From: [redacted]
To: [redacted]
Cc: [redacted]

Subject: January 12 NFSS Conference Call (UNCLASSIFIED)
Date: Monday, January 10, 2011 3:26:57 PM
Attachments: Data1997 to 2009 Radium 226 rev2.pdf
Total U - Total 11 by 17.pdf
Total Ra-226 11 by 17.pdf
Niagara Falls Storage Site FUSRAP Project, 6 January 2011.pdf
Graphs 1997 to 2009 Radium 226 rev2.pdf
Graph Well OW11B 1997 to 2009 uranium water levels.pdf
Graph All wells 1997 to 2009 uranium.pdf
Data table for all wells 1997 to 2009 uranium.pdf

Classification: UNCLASSIFIED
Caveats: NONE

Hello Ann,

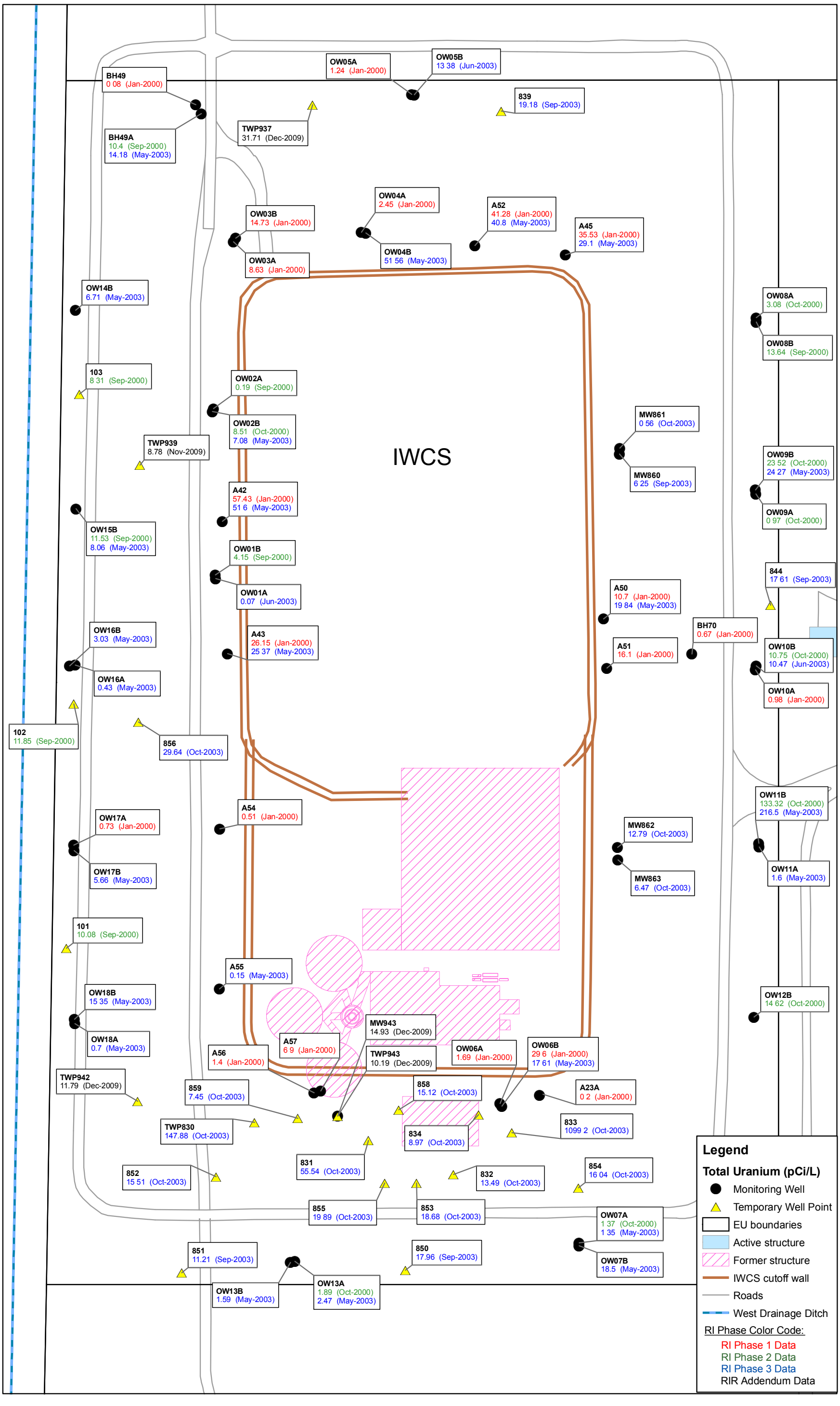
To address your concerns regarding the IWCS integrity, total isotopic uranium and total radium-226 data from wells around the IWCS (EU 10) have been tabulated and graphed. In addition, statistical analyses have been performed on the uranium data by a person not affiliated with the project. Since the majority of the data depicted on the graphs was collected as part of the Environmental Surveillance Program (ESP), we have included two figures that show total isotopic uranium and total radium-226 data collected as part of the RI and RIR Addendum effort.

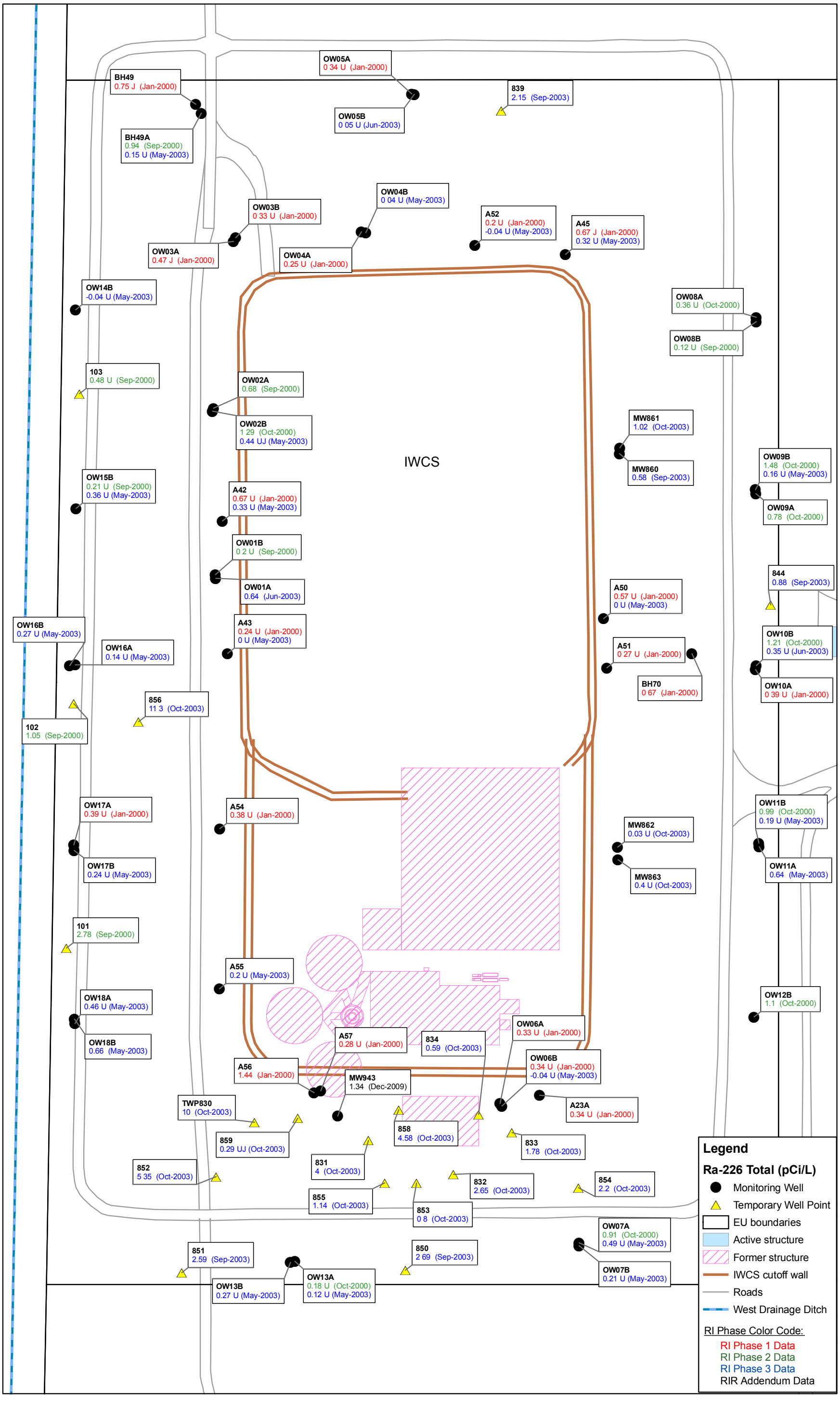
[redacted]

Classification: UNCLASSIFIED
Caveats: NONE

UNFILTERED RADIUM-226 IN WELLS NEAR IWCS (pCi/L)

Date Collected		A45	A45 FLAG	A50	A50 Flag	OW04B	OW4B Flag	OW06B	OW6B Flag	OW07A	OW7A Flag	OW07B	OW7B Flag	OW13B	OW13B Flag	OW15B	OW15B Flag	OW17B	OW17B Flag	A42	A42 Flag	BH49A	BH49A Flag	OW04A	OW04A Flag	OW11B	OW11B Flag	OW6A	OW6A Flag	OW15A	OW15 A Flag	OW14B	OW14B Flag
4/29/1997		0.080	U	0.070	U	0.140	U	0.090	U			0.050	U			0.080	U	0.110	U														
4/8/1998		0.940	J	0.210	J	0.230	J	0.190	UJ			1.290	J			0.240	J	0.100	UJ														
6/9/1999		0.100		0.300		-		0.100		0.400						0.100		ND															
1/5/2000		0.671	J	0.574	U	-										0.205	U			0.667	U	0.754	J	0.253	U	0.986							
7/21/2000		0.398		0.348		0.291		0.024				0.274				0.269		0.134															
5/8/2001		0.520		0.160	U	0.100	U	0.490	U			0.740				0.210	U	0.170	U														
5/21/2002		0.070	U	0.150	U	0.100	U	0.150	U			0.033				0.210		0.090	U														
5/14/2003		0.320	U	0.000	U	0.042	U	-0.040	U			0.213	U	0.267	U	0.357	U	0.235	U	0.326	U	0.153	U			0.189	U					-0.037	U
4/26/2004		1.120		0.443	U	0.280	U	0.971						0.359	U	0.408	U	-0.085	U														
11/3/2004						1.290														1.61						2.250							
5/23/2005		0.160	J	0.090	U	-0.010	U	0.150	U					0.066	U	0.180	U	0.030	U														
5/26/2005						-														0.080	U					-0.160	U						
11/8/2005						-																											
5/17/2006		0.250	J	0.101	U	0.088	U	0.168	J					0.056	U	0.180	U	0.040	U	0.26	J					0.23	J						
6/12/2007		0.636		0.332	U	0.523		0.230	U					0.159	U	0.111	U	0.264	U	0.826	0.42					0.466							
6/17/2008		0.250	U	0.422		0.275	U	0.079						0.490		0.228	U	0.112															
10/28/2008		0.451		0.405	U	0.508	U	0.443						1.050		0.249	U	0.587															
5/19/2009		0.663	J	0.159	U	0.729	U	0.096	U					0.800	U	0.188	U	0.402	U														
10/28/2009		0.970		0.335		0.558		0.810						0.519		0.729		0.981															
6/4/2010						0.051	U	0.163	U											0.341				0.281	U			0.091	U	0.257	U		


IWCS
BH49
0 08 (Jan-2000)
BH49A
10.4 (Sep-2000)
14.18 (May-2003)
OW05A
1.24 (Jan-2000)
OW05B
13 38 (Jun-2003)
839
19.18 (Sep-2003)
TWP937
31.71 (Dec-2009)
OW04A
2.45 (Jan-2000)
OW04B
51 56 (May-2003)
A52
41.28 (Jan-2000)
40.8 (May-2003)
A45
35.53 (Jan-2000)
29.1 (May-2003)
OW03B
14.73 (Jan-2000)
OW03A
8.63 (Jan-2000)
OW14B
6.71 (May-2003)
OW08A
3.08 (Oct-2000)
OW08B
13.64 (Sep-2000)
103
8 31 (Sep-2000)
OW02A
0.19 (Sep-2000)
OW02B
8.51 (Oct-2000)
7.08 (May-2003)
TWP939
8.78 (Nov-2009)
MW861
0 56 (Oct-2003)
MW860
6 25 (Sep-2003)
OW09B
23 52 (Oct-2000)
24 27 (May-2003)
OW09A
0 97 (Oct-2000)
A42
57.43 (Jan-2000)
51 6 (May-2003)
OW15B
11.53 (Sep-2000)
8.06 (May-2003)
OW01B
4.15 (Sep-2000)
OW01A
0.07 (Jun-2003)
844
17 61 (Sep-2003)
A50
10.7 (Jan-2000)
19 84 (May-2003)
BH70
0.67 (Jan-2000)
A51
16.1 (Jan-2000)
OW10B
10.75 (Oct-2000)
10.47 (Jun-2003)
OW10A
0.98 (Jan-2000)
OW16B
3.03 (May-2003)
OW16A
0.43 (May-2003)
A43
26.15 (Jan-2000)
25 37 (May-2003)
102
11.85 (Sep-2000)
856
29.64 (Oct-2003)
OW11B
133.32 (Oct-2000)
216.5 (May-2003)
A54
0.51 (Jan-2000)
OW17A
0.73 (Jan-2000)
OW17B
5.66 (May-2003)
MW862
12.79 (Oct-2003)
MW863
6.47 (Oct-2003)
OW11A
1.6 (May-2003)
101
10.08 (Sep-2000)
A55
0.15 (May-2003)
OW18B
15 35 (May-2003)
OW18A
0.7 (May-2003)
OW12B
14 62 (Oct-2000)
MW943
14.93 (Dec-2009)
A57
6 9 (Jan-2000)
A56
1.4 (Jan-2000)
TWP943
10.19 (Dec-2009)
OW06A
1.69 (Jan-2000)
OW06B
29 6 (Jan-2000)
17 61 (May-2003)
TWP942
11.79 (Dec-2009)
859
7.45 (Oct-2003)
858
15.12 (Oct-2003)
A23A
0 2 (Jan-2000)
TWP830
147.88 (Oct-2003)
834
8.97 (Oct-2003)
833
1099 2 (Oct-2003)
852
15 51 (Oct-2003)
831
55.54 (Oct-2003)
832
13.49 (Oct-2003)
854
16 04 (Oct-2003)
855
19 89 (Oct-2003)
853
18.68 (Oct-2003)
OW07A
1 37 (Oct-2000)
1 35 (May-2003)
OW07B
18.5 (May-2003)
851
11.21 (Sep-2003)
850
17.96 (Sep-2003)
OW13B
1.59 (May-2003)
OW13A
1.89 (Oct-2000)
2.47 (May-2003)
Legend
Total Uranium (pCi/L)
Monitoring Well
Temporary Well Point
EU boundaries
Active structure
Former structure
IWCS cutoff wall
Roads
West Drainage Ditch
RI Phase Color Code:
RI Phase 1 Data
RI Phase 2 Data
RI Phase 3 Data
RIR Addendum Data


