# STAND*point*

*a Special Edition*
*January 2006*

During 2005, STAND conducted several projects funded by a monitoring and technical assistance grant.

One project was a small sampling project with which to gain a better understanding of soils contamination off-site and near Pantex. Twelve soil samples were analyzed for a suite of High Explosives. With a reporting limit ranging between 480 and 500 µg/kg, none of the soils were reported to have high explosives contaminants. An additional 15 soil samples were analyzed for a suite of radionuclides, using gamma spectroscopy. At this time, results reported for the 17 radionuclides raise more questions than they resolved about the Pratt Lake watershed, which is located above the Amarillo well-field and receives stormwater from Pantex. To date, Pratt Lake has not been investigated by Pantex, nor have the regulators required it.

These results will be provided to STAND's technical assistants that are reviewing the Pantex human health and ecological risk assessments and the Pantex Radiological Information Report. In this way, data gaps that may have gone unnoticed might be identified and a better cleanup may be required by the regulators.

Since September 1995, the Pantex Plant has relied upon its Pump and Treat system to clean up the contaminated perched aquifer that extends beyond the Pantex surface boundary, beneath neighbor's land to the south and southeast. At the December 5, 2005, quarterly groundwater meeting, a Pantex representative reported that – through October 2005 – the system had treated 404,489,692 gallons of contaminated water. Through this treatment, 132 pounds of Chromium and 4,367 pounds of High Explosives have been removed.

To understand the effectiveness of a decade of Pump and Treat cleanup operations, another project conducted by STAND was an independent review by groundwater hydrologist, George Rice, part of which follows:

## Effectiveness of the Perched Aquifer Pump and Treat System

**December 2005**

The Department of Energy's (DOE) report: *Annual Report in Support of Compliance Plan No. CP-50284-000*[1] briefly summarizes information contained in other DOE reports regarding clean-up activities at Pantex. However, it does not present a thorough analysis of the effectiveness of DOE's clean-up activities. Because of this, DOE's quarterly reports of analytical results[2] were examined to evaluate the effectiveness of one of the major clean-up systems at Pantex – the perched aquifer pump and treat system.

The high explosive RDX is one indicator of clean-up effectiveness because it is one of the most widespread contaminants in the perched aquifer.

Table 1 presents RDX data for selected monitor wells in the perched aquifer. Graphs depicting the changes in RDX concentrations are presented in figures 1-7.

The RDX data lead to the preliminary conclusion that DOE's perched aquifer pump and treat system has been marginally effective.

To date, cleanup appears to be have been effective in only one of the selected wells: PTX06-1005 (figure 1). Between 1999 and 2005, RDX concentrations dropped from approximately 1000 µg/L to 20 µg/L. This is less than the TCEQ Industrial Risk Reduction Standard 2 level of 26 µg/L[3]. However it is higher than the EPA lifetime health advisory of 2 µg/L[4].

*Continued from page 1*

Well PTX06-1005 is near a clean-up system injection well[5]. This may be the reason RDX concentrations have decreased as much as they have.

RDX concentrations have declined in some wells (e.g., PTX06-1042, figure 4) and increased in others (e.g., PTX06-1046, figure 5). Still, except for well PTX06-1005, RDX concentrations remain high in all the wells (figures 2 – 7), far above any standards established to protect human health.

A complete evaluation of the effectiveness of the pump and treat system would require an assessment of the temporal distribution of additional contaminants (e.g., chromium, TCE, TNT), as well as the assessment of additional monitor wells.

[1] DOE, 2005a.
[2] DOE, 1998 – 2005.
[3] DOE, 2005a, figure 19.1.
[4] EPA, 2004.
[5] PTX06-1005 is less than 200 feet from injection well PTX06-INJ-8 (DOE, 2005a, figure 17.3).

