## Young, John, NMENV

**From:** Jean M. Dewart [dewart@lanl.gov]
**Sent:** Friday, July 14, 2006 5:43 PM
**To:** Young, John, NMENV; david.cobrain@state.nm.us; Bearzi, James, NMENV
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**Subject:** draft letter of future of R-25
**Attachments:** R-25 letter to NMED 7-14.doc

LANL TA-16 [Groundwater, R-25]

John, Dave, James -

Attached is a draft letter we are working on concerning the path forward on R-25. The Well Rehabilitation Plan supercedes our May 2005 plan to validate the R-25 data. I had spoken to James in late May, and John a couple of weeks ago about writing a formal letter on this subject.

About 2 weeks ago, we identified elevated nickel concentrations in the well. This information now needs to be incorporated into our thinking on the well rehabilitation. We've put together a preliminary proposal and would like to discuss this with you.

thx - Jean

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James Bearzi
Hazardous Waste Bureau
New Mexico Environment Department

**Subject: Update on Status of Groundwater Well R-25**

Dear Mr. Bearzi;

As you know, the Compliance Order on Consent gave Los Alamos National Laboratory the opportunity to demonstrate that water quality data from well R-25 are, or will be, valid and reliable. Los Alamos National Laboratory submitted the "Plan to Demonstrate Validity of R-25 Data" (ER2005-0256) on May 27, 2005. This letter is to inform you that our plans for actions related to R-25 presented in this document have been superseded by the "Workplan for R-Well Rehabilitation and Replacement" (ER2006-0465) submitted to the Hazardous Waste Bureau on May 31, 2006. This information is also presented in Section 4.4.6 of the "Workplan for R-Well Rehabilitation and Replacement." The "Plan to Demonstrate Validity of R-25 Data" no longer requires review and approval by the Hazardous Waste Bureau.

In the Workplan for Well Rehabilitation and Replacement, we proposed that the rehabilitation plans for R-25 be reviewed following the results of the pilot well rehabilitation and subsequent rehabilitation of 5 other wells. Thus, we will have a thorough investigation of the success of well rehabilitation prior to making final decisions on R-25. Seven of the nine R-25 screens are considered for rehabilitation, because 2 screens (#3 and #9) are unusable, due to construction problems.

We continue to sample R-25 and review the results. As you know, nickel and chromium levels at R-25 screens one and two have been elevated since the time the well was drilled (Longmire 2002, ESR 2002, ESR 2003, ESR 2004). This trend has continued in 2005 (attachment 1). The rise in filtered sample levels of nickel and chromium in the last year suggest increased breakdown and mobility of stainless steel from corrosion of screens 1 and 2 and/or particles remaining from construction problems. To evaluate stainless steel as the source, we have reviewed concentrations of other metal indicators by performing calculations using the PHREEQC2.2 computer code (attachment 2). These results support the understanding that stainless steel corrosion is occurring in R-25 screens 1 and 2.

Other R-25 screens do not demonstrate corrosion of the well casing. In addition, we reviewed metals data from wells R-9, R9i, and R-12. These wells were constructed during the same time period as R-25. These wells do not demonstrate corrosion of the well casing.

Over time, the corrosion of stainless steel is a potential source of groundwater contamination (California EPA 1995). Because of this concern, we are re-evaluating our Well Rehabilitation Plan proposal for R-25. Our preliminary proposal is:

Attachment 1
Observations of Metals in R-9, R-9i, R-25, R-12
7/10/06

**R-25 (Figures 1-5)**

- Figures 1-3 show nickel, chromium, and molybdenum concentrations versus time for all screens in R-25. Only the upper two screens exhibit increasing concentrations with time.
- Figures 4-5 show increasing values for chromium, manganese, nickel, and iron, but not molybdenum for the top two screens.
- Filtered Cr does not appear to be increasing
- Unfiltered values tend to be higher than filtered values.
- There appears to be some elevated concentrations in 2002 that aren't congruent with the other values.

**R-12 (Figures 6-7)**

- R-12 doesn't exhibit elevated metal concentrations.
- All nickel concentrations in R-12 are below 10 ug/L, with the exception of the values from the screen at 898.1' bgs which have elevated concentrations in the first sampling event only.
- Iron and manganese also show elevated concentration only in the first sampling event (not shown graphically).
- Molybdenum remains relatively constant (not shown graphically).

