regulated SNL activities on its HWB's webpage including information on the proposed Resource Conservation and Recovery Act (RCRA) Permit for SNL, the Chemical Waste Landfill and Mixed Waste Landfill.

SNL's Environmental Restoration Operations Consolidated Quarterly Reports submitted to NMED fail to include data from the quarterly sampling programs required by NMED for the TA-V and TAG sites (and other SNL ER sites) identified in that Quarterly Report, deferring reporting of quarterly data until the next Annual Groundwater Monitoring Report. (NMED posts the SNL ER Quarterly Reports at ftp://ftp.nmenv.state.nm.us/hwbdocs/snl/SNL_Cons_Rpts/). AS the SNL Annual Monitoring Reports are made available to the public in the second half of the following year. SNL Calendar Year 2012 Annual Groundwater Monitoring Report is likely to be made available no sooner than June 2013, resulting the delay of publication of 2012 monitoring data by 6 – 18 months (for 4th quarter 2012 data and 1st quarter 2012 data, respectively).

In this memo, TA-V monitoring data is discussed below, at p. 2, and TAG monitoring data is discussed at p. 11.

TA-V Monitoring Data

The contaminants of concern at TA-V are Trichloroethene (TCE) and Nitrate. In response to the third in a series of Notices of Deficiency issued by the New Mexico Environment Department for its performance of environmental remediation at the site, SNL has installed and sampled an expanded groundwater monitoring well network, conducted soil-vapor sampling from the surface to the regional water table at approximately 500 feet below ground surface and measured groundwater water elevation (piezometric surface or "water table"). The SNL sampling program is part a 2-year, 8-quarterly sample program groundwater and soil vapor characterization program

The groundwater monitoring well data reported in SNL 2012 shows rising trends in Trichloroethene concentrations in all TA-V monitoring wells for which graphs were included. Nitrate concentrations showed steady or rising trends in all wells for which figures were provided in SNL 2012.

TA-V Soil Vapor Monitoring data in SNL 2012 document increased levels of TCE in soil vapor in deeper samples than in shallow samples. Most significantly, TCE soil vapor concentrations are significant higher in the 400 - 500 foot depth range than in the 0 – 100-foot depth range for all Soil Vapor data graphed in SAND 2012.

The occurrence of significantly higher TCE concentrations in the 300 – 500 foot depth range demonstrates the occurrence of significant TCE contamination in the "Vadose Zone", the soil column below the surface and above the regional water table, at a SNL environmental restoration site not detected prior to the soil vapor sampling program current being conducted.

The increased TCE concentrations in soil vapor at depth demonstrates the type of contaminant plume that can develop without effective soil vapor monitoring for to establish the full depth of contamination. The example of significantly increased levels of TCE in the 400 – 500 depth at the TA-V site, provides a basis for expanded soil vapor monitoring at other SNL environmental restoration sites that lack soil vapor sampling for the full depth of the soil column, most notably the Mixed Waste Landfill and the TAG site. At the Mixed Waste Landfill, soil vapor investigation have failed to sample soil vapor more than 50 feet below ground surface, though contaminant concentrations well above background levels were detected in the deepest samples.

SNL 2012 data shows that the water table for most of the wells sampled at the TA-V and TAG sites is falling, reflecting the continuing influence of groundwater pumping to the north, in the City of Albuquerque and on Kirtland Air Force Base, on the water table at the TA-V site.

The graphs of summarizing these data for the TA-V site from SAND 2012 are included below.

TA-V Groundwater monitoring well data for TCE and Nitrate through Time:

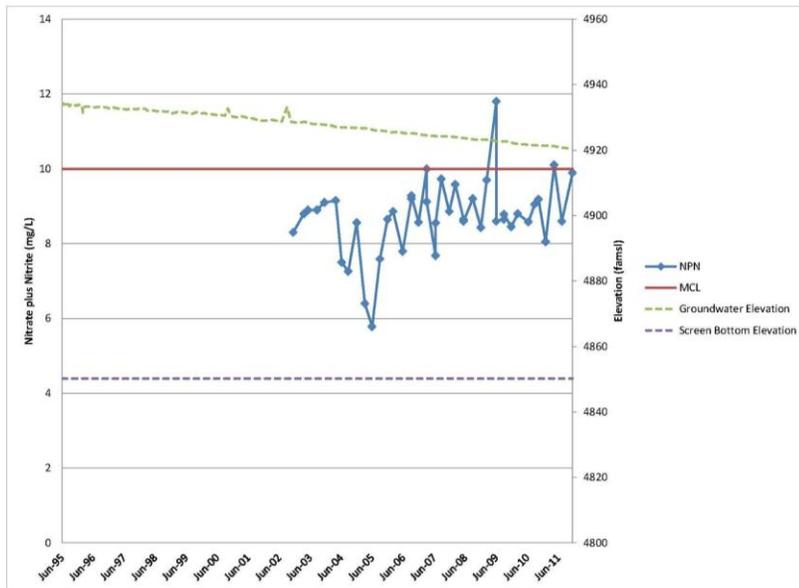


Figure 5B-1. Nitrate Plus Nitrite Concentrations, AVN-1

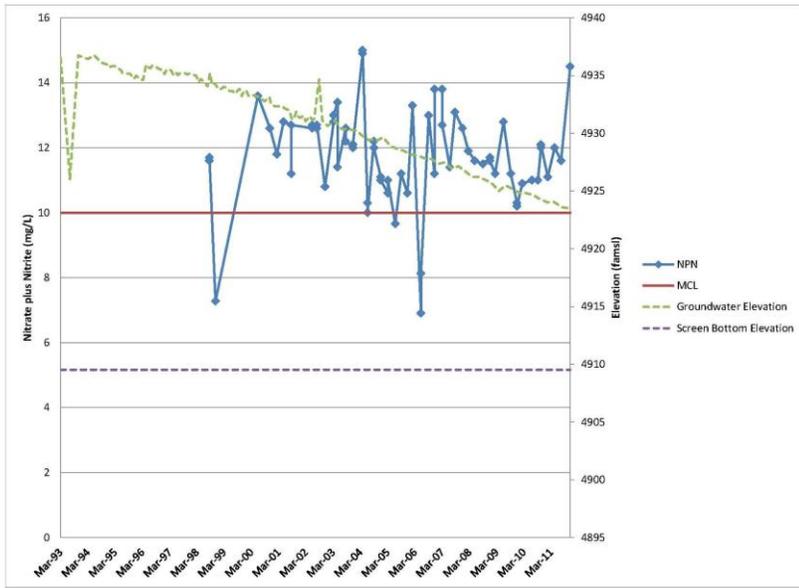


Figure 5B-2. Nitrate Plus Nitrite Concentrations, LWDS-MW1

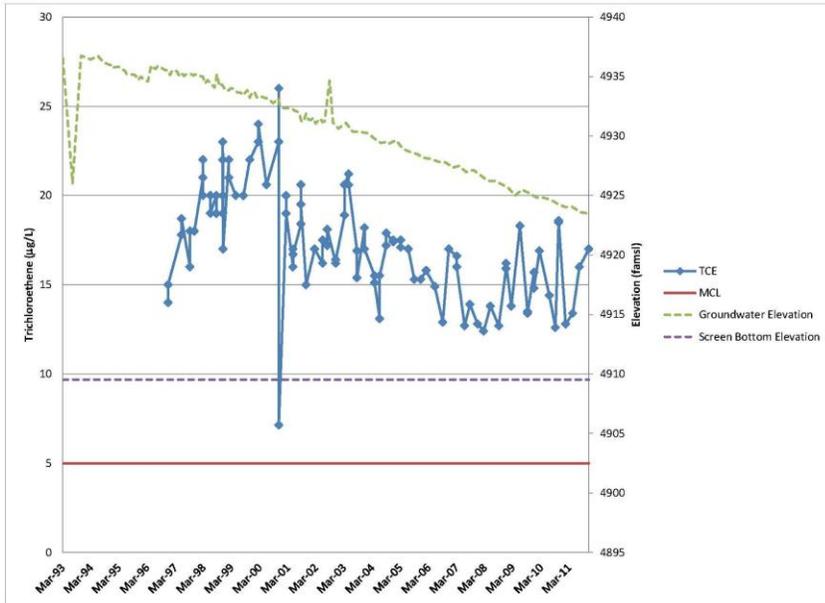


Figure 5B-3. Trichloroethene Concentrations, LWDS-MW1

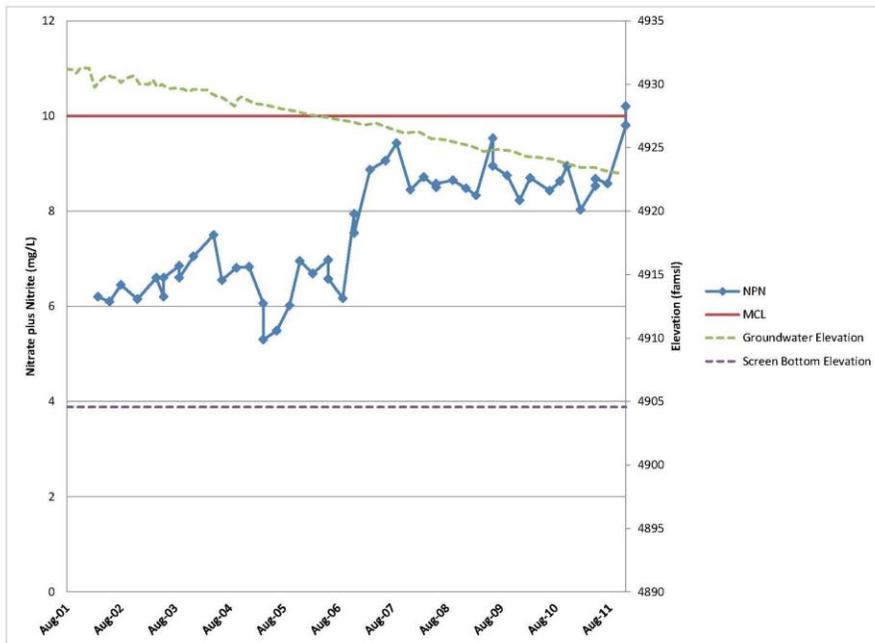


Figure 5B-4. Nitrate Plus Nitrite Concentrations, TAV-MW6

