Department of Energy
Office of Legacy Management

March 10, 2008

Mr. Timothy Fischer, Remedial Project Manager
United States Environmental Protection Agency
Region V-SR-6J
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Mr. Thomas A. Schneider
Ohio Environmental Protection Agency
401 East 5th Street
Dayton, Ohio 45402

Dear Mr. Fischer and Mr. Schneider:

SUBJECT: **Evaluation of Aqueous Ions in the Monitoring Systems of the On-Site Disposal Facility (OSDF)**

Enclosed please find the subject report. Issue of this report fulfills an agreement that was made between the Department of Energy, U.S. Environmental Protection Agency (EPA), and Ohio EPA at the March 8, 2005 TIE meeting, to conduct a common ion study within the Leachate Collection System (LCS), Leak Detection System (LDS), and Horizontal Till Wells (HTW) of the OSDF. Monitoring to support the study was initiated in May 2005 and completed last year. The objective of the study was to determine which ions could be used as useful indicators of leachate leaking from the LCS to the LDS, or from the LDS to the HTW.

The report concludes that no one ion can serve as a leak indicator for all cells of the disposal facility, but useful indicator ions for specific target horizons of each cell are identified. For the indicator ions identified, baseline data are sufficient to establish control charts.

Fluid volume appears to be the key monitoring parameter to indicate the potential for leachate migration from the OSDF, and the sampling of and analysis for indicator ions are useful only if the hydraulic conditions permit leachate to migrate.

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626 Cochrans Mill Road, P.O. Box 10940, Pittsburgh, PA 15236	☐	1000 Independence Ave., S.W., Washington, DC 20585
11025 Dover St., Suite 1000, Westminster, CO 80021	☐	10995 Hamilton-Cleves Highway, Harrison, OH 45030
955 Mound Road, Miamisburg, OH 45342	☐	232 Energy Way, N. Las Vegas, NV 89030

REPLY TO: Harrison Office

We look forward to discussing the report with you as part of our efforts to refine the OSDF post-closure monitoring program. If you have any questions or require any additional information, please call me at (513) 648-3148.

Sincerely,

Jane Powell

Jane Powell
Fernald Site Manager
DOE-LM-20.1

Enclosure

cc w/enclosure:
Michelle Cullerton, Tetra Tech
Stephen Helmer, ODH
Tom Pauling, DOE-LM-20.1
Johnny Reising, DOE-EM
Thomas Schneider, OEPA (3 copies of enclosure)
Project File FER 705.05(A) (Thru W. Sumner)
AR Coordinator (Thru W. Sumner)

cc w/o enclosures: (electronic)
Ken Broberg, Stoller
Bill Hertel, Stoller
Frank Johnston, Stoller
Greg Lupton, Stoller
Chuck White, Stoller

Summary of Statistical Tests for Boron
LDS and HTW Monitoring Horizons of the OSDF

	Horizon	Distribution	Trend	Serial Correlation	Outliers	
					Present	Removed
Cell 1	LDS	normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 2	LDS	Insuf. data	Insuf. data	Insuf. data	Insuf. data	Insuf. data
	HTW	normal	up	yes	no	NA
Cell 3	LDS	normal	down	yes	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 4	LDS	NC	NC	NC	NC	NC
	HTW	log normal	down	yes	no	NA
Cell 5	LDS	NC	NC	NC	NC	NC
	HTW	normal	up	no	no	NA
Cell 6	LDS	NC	NC	NC	NC	NC
	HTW	normal	down	no	no	NA
Cell 7	LDS	NC	NC	NC	NC	NC
	HTW	normal	down	no	no	NA
Cell 8	LDS	NC	NC	NC	NC	NC
	HTW	normal	none	no	no	NA

Distribution determined by Shapiro-Wilks Test of Normality
Trend determined by Mann-Kendall Trend Analysis & Sens Slope Analysis
Serial Correlation determined by Rank Von Neumann Ratio Test
Outliers determined by Dixon's Test. Outliers were removed if Shapiro-Wilks test failed.
NA – not applicable
NC – not considered because the boron concentration is inappropriate for use as a detection ion in this horizon

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12338D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	169	327	158	0.6431	101.61
2	217	271	54	0.2806	15.1524
3	225	230	5	0.0875	0.4375
4	230	225	-5		
5	271	217	-54		
6	327	169	-158		

Sum of b values = 117.2
Sample Standard Deviation = 53.7119
W Statistic = 0.952231

5% Critical value of 0.788 is less than 0.952231
Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.952231
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
271	225	46	1	0
327	225	102	2	0
230	225	5	3	0
217	225	-8	3	1
169	225	-56	3	2
327	271	56	4	2
230	271	-41	4	3
217	271	-54	4	4
169	271	-102	4	5
230	327	-97	4	6
217	327	-110	4	7
169	327	-158	4	8
217	230	-13	4	9
169	230	-6[illegible]	4	10
169	217	-48	4	11

ChemStat
Trial Version

S Statistic = 4 - 11 = -7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-7| is 0.272
0.272 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: B
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
271 (8/10/2005)	225 (5/11/2005)	(271 - 225)/(2 - 1)	46
327 (11/16/2005)	225 (5/11/2005)	(327 - 225)/(3 - 1)	51
230 (2/20/2006)	225 (5/11/2005)	(230 - 225)/(4 - 1)	1.66667
217 (5/30/2006)	225 (5/11/2005)	(217 - 225)/(5 - 1)	-2
169 (2/21/2007)	225 (5/11/2005)	(169 - 225)/(6 - 1)	-11.2
327 (11/16/2005)	271 (8/10/2005)	(327 - 271)/(3 - 2)	56
230 (2/20/2006)	271 (8/10/2005)	(230 - 271)/(4 - 2)	-20.5
217 (5/30/2006)	271 (8/10/2005)	(217 - 271)/(5 - 2)	-18
169 (2/21/2007)	271 (8/10/2005)	(169 - 271)/(6 - 2)	-25.5
230 (2/20/2006)	327 (11/16/2005)	(230 - 327)/(4 - 3)	-97
217 (5/30/2006)	327 (11/16/2005)	(217 - 327)/(5 - 3)	-55
169 (2/21/2007)	327 (11/16/2005)	(169 - 327)/(6 - 3)	-52.6667
217 (5/30/2006)	230 (2/20/2006)	(217 - 230)/(5 - 4)	-13
169 (2/21/2007)	230 (2/20/2006)	(169 - 230)/(6 - 4)	-30.5
169 (2/21/2007)	217 (5/30/2006)	(169 - 217)/(6 - 5)	-48

ChemStat Trial Version

Number of Q values = 1

Ordered Q Values

n	Q
1	-97
2	-55
3	-52.6667
4	-48
5	-30.5
6	-25.5
7	-20.5
8	-18
9	-13
10	-11.2
11	-2
12	1.66667
13	46
14	51
15	56

Sen's Estimator (Median Q) is -18

Time Period	Observations
5/11/2005	1
8/10/2005	1
11/16/2005	1
2/20/2006	1

5/30/2006 1
2/21/2007 1
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 510
b = 1080
c = 60
Group Variance = 28.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 8.7554
M1 = (15 - 8.7554)/2.0 = 3.1223
M2 = (15 + 8.7554)/2.0 + 1 = 12.8777
Lower limit is -52.6667 = Q(3)
Upper limit is 46 = Q(13)
-52.6667 < 0 < 46 indicating no trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: B
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/11/2005	225	3
8/10/2005	271	5
11/16/2005	327	6
2/20/2006	230	4
5/30/2006	217	2
2/21/2007	169	1

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von Neumann ratio v = 0.8 = 14/17.5
99% Critical Value = 0.46
0.8 > 0.46
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 6 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.35443	0.303797	0.698	None

Loc.	Date	Conc.	Outlier
12338D	5/11/2005	225	FALSE
	8/10/2005	271	FALSE
	11/16/2005	327	FALSE
	2/20/2006	230	FALSE
	5/30/2006	217	FALSE
	2/21/2007	169	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12338E
Normallty Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	159	226	67	0.6052	40.5484
2	175	199	24	0.3164	7.5936
3	178	193	15	0.1743	2.6145
4	188	192	4	0.0561	0.2244
5	192	188	-4		
6	193	178	-15		
7	199	175	-24		
8	226	159	-67		

Sum of b values = 50.9809
Sample Standard Deviation = 19.6814
W Statistic = 0.958529

5% Critical value of 0.818 is less than 0.958529
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.958529
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
226	199	27	1	0
159	199	-40	1	1
192	199	-7	1	2
193	199	-6	1	3
188	199	-11	1	4
175	199	-24	1	5
178	199	-21	1	6
159	226	-67	1	7
192	226	-34	1	8
193	226	-33	1	9
188	226	-38	1	10
175	226	-51	1	11
178	226	-48	1	12
192	159	33	[illegible]	12
193	159	34	[illegible]	12
188	159	29	4	12
175	159	16	5	12
178	159	19	[illegible]	12
193	192	1	7	12
188	192	-4	7	13
175	192	-17	7	14
178	192	-14	7	15
188	193	-5	7	16
175	193	-18	7	17
178	193	-15	7	18
175	188	-13	7	19
178	188	-10	7	20
178	175	3	8	20

ChemStat
Trial Version

S Statistic = 8 - 20 = -12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-12| is 0.178
0.178 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: B
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
226 (8/8/2005)	199 (5/24/2005)	(226 - 199)/(2 - 1)	27
159 (11/14/2005)	199 (5/24/2005)	(159 - 199)/(3 - 1)	-20
192 (2/14/2006)	199 (5/24/2005)	(192 - 199)/(4 - 1)	-2.33333
193 (5/24/2006)	199 (5/24/2005)	(193 - 199)/(5 - 1)	-1.5
188 (8/17/2006)	199 (5/24/2005)	(188 - 199)/(6 - 1)	-2.2
175 (11/6/2006)	199 (5/24/2005)	(175 - 199)/(7 - 1)	-4
178 (2/27/2007)	199 (5/24/2005)	(178 - 199)/(8 - 1)	-3
159 (11/14/2005)	226 (8/8/2005)	(159 - 226)/(3 - 2)	-67
192 (2/14/2006)	226 (8/8/2005)	(192 - 226)/(4 - 2)	-17
193 (5/24/2006)	226 (8/8/2005)	(193 - 226)/(5 - 2)	-11
188 (8/17/2006)	226 (8/8/2005)	(188 - 226)/(6 - 2)	-9.5
175 (11/6/2006)	226 (8/8/2005)	(175 - 226)/(7 - 2)	-10.2
178 (2/27/2007)	226 (8/8/2005)	(178 - 226)/(8 - 2)	-8
192 (2/14/2006)	159 (11/14/2005)	(192 - 159)/(4 - 3)	33
193 (5/24/2006)	159 (11/14/2005)	(193 - 159)/(5 - 3)	17
188 (8/17/2006)	159 (11/14/2005)	(188 - 159)/(6 - 3)	9.66667
175 (11/6/2006)	159 (11/14/2005)	(175 - 159)/(7 - 3)	4
178 (2/27/2007)	159 (11/14/2005)	(178 - 159)/(8 - 3)	3.8
193 (5/24/2006)	192 (2/14/2006)	(193 - 192)/(5 - 4)	1
188 (8/17/2006)	192 (2/14/2006)	(188 - 192)/(6 - 4)	-2
175 (11/6/2006)	192 (2/14/2006)	(175 - 192)/(7 - 4)	-5.66667
178 (2/27/2007)	192 (2/14/2006)	(178 - 192)/(8 - 4)	-3.5
188 (8/17/2006)	193 (5/24/2006)	(188 - 193)/(6 - 5)	-5
175 (11/6/2006)	193 (5/24/2006)	(175 - 193)/(7 - 5)	-9
178 (2/27/2007)	193 (5/24/2006)	(178 - 193)/(8 - 5)	-5
175 (11/6/2006)	188 (8/17/2006)	(175 - 188)/(7 - 6)	-13
178 (2/27/2007)	188 (8/17/2006)	(178 - 188)/(8 - 6)	-5
178 (2/27/2007)	175 (11/6/2006)	(178 - 175)/(8 - 7)	3

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-67
2	-20
3	-17
4	-13
5	-11
6	-10.2
7	-9.5

8	-9
9	-8
10	-5.66667
11	-5
12	-5
13	-5
14	-4
15	-3.5
16	-3
17	-2.33333
18	-2.2
19	-2
20	-1.5
21	1
22	3
23	3.8
24	4
25	9.66667
26	17
27	27
28	33

Sen's Estimator (Median Q) is -3.75

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/14/2006	1
5/24/2006	1
8/17/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -9.5 = Q(7)
Upper limit is 3 = Q(22)
-9.5 < 0 < 3 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: B

Location: 12338E

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/24/2005	199	7
8/8/2005	226	8
11/14/2005	159	1
2/14/2006	192	5
5/24/2006	193	6
8/17/2006	188	4
11/6/2006	175	2
2/27/2007	178	3

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von Neumann ratio v = 1.80952 = 76/42

99% Critical Value = 0.62

1.80952 > 0.62

Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.529412	0.4	0.683	None

Loc.	Date	Conc.	Outlier
12338E	5/24/2005	199	FALSE
	8/8/2005	226	FALSE
	11/14/2005	159	FALSE
	2/14/2006	192	FALSE
	5/24/2006	193	FALSE
	8/17/2006	188	FALSE
	11/6/2006	175	FALSE
	2/27/2007	178	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12339E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	107	174	67	0.6052	40.5484
2	116	154	38	0.3164	12.0232
3	133	154	21	0.1743	3.6603
4	134	144	10	0.0561	0.561
5	144	134	-10		
6	154	133	-21		
7	154	116	-38		
8	174	107	-67		

Sum of b values = 56.7929
Sample Standard Deviation = 21.7518
W Statistic = 0.973863

5% Critical value of 0.818 is less than 0.973863
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.973863
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
133	107	26	1	0
116	107	9	2	0
134	107	27	3	0
144	107	37	4	0
154	107	47	5	0
154	107	47	6	0
174	107	67	7	0
116	133	-17	7	1
134	133	1	8	1
144	133	11	9	1
154	133	21	10	1
154	133	21	11	1
174	133	41	12	1
134	116	18	13	1
144	116	28	14	1
154	116	38	15	1
154	116	38	16	1
174	116	58	17	1
144	134	10	18	1
154	134	20	19	1
154	134	20	20	1
174	134	40	21	1
154	144	10	22	1
154	144	10	23	1
174	144	30	24	1
154	154	0	24	1
174	154	20	25	1
174	154	20	26	1

ChemStat
Trial Version

S Statistic = 26 - 1 = 25
Comparing at 95% confidence level (upward trend)
Failed to calculate probability for S = 25
Table out of range

Sen's Slope Analysis
Parameter: B
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
133 (8/8/2005)	107 (5/24/2005)	(133 - 107)/(2 - 1)	26
116 (11/14/2005)	107 (5/24/2005)	(116 - 107)/(3 - 1)	4.5
134 (2/16/2006)	107 (5/24/2005)	(134 - 107)/(4 - 1)	9
144 (5/24/2006)	107 (5/24/2005)	(144 - 107)/(5 - 1)	9.25
154 (8/22/2006)	107 (5/24/2005)	(154 - 107)/(6 - 1)	9.4
154 (11/6/2006)	107 (5/24/2005)	(154 - 107)/(7 - 1)	7.83333
174 (2/27/2007)	107 (5/24/2005)	(174 - 107)/(8 - 1)	9.57143
116 (11/14/2005)	133 (8/8/2005)	(116 - 133)/(3 - 2)	-17
134 (2/16/2006)	133 (8/8/2005)	(134 - 133)/(4 - 2)	0.5
144 (5/24/2006)	133 (8/8/2005)	(144 - 133)/(5 - 2)	3.66667
154 (8/22/2006)	133 (8/8/2005)	(154 - 133)/(6 - 2)	5.25
154 (11/6/2006)	133 (8/8/2005)	(154 - 133)/(7 - 2)	4.2
174 (2/27/2007)	133 (8/8/2005)	(174 - 133)/(8 - 2)	6.83333
134 (2/16/2006)	116 (11/14/2005)	(134 - 116)/(4 - 3)	18
144 (5/24/2006)	116 (11/14/2005)	(144 - 116)/(5 - 3)	14
154 (8/22/2006)	116 (11/14/2005)	(154 - 116)/(6 - 3)	12.6667
154 (11/6/2006)	116 (11/14/2005)	(154 - 116)/(7 - 3)	9.5
174 (2/27/2007)	116 (11/14/2005)	(174 - 116)/(8 - 3)	11.6
144 (5/24/2006)	134 (2/16/2006)	(144 - 134)/(5 - 4)	10
154 (8/22/2006)	134 (2/16/2006)	(154 - 134)/(6 - 4)	10
154 (11/6/2006)	134 (2/16/2006)	(154 - 134)/(7 - 4)	6.66667
174 (2/27/2007)	134 (2/16/2006)	(174 - 134)/(8 - 4)	10
154 (8/22/2006)	144 (5/24/2006)	(154 - 144)/(6 - 5)	10
154 (11/6/2006)	144 (5/24/2006)	(154 - 144)/(7 - 5)	5
174 (2/27/2007)	144 (5/24/2006)	(174 - 144)/(8 - 5)	10
154 (11/6/2006)	154 (8/22/2006)	(154 - 154)/(7 - 6)	0
174 (2/27/2007)	154 (8/22/2006)	(174 - 154)/(8 - 6)	10
174 (2/27/2007)	154 (11/6/2006)	(174 - 154)/(8 - 7)	20

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-17
2	0
3	0.5
4	3.66667
5	4.2
6	4.5
7	5

8	5.25
9	6.66667
10	6.83333
11	7.83333
12	9
13	9.25
14	9.4
15	9.5
16	9.57143
17	10
18	10
19	10
20	10
21	10
22	10
23	11.6
24	12.6667
25	14
26	18
27	20
28	26

Sen's Estimator (Median Q) is 9.45

Tied Group	Value	Members
1	154	2

ChemStat Trial Version

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/16/2006	1
5/24/2006	1
8/22/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is 5 = Q(7)
Upper limit is 10 = Q(22)
5 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: B

Location: 12339E

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/24/2005	107	1
8/8/2005	133	3
11/14/2005	116	2
2/16/2006	134	4
5/24/2006	144	5
8/22/2006	154	6.5
11/6/2006	154	6.5
2/27/2007	174	8

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von Neumann ratio v = 0.345238 = 14.5/42

99% Critical Value = 0.62

0.345238 <= 0.62

Test for statistical independence falls at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.344828	0.191489	0.683	None

Loc.	Date	Conc.	Outlier
12339E	5/24/2005	107	FALSE
	8/8/2005	133	FALSE
	11/14/2005	116	FALSE
	2/16/2006	134	FALSE
	5/24/2006	144	FALSE
	8/22/2006	154	FALSE
	11/6/2006	154	FALSE
	2/27/2007	174	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12340D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	73.2	155	81.8	0.6052	49.5054
2	81.8	128	46.2	0.3164	14.6177
3	87.3	119	31.7	0.1743	5.52531
4	88	119	31	0.0561	1.7391
5	119	88	-31		
6	119	87.3	-31.7		
7	128	81.8	-46.2		
8	155	73.2	-81.8		

Sum of b values = 71.3875
Sample Standard Deviation = 28.175
W Statistic = 0.917103

5% Critical value of 0.818 is less than 0.917103
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.917103
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
128	155	-27	0	1
119	155	-36	0	2
119	155	-36	0	3
87.3	155	-67.7	0	4
88	155	-67	0	5
81.8	155	-73.2	0	6
73.2	155	-81.8	0	7
119	128	-9	0	8
119	128	-9	0	9
87.3	128	-40.7	0	10
88	128	-40	0	11
81.8	128	-46.2	0	12
73.2	128	-54.8	0	13
119	119	0	[illegible]	[illegible]
87.3	119	-31.7	[illegible]	[illegible]
88	119	-31	0	15
81.8	119	-37.2	0	16
73.2	119	-45.8	0	17
87.3	119	-31.7	0	18
88	119	-31	0	19
81.8	119	-37.2	0	20
73.2	119	-45.8	0	21
88	87.3	0.7	1	21
81.8	87.3	-5.5	1	22
73.2	87.3	-14.1	1	23
81.8	88	-6.2	1	24
73.2	88	-14.8	1	25
73.2	81.8	-8.6	1	26

ChemStat
Trial Version

S Statistic = 1 - 26 = -25
Comparing at 95% confidence level (downward trend)
Failed to calculate probability for S = -25
Table out of range

Sen's Slope Analysis
Parameter: B
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
128 (8/9/2005)	155 (5/16/2005)	(128 - 155)/(2 - 1)	-27
119 (11/28/2005)	155 (5/16/2005)	(119 - 155)/(3 - 1)	-18
119 (2/20/2006)	155 (5/16/2005)	(119 - 155)/(4 - 1)	-12
87.3 (5/30/2006)	155 (5/16/2005)	(87.3 - 155)/(5 - 1)	-16.925
88 (8/25/2006)	155 (5/16/2005)	(88 - 155)/(6 - 1)	-13.4
81.8 (11/1/2006)	155 (5/16/2005)	(81.8 - 155)/(7 - 1)	-12.2
73.2 (2/20/2007)	155 (5/16/2005)	(73.2 - 155)/(8 - 1)	-11.6857
119 (11/28/2005)	128 (8/9/2005)	(119 - 128)/(3 - 2)	-9
119 (2/20/2006)	128 (8/9/2005)	(119 - 128)/(4 - 2)	-4.5
87.3 (5/30/2006)	128 (8/9/2005)	(87.3 - 128)/(5 - 2)	-13.5667
88 (8/25/2006)	128 (8/9/2005)	(88 - 128)/(6 - 2)	-10
81.8 (11/1/2006)	128 (8/9/2005)	(81.8 - 128)/(7 - 2)	-9.24
73.2 (2/20/2007)	128 (8/9/2005)	(73.2 - 128)/(8 - 2)	-9.13333
119 (2/20/2006)	[illegible] (11/28/2005)	(119 - 119)/(4 - 3)	0
87.3 (5/30/2006)	119 [illegible]	[illegible]	-15.85
88 (8/25/2006)	[illegible]	[illegible]	-10.3333
81.8 (11/1/2006)	119 (11/28/2005)	(81.8 - 119)/(7 - 3)	-9.3
73.2 (2/20/2007)	119 (11/28/2005)	(73.2 - 119)/(8 - 3)	-9.16
87.3 (5/30/2006)	119 (2/20/2006)	[illegible]	-31.7
88 (8/25/2006)	119 (2/20/2006)	[illegible]	-15.5
81.8 (11/1/2006)	119 (2/20/2006)	(81.8 - 119)/(7 - 4)	-12.4
73.2 (2/20/2007)	119 (2/20/2006)	(73.2 - 119)/(8 - 4)	-11.45
88 (8/25/2006)	87.3 (5/30/2006)	(88 - 87.3)/(6 - 5)	0.7
81.8 (11/1/2006)	87.3 (5/30/2006)	(81.8 - 87.3)/(7 - 5)	-2.75
73.2 (2/20/2007)	87.3 (5/30/2006)	(73.2 - 87.3)/(8 - 5)	-4.7
81.8 (11/1/2006)	88 (8/25/2006)	(81.8 - 88)/(7 - 6)	-6.2
73.2 (2/20/2007)	88 (8/25/2006)	(73.2 - 88)/(8 - 6)	-7.4
73.2 (2/20/2007)	81.8 (11/1/2006)	(73.2 - 81.8)/(8 - 7)	-8.6

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-31.7
2	-27
3	-18
4	-16.925
5	-15.85
6	-15.5
7	-13.5667

8	-13.4
9	-12.4
10	-12.2
11	-12
12	-11.6857
13	-11.45
14	-10.3333
15	-10
16	-9.3
17	-9.24
18	-9.16
19	-9.13333
20	-9
21	-8.6
22	-7.4
23	-6.2
24	-4.7
25	-4.5
26	-2.75
27	0
28	0.7

Sen's Estimator (Median Q) is -10.1667

Tied Group	Value	Members
1	119	2

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/28/2005	1
2/20/2006	1
5/30/2006	1
8/25/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -13.5667 = Q(7)
Upper limit is -7.4 = Q(22)
-7.4 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: B
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/16/2005	155	8
8/9/2005	128	7
11/28/2005	119	5.5
2/20/2006	119	5.5
5/30/2006	87.3	3
8/25/2006	88	4
11/1/2006	81.8	2
2/20/2007	73.2	1

---

von Neumann ratio v = 0.369048 = 15.5/42
99% Critical Value = 0.62
0.369048 <= 0.62
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.368852	0.156934	0.683	None

Loc.	Date	Conc.	Outlier
12340D	5/16/2005	155	FALSE
	8/9/2005	128	FALSE
	11/28/2005	119	FALSE
	2/20/2006	119	FALSE
	5/30/2006	87.3	FALSE
	8/25/2006	88	FALSE
	11/1/2006	81.8	FALSE
	2/20/2007	73.2	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12340E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	75.1	166	90.9	0.6233	56.658
2	77.4	163	85.6	0.3031	25.9454
3	81.4	108	26.6	0.1401	3.72666
4	96.7	96.7	0		
5	108	81.4	-26.6		
6	163	77.4	-85.6		
7	166	75.1	-90.9		

Sum of b values = 86.33
Sample Standard Deviation = 39.2084
W Statistic = 0.808004

5% Critical value of 0.803 is less than 0.808004
Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less than 0.808004
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
108	96.7	11.3	1	0
75.1	96.7	-21.6	1	1
77.4	96.7	-19.3	1	2
81.4	96.7	-15.3	1	3
163	96.7	66.3	2	3
166	96.7	69.3	3	3
75.1	108	-32.9	3	4
77.4	108	-30.6	3	5
81.4	108	-26.6	3	6
163	108	55	4	6
166	108	58	5	6
77.4	75.1	2.3	6	6
81.4	75.1	[illegible]	7	[illegible]
163	75.1	87.9	[illegible]	6
166	75.1	90.9	[illegible]	6
81.4	77.4	4	10	6
163	77.4	85.6	[illegible]	6
166	77.4	88.6	1[illegible]	[illegible]
163	81.4	81.6	13	6
166	81.4	84.6	14	6
166	163	3	15	6

ChemStat Trial Version

S Statistic = 15 - 6 = 9
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |9| is 0.238
0.238 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: B
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
108 (8/8/2005)	96.7 (5/18/2005)	(108 - 96.7)/(2 - 1)	11.3
75.1 (11/14/2005)	96.7 (5/18/2005)	(75.1 - 96.7)/(3 - 1)	-10.8
77.4 (2/15/2006)	96.7 (5/18/2005)	(77.4 - 96.7)/(4 - 1)	-6.43333
81.4 (5/24/2006)	96.7 (5/18/2005)	(81.4 - 96.7)/(5 - 1)	-3.825
163 (11/6/2006)	96.7 (5/18/2005)	(163 - 96.7)/(6 - 1)	13.26
166 (2/27/2007)	96.7 (5/18/2005)	(166 - 96.7)/(7 - 1)	11.55
75.1 (11/14/2005)	108 (8/8/2005)	(75.1 - 108)/(3 - 2)	-32.9
77.4 (2/15/2006)	108 (8/8/2005)	(77.4 - 108)/(4 - 2)	-15.3
81.4 (5/24/2006)	108 (8/8/2005)	(81.4 - 108)/(5 - 2)	-8.86667
163 (11/6/2006)	108 (8/8/2005)	(163 - 108)/(6 - 2)	13.75
166 (2/27/2007)	108 (8/8/2005)	(166 - 108)/(7 - 2)	11.6
77.4 (2/15/2006)	75.1 (11/14/2005)	(77.4 - 75.1)/(4 - 3)	2.3
81.4 (5/24/2006)	75.1 (11/14/2005)	(81.4 - 75.1)/(5 - 3)	3.15
163 (11/6/2006)	75.1 (11/14/2005)	(163 - 75.1)/(6 - 3)	29.3
166 (2/27/2007)	75.1 (11/14/2005)	(166 - 75.1)/(7 - 3)	22.725
81.4 (5/24/2006)	77.4 (2/15/2006)	(81.4 - 77.4)/(5 - 4)	4
163 (11/6/2006)	77.4 (2/15/2006)	(163 - 77.4)/(6 - 4)	42.8
166 (2/27/2007)	77.4 (2/15/2006)	(166 - 77.4)/(7 - 4)	29.5333
163 (11/6/2006)	81.4 (5/24/2006)	(163 - 81.4)/(6 - 5)	81.6
166 (2/27/2007)	81.4 (5/24/2006)	(166 - 81.4)/(7 - 5)	42.3
166 (2/27/2007)	163 (11/6/2006)	(166 - 163)/(7 - 6)	3

ChemStat Trial Version

Number of Q values = 21

Ordered Q Values

n	Q
1	-32.9
2	-15.3
3	-10.8
4	-8.86667
5	-6.43333
6	-3.825
7	2.3
8	3
9	3.15
10	4
11	11.3
12	11.55
13	11.6
14	13.26
15	13.75

16	22.725
17	29.3
18	29.5333
19	42.3
20	42.8
21	81.6

Sen's Estimator (Median Q) is 11.3

Time Period	Observations
5/18/2005	1
8/8/2005	1
11/14/2005	1
2/15/2006	1
5/24/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02404
M2 = (21 + 10.952)/2.0 + 1 = 16.976
Lower limit is -6.43333 = Q(5)
Upper limit is 29.3 = Q(17)
-6.43333 < 0 < 29.3 indicating no trend in data.