**R-9/R-9i (Figures 8-9)**

- Chromium and nickel decrease 2-3 orders of magnitude from initial sampling in R-9.
- All Chromium values have been below 10 ug/L since 2001
- Nickel concentrations are between 10-100 ug/L in well R-9i, and below 10 ug/L in well R-9.
- Note: R-9 was installed earlier than R-9i.

**Conclusions**

Elevated metal concentrations exist in the top two screens of R-25. The other screens in R-25 and all screens in wells R-9, R-9i, and R-12 do not exhibit elevated metal concentrations. Nickel, manganese, iron, and chromium concentrations are elevated and increasing with time in the upper two screens of R-25. Unfiltered values are generally higher than filtered values.

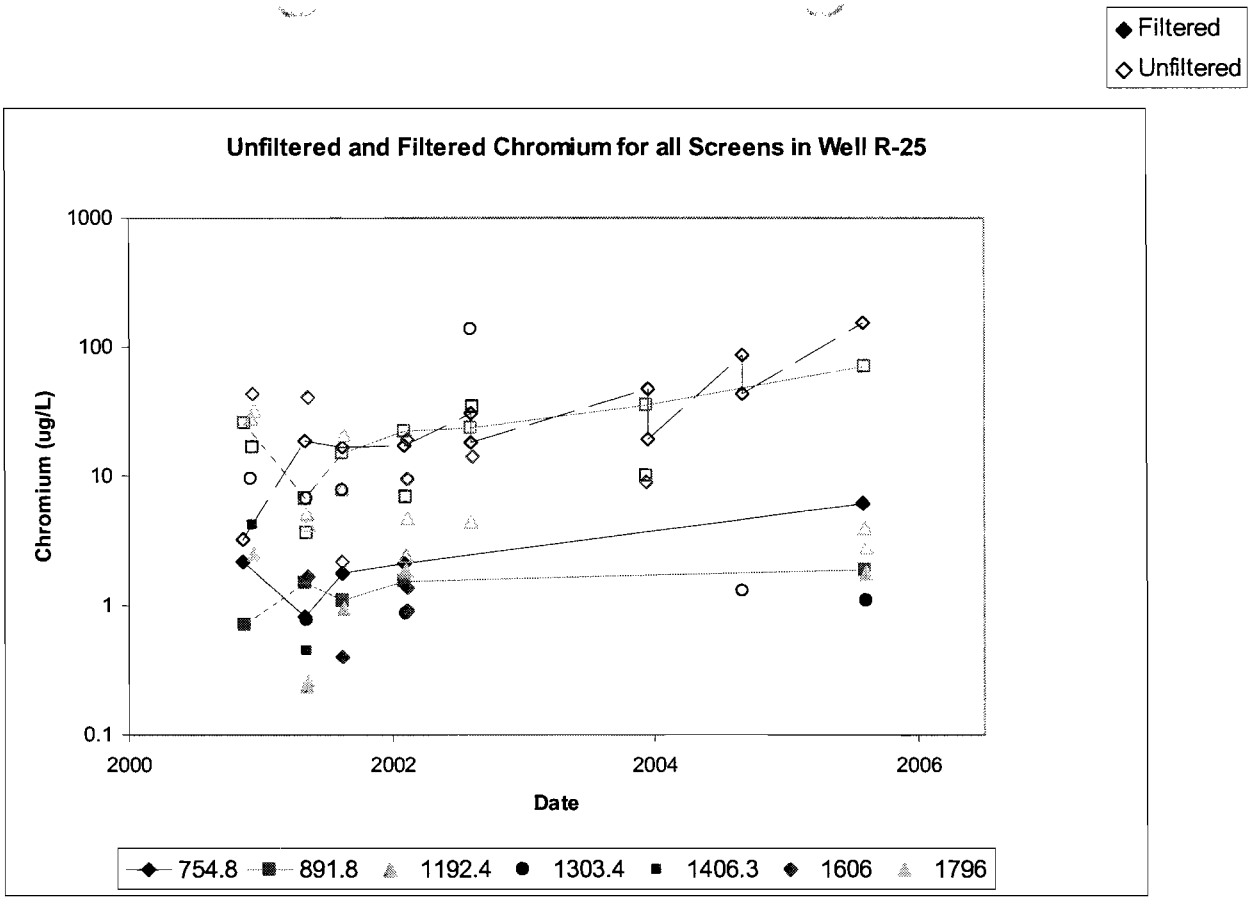


Figure 1 Chromium concentrations versus time for all screens in well R-25. Note the logarithmic Y-axis.