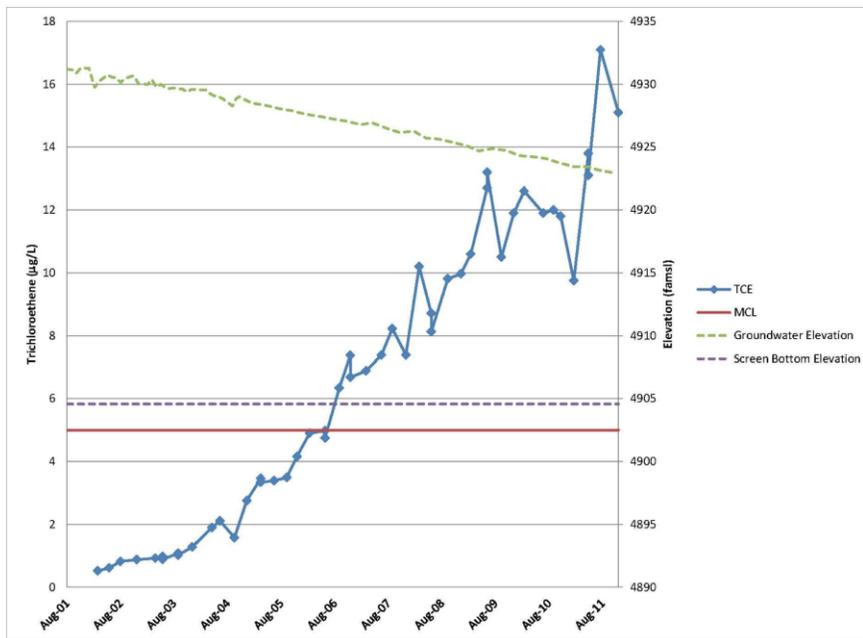


Figure 5B-5. Trichloroethene Concentrations, TAV-MW6

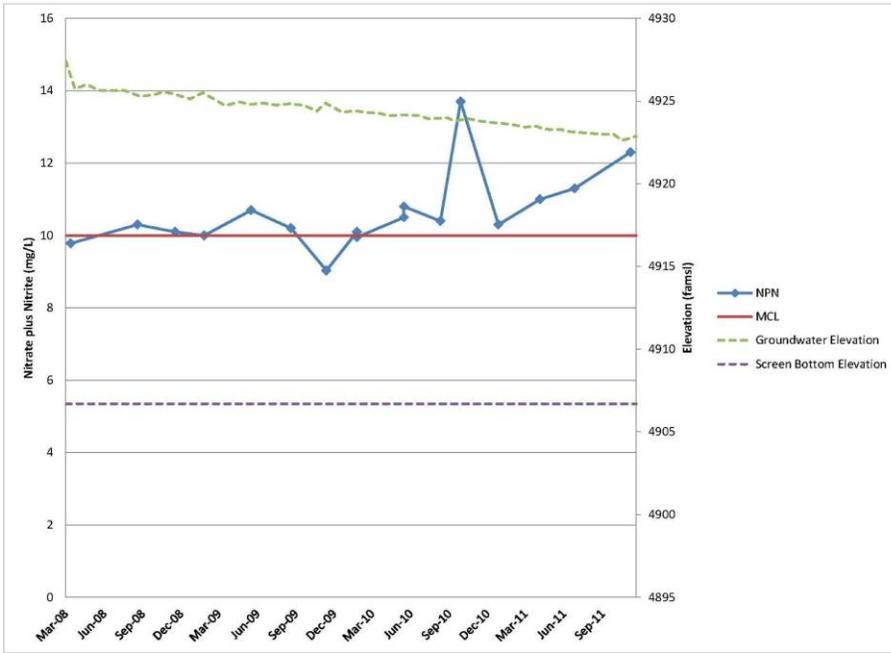


Figure 5B-6. Nitrate Plus Nitrite Concentrations, TAV-MW10

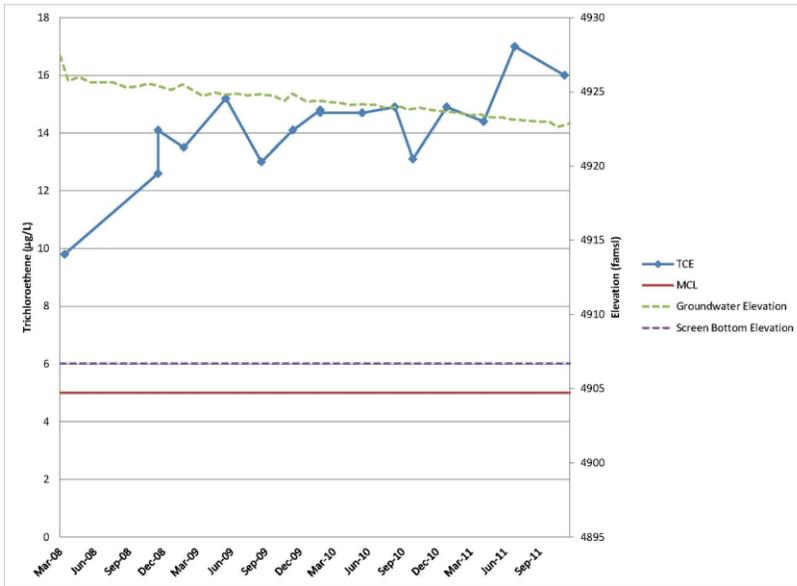


Figure 5B-7. Trichloroethene Concentrations, TAV-MW10

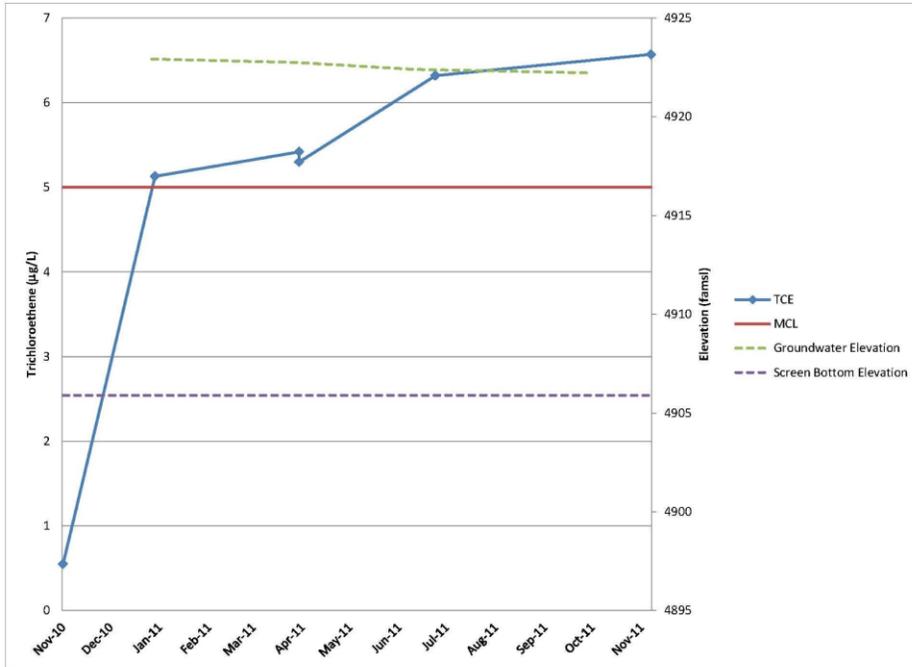