ChemStat Trial Version

Rank Von Neumann Ratio Test

Parameter: B
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	96.7	4
8/8/2005	108	5
11/14/2005	75.1	1
2/15/2006	77.4	2
5/24/2006	81.4	3
11/6/2006	163	6
2/27/2007	166	7

---

von Neumann ratio v = 1.03571 = 29/28
99% Critical Value = 0.54
1.03571 > 0.54
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.899615	0.0253025	0.683	960
2	0.0330033	0.0253025	0.637	None

Loc.	Date	Conc.	Outlier
12340E	5/18/2005	96.7	FALSE
	8/8/2005	108	FALSE
	11/14/2005	75.1	FALSE
	2/15/2006	77.4	FALSE
	5/24/2006	81.4	FALSE
	8/25/2006	**960**	**TRUE**
	11/6/2006	163	FALSE
	2/27/2007	166	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12341D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	415	636	221	0.6052	133.749
2	428	618	190	0.3164	60.116
3	476	525	49	0.1743	8.5407
4	482	489	7	0.0561	0.3927
5	489	482	-7		
6	525	476	-49		
7	618	428	-190		
8	636	415	-221		

Sum of b values = 202.799
Sample Standard Deviation = 80.9584
W Statistic = 0.896412

5% Critical value of 0.818 is less than 0.896412
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.896412
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
476	636	-160	0	1
415	636	-221	0	2
428	636	-208	0	3
489	636	-147	0	4
618	636	-18	0	5
482	636	-154	0	6
525	636	-111	0	7
415	476	-61	0	8
428	476	-48	0	9
489	476	13	1	9
618	476	142	2	9
482	476	6	3	9
525	476	49	4	9
428	415	13	5	9
489	415	74	6	9
618	415	203	7	9
482	415	67	8	9
525	415	110	9	9
489	428	61	10	9
618	428	190	11	9
482	428	54	12	9
525	428	97	13	9
618	489	129	14	9
482	489	-7	14	10
525	489	36	15	10
482	618	-136	15	11
525	618	-93	15	12
525	482	43	16	12

ChemStat
Trial Version

S Statistic = 16 - 12 = 4
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |4| is 0.72
0.72 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: B
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
476 (8/9/2005)	636 (5/16/2005)	(476 - 636)/(2 - 1)	-160
415 (11/15/2005)	636 (5/16/2005)	(415 - 636)/(3 - 1)	-110.5
428 (2/20/2006)	636 (5/16/2005)	(428 - 636)/(4 - 1)	-69.3333
489 (5/23/2006)	636 (5/16/2005)	(489 - 636)/(5 - 1)	-36.75
618 (8/28/2006)	636 (5/16/2005)	(618 - 636)/(6 - 1)	-3.6
482 (11/1/2006)	636 (5/16/2005)	(482 - 636)/(7 - 1)	-25.6667
525 (2/20/2007)	636 (5/16/2005)	(525 - 636)/(8 - 1)	-15.8571
415 (11/15/2005)	476 (8/9/2005)	(415 - 476)/(3 - 2)	-61
428 (2/20/2006)	476 (8/9/2005)	(428 - 476)/(4 - 2)	-24
489 (5/23/2006)	476 (8/9/2005)	(489 - 476)/(5 - 2)	4.33333
618 (8/28/2006)	476 (8/9/2005)	(618 - 476)/(6 - 2)	35.5
482 (11/1/2006)	476 (8/9/2005)	(482 - 476)/(7 - 2)	1.2
525 (2/20/2007)	476 (8/9/2005)	(525 - 476)/(8 - 2)	8.16667
428 (2/20/2006)	415 (11/15/2005)	(428 - 415)/(4 - 3)	13
489 (5/23/2006)	415 (11/15/2005)	(489 - 415)/(5 - 3)	37
618 (8/28/2006)	415 (11/15/2005)	(618 - 415)/(6 - 3)	67.6667
482 (11/1/2006)	415 (11/15/2005)	(482 - 415)/(7 - 3)	16.75
525 (2/20/2007)	415 (11/15/2005)	(525 - 415)/(8 - 3)	22
489 (5/23/2006)	428 (2/20/2006)	(489 - 428)/(5 - 4)	61
618 (8/28/2006)	428 (2/20/2006)	(618 - 428)/(6 - 4)	95
482 (11/1/2006)	428 (2/20/2006)	(482 - 428)/(7 - 4)	18
525 (2/20/2007)	428 (2/20/2006)	(525 - 428)/(8 - 4)	24.25
618 (8/28/2006)	489 (5/23/2006)	(618 - 489)/(6 - 5)	129
482 (11/1/2006)	489 (5/23/2006)	(482 - 489)/(7 - 5)	-3.5
525 (2/20/2007)	489 (5/23/2006)	(525 - 489)/(8 - 5)	12
482 (11/1/2006)	618 (8/28/2006)	(482 - 618)/(7 - 6)	-136
525 (2/20/2007)	618 (8/28/2006)	(525 - 618)/(8 - 6)	-46.5
525 (2/20/2007)	482 (11/1/2006)	(525 - 482)/(8 - 7)	43

GraphStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-160
2	-136
3	-110.5
4	-69.3333
5	-61
6	-46.5
7	-36.75

8	-25.6667
9	-24
10	-15.8571
11	-3.6
12	-3.5
13	1.2
14	4.33333
15	8.16667
16	12
17	13
18	16.75
19	18
20	22
21	24.25
22	35.5
23	37
24	43
25	61
26	67.6667
27	95
28	129

Sen's Estimator (Median Q) is 6.25

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/15/2005	1
2/20/2006	
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -36.75 = Q(7)
Upper limit is 35.5 = Q(22)
-36.75 < 0 < 35.5 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: B
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/16/2005	636	8
8/9/2005	476	3
11/15/2005	415	1
2/20/2006	428	2
5/23/2006	489	5
8/28/2006	618	7
11/1/2006	482	4
2/20/2007	525	6

---

von Neumann ratio v = 1.33333 = 56/42
99% Critical Value = 0.62
1.33333 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0865385	0.0640394	0.683	None

Loc.	Date	Conc.	Outlier
12341D	5/16/2005	636	FALSE
	8/9/2005	476	FALSE
	11/15/2005	415	FALSE
	2/20/2006	428	FALSE
	5/23/2006	489	FALSE
	8/28/2006	618	FALSE
	11/1/2006	482	FALSE
	2/20/2007	525	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12341E
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.0607	2.25768	0.196981	0.6052	0.119213
2	2.06446	2.18469	0.120233	0.3164	0.0380419
3	2.06446	2.1271	0.0626468	0.1743	0.0109193
4	2.08279	2.08636	0.00357446	0.0561	0.000200527
5	2.08636	2.08279	-0.00357446		
6	2.1271	2.06446	-0.0626468		
7	2.18469	2.06446	-0.120233		
8	2.25768	2.0607	-0.196981		

Sum of b values = 0.168374
Sample Standard Deviation = 0.0709808
W Statistic = 0.803847

5% Critical value of 0.818 exceeds 0.803847
Evidence of non-normality at 95% level of significance

1% Critical value of 0.749 is less than 0.803847
Data is normally distributed at 1% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12341E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2.18469	2.25768	-0.0729871	0	1
2.08636	2.25768	-0.171319	0	2
2.1271	2.25768	-0.130574	0	3
2.08279	2.25768	-0.174893	0	4
2.06446	2.25768	-0.193221	0	5
2.0607	2.25768	-0.196981	0	6
2.06446	2.25768	-0.193221	0	7
2.08636	2.18469	-0.0983316	0	8
2.1271	2.18469	-0.0575866	0	9
2.08279	2.18469	-0.101906	0	10
2.06446	2.18469	-0.120233	0	11
2.0607	2.18469	-0.123994	0	12
2.06446	2.18469	-0.120233	0	13
2.1271	2.08636	0.040[illegible]	[illegible]	13
2.08279	2.08636	-0.0[illegible]574[illegible]	[illegible]	14
2.06446	2.08636	-0.0219018	1	15
2.0607	2.08636	-0.025662	1	16
2.06446	2.086[illegible]	-0.0219018	[illegible]	17
2.08279	2.1271	-0.0[illegible]43[illegible]9[illegible]	1	18
2.06446	2.1271	-0.0626468	1	19
2.0607	2.1271	-0.066407	1	20
2.06446	2.1271	-0.0626468	1	21
2.06446	2.08279	-0.0183274	1	22
2.0607	2.08279	-0.0220875	1	23
2.06446	2.08279	-0.0183274	1	24
2.0607	2.06446	-0.00376015	1	25
2.06446	2.06446	0	1	25
2.06446	2.0607	0.00376015	2	25

S Statistic = 2 - 25 = -23
Comparing at 95% confidence level (downward trend)
Failed to calculate probability for S = -23
Table out of range

ChemStat Trial Version

Sen's Slope Analysis
Parameter: B
Location: 12341E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2.18469 (8/9/2005)	2.25768 (5/18/2005)	(2.18469 - 2.25768)/(2 - 1)	-0.0729871
2.08636 (11/21/2005)	2.25768 (5/18/2005)	(2.08636 - 2.25768)/(3 - 1)	-0.0856594
2.1271 (2/15/2006)	2.25768 (5/18/2005)	(2.1271 - 2.25768)/(4 - 1)	-0.0435246
2.08279 (5/22/2006)	2.25768 (5/18/2005)	(2.08279 - 2.25768)/(5 - 1)	-0.0437233
2.06446 (8/29/2006)	2.25768 (5/18/2005)	(2.06446 - 2.25768)/(6 - 1)	-0.0386441
2.0607 (11/7/2006)	2.25768 (5/18/2005)	(2.0607 - 2.25768)/(7 - 1)	-0.0328301
2.06446 (2/27/2007)	2.25768 (5/18/2005)	(2.06446 - 2.25768)/(8 - 1)	-0.0276029
2.08636 (11/21/2005)	2.18469 (8/9/2005)	(2.08636 - 2.18469)/(3 - 2)	-0.0983316
2.1271 (2/15/2006)	2.18469 (8/9/2005)	(2.1271 - 2.18469)/(4 - 2)	-0.0287933
2.08279 (5/22/2006)	2.18469 (8/9/2005)	(2.08279 - 2.18469)/(5 - 2)	-0.0339687
2.06446 (8/29/2006)	2.18469 (8/9/2005)	(2.06446 - 2.18469)/(6 - 2)	-0.0300584
2.0607 (11/7/2006)	2.18469 (8/9/2005)	(2.0607 - 2.18469)/(7 - 2)	-0.0247987
2.06446 (2/27/2007)	2.18469 (8/9/2005)	(2.06446 - 2.18469)/(8 - 2)	-0.0200389
2.1271 (2/15/2006)	2.08636 (11/21/2005)	(2.1271 - 2.08636)/(4 - 3)	0.040745
2.08279 (5/22/2006)	2.08636 (11/21/2005)	(2.08279 - 2.08636)/(5 - 3)	-0.00178723
2.06446 (8/29/2006)	2.08636 (11/21/2005)	(2.06446 - 2.08636)/(6 - 3)	-0.00730061
2.0607 (11/7/2006)	2.08636 (11/21/2005)	(2.0607 - 2.08636)/(7 - 3)	-0.0064155
2.06446 (2/27/2007)	2.08636 (11/21/2005)	(2.06446 - 2.08636)/(8 - 3)	-0.00438037
2.08279 (5/22/2006)	2.1271 (2/15/2006)	(2.08279 - 2.1271)/(5 - 4)	-0.0443194
2.06446 (8/29/2006)	2.1271 (2/15/2006)	(2.06446 - 2.1271)/(6 - 4)	-0.0313234
2.0607 (11/7/2006)	2.1271 (2/15/2006)	(2.0607 - 2.1271)/(7 - 4)	-0.0221357
2.06446 (2/27/2007)	2.1271 (2/15/2006)	(2.06446 - 2.1271)/(8 - 4)	-0.0156617
2.06446 (8/29/2006)	2.08279 (5/22/2006)	(2.06446 - 2.08279)/(6 - 5)	-0.0183274
2.0607 (11/7/2006)	2.08279 (5/22/2006)	(2.0607 - 2.08279)/(7 - 5)	-0.0110438
2.06446 (2/27/2007)	2.08279 (5/22/2006)	(2.06446 - 2.08279)/(8 - 5)	-0.00610913
2.0607 (11/7/2006)	2.06446 (8/29/2006)	(2.0607 - 2.06446)/(7 - 6)	-0.00376015
2.06446 (2/27/2007)	2.06446 (8/29/2006)	(2.06446 - 2.06446)/(8 - 6)	0
2.06446 (2/27/2007)	2.0607 (11/7/2006)	(2.06446 - 2.0607)/(8 - 7)	0.00376015

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.0983316
2	-0.0856594
3	-0.0729871
4	-0.0443194
5	-0.0437233
6	-0.0435246
7	-0.0386441

8	-0.0339687
9	-0.0328301
10	-0.0313234
11	-0.0300584
12	-0.0287933
13	-0.0276029
14	-0.0247987
15	-0.0221357
16	-0.0200389
17	-0.0183274
18	-0.0156617
19	-0.0110438
20	-0.00730061
21	-0.0064155
22	-0.00610913
23	-0.00438037
24	-0.00376015
25	-0.00178723
26	0
27	0.00376015
28	0.040745

Sen's Estimator (Median Q) is -0.0234672

Tied Group	Value	Members
1	2.06446	2

Time Period	Observations
5/18/2005	
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -0.0386441 = Q(7)
Upper limit is -0.00610913 = Q(22)
-0.00610913 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: B
Location: 12341E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	2.25768	8
8/9/2005	2.18469	7
11/21/2005	2.08636	5
2/15/2006	2.1271	6
5/22/2006	2.08279	4
8/29/2006	2.06446	2.5
11/7/2006	2.0607	1
2/27/2007	2.06446	2.5

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von Neumann ratio v = 0.39881 = 16.75/42
99% Critical Value = 0.62
0.39881 <= 0.62
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12341E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.37774	0.0303253	0.683	None

Loc.	Date	Conc.	Outlier
12341E	5/18/2005	2.25768	FALSE
	8/9/2005	2.18469	FALSE
	11/21/2005	2.08636	FALSE
	2/15/2006	2.1271	FALSE
	5/22/2006	2.08279	FALSE
	8/29/2006	2.06446	FALSE
	11/7/2006	2.0607	FALSE
	2/27/2007	2.06446	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12342D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	219	269	50	0.6233	31.165
2	239	260	21	0.3031	6.3651
3	239	260	21	0.1401	2.9421
4	253	253	0		
5	260	239	-21		
6	260	239	-21		
7	269	219	-50		

Sum of b values = 40.4722
Sample Standard Deviation = 17.1061
W Statistic = 0.932953

5% Critical value of 0.803 is less than 0.932953
Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less than 0.932953
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
219	269	-50	0	1
260	269	-9	0	2
239	269	-30	0	3
253	269	-16	0	4
239	269	-30	0	5
260	269	-9	0	6
260	219	41	1	6
239	219	20	2	6
253	219	34	3	6
239	219	20	4	6
260	219	41	5	6
239	260	-21	5	7
253	260	[illegible]	5	[illegible]
239	260	-21	[illegible]	[illegible]
260	260	0	[illegible]	9
253	239	14	6	9
239	239	0	[illegible]	9
260	239	21	7	[illegible]
239	253	-14	7	10
260	253	7	8	10
260	239	21	9	10

ChemStat
Trial Version

S Statistic = 9 - 10 = -1
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-1| is 1
1 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: B
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
219 (11/15/2005)	269 (8/10/2005)	(219 - 269)/(2 - 1)	-50
260 (2/20/2006)	269 (8/10/2005)	(260 - 269)/(3 - 1)	-4.5
239 (5/23/2006)	269 (8/10/2005)	(239 - 269)/(4 - 1)	-10
253 (8/28/2006)	269 (8/10/2005)	(253 - 269)/(5 - 1)	-4
239 (11/1/2006)	269 (8/10/2005)	(239 - 269)/(6 - 1)	-6
260 (2/20/2007)	269 (8/10/2005)	(260 - 269)/(7 - 1)	-1.5
260 (2/20/2006)	219 (11/15/2005)	(260 - 219)/(3 - 2)	41
239 (5/23/2006)	219 (11/15/2005)	(239 - 219)/(4 - 2)	10
253 (8/28/2006)	219 (11/15/2005)	(253 - 219)/(5 - 2)	11.3333
239 (11/1/2006)	219 (11/15/2005)	(239 - 219)/(6 - 2)	5
260 (2/20/2007)	219 (11/15/2005)	(260 - 219)/(7 - 2)	8.2
239 (5/23/2006)	260 (2/20/2006)	(239 - 260)/(4 - 3)	-21
253 (8/28/2006)	260 (2/20/2006)	(253 - 260)/(5 - 3)	-3.5
239 (11/1/2006)	260 (2/20/2006)	(239 - 260)/(6 - 3)	-7
260 (2/20/2007)	260 (2/20/2006)	(260 - 260)/(7 - 3)	0
253 (8/28/2006)	239 (5/23/2006)	(253 - 239)/(5 - 4)	14
239 (11/1/2006)	239 (5/23/2006)	(239 - 239)/(6 - 4)	0
260 (2/20/2007)	239 (5/23/2006)	(260 - 239)/(7 - 4)	7
239 (11/1/2006)	253 (8/28/2006)	(239 - 253)/(6 - 5)	-14
260 (2/20/2007)	253 (8/28/2006)	(260 - 253)/(7 - 5)	3.5
260 (2/20/2007)	239 (11/1/2006)	(260 - 239)/(7 - 6)	21

ChemStat Trial Version

Number of Q values = 21

Ordered Q Values

n	Q
1	-50
2	-21
3	-14
4	-10
5	-7
6	-6
7	-4.5
8	-4
9	-3.5
10	-1.5
11	0
12	0
13	3.5
14	5
15	7

16	8.2
17	10
18	11.3333
19	14
20	21
21	41

Sen's Estimator (Median Q) is 0

Tied Group	Value	Members
1	260	2
2	239	2

Time Period	Observations
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

A = 36
B = 0
C = 0
D = 0
E = 4
F = 0
a = 798
b = 1890
c = 84
Group Variance = 42.33[illegible]3
For 90% confidence interval (two-tailed), z at (1-0.9)/2 = 1.64485
C = 10.7021
M1 = (21 - 10.7021)/2.0 = 5.14896
M2 = (21 + 10.7021)/2.0 + 1 = 16.851
Lower limit is -7 = Q(5)
Upper limit is 10 = Q(17)
-7 < 0 < 10 indicating no trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: B
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/10/2005	269	7
11/15/2005	219	1
2/20/2006	260	5.5
5/23/2006	239	2.5
8/28/2006	253	4
11/1/2006	239	2.5
2/20/2007	260	5.5

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von Neumann ratio v = 2.8125 = 78.75/28
99% Critical Value = 0.54
2.8125 > 0.54
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.808917	0.4	0.683	396
2	0.18	0.4	0.637	None

Loc.	Date	Conc.	Outlier
12342D	5/10/2005	**396**	**TRUE**
	8/10/2005	269	FALSE
	11/15/2005	219	FALSE
	2/20/2006	260	FALSE
	5/23/2006	239	FALSE
	8/28/2006	253	FALSE
	11/1/2006	239	FALSE
	2/20/2007	260	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12342E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	49.9	85	35.1	0.6052	21.2425
2	57.4	75.9	18.5	0.3164	5.8534
3	61.1	72.2	11.1	0.1743	1.93473
4	61.9	64.7	2.8	0.0561	0.15708
5	64.7	61.9	-2.8		
6	72.2	61.1	-11.1		
7	75.9	57.4	-18.5		
8	85	49.9	-35.1		

Sum of b values = 29.1877
Sample Standard Deviation = 11.1684
W Statistic = 0.975714

5% Critical value of 0.818 is less than 0.975714
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.975714
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
57.4	49.9	7.5	1	0
61.1	49.9	11.2	2	0
61.9	49.9	12	3	0
85	49.9	35.1	4	0
64.7	49.9	14.8	5	0
72.2	49.9	22.3	6	0
75.9	49.9	26	7	0
61.1	57.4	3.7	8	0
61.9	57.4	4.5	9	0
85	57.4	27.6	10	0
64.7	57.4	7.3	11	0
72.2	57.4	14.8	12	0
75.9	57.4	18.5	13	0
61.9	61.1	0.8	14	0
85	61.1	23.9	15	0
64.7	61.1	3.6	16	0
72.2	61.1	11.1	17	0
75.9	61.1	14.8	18	0
85	61.9	23.1	19	0
64.7	61.9	2.8	20	0
72.2	61.9	10.3	21	0
75.9	61.9	14	22	0
64.7	85	-20.3	22	1
72.2	85	-12.8	22	2
75.9	85	-9.1	22	3
72.2	64.7	7.5	23	3
75.9	64.7	11.2	24	3
75.9	72.2	3.7	25	3

ChemStat
Trial Version

S Statistic = 25 - 3 = 22
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 22 is 0.0028
S > 0 and 0.0028 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: B
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
57.4 (8/10/2005)	49.9 (5/18/2005)	(57.4 - 49.9)/(2 - 1)	7.5
61.1 (11/21/2005)	49.9 (5/18/2005)	(61.1 - 49.9)/(3 - 1)	5.6
61.9 (2/15/2006)	49.9 (5/18/2005)	(61.9 - 49.9)/(4 - 1)	4
85 (5/22/2006)	49.9 (5/18/2005)	(85 - 49.9)/(5 - 1)	8.775
64.7 (8/29/2006)	49.9 (5/18/2005)	(64.7 - 49.9)/(6 - 1)	2.96
72.2 (11/7/2006)	49.9 (5/18/2005)	(72.2 - 49.9)/(7 - 1)	3.71667
75.9 (2/27/2007)	49.9 (5/18/2005)	(75.9 - 49.9)/(8 - 1)	3.71429
61.1 (11/21/2005)	57.4 (8/10/2005)	(61.1 - 57.4)/(3 - 2)	3.7
61.9 (2/15/2006)	57.4 (8/10/2005)	(61.9 - 57.4)/(4 - 2)	2.25
85 (5/22/2006)	57.4 (8/10/2005)	(85 - 57.4)/(5 - 2)	9.2
64.7 (8/29/2006)	57.4 (8/10/2005)	(64.7 - 57.4)/(6 - 2)	1.825
72.2 (11/7/2006)	57.4 (8/10/2005)	(72.2 - 57.4)/(7 - 2)	2.96
75.9 (2/27/2007)	57.4 (8/10/2005)	(75.9 - 57.4)/(8 - 2)	3.08333
61.9 (2/15/2006)	61.1 (11/21/2005)	(61.9 - 61.1)/(4 - 3)	0.8
85 (5/22/2006)	61.1 (11/21/2005)	(85 - 61.1)/(5 - 3)	11.95
64.7 (8/29/2006)	61.1 (11/21/2005)	(64.7 - 61.1)/(6 - 3)	1.2
72.2 (11/7/2006)	61.1 (11/21/2005)	(72.2 - 61.1)/(7 - 3)	2.775
75.9 (2/27/2007)	61.1 (11/21/2005)	(75.9 - 61.1)/(8 - 3)	2.96
85 (5/22/2006)	61.9 (2/15/2006)	(85 - 61.9)/(5 - 4)	23.1
64.7 (8/29/2006)	61.9 (2/15/2006)	(64.7 - 61.9)/(6 - 4)	1.4
72.2 (11/7/2006)	61.9 (2/15/2006)	(72.2 - 61.9)/(7 - 4)	3.43333
75.9 (2/27/2007)	61.9 (2/15/2006)	(75.9 - 61.9)/(8 - 4)	3.5
64.7 (8/29/2006)	85 (5/22/2006)	(64.7 - 85)/(6 - 5)	-20.3
72.2 (11/7/2006)	85 (5/22/2006)	(72.2 - 85)/(7 - 5)	-6.4
75.9 (2/27/2007)	85 (5/22/2006)	(75.9 - 85)/(8 - 5)	-3.03333
72.2 (11/7/2006)	64.7 (8/29/2006)	(72.2 - 64.7)/(7 - 6)	7.5
75.9 (2/27/2007)	64.7 (8/29/2006)	(75.9 - 64.7)/(8 - 6)	5.6
75.9 (2/27/2007)	72.2 (11/7/2006)	(75.9 - 72.2)/(8 - 7)	3.7

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-20.3
2	-6.4
3	-3.03333
4	0.8
5	1.2
6	1.4
7	1.825

8	2.25
9	2.775
10	2.96
11	2.96
12	2.96
13	3.08333
14	3.43333
15	3.5
16	3.7
17	3.7
18	3.71429
19	3.71667
20	4
21	5.6
22	5.6
23	7.5
24	7.5
25	8.775
26	9.2
27	11.95
28	23.1

Sen's Estimator (Median Q) is 3.46667

Time Period	Observations
5/18/2005	1
8/10/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 1.825 = Q(7)
Upper limit is 5.6 = Q(22)
1.825 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: B
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	49.9	1
8/10/2005	57.4	2
11/21/2005	61.1	3
2/15/2006	61.9	4
5/22/2006	85	8
8/29/2006	64.7	5
11/7/2006	72.2	6
2/27/2007	75.9	7

---

von Neumann ratio v = 0.714286 = 30/42
99% Critical Value = 0.62
0.714286 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.32971	0.288462	0.683	None

Loc.	Date	Conc.	Outlier
12342E	5/18/2005	49.9	FALSE
	8/10/2005	57.4	FALSE
	11/21/2005	61.1	FALSE
	2/15/2006	61.9	FALSE
	5/22/2006	85	FALSE
	8/29/2006	64.7	FALSE
	11/7/2006	72.2	FALSE
	2/27/2007	75.9	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12343D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	319	577	258	0.6052	156.142
2	352	555	203	0.3164	64.2292
3	373	482	109	0.1743	18.9987
4	393	411	18	0.0561	1.0098
5	411	393	-18		
6	482	373	-109		
7	555	352	-203		
8	577	319	-258		

Sum of b values = 240.379
Sample Standard Deviation = 95.065
W Statistic = 0.913387

5% Critical value of 0.818 is less than 0.913387
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.913387
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis
Parameter: B
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
555	577	-22	0	1
411	577	-166	0	2
482	577	-95	0	3
352	577	-225	0	4
393	577	-184	0	5
319	577	-258	0	6
373	577	-204	0	7
411	555	-144	0	8
482	555	-73	0	9
352	555	-203	0	10
393	555	-162	0	11
319	555	-236	0	12
373	555	-182	0	13
482	411	71	1	13
352	411	-59	1	14
393	411	-18	1	15
319	411	-92	1	16
373	411	-38	1	17
352	482	-130	1	18
393	482	-89	1	19
319	482	-163	1	20
373	482	-109	1	21
393	352	41	2	21
319	352	-33	2	22
373	352	21	3	22
319	393	-74	3	23
373	393	-20	3	24
373	319	54	4	24

ChemStat
Trial Version

S Statistic = 4 - 24 = -20
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 20 is 0.0071
S < 0 and 0.0071 < 0.05 indicating a downward trend