OW05A
0 34 U (Jan-2000)
BH49
0.75 J (Jan-2000)
839
2.15 (Sep-2003)
OW05B
0 05 U (Jun-2003)
BH49A
0.94 (Sep-2000)
0.15 U (May-2003)
OW04B
0 04 U (May-2003)
OW03B
0 33 U (Jan-2000)
A52
0.2 U (Jan-2000)
-0.04 U (May-2003)
A45
0.67 J (Jan-2000)
0.32 U (May-2003)
OW03A
0.47 J (Jan-2000)
OW04A
0.25 U (Jan-2000)
OW14B
-0.04 U (May-2003)
OW08A
0.36 U (Oct-2000)
OW08B
0.12 U (Sep-2000)
103
0.48 U (Sep-2000)
OW02A
0.68 (Sep-2000)
OW02B
1 29 (Oct-2000)
0.44 UJ (May-2003)
MW861
1.02 (Oct-2003)
IWCS
MW860
0.58 (Sep-2003)
OW09B
1.48 (Oct-2000)
0.16 U (May-2003)
OW15B
0.21 U (Sep-2000)
0.36 U (May-2003)
A42
0.67 U (Jan-2000)
0.33 U (May-2003)
OW09A
0.78 (Oct-2000)
OW01B
0 2 U (Sep-2000)
844
0.88 (Sep-2003)
OW01A
0.64 (Jun-2003)
A50
0.57 U (Jan-2000)
0 U (May-2003)
OW16B
0.27 U (May-2003)
A43
0.24 U (Jan-2000)
0 U (May-2003)
OW10B
1.21 (Oct-2000)
0.35 U (Jun-2003)
OW16A
0.14 U (May-2003)
A51
0 27 U (Jan-2000)
BH70
0 67 (Jan-2000)
OW10A
0 39 U (Jan-2000)
856
11 3 (Oct-2003)
102
1.05 (Sep-2000)
OW17A
0.39 U (Jan-2000)
A54
0.38 U (Jan-2000)
OW11B
0.99 (Oct-2000)
0.19 U (May-2003)
MW862
0.03 U (Oct-2003)
OW17B
0.24 U (May-2003)
OW11A
0.64 (May-2003)
MW863
0.4 U (Oct-2003)
101
2.78 (Sep-2000)
A55
0.2 U (May-2003)
OW12B
1.1 (Oct-2000)
OW18A
0.46 U (May-2003)
OW06A
0.33 U (Jan-2000)
A57
0.28 U (Jan-2000)
834
0.59 (Oct-2003)
OW18B
0.66 (May-2003)
OW06B
0.34 U (Jan-2000)
-0.04 U (May-2003)
A56
1.44 (Jan-2000)
MW943
1.34 (Dec-2009)
TWP830
10 (Oct-2003)
A23A
0.34 U (Jan-2000)
858
4.58 (Oct-2003)
859
0.29 UJ (Oct-2003)
833
1.78 (Oct-2003)
831
4 (Oct-2003)
852
5 35 (Oct-2003)
832
2.65 (Oct-2003)
854
2.2 (Oct-2003)
855
1.14 (Oct-2003)
853
0 8 (Oct-2003)
OW07A
0.91 (Oct-2000)
0.49 U (May-2003)
851
2.59 (Sep-2003)
850
2 69 (Sep-2003)
OW07B
0.21 U (May-2003)
OW13B
0.27 U (May-2003)
OW13A
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RI Phase 3 Data
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11 January 2011

Niagara Falls Storage Site FUSRAP Project

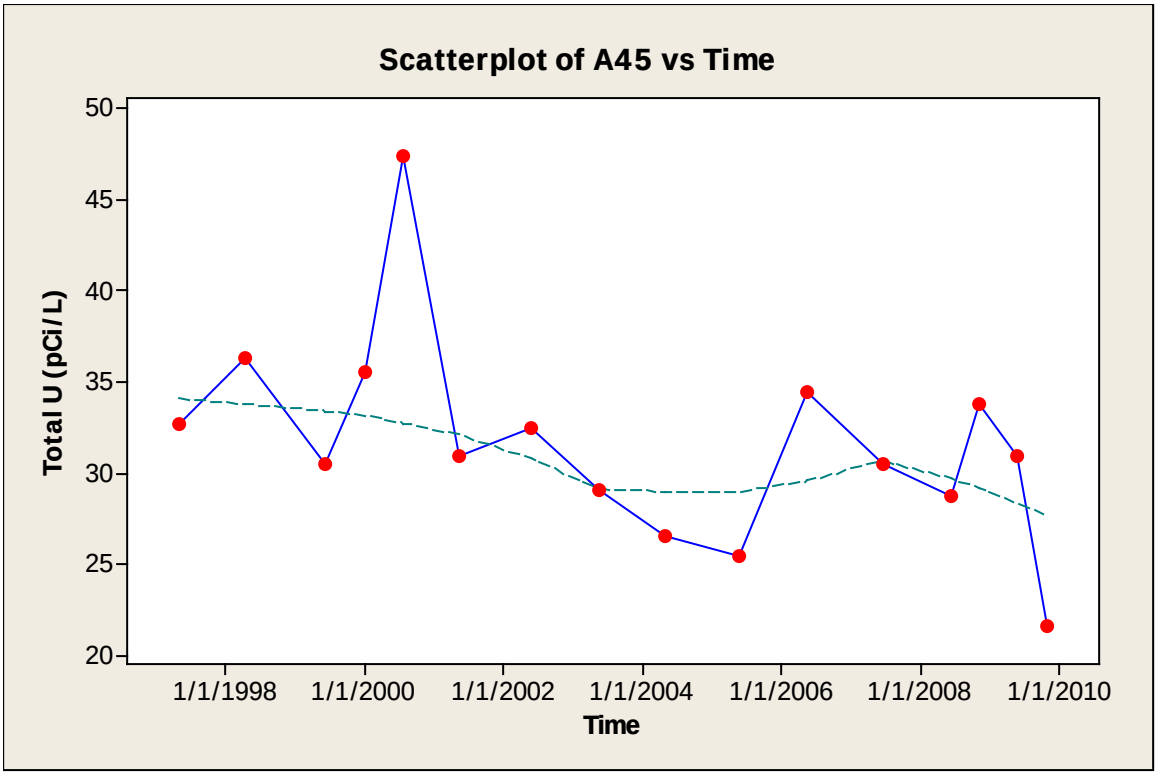
Total Uranium Groundwater Results (pCi/L)

Remarks: The data sets were imported into Minitab (commercial statistical software) from the Excel file "Graphs 1997 to 2009_uranium.xlsx" to do temporal trend analyses for a set of groundwater monitoring wells.

Summary of Trend Evaluations for Total U:

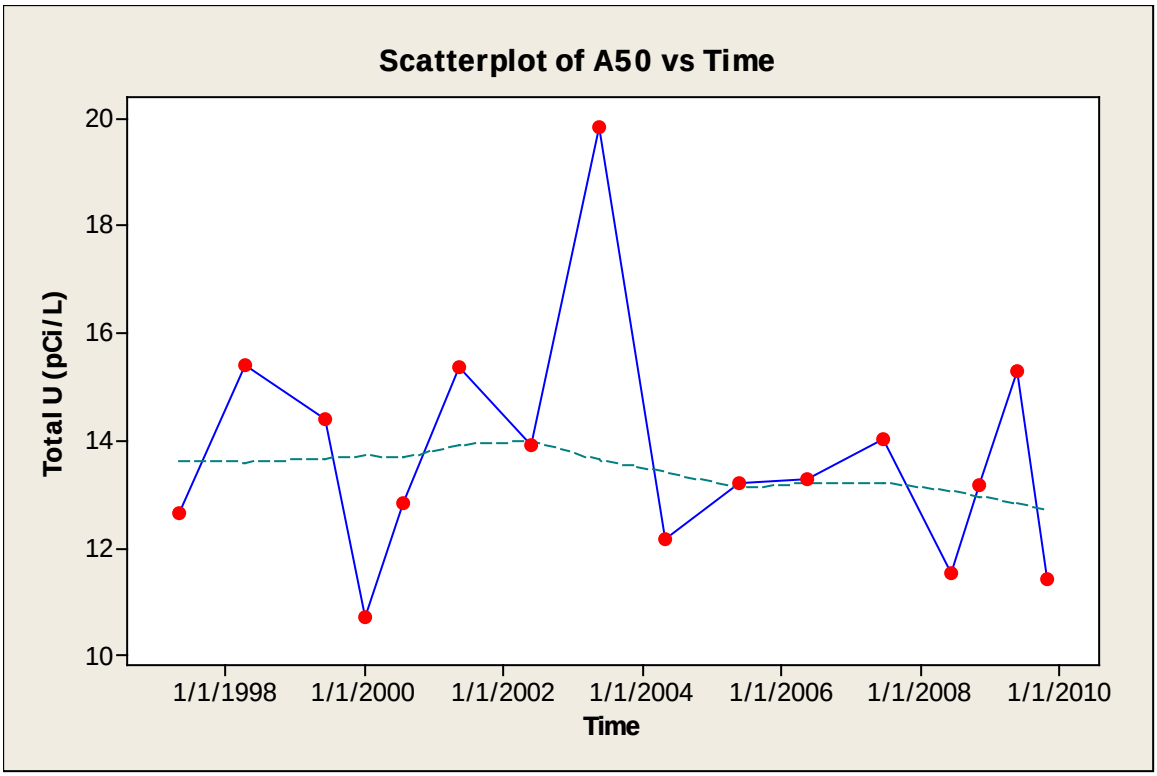
Well	*n*	Kendall's Tau	p-value	Remarks
A45	16	- 0.37	**0.053**	Weak downward trend at 90 – 95% CL
A50	16	- 0.17	0.56	No statistically significant trend. Time series plot suggests possible weak downward trend.
OW04B	18	-0.06	0.76	No trend.
OW06B	17	-0.49	**0.0065**	Relatively strong decreasing trend at over 99% CL
OW7B	6	**0.33**	0.45	No statistical trend but same size is small. Time series plot suggests possible increasing trend.
OW13B	9	**0.28**	0.35	No trend but sample size is marginal.
OW15B	16	-0.13	0.50	No trend.
OW17B	15	-0.18	0.37	No trend.
A42	12	**0.24**	0.30	No statistically significant trend.
BH49A	6	**0.20**	0.70	No trend but sample size is small.
OW04A	6	-0.07	1.0	No trend but sample size is small.
OW11B	11	**0.24**	0.35	No statistically significant trend. Sample size (n = 9) is marginal. Time series plot suggests possible upward trend.
OW18B	5	-0.20	0.81	No trend but sample size is small.