Figure 5B-8. Trichloroethene Concentrations, TAV-MW12

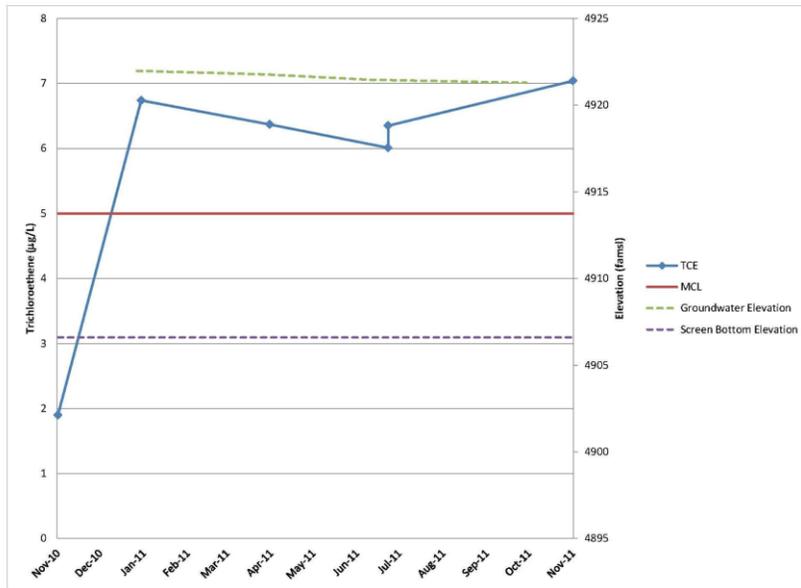


Figure 5B-9. Trichloroethene Concentrations, TAV-MW14

TA-V Soil Vapor Data for Increasing Depth Below Ground Surface through Time

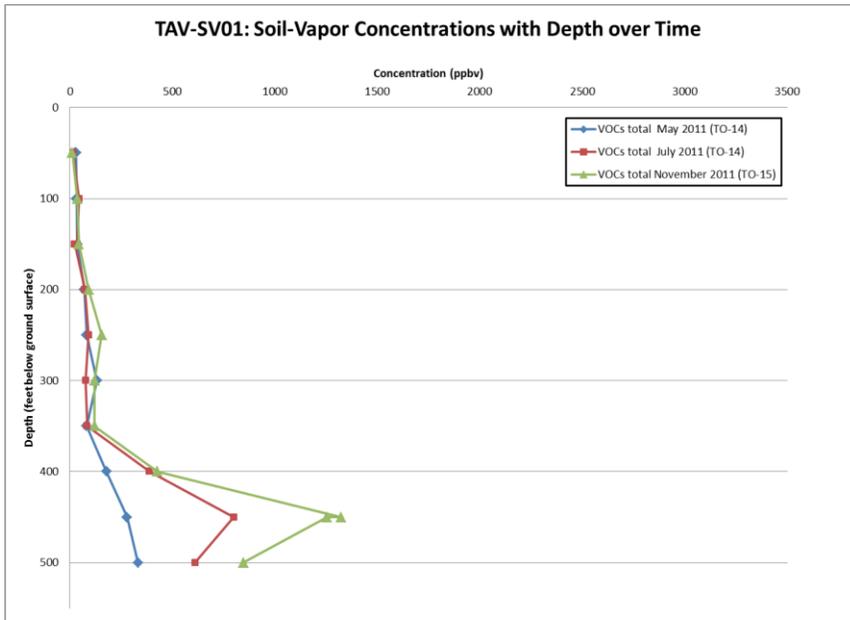


Figure 5D-5. TA-V Soil-Vapor Monitoring Total VOC Results (ppbv) at TAV-SV01

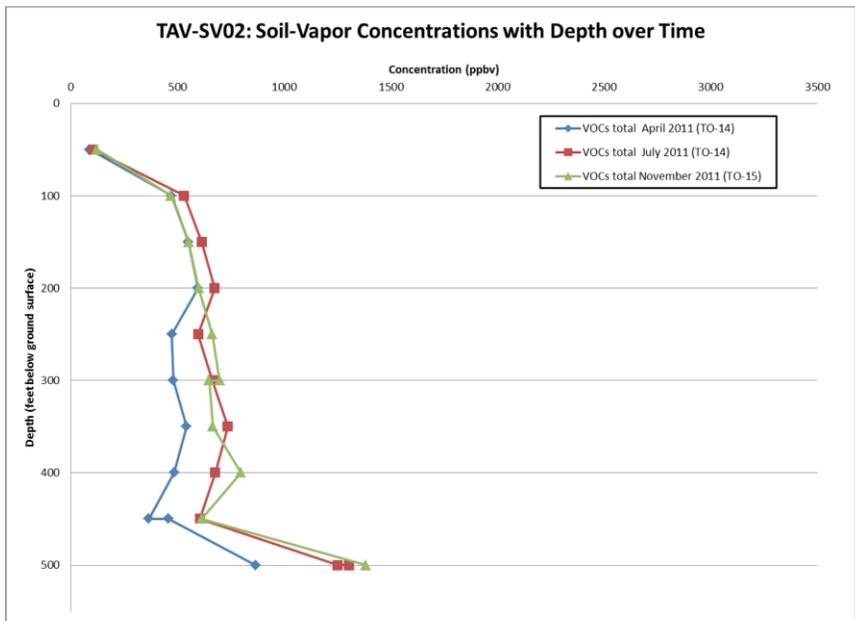