Sen's Slope Analysis

Parameter: B
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
555 (8/10/2005)	577 (5/9/2005)	(555 - 577)/(2 - 1)	-22
411 (11/15/2005)	577 (5/9/2005)	(411 - 577)/(3 - 1)	-83
482 (2/20/2006)	577 (5/9/2005)	(482 - 577)/(4 - 1)	-31.6667
352 (5/23/2006)	577 (5/9/2005)	(352 - 577)/(5 - 1)	-56.25
393 (8/28/2006)	577 (5/9/2005)	(393 - 577)/(6 - 1)	-36.8
319 (11/2/2006)	577 (5/9/2005)	(319 - 577)/(7 - 1)	-43
373 (2/20/2007)	577 (5/9/2005)	(373 - 577)/(8 - 1)	-29.1429
411 (11/15/2005)	555 (8/10/2005)	(411 - 555)/(3 - 2)	-144
482 (2/20/2006)	555 (8/10/2005)	(482 - 555)/(4 - 2)	-36.5
352 (5/23/2006)	555 (8/10/2005)	(352 - 555)/(5 - 2)	-67.6667
393 (8/28/2006)	555 (8/10/2005)	(393 - 555)/(6 - 2)	-40.5
319 (11/2/2006)	555 (8/10/2005)	(319 - 555)/(7 - 2)	-47.2
373 (2/20/2007)	555 (8/10/2005)	(373 - 555)/(8 - 2)	-30.3333
482 (2/20/2006)	411 (11/15/2005)	(482 - 411)/(4 - 3)	71
352 (5/23/2006)	411 (11/15/2005)	(352 - 411)/(5 - 3)	-29.5
393 (8/28/2006)	411 (11/15/2005)	(393 - 411)/(6 - 3)	-6
319 (11/2/2006)	411 (11/15/2005)	(319 - 411)/(7 - 3)	-23
373 (2/20/2007)	411 (11/15/2005)	(373 - 411)/(8 - 3)	-7.6
352 (5/23/2006)	482 (2/20/2006)	(352 - 482)/(5 - 4)	-130
393 (8/28/2006)	482 (2/20/2006)	(393 - 482)/(6 - 4)	-44.5
319 (11/2/2006)	482 (2/20/2006)	(319 - 482)/(7 - 4)	-54.3333
373 (2/20/2007)	482 (2/20/2006)	(373 - 482)/(8 - 4)	-27.25
393 (8/28/2006)	352 (5/23/2006)	(393 - 352)/(6 - 5)	41
319 (11/2/2006)	352 (5/23/2006)	(319 - 352)/(7 - 5)	-16.5
373 (2/20/2007)	352 (5/23/2006)	(373 - 352)/(8 - 5)	7
319 (11/2/2006)	393 (8/28/2006)	(319 - 393)/(7 - 6)	-74
373 (2/20/2007)	393 (8/28/2006)	(373 - 393)/(8 - 6)	-10
373 (2/20/2007)	319 (11/2/2006)	(373 - 319)/(8 - 7)	54

GhemStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-144
2	-130
3	-83
4	-74
5	-67.6667
6	-56.25
7	-54.3333

8	-47.2
9	-44.5
10	-43
11	-40.5
12	-36.8
13	-36.5
14	-31.6667
15	-30.3333
16	-29.5
17	-29.1429
18	-27.25
19	-23
20	-22
21	-16.5
22	-10
23	-7.6
24	-6
25	7
26	41
27	54
28	71

Sen's Estimator (Median Q) is -31

Time Period	Observations
5/9/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/2/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -54.3333 = Q(7)
Upper limit is -10 = Q(22)
-10 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: B
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/9/2005	577	8
8/10/2005	555	7
11/15/2005	411	5
2/20/2006	482	6
5/23/2006	352	2
8/28/2006	393	4
11/2/2006	319	1
2/20/2007	373	3

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von Neumann ratio v = 0.928571 = 39/42
99% Critical Value = 0.62
0.928571 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0977778	0.139831	0.683	None

Loc.	Date	Conc.	Outlier
12343D	5/9/2005	577	FALSE
	8/10/2005	555	FALSE
	11/15/2005	411	FALSE
	2/20/2006	482	FALSE
	5/23/2006	352	FALSE
	8/28/2006	393	FALSE
	11/2/2006	319	FALSE
	2/20/2007	373	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12343E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	62.7	124	61.3	0.6233	38.2083
2	72	92.8	20.8	0.3031	6.30448
3	77.2	81.8	4.6	0.1401	0.64446
4	79	79	0		
5	81.8	77.2	-4.6		
6	92.8	72	-20.8		
7	124	62.7	-61.3		

Sum of b values = 45.1572
Sample Standard Deviation = 19.7943
W Statistic = 0.867406

5% Critical value of 0.803 is less than 0.867406
Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less than 0.867406
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
92.8	124	-31.2	0	1
79	124	-45	0	2
81.8	124	-42.2	0	3
62.7	124	-61.3	0	4
72	124	-52	0	5
77.2	124	-46.8	0	6
79	92.8	-13.8	0	7
81.8	92.8	-11	0	8
62.7	92.8	-30.1	0	9
72	92.8	-20.8	0	10
77.2	92.8	-15.6	0	11
81.8	79	2.8	1	11
62.7	79	-16.3	1	12
72	79	-7	1	13
77.2	79	-1.8	1	14
62.7	81.8	-19.1	1	15
72	81.8	-9.8		16
77.2	81.8	-4.6	1	17
72	62.7	9.3	2	17
77.2	62.7	14.5	3	17
77.2	72	5.2	4	17

ChemStat
Trial Version

S Statistic = 4 - 17 = -13
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 13 is 0.035
S < 0 and 0.035 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: B
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
92.8 (11/21/2005)	124 (8/9/2005)	(92.8 - 124)/(2 - 1)	-31.2
79 (2/15/2006)	124 (8/9/2005)	(79 - 124)/(3 - 1)	-22.5
81.8 (5/22/2006)	124 (8/9/2005)	(81.8 - 124)/(4 - 1)	-14.0667
62.7 (8/29/2006)	124 (8/9/2005)	(62.7 - 124)/(5 - 1)	-15.325
72 (11/7/2006)	124 (8/9/2005)	(72 - 124)/(6 - 1)	-10.4
77.2 (2/27/2007)	124 (8/9/2005)	(77.2 - 124)/(7 - 1)	-7.8
79 (2/15/2006)	92.8 (11/21/2005)	(79 - 92.8)/(3 - 2)	-13.8
81.8 (5/22/2006)	92.8 (11/21/2005)	(81.8 - 92.8)/(4 - 2)	-5.5
62.7 (8/29/2006)	92.8 (11/21/2005)	(62.7 - 92.8)/(5 - 2)	-10.0333
72 (11/7/2006)	92.8 (11/21/2005)	(72 - 92.8)/(6 - 2)	-5.2
77.2 (2/27/2007)	92.8 (11/21/2005)	(77.2 - 92.8)/(7 - 2)	-3.12
81.8 (5/22/2006)	79 (2/15/2006)	(81.8 - 79)/(4 - 3)	2.8
62.7 (8/29/2006)	79 (2/15/2006)	(62.7 - 79)/(5 - 3)	-8.15
72 (11/7/2006)	[illegible] (2/15/2006)	(72 - 79)/(6 - 3)	-2.33333
77.2 (2/27/2007)	79 (2/15/2006)	(77.2 - 79)/(7 - 3)	-0.45
62.7 (8/29/2006)	81.8 (5/22/2006)	(62.7 - 81.8)/(5 - 4)	-19.1
72 (11/7/2006)	81.8 (5/22/2006)	(72 - 81.8)/(6 - 4)	-4.9
77.2 (2/27/2007)	81.8 (5/22/2006)	(77.2 - 81.8)/(7 - 4)	-1.53333
72 (11/7/2006)	62.7 (8/29/2006)	(72 - 62.7)/(6 - 5)	9.3
77.2 (2/27/2007)	62.7 (8/29/2006)	(77.2 - 62.7)/(7 - 5)	7.25
77.2 (2/27/2007)	72 (11/7/2006)	(77.2 - 72)/(7 - 6)	5.2

ChemStat Trial Version

Number of Q values = 21

Ordered Q Values

n	Q
1	-31.2
2	-22.5
3	-19.1
4	-15.325
5	-14.0667
6	-13.8
7	-10.4
8	-10.0333
9	-8.15
10	-7.8
11	-5.5
12	-5.2
13	-4.9
14	-3.12
15	-2.33333

16	-1.53333
17	-0.45
18	2.8
19	5.2
20	7.25
21	9.3

Sen's Estimator (Median Q) is -5.5

Time Period	Observations
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02404
M2 = (21 + 10.952)/2.0 - 1 = 15.976
Lower limit is -14.0667 = Q(5)
Upper limit is -0.45 = Q(17)
-0.45 < 0 indicating a downward trend in data.

ChemStat Trial Version

Rank Von Neumann Ratio Test

Parameter: B
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/9/2005	124	7
11/21/2005	92.8	6
2/15/2006	79	4
5/22/2006	81.8	5
8/29/2006	62.7	1
11/7/2006	72	2
2/27/2007	77.2	3

---

von Neumann ratio v = 0.857143 = 24/28
99% Critical Value = 0.54
0.857143 > 0.54
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 7 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.508972	0.151713	0.637	None

Loc.	Date	Conc.	Outlier
12343E	8/9/2005	124	FALSE
	11/21/2005	92.8	FALSE
	2/15/2006	79	FALSE
	5/22/2006	81.8	FALSE
	8/29/2006	62.7	FALSE
	11/7/2006	72	FALSE
	2/27/2007	77.2	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12344D
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.22531	2.81158	0.586266	0.6052	0.354808
2	2.25768	2.69636	0.438678	0.3164	0.138798
3	2.30103	2.4843	0.18327	0.1743	0.0319439
4	2.36922	2.37107	0.001852	0.0561	0.000103897
5	2.37107	2.36922	-0.001852		
6	2.4843	2.30103	-0.18327		
7	2.69636	2.25768	-0.438678		
8	2.81158	2.22531	-0.586266		

Sum of b values = 0.525654
Sample Standard Deviation = 0.211847
W Statistic = 0.879538

5% Critical value of 0.818 is less than 0.879538
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.879538
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12344D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2.69636	2.81158	-0.115219	0	1
2.4843	2.81158	-0.327275	0	2
2.30103	2.81158	-0.510545	0	3
2.22531	2.81158	-0.586266	0	4
2.37107	2.81158	-0.440507	0	5
2.25768	2.81158	-0.553896	0	6
2.36922	2.81158	-0.442359	0	7
2.4843	2.69636	-0.212057	0	8
2.30103	2.69636	-0.395326	0	9
2.22531	2.69636	-0.471047	0	10
2.37107	2.69636	-0.325289	0	11
2.25768	2.69636	-0.438678	0	12
2.36922	2.69636	-0.327141	0	13
2.30103	2.4843	-0.18[illegible]	[illegible]	14
2.22531	2.4843	-0.258991	[illegible]	15
2.37107	2.4843	-0.113232	0	16
2.25768	2.4843	-0.226621	0	17
2.36922	2.484[illegible]	-0.115084	[illegible]	18
2.22531	2.3010[illegible]	-0.[illegible]57[illegible]0[illegible]	0	19
2.37107	2.30103	0.0700379	1	19
2.25768	2.30103	-0.0433514	1	20
2.36922	2.30103	0.0681859	2	20
2.37107	2.22531	0.145759	3	20
2.25768	2.22531	0.0323693	4	20
2.36922	2.22531	0.143907	5	20
2.25768	2.37107	-0.113389	5	21
2.36922	2.37107	-0.001852	5	22
2.36922	2.25768	0.111537	6	22

S Statistic = 6 - 22 = -16
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 16 is 0.031
S < 0 and 0.031 < 0.05 indicating a downward trend

ChemStat Trial Version

Sen's Slope Analysis
Parameter: B
Location: 12344D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2.69636 (8/23/2005)	2.81158 (5/31/2005)	(2.69636 - 2.81158)/(2 - 1)	-0.115219
2.4843 (11/16/2005)	2.81158 (5/31/2005)	(2.4843 - 2.81158)/(3 - 1)	-0.163638
2.30103 (2/21/2006)	2.81158 (5/31/2005)	(2.30103 - 2.81158)/(4 - 1)	-0.170182
2.22531 (5/30/2006)	2.81158 (5/31/2005)	(2.22531 - 2.81158)/(5 - 1)	-0.146566
2.37107 (8/23/2006)	2.81158 (5/31/2005)	(2.37107 - 2.81158)/(6 - 1)	-0.0881014
2.25768 (11/2/2006)	2.81158 (5/31/2005)	(2.25768 - 2.81158)/(7 - 1)	-0.0923161
2.36922 (2/21/2007)	2.81158 (5/31/2005)	(2.36922 - 2.81158)/(8 - 1)	-0.0631942
2.4843 (11/16/2005)	2.69636 (8/23/2005)	(2.4843 - 2.69636)/(3 - 2)	-0.212057
2.30103 (2/21/2006)	2.69636 (8/23/2005)	(2.30103 - 2.69636)/(4 - 2)	-0.197663
2.22531 (5/30/2006)	2.69636 (8/23/2005)	(2.22531 - 2.69636)/(5 - 2)	-0.157016
2.37107 (8/23/2006)	2.69636 (8/23/2005)	(2.37107 - 2.69636)/(6 - 2)	-0.0813221
2.25768 (11/2/2006)	2.69636 (8/23/2005)	(2.25768 - 2.69636)/(7 - 2)	-0.0877356
2.36922 (2/21/2007)	2.69636 (8/23/2005)	(2.36922 - 2.69636)/(8 - 2)	-0.0545234
2.30103 (2/21/2006)	2.4843 (11/16/2005)	(2.30103 - 2.4843)/(4 - 3)	-0.18327
2.22531 (5/30/2006)	2.4843 (11/16/2005)	(2.22531 - 2.4843)/(5 - 3)	-0.129495
2.37107 (8/23/2006)	2.4843 (11/16/2005)	(2.37107 - 2.4843)/(6 - 3)	-0.037744
2.25768 (11/2/2006)	2.4843 (11/16/2005)	(2.25768 - 2.4843)/(7 - 3)	-0.0566553
2.36922 (2/21/2007)	2.4843 (11/16/2005)	(2.36922 - 2.4843)/(8 - 3)	-0.0230168
2.22531 (5/30/2006)	2.30103 (2/21/2006)	(2.22531 - 2.30103)/(5 - 4)	-0.0757207
2.37107 (8/23/2006)	2.30103 (2/21/2006)	(2.37107 - 2.30103)/(6 - 4)	0.0350189
2.25768 (11/2/2006)	2.30103 (2/21/2006)	(2.25768 - 2.30103)/(7 - 4)	-0.0144505
2.36922 (2/21/2007)	2.30103 (2/21/2006)	(2.36922 - 2.30103)/(8 - 4)	0.0170465
2.37107 (8/23/2006)	2.22531 (5/30/2006)	(2.37107 - 2.22531)/(6 - 5)	0.145759
2.25768 (11/2/2006)	2.22531 (5/30/2006)	(2.25768 - 2.22531)/(7 - 5)	0.0161846
2.36922 (2/21/2007)	2.22531 (5/30/2006)	(2.36922 - 2.22531)/(8 - 5)	0.0479689
2.25768 (11/2/2006)	2.37107 (8/23/2006)	(2.25768 - 2.37107)/(7 - 6)	-0.113389
2.36922 (2/21/2007)	2.37107 (8/23/2006)	(2.36922 - 2.37107)/(8 - 6)	-0.000926002
2.36922 (2/21/2007)	2.25768 (11/2/2006)	(2.36922 - 2.25768)/(8 - 7)	0.111537

Number of Q values = 28

ChemStat Trial Version

Ordered Q Values

n	Q
1	-0.212057
2	-0.197663
3	-0.18327
4	-0.170182
5	-0.163638
6	-0.157016
7	-0.146566

8	-0.129495
9	-0.115219
10	-0.113389
11	-0.0923161
12	-0.0881014
13	-0.0877356
14	-0.0813221
15	-0.0757207
16	-0.0631942
17	-0.0566553
18	-0.0545234
19	-0.037744
20	-0.0230168
21	-0.0144505
22	-0.000926002
23	0.0161846
24	0.0170465
25	0.0350189
26	0.0479689
27	0.111537
28	0.145759

Sen's Estimator (Median Q) is -0.0785214

Time Period	Observations
5/31/2005	1
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
8/23/2006	1
11/2/2006	1
2/21/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.146566 = Q(7)
Upper limit is -0.000926002 = Q(22)
-0.000926002 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: B
Location: 12344D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/31/2005	2.81158	8
8/23/2005	2.69636	7
11/16/2005	2.4843	6
2/21/2006	2.30103	3
5/30/2006	2.22531	1
8/23/2006	2.37107	5
11/2/2006	2.25768	2
2/21/2007	2.36922	4

---

von Neumann ratio v = 1.04762 = 44/42
99% Critical Value = 0.62
1.04762 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12344D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.208015	0.0687177	0.683	None

Loc.	Date	Conc.	Outlier
12344D	5/31/2005	2.81158	FALSE
	8/23/2005	2.69636	FALSE
	11/16/2005	2.4843	FALSE
	2/21/2006	2.30103	FALSE
	5/30/2006	2.22531	FALSE
	8/23/2006	2.37107	FALSE
	11/2/2006	2.25768	FALSE
	2/21/2007	2.36922	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12344E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	17.5	47.4	29.9	0.6052	18.0955
2	17.8	32.4	14.6	0.3164	4.61944
3	20	25.4	5.4	0.1743	0.94122
4	24.2	24.6	0.4	0.0561	0.02244
5	24.6	24.2	-0.4		
6	25.4	20	-5.4		
7	32.4	17.8	-14.6		
8	47.4	17.5	-29.9		

Sum of b values = 23.6786
Sample Standard Deviation = 9.85436
W Statistic = 0.824815

5% Critical value of 0.818 is less than 0.824815
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.824815
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
47.4	25.4	22	1	0
32.4	25.4	7	2	0
24.2	25.4	-1.2	2	1
24.6	25.4	-0.8	2	2
17.8	25.4	-7.6	2	3
20	25.4	-5.4	2	4
17.5	25.4	-7.9	2	5
32.4	47.4	-15	2	6
24.2	47.4	-23.2	2	7
24.6	47.4	-22.8	2	8
17.8	47.4	-29.6	2	9
20	47.4	-27.4	2	10
17.5	47.4	-29.9	2	11
24.2	32.4	-8.2	[illegible]	[illegible]
24.6	32.4	[illegible]	[illegible]	13
17.8	32.4	-14.6	2	14
20	32.4	-12.4	2	15
17.5	32.4	-14.9	[illegible]	16
24.6	24.2	[illegible]	3	16
17.8	24.2	-6.4	3	17
20	24.2	-4.2	3	18
17.5	24.2	-6.7	3	19
17.8	24.6	-6.8	3	20
20	24.6	-4.6	3	21
17.5	24.6	-7.1	3	22
20	17.8	2.2	4	22
17.5	17.8	-0.3	4	23
17.5	20	-2.5	4	24

ChemStat
Trial Version

S Statistic = 4 - 24 = -20
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 20 is 0.0071
S < 0 and 0.0071 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: B
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
47.4 (10/11/2005)	25.4 (8/24/2005)	(47.4 - 25.4)/(2 - 1)	22
32.4 (12/13/2005)	25.4 (8/24/2005)	(32.4 - 25.4)/(3 - 1)	3.5
24.2 (2/14/2006)	25.4 (8/24/2005)	(24.2 - 25.4)/(4 - 1)	-0.4
24.6 (5/31/2006)	25.4 (8/24/2005)	(24.6 - 25.4)/(5 - 1)	-0.2
17.8 (8/21/2006)	25.4 (8/24/2005)	(17.8 - 25.4)/(6 - 1)	-1.52
20 (11/7/2006)	25.4 (8/24/2005)	(20 - 25.4)/(7 - 1)	-0.9
17.5 (2/27/2007)	25.4 (8/24/2005)	(17.5 - 25.4)/(8 - 1)	-1.12857
32.4 (12/13/2005)	47.4 (10/11/2005)	(32.4 - 47.4)/(3 - 2)	-15
24.2 (2/14/2006)	47.4 (10/11/2005)	(24.2 - 47.4)/(4 - 2)	-11.6
24.6 (5/31/2006)	47.4 (10/11/2005)	(24.6 - 47.4)/(5 - 2)	-7.6
17.8 (8/21/2006)	47.4 (10/11/2005)	(17.8 - 47.4)/(6 - 2)	-7.4
20 (11/7/2006)	47.4 (10/11/2005)	(20 - 47.4)/(7 - 2)	-5.48
17.5 (2/27/2007)	47.4 (10/11/2005)	(17.5 - 47.4)/(8 - 2)	-4.98333
24.2 (2/14/2006)	32.4 (12/13/2005)	(24.2 - 32.4)/(4 - 3)	-8.2
24.6 (5/31/2006)	32.4 (12/13/2005)	(24.6 - 32.4)/(5 - 3)	-3.9
17.8 (8/21/2006)	32.4 (12/13/2005)	(17.8 - 32.4)/(6 - 3)	-4.86667
20 (11/7/2006)	32.4 (12/13/2005)	(20 - 32.4)/(7 - 3)	-3.1
17.5 (2/27/2007)	32.4 (12/13/2005)	(17.5 - 32.4)/(8 - 3)	-2.98
24.6 (5/31/2006)	24.2 (2/14/2006)	(24.6 - 24.2)/(5 - 4)	0.4
17.8 (8/21/2006)	24.2 (2/14/2006)	(17.8 - 24.2)/(6 - 4)	-3.2
20 (11/7/2006)	24.2 (2/14/2006)	(20 - 24.2)/(7 - 4)	-1.4
17.5 (2/27/2007)	24.2 (2/14/2006)	(17.5 - 24.2)/(8 - 4)	-1.675
17.8 (8/21/2006)	24.6 (5/31/2006)	(17.8 - 24.6)/(6 - 5)	-6.8
20 (11/7/2006)	24.6 (5/31/2006)	(20 - 24.6)/(7 - 5)	-2.3
17.5 (2/27/2007)	24.6 (5/31/2006)	(17.5 - 24.6)/(8 - 5)	-2.36667
20 (11/7/2006)	17.8 (8/21/2006)	(20 - 17.8)/(7 - 6)	2.2
17.5 (2/27/2007)	17.8 (8/21/2006)	(17.5 - 17.8)/(8 - 6)	-0.15
17.5 (2/27/2007)	20 (11/7/2006)	(17.5 - 20)/(8 - 7)	-2.5

ChemStat
TrialVersion

Number of Q values = 28

Ordered Q Values

n	Q
1	-15
2	-11.6
3	-8.2
4	-7.6
5	-7.4
6	-6.8
7	-5.48

8	-4.98333
9	-4.86667
10	-3.9
11	-3.2
12	-3.1
13	-2.98
14	-2.5
15	-2.36667
16	-2.3
17	-1.675
18	-1.52
19	-1.4
20	-1.12857
21	-0.9
22	-0.4
23	-0.2
24	-0.15
25	0.4
26	2.2
27	3.5
28	22

Sen's Estimator (Median Q) is -2.43333

Time Period	**Observations**
8/24/2005	1
10/11/2005	1
12/13/2005	1
2/14/2006	
5/31/2006	1
8/21/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -5.48 = Q(7)
Upper limit is -0.4 = Q(22)
-0.4 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: B
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/24/2005	25.4	6
10/11/2005	47.4	8
12/13/2005	32.4	7
2/14/2006	24.2	4
5/31/2006	24.6	5
8/21/2006	17.8	2
11/7/2006	20	3
2/27/2007	17.5	1

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von Neumann ratio v = 0.690476 = 29/42
99% Critical Value = 0.62
0.690476 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.506757	0.0201342	0.683	None

Loc.	Date	Conc.	Outlier
12344E	8/24/2005	25.4	FALSE
	10/11/2005	47.4	FALSE
	12/13/2005	32.4	FALSE
	2/14/2006	24.2	FALSE
	5/31/2006	24.6	FALSE
	8/21/2006	17.8	FALSE
	11/7/2006	20	FALSE
	2/27/2007	17.5	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12345D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	645	2230	1585	0.6233	987.93
2	659	1850	1191	0.3031	360.992
3	728	1370	642	0.1401	89.9442
4	952	952	0		
5	1370	728	-642		
6	1850	659	-1191		
7	2230	645	-1585		

Sum of b values = 1438.87
Sample Standard Deviation = 632.077
W Statistic = 0.863674

5% Critical value of 0.803 is less than 0.863674
Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less [illegible] 0.863674
Data is normally distributed at [illegible]9% level [illegible]

ChemStat
Trial Version

Mann-Kendall Trend Analysis
Parameter: B
Location: 12345D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2230	1850	380	1	0
1370	1850	-480	1	1
952	1850	-898	1	2
728	1850	-1122	1	3
659	1850	-1191	1	4
645	1850	-1205	1	5
1370	2230	-860	1	6
952	2230	-1278	1	7
728	2230	-1502	1	8
659	2230	-1571	1	9
645	2230	-1585	1	10
952	1370	-418	1	11
728	1370	[illegible]	1	[illegible]
659	1370	-711	[illegible]	13
645	1370	[illegible]	[illegible]	1[illegible]
728	952	-224	1	15
659	952	[illegible]	[illegible]	16
645	952	[illegible]	1	[illegible]
659	728	-69	1	18
645	728	-83	1	19
645	659	-14	1	20

ChemStat
Trial Version

S Statistic = 1 - 20 = -19
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 19 is 0.0014
S < 0 and 0.0014 < 0.05 indicating a downward trend

Sen's Slope Analysis

Parameter: B
Location: 12345D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2230 (11/16/2005)	1850 (8/23/2005)	(2230 - 1850)/(2 - 1)	380
1370 (2/21/2006)	1850 (8/23/2005)	(1370 - 1850)/(3 - 1)	-240
952 (5/30/2006)	1850 (8/23/2005)	(952 - 1850)/(4 - 1)	-299.333
728 (8/23/2006)	1850 (8/23/2005)	(728 - 1850)/(5 - 1)	-280.5
659 (11/6/2006)	1850 (8/23/2005)	(659 - 1850)/(6 - 1)	-238.2
645 (2/21/2007)	1850 (8/23/2005)	(645 - 1850)/(7 - 1)	-200.833
1370 (2/21/2006)	2230 (11/16/2005)	(1370 - 2230)/(3 - 2)	-860
952 (5/30/2006)	2230 (11/16/2005)	(952 - 2230)/(4 - 2)	-639
728 (8/23/2006)	2230 (11/16/2005)	(728 - 2230)/(5 - 2)	-500.667
659 (11/6/2006)	2230 (11/16/2005)	(659 - 2230)/(6 - 2)	-392.75
645 (2/21/2007)	2230 (11/16/2005)	(645 - 2230)/(7 - 2)	-317
952 (5/30/2006)	1370 (2/21/2006)	(952 - 1370)/(4 - 3)	-418
728 (8/23/2006)	1370 (2/21/2006)	(728 - 1370)/(5 - 3)	-321
659 (11/6/2006)	1370 (2/21/2006)	(659 - 1370)/(6 - 3)	-237
645 (2/21/2007)	1370 (2/21/2006)	(645 - 1370)/(7 - 3)	-181.25
728 (8/23/2006)	952 (5/30/2006)	(728 - 952)/(5 - 4)	-224
659 (11/6/2006)	952 (5/30/2006)	(659 - 952)/(6 - 4)	-146.5
645 (2/21/2007)	952 (5/30/2006)	(645 - 952)/(7 - 4)	-102.333
659 (11/6/2006)	728 (8/23/2006)	(659 - 728)/(6 - 5)	-69
645 (2/21/2007)	728 (8/23/2006)	(645 - 728)/(7 - 5)	-41.5
645 (2/21/2007)	659 (11/6/2006)	(645 - 659)/(7 - 6)	-14

ChemStat Trial Version

Number of Q values = 21

Ordered Q Values

n	Q
1	-860
2	-639
3	-500.667
4	-418
5	-392.75
6	-321
7	-317
8	-299.333
9	-280.5
10	-240
11	-238.2
12	-237
13	-224
14	-200.833
15	-181.25

16	-146.5
17	-102.333
18	-69
19	-41.5
20	-14
21	380

Sen's Estimator (Median Q) is -238.2

Time Period	Observations
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
8/23/2006	1
11/6/2006	1
2/21/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02404
M2 = (21 + 10.952)/2.0 + 1 = 16.976
Lower limit is -392.75 = Q(5)
Upper limit is -102.333 = Q(17)
-102.333 < 0 indicating a downward trend in data.