Time Series Plots and Statistical Trend Evaluations



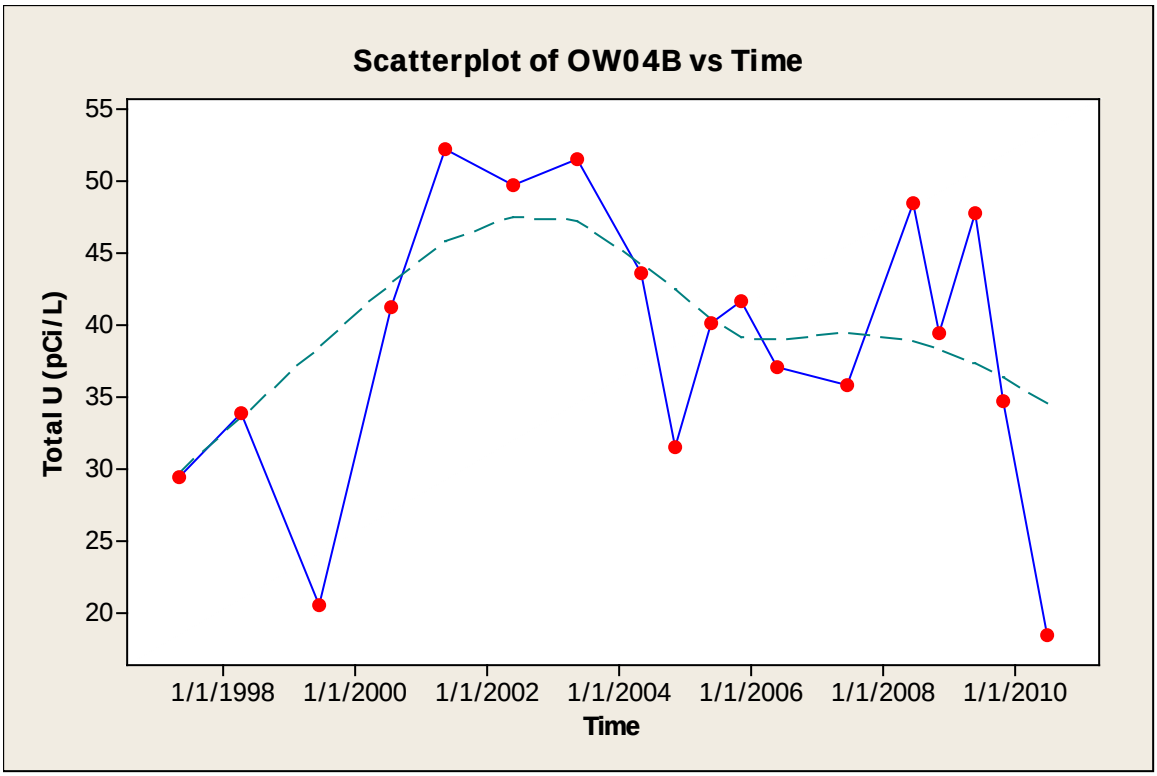
CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	-0.475516	0.0626586
SPEARMAN'S RHO	-0.491176	0.0533504
KENDALL'S TAU_A	-0.366667	**0.0528716**
KENDALL'S TAU_B	-0.366667	0.0528716

Remarks: Decreasing trend at 90 – 95% confidence level (CL)



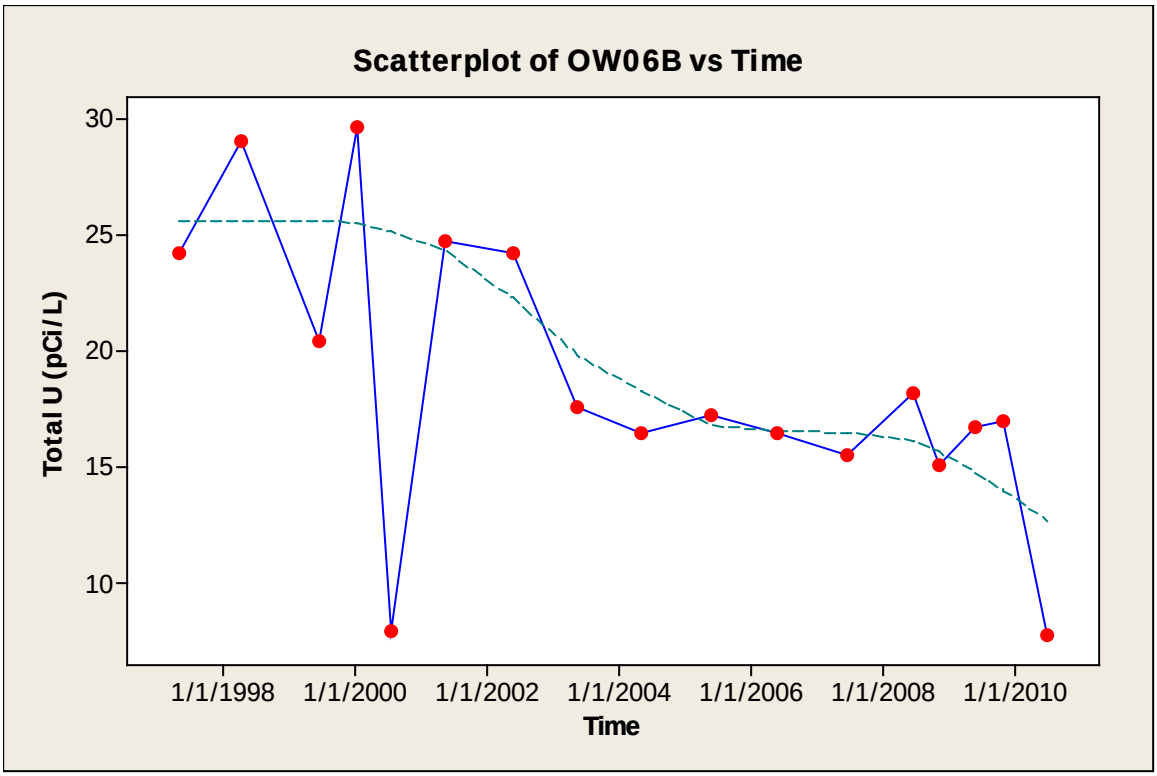
CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	-0.129901	0.631587
SPEARMAN'S RHO	-0.170588	0.527610
KENDALL'S TAU_A	-0.116667	0.558351
KENDALL'S TAU_B	-0.116667	0.558351

Remarks: No statistically significant trend.



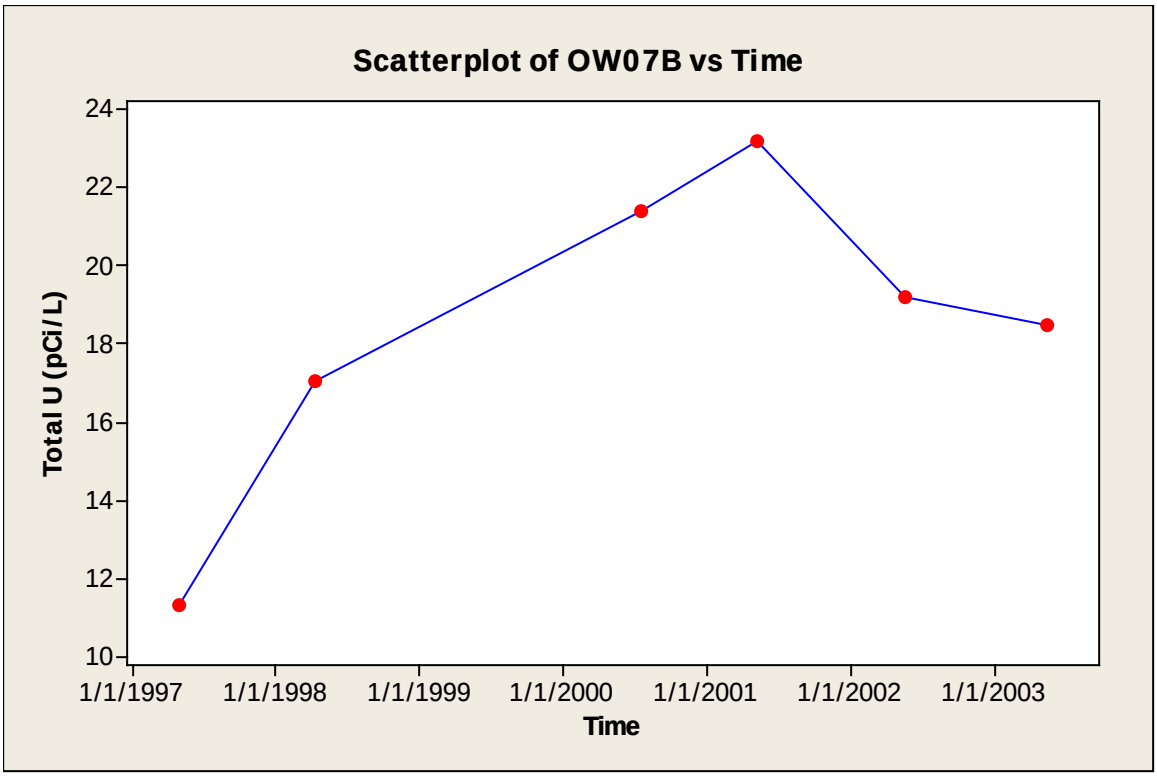
CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	0.0465313	0.854530
SPEARMAN'S RHO	-0.0175439	0.944915
KENDALL'S TAU_A	-0.0588235	0.761873
KENDALL'S TAU_B	-0.0588235	0.761873

Remarks: No trend.



CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	-0.618538	0.0081237
SPEARMAN'S RHO	-0.659718	0.0039585
KENDALL'S TAU_A	**-0.492647**	**0.0065080**
KENDALL'S TAU_B	-0.494468	0.0065080

Remarks: Relatively strong decreasing trend at over 99% CL.



CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	0.653087	0.159648
SPEARMAN'S RHO	0.485714	0.328723
KENDALL'S TAU_A	0.333333	0.452370
KENDALL'S TAU_B	0.333333	0.452370

Remarks: Qualitative evaluation of times series plot suggests a possible increasing trend. No statistically significant trend was observed but the small size is too small for a reliable evaluation.

Regression Analysis: OW07B versus Time

The regression equation is
OW07B = - 97.1 + 0.00315 Time

6 cases used, 14 cases contain missing values

Predictor	Coef	SE Coef	T	P
Constant	-97.08	67.00	-1.45	0.221
Time	0.003146	0.001824	1.72	**0.160**

S = 3.49742 R-Sq = 42.7% R-Sq(adj) = 28.3%

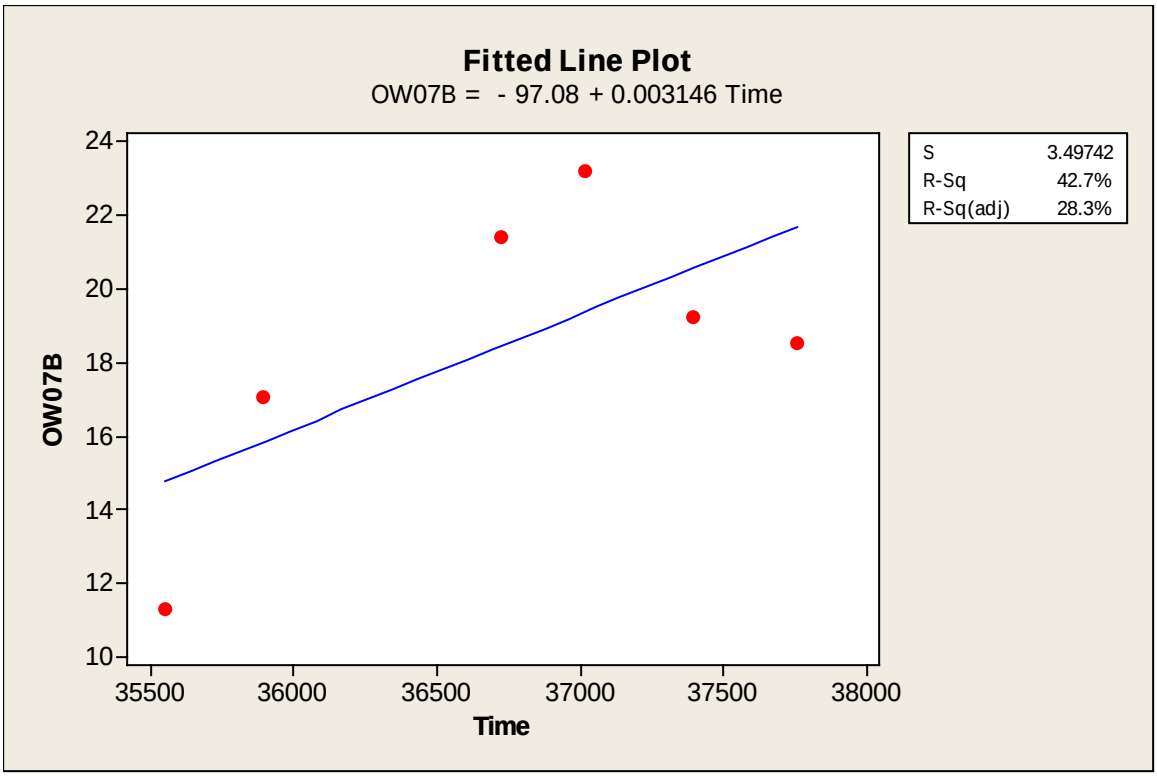
Analysis of Variance

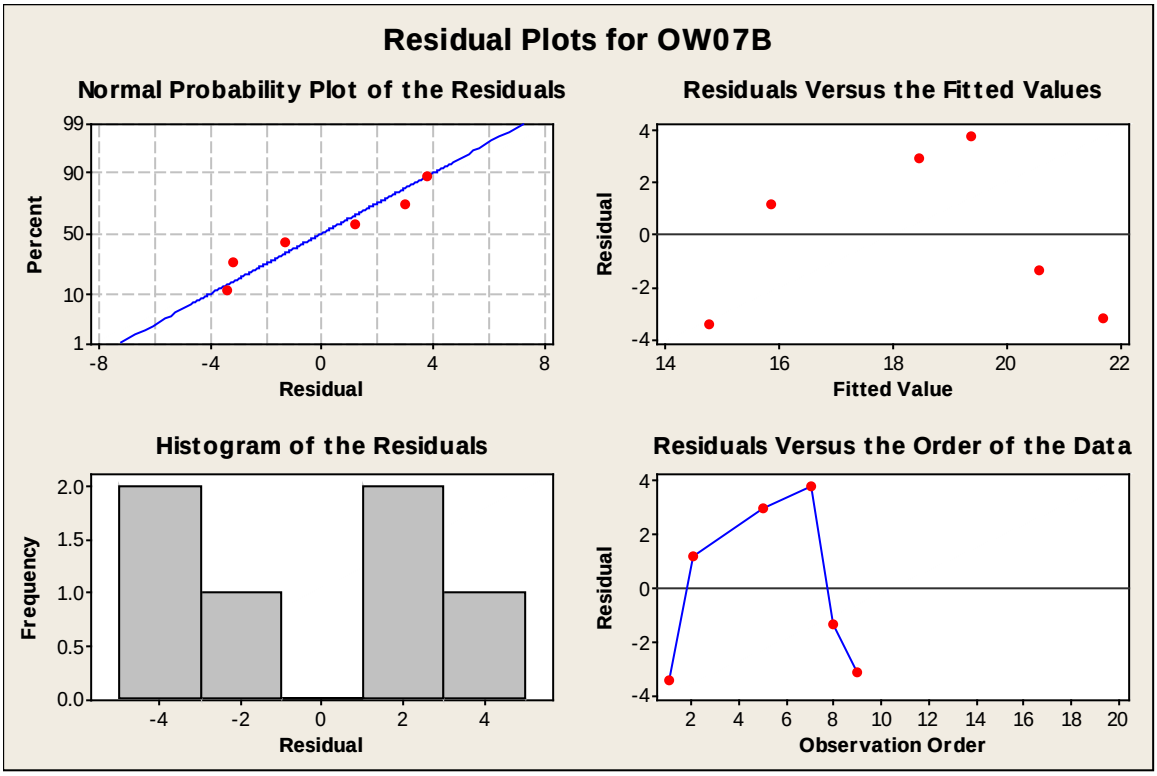
Source	DF	SS	MS	F	P
Regression	1	36.39	36.39	2.97	0.160
Residual Error	4	48.93	12.23		
Total	5	85.32			