Figure 5D-6. TA-V Soil-Vapor Monitoring Total VOC Results (ppbv) at TAV-SV02

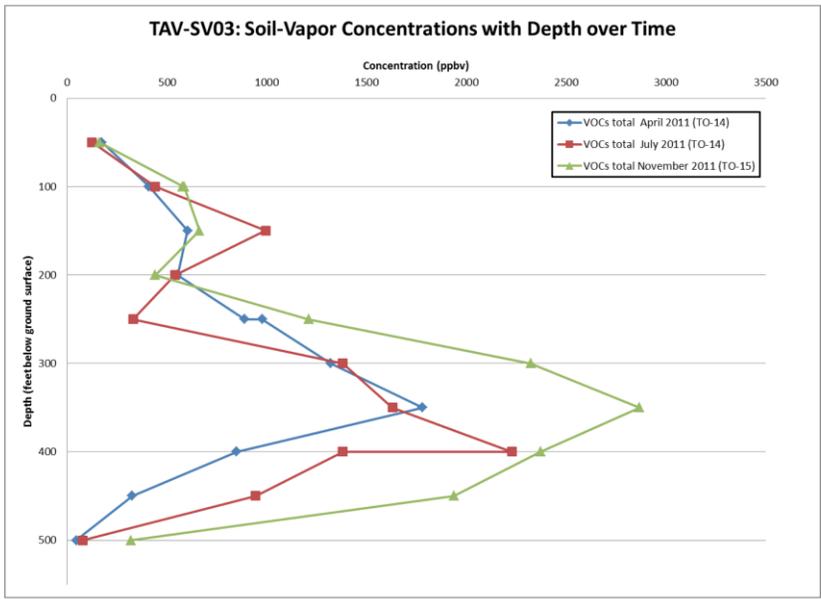


Figure 5D-7. TA-V Soil-Vapor Monitoring Total VOC Results (ppbv) at TAV-SV03

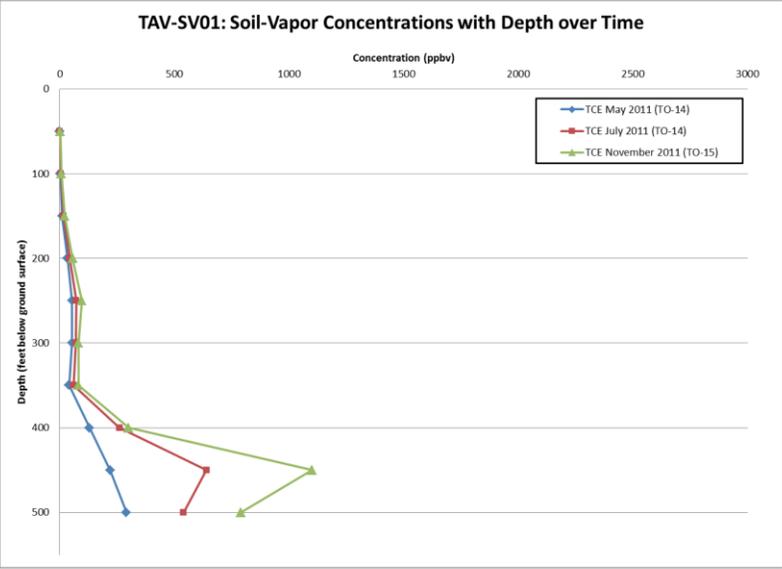


Figure 5D-8. TA-V Soil-Vapor Monitoring TCE Results (ppbv) at TAV-SV01

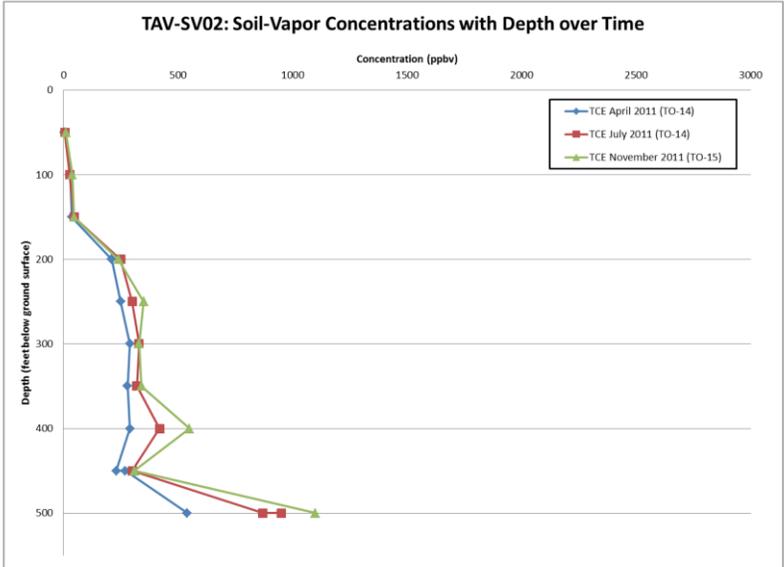