ChemStat Trial Version

Rank Von Neumann Ratio Test

Parameter: B
Location: 12345D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/23/2005	1850	6
11/16/2005	2230	7
2/21/2006	1370	5
5/30/2006	952	4
8/23/2006	728	3
11/6/2006	659	2
2/21/2007	645	1

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von Neumann ratio v = 0.321429 = 9/28
99% Critical Value = 0.54
0.321429 <= 0.54
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12345D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 7 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.239748	0.00883281	0.637	None

Loc.	Date	Conc.	Outlier
12345D	8/23/2005	1850	FALSE
	11/16/2005	2230	FALSE
	2/21/2006	1370	FALSE
	5/30/2006	952	FALSE
	8/23/2006	728	FALSE
	11/6/2006	659	FALSE
	2/21/2007	645	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: B
Location: 12345E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	68.3	85.5	17.2	0.6052	10.4094
2	71.3	83.5	12.2	0.3164	3.86008
3	72.9	83.2	10.3	0.1743	1.79529
4	75.5	81	5.5	0.0561	0.30855
5	81	75.5	-5.5		
6	83.2	72.9	-10.3		
7	83.5	71.3	-12.2		
8	85.5	68.3	-17.2		

Sum of b values = 16.3734
Sample Standard Deviation = 6.4675
W Statistic = 0.915597

5% Critical value of 0.818 is less than 0.915597
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.915597
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: B
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
85.5	75.5	10	1	0
83.5	75.5	8	2	0
68.3	75.5	-7.2	2	1
72.9	75.5	-2.6	2	2
71.3	75.5	-4.2	2	3
81	75.5	5.5	3	3
83.2	75.5	7.7	4	3
83.5	85.5	-2	4	4
68.3	85.5	-17.2	4	5
72.9	85.5	-12.6	4	6
71.3	85.5	-14.2	4	7
81	85.5	-4.5	4	8
83.2	85.5	-2.3	4	9
68.3	83.5	-15.2	[illegible]	[illegible]
72.9	83.5	-10.6	[illegible]	[illegible]
71.3	83.5	-12.2	4	12
81	83.5	-2.5	4	13
83.2	83.5	-0.3	[illegible]	14
72.9	68.3	4.6	5	14
71.3	68.3	3	6	14
81	68.3	12.7	7	14
83.2	68.3	14.9	8	14
71.3	72.9	-1.6	8	15
81	72.9	8.1	9	15
83.2	72.9	10.3	10	15
81	71.3	9.7	11	15
83.2	71.3	11.9	12	15
83.2	81	2.2	13	15

ChemStat
Trial Version

S Statistic = 13 - 15 = -2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-2| is 0.904
0.904 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: B
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
85.5 (10/11/2005)	75.5 (8/24/2005)	(85.5 - 75.5)/(2 - 1)	10
83.5 (12/13/2005)	75.5 (8/24/2005)	(83.5 - 75.5)/(3 - 1)	4
68.3 (2/14/2006)	75.5 (8/24/2005)	(68.3 - 75.5)/(4 - 1)	-2.4
72.9 (4/21/2006)	75.5 (8/24/2005)	(72.9 - 75.5)/(5 - 1)	-0.65
71.3 (6/27/2006)	75.5 (8/24/2005)	(71.3 - 75.5)/(6 - 1)	-0.84
81 (8/21/2006)	75.5 (8/24/2005)	(81 - 75.5)/(7 - 1)	0.916667
83.2 (2/28/2007)	75.5 (8/24/2005)	(83.2 - 75.5)/(8 - 1)	1.1
83.5 (12/13/2005)	85.5 (10/11/2005)	(83.5 - 85.5)/(3 - 2)	-2
68.3 (2/14/2006)	85.5 (10/11/2005)	(68.3 - 85.5)/(4 - 2)	-8.6
72.9 (4/21/2006)	85.5 (10/11/2005)	(72.9 - 85.5)/(5 - 2)	-4.2
71.3 (6/27/2006)	85.5 (10/11/2005)	(71.3 - 85.5)/(6 - 2)	-3.55
81 (8/21/2006)	85.5 (10/11/2005)	(81 - 85.5)/(7 - 2)	-0.9
83.2 (2/28/2007)	85.5 (10/11/2005)	(83.2 - 85.5)/(8 - 2)	-0.383333
68.3 (2/14/2006)	[illegible] (12/13/2005)	(68.3 - 83.5)/(4 - 3)	-15.2
72.9 (4/21/2006)	83.5 (12/13/2005)	(72.9 - 83.5)/(5 - 3)	-5.3
71.3 (6/27/2006)	83.5 (12/13/2005)	(71.3 - 83.5)/(6 - 3)	-4.06667
81 (8/21/2006)	83.5 (12/13/2005)	(81 - 83.5)/(7 - 3)	-0.625
83.2 (2/28/2007)	83.5 (12/13/2005)	(83.2 - 83.5)/(8 - 3)	-0.06
72.9 (4/21/2006)	68.3 (2/14/2006)	(72.9 - 68.3)/(5 - 4)	4.6
71.3 (6/27/2006)	68.3 (2/14/2006)	(71.3 - 68.3)/(6 - 4)	1.5
81 (8/21/2006)	68.3 (2/14/2006)	(81 - 68.3)/(7 - 4)	4.23333
83.2 (2/28/2007)	68.3 (2/14/2006)	(83.2 - 68.3)/(8 - 4)	3.725
71.3 (6/27/2006)	72.9 (4/21/2006)	(71.3 - 72.9)/(6 - 5)	-1.6
81 (8/21/2006)	72.9 (4/21/2006)	(81 - 72.9)/(7 - 5)	4.05
83.2 (2/28/2007)	72.9 (4/21/2006)	(83.2 - 72.9)/(8 - 5)	3.43333
81 (8/21/2006)	71.3 (6/27/2006)	(81 - 71.3)/(7 - 6)	9.7
83.2 (2/28/2007)	71.3 (6/27/2006)	(83.2 - 71.3)/(8 - 6)	5.95
83.2 (2/28/2007)	81 (8/21/2006)	(83.2 - 81)/(8 - 7)	2.2

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-15.2
2	-8.6
3	-5.3
4	-4.2
5	-4.06667
6	-3.55
7	-2.4

8	-2
9	-1.6
10	-0.9
11	-0.84
12	-0.65
13	-0.625
14	-0.383333
15	-0.06
16	0.916667
17	1.1
18	1.5
19	2.2
20	3.43333
21	3.725
22	4
23	4.05
24	4.23333
25	4.6
26	5.95
27	9.7
28	10

Sen's Estimator (Median Q) is -0.221667

Time Period	Observations
8/24/2005	1
10/11/2005	1
12/13/2005	1
2/14/2006	1
4/21/2006	1
6/27/2006	1
8/21/2006	1
2/28/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -2.4 = Q(7)
Upper limit is 4 = Q(22)
-2.4 < 0 < 4 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: B
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/24/2005	75.5	4
10/11/2005	85.5	8
12/13/2005	83.5	7
2/14/2006	68.3	1
4/21/2006	72.9	3
6/27/2006	71.3	2
8/21/2006	81	5
2/28/2007	83.2	6

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von Neumann ratio v = 1.61905 = 68/42
99% Critical Value = 0.62
1.61905 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: B
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.140845	0.197368	0.683	None

Loc.	Date	Conc.	Outlier
12345E	8/24/2005	75.5	FALSE
	10/11/2005	85.5	FALSE
	12/13/2005	83.5	FALSE
	2/14/2006	68.3	FALSE
	4/21/2006	72.9	FALSE
	6/27/2006	71.3	FALSE
	8/21/2006	81	FALSE
	2/28/2007	83.2	FALSE

ChemStat
Trial Version

Summary of Statistical Tests for Manganese
LDS and HTW Monitoring Horizons of the OSDF

	Horizon	Distribution	Trend	Serial Correlation	Outliers	
					Present	Removed
Cell 1	LDS	log normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 2	LDS	Insuf. data	Insuf. data	Insuf. data	Insuf. data	Insuf. data
	HTW	normal	none	no	no	NA
Cell 3	LDS	normal	none	no	yes	yes
	HTW	NC	NC	NC	NC	NC
Cell 4	LDS	NC	NC	NC	NC	NC
	HTW	NC	NC	NC	NC	NC
Cell 5	LDS	normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 6	LDS	normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 7	LDS	normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 8	LDS	NC	NC	NC	NC	NC
	HTW	NC	NC	NC	NC	NC

Distribution determined by Shapiro-Wilks Test of Normality
Trend determined by Mann-Kendall Trend Analysis & Sens Slope Analysis
Serial Correlation determined by Rank Von Neumann Ratio Test
Outliers determined by Dixon's Test. Outliers were removed if Shapiro-Wilks test failed.
NA – not applicable
NC – not considered because the manganese concentration is inappropriate for use as a detection ion in this horizon

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12338D
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.857332	2.26482	1.40749	0.6431	0.905154
2	0.880814	1.43775	0.556937	0.2806	0.156277
3	1.07918	1.1038	0.0246225	0.0875	0.00215447
4	1.1038	1.07918	-0.0246225		
5	1.43775	0.880814	-0.556937		
6	2.26482	0.857332	-1.40749		

Sum of b values = 1.06358
Sample Standard Deviation = 0.529829
W Statistic = 0.80594

5% Critical value of 0.788 is less than 0.80594
Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.80594
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12338D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.1038	0.880814	0.22299	1	0
1.43775	0.880814	0.556937	2	0
1.07918	0.880814	0.198368	3	0
0.857332	0.880814	-0.0234811	3	1
2.26482	0.880814	1.384	4	1
1.43775	1.1038	0.333947	5	1
1.07918	1.1038	-0.0246225	5	2
0.857332	1.1038	-0.246471	5	3
2.26482	1.1038	1.16101	6	3
1.07918	1.43775	-0.358569	6	4
0.857332	1.43775	-0.580418	6	5
2.26482	1.43775	0.827067	7	5
0.857332	1.07918	-0.22[illegible]	7	6
2.26482	1.07918	1.185[illegible]4	8	6
2.26482	0.857332	1.40749	9	6

ChemStat
Trial Version

S Statistic = 9 - 6 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.72
0.72 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: Mn
Location: 12338D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.1038 (8/10/2005)	0.880814 (5/11/2005)	(1.1038 - 0.880814)/(2 - 1)	0.22299
1.43775 (11/16/2005)	0.880814 (5/11/2005)	(1.43775 - 0.880814)/(3 - 1)	0.278468
1.07918 (2/20/2006)	0.880814 (5/11/2005)	(1.07918 - 0.880814)/(4 - 1)	0.0661226
0.857332 (5/30/2006)	0.880814 (5/11/2005)	(0.857332 - 0.880814)/(5 - 1)	-0.00587027
2.26482 (2/21/2007)	0.880814 (5/11/2005)	(2.26482 - 0.880814)/(6 - 1)	0.276801
1.43775 (11/16/2005)	1.1038 (8/10/2005)	(1.43775 - 1.1038)/(3 - 2)	0.333947
1.07918 (2/20/2006)	1.1038 (8/10/2005)	(1.07918 - 1.1038)/(4 - 2)	-0.0123112
0.857332 (5/30/2006)	1.1038 (8/10/2005)	(0.857332 - 1.1038)/(5 - 2)	-0.0821571
2.26482 (2/21/2007)	1.1038 (8/10/2005)	(2.26482 - 1.1038)/(6 - 2)	0.290254
1.07918 (2/20/2006)	1.43775 (11/16/2005)	(1.07918 - 1.43775)/(4 - 3)	-0.358569
0.857332 (5/30/2006)	1.43775 (11/16/2005)	(0.857332 - 1.43775)/(5 - 3)	-0.290209
2.26482 (2/21/2007)	1.43775 (11/16/2005)	(2.26482 - 1.43775)/(6 - 3)	0.275689
0.857332 (5/30/2006)	1.07918 (2/20/2006)	(0.857332 - 1.07918)/(5 - 4)	-0.221849
2.26482 (2/21/2007)	1.079[illegible]	(2.26[illegible]/(6 - 4)	0.592818
2.26482 (2/21/2007)	0.857332 (5/30/2006)	(2.26482 - 0.857332)/(6 - 5)	1.40749

ChemStat Trial Version

Number of Q values = 1

Ordered Q Values

n	Q
1	-0.358569
2	-0.290209
3	-0.221849
4	-0.0821571
5	-0.0123112
6	-0.00587027
7	0.0661226
8	0.22299
9	0.275689
10	0.276801
11	0.278468
12	0.290254
13	0.333947
14	0.592818
15	1.40749

Sen's Estimator (Median Q) is 0.22299

Time Period	Observations
5/11/2005	1
8/10/2005	1
11/16/2005	1
2/20/2006	1

5/30/2006 1
2/21/2007 1
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 510
b = 1080
c = 60
Group Variance = 28.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 8.7554
M1 = (15 - 8.7554)/2.0 = 3.1223
M2 = (15 + 8.7554)/2.0 + 1 = 12.8777
Lower limit is -0.221849 = Q(3)
Upper limit is 0.333947 = Q(13)
-0.221849 < 0 < 0.333947 indicating no trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12338D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/11/2005	0.880814	2
8/10/2005	1.1038	4
11/16/2005	1.43775	5
2/20/2006	1.07918	3
5/30/2006	0.857332	1
2/21/2007	2.26482	6

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von Neumann ratio v = 2.17143 = 38/17.5
99% Critical Value = 0.46
2.17143 > 0.46
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12338D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 6 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.587621	0.016683	0.698	None

Loc.	Date	Conc.	Outlier
12338D	5/11/2005	0.880814	FALSE
	8/10/2005	1.1038	FALSE
	11/16/2005	1.43775	FALSE
	2/20/2006	1.07918	FALSE
	5/30/2006	0.857332	FALSE
	2/21/2007	2.26482	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12338E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.9	136	129.1	0.6052	78.1313
2	19.3	104	84.7	0.3164	26.7991
3	31.2	70.2	39	0.1743	6.7977
4	45.8	49.9	4.1	0.0561	0.23001
5	49.9	45.8	-4.1		
6	70.2	31.2	-39		
7	104	19.3	-84.7		
8	136	6.9	-129.1		

Sum of b values = 111.958
Sample Standard Deviation = 43.7368
W Statistic = 0.936092

5% Critical value of 0.818 is less than 0.936092
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.936092
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
6.9	45.8	-38.9	0	1
104	45.8	58.2	1	1
49.9	45.8	4.1	2	1
136	45.8	90.2	3	1
70.2	45.8	24.4	4	1
31.2	45.8	-14.6	4	2
19.3	45.8	-26.5	4	3
104	6.9	97.1	5	3
49.9	6.9	43	6	3
136	6.9	129.1	7	3
70.2	6.9	63.3	8	3
31.2	6.9	24.3	9	3
19.3	6.9	12.4	10	3
49.9	104	-54.1	10	4
136	104	32	11	4
70.2	104	-33.8	11	5
31.2	104	-72.8	11	6
19.3	104	-84.7	11	7
136	49.9	8[illegible]	12	7
70.2	49.9	20.3	13	7
31.2	49.9	-18.7	13	8
19.3	49.9	-30.6	13	9
70.2	136	-65.8	13	10
31.2	136	-104.8	13	11
19.3	136	-116.7	13	12
31.2	70.2	-39	13	13
19.3	70.2	-50.9	13	14
19.3	31.2	-11.9	13	15

ChemStat
Trial Version

S Statistic = 13 - 15 = -2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-2| is 0.904
0.904 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Mn
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
6.9 (8/8/2005)	45.8 (5/24/2005)	(6.9 - 45.8)/(2 - 1)	-38.9
104 (11/14/2005)	45.8 (5/24/2005)	(104 - 45.8)/(3 - 1)	29.1
49.9 (2/14/2006)	45.8 (5/24/2005)	(49.9 - 45.8)/(4 - 1)	1.36667
136 (5/24/2006)	45.8 (5/24/2005)	(136 - 45.8)/(5 - 1)	22.55
70.2 (8/17/2006)	45.8 (5/24/2005)	(70.2 - 45.8)/(6 - 1)	4.88
31.2 (11/6/2006)	45.8 (5/24/2005)	(31.2 - 45.8)/(7 - 1)	-2.43333
19.3 (2/27/2007)	45.8 (5/24/2005)	(19.3 - 45.8)/(8 - 1)	-3.78571
104 (11/14/2005)	6.9 (8/8/2005)	(104 - 6.9)/(3 - 2)	97.1
49.9 (2/14/2006)	6.9 (8/8/2005)	(49.9 - 6.9)/(4 - 2)	21.5
136 (5/24/2006)	6.9 (8/8/2005)	(136 - 6.9)/(5 - 2)	43.0333
70.2 (8/17/2006)	6.9 (8/8/2005)	(70.2 - 6.9)/(6 - 2)	15.825
31.2 (11/6/2006)	6.9 (8/8/2005)	(31.2 - 6.9)/(7 - 2)	4.86
19.3 (2/27/2007)	6.9 (8/8/2005)	(19.3 - 6.9)/(8 - 2)	2.06667
49.9 (2/14/2006)	104 (11/14/2005)	(49.9 - 104)/(4 - 3)	-54.1
136 (5/24/2006)	104 (11/14/2005)	(136 - 104)/(5 - 3)	16
70.2 (8/17/2006)	104 (11/14/2005)	(70.2 - 104)/(6 - 3)	-11.2667
31.2 (11/6/2006)	104 (11/14/2005)	(31.2 - 104)/(7 - 3)	-18.2
19.3 (2/27/2007)	104 (11/14/2005)	(19.3 - 104)/(8 - 3)	-16.94
136 (5/24/2006)	49.9 (2/14/2006)	(136 - 49.9)/(5 - 4)	86.1
70.2 (8/17/2006)	49.9 (2/14/2006)	(70.2 - 49.9)/(6 - 4)	10.15
31.2 (11/6/2006)	49.9 (2/14/2006)	(31.2 - 49.9)/(7 - 4)	-6.23333
19.3 (2/27/2007)	49.9 (2/14/2006)	(19.3 - 49.9)/(8 - 4)	-7.65
70.2 (8/17/2006)	136 (5/24/2006)	(70.2 - 136)/(6 - 5)	-65.8
31.2 (11/6/2006)	136 (5/24/2006)	(31.2 - 136)/(7 - 5)	-52.4
19.3 (2/27/2007)	136 (5/24/2006)	(19.3 - 136)/(8 - 5)	-38.9
31.2 (11/6/2006)	70.2 (8/17/2006)	(31.2 - 70.2)/(7 - 6)	-39
19.3 (2/27/2007)	70.2 (8/17/2006)	(19.3 - 70.2)/(8 - 6)	-25.45
19.3 (2/27/2007)	31.2 (11/6/2006)	(19.3 - 31.2)/(8 - 7)	-11.9

GraphPad Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-65.8
2	-54.1
3	-52.4
4	-39
5	-38.9
6	-38.9
7	-25.45

8	-18.2
9	-16.94
10	-11.9
11	-11.2667
12	-7.65
13	-6.23333
14	-3.78571
15	-2.43333
16	1.36667
17	2.06667
18	4.86
19	4.88
20	10.15
21	15.825
22	16
23	21.5
24	22.55
25	29.1
26	43.0333
27	86.1
28	97.1

Sen's Estimator (Median Q) is -3.10952

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/14/2006	1
5/24/2006	1
8/17/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -25.45 = Q(7)
Upper limit is 16 = Q(22)
-25.45 < 0 < 16 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/24/2005	45.8	4
8/8/2005	6.9	1
11/14/2005	104	7
2/14/2006	49.9	5
5/24/2006	136	8
8/17/2006	70.2	6
11/6/2006	31.2	3
2/27/2007	19.3	2

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von Neumann ratio v = 1.71429 = 72/42
99% Critical Value = 0.62
1.71429 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.274207	0.127703	0.683	None

Loc.	Date	Conc.	Outlier
12338E	5/24/2005	45.8	FALSE
	8/8/2005	6.9	FALSE
	11/14/2005	104	FALSE
	2/14/2006	49.9	FALSE
	5/24/2006	136	FALSE
	8/17/2006	70.2	FALSE
	11/6/2006	31.2	FALSE
	2/27/2007	19.3	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12339E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	21.3	71.7	50.4	0.6052	30.5021
2	29.8	69.8	40	0.3164	12.656
3	40.7	63.1	22.4	0.1743	3.90432
4	51.2	56.1	4.9	0.0561	0.27489
5	56.1	51.2	-4.9		
6	63.1	40.7	-22.4		
7	69.8	29.8	-40		
8	71.7	21.3	-50.4		

Sum of b values = 47.3373
Sample Standard Deviation = 18.4766
W Statistic = 0.937699

5% Critical value of 0.818 is less than 0.937699
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.937699
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
29.8	56.1	-26.3	0	1
51.2	56.1	-4.9	0	2
63.1	56.1	7	1	2
40.7	56.1	-15.4	1	3
69.8	56.1	13.7	2	3
71.7	56.1	15.6	3	3
21.3	56.1	-34.8	3	4
51.2	29.8	21.4	4	4
63.1	29.8	33.3	5	4
40.7	29.8	10.9	6	4
69.8	29.8	40	7	4
71.7	29.8	41.9	8	4
21.3	29.8	-8.5	8	5
63.1	51.2	11.9	9	5
40.7	51.2	-10.5	9	6
69.8	51.2	18.6	10	6
71.7	51.2	20.5	11	6
21.3	51.2	-29.9	11	7
40.7	63.1	-22.4	11	8
69.8	63.1	6.7	12	8
71.7	63.1	8.6	13	8
21.3	63.1	-41.8	13	9
69.8	40.7	29.1	14	9
71.7	40.7	31	15	9
21.3	40.7	-19.4	15	10
71.7	69.8	1.9	16	10
21.3	69.8	-48.5	16	11
21.3	71.7	-50.4	16	12

ChemStat
Trial Version

S Statistic = 16 - 12 = 4
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |4| is 0.72
0.72 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Mn
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
29.8 (8/8/2005)	56.1 (5/24/2005)	(29.8 - 56.1)/(2 - 1)	-26.3
51.2 (11/14/2005)	56.1 (5/24/2005)	(51.2 - 56.1)/(3 - 1)	-2.45
63.1 (2/16/2006)	56.1 (5/24/2005)	(63.1 - 56.1)/(4 - 1)	2.33333
40.7 (5/24/2006)	56.1 (5/24/2005)	(40.7 - 56.1)/(5 - 1)	-3.85
69.8 (8/22/2006)	56.1 (5/24/2005)	(69.8 - 56.1)/(6 - 1)	2.74
71.7 (11/6/2006)	56.1 (5/24/2005)	(71.7 - 56.1)/(7 - 1)	2.6
21.3 (2/27/2007)	56.1 (5/24/2005)	(21.3 - 56.1)/(8 - 1)	-4.97143
51.2 (11/14/2005)	29.8 (8/8/2005)	(51.2 - 29.8)/(3 - 2)	21.4
63.1 (2/16/2006)	29.8 (8/8/2005)	(63.1 - 29.8)/(4 - 2)	16.65
40.7 (5/24/2006)	29.8 (8/8/2005)	(40.7 - 29.8)/(5 - 2)	3.63333
69.8 (8/22/2006)	29.8 (8/8/2005)	(69.8 - 29.8)/(6 - 2)	10
71.7 (11/6/2006)	29.8 (8/8/2005)	(71.7 - 29.8)/(7 - 2)	8.38
21.3 (2/27/2007)	29.8 (8/8/2005)	(21.3 - 29.8)/(8 - 2)	-1.41667
63.1 (2/16/2006)	51.2 (11/14/2005)	(63.1 - 51.2)/(4 - 3)	11.9
40.7 (5/24/2006)	51.2 (11/14/2005)	(40.7 - 51.2)/(5 - 3)	-5.25
69.8 (8/22/2006)	51.2 (11/14/2005)	(69.8 - 51.2)/(6 - 3)	6.2
71.7 (11/6/2006)	51.2 (11/14/2005)	(71.7 - 51.2)/(7 - 3)	5.125
21.3 (2/27/2007)	51.2 (11/14/2005)	(21.3 - 51.2)/(8 - 3)	-5.98
40.7 (5/24/2006)	63.1 (2/16/2006)	(40.7 - 63.1)/(5 - 4)	-22.4
69.8 (8/22/2006)	63.1 (2/16/2006)	(69.8 - 63.1)/(6 - 4)	3.35
71.7 (11/6/2006)	63.1 (2/16/2006)	(71.7 - 63.1)/(7 - 4)	2.86667
21.3 (2/27/2007)	63.1 (2/16/2006)	(21.3 - 63.1)/(8 - 4)	-10.45
69.8 (8/22/2006)	40.7 (5/24/2006)	(69.8 - 40.7)/(6 - 5)	29.1
71.7 (11/6/2006)	40.7 (5/24/2006)	(71.7 - 40.7)/(7 - 5)	15.5
21.3 (2/27/2007)	40.7 (5/24/2006)	(21.3 - 40.7)/(8 - 5)	-6.46667
71.7 (11/6/2006)	69.8 (8/22/2006)	(71.7 - 69.8)/(7 - 6)	1.9
21.3 (2/27/2007)	69.8 (8/22/2006)	(21.3 - 69.8)/(8 - 6)	-24.25
21.3 (2/27/2007)	71.7 (11/6/2006)	(21.3 - 71.7)/(8 - 7)	-50.4

ChemStat TrialVersion

Number of Q values = 28

Ordered Q Values

n	Q
1	-50.4
2	-26.3
3	-24.25
4	-22.4
5	-10.45
6	-6.46667
7	-5.98

8	-5.25
9	-4.97143
10	-3.85
11	-2.45
12	-1.41667
13	1.9
14	2.33333
15	2.6
16	2.74
17	2.86667
18	3.35
19	3.63333
20	5.125
21	6.2
22	8.38
23	10
24	11.9
25	15.5
26	16.65
27	21.4
28	29.1

Sen's Estimator (Median Q) is 2.46667

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/16/2006	1
5/24/2006	1
8/22/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -5.98 = Q(7)
Upper limit is 8.38 = Q(22)
-5.98 < 0 < 8.38 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/24/2005	56.1	5
8/8/2005	29.8	2
11/14/2005	51.2	4
2/16/2006	63.1	6
5/24/2006	40.7	3
8/22/2006	69.8	7
11/6/2006	71.7	8
2/27/2007	21.3	1

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von Neumann ratio v = 2.19048 = 92/42
99% Critical Value = 0.62
2.19048 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0453461	0.175258	0.683	None

Loc.	Date	Conc.	Outlier
12339E	5/24/2005	56.1	FALSE
	8/8/2005	29.8	FALSE
	11/14/2005	51.2	FALSE
	2/16/2006	63.1	FALSE
	5/24/2006	40.7	FALSE
	8/22/2006	69.8	FALSE
	11/6/2006	71.7	FALSE
	2/27/2007	21.3	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12340D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.5	13.6	12.1	0.6233	7.54193
2	4.7	12.4	7.7	0.3031	2.33387
3	5	8.4	3.4	0.1401	0.47634
4	6.3	6.3	0		
5	8.4	5	-3.4		
6	12.4	4.7	-7.7		
7	13.6	1.5	-12.1		

Sum of b values = 10.3521
Sample Standard Deviation = 4.34949
W Statistic = 0.94413

5% Critical value of 0.803 is less than 0.94413
Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less [illegible] 0.[illegible]413
Data is normally distributed at [illegible]9% leve[illegible]

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.5	5	-3.5	0	1
8.4	5	3.4	1	1
13.6	5	8.6	2	1
6.3	5	1.3	3	1
4.7	5	-0.3	3	2
12.4	5	7.4	4	2
8.4	1.5	6.9	5	2
13.6	1.5	12.1	6	2
6.3	1.5	4.8	7	2
4.7	1.5	3.2	8	2
12.4	1.5	10.9	9	2
13.6	8.4	5.2	10	2
6.3	8.4	-2.1	10	[illegible]
4.7	8.4	-3.7	10	[illegible]
12.4	8.4	4	11	4
6.3	13.6	-7.3	11	5
4.7	13.6	-8.9	[illegible]	6
12.4	13.6	-1.2	1[illegible]	[illegible]
4.7	6.3	-1.6	11	8
12.4	6.3	6.1	12	8
12.4	4.7	7.7	13	8

ChemStat
Trial Version

S Statistic = 13 - 8 = 5
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |5| is 0.562
0.562 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: Mn
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.5 (8/9/2005)	5 (5/16/2005)	(1.5 - 5)/(2 - 1)	-3.5
8.4 (11/28/2005)	5 (5/16/2005)	(8.4 - 5)/(3 - 1)	1.7
13.6 (2/20/2006)	5 (5/16/2005)	(13.6 - 5)/(4 - 1)	2.86667
6.3 (5/30/2006)	5 (5/16/2005)	(6.3 - 5)/(5 - 1)	0.325
4.7 (8/25/2006)	5 (5/16/2005)	(4.7 - 5)/(6 - 1)	-0.06
12.4 (2/20/2007)	5 (5/16/2005)	(12.4 - 5)/(7 - 1)	1.23333
8.4 (11/28/2005)	1.5 (8/9/2005)	(8.4 - 1.5)/(3 - 2)	6.9
13.6 (2/20/2006)	1.5 (8/9/2005)	(13.6 - 1.5)/(4 - 2)	6.05
6.3 (5/30/2006)	1.5 (8/9/2005)	(6.3 - 1.5)/(5 - 2)	1.6
4.7 (8/25/2006)	1.5 (8/9/2005)	(4.7 - 1.5)/(6 - 2)	0.8
12.4 (2/20/2007)	1.5 (8/9/2005)	(12.4 - 1.5)/(7 - 2)	2.18
13.6 (2/20/2006)	8.4 (11/28/2005)	(13.6 - 8.4)/(4 - 3)	5.2
6.3 (5/30/2006)	8.4 (11/28/2005)	(6.3 - 8.4)/(5 - 3)	-1.05
4.7 (8/25/2006)	[illegible] (11/28/2005)	(4.7 - 8.4)/(6 - 3)	-1.23333
12.4 (2/20/2007)	8.4 ([illegible]/2005)	(12.4 - 8.4)/(7 - 3)	1
6.3 (5/30/2006)	13.6 (2/20/2006)	(6.3 - 13.6)/(5 - 4)	-7.3
4.7 (8/25/2006)	13.6 (2/20/2006)	(4.7 - 13.6)/(6 - 4)	-4.45
12.4 (2/20/2007)	13.6 (2/20/2006)	(12.4 - 13.6)/(7 - 4)	-0.4
4.7 (8/25/2006)	6.3 (5/30/2006)	(4.7 - 6.3)/(6 - 5)	-1.6
12.4 (2/20/2007)	6.3 (5/30/2006)	(12.4 - 6.3)/(7 - 5)	3.05
12.4 (2/20/2007)	4.7 (8/25/2006)	(12.4 - 4.7)/(7 - 6)	7.7

ChemStat Trial Version

Number of Q values = 21

Ordered Q Values

n	Q
1	-7.3
2	-4.45
3	-3.5
4	-1.6
5	-1.23333
6	-1.05
7	-0.4
8	-0.06
9	0.325
10	0.8
11	1
12	1.23333
13	1.6
14	1.7
15	2.18

16	2.86667
17	3.05
18	5.2
19	6.05
20	6.9
21	7.7

Sen's Estimator (Median Q) is 1

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/28/2005	1
2/20/2006	1
5/30/2006	1
8/25/2006	1
2/20/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02404
M2 = (21 + 10.952)/2.0 + 1 = 15.976
Lower limit is -1.23333 = Q(5)
Upper limit is 3.05 = Q(17)
-1.23333 < 0 < 3.05 indicating no trend in data.