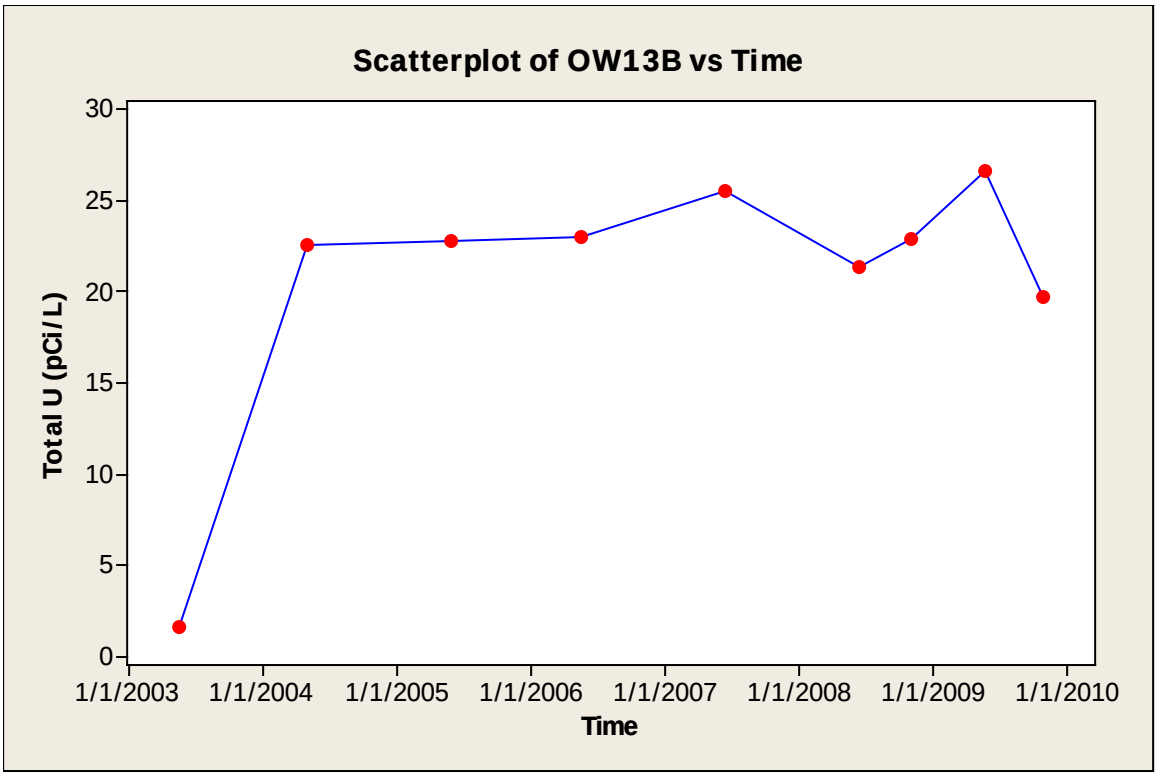
Unusual Observations

Obs	Time_	OW07B	Fit	SE Fit	Residual	St Resid	
12	38498	*	24.03	3.54	*	*	X
13	38664	*	24.56	3.82	*	*	X
14	38854	*	25.15	4.14	*	*	X
15	39245	*	26.38	4.82	*	*	X
16	39611	*	27.54	5.46	*	*	X
17	39752	*	27.98	5.71	*	*	X
18	39952	*	28.61	6.06	*	*	X
19	40112	*	29.11	6.34	*	*	X
20	40353	*	29.87	6.77	*	*	X

X denotes an observation whose X value gives it large influence.


Fitted Line Plot
OW07B = - 97.08 + 0.003146 Time
S 3.49742
R-Sq 42.7%
R-Sq(adj) 28.3%
OW07B
Time


Residual Plots for OW07B
Normal Probability Plot of the Residuals
Percent
Residual
Residuals Versus the Fitted Values
Residual
Fitted Value
Histogram of the Residuals
Frequency
Residual
Residuals Versus the Order of the Data
Residual
Observation Order



CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	0.569546	0.109419
SPEARMAN'S RHO	0.283333	0.460030
KENDALL'S TAU_A	0.277778	0.348083
KENDALL'S TAU_B	0.277778	0.348083

Remarks: No trend but sample size is small.