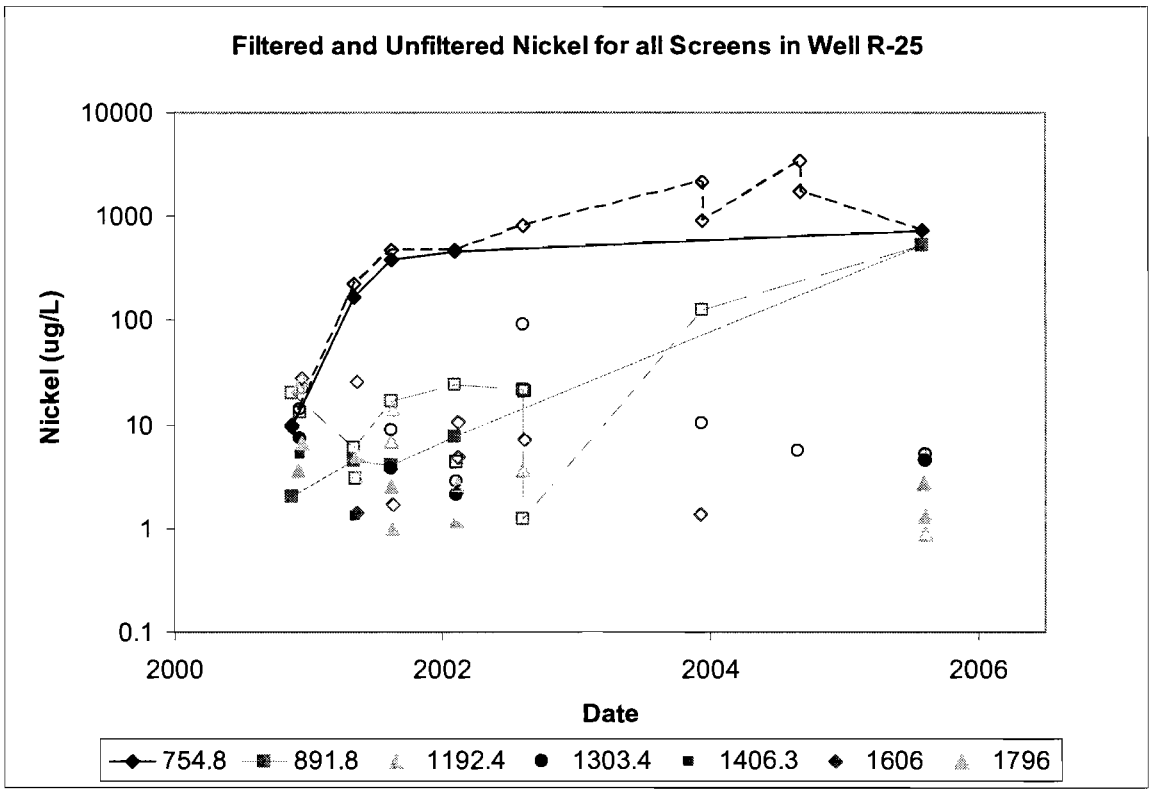


Figure 2 Nickel concentrations versus time for all screens in well R-25. Note the logarithmic Y-axis.