Figure 5D-9. TA-V Soil-Vapor Monitoring TCE Results (ppbv) at TAV-SV02

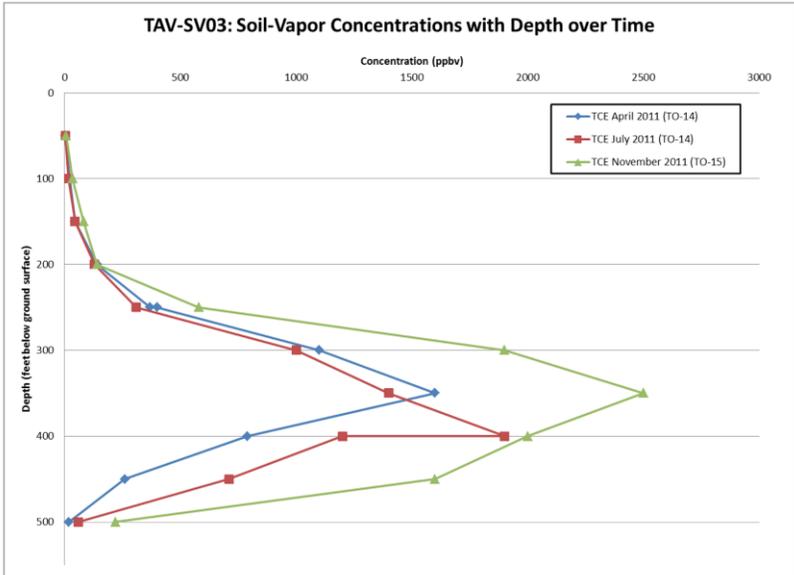


Figure 5D-10. TA-V Soil-Vapor Monitoring TCE Results (ppbv) at TAV-SV03

TAG Monitoring Data

Data for the TAG site graphed in SAND 2012 shows steady or rising concentrations of TCE and Nitrate in recent groundwater samples for all data graphed in SNL 2012.