Regression Analysis: OW13B versus Time

```
The regression equation is
OW13B = - 176 + 0.00503 Time


9 cases used, 11 cases contain missing values


Predictor       Coef   SE Coef      T      P
Constant      -176.2     107.4  -1.64  0.145
Time_       0.005035  0.002746   1.83  0.109


S = 6.54075   R-Sq = 32.4%   R-Sq(adj) = 22.8%


Analysis of Variance

Source          DF      SS      MS     F      P
Regression       1  143.78  143.78  3.36  0.109
Residual Error   7  299.47   42.78
Total            8  443.25


Unusual Observations

Obs  Time_  OW13B    Fit  SE Fit  Residual  St Resid
  1  35549      *   2.81    9.99         *         * X
  2  35893      *   4.54    9.07         *         * X
  3  36320      *   6.69    7.94         *         * X
  4  36530      *   7.75    7.38         *         * X
  5  36726      *   8.74    6.87         *         * X
  6  36799      *   9.10    6.68         *         * X
  7  37019      *  10.21    6.11         *         * X
  9  37757   1.59  13.93    4.28    -12.34     -2.49R

R denotes an observation with a large standardized residual.
X denotes an observation whose X value gives it large influence.
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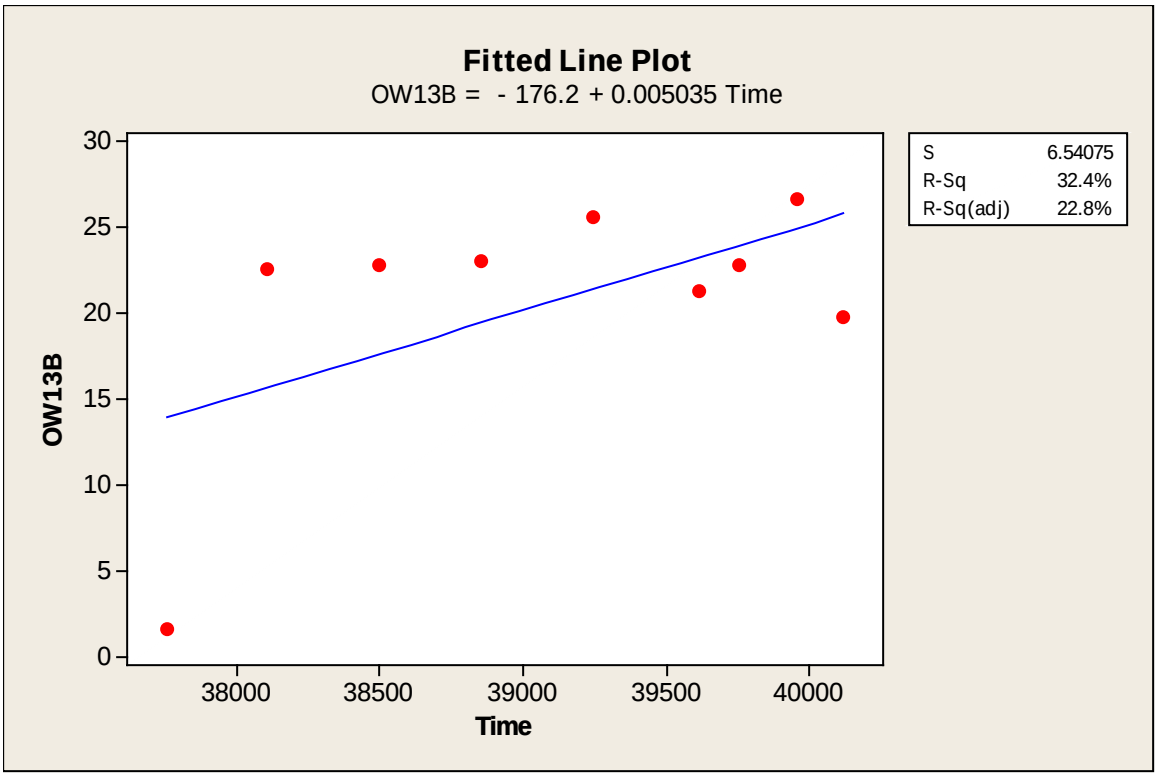
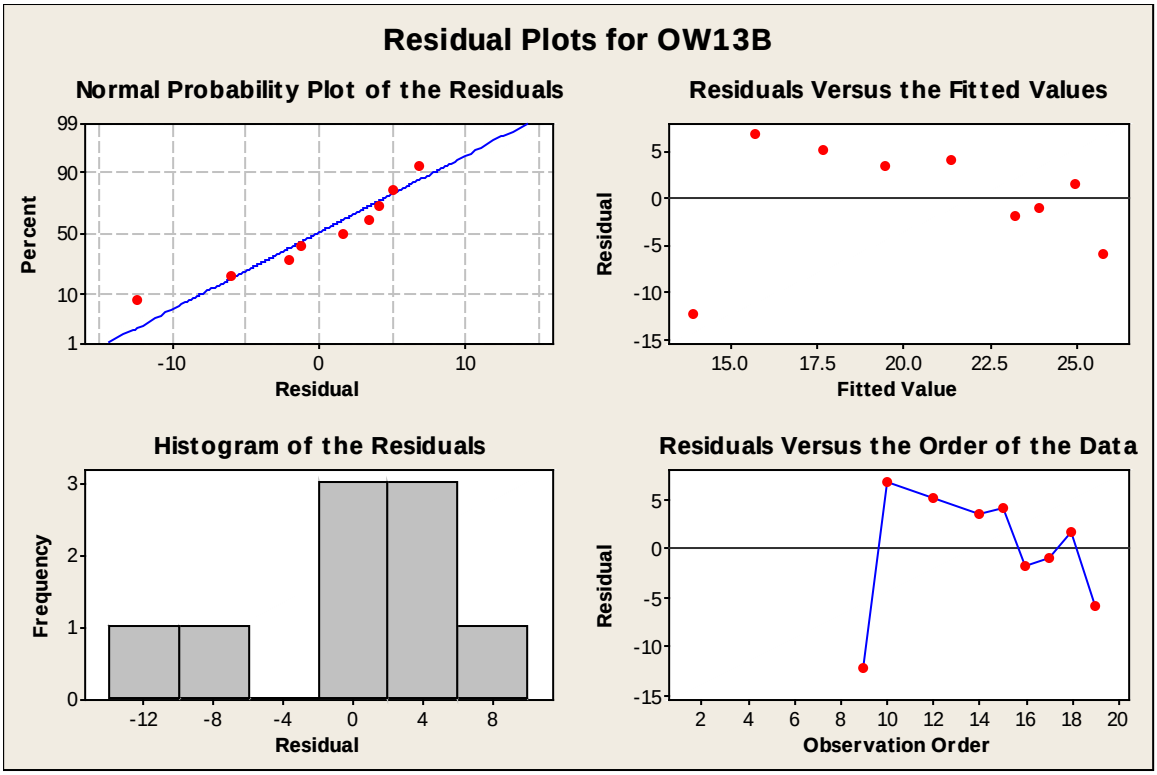
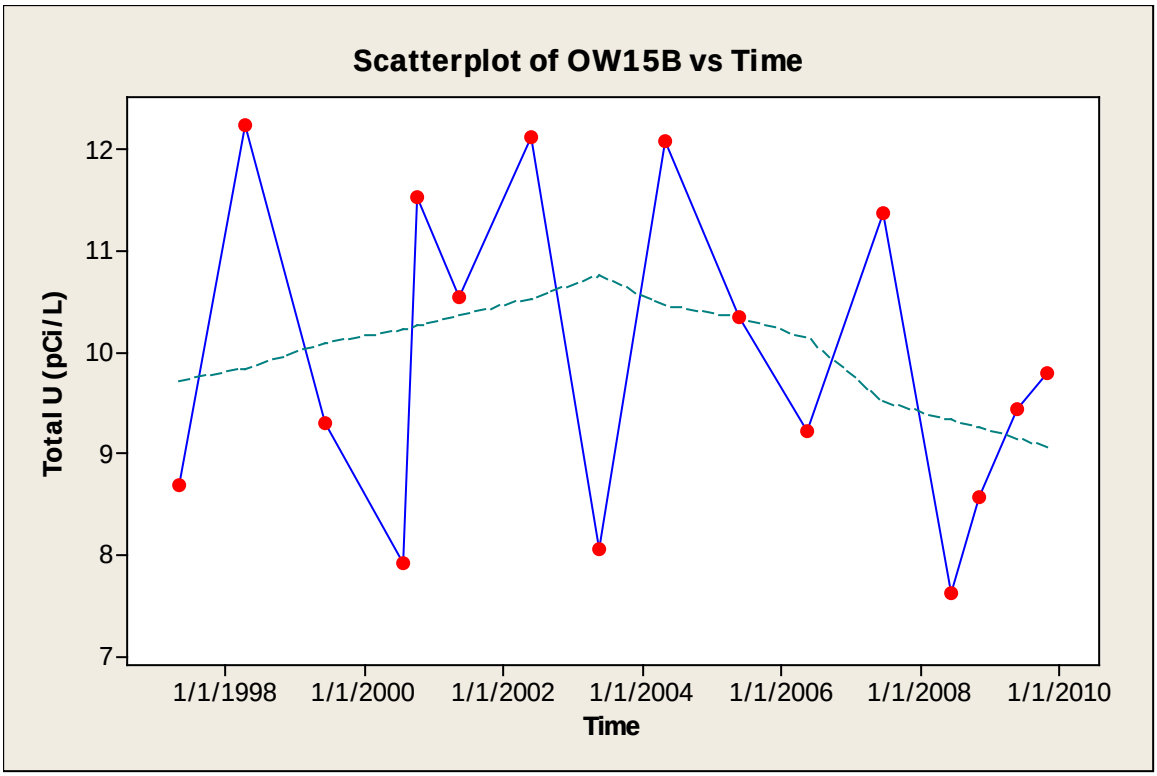
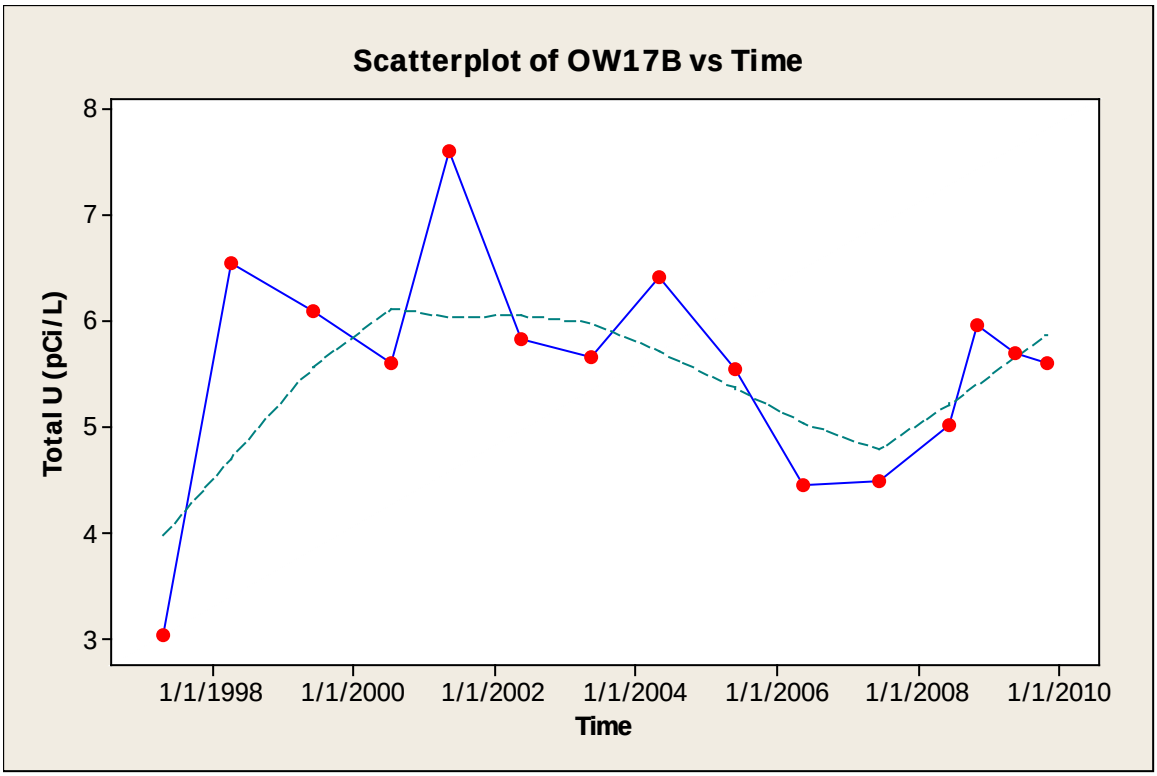

Fitted Line Plot
OW13B = - 176.2 + 0.005035 Time
S 6.54075
R-Sq 32.4%
R-Sq(adj) 22.8%
OW13B
Time
30
25
20
15
10
5
0
38000
38500
39000
39500
40000


Residual Plots for OW13B
Normal Probability Plot of the Residuals
Percent
Residual
Residuals Versus the Fitted Values
Residual
Fitted Value
Histogram of the Residuals
Frequency
Residual
Residuals Versus the Order of the Data
Residual
Observation Order



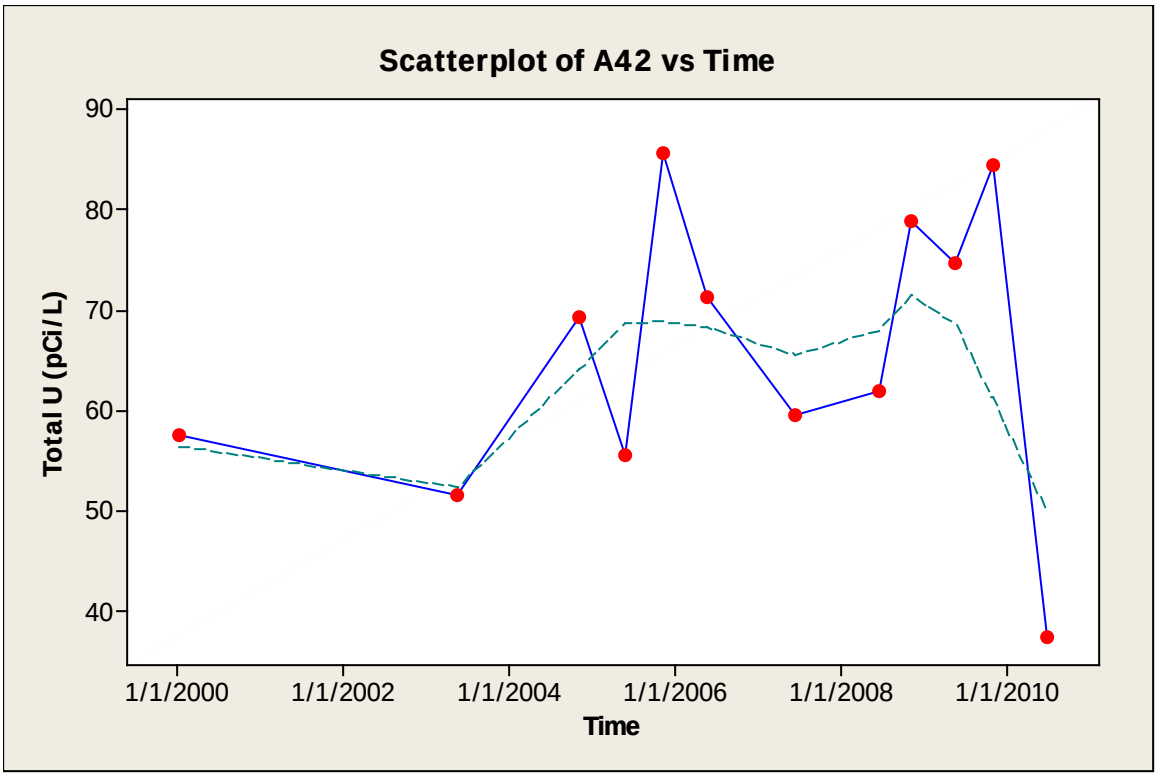
CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	-0.205401	0.445373
SPEARMAN'S RHO	-0.179412	0.506140
KENDALL'S TAU_A	-0.133333	0.499461
KENDALL'S TAU_B	-0.133333	0.499461

Remarks: No trend.



CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	-0.044792	0.874058
SPEARMAN'S RHO	-0.239286	0.390379
KENDALL'S TAU_A	-0.180952	0.373053
KENDALL'S TAU_B	-0.180952	0.373053

Remarks: No trend.



CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	0.172775	0.591287
SPEARMAN'S RHO	0.265734	0.403833
KENDALL'S TAU_A	0.242424	0.303673
KENDALL'S TAU_B	0.242424	0.303673

Remarks: No statistically significant trend.

Regression Analysis: A42 versus Time

```
The regression equation is
A42 = - 22 + 0.00224 Time


12 cases used, 8 cases contain missing values


Predictor       Coef   SE Coef      T      P
Constant       -21.6     157.3  -0.14  0.894
Time        0.002238  0.004035   0.55  0.591


S = 14.8199   R-Sq = 3.0%   R-Sq(adj) = 0.0%

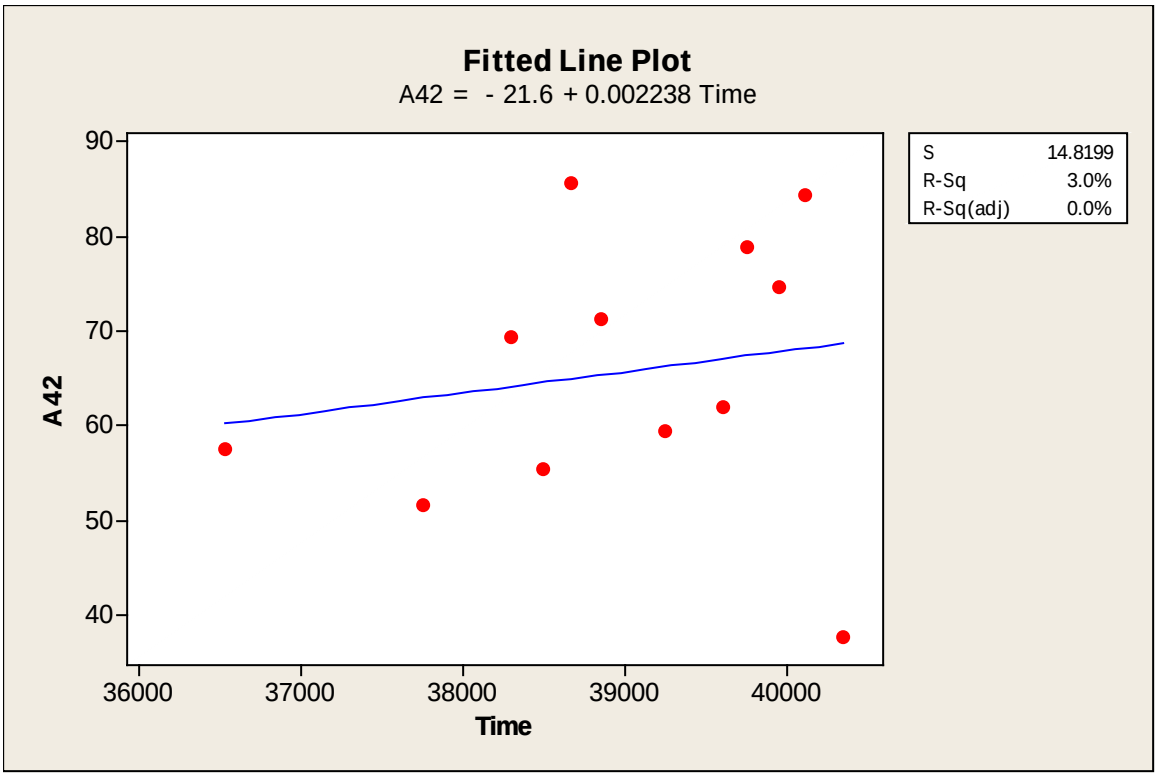

Analysis of Variance

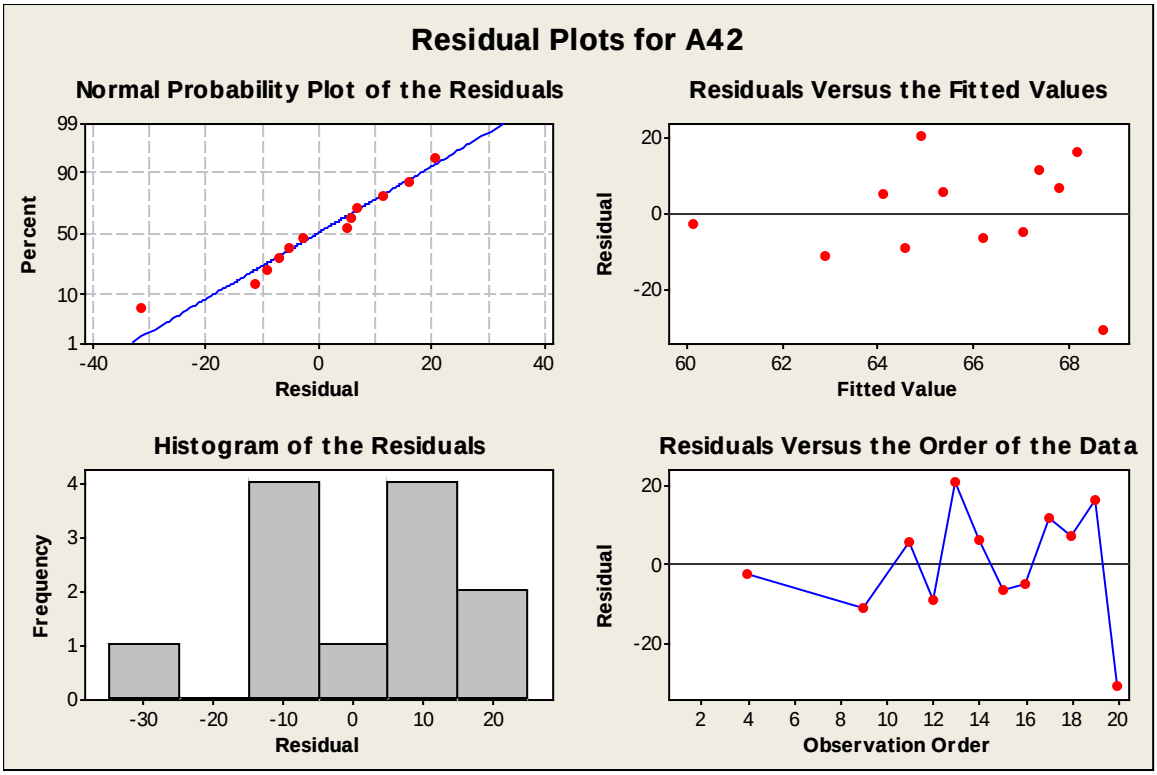
Source          DF      SS     MS     F      P
Regression       1    67.6   67.6  0.31  0.591
Residual Error  10  2196.3  219.6
Total           11  2263.9