ChemStat Trial Version

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/16/2005	5	3
8/9/2005	1.5	1
11/28/2005	8.4	5
2/20/2006	13.6	7
5/30/2006	6.3	4
8/25/2006	4.7	2
2/20/2007	12.4	6

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von Neumann ratio v = 1.89286 = 53/28
99% Critical Value = 0.54
1.89286 > 0.54
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.937013	0.264463	0.683	146
2	0.0991736	0.264463	0.637	None

Loc.	Date	Conc.	Outlier
12340D	5/16/2005	5	FALSE
	8/9/2005	1.5	FALSE
	11/28/2005	8.4	FALSE
	2/20/2006	13.6	FALSE
	5/30/2006	6.3	FALSE
	8/25/2006	4.7	FALSE
	11/1/2006	**146**	**TRUE**
	2/20/2007	12.4	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12340E
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.06446	2.84323	0.778775	0.6052	0.471315
2	2.19866	2.45939	0.260735	0.3164	0.0824967
3	2.22531	2.38739	0.162081	0.1743	0.0282506
4	2.233	2.24797	0.0149772	0.0561	0.000840218
5	2.24797	2.233	-0.0149772		
6	2.38739	2.22531	-0.162081		
7	2.45939	2.19866	-0.260735		
8	2.84323	2.06446	-0.778775		

Sum of b values = 0.582902
Sample Standard Deviation = 0.238525
W Statistic = 0.853151

5% Critical value of 0.818 is less than 0.853151
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.853151
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12340E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2.84323	2.45939	0.38384	1	0
2.19866	2.45939	-0.260735	1	1
2.06446	2.45939	-0.394934	1	2
2.233	2.45939	-0.226396	1	3
2.38739	2.45939	-0.0720027	1	4
2.24797	2.45939	-0.211419	1	5
2.22531	2.45939	-0.234083	1	6
2.19866	2.84323	-0.644576	1	7
2.06446	2.84323	-0.778775	1	8
2.233	2.84323	-0.610237	1	9
2.38739	2.84323	-0.455843	1	10
2.24797	2.84323	-0.59526	1	11
2.22531	2.84323	-0.617923	1	12
2.06446	2.19866	[illegible]	[illegible]	13
2.233	2.19866	[illegible]	[illegible]	13
2.38739	2.19866	0.188733	3	13
2.24797	2.19866	0.0493162	4	13
2.22531	[illegible]	0.0266522	[illegible]	13
2.233	2.0644[illegible]	[illegible]	6	13
2.38739	2.06446	0.322932	7	13
2.24797	2.06446	0.183515	8	13
2.22531	2.06446	0.160851	9	13
2.38739	2.233	0.154394	10	13
2.24797	2.233	0.0149772	11	13
2.22531	2.233	-0.00768683	11	14
2.24797	2.38739	-0.139417	11	15
2.22531	2.38739	-0.162081	11	16
2.22531	2.24797	-0.022664	11	17

ChemStat Trial Version

S Statistic = 11 - 17 = -6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-6| is 0.548
0.548 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Mn
Location: 12340E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2.84323 (8/8/2005)	2.45939 (5/18/2005)	(2.84323 - 2.45939)/(2 - 1)	0.38384
2.19866 (11/14/2005)	2.45939 (5/18/2005)	(2.19866 - 2.45939)/(3 - 1)	-0.130368
2.06446 (2/15/2006)	2.45939 (5/18/2005)	(2.06446 - 2.45939)/(4 - 1)	-0.131645
2.233 (5/24/2006)	2.45939 (5/18/2005)	(2.233 - 2.45939)/(5 - 1)	-0.0565991
2.38739 (8/25/2006)	2.45939 (5/18/2005)	(2.38739 - 2.45939)/(6 - 1)	-0.0144005
2.24797 (11/6/2006)	2.45939 (5/18/2005)	(2.24797 - 2.45939)/(7 - 1)	-0.0352365
2.22531 (2/27/2007)	2.45939 (5/18/2005)	(2.22531 - 2.45939)/(8 - 1)	-0.0334405
2.19866 (11/14/2005)	2.84323 (8/8/2005)	(2.19866 - 2.84323)/(3 - 2)	-0.644576
2.06446 (2/15/2006)	2.84323 (8/8/2005)	(2.06446 - 2.84323)/(4 - 2)	-0.389387
2.233 (5/24/2006)	2.84323 (8/8/2005)	(2.233 - 2.84323)/(5 - 2)	-0.203412
2.38739 (8/25/2006)	2.84323 (8/8/2005)	(2.38739 - 2.84323)/(6 - 2)	-0.113961
2.24797 (11/6/2006)	2.84323 (8/8/2005)	(2.24797 - 2.84323)/(7 - 2)	-0.119052
2.22531 (2/27/2007)	2.84323 (8/8/2005)	(2.22531 - 2.84323)/(8 - 2)	-0.102987
2.06446 (2/15/2006)	2.19866 (11/14/2005)	(2.06446 - 2.19866)/(4 - 3)	-0.134199
2.233 (5/24/2006)	2.19866 (11/14/2005)	(2.233 - 2.19866)/(5 - 3)	0.0171695
2.38739 (8/25/2006)	2.19866 (11/14/2005)	(2.38739 - 2.19866)/(6 - 3)	0.0629109
2.24797 (11/6/2006)	2.19866 (11/14/2005)	(2.24797 - 2.19866)/(7 - 3)	0.012329
2.22531 (2/27/2007)	2.19866 (11/14/2005)	(2.22531 - 2.19866)/(8 - 3)	0.00533044
2.233 (5/24/2006)	2.06446 (2/15/2006)	(2.233 - 2.06446)/(5 - 4)	0.168538
2.38739 (8/25/2006)	2.06446 (2/15/2006)	(2.38739 - 2.06446)/(6 - 4)	0.161466
2.24797 (11/6/2006)	2.06446 (2/15/2006)	(2.24797 - 2.06446)/(7 - 4)	0.0611718
2.22531 (2/27/2007)	2.06446 (2/15/2006)	(2.22531 - 2.06446)/(8 - 4)	0.0402128
2.38739 (8/25/2006)	2.233 (5/24/2006)	(2.38739 - 2.233)/(6 - 5)	0.154394
2.24797 (11/6/2006)	2.233 (5/24/2006)	(2.24797 - 2.233)/(7 - 5)	0.00748858
2.22531 (2/27/2007)	2.233 (5/24/2006)	(2.22531 - 2.233)/(8 - 5)	-0.00256228
2.24797 (11/6/2006)	2.38739 (8/25/2006)	(2.24797 - 2.38739)/(7 - 6)	-0.139417
2.22531 (2/27/2007)	2.38739 (8/25/2006)	(2.22531 - 2.38739)/(8 - 6)	-0.0810403
2.22531 (2/27/2007)	2.24797 (11/6/2006)	(2.22531 - 2.24797)/(8 - 7)	-0.022664

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.644576
2	-0.389387
3	-0.203412
4	-0.139417
5	-0.134199
6	-0.131645
7	-0.130368

8	-0.119052
9	-0.113961
10	-0.102987
11	-0.0810403
12	-0.0565991
13	-0.0352365
14	-0.0334405
15	-0.022664
16	-0.0144005
17	-0.00256228
18	0.00533044
19	0.00748858
20	0.012329
21	0.0171695
22	0.0402128
23	0.0611718
24	0.0629109
25	0.154394
26	0.161466
27	0.168538
28	0.38384

Sen's Estimator (Median Q) is -0.0280522

Time Period	Observations
5/18/2005	1
8/8/2005	1
11/14/2005	1
2/15/2006	1
5/24/2006	1
8/25/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.130368 = Q(7)
Upper limit is 0.0402128 = Q(22)
-0.130368 < 0 < 0.0402128 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12340E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	2.45939	7
8/8/2005	2.84323	8
11/14/2005	2.19866	2
2/15/2006	2.06446	1
5/24/2006	2.233	4
8/25/2006	2.38739	6
11/6/2006	2.24797	5
2/27/2007	2.22531	3

---

von Neumann ratio v = 1.33333 = 56/42
99% Critical Value = 0.62
1.33333 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12340E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.595493	0.339801	0.683	None

Loc.	Date	Conc.	Outlier
12340E	5/18/2005	2.45939	FALSE
	8/8/2005	2.84323	FALSE
	11/14/2005	2.19866	FALSE
	2/15/2006	2.06446	FALSE
	5/24/2006	2.233	FALSE
	8/25/2006	2.38739	FALSE
	11/6/2006	2.24797	FALSE
	2/27/2007	2.22531	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12341D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	5.1	1200	1194.9	0.6052	723.153
2	14.3	904	889.7	0.3164	281.501
3	266	533	267	0.1743	46.5381
4	498	511	13	0.0561	0.7293
5	511	498	-13		
6	533	266	-267		
7	904	14.3	-889.7		
8	1200	5.1	-1194.9		

Sum of b values = 1051.92
Sample Standard Deviation = 412.212
W Statistic = 0.930312

5% Critical value of 0.818 is less than 0.930312
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.930312
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
14.3	511	-496.7	0	1
5.1	511	-505.9	0	2
498	511	-13	0	3
533	511	22	1	3
266	511	-245	1	4
1200	511	689	2	4
904	511	393	3	4
5.1	14.3	-9.2	3	5
498	14.3	483.7	4	5
533	14.3	518.7	5	5
266	14.3	251.7	6	5
1200	14.3	1185.7	7	5
904	14.3	889.7	8	5
498	5.1	492.9	[illegible]	5
533	5.1	527.9	10	5
266	5.1	260.9	11	5
1200	5.1	1194.9	12	5
904	5.1	898.9	[illegible]	5
533	498	[illegible]	14	5
266	498	-232	14	6
1200	498	702	15	6
904	498	406	16	6
266	533	-267	16	7
1200	533	667	17	7
904	533	371	18	7
1200	266	934	19	7
904	266	638	20	7
904	1200	-296	20	8

ChemStat
Trial Version

S Statistic = 20 - 8 = 12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |12| is 0.178
0.178 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Mn
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
14.3 (8/9/2005)	511 (5/16/2005)	(14.3 - 511)/(2 - 1)	-496.7
5.1 (11/15/2005)	511 (5/16/2005)	(5.1 - 511)/(3 - 1)	-252.95
498 (2/20/2006)	511 (5/16/2005)	(498 - 511)/(4 - 1)	-4.33333
533 (5/23/2006)	511 (5/16/2005)	(533 - 511)/(5 - 1)	5.5
266 (8/28/2006)	511 (5/16/2005)	(266 - 511)/(6 - 1)	-49
1200 (11/1/2006)	511 (5/16/2005)	(1200 - 511)/(7 - 1)	114.833
904 (2/20/2007)	511 (5/16/2005)	(904 - 511)/(8 - 1)	56.1429
5.1 (11/15/2005)	14.3 (8/9/2005)	(5.1 - 14.3)/(3 - 2)	-9.2
498 (2/20/2006)	14.3 (8/9/2005)	(498 - 14.3)/(4 - 2)	241.85
533 (5/23/2006)	14.3 (8/9/2005)	(533 - 14.3)/(5 - 2)	172.9
266 (8/28/2006)	14.3 (8/9/2005)	(266 - 14.3)/(6 - 2)	62.925
1200 (11/1/2006)	14.3 (8/9/2005)	(1200 - 14.3)/(7 - 2)	237.14
904 (2/20/2007)	14.3 (8/9/2005)	(904 - 14.3)/(8 - 2)	148.283
498 (2/20/2006)	5.1 (11/15/2005)	(498 - 5.1)/(4 - 3)	492.9
533 (5/23/2006)	5.1 (11/15/2005)	(533 - 5.1)/(5 - 3)	263.95
266 (8/28/2006)	5.1 (11/15/2005)	(266 - 5.1)/(6 - 3)	86.9667
1200 (11/1/2006)	5.1 (11/15/2005)	(1200 - 5.1)/(7 - 3)	298.725
904 (2/20/2007)	5.1 (11/15/2005)	(904 - 5.1)/(8 - 3)	179.78
533 (5/23/2006)	498 (2/20/2006)	(533 - 498)/(5 - 4)	35
266 (8/28/2006)	498 (2/20/2006)	(266 - 498)/(6 - 4)	-116
1200 (11/1/2006)	498 (2/20/2006)	(1200 - 498)/(7 - 4)	234
904 (2/20/2007)	498 (2/20/2006)	(904 - 498)/(8 - 4)	101.5
266 (8/28/2006)	533 (5/23/2006)	(266 - 533)/(6 - 5)	-267
1200 (11/1/2006)	533 (5/23/2006)	(1200 - 533)/(7 - 5)	333.5
904 (2/20/2007)	533 (5/23/2006)	(904 - 533)/(8 - 5)	123.667
1200 (11/1/2006)	266 (8/28/2006)	(1200 - 266)/(7 - 6)	934
904 (2/20/2007)	266 (8/28/2006)	(904 - 266)/(8 - 6)	319
904 (2/20/2007)	1200 (11/1/2006)	(904 - 1200)/(8 - 7)	-296

ChemStat
TrialVersion

Number of Q values = 28

Ordered Q Values

n	Q
1	-496.7
2	-296
3	-267
4	-252.95
5	-116
6	-49
7	-9.2

8	-4.33333
9	5.5
10	35
11	56.1429
12	62.925
13	86.9667
14	101.5
15	114.833
16	123.667
17	148.283
18	172.9
19	179.78
20	234
21	237.14
22	241.85
23	263.95
24	298.725
25	319
26	333.5
27	492.9
28	934

Sen's Estimator (Median Q) is 108.167

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -9.2 = Q(7)
Upper limit is 241.85 = Q(22)
-9.2 < 0 < 241.85 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/16/2005	511	5
8/9/2005	14.3	2
11/15/2005	5.1	1
2/20/2006	498	4
5/23/2006	533	6
8/28/2006	266	3
11/1/2006	1200	8
2/20/2007	904	7

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von Neumann ratio v = 1.38095 = 58/42
99% Critical Value = 0.62
1.38095 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.249642	0.0102347	0.683	None

Loc.	Date	Conc.	Outlier
12341D	5/16/2005	511	FALSE
	8/9/2005	14.3	FALSE
	11/15/2005	5.1	FALSE
	2/20/2006	498	FALSE
	5/23/2006	533	FALSE
	8/28/2006	266	FALSE
	11/1/2006	1200	FALSE
	2/20/2007	904	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12341E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	182	307	125	0.6052	75.65
2	234	265	31	0.3164	9.8084
3	235	256	21	0.1743	3.6603
4	242	253	11	0.0561	0.6171
5	253	242	-11		
6	256	235	-21		
7	265	234	-31		
8	307	182	-125		

Sum of b values = 89.7358
Sample Standard Deviation = 35.0581
W Statistic = 0.935958

5% Critical value of 0.818 is less than 0.935958
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.935958
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
256	265	-9	0	1
242	265	-23	0	2
253	265	-12	0	3
234	265	-31	0	4
182	265	-83	0	5
235	265	-30	0	6
307	265	42	1	6
242	256	-14	1	7
253	256	-3	1	8
234	256	-22	1	9
182	256	-74	1	10
235	256	-21	1	11
307	256	51	2	11
253	242	11	[illegible]	11
234	242	-8	[illegible]	12
182	242	-60	3	13
235	242	-7	3	14
307	242	65	[illegible]	14
234	253	-19	4	15
182	253	-71	4	16
235	253	-18	4	17
307	253	54	5	17
182	234	-52	5	18
235	234	1	6	18
307	234	73	7	18
235	182	53	8	18
307	182	125	9	18
307	235	72	10	18

ChemStat
Trial Version

S Statistic = 10 - 18 = -8
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-8| is 0.398
0.398 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: Mn
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
256 (8/9/2005)	265 (5/18/2005)	(256 - 265)/(2 - 1)	-9
242 (11/21/2005)	265 (5/18/2005)	(242 - 265)/(3 - 1)	-11.5
253 (2/15/2006)	265 (5/18/2005)	(253 - 265)/(4 - 1)	-4
234 (5/22/2006)	265 (5/18/2005)	(234 - 265)/(5 - 1)	-7.75
182 (8/29/2006)	265 (5/18/2005)	(182 - 265)/(6 - 1)	-16.6
235 (11/7/2006)	265 (5/18/2005)	(235 - 265)/(7 - 1)	-5
307 (2/27/2007)	265 (5/18/2005)	(307 - 265)/(8 - 1)	6
242 (11/21/2005)	256 (8/9/2005)	(242 - 256)/(3 - 2)	-14
253 (2/15/2006)	256 (8/9/2005)	(253 - 256)/(4 - 2)	-1.5
234 (5/22/2006)	256 (8/9/2005)	(234 - 256)/(5 - 2)	-7.33333
182 (8/29/2006)	256 (8/9/2005)	(182 - 256)/(6 - 2)	-18.5
235 (11/7/2006)	256 (8/9/2005)	(235 - 256)/(7 - 2)	-4.2
307 (2/27/2007)	256 (8/9/2005)	(307 - 256)/(8 - 2)	8.5
253 (2/15/2006)	242 (11/21/2005)	(253 - 242)/(4 - 3)	11
234 (5/22/2006)	242 (11/21/2005)	(234 - 242)/(5 - 3)	-4
182 (8/29/2006)	242 (11/21/2005)	(182 - 242)/(6 - 3)	-20
235 (11/7/2006)	242 (11/21/2005)	(235 - 242)/(7 - 3)	-1.75
307 (2/27/2007)	242 (11/21/2005)	(307 - 242)/(8 - 3)	13
234 (5/22/2006)	253 (2/15/2006)	(234 - 253)/(5 - 4)	-19
182 (8/29/2006)	253 (2/15/2006)	(182 - 253)/(6 - 4)	-35.5
235 (11/7/2006)	253 (2/15/2006)	(235 - 253)/(7 - 4)	-6
307 (2/27/2007)	253 (2/15/2006)	(307 - 253)/(8 - 4)	13.5
182 (8/29/2006)	234 (5/22/2006)	(182 - 234)/(6 - 5)	-52
235 (11/7/2006)	234 (5/22/2006)	(235 - 234)/(7 - 5)	0.5
307 (2/27/2007)	234 (5/22/2006)	(307 - 234)/(8 - 5)	24.3333
235 (11/7/2006)	182 (8/29/2006)	(235 - 182)/(7 - 6)	53
307 (2/27/2007)	182 (8/29/2006)	(307 - 182)/(8 - 6)	62.5
307 (2/27/2007)	235 (11/7/2006)	(307 - 235)/(8 - 7)	72

GraphStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-52
2	-35.5
3	-20
4	-19
5	-18.5
6	-16.6
7	-14

8	-11.5
9	-9
10	-7.75
11	-7.33333
12	-6
13	-5
14	-4.2
15	-4
16	-4
17	-1.75
18	-1.5
19	0.5
20	6
21	8.5
22	11
23	13
24	13.5
25	24.3333
26	53
27	62.5
28	72

Sen's Estimator (Median Q) is -4.1

Time Period	Observations
5/18/2005	1
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -14 = Q(7)
Upper limit is 11 = Q(22)
-14 < 0 < 11 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	265	7
8/9/2005	256	6
11/21/2005	242	4
2/15/2006	253	5
5/22/2006	234	2
8/29/2006	182	1
11/7/2006	235	3
2/27/2007	307	8

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von Neumann ratio v = 1.07143 = 45/42
99% Critical Value = 0.62
1.07143 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers
Parameter: Mn
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.575342	0.626506	0.683	None

Loc.	Date	Conc.	Outlier
12341E	5/18/2005	265	FALSE
	8/9/2005	256	FALSE
	11/21/2005	242	FALSE
	2/15/2006	253	FALSE
	5/22/2006	234	FALSE
	8/29/2006	182	FALSE
	11/7/2006	235	FALSE
	2/27/2007	307	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12342D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	27.6	333	305.4	0.6052	184.828
2	36.7	146	109.3	0.3164	34.5825
3	40.1	138	97.9	0.1743	17.064
4	103	133	30	0.0561	1.683
5	133	103	-30		
6	138	40.1	-97.9		
7	146	36.7	-109.3		
8	333	27.6	-305.4		

Sum of b values = 238.158
Sample Standard Deviation = 99.0576
W Statistic = 0.825763

5% Critical value of 0.818 is less than 0.825763
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.825763
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
133	103	30	1	0
138	103	35	2	0
333	103	230	3	0
36.7	103	-66.3	3	1
27.6	103	-75.4	3	2
40.1	103	-62.9	3	3
146	103	43	4	3
138	133	5	5	3
333	133	200	6	3
36.7	133	-96.3	6	4
27.6	133	-105.4	6	5
40.1	133	-92.9	6	6
146	133	13	7	6
333	138	195	8	6
36.7	138	-101.3	8	7
27.6	138	-110.4	8	8
40.1	138	-97.9	8	9
146	138	8	8	9
36.7	333	-296.3	9	10
27.6	333	-305.4	9	11
40.1	333	-292.9	9	12
146	333	-187	9	13
27.6	36.7	-9.1	9	14
40.1	36.7	3.4	10	14
146	36.7	109.3	11	14
40.1	27.6	12.5	12	14
146	27.6	118.4	13	14
146	40.1	105.9	14	14

ChemStat
Trial Version

S Statistic = 14 - 14 = 0
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |0| is 1.096
1.096 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Mn
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
133 (8/10/2005)	103 (5/10/2005)	(133 - 103)/(2 - 1)	30
138 (11/15/2005)	103 (5/10/2005)	(138 - 103)/(3 - 1)	17.5
333 (2/20/2006)	103 (5/10/2005)	(333 - 103)/(4 - 1)	76.6667
36.7 (5/23/2006)	103 (5/10/2005)	(36.7 - 103)/(5 - 1)	-16.575
27.6 (8/28/2006)	103 (5/10/2005)	(27.6 - 103)/(6 - 1)	-15.08
40.1 (11/1/2006)	103 (5/10/2005)	(40.1 - 103)/(7 - 1)	-10.4833
146 (2/20/2007)	103 (5/10/2005)	(146 - 103)/(8 - 1)	6.14286
138 (11/15/2005)	133 (8/10/2005)	(138 - 133)/(3 - 2)	5
333 (2/20/2006)	133 (8/10/2005)	(333 - 133)/(4 - 2)	100
36.7 (5/23/2006)	133 (8/10/2005)	(36.7 - 133)/(5 - 2)	-32.1
27.6 (8/28/2006)	133 (8/10/2005)	(27.6 - 133)/(6 - 2)	-26.35
40.1 (11/1/2006)	133 (8/10/2005)	(40.1 - 133)/(7 - 2)	-18.58
146 (2/20/2007)	133 (8/10/2005)	(146 - 133)/(8 - 2)	2.16667
333 (2/20/2006)	138 (11/15/2005)	(333 - 138)/(4 - 3)	195
36.7 (5/23/2006)	138 (11/15/2005)	(36.7 - 138)/(5 - 3)	-50.65
27.6 (8/28/2006)	138 (11/15/2005)	(27.6 - 138)/(6 - 3)	-36.8
40.1 (11/1/2006)	138 (11/15/2005)	(40.1 - 138)/(7 - 3)	-24.475
146 (2/20/2007)	138 (11/15/2005)	(146 - 138)/(8 - 3)	1.6
36.7 (5/23/2006)	333 (2/20/2006)	(36.7 - 333)/(5 - 4)	-296.3
27.6 (8/28/2006)	333 (2/20/2006)	(27.6 - 333)/(6 - 4)	-152.7
40.1 (11/1/2006)	333 (2/20/2006)	(40.1 - 333)/(7 - 4)	-97.6333
146 (2/20/2007)	333 (2/20/2006)	(146 - 333)/(8 - 4)	-46.75
27.6 (8/28/2006)	36.7 (5/23/2006)	(27.6 - 36.7)/(6 - 5)	-9.1
40.1 (11/1/2006)	36.7 (5/23/2006)	(40.1 - 36.7)/(7 - 5)	1.7
146 (2/20/2007)	36.7 (5/23/2006)	(146 - 36.7)/(8 - 5)	36.4333
40.1 (11/1/2006)	27.6 (8/28/2006)	(40.1 - 27.6)/(7 - 6)	12.5
146 (2/20/2007)	27.6 (8/28/2006)	(146 - 27.6)/(8 - 6)	59.2
146 (2/20/2007)	40.1 (11/1/2006)	(146 - 40.1)/(8 - 7)	105.9

GraphStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-296.3
2	-152.7
3	-97.6333
4	-50.65
5	-46.75
6	-36.8
7	-32.1

8	-26.35
9	-24.475
10	-18.58
11	-16.575
12	-15.08
13	-10.4833
14	-9.1
15	1.6
16	1.7
17	2.16667
18	5
19	6.14286
20	12.5
21	17.5
22	30
23	36.4333
24	59.2
25	76.6667
26	100
27	105.9
28	195

Sen's Estimator (Median Q) is -3.75

Time Period	Observations
5/10/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -32.1 = Q(7)
Upper limit is 30 = Q(22)
-32.1 < 0 < 30 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/10/2005	103	4
8/10/2005	133	5
11/15/2005	138	6
2/20/2006	333	8
5/23/2006	36.7	2
8/28/2006	27.6	1
11/1/2006	40.1	3
2/20/2007	146	7

---

von Neumann ratio v = 1.5 = 63/42
99% Critical Value = 0.62
1.5 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.631117	0.0768581	0.683	None

Loc.	Date	Conc.	Outlier
12342D	5/10/2005	103	FALSE
	8/10/2005	133	FALSE
	11/15/2005	138	FALSE
	2/20/2006	333	FALSE
	5/23/2006	36.7	FALSE
	8/28/2006	27.6	FALSE
	11/1/2006	40.1	FALSE
	2/20/2007	146	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12342E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	687	951	264	0.6052	159.773
2	761	951	190	0.3164	60.116
3	826	919	93	0.1743	16.2099
4	849	902	53	0.0561	2.9733
5	902	849	-53		
6	919	826	-93		
7	951	761	-190		
8	951	687	-264		

Sum of b values = 239.072
Sample Standard Deviation = 94.6192
W Statistic = 0.912013