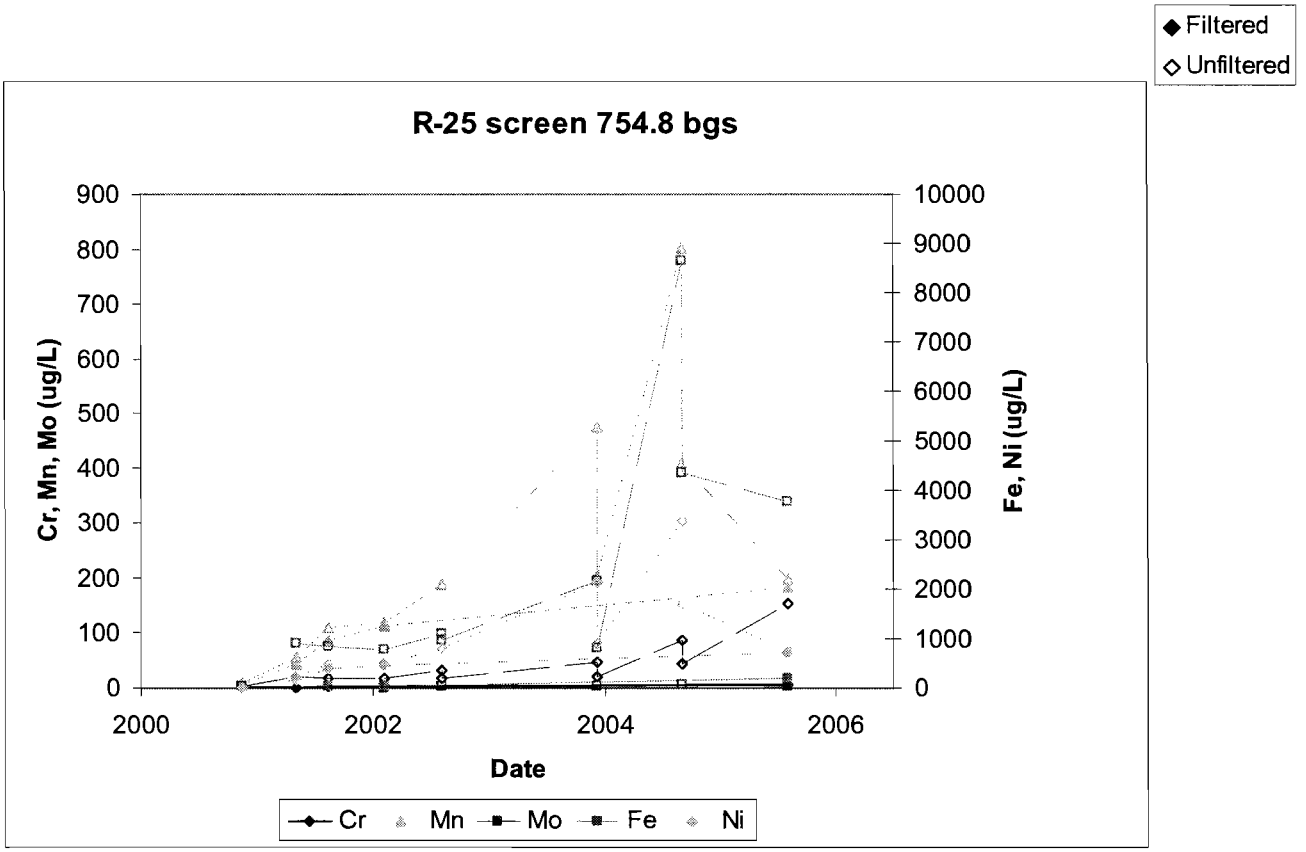


Figure 4 Metal concentrations for first screen (754.8' bgs) in well R-25.