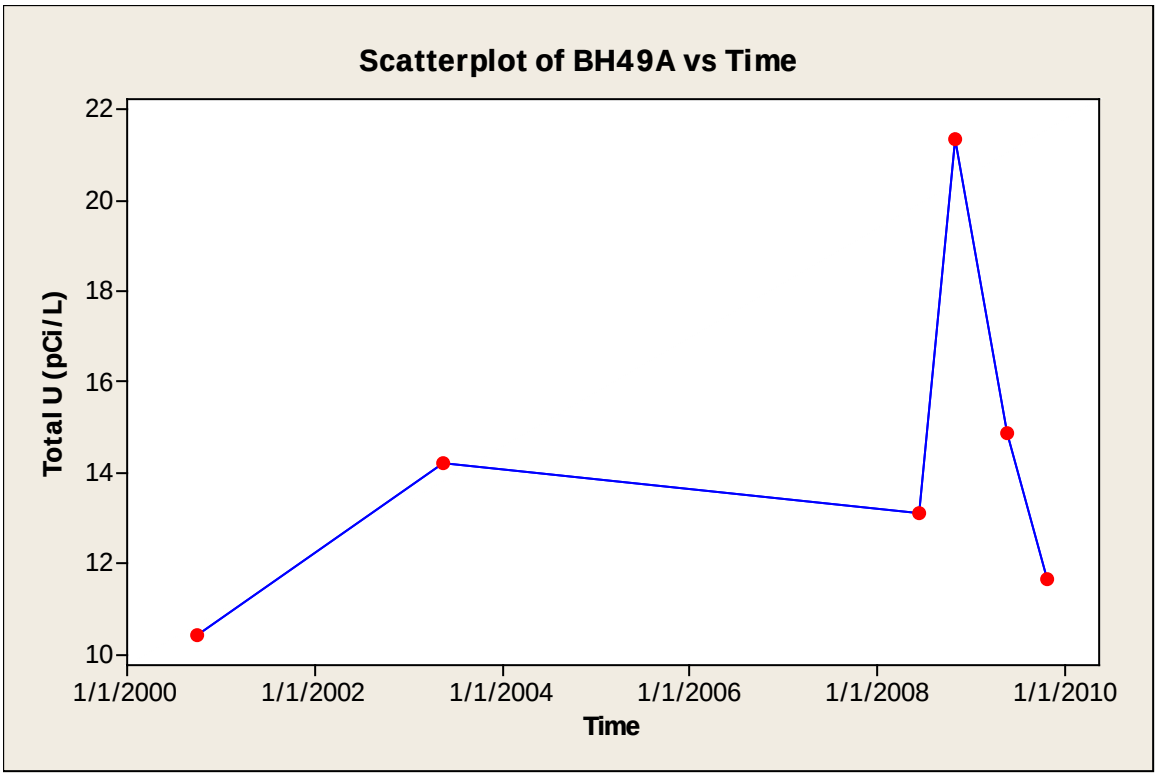

Unusual Observations

Obs  Time_    A42    Fit  SE Fit  Residual  St Resid
  1  35549      *  57.96   14.45         *         * X
  2  35893      *  58.73   13.13         *         * X
  3  36320      *  59.69   11.51         *         * X
  4  36530  57.43  60.16   10.73     -2.73     -0.27 X
 20  40353  37.50  68.72    7.04    -31.22     -2.39R

R denotes an observation with a large standardized residual.
X denotes an observation whose X value gives it large influence.
```

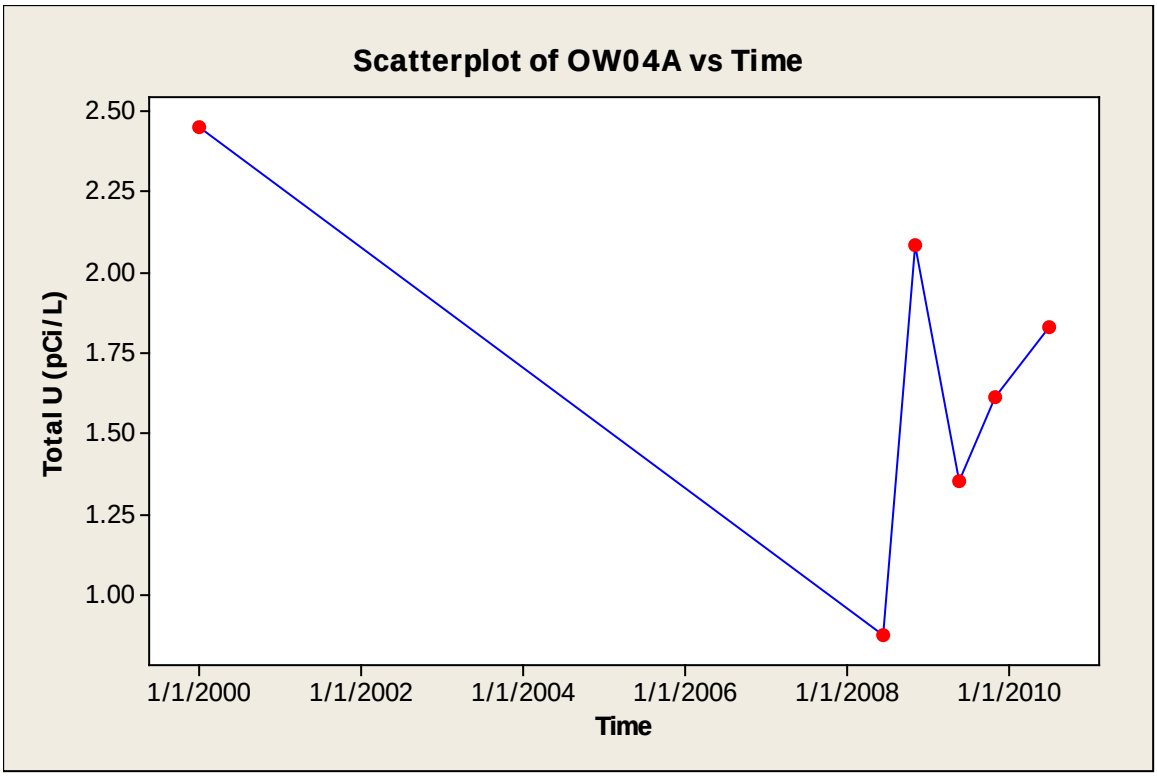

Fitted Line Plot
A42 = - 21.6 + 0.002238 Time
S 14.8199
R-Sq 3.0%
R-Sq(adj) 0.0%
A42
Time
90
80
70
60
50
40
36000
37000
38000
39000
40000


Residual Plots for A42
Normal Probability Plot of the Residuals
Percent
Residual
Residuals Versus the Fitted Values
Residual
Fitted Value
Histogram of the Residuals
Frequency
Residual
Residuals Versus the Order of the Data
Residual
Observation Order



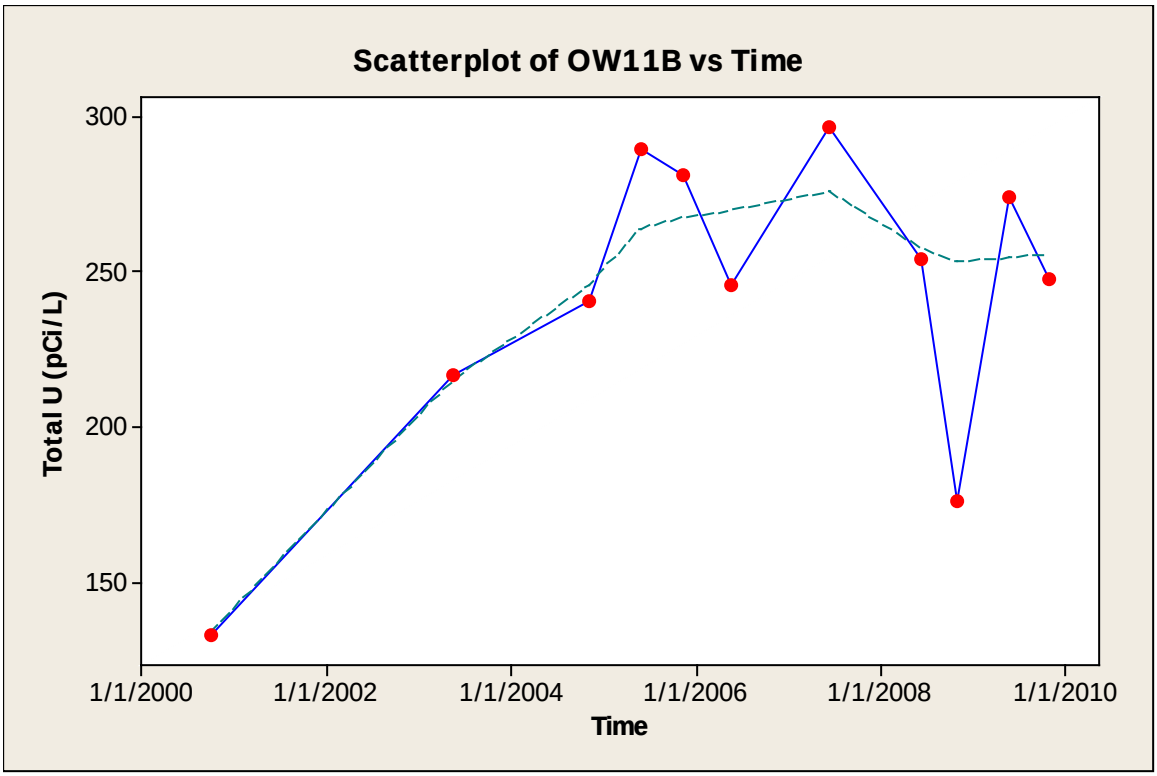
CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	0.411262	0.417886
SPEARMAN'S RHO	0.314286	0.544093
KENDALL'S TAU_A	0.200000	0.707114
KENDALL'S TAU_B	0.200000	0.707114

Remarks: No trend but sample size is small.



CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	-0.588307	0.21935
SPEARMAN'S RHO	-0.200000	0.70400
KENDALL'S TAU_A	-0.066667	1.00000
KENDALL'S TAU_B	-0.066667	1.00000

Remarks: No trend but sample size is small.



CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	0.478451	0.136567
SPEARMAN'S RHO	0.318182	0.340298
KENDALL'S TAU_A	0.236364	0.350201
KENDALL'S TAU_B	0.236364	0.350201

Remarks: No statistically significant trend but sample size is marginal. The time series plot suggests a possible weak upward trend.

Regression Analysis: OW11B versus Time

```
The regression equation is
OW11B = - 674 + 0.0235 Time


11 cases used, 9 cases contain missing values


Predictor     Coef  SE Coef      T      P
Constant    -673.7    559.9  -1.20  0.260
Time_      0.02354  0.01440   1.63  0.137