**Table 1. Concentrations of RDX in selected Perched Aquifer Wells (DOE, 1998-2005).**

| Date | PTX06-1005 | PTX06-1030 | PTX06-1039A | PTX06-1042 | PTX06-1046 | PTX06-1050 | PTX08-1002 |
|---|---|---|---|---|---|---|---|
| 1998-Q3 | NA[1] | NA | 288/535 | NA | NA | NA | 21 |
| 1998-Q4 | NA | NA | NA | NA | NA | NA | NA |
| 1999-Q1 | 362, 846 | NA | 1130/1180 | NA | NA | NA | 158/176 |
| 1999-Q2 | NA | NA | 1300 | NA | NA | NA | NA |
| 1999-Q3 | NA | NA | NA | NA | NA | NA | NA |
| 1999-Q4 | NA | NA | NA | NA | NA | NA | NA |
| 2000-Q1 | 1340 | NA | 1180/671 | 526/1430 | 450 | NA | 93/90 |
| 2000-Q2 | NA | NA | NA | 451/959 | NA | NA | NA |
| 2000-Q3 | NA | NA | NA | 1700 | 624/467 | 164 | NA |
| 2000-Q4 | NA | NA | NA | NA | 358/685 | 190/210 | NA |
| 2001-Q1 | 1050/622 | NA | 120 | 1500/1900 | 686 | 250/280 | NA |
| 2001-Q2 | NA | NA | NA | NA | 366/717 | 270/296 | 234/252 |
| 2001-Q3 | NA | NA | NA | NA | NA | NA | NA |
| 2001-Q4 | NA | NA | 0/1360 | 982/2650 | 540/746 | NA | NA |
| 2002-Q1 | NA | NA | NA | NA | NA | NA | NA |
| 2002-Q2 | NA | NA | NA | NA | NA | NA | NA |
| 2002-Q3 | NA | 543/832 | NA | NA | NA | 332/376 | NA |
| 2002-Q4 | NA | NA | 627/1010 | 636/1050 | 514/702 | NA | NA |
| 2003-Q1 | 520/768 | 598/2080 | NA | NA | NA | NA | NA |
| 2003-Q2 | NA | NA | 526/840 | 1040/146 (?) | 507/732, 771/356 | NA | 238/277 |
| 2003-Q3 | NA | 845/1130 | NA | 576/891 | 705/375 | 474/546, 481/336 | NA |
| 2003-Q4 | NA | NA | 621/336 | NA | NA | NA | NA |
| 2004-Q1 | NA | 1500/1610 | NA | 998/1000 | 760/782 | NA | NA |
| 2004-Q2 | 15.6/16.5 | NA | 557/567 | NA | NA | NA | NA |
| 2004-Q3 | NA | 1520/1830 | NA | 1110/1150 | 816/831 | NA | NA |
| 2004-Q4 | NA | NA | NA | NA | NA | 222/499 | 84.8 |
| 2005-Q1 | NA | 1480/1710 1340/1750 | NA | 824/87, 970/1000 | 673/685, 841/855 | NA | |
| 2005-Q2 | 22.2/23.5 | NA | 498/406 | NA | NA | NA | NA |