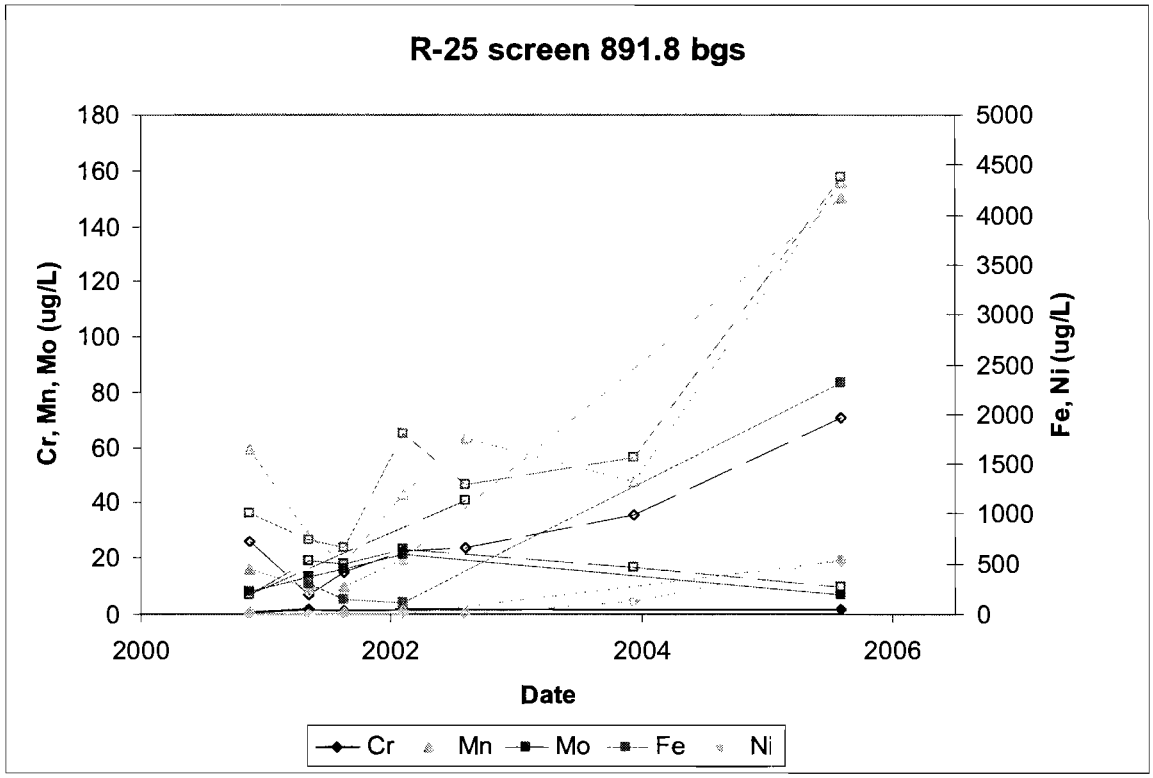


Figure 5 Metal concentrations for second screen (891.8' bgs) in well R-25.