S = 46.0424   R-Sq = 22.9%   R-Sq(adj) = 14.3%

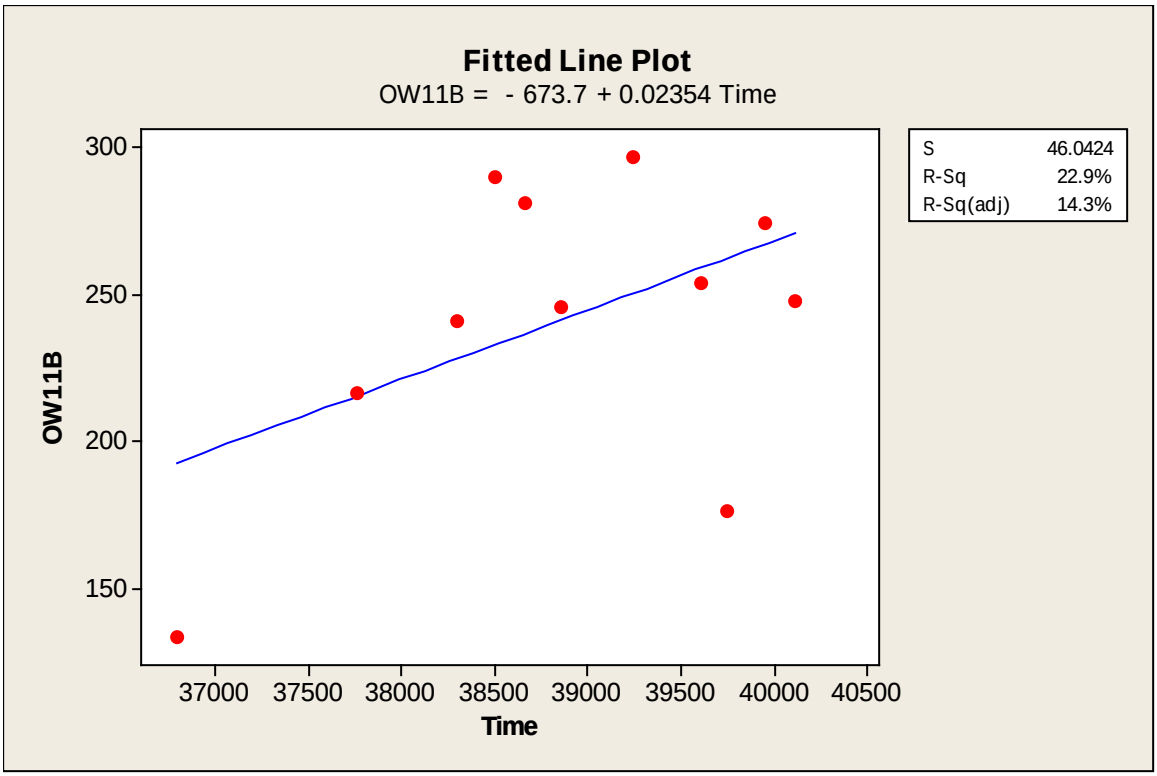

Analysis of Variance

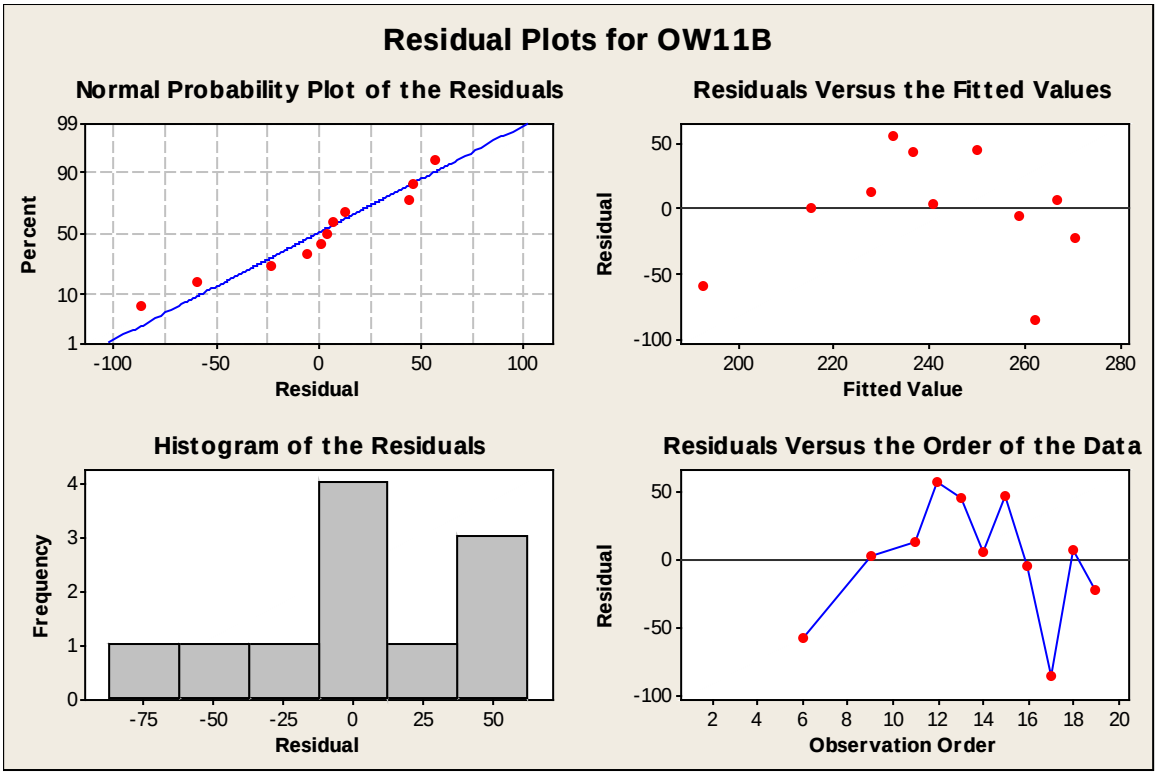
Source          DF     SS    MS     F      P
Regression       1   5664  5664  2.67  0.137
Residual Error   9  19079  2120
Total           10  24743

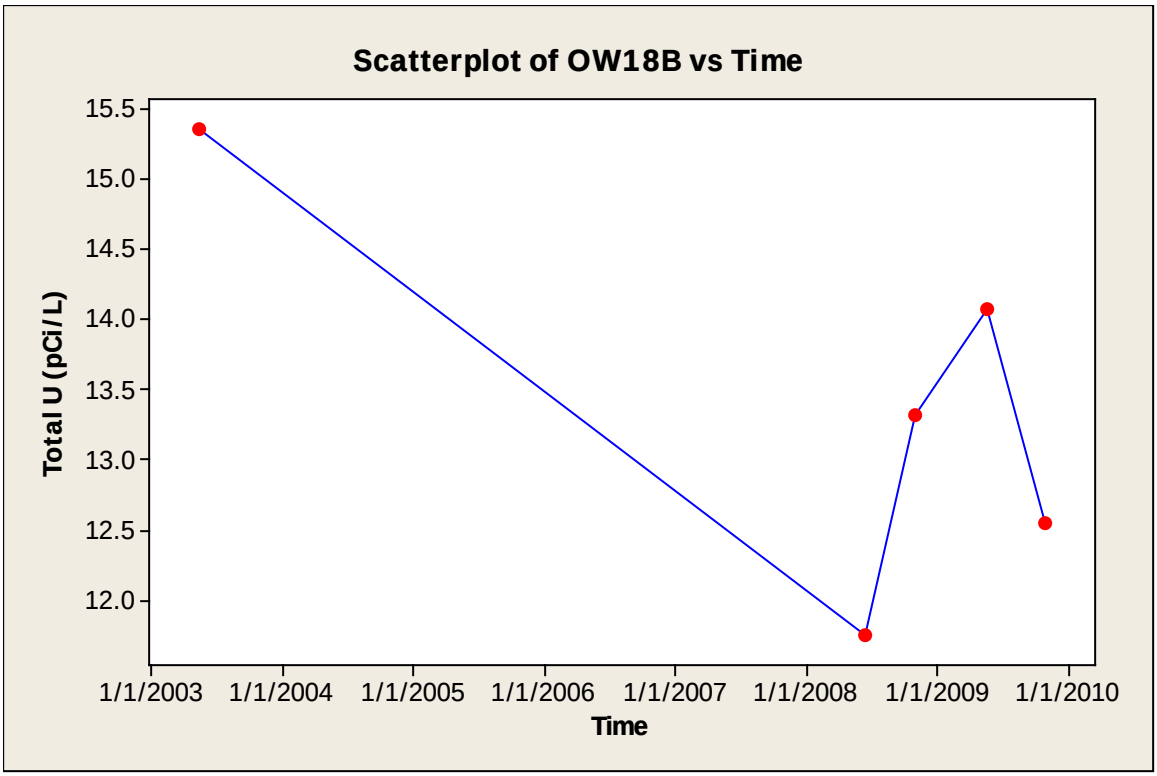

Unusual Observations

Obs  Time_  OW11B    Fit  SE Fit  Residual  St Resid
  1  35549      *  163.1    49.8         *         * X
  2  35893      *  171.2    45.0         *         * X
  3  36320      *  181.3    39.2         *         * X
  4  36530      *  186.2    36.4         *         * X
 17  39752  176.0  262.1    18.8     -86.1     -2.05R