NA = No analysis

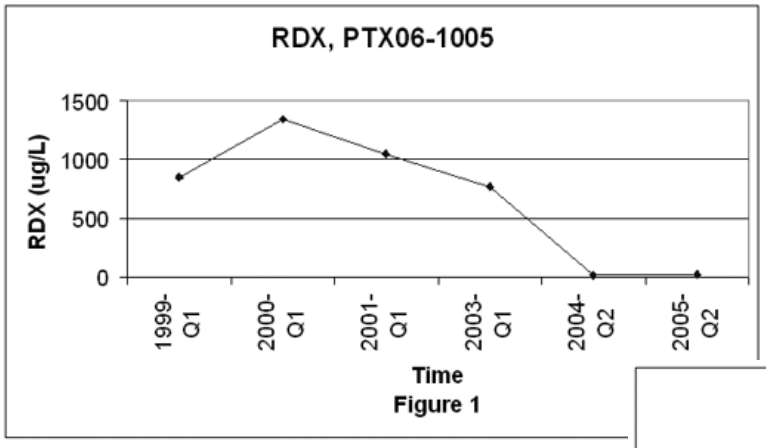

Figure 1

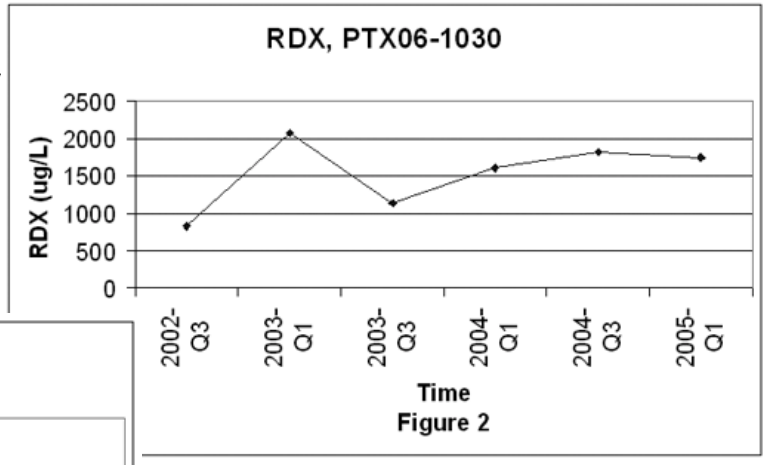

Figure 2

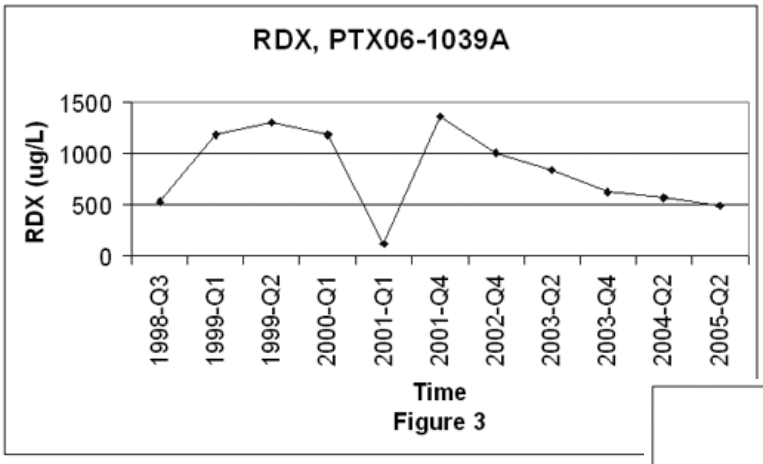

Figure 3

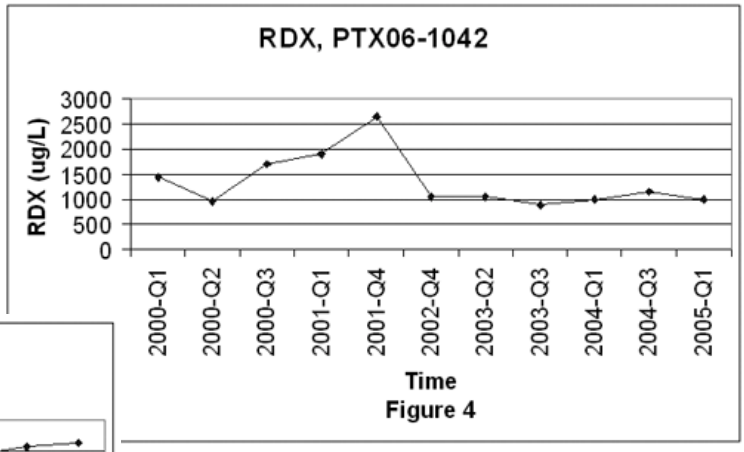

Figure 4

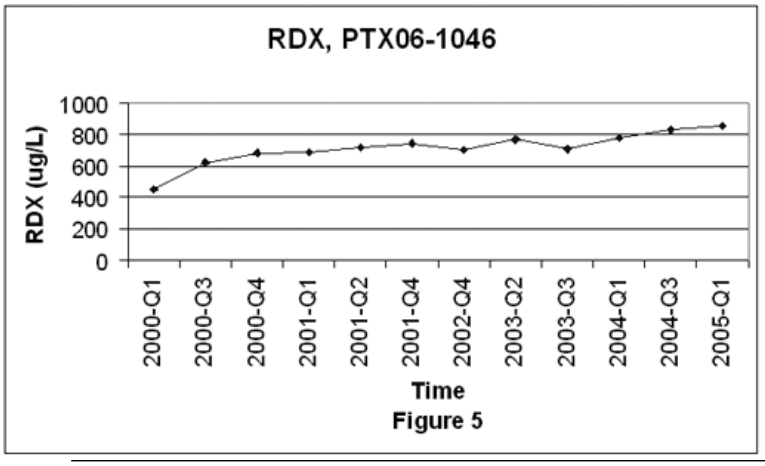

Figure 5

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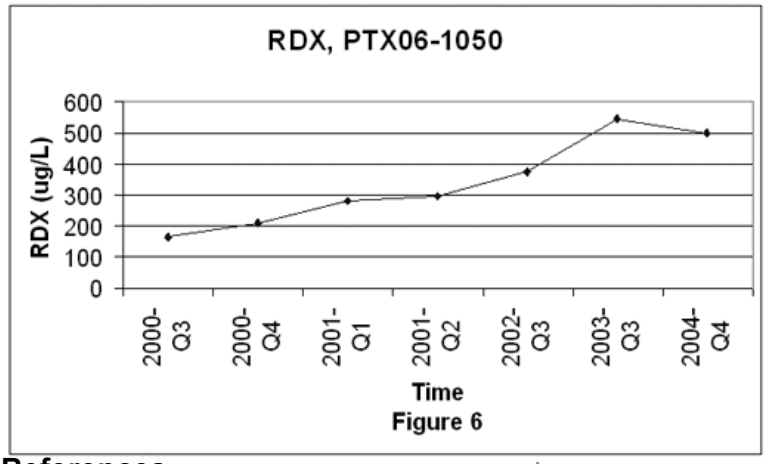

Figure 6

*For additional information about STAND or its projects, contact its office at* (806) 358-2622