5% Critical value of 0.818 is less than 0.912013
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.912013
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
951	826	125	1	0
902	826	76	2	0
761	826	-65	2	1
849	826	23	3	1
687	826	-139	3	2
951	826	125	4	2
919	826	93	5	2
902	951	-49	5	3
761	951	-190	5	4
849	951	-102	5	5
687	951	-264	5	6
951	951	0	5	6
919	951	-32	5	7
761	902	-141	[illegible]	[illegible]
849	902	-53	[illegible]	9
687	902	-215	5	10
951	902	49	6	10
919	902	[illegible]	[illegible]	10
849	761	[illegible]	8	10
687	761	-74	8	11
951	761	190	9	11
919	761	158	10	11
687	849	-162	10	12
951	849	102	11	12
919	849	70	12	12
951	687	264	13	12
919	687	232	14	12
919	951	-32	14	13

ChemStat
Trial Version

S Statistic = 14 - 13 = 1
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Failed to calculate probability for S = 1
Table out of range

Sen's Slope Analysis

Parameter: Mn
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
951 (8/10/2005)	826 (5/18/2005)	(951 - 826)/(2 - 1)	125
902 (11/21/2005)	826 (5/18/2005)	(902 - 826)/(3 - 1)	38
761 (2/15/2006)	826 (5/18/2005)	(761 - 826)/(4 - 1)	-21.6667
849 (5/22/2006)	826 (5/18/2005)	(849 - 826)/(5 - 1)	5.75
687 (8/29/2006)	826 (5/18/2005)	(687 - 826)/(6 - 1)	-27.8
951 (11/7/2006)	826 (5/18/2005)	(951 - 826)/(7 - 1)	20.8333
919 (2/27/2007)	826 (5/18/2005)	(919 - 826)/(8 - 1)	13.2857
902 (11/21/2005)	951 (8/10/2005)	(902 - 951)/(3 - 2)	-49
761 (2/15/2006)	951 (8/10/2005)	(761 - 951)/(4 - 2)	-95
849 (5/22/2006)	951 (8/10/2005)	(849 - 951)/(5 - 2)	-34
687 (8/29/2006)	951 (8/10/2005)	(687 - 951)/(6 - 2)	-66
951 (11/7/2006)	951 (8/10/2005)	(951 - 951)/(7 - 2)	0
919 (2/27/2007)	951 (8/10/2005)	(919 - 951)/(8 - 2)	-5.33333
761 (2/15/2006)	902 (11/21/2005)	(761 - 902)/(4 - 3)	-141
849 (5/22/2006)	902 (11/21/2005)	(849 - 902)/(5 - 3)	-26.5
687 (8/29/2006)	902 (11/21/2005)	(687 - 902)/(6 - 3)	-71.6667
951 (11/7/2006)	902 (11/21/2005)	(951 - 902)/(7 - 3)	12.25
919 (2/27/2007)	902 (11/21/2005)	(919 - 902)/(8 - 3)	3.4
849 (5/22/2006)	761 (2/15/2006)	(849 - 761)/(5 - 4)	88
687 (8/29/2006)	761 (2/15/2006)	(687 - 761)/(6 - 4)	-37
951 (11/7/2006)	761 (2/15/2006)	(951 - 761)/(7 - 4)	63.3333
919 (2/27/2007)	761 (2/15/2006)	(919 - 761)/(8 - 4)	39.5
687 (8/29/2006)	849 (5/22/2006)	(687 - 849)/(6 - 5)	-162
951 (11/7/2006)	849 (5/22/2006)	(951 - 849)/(7 - 5)	51
919 (2/27/2007)	849 (5/22/2006)	(919 - 849)/(8 - 5)	23.3333
951 (11/7/2006)	687 (8/29/2006)	(951 - 687)/(7 - 6)	264
919 (2/27/2007)	687 (8/29/2006)	(919 - 687)/(8 - 6)	116
919 (2/27/2007)	951 (11/7/2006)	(919 - 951)/(8 - 7)	-32

GemStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-162
2	-141
3	-95
4	-71.6667
5	-66
6	-49
7	-37

8	-34
9	-32
10	-27.8
11	-26.5
12	-21.6667
13	-5.33333
14	0
15	3.4
16	5.75
17	12.25
18	13.2857
19	20.8333
20	23.3333
21	38
22	39.5
23	51
24	63.3333
25	88
26	116
27	125
28	264

Sen's Estimator (Median Q) is 1.7

Tied Group	Value	Members
1	951	2

Time Period	Observations
5/18/2005	[illegible]
8/10/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -37 = Q(7)
Upper limit is 39.5 = Q(22)
-37 < 0 < 39.5 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	826	3
8/10/2005	951	7.5
11/21/2005	902	5
2/15/2006	761	2
5/22/2006	849	4
8/29/2006	687	1
11/7/2006	951	7.5
2/27/2007	919	6

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von Neumann ratio v = 2.21429 = 93/42
99% Critical Value = 0.62
2.21429 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0	0.280303	0.683	None

Loc.	Date	Conc.	Outlier
12342E	5/18/2005	826	FALSE
	8/10/2005	951	FALSE
	11/21/2005	902	FALSE
	2/15/2006	761	FALSE
	5/22/2006	849	FALSE
	8/29/2006	687	FALSE
	11/7/2006	951	FALSE
	2/27/2007	919	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12343D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	5	30.4	25.4	0.6052	15.3721
2	8.1	25.2	17.1	0.3164	5.41044
3	9	17.8	8.8	0.1743	1.53384
4	9.9	16.6	6.7	0.0561	0.37587
5	16.6	9.9	-6.7		
6	17.8	9	-8.8		
7	25.2	8.1	-17.1		
8	30.4	5	-25.4		

Sum of b values = 22.6922
Sample Standard Deviation = 8.95002
W Statistic = 0.91835

5% Critical value of 0.818 is less than 0.91835
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.91835
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
16.6	9.9	6.7	1	0
5	9.9	-4.9	1	1
9	9.9	-0.9	1	2
17.8	9.9	7.9	2	2
30.4	9.9	20.5	3	2
25.2	9.9	15.3	4	2
8.1	9.9	-1.8	4	3
5	16.6	-11.6	4	4
9	16.6	-7.6	4	5
17.8	16.6	1.2	5	5
30.4	16.6	13.8	6	5
25.2	16.6	8.6	7	5
8.1	16.6	-8.5	7	6
9	5	4	[illegible]	6
17.8	5	12.8	[illegible]	6
30.4	5	25.4	10	6
25.2	5	20.2	11	6
8.1	5	3.1	[illegible]	6
17.8	9	8.8	13	6
30.4	9	21.4	14	6
25.2	9	16.2	15	6
8.1	9	-0.9	15	7
30.4	17.8	12.6	16	7
25.2	17.8	7.4	17	7
8.1	17.8	-9.7	17	8
25.2	30.4	-5.2	17	9
8.1	30.4	-22.3	17	10
8.1	25.2	-17.1	17	11

ChemStat
Trial Version

S Statistic = 17 - 11 = 6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |6| is 0.548
0.548 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: Mn
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
16.6 (8/10/2005)	9.9 (5/9/2005)	(16.6 - 9.9)/(2 - 1)	6.7
5 (11/15/2005)	9.9 (5/9/2005)	(5 - 9.9)/(3 - 1)	-2.45
9 (2/20/2006)	9.9 (5/9/2005)	(9 - 9.9)/(4 - 1)	-0.3
17.8 (5/23/2006)	9.9 (5/9/2005)	(17.8 - 9.9)/(5 - 1)	1.975
30.4 (8/28/2006)	9.9 (5/9/2005)	(30.4 - 9.9)/(6 - 1)	4.1
25.2 (11/2/2006)	9.9 (5/9/2005)	(25.2 - 9.9)/(7 - 1)	2.55
8.1 (2/20/2007)	9.9 (5/9/2005)	(8.1 - 9.9)/(8 - 1)	-0.257143
5 (11/15/2005)	16.6 (8/10/2005)	(5 - 16.6)/(3 - 2)	-11.6
9 (2/20/2006)	16.6 (8/10/2005)	(9 - 16.6)/(4 - 2)	-3.8
17.8 (5/23/2006)	16.6 (8/10/2005)	(17.8 - 16.6)/(5 - 2)	0.4
30.4 (8/28/2006)	16.6 (8/10/2005)	(30.4 - 16.6)/(6 - 2)	3.45
25.2 (11/2/2006)	16.6 (8/10/2005)	(25.2 - 16.6)/(7 - 2)	1.72
8.1 (2/20/2007)	16.6 (8/10/2005)	(8.1 - 16.6)/(8 - 2)	-1.41667
9 (2/20/2006)	[illegible] (11/15/2005)	[illegible] - 5)/(4 - 3)	4
17.8 (5/23/2006)	5 (11/15/2005)	(17.8 - 5)/(5 - 3)	6.4
30.4 (8/28/2006)	5 (11/15/2005)	(30.4 - 5)/(6 - 3)	8.46667
25.2 (11/2/2006)	5 (11/15/2005)	(25.2 - 5)/(7 - 3)	5.05
8.1 (2/20/2007)	5 (11/15/2005)	(8.1 - 5)/(8 - 3)	0.62
17.8 (5/23/2006)	9 (2/20/2006)	(17.8 - 9)/(5 - 4)	8.8
30.4 (8/28/2006)	9 (2/20/2006)	(30.4 - 9)/(6 - 4)	10.7
25.2 (11/2/2006)	9 (2/20/2006)	(25.2 - 9)/(7 - 4)	5.4
8.1 (2/20/2007)	9 (2/20/2006)	(8.1 - 9)/(8 - 4)	-0.225
30.4 (8/28/2006)	17.8 (5/23/2006)	(30.4 - 17.8)/(6 - 5)	12.6
25.2 (11/2/2006)	17.8 (5/23/2006)	(25.2 - 17.8)/(7 - 5)	3.7
8.1 (2/20/2007)	17.8 (5/23/2006)	(8.1 - 17.8)/(8 - 5)	-3.23333
25.2 (11/2/2006)	30.4 (8/28/2006)	(25.2 - 30.4)/(7 - 6)	-5.2
8.1 (2/20/2007)	30.4 (8/28/2006)	(8.1 - 30.4)/(8 - 6)	-11.15
8.1 (2/20/2007)	25.2 (11/2/2006)	(8.1 - 25.2)/(8 - 7)	-17.1

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-17.1
2	-11.6
3	-11.15
4	-5.2
5	-3.8
6	-3.23333
7	-2.45

8	-1.41667
9	-0.3
10	-0.257143
11	-0.225
12	0.4
13	0.62
14	1.72
15	1.975
16	2.55
17	3.45
18	3.7
19	4
20	4.1
21	5.05
22	5.4
23	6.4
24	6.7
25	8.46667
26	8.8
27	10.7
28	12.6

Sen's Estimator (Median Q) is 1.8475

Time Period	Observations
5/9/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/2/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -2.45 = Q(7)
Upper limit is 5.4 = Q(22)
-2.45 < 0 < 5.4 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/9/2005	9.9	4
8/10/2005	16.6	5
11/15/2005	5	1
2/20/2006	9	3
5/23/2006	17.8	6
8/28/2006	30.4	8
11/2/2006	25.2	7
2/20/2007	8.1	2

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von Neumann ratio v = 1.42857 = 60/42
99% Critical Value = 0.62
1.42857 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn

Location: 12343D

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.233184	0.153465	0.683	None

Loc.	Date	Conc.	Outlier
12343D	5/9/2005	9.9	FALSE
	8/10/2005	16.6	FALSE
	11/15/2005	5	FALSE
	2/20/2006	9	FALSE
	5/23/2006	17.8	FALSE
	8/28/2006	30.4	FALSE
	11/2/2006	25.2	FALSE
	2/20/2007	8.1	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12343E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	21.2	1180	1158.8	0.6233	722.28
2	31.4	789	757.6	0.3031	229.629
3	94.4	415	320.6	0.1401	44.9161
4	170	170	0		
5	415	94.4	-320.6		
6	789	31.4	-757.6		
7	1180	21.2	-1158.8		

Sum of b values = 996.825
Sample Standard Deviation = 444.258
W Statistic = 0.839103

5% Critical value of 0.803 is less than 0.839103
Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less than 0.839103
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
170	21.2	148.8	1	0
94.4	21.2	73.2	2	0
789	21.2	767.8	3	0
1180	21.2	1158.8	4	0
415	21.2	393.8	5	0
31.4	21.2	10.2	6	0
94.4	170	-75.6	6	1
789	170	619	7	1
1180	170	1010	8	1
415	170	245	9	1
31.4	170	-138.6	9	2
789	94.4	694.6	10	2
1180	94.4	[illegible]	11	[illegible]
415	94.4	320.6	[illegible]	[illegible]
31.4	94.4	[illegible]	[illegible]	3
1180	789	391	13	3
415	789	[illegible]	[illegible]	4
31.4	789	[illegible]	[illegible]	[illegible]
415	1180	-765	13	6
31.4	1180	-1148.6	13	7
31.4	415	-383.6	13	8

ChemStat
Trial Version

S Statistic = 13 - 8 = 5
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |5| is 0.562
0.562 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Mn
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
170 (11/21/2005)	21.2 (8/9/2005)	(170 - 21.2)/(2 - 1)	148.8
94.4 (2/15/2006)	21.2 (8/9/2005)	(94.4 - 21.2)/(3 - 1)	36.6
789 (5/22/2006)	21.2 (8/9/2005)	(789 - 21.2)/(4 - 1)	255.933
1180 (8/29/2006)	21.2 (8/9/2005)	(1180 - 21.2)/(5 - 1)	289.7
415 (11/7/2006)	21.2 (8/9/2005)	(415 - 21.2)/(6 - 1)	78.76
31.4 (2/27/2007)	21.2 (8/9/2005)	(31.4 - 21.2)/(7 - 1)	1.7
94.4 (2/15/2006)	170 (11/21/2005)	(94.4 - 170)/(3 - 2)	-75.6
789 (5/22/2006)	170 (11/21/2005)	(789 - 170)/(4 - 2)	309.5
1180 (8/29/2006)	170 (11/21/2005)	(1180 - 170)/(5 - 2)	336.667
415 (11/7/2006)	170 (11/21/2005)	(415 - 170)/(6 - 2)	61.25
31.4 (2/27/2007)	170 (11/21/2005)	(31.4 - 170)/(7 - 2)	-27.72
789 (5/22/2006)	94.4 (2/15/2006)	(789 - 94.4)/(4 - 3)	694.6
1180 (8/29/2006)	94.4 (2/15/2006)	(1180 - 94.4)/(5 - 3)	542.8
415 (11/7/2006)	[illegible] (2/15/2006)	(415 - 94.4)/(6 - 3)	106.867
31.4 (2/27/2007)	94.4 [illegible]	[illegible]	-15.75
1180 (8/29/2006)	789 (5/22/2006)	(1180 - 789)/(5 - 4)	391
415 (11/7/2006)	789 (5/22/2006)	(415 - 789)/(6 - 4)	-187
31.4 (2/27/2007)	789 (5/22/2006)	(31.4 - 789)/(7 - 4)	-252.533
415 (11/7/2006)	[illegible] (8/29/2006)	[illegible]	-765
31.4 (2/27/2007)	1180 (8/29/2006)	(31.4 - 1180)/(7 - 5)	-574.3
31.4 (2/27/2007)	415 (11/7/2006)	(31.4 - 415)/(7 - 6)	-383.6

ChemStat Trial Version

Number of Q values = 21

Ordered Q Values

n	Q
1	-765
2	-574.3
3	-383.6
4	-252.533
5	-187
6	-75.6
7	-27.72
8	-15.75
9	1.7
10	36.6
11	61.25
12	78.76
13	106.867
14	148.8
15	255.933

16	289.7
17	309.5
18	336.667
19	391
20	542.8
21	694.6

Sen's Estimator (Median Q) is 61.25

Time Period	Observations
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02404
M2 = (21 + 10.952)/2.0 + 1 = 16.976
Lower limit is -187 = Q(5)
Upper limit is 309.5 = Q(17)
-187 < 0 < 309.5 indicating no trend in data.

ChemStat Trial Version

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/9/2005	21.2	1
11/21/2005	170	4
2/15/2006	94.4	3
5/22/2006	789	6
8/29/2006	1180	7
11/7/2006	415	5
2/27/2007	31.4	2

---

von Neumann ratio v = 1.17857 = 33/28
99% Critical Value = 0.54
1.17857 > 0.54
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 7 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.337418	0.00880221	0.637	None

Loc.	Date	Conc.	Outlier
12343E	8/9/2005	21.2	FALSE
	11/21/2005	170	FALSE
	2/15/2006	94.4	FALSE
	5/22/2006	789	FALSE
	8/29/2006	1180	FALSE
	11/7/2006	415	FALSE
	2/27/2007	31.4	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12344D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2	15.8	13.8	0.6052	8.35176
2	5	15.4	10.4	0.3164	3.29056
3	5	11	6	0.1743	1.0458
4	5.4	6.3	0.9	0.0561	0.05049
5	6.3	5.4	-0.9		
6	11	5	-6		
7	15.4	5	-10.4		
8	15.8	2	-13.8		

Sum of b values = 12.7386
Sample Standard Deviation = 5.17961
W Statistic = 0.864075

5% Critical value of 0.818 is less than 0.864075
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.864075
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
11	6.3	4.7	1	0
15.8	6.3	9.5	2	0
15.4	6.3	9.1	3	0
5	6.3	-1.3	3	1
5	6.3	-1.3	3	2
5.4	6.3	-0.9	3	3
2	6.3	-4.3	3	4
15.8	11	4.8	4	4
15.4	11	4.4	5	4
5	11	-6	5	5
5	11	-6	5	6
5.4	11	-5.6	5	7
2	11	-9	5	8
15.4	15.8	-0.4	5	9
5	15.8	-10.8	5	10
5	15.8	-10.8	5	11
5.4	15.8	-10.4	5	12
2	15.8	-13.8	5	13
5	15.4	-10	5	14
5	15.4	-10.4	5	15
5.4	15.4	-10	5	16
2	15.4	-13.4	5	17
5	5	0	5	17
5.4	5	0.4	6	17
2	5	-3	6	18
5.4	5	0.4	7	18
2	5	-3	7	19
2	5.4	-3.4	7	20

ChemStat
Trial Version

S Statistic = 7 - 20 = -13
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Failed to calculate probability for S = -13
Table out of range

Sen's Slope Analysis
Parameter: Mn
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
11 (8/23/2005)	6.3 (5/31/2005)	(11 - 6.3)/(2 - 1)	4.7
15.8 (11/16/2005)	6.3 (5/31/2005)	(15.8 - 6.3)/(3 - 1)	4.75
15.4 (2/21/2006)	6.3 (5/31/2005)	(15.4 - 6.3)/(4 - 1)	3.03333
5 (5/30/2006)	6.3 (5/31/2005)	(5 - 6.3)/(5 - 1)	-0.325
5 (8/23/2006)	6.3 (5/31/2005)	(5 - 6.3)/(6 - 1)	-0.26
5.4 (11/2/2006)	6.3 (5/31/2005)	(5.4 - 6.3)/(7 - 1)	-0.15
2 (2/21/2007)	6.3 (5/31/2005)	(2 - 6.3)/(8 - 1)	-0.614286
15.8 (11/16/2005)	11 (8/23/2005)	(15.8 - 11)/(3 - 2)	4.8
15.4 (2/21/2006)	11 (8/23/2005)	(15.4 - 11)/(4 - 2)	2.2
5 (5/30/2006)	11 (8/23/2005)	(5 - 11)/(5 - 2)	-2
5 (8/23/2006)	11 (8/23/2005)	(5 - 11)/(6 - 2)	-1.5
5.4 (11/2/2006)	11 (8/23/2005)	(5.4 - 11)/(7 - 2)	-1.12
2 (2/21/2007)	11 (8/23/2005)	(2 - 11)/(8 - 2)	-1.5
15.4 (2/21/2006)	15.8 (11/16/2005)	(15.4 - 15.8)/(4 - 3)	-0.4
5 (5/30/2006)	15.8 (11/16/2005)	(5 - 15.8)/(5 - 3)	-5.4
5 (8/23/2006)	15.8 (11/16/2005)	(5 - 15.8)/(6 - 3)	-3.6
5.4 (11/2/2006)	15.8 (11/16/2005)	(5.4 - 15.8)/(7 - 3)	-2.6
2 (2/21/2007)	15.8 (11/16/2005)	(2 - 15.8)/(8 - 3)	-2.76
5 (5/30/2006)	15.4 (2/21/2006)	(5 - 15.4)/(5 - 4)	-10.4
5 (8/23/2006)	15.4 (2/21/2006)	(5 - 15.4)/(6 - 4)	-5.2
5.4 (11/2/2006)	15.4 (2/21/2006)	(5.4 - 15.4)/(7 - 4)	-3.33333
2 (2/21/2007)	15.4 (2/21/2006)	(2 - 15.4)/(8 - 4)	-3.35
5 (8/23/2006)	5 (5/30/2006)	(5 - 5)/(6 - 5)	0
5.4 (11/2/2006)	5 (5/30/2006)	(5.4 - 5)/(7 - 5)	0.2
2 (2/21/2007)	5 (5/30/2006)	(2 - 5)/(8 - 5)	-1
5.4 (11/2/2006)	5 (8/23/2006)	(5.4 - 5)/(7 - 6)	0.4
2 (2/21/2007)	5 (8/23/2006)	(2 - 5)/(8 - 6)	-1.5
2 (2/21/2007)	5.4 (11/2/2006)	(2 - 5.4)/(8 - 7)	-3.4

ChemStat
TrialVersion

Number of Q values = 28

Ordered Q Values

n	Q
1	-10.4
2	-5.4
3	-5.2
4	-3.6
5	-3.4
6	-3.35
7	-3.33333

8	-2.76
9	-2.6
10	-2
11	-1.5
12	-1.5
13	-1.5
14	-1.12
15	-1
16	-0.614286
17	-0.4
18	-0.325
19	-0.26
20	-0.15
21	0
22	0.2
23	0.4
24	2.2
25	3.03333
26	4.7
27	4.75
28	4.8

Sen's Estimator (Median Q) is -1.06

Tied Group	Value	Members
1	5	2

ChemStat
Trial Version

Time Period	Observations
5/31/2005	[illegible]
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
8/23/2006	1
11/2/2006	1
2/21/2007	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -3.33333 = Q(7)
Upper limit is 0.2 = Q(22)
-3.33333 < 0 < 0.2 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/31/2005	6.3	5
8/23/2005	11	6
11/16/2005	15.8	8
2/21/2006	15.4	7
5/30/2006	5	2.5
8/23/2006	5	2.5
11/2/2006	5.4	4
2/21/2007	2	1

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von Neumann ratio v = 0.892857 = 37.5/42
99% Critical Value = 0.62
0.892857 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.037037	0.223881	0.683	None

Loc.	Date	Conc.	Outlier
12344D	5/31/2005	6.3	FALSE
	8/23/2005	11	FALSE
	11/16/2005	15.8	FALSE
	2/21/2006	15.4	FALSE
	5/30/2006	5	FALSE
	8/23/2006	5	FALSE
	11/2/2006	5.4	FALSE
	2/21/2007	2	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12344E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	3.9	61	57.1	0.6052	34.5569
2	5	43.7	38.7	0.3164	12.2447
3	9.5	42	32.5	0.1743	5.66475
4	11	22.3	11.3	0.0561	0.63393
5	22.3	11	-11.3		
6	42	9.5	-32.5		
7	43.7	5	-38.7		
8	61	3.9	-57.1		

Sum of b values = 53.1003
Sample Standard Deviation = 21.458
W Statistic = 0.874817

5% Critical value of 0.818 is less than 0.874817
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.874817
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
42	22.3	19.7	1	0
43.7	22.3	21.4	2	0
3.9	22.3	-18.4	2	1
61	22.3	38.7	3	1
11	22.3	-11.3	3	2
5	22.3	-17.3	3	3
9.5	22.3	-12.8	3	4
43.7	42	1.7	4	4
3.9	42	-38.1	4	5
61	42	19	5	5
11	42	-31	5	6
5	42	-37	5	7
9.5	42	-32.5	5	8
3.9	43.7	-39.8	5	9
61	43.7	17.3	5	9
11	43.7	-32.7	6	10
5	43.7	-38.7	6	11
9.5	43.7	-34.2		12
61	3.9	57.1	7	12
11	3.9	7.1	8	12
5	3.9	1.1	9	12
9.5	3.9	5.6	10	12
11	61	-50	10	13
5	61	-56	10	14
9.5	61	-51.5	10	15
5	11	-6	10	16
9.5	11	-1.5	10	17
9.5	5	4.5	11	17

ChemStat
Trial Version

S Statistic = 11 - 17 = -6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-6| is 0.548
0.548 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Mn
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
42 (10/11/2005)	22.3 (8/24/2005)	(42 - 22.3)/(2 - 1)	19.7
43.7 (12/13/2005)	22.3 (8/24/2005)	(43.7 - 22.3)/(3 - 1)	10.7
3.9 (2/14/2006)	22.3 (8/24/2005)	(3.9 - 22.3)/(4 - 1)	-6.13333
61 (5/31/2006)	22.3 (8/24/2005)	(61 - 22.3)/(5 - 1)	9.675
11 (8/21/2006)	22.3 (8/24/2005)	(11 - 22.3)/(6 - 1)	-2.26
5 (11/7/2006)	22.3 (8/24/2005)	(5 - 22.3)/(7 - 1)	-2.88333
9.5 (2/27/2007)	22.3 (8/24/2005)	(9.5 - 22.3)/(8 - 1)	-1.82857
43.7 (12/13/2005)	42 (10/11/2005)	(43.7 - 42)/(3 - 2)	1.7
3.9 (2/14/2006)	42 (10/11/2005)	(3.9 - 42)/(4 - 2)	-19.05
61 (5/31/2006)	42 (10/11/2005)	(61 - 42)/(5 - 2)	6.33333
11 (8/21/2006)	42 (10/11/2005)	(11 - 42)/(6 - 2)	-7.75
5 (11/7/2006)	42 (10/11/2005)	(5 - 42)/(7 - 2)	-7.4
9.5 (2/27/2007)	42 (10/11/2005)	(9.5 - 42)/(8 - 2)	-5.41667
3.9 (2/14/2006)	[illegible] (12/13/2005)	[illegible] - 43.7)/(4 - 3)	-39.8
61 (5/31/2006)	43.7 [illegible]	[illegible]	8.65
11 (8/21/2006)	43.7 [illegible]	[illegible]	-10.9
5 (11/7/2006)	43.7 (12/13/2005)	(5 - 43.7)/(7 - 3)	-9.675
9.5 (2/27/2007)	43.7 (12/13/2005)	(9.5 - 43.7)/(8 - 3)	-6.84
61 (5/31/2006)	3.9 (2/14/2006)	[illegible]	57.1
11 (8/21/2006)	3.9 (2/14/2006)	[illegible]	3.55
5 (11/7/2006)	3.9 (2/14/2006)	(5 - 3.9)/(7 - 4)	0.366667
9.5 (2/27/2007)	3.9 (2/14/2006)	(9.5 - 3.9)/(8 - 4)	1.4
11 (8/21/2006)	61 (5/31/2006)	(11 - 61)/(6 - 5)	-50
5 (11/7/2006)	61 (5/31/2006)	(5 - 61)/(7 - 5)	-28
9.5 (2/27/2007)	61 (5/31/2006)	(9.5 - 61)/(8 - 5)	-17.1667
5 (11/7/2006)	11 (8/21/2006)	(5 - 11)/(7 - 6)	-6
9.5 (2/27/2007)	11 (8/21/2006)	(9.5 - 11)/(8 - 6)	-0.75
9.5 (2/27/2007)	5 (11/7/2006)	(9.5 - 5)/(8 - 7)	4.5

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-50
2	-39.8
3	-28
4	-19.05
5	-17.1667
6	-10.9
7	-9.675

8	-7.75
9	-7.4
10	-6.84
11	-6.13333
12	-6
13	-5.41667
14	-2.88333
15	-2.26
16	-1.82857
17	-0.75
18	0.366667
19	1.4
20	1.7
21	3.55
22	4.5
23	6.33333
24	8.65
25	9.675
26	10.7
27	19.7
28	57.1

Sen's Estimator (Median Q) is -2.57167

Time Period	Observations
8/24/2005	1
10/11/2005	1
12/13/2005	1
2/14/2006	
5/31/2006	1
8/21/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -9.675 = Q(7)
Upper limit is 4.5 = Q(22)
-9.675 < 0 < 4.5 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/24/2005	22.3	5
10/11/2005	42	6
12/13/2005	43.7	7
2/14/2006	3.9	1
5/31/2006	61	8
8/21/2006	11	4
11/7/2006	5	2
2/27/2007	9.5	3

---

von Neumann ratio v = 2.57143 = 108/42
99% Critical Value = 0.62
2.57143 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.308929	0.0276382	0.683	None

Loc.	Date	Conc.	Outlier
12344E	8/24/2005	22.3	FALSE
	10/11/2005	42	FALSE
	12/13/2005	43.7	FALSE
	2/14/2006	3.9	FALSE
	5/31/2006	61	FALSE
	8/21/2006	11	FALSE
	11/7/2006	5	FALSE
	2/27/2007	9.5	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Mn
Location: 12345D
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 2 for 5 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.04532	2.83696	1.79163	0.6646	1.19072
2	1.92065	2.13354	0.212894	0.2413	0.0513713
3	2.08991	2.08991	0		
4	2.13354	1.92065	-0.212894		
5	2.83696	1.04532	-1.79163		

Sum of b values = 1.24209
Sample Standard Deviation = 0.641089
W Statistic = 0.938449

5% Critical value of 0.762 is less than 0.938449
Data is normally distributed at 95% level of significance

1% Critical value of 0.686 is less than 0.938449
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Mn
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2.13354	2.08991	0.0436338	1	0
1.92065	2.08991	-0.16926	1	1
1.04532	2.08991	-1.04458	1	2
2.83696	2.08991	0.747052	2	2
1.92065	2.13354	-0.212894	2	3
1.04532	2.13354	-1.08822	2	4
2.83696	2.13354	0.703418	3	4
1.04532	1.92065	-0.875322	3	5
2.83696	1.92065	0.916312	4	5
2.83696	1.04532	1.79163	5	5

S Statistic = 5 - 5 = 0
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |0| is 1.184
1.184 >= 0.025 indicating no evidence of a trend

ChemStat
Trial Version

Sen's Slope Analysis
Parameter: Mn
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2.13354 (11/16/2005)	2.08991 (8/23/2005)	(2.13354 - 2.08991)/(2 - 1)	0.0436338
1.92065 (2/21/2006)	2.08991 (8/23/2005)	(1.92065 - 2.08991)/(3 - 1)	-0.0846301
1.04532 (5/30/2006)	2.08991 (8/23/2005)	(1.04532 - 2.08991)/(4 - 1)	-0.348194
2.83696 (2/21/2007)	2.08991 (8/23/2005)	(2.83696 - 2.08991)/(5 - 1)	0.186763
1.92065 (2/21/2006)	2.13354 (11/16/2005)	(1.92065 - 2.13354)/(3 - 2)	-0.212894
1.04532 (5/30/2006)	2.13354 (11/16/2005)	(1.04532 - 2.13354)/(4 - 2)	-0.544108
2.83696 (2/21/2007)	2.13354 (11/16/2005)	(2.83696 - 2.13354)/(5 - 2)	0.234473
1.04532 (5/30/2006)	1.92065 (2/21/2006)	(1.04532 - 1.92065)/(4 - 3)	-0.875322
2.83696 (2/21/2007)	1.92065 (2/21/2006)	(2.83696 - 1.92065)/(5 - 3)	0.458156
2.83696 (2/21/2007)	1.04532 (5/30/2006)	(2.83696 - 1.04532)/(5 - 4)	1.79163

Number of Q values = 10

ChemStat
Trial Version

Ordered Q Values

n	Q
1	-0.875322
2	-0.544108
3	-0.348194
4	-0.212894
5	-0.0846301
6	0.0436338
7	0.186763
8	0.234473
9	0.458156
10	1.79163

Sen's Estimator (Median Q) is -0.0204981

Time Period	Observations
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
2/21/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 300
b = 540

c = 40
Group Variance = 16.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 6.71508
M1 = (10 - 6.71508)/2.0 = 1.64246
M2 = (10 + 6.71508)/2.0 + 1 = 9.35754
Lower limit is -0.544108 = Q(2)
Upper limit is 0.458156 = Q(9)
-0.544108 < 0 < 0.458156 indicating no trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: Mn
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/23/2005	2.08991	3
11/16/2005	2.13354	4
2/21/2006	1.92065	2
5/30/2006	1.04532	1
2/21/2007	2.83696	5

---

von Neumann ratio v = 2.2 = 22/10
Insufficient Measurements
A minimum of six measurements is required.