R denotes an observation with a large standardized residual.
X denotes an observation whose X value gives it large influence.
```


Fitted Line Plot
OW11B = - 673.7 + 0.02354 Time
S 46.0424
R-Sq 22.9%
R-Sq(adj) 14.3%
OW11B
Time
300
250
200
150
37000
37500
38000
38500
39000
39500
40000
40500


Residual Plots for OW11B
Normal Probability Plot of the Residuals
Percent
Residual
Residuals Versus the Fitted Values
Residual
Fitted Value
Histogram of the Residuals
Frequency
Residual
Residuals Versus the Order of the Data
Residual
Observation Order



CORRTYPE	CORR_VAL	P_VALUE
PEARSON'S R	-0.717366	0.172521
SPEARMAN'S RHO	-0.300000	0.623838
KENDALL'S TAU_A	-0.200000	0.806496
KENDALL'S TAU_B	-0.200000	0.806496

Remarks: No trend but sample size is small.

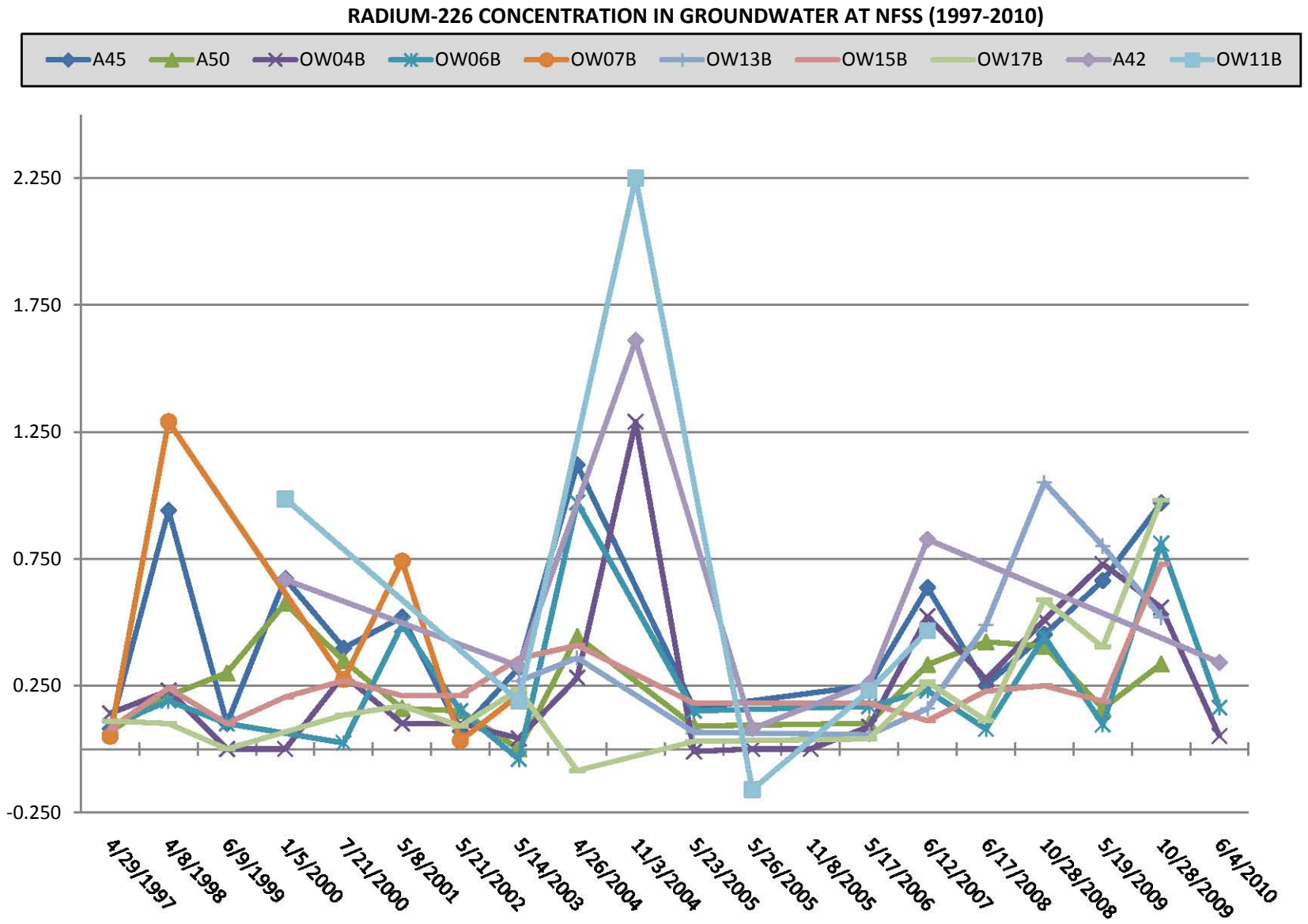
Data Sets

Time	A45	A50	OW04B	OW06B
4/29/1997	32.670	12.660	29.500	24.200
4/8/1998	36.320	15.410	33.870	29.000
6/9/1999	30.500	14.400	20.600	20.400
1/5/2000	35.531	10.703	*	29.602
7/19/2000	47.411	12.830	41.211	7.917
9/30/2000	*	*	*	*
5/8/2001	30.880	15.370	52.150	24.760
5/20/2002	32.510	13.900	49.720	24.200
5/16/2003	29.100	19.840	51.560	17.610
4/29/2004	26.510	12.160	43.560	16.480
11/3/2004	*	*	31.558	*
5/26/2005	25.430	13.220	40.100	17.230
11/8/2005	*	*	41.600	*
5/17/2006	34.420	13.290	37.020	16.490
6/12/2007	30.460	14.010	35.780	15.550
6/12/2008	28.699	11.527	48.500	18.198
10/31/2008	33.740	13.180	39.489	15.106
5/19/2009	30.956	15.300	47.741	16.721
10/26/2009	21.543	11.420	34.731	16.961
6/24/2010	*	*	18.406	7.790

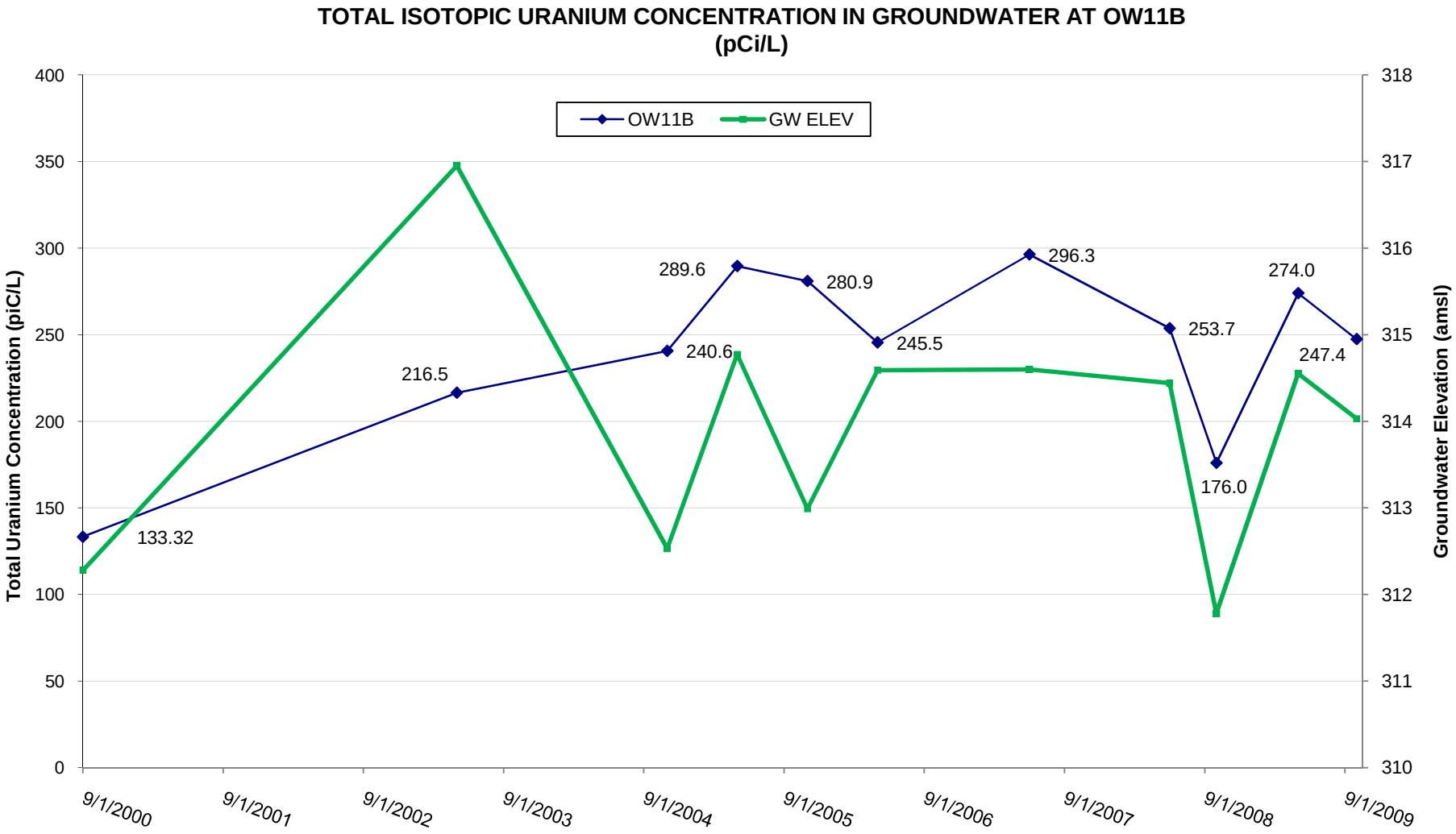
Time	OW07B	OW13B	OW15B	OW17B
4/29/1997	11.300	*	8.690	3.030
4/8/1998	17.030	*	12.240	6.540
6/9/1999	*	*	9.300	6.100
1/5/2000	*	*	*	*
7/19/2000	21.435	*	7.917	5.611
9/30/2000	*	*	11.527	*
5/8/2001	23.210	*	10.540	7.610
5/20/2002	19.230	*	12.130	5.820
5/16/2003	18.500	1.590	8.060	5.660
4/29/2004	*	22.540	12.090	6.410
11/3/2004	*	*	*	*
5/26/2005	*	22.820	10.340	5.540
11/8/2005	*	*	*	*
5/17/2006	*	22.990	9.210	4.449
6/12/2007	*	25.578	11.369	4.487
6/12/2008	*	21.338	7.609	5.023
10/31/2008	*	22.866	8.571	5.970
5/19/2009	*	26.632	9.443	5.700
10/26/2009	*	19.773	9.790	5.610
6/24/2010	*	*	*	*

Time	A42	BH49A	OW04A	OW11B
4/29/1997	*	*	*	*
4/8/1998	*	*	*	*
6/9/1999	*	*	*	*
1/5/2000	57.430	*	2.448	*
7/19/2000	*	*	*	*
9/30/2000	*	10.403	*	133.32
5/8/2001	*	*	*	*
5/20/2002	*	*	*	*
5/16/2003	51.600	14.182	*	216.50
4/29/2004	*	*	*	*
11/3/2004	69.340	*	*	240.60
5/26/2005	55.460	*	*	289.60
11/8/2005	85.600	*	*	280.90
5/17/2006	71.230	*	*	245.50
6/12/2007	59.470	*	*	296.30
6/12/2008	61.880	13.081	0.875	253.70
10/31/2008	78.820	21.322	2.085	176.00
5/19/2009	74.617	14.856	1.351	274.00
10/26/2009	84.455	11.647	1.614	247.40
6/24/2010	37.500	*	1.827	*

Time	OW18B
4/29/1997	*
4/8/1998	*
6/9/1999	*
1/5/2000	*
7/19/2000	*
9/30/2000	*
5/8/2001	*
5/20/2002	*
5/16/2003	15.354
4/29/2004	*
11/3/2004	*
5/26/2005	*
11/8/2005	*
5/17/2006	*
6/12/2007	*
6/12/2008	11.748
10/31/2008	13.317
5/19/2009	14.074
10/26/2009	12.552
6/24/2010	*

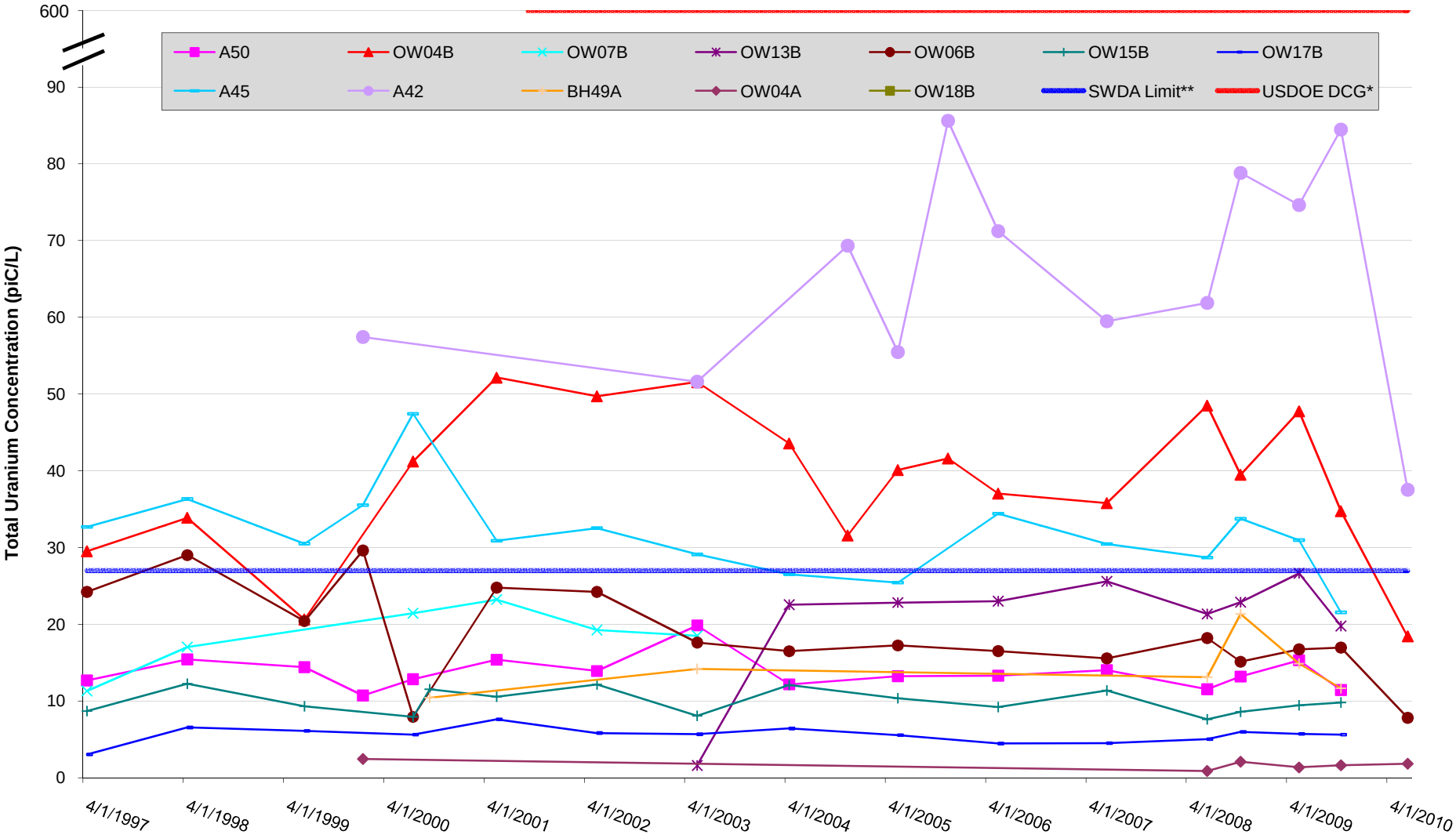


*The Safe Drinking Water Act Maximum Containment Level (SDWA MCL) for Total Radium is 5 pCi/L. Groundwater at NFSS is not a drinking water source. The above concentrations are for comparative purposes only.



* The United States Department of Energy Derived Concentration Guide (USDOE DCG) for Total Uranium is 600 pCi/L.
**The Safe Drinking Water Act Maximum Containment Level (SDWA MCL) for Total Uranium is 27 pCi/L.

TOTAL ISOTOPIC URANIUM CONCENTRATIONS IN GROUNDWATER NEAR THE IWCS (1997 - 2010)



* The United States Department of Energy Derived Concentration Guide (USDOE DCG) for Total Uranium is 600 pCi/L.
**The Safe Drinking Water Act Maximum Containment Level (SDWA MCL) for Total Uranium is 27 pCi/L. Groundwater at NFSS is not a drinking water source. The above concentrations are for comparative purposes only.
The 2010 sampling event took place on 24 Jun following the earthquake and included a select set of wells.

Total Isotopic Uranium Data for Wells Near the IWCS (1997 - 2010)

(pCi/L)

	A45	A50	OW04B	OW06B	OW07A	OW07B	OW13B	OW15B	OW17B	A42	BH49A	OW04A	OW11B	OW18B
4/29/1997	32.67	12.66	29.5	24.2		11.3		8.69	3.03					
4/8/1998	36.32	15.41	33.87	29		17.03		12.24	6.54					
6/9/1999	30.5	14.4	20.6	20.4	1.9			9.3	6.1					
1/5/2000	35.531	10.703		29.602						57.43		2.448		
7/19/2000	47.411	12.83	41.211	7.917		21.435		7.917	5.611					
9/30/2000								11.527			10.403		133.32	
5/8/2001	30.88	15.37	52.15	24.76		23.21		10.54	7.61					
5/20/2002	32.51	13.90	49.72	24.20		19.23		12.13	5.82					
5/16/2003	29.1	19.84	51.56	17.61		18.50	1.59	8.06	5.66	51.6	14.182		216.5	15.354
4/29/2004	26.510	12.160	43.560	16.480			22.540	12.090	6.410					
11/3/2004			31.558							69.340			240.6	
5/26/2005	25.430	13.220	40.100	17.230			22.820	10.340	5.540	55.460			289.6	
11/8/2005			41.600							85.600			280.9	
5/17/2006	34.420	13.290	37.020	16.490			22.990	9.210	4.449	71.230			245.5	
6/12/2007	30.460	14.010	35.780	15.550			25.578	11.369	4.487	59.470			296.3	
6/12/2008	28.699	11.527	48.500	18.198			21.338	7.609	5.023	61.880	13.080	0.875	253.7	11.748
10/31/2008	33.740	13.180	39.489	15.106			22.866	8.571	5.970	78.820	21.322	2.085	176.0	13.317
5/19/2009	30.956	15.300	47.741	16.721			26.632	9.443	5.700	74.617	14.856	1.351	274.0	14.074
10/26/2009	21.543	11.420	34.731	16.961			19.773	9.790	5.610	84.455	11.647	1.614	247.4	12.552
6/24/2010			18.406	7.790						37.500		1.827		

Blanks indicated that the sample was not analyzed.