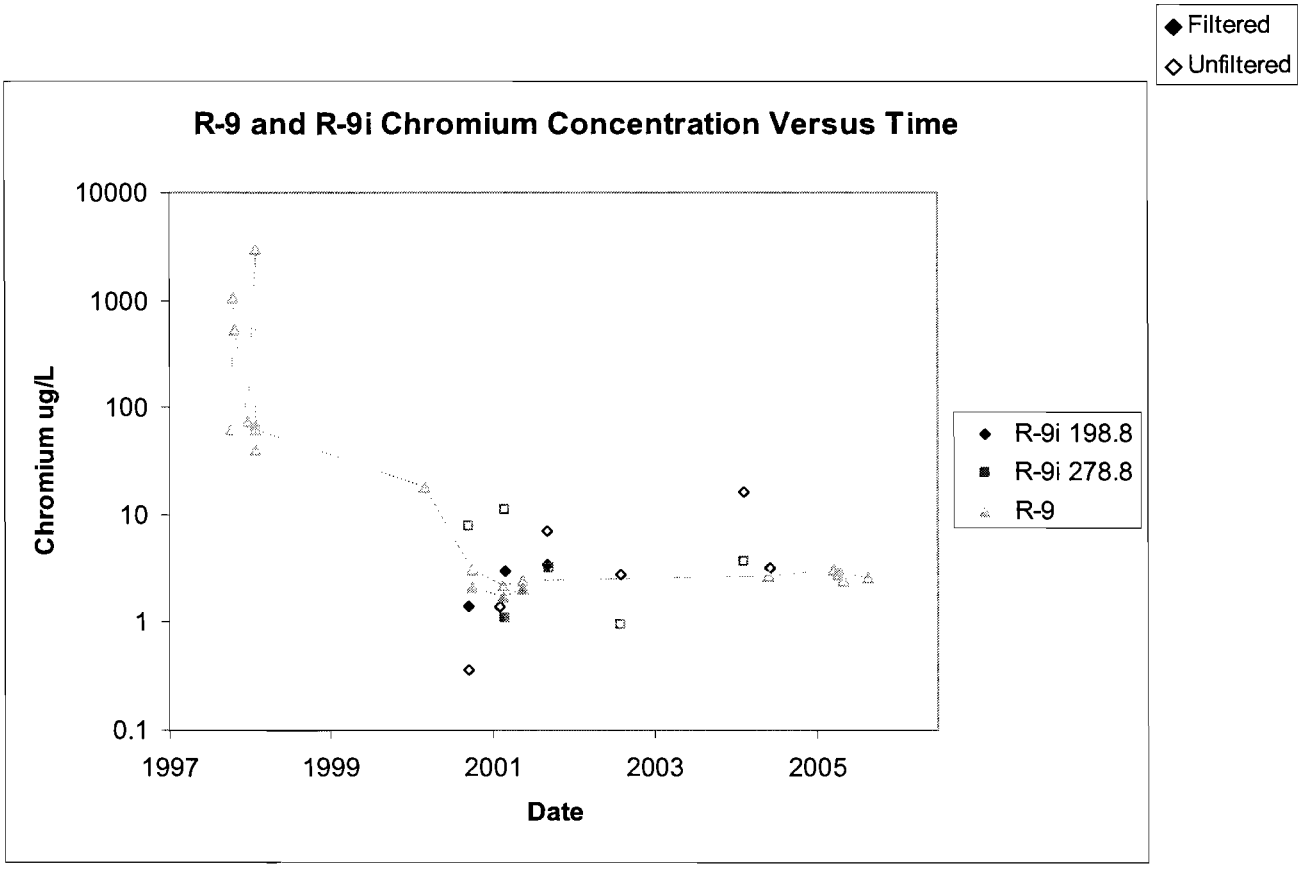


Figure 8 Chromium versus time for all screens in wells R-9 and R-9i. Note logarithmic Y-axis.

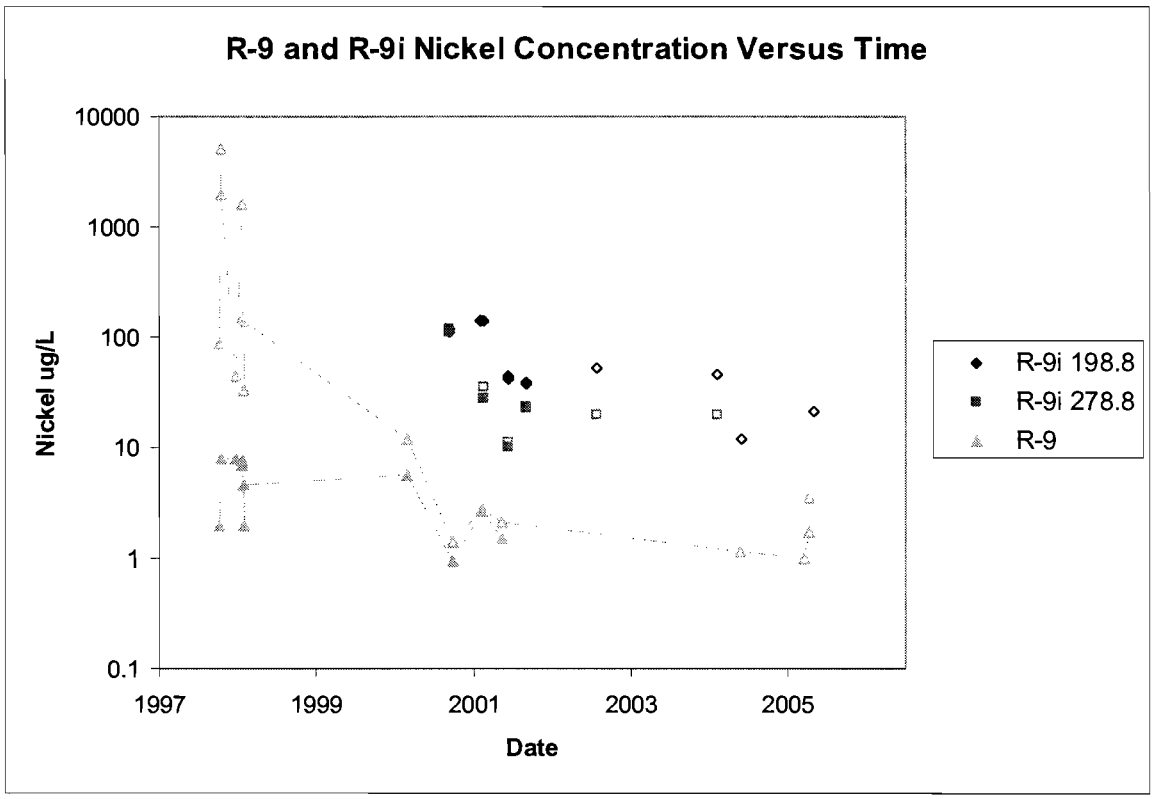


Figure 9 Nickel concentration versus time for all screens in wells R-9 and R-9i. Note logarithmic Y-axis.