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Mn
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 5 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.392613	0.488561	0.78	None

Loc.	Date	Conc.	Outlier
12345D	8/23/2005	2.08991	FALSE
	11/16/2005	2.13354	FALSE
	2/21/2006	1.92065	FALSE
	5/30/2006	1.04532	FALSE
	2/21/2007	2.83696	FALSE

ChemStat
Trial Version

Summary of Statistical Tests for Sodium
LDS and HTW Monitoring Horizons of the OSDF

	Horizon	Distribution	Trend	Serial Correlation	Outliers	
					Present	Removed
Cell 1	LDS	NC	NC	NC	NC	NC
	HTW	normal	down	no	no	NA
Cell 2	LDS	NC	NC	NC	NC	NC
	HTW	normal	down	no	no	NA
Cell 3	LDS	NC	NC	NC	NC	NC
	HTW	normal	none	no	no	NA
Cell 4	LDS	NC	NC	NC	NC	NC
	HTW	normal	none	no	no	NA
Cell 5	LDS	NC	NC	NC	NC	NC
	HTW	normal	up	no	no	NA
Cell 6	LDS	NC	NC	NC	NC	NC
	HTW	normal	none	no	no	NA
Cell 7	LDS	NC	NC	NC	NC	NC
	HTW	normal	down	no	no	NA
Cell 8	LDS	NC	NC	NC	NC	NC
	HTW	NC	NC	NC	NC	NC

Distribution determined by Shapiro-Wilks Test of Normality
Trend determined by Mann-Kendall Trend Analysis & Sens Slope Analysis
Serial Correlation determined by Rank Von Neumann Ratio Test
Outliers determined by Dixon's Test. Outliers were removed if Shapiro-Wilks test failed.
NA – not applicable
NC – not considered because the sodium concentration is inappropriate for use as a detection ion in this horizon

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12338D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	334000	612000	278000	0.6431	178782
2	335000	450000	115000	0.2806	32269
3	446000	450000	4000	0.0875	350
4	450000	446000	-4000		
5	450000	335000	-115000		
6	612000	334000	-278000		

Sum of b values = 211401
Sample Standard Deviation = 102032
W Statistic = 0.858556

5% Critical value of 0.788 is less than 0.858556
Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.858556
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
446000	334000	112000	1	0
612000	334000	278000	2	0
450000	334000	116000	3	0
450000	334000	116000	4	0
335000	334000	1000	5	0
612000	446000	166000	6	0
450000	446000	4000	7	0
450000	446000	4000	8	0
335000	446000	-111000	8	1
450000	612000	-162000	8	2
450000	612000	-162000	8	3
335000	612000	-277000	8	4
450000	450000	0	[illegible]	[illegible]
335000	450000	-115000	8	5
335000	450000	-115000	8	6

ChemStat
Trial Version

S Statistic = 8 - 6 = 2
Comparing at 95% confidence level (upward trend)
Failed to calculate probability for S = 2
Table out of range

Sen's Slope Analysis

Parameter: Na
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
446000 (8/10/2005)	334000 (5/11/2005)	(446000 - 334000)/(2 - 1)	112000
612000 (11/16/2005)	334000 (5/11/2005)	(612000 - 334000)/(3 - 1)	139000
450000 (2/20/2006)	334000 (5/11/2005)	(450000 - 334000)/(4 - 1)	38666.7
450000 (5/30/2006)	334000 (5/11/2005)	(450000 - 334000)/(5 - 1)	29000
335000 (2/21/2007)	334000 (5/11/2005)	(335000 - 334000)/(6 - 1)	200
612000 (11/16/2005)	446000 (8/10/2005)	(612000 - 446000)/(3 - 2)	166000
450000 (2/20/2006)	446000 (8/10/2005)	(450000 - 446000)/(4 - 2)	2000
450000 (5/30/2006)	446000 (8/10/2005)	(450000 - 446000)/(5 - 2)	1333.33
335000 (2/21/2007)	446000 (8/10/2005)	(335000 - 446000)/(6 - 2)	-27750
450000 (2/20/2006)	612000 (11/16/2005)	(450000 - 612000)/(4 - 3)	-162000
450000 (5/30/2006)	612000 (11/16/2005)	(450000 - 612000)/(5 - 3)	-81000
335000 (2/21/2007)	612000 (11/16/2005)	(335000 - 612000)/(6 - 3)	-92333.3
450000 (5/30/2006)	450000 (2/20/2006)	(450000 - 450000)/(5 - 4)	0
335000 (2/21/2007)	450000 (2/20/2006)	(335000 - 450000)/(6 - 4)	-57500
335000 (2/21/2007)	450000 (5/30/2006)	(335000 - 450000)/(6 - 5)	-115000

ChemStat Trial Version

Number of Q values = 1

Ordered Q Values

n	Q
1	-162000
2	-115000
3	-92333.3
4	-81000
5	-57500
6	-27750
7	0
8	200
9	1333.33
10	2000
11	29000
12	38666.7
13	112000
14	139000
15	166000

Sen's Estimator (Median Q) is 200

Tied Group	Value	Members
1	450000	2

Time Period	Observations
5/11/2005	1

8/10/2005	1
11/16/2005	1
2/20/2006	1
5/30/2006	1
2/21/2007	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 510
b = 1080
c = 60
Group Variance = 27.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 8.5995
M1 = (15 - 8.5995)/2.0 = 3.20025
M2 = (15 + 8.5995)/2.0 + 1 = 12.7998
Lower limit is -92333.3 = Q(3)
Upper limit is 112000 = Q(13)
-92333.3 < 0 < 112000 indicating no trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/11/2005	334000	1
8/10/2005	446000	3
11/16/2005	612000	6
2/20/2006	450000	4.5
5/30/2006	450000	4.5
2/21/2007	335000	2

---

von Neumann ratio v = 1.22857 = 21.5/17.5
99% Critical Value = 0.46
1.22857 > 0.46
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 6 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.582734	0.00359712	0.698	None

Loc.	Date	Conc.	Outlier
12338D	5/11/2005	334000	FALSE
	8/10/2005	446000	FALSE
	11/16/2005	612000	FALSE
	2/20/2006	450000	FALSE
	5/30/2006	450000	FALSE
	2/21/2007	335000	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12338E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	19100	23800	4700	0.6052	2844.44
2	19200	21600	2400	0.3164	759.36
3	19500	20900	1400	0.1743	244.02
4	20000	20300	300	0.0561	16.83
5	20300	20000	-300		
6	20900	19500	-1400		
7	21600	19200	-2400		
8	23800	19100	-4700		

Sum of b values = 3864.65
Sample Standard Deviation = 1566.62
W Statistic = 0.869355

5% Critical value of 0.818 is less than 0.869355
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.869355
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
23800	20900	2900	1	0
20000	20900	-900	1	1
21600	20900	700	2	1
20300	20900	-600	2	2
19500	20900	-1400	2	3
19100	20900	-1800	2	4
19200	20900	-1700	2	5
20000	23800	-3800	2	6
21600	23800	-2200	2	7
20300	23800	-3500	2	8
19500	23800	-4300	2	9
19100	23800	-4700	2	10
19200	23800	-4600	2	11
21600	20000	1600	[illegible]	[illegible]
20300	20000	30[illegible]	4	1[illegible]
19500	20000	-500	4	12
19100	20000	-900	4	13
19200	2000[illegible]	-[illegible]00	[illegible]	14
20300	21600	-1[illegible]3[illegible]	4	15
19500	21600	-2100	4	16
19100	21600	-2500	4	17
19200	21600	-2400	4	18
19500	20300	-800	4	19
19100	20300	-1200	4	20
19200	20300	-1100	4	21
19100	19500	-400	4	22
19200	19500	-300	4	23
19200	19100	100	5	23

ChemStat
Trial Version

S Statistic = 5 - 23 = -18
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 18 is 0.016
S < 0 and 0.016 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: Na
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
23800 (8/8/2005)	20900 (5/24/2005)	(23800 - 20900)/(2 - 1)	2900
20000 (11/14/2005)	20900 (5/24/2005)	(20000 - 20900)/(3 - 1)	-450
21600 (2/14/2006)	20900 (5/24/2005)	(21600 - 20900)/(4 - 1)	233.333
20300 (5/24/2006)	20900 (5/24/2005)	(20300 - 20900)/(5 - 1)	-150
19500 (8/17/2006)	20900 (5/24/2005)	(19500 - 20900)/(6 - 1)	-280
19100 (11/6/2006)	20900 (5/24/2005)	(19100 - 20900)/(7 - 1)	-300
19200 (2/27/2007)	20900 (5/24/2005)	(19200 - 20900)/(8 - 1)	-242.857
20000 (11/14/2005)	23800 (8/8/2005)	(20000 - 23800)/(3 - 2)	-3800
21600 (2/14/2006)	23800 (8/8/2005)	(21600 - 23800)/(4 - 2)	-1100
20300 (5/24/2006)	23800 (8/8/2005)	(20300 - 23800)/(5 - 2)	-1166.67
19500 (8/17/2006)	23800 (8/8/2005)	(19500 - 23800)/(6 - 2)	-1075
19100 (11/6/2006)	23800 (8/8/2005)	(19100 - 23800)/(7 - 2)	-940
19200 (2/27/2007)	23800 (8/8/2005)	(19200 - 23800)/(8 - 2)	-766.667
21600 (2/14/2006)	20000 (11/14/2005)	(21600 - 20000)/(4 - 3)	1600
20300 (5/24/2006)	20000 (11/14/2005)	(20300 - 20000)/(5 - 3)	150
19500 (8/17/2006)	20000 (11/14/2005)	(19500 - 20000)/(6 - 3)	-166.667
19100 (11/6/2006)	20000 (11/14/2005)	(19100 - 20000)/(7 - 3)	-225
19200 (2/27/2007)	20000 (11/14/2005)	(19200 - 20000)/(8 - 3)	-160
20300 (5/24/2006)	21600 (2/14/2006)	(20300 - 21600)/(5 - 4)	-1300
19500 (8/17/2006)	21600 (2/14/2006)	(19500 - 21600)/(6 - 4)	-1050
19100 (11/6/2006)	21600 (2/14/2006)	(19100 - 21600)/(7 - 4)	-833.333
19200 (2/27/2007)	21600 (2/14/2006)	(19200 - 21600)/(8 - 4)	-600
19500 (8/17/2006)	20300 (5/24/2006)	(19500 - 20300)/(6 - 5)	-800
19100 (11/6/2006)	20300 (5/24/2006)	(19100 - 20300)/(7 - 5)	-600
19200 (2/27/2007)	20300 (5/24/2006)	(19200 - 20300)/(8 - 5)	-366.667
19100 (11/6/2006)	19500 (8/17/2006)	(19100 - 19500)/(7 - 6)	-400
19200 (2/27/2007)	19500 (8/17/2006)	(19200 - 19500)/(8 - 6)	-150
19200 (2/27/2007)	19100 (11/6/2006)	(19200 - 19100)/(8 - 7)	100

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-3800
2	-1300
3	-1166.67
4	-1100
5	-1075
6	-1050
7	-940

8	-833.333
9	-800
10	-766.667
11	-600
12	-600
13	-450
14	-400
15	-366.667
16	-300
17	-280
18	-242.857
19	-225
20	-166.667
21	-160
22	-150
23	-150
24	100
25	150
26	233.333
27	1600
28	2900

Sen's Estimator (Median Q) is -383.333

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/14/2006	1
5/24/2006	1
8/17/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -940 = Q(7)
Upper limit is -150 = Q(22)
-150 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/24/2005	20900	6
8/8/2005	23800	8
11/14/2005	20000	4
2/14/2006	21600	7
5/24/2006	20300	5
8/17/2006	19500	3
11/6/2006	19100	1
2/27/2007	19200	2

---

von Neumann ratio v = 1 = 42/42
99% Critical Value = 0.62
1 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.478261	0.04	0.683	None

Loc.	Date	Conc.	Outlier
12338E	5/24/2005	20900	FALSE
	8/8/2005	23800	FALSE
	11/14/2005	20000	FALSE
	2/14/2006	21600	FALSE
	5/24/2006	20300	FALSE
	8/17/2006	19500	FALSE
	11/6/2006	19100	FALSE
	2/27/2007	19200	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12339E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	87100	119000	31900	0.6052	19305.9
2	88400	111000	22600	0.3164	7150.64
3	90500	97000	6500	0.1743	1132.95
4	96300	96600	300	0.0561	16.83
5	96600	96300	-300		
6	97000	90500	-6500		
7	111000	88400	-22600		
8	119000	87100	-31900		

Sum of b values = 27606.3
Sample Standard Deviation = 11228.9
W Statistic = 0.863462

5% Critical value of 0.818 is less than 0.863462
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.863462
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
96600	119000	-22400	0	1
97000	119000	-22000	0	2
111000	119000	-8000	0	3
96300	119000	-22700	0	4
88400	119000	-30600	0	5
87100	119000	-31900	0	6
90500	119000	-28500	0	7
97000	96600	400	1	7
111000	96600	14400	2	7
96300	96600	-300	2	8
88400	96600	-8200	2	9
87100	96600	-9500	2	10
90500	96600	-6100	2	11
111000	97000	14000	[illegible]	11
96300	97000	-700	[illegible]	12
88400	97000	-8600	3	13
87100	97000	-9900	3	14
90500	97000	-6500	[illegible]	15
96300	111000	-14700	3	16
88400	111000	-22600	3	17
87100	111000	-23900	3	18
90500	111000	-20500	3	19
88400	96300	-7900	3	20
87100	96300	-9200	3	21
90500	96300	-5800	3	22
87100	88400	-1300	3	23
90500	88400	2100	4	23
90500	87100	3400	5	23

ChemStat
Trial Version

S Statistic = 5 - 23 = -18
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 18 is 0.016
S < 0 and 0.016 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: Na
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
96600 (8/8/2005)	119000 (5/24/2005)	(96600 - 119000)/(2 - 1)	-22400
97000 (11/14/2005)	119000 (5/24/2005)	(97000 - 119000)/(3 - 1)	-11000
111000 (2/16/2006)	119000 (5/24/2005)	(111000 - 119000)/(4 - 1)	-2666.67
96300 (5/24/2006)	119000 (5/24/2005)	(96300 - 119000)/(5 - 1)	-5675
88400 (8/22/2006)	119000 (5/24/2005)	(88400 - 119000)/(6 - 1)	-6120
87100 (11/6/2006)	119000 (5/24/2005)	(87100 - 119000)/(7 - 1)	-5316.67
90500 (2/27/2007)	119000 (5/24/2005)	(90500 - 119000)/(8 - 1)	-4071.43
97000 (11/14/2005)	96600 (8/8/2005)	(97000 - 96600)/(3 - 2)	400
111000 (2/16/2006)	96600 (8/8/2005)	(111000 - 96600)/(4 - 2)	7200
96300 (5/24/2006)	96600 (8/8/2005)	(96300 - 96600)/(5 - 2)	-100
88400 (8/22/2006)	96600 (8/8/2005)	(88400 - 96600)/(6 - 2)	-2050
87100 (11/6/2006)	96600 (8/8/2005)	(87100 - 96600)/(7 - 2)	-1900
90500 (2/27/2007)	96600 (8/8/2005)	(90500 - 96600)/(8 - 2)	-1016.67
111000 (2/16/2006)	97000 (11/14/2005)	(111000 - 97000)/(4 - 3)	14000
96300 (5/24/2006)	97000 (11/14/2005)	(96300 - 97000)/(5 - 3)	-350
88400 (8/22/2006)	97000 (11/14/2005)	(88400 - 97000)/(6 - 3)	-2866.67
87100 (11/6/2006)	97000 (11/14/2005)	(87100 - 97000)/(7 - 3)	-2475
90500 (2/27/2007)	97000 (11/14/2005)	(90500 - 97000)/(8 - 3)	-1300
96300 (5/24/2006)	111000 (2/16/2006)	(96300 - 111000)/(5 - 4)	-14700
88400 (8/22/2006)	111000 (2/16/2006)	(88400 - 111000)/(6 - 4)	-11300
87100 (11/6/2006)	111000 (2/16/2006)	(87100 - 111000)/(7 - 4)	-7966.67
90500 (2/27/2007)	111000 (2/16/2006)	(90500 - 111000)/(8 - 4)	-5125
88400 (8/22/2006)	96300 (5/24/2006)	(88400 - 96300)/(6 - 5)	-7900
87100 (11/6/2006)	96300 (5/24/2006)	(87100 - 96300)/(7 - 5)	-4600
90500 (2/27/2007)	96300 (5/24/2006)	(90500 - 96300)/(8 - 5)	-1933.33
87100 (11/6/2006)	88400 (8/22/2006)	(87100 - 88400)/(7 - 6)	-1300
90500 (2/27/2007)	88400 (8/22/2006)	(90500 - 88400)/(8 - 6)	1050
90500 (2/27/2007)	87100 (11/6/2006)	(90500 - 87100)/(8 - 7)	3400

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-22400
2	-14700
3	-11300
4	-11000
5	-7966.67
6	-7900
7	-6120

8	-5675
9	-5316.67
10	-5125
11	-4600
12	-4071.43
13	-2866.67
14	-2666.67
15	-2475
16	-2050
17	-1933.33
18	-1900
19	-1300
20	-1300
21	-1016.67
22	-350
23	-100
24	400
25	1050
26	3400
27	7200
28	14000

Sen's Estimator (Median Q) is -2570.83

Time Period	**Observations**
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/16/2006	1
5/24/2006	1
8/22/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -6120 = Q(7)
Upper limit is -350 = Q(22)
-350 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/24/2005	119000	8
8/8/2005	96600	5
11/14/2005	97000	6
2/16/2006	111000	7
5/24/2006	96300	4
8/22/2006	88400	2
11/6/2006	87100	1
2/27/2007	90500	3

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von Neumann ratio v = 0.690476 = 29/42
99% Critical Value = 0.62
0.690476 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.261438	0.0543933	0.683	None

Loc.	Date	Conc.	Outlier
12339E	5/24/2005	119000	FALSE
	8/8/2005	96600	FALSE
	11/14/2005	97000	FALSE
	2/16/2006	111000	FALSE
	5/24/2006	96300	FALSE
	8/22/2006	88400	FALSE
	11/6/2006	87100	FALSE
	2/27/2007	90500	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12340D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	263000	344000	81000	0.6052	49021.2
2	289000	337000	48000	0.3164	15187.2
3	312000	335000	23000	0.1743	4008.9
4	329000	332000	3000	0.0561	168.3
5	332000	329000	-3000		
6	335000	312000	-23000		
7	337000	289000	-48000		
8	344000	263000	-81000		

Sum of b values = 68385.6
Sample Standard Deviation = 28142.2
W Statistic = 0.84356

5% Critical value of 0.818 is less than 0.84356
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.84356
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
332000	337000	-5000	0	1
312000	337000	-25000	0	2
329000	337000	-8000	0	3
289000	337000	-48000	0	4
263000	337000	-74000	0	5
335000	337000	-2000	0	6
344000	337000	7000	1	6
312000	332000	-20000	1	7
329000	332000	-3000	1	8
289000	332000	-43000	1	9
263000	332000	-69000	1	10
335000	332000	3000	2	10
344000	332000	12000	3	10
329000	312000	17000	4	10
289000	312000	-23000	4	11
263000	312000	-49000	4	12
335000	312000	23000	5	12
344000	312000	32000	6	12
289000	329000	-40000	6	13
263000	329000	-66000	6	14
335000	329000	6000	7	14
344000	329000	15000	8	14
263000	289000	-26000	8	15
335000	289000	46000	9	15
344000	289000	55000	10	15
335000	263000	72000	11	15
344000	263000	81000	12	15
344000	335000	9000	13	15

ChemStat Trial Version

S Statistic = 13 - 15 = -2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-2| is 0.904
0.904 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Na
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
332000 (8/9/2005)	337000 (5/16/2005)	(332000 - 337000)/(2 - 1)	-5000
312000 (11/28/2005)	337000 (5/16/2005)	(312000 - 337000)/(3 - 1)	-12500
329000 (2/20/2006)	337000 (5/16/2005)	(329000 - 337000)/(4 - 1)	-2666.67
289000 (5/30/2006)	337000 (5/16/2005)	(289000 - 337000)/(5 - 1)	-12000
263000 (8/25/2006)	337000 (5/16/2005)	(263000 - 337000)/(6 - 1)	-14800
335000 (11/1/2006)	337000 (5/16/2005)	(335000 - 337000)/(7 - 1)	-333.333
344000 (2/20/2007)	337000 (5/16/2005)	(344000 - 337000)/(8 - 1)	1000
312000 (11/28/2005)	332000 (8/9/2005)	(312000 - 332000)/(3 - 2)	-20000
329000 (2/20/2006)	332000 (8/9/2005)	(329000 - 332000)/(4 - 2)	-1500
289000 (5/30/2006)	332000 (8/9/2005)	(289000 - 332000)/(5 - 2)	-14333.3
263000 (8/25/2006)	332000 (8/9/2005)	(263000 - 332000)/(6 - 2)	-17250
335000 (11/1/2006)	332000 (8/9/2005)	(335000 - 332000)/(7 - 2)	600
344000 (2/20/2007)	332000 (8/9/2005)	(344000 - 332000)/(8 - 2)	2000
329000 (2/20/2006)	312000 (11/28/2005)	(329000 - 312000)/(4 - 3)	17000
289000 (5/30/2006)	312000 (11/28/2005)	(289000 - 312000)/(5 - 3)	-11500
263000 (8/25/2006)	312000 (11/28/2005)	(263000 - 312000)/(6 - 3)	-16333.3
335000 (11/1/2006)	312000 (11/28/2005)	(335000 - 312000)/(7 - 3)	5750
344000 (2/20/2007)	312000 (11/28/2005)	(344000 - 312000)/(8 - 3)	6400
289000 (5/30/2006)	329000 (2/20/2006)	(289000 - 329000)/(5 - 4)	-40000
263000 (8/25/2006)	329000 (2/20/2006)	(263000 - 329000)/(6 - 4)	-33000
335000 (11/1/2006)	329000 (2/20/2006)	(335000 - 329000)/(7 - 4)	2000
344000 (2/20/2007)	329000 (2/20/2006)	(344000 - 329000)/(8 - 4)	3750
263000 (8/25/2006)	289000 (5/30/2006)	(263000 - 289000)/(6 - 5)	-26000
335000 (11/1/2006)	289000 (5/30/2006)	(335000 - 289000)/(7 - 5)	23000
344000 (2/20/2007)	289000 (5/30/2006)	(344000 - 289000)/(8 - 5)	18333.3
335000 (11/1/2006)	263000 (8/25/2006)	(335000 - 263000)/(7 - 6)	72000
344000 (2/20/2007)	263000 (8/25/2006)	(344000 - 263000)/(8 - 6)	40500
344000 (2/20/2007)	335000 (11/1/2006)	(344000 - 335000)/(8 - 7)	9000

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-40000
2	-33000
3	-26000
4	-20000
5	-17250
6	-16333.3
7	-14800

8	-14333.3
9	-12500
10	-12000
11	-11500
12	-5000
13	-2666.67
14	-1500
15	-333.333
16	600
17	1000
18	2000
19	2000
20	3750
21	5750
22	6400
23	9000
24	17000
25	18333.3
26	23000
27	40500
28	72000

Sen's Estimator (Median Q) is -916.667

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/28/2005	1
2/20/2006	1
5/30/2006	1
8/25/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -14800 = Q(7)
Upper limit is 6400 = Q(22)
-14800 < 0 < 6400 *indicating no trend in data.*

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/16/2005	337000	7
8/9/2005	332000	5
11/28/2005	312000	3
2/20/2006	329000	4
5/30/2006	289000	2
8/25/2006	263000	1
11/1/2006	335000	6
2/20/2007	344000	8

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von Neumann ratio v = 1.02381 = 43/42
99% Critical Value = 0.62
1.02381 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.127273	0.351351	0.683	None

Loc.	Date	Conc.	Outlier
12340D	5/16/2005	337000	FALSE
	8/9/2005	332000	FALSE
	11/28/2005	312000	FALSE
	2/20/2006	329000	FALSE
	5/30/2006	289000	FALSE
	8/25/2006	263000	FALSE
	11/1/2006	335000	FALSE
	2/20/2007	344000	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12340E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	43200	74100	30900	0.6052	18700.7
2	45500	71300	25800	0.3164	8163.12
3	50900	71200	20300	0.1743	3538.29
4	63000	66200	3200	0.0561	179.52
5	66200	63000	-3200		
6	71200	50900	-20300		
7	71300	45500	-25800		
8	74100	43200	-30900		