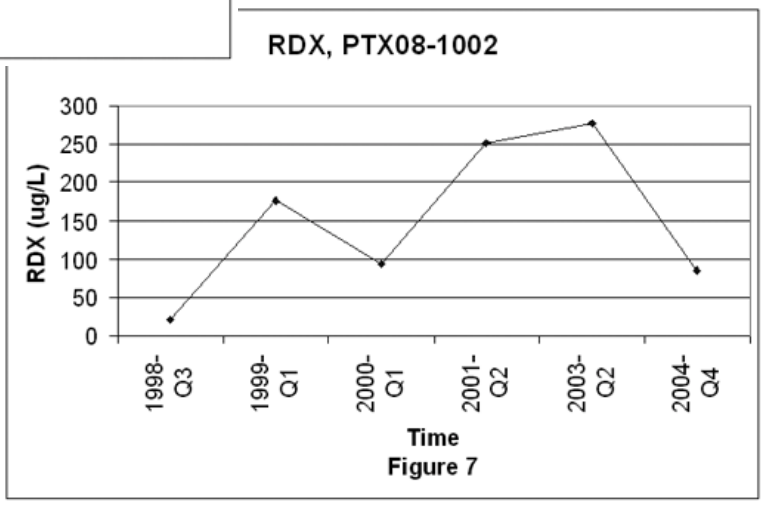

Figure 7

## References


DOE, 1998 – 2005, *Environmental Monitoring Quarterly Reports*, posted on the Pantex web site: http://www.pantex.com/environment/epd/index.shtml

DOE, 2005a, *Annual Report in Support of Compliance Plan No. CP-50284-000*, April 1, 2005.

EPA, 2004, *2004 Edition of the Drinking Water Standards and Health Advisories*, EPA 822-R-04-005, Winter 2004.