Water table elevation data at TAG graphed in SNL 2012 shows that water table elevations are dropping in some wells and steady or slowly rising on other wells.

No Soil Vapor for TAG data is reported in SAND 2012 as no soil vapor investigations have been required for the site by the New meico Environment Department, nor conducted or reported by SNL or its contractors.

SNL 2012 demonstrates that the TCE concentration is continue to rise in the perched aquifer monitoring well, WYO-4, presented in the report while the water table elevation continues to fall. As TCE residuals are almost certain likely to remain in the soil column above the current water table elevation, as well as in the soil column above the original water table elevation beneath the sources of TCE release at near the surface, soil vapor investigations should be incorporated in to the SNL and NMED efforts to characterize the contmination at the TAG site.

TAG Groundwater Monitoring Data for TCE and Nitrate through Time:

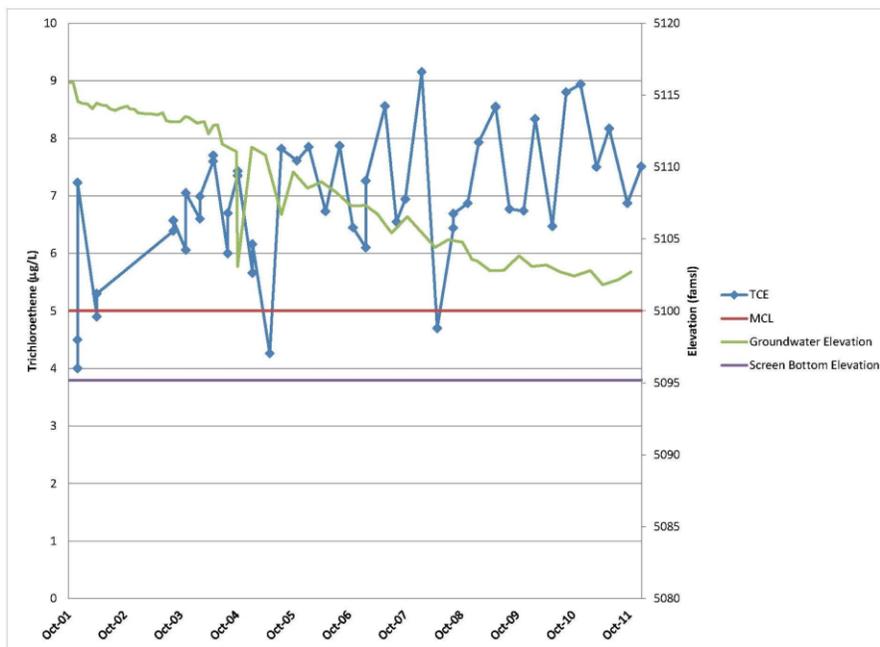


Figure 6B-1. Trichloroethene Concentrations, WYO-4

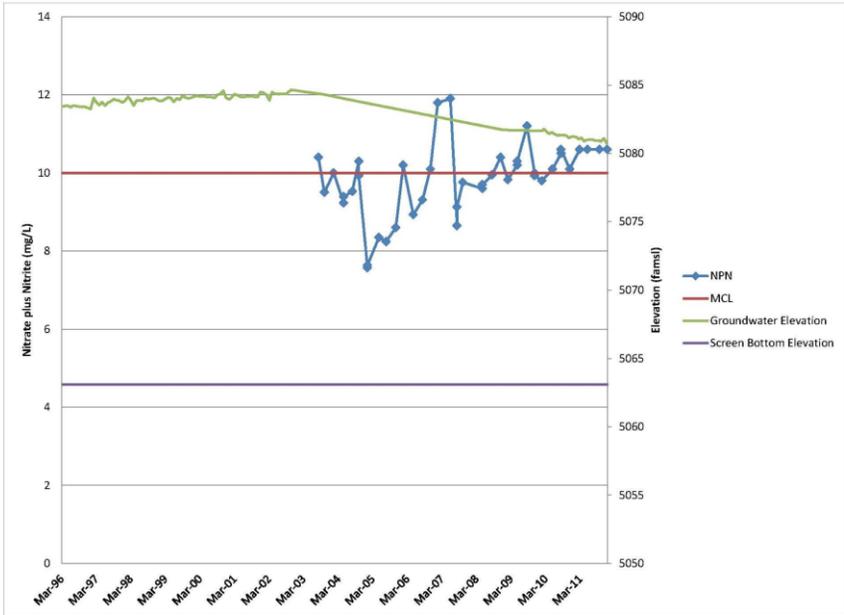


Figure 6B-3. Nitrate plus Nitrite Concentrations, TA2-W-19

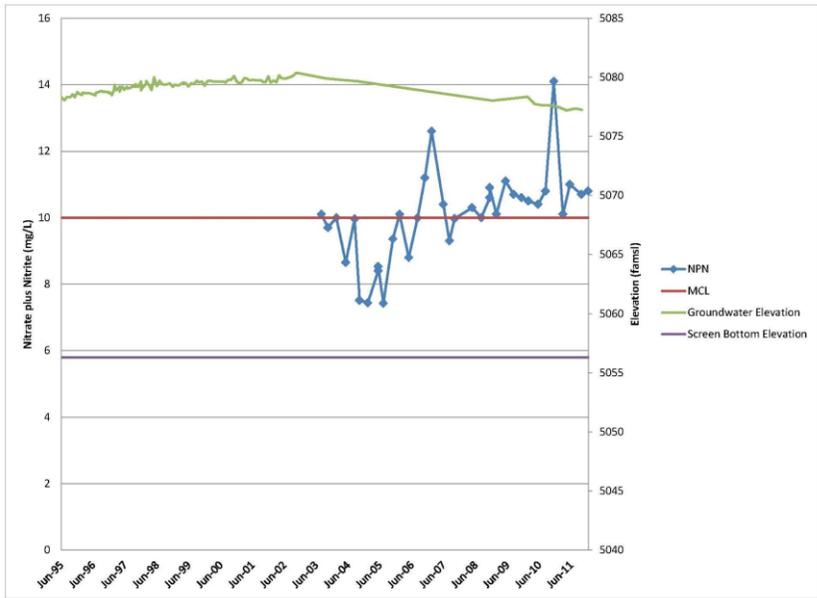


Figure 6B-4. Nitrate plus Nitrite Concentrations, TJA-2

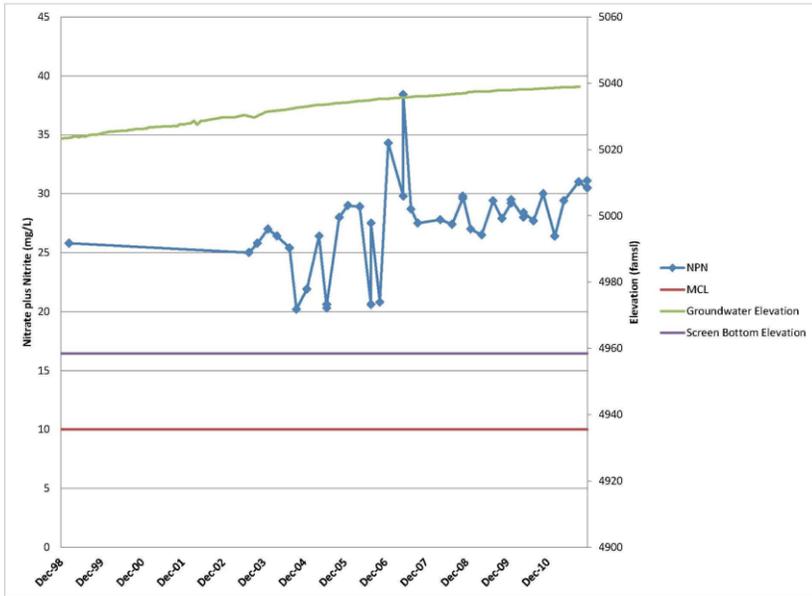


Figure 6B-5. Nitrate plus Nitrite Concentrations, TJA-4

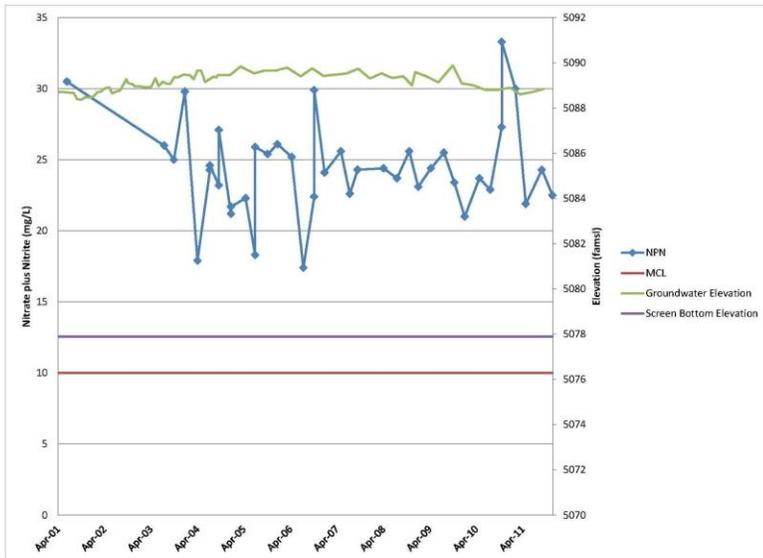


Figure 6B-6. Nitrate plus Nitrite Concentrations, TJA-7