Sum of b values = 30581.6
Sample Standard Deviation = 12369.5
W Statistic = 0.873207

5% Critical value of 0.818 is less than 0.873207
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.873207
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
71300	66200	5100	1	0
45500	66200	-20700	1	1
43200	66200	-23000	1	2
50900	66200	-15300	1	3
63000	66200	-3200	1	4
74100	66200	7900	2	4
71200	66200	5000	3	4
45500	71300	-25800	3	5
43200	71300	-28100	3	6
50900	71300	-20400	3	7
63000	71300	-8300	3	8
74100	71300	2800	4	8
71200	71300	-100	4	9
43200	45500	-2300	4	10
50900	45500	5400	5	10
63000	45500	17500	6	10
74100	45500	28600	7	10
71200	45500	25700	8	10
50900	43200	7700	9	10
63000	43200	19800	10	10
74100	43200	30900	11	10
71200	43200	28000	12	10
63000	50900	12100	13	10
74100	50900	23200	14	10
71200	50900	20300	15	10
74100	63000	11100	16	10
71200	63000	8200	17	10
71200	74100	-2900	17	11

ChemStat Trial Version

S Statistic = 17 - 11 = 6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |6| is 0.548
0.548 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: Na
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
71300 (8/8/2005)	66200 (5/18/2005)	(71300 - 66200)/(2 - 1)	5100
45500 (11/14/2005)	66200 (5/18/2005)	(45500 - 66200)/(3 - 1)	-10350
43200 (2/15/2006)	66200 (5/18/2005)	(43200 - 66200)/(4 - 1)	-7666.67
50900 (5/24/2006)	66200 (5/18/2005)	(50900 - 66200)/(5 - 1)	-3825
63000 (8/25/2006)	66200 (5/18/2005)	(63000 - 66200)/(6 - 1)	-640
74100 (11/6/2006)	66200 (5/18/2005)	(74100 - 66200)/(7 - 1)	1316.67
71200 (2/27/2007)	66200 (5/18/2005)	(71200 - 66200)/(8 - 1)	714.286
45500 (11/14/2005)	71300 (8/8/2005)	(45500 - 71300)/(3 - 2)	-25800
43200 (2/15/2006)	71300 (8/8/2005)	(43200 - 71300)/(4 - 2)	-14050
50900 (5/24/2006)	71300 (8/8/2005)	(50900 - 71300)/(5 - 2)	-6800
63000 (8/25/2006)	71300 (8/8/2005)	(63000 - 71300)/(6 - 2)	-2075
74100 (11/6/2006)	71300 (8/8/2005)	(74100 - 71300)/(7 - 2)	560
71200 (2/27/2007)	71300 (8/8/2005)	(71200 - 71300)/(8 - 2)	-16.6667
43200 (2/15/2006)	45500 (11/14/2005)	(43200 - 45500)/(4 - 3)	-2300
50900 (5/24/2006)	45500 (11/14/2005)	(50900 - 45500)/(5 - 3)	2700
63000 (8/25/2006)	45500 (11/14/2005)	(63000 - 45500)/(6 - 3)	5833.33
74100 (11/6/2006)	45500 (11/14/2005)	(74100 - 45500)/(7 - 3)	7150
71200 (2/27/2007)	45500 (11/14/2005)	(71200 - 45500)/(8 - 3)	5140
50900 (5/24/2006)	43200 (2/15/2006)	(50900 - 43200)/(5 - 4)	7700
63000 (8/25/2006)	43200 (2/15/2006)	(63000 - 43200)/(6 - 4)	9900
74100 (11/6/2006)	43200 (2/15/2006)	(74100 - 43200)/(7 - 4)	10300
71200 (2/27/2007)	43200 (2/15/2006)	(71200 - 43200)/(8 - 4)	7000
63000 (8/25/2006)	50900 (5/24/2006)	(63000 - 50900)/(6 - 5)	12100
74100 (11/6/2006)	50900 (5/24/2006)	(74100 - 50900)/(7 - 5)	11600
71200 (2/27/2007)	50900 (5/24/2006)	(71200 - 50900)/(8 - 5)	6766.67
74100 (11/6/2006)	63000 (8/25/2006)	(74100 - 63000)/(7 - 6)	11100
71200 (2/27/2007)	63000 (8/25/2006)	(71200 - 63000)/(8 - 6)	4100
71200 (2/27/2007)	74100 (11/6/2006)	(71200 - 74100)/(8 - 7)	-2900

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-25800
2	-14050
3	-10350
4	-7666.67
5	-6800
6	-3825
7	-2900

8	-2300
9	-2075
10	-640
11	-16.6667
12	560
13	714.286
14	1316.67
15	2700
16	4100
17	5100
18	5140
19	5833.33
20	6766.67
21	7000
22	7150
23	7700
24	9900
25	10300
26	11100
27	11600
28	12100

Sen's Estimator (Median Q) is 2008.33

Time Period	Observations
5/18/2005	1
8/8/2005	1
11/14/2005	1
2/15/2006	1
5/24/2006	1
8/25/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -2900 = Q(7)
Upper limit is 7150 = Q(22)
-2900 < 0 < 7150 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/18/2005	66200	5
8/8/2005	71300	7
11/14/2005	45500	2
2/15/2006	43200	1
5/24/2006	50900	3
8/25/2006	63000	4
11/6/2006	74100	8
2/27/2007	71200	6

---

von Neumann ratio v = 1.30952 = 55/42
99% Critical Value = 0.62
1.30952 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0979021	0.0818505	0.683	None

Loc.	Date	Conc.	Outlier
12340E	5/18/2005	66200	FALSE
	8/8/2005	71300	FALSE
	11/14/2005	45500	FALSE
	2/15/2006	43200	FALSE
	5/24/2006	50900	FALSE
	8/25/2006	63000	FALSE
	11/6/2006	74100	FALSE
	2/27/2007	71200	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12341D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	352000	439000	87000	0.6052	52652.4
2	382000	405000	23000	0.3164	7277.2
3	385000	396000	11000	0.1743	1917.3
4	386000	389000	3000	0.0561	168.3
5	389000	386000	-3000		
6	396000	385000	-11000		
7	405000	382000	-23000		
8	439000	352000	-87000		

Sum of b values = 62015.2
Sample Standard Deviation = 24458.4
W Statistic = 0.91842

5% Critical value of 0.818 is less than 0.91842
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.91842
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
386000	439000	-53000	0	1
389000	439000	-50000	0	2
405000	439000	-34000	0	3
352000	439000	-87000	0	4
382000	439000	-57000	0	5
385000	439000	-54000	0	6
396000	439000	-43000	0	7
389000	386000	3000	1	7
405000	386000	19000	2	7
352000	386000	-34000	2	8
382000	386000	-4000	2	9
385000	386000	-1000	2	10
396000	386000	10000	3	10
405000	389000	16000	4	10
352000	389000	-37000	4	11
382000	389000	-7000	4	12
385000	389000	-4000	4	13
396000	389000	7000	5	13
352000	405000	-53000	5	14
382000	405000	-23000	5	15
385000	405000	-20000	5	16
396000	405000	-9000	5	17
382000	352000	30000	6	17
385000	352000	33000	7	17
396000	352000	44000	8	17
385000	382000	3000	9	17
396000	382000	14000	10	17
396000	385000	11000	11	17

S Statistic = 11 - 17 = -6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-6| is 0.548
0.548 >= 0.025 indicating no evidence of a trend

ChemStat Trial Version

Sen's Slope Analysis

Parameter: Na
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
386000 (8/9/2005)	439000 (5/16/2005)	(386000 - 439000)/(2 - 1)	-53000
389000 (11/15/2005)	439000 (5/16/2005)	(389000 - 439000)/(3 - 1)	-25000
405000 (2/20/2006)	439000 (5/16/2005)	(405000 - 439000)/(4 - 1)	-11333.3
352000 (5/23/2006)	439000 (5/16/2005)	(352000 - 439000)/(5 - 1)	-21750
382000 (8/28/2006)	439000 (5/16/2005)	(382000 - 439000)/(6 - 1)	-11400
385000 (11/1/2006)	439000 (5/16/2005)	(385000 - 439000)/(7 - 1)	-9000
396000 (2/20/2007)	439000 (5/16/2005)	(396000 - 439000)/(8 - 1)	-6142.86
389000 (11/15/2005)	386000 (8/9/2005)	(389000 - 386000)/(3 - 2)	3000
405000 (2/20/2006)	386000 (8/9/2005)	(405000 - 386000)/(4 - 2)	9500
352000 (5/23/2006)	386000 (8/9/2005)	(352000 - 386000)/(5 - 2)	-11333.3
382000 (8/28/2006)	386000 (8/9/2005)	(382000 - 386000)/(6 - 2)	-1000
385000 (11/1/2006)	386000 (8/9/2005)	(385000 - 386000)/(7 - 2)	-200
396000 (2/20/2007)	386000 (8/9/2005)	(396000 - 386000)/(8 - 2)	1666.67
405000 (2/20/2006)	389000 (11/15/2005)	(405000 - 389000)/(4 - 3)	16000
352000 (5/23/2006)	389000 (11/15/2005)	(352000 - 389000)/(5 - 3)	-18500
382000 (8/28/2006)	389000 (11/15/2005)	(382000 - 389000)/(6 - 3)	-2333.33
385000 (11/1/2006)	389000 (11/15/2005)	(385000 - 389000)/(7 - 3)	-1000
396000 (2/20/2007)	389000 (11/15/2005)	(396000 - 389000)/(8 - 3)	1400
352000 (5/23/2006)	405000 (2/20/2006)	(352000 - 405000)/(5 - 4)	-53000
382000 (8/28/2006)	405000 (2/20/2006)	(382000 - 405000)/(6 - 4)	-11500
385000 (11/1/2006)	405000 (2/20/2006)	(385000 - 405000)/(7 - 4)	-6666.67
396000 (2/20/2007)	405000 (2/20/2006)	(396000 - 405000)/(8 - 4)	-2250
382000 (8/28/2006)	352000 (5/23/2006)	(382000 - 352000)/(6 - 5)	30000
385000 (11/1/2006)	352000 (5/23/2006)	(385000 - 352000)/(7 - 5)	16500
396000 (2/20/2007)	352000 (5/23/2006)	(396000 - 352000)/(8 - 5)	14666.7
385000 (11/1/2006)	382000 (8/28/2006)	(385000 - 382000)/(7 - 6)	3000
396000 (2/20/2007)	382000 (8/28/2006)	(396000 - 382000)/(8 - 6)	7000
396000 (2/20/2007)	385000 (11/1/2006)	(396000 - 385000)/(8 - 7)	11000

ChemStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-53000
2	-53000
3	-25000
4	-21750
5	-18500
6	-11500
7	-11400

8	-11333.3
9	-11333.3
10	-9000
11	-6666.67
12	-6142.86
13	-2333.33
14	-2250
15	-1000
16	-1000
17	-200
18	1400
19	1666.67
20	3000
21	3000
22	7000
23	9500
24	11000
25	14666.7
26	16000
27	16500
28	30000

Sen's Estimator (Median Q) is -1625

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -11400 = Q(7)
Upper limit is 7000 = Q(22)
-11400 < 0 < 7000 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/16/2005	439000	8
8/9/2005	386000	4
11/15/2005	389000	5
2/20/2006	405000	7
5/23/2006	352000	1
8/28/2006	382000	2
11/1/2006	385000	3
2/20/2007	396000	6

---

von Neumann ratio v = 1.61905 = 68/42
99% Critical Value = 0.62
1.61905 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.596491	0.566038	0.683	None

Loc.	Date	Conc.	Outlier
12341D	5/16/2005	439000	FALSE
	8/9/2005	386000	FALSE
	11/15/2005	389000	FALSE
	2/20/2006	405000	FALSE
	5/23/2006	352000	FALSE
	8/28/2006	382000	FALSE
	11/1/2006	385000	FALSE
	2/20/2007	396000	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12341E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	14100	18100	4000	0.6052	2420.8
2	14700	16400	1700	0.3164	537.88
3	15200	16200	1000	0.1743	174.3
4	15700	16000	300	0.0561	16.83
5	16000	15700	-300		
6	16200	15200	-1000		
7	16400	14700	-1700		
8	18100	14100	-4000		

Sum of b values = 3149.81
Sample Standard Deviation = 1214.2
W Statistic = 0.961367

5% Critical value of 0.818 is less than 0.961367
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.961367
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
16000	14100	1900	1	0
18100	14100	4000	2	0
15200	14100	1100	3	0
15700	14100	1600	4	0
14700	14100	600	5	0
16400	14100	2300	6	0
16200	14100	2100	7	0
18100	16000	2100	8	0
15200	16000	-800	8	1
15700	16000	-300	8	2
14700	16000	-1300	8	3
16400	16000	400	9	3
16200	16000	200	10	3
15200	18100	-2900	10	4
15700	18100	-2400	10	5
14700	18100	-3400	10	6
16400	18100	-1700	10	7
16200	18100	-1900	[illegible]	8
15700	15200	500	11	8
14700	15200	-500	11	9
16400	15200	1200	12	9
16200	15200	1000	13	9
14700	15700	-1000	13	10
16400	15700	700	14	10
16200	15700	500	15	10
16400	14700	1700	16	10
16200	14700	1500	17	10
16200	16400	-200	17	11

ChemStat
Trial Version

S Statistic = 17 - 11 = 6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |6| is 0.548
0.548 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Na
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
16000 (8/9/2005)	14100 (5/18/2005)	(16000 - 14100)/(2 - 1)	1900
18100 (11/21/2005)	14100 (5/18/2005)	(18100 - 14100)/(3 - 1)	2000
15200 (2/15/2006)	14100 (5/18/2005)	(15200 - 14100)/(4 - 1)	366.667
15700 (5/22/2006)	14100 (5/18/2005)	(15700 - 14100)/(5 - 1)	400
14700 (8/29/2006)	14100 (5/18/2005)	(14700 - 14100)/(6 - 1)	120
16400 (11/7/2006)	14100 (5/18/2005)	(16400 - 14100)/(7 - 1)	383.333
16200 (2/27/2007)	14100 (5/18/2005)	(16200 - 14100)/(8 - 1)	300
18100 (11/21/2005)	16000 (8/9/2005)	(18100 - 16000)/(3 - 2)	2100
15200 (2/15/2006)	16000 (8/9/2005)	(15200 - 16000)/(4 - 2)	-400
15700 (5/22/2006)	16000 (8/9/2005)	(15700 - 16000)/(5 - 2)	-100
14700 (8/29/2006)	16000 (8/9/2005)	(14700 - 16000)/(6 - 2)	-325
16400 (11/7/2006)	16000 (8/9/2005)	(16400 - 16000)/(7 - 2)	80
16200 (2/27/2007)	16000 (8/9/2005)	(16200 - 16000)/(8 - 2)	33.3333
15200 (2/15/2006)	[illegible] (11/21/2005)	(15200 - 18100)/(4 - 3)	-2900
15700 (5/22/2006)	18100 (11/21/2005)	[illegible] - 3)	-1200
14700 (8/29/2006)	18100 (11/21/2005)	[illegible] - 3)	-1133.33
16400 (11/7/2006)	18100 (11/21/2005)	(16400 - 18100)/(7 - 3)	-425
16200 (2/27/2007)	18100 (11/21/2005)	(16200 - 18100)/(8 - 3)	-380
15700 (5/22/2006)	[illegible]	[illegible]	500
14700 (8/29/2006)	[illegible]	[illegible]	-250
16400 (11/7/2006)	15200 (2/15/2006)	(16400 - 15200)/(7 - 4)	400
16200 (2/27/2007)	15200 (2/15/2006)	(16200 - 15200)/(8 - 4)	250
14700 (8/29/2006)	15700 (5/22/2006)	(14700 - 15700)/(6 - 5)	-1000
16400 (11/7/2006)	15700 (5/22/2006)	(16400 - 15700)/(7 - 5)	350
16200 (2/27/2007)	15700 (5/22/2006)	(16200 - 15700)/(8 - 5)	166.667
16400 (11/7/2006)	14700 (8/29/2006)	(16400 - 14700)/(7 - 6)	1700
16200 (2/27/2007)	14700 (8/29/2006)	(16200 - 14700)/(8 - 6)	750
16200 (2/27/2007)	16400 (11/7/2006)	(16200 - 16400)/(8 - 7)	-200

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-2900
2	-1200
3	-1133.33
4	-1000
5	-425
6	-400
7	-380

8	-325
9	-250
10	-200
11	-100
12	33.3333
13	80
14	120
15	166.667
16	250
17	300
18	350
19	366.667
20	383.333
21	400
22	400
23	500
24	750
25	1700
26	1900
27	2000
28	2100

Sen's Estimator (Median Q) is 143.333

Time Period	Observations
5/18/2005	1
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -380 = Q(7)
Upper limit is 400 = Q(22)
-380 < 0 < 400 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/18/2005	14100	1
8/9/2005	16000	5
11/21/2005	18100	8
2/15/2006	15200	3
5/22/2006	15700	4
8/29/2006	14700	2
11/7/2006	16400	7
2/27/2007	16200	6

---

von Neumann ratio v = 1.92857 = 81/42
99% Critical Value = 0.62
1.92857 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.5	0.26087	0.683	None

Loc.	Date	Conc.	Outlier
12341E	5/18/2005	14100	FALSE
	8/9/2005	16000	FALSE
	11/21/2005	18100	FALSE
	2/15/2006	15200	FALSE
	5/22/2006	15700	FALSE
	8/29/2006	14700	FALSE
	11/7/2006	16400	FALSE
	2/27/2007	16200	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12342D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	328000	409000	81000	0.6052	49021.2
2	330000	395000	65000	0.3164	20566
3	332000	350000	18000	0.1743	3137.4
4	337000	342000	5000	0.0561	280.5
5	342000	337000	-5000		
6	350000	332000	-18000		
7	395000	330000	-65000		
8	409000	328000	-81000		

Sum of b values = 73005.1
Sample Standard Deviation = 31352.5
W Statistic = 0.774574

5% Critical value of 0.818 exceeds 0.774574
Evidence of non-normality at 95% level of significance

1% Critical value of 0.749 is less than 0.774574
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
395000	409000	-14000	0	1
328000	409000	-81000	0	2
350000	409000	-59000	0	3
337000	409000	-72000	0	4
330000	409000	-79000	0	5
342000	409000	-67000	0	6
332000	409000	-77000	0	7
328000	395000	-67000	0	8
350000	395000	-45000	0	9
337000	395000	-58000	0	10
330000	395000	-65000	0	11
342000	395000	-53000	0	12
332000	395000	-63000	0	13
350000	328000	22000	1	13
337000	328000	9000	2	13
330000	328000	2000	3	13
342000	328000	14000	4	13
332000	328000	4000	4	13
337000	350000	-13000	5	14
330000	350000	-20000	5	15
342000	350000	-8000	5	16
332000	350000	-18000	5	17
330000	337000	-7000	5	18
342000	337000	5000	6	18
332000	337000	-5000	6	19
342000	330000	12000	7	19
332000	330000	2000	8	19
332000	342000	-10000	8	20

ChemStat Trial Version

S Statistic = 8 - 20 = -12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-12| is 0.178
0.178 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Na
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
395000 (8/10/2005)	409000 (5/10/2005)	(395000 - 409000)/(2 - 1)	-14000
328000 (11/15/2005)	409000 (5/10/2005)	(328000 - 409000)/(3 - 1)	-40500
350000 (2/20/2006)	409000 (5/10/2005)	(350000 - 409000)/(4 - 1)	-19666.7
337000 (5/23/2006)	409000 (5/10/2005)	(337000 - 409000)/(5 - 1)	-18000
330000 (8/28/2006)	409000 (5/10/2005)	(330000 - 409000)/(6 - 1)	-15800
342000 (11/1/2006)	409000 (5/10/2005)	(342000 - 409000)/(7 - 1)	-11166.7
332000 (2/20/2007)	409000 (5/10/2005)	(332000 - 409000)/(8 - 1)	-11000
328000 (11/15/2005)	395000 (8/10/2005)	(328000 - 395000)/(3 - 2)	-67000
350000 (2/20/2006)	395000 (8/10/2005)	(350000 - 395000)/(4 - 2)	-22500
337000 (5/23/2006)	395000 (8/10/2005)	(337000 - 395000)/(5 - 2)	-19333.3
330000 (8/28/2006)	395000 (8/10/2005)	(330000 - 395000)/(6 - 2)	-16250
342000 (11/1/2006)	395000 (8/10/2005)	(342000 - 395000)/(7 - 2)	-10600
332000 (2/20/2007)	395000 (8/10/2005)	(332000 - 395000)/(8 - 2)	-10500
350000 (2/20/2006)	328000 (11/15/2005)	(350000 - 328000)/(4 - 3)	22000
337000 (5/23/2006)	328000 (11/15/2005)	(337000 - 328000)/(5 - 3)	4500
330000 (8/28/2006)	328000 (11/15/2005)	(330000 - 328000)/(6 - 3)	666.667
342000 (11/1/2006)	328000 (11/15/2005)	(342000 - 328000)/(7 - 3)	3500
332000 (2/20/2007)	328000 (11/15/2005)	(332000 - 328000)/(8 - 3)	800
337000 (5/23/2006)	350000 (2/20/2006)	(337000 - 350000)/(5 - 4)	-13000
330000 (8/28/2006)	350000 (2/20/2006)	(330000 - 350000)/(6 - 4)	-10000
342000 (11/1/2006)	350000 (2/20/2006)	(342000 - 350000)/(7 - 4)	-2666.67
332000 (2/20/2007)	350000 (2/20/2006)	(332000 - 350000)/(8 - 4)	-4500
330000 (8/28/2006)	337000 (5/23/2006)	(330000 - 337000)/(6 - 5)	-7000
342000 (11/1/2006)	337000 (5/23/2006)	(342000 - 337000)/(7 - 5)	2500
332000 (2/20/2007)	337000 (5/23/2006)	(332000 - 337000)/(8 - 5)	-1666.67
342000 (11/1/2006)	330000 (8/28/2006)	(342000 - 330000)/(7 - 6)	12000
332000 (2/20/2007)	330000 (8/28/2006)	(332000 - 330000)/(8 - 6)	1000
332000 (2/20/2007)	342000 (11/1/2006)	(332000 - 342000)/(8 - 7)	-10000

ChemStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-67000
2	-40500
3	-22500
4	-19666.7
5	-19333.3
6	-18000
7	-16250

8	-15800
9	-14000
10	-13000
11	-11166.7
12	-11000
13	-10600
14	-10500
15	-10000
16	-10000
17	-7000
18	-4500
19	-2666.67
20	-1666.67
21	666.667
22	800
23	1000
24	2500
25	3500
26	4500
27	12000
28	22000

Sen's Estimator (Median Q) is -10250

Time Period	Observations
5/10/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -16250 = Q(7)
Upper limit is 800 = Q(22)
-16250 < 0 < 800 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/10/2005	409000	8
8/10/2005	395000	7
11/15/2005	328000	1
2/20/2006	350000	6
5/23/2006	337000	4
8/28/2006	330000	2
11/1/2006	342000	5
2/20/2007	332000	3

---

von Neumann ratio v = 1.97619 = 83/42
99% Critical Value = 0.62
1.97619 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.177215	0.0298507	0.683	None

Loc.	Date	Conc.	Outlier
12342D	5/10/2005	409000	FALSE
	8/10/2005	395000	FALSE
	11/15/2005	328000	FALSE
	2/20/2006	350000	FALSE
	5/23/2006	337000	FALSE
	8/28/2006	330000	FALSE
	11/1/2006	342000	FALSE
	2/20/2007	332000	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12342E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	17000	26800	9800	0.6052	5930.96
2	17900	25400	7500	0.3164	2373
3	18400	20800	2400	0.1743	418.32
4	18800	20300	1500	0.0561	84.15
5	20300	18800	-1500		
6	20800	18400	-2400		
7	25400	17900	-7500		
8	26800	17000	-9800		

Sum of b values = 8806.43
Sample Standard Deviation = 3583.59
W Statistic = 0.862709

5% Critical value of 0.818 is less than 0.862709
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.862709
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
18400	17000	1400	1	0
18800	17000	1800	2	0
17900	17000	900	3	0
20300	17000	3300	4	0
20800	17000	3800	5	0
26800	17000	9800	6	0
25400	17000	8400	7	0
18800	18400	400	8	0
17900	18400	-500	8	1
20300	18400	1900	9	1
20800	18400	2400	10	1
26800	18400	8400	11	1
25400	18400	7000	12	1
17900	18800	-900	12	2
20300	18800	1500	13	2
20800	18800	2000	14	2
26800	18800	8000	15	2
25400	18800	6600	[illegible]	2
20300	17900	2400	17	2
20800	17900	2900	18	2
26800	17900	8900	19	2
25400	17900	7500	20	2
20800	20300	500	21	2
26800	20300	6500	22	2
25400	20300	5100	23	2
26800	20800	6000	24	2
25400	20800	4600	25	2
25400	26800	-1400	25	3

ChemStat Trial Version

S Statistic = 25 - 3 = 22
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 22 is 0.0028
S > 0 and 0.0028 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: Na
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
18400 (8/10/2005)	17000 (5/18/2005)	(18400 - 17000)/(2 - 1)	1400
18800 (11/21/2005)	17000 (5/18/2005)	(18800 - 17000)/(3 - 1)	900
17900 (2/15/2006)	17000 (5/18/2005)	(17900 - 17000)/(4 - 1)	300
20300 (5/22/2006)	17000 (5/18/2005)	(20300 - 17000)/(5 - 1)	825
20800 (8/29/2006)	17000 (5/18/2005)	(20800 - 17000)/(6 - 1)	760
26800 (11/7/2006)	17000 (5/18/2005)	(26800 - 17000)/(7 - 1)	1633.33
25400 (2/27/2007)	17000 (5/18/2005)	(25400 - 17000)/(8 - 1)	1200
18800 (11/21/2005)	18400 (8/10/2005)	(18800 - 18400)/(3 - 2)	400
17900 (2/15/2006)	18400 (8/10/2005)	(17900 - 18400)/(4 - 2)	-250
20300 (5/22/2006)	18400 (8/10/2005)	(20300 - 18400)/(5 - 2)	633.333
20800 (8/29/2006)	18400 (8/10/2005)	(20800 - 18400)/(6 - 2)	600
26800 (11/7/2006)	18400 (8/10/2005)	(26800 - 18400)/(7 - 2)	1680
25400 (2/27/2007)	18400 (8/10/2005)	(25400 - 18400)/(8 - 2)	1166.67
17900 (2/15/2006)	18800 (11/21/2005)	(17900 - 18800)/(4 - 3)	-900
20300 (5/22/2006)	18800 (11/21/2005)	(20300 - 18800)/(5 - 3)	750
20800 (8/29/2006)	18800 (11/21/2005)	(20800 - 18800)/(6 - 3)	666.667
26800 (11/7/2006)	18800 (11/21/2005)	(26800 - 18800)/(7 - 3)	2000
25400 (2/27/2007)	18800 (11/21/2005)	(25400 - 18800)/(8 - 3)	1320
20300 (5/22/2006)	17900 (2/15/2006)	(20300 - 17900)/(5 - 4)	2400
20800 (8/29/2006)	17900 (2/15/2006)	(20800 - 17900)/(6 - 4)	1450
26800 (11/7/2006)	17900 (2/15/2006)	(26800 - 17900)/(7 - 4)	2966.67
25400 (2/27/2007)	17900 (2/15/2006)	(25400 - 17900)/(8 - 4)	1875
20800 (8/29/2006)	20300 (5/22/2006)	(20800 - 20300)/(6 - 5)	500
26800 (11/7/2006)	20300 (5/22/2006)	(26800 - 20300)/(7 - 5)	3250
25400 (2/27/2007)	20300 (5/22/2006)	(25400 - 20300)/(8 - 5)	1700
26800 (11/7/2006)	20800 (8/29/2006)	(26800 - 20800)/(7 - 6)	6000
25400 (2/27/2007)	20800 (8/29/2006)	(25400 - 20800)/(8 - 6)	2300
25400 (2/27/2007)	26800 (11/7/2006)	(25400 - 26800)/(8 - 7)	-1400

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-1400
2	-900
3	-250
4	300
5	400
6	500
7	600

8	633.333
9	666.667
10	750
11	760
12	825
13	900
14	1166.67
15	1200
16	1320
17	1400
18	1450
19	1633.33
20	1680
21	1700
22	1875
23	2000
24	2300
25	2400
26	2966.67
27	3250
28	6000

Sen's Estimator (Median Q) is 1183.33

Time Period	**Observations**
5/18/2005	1
8/10/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 600 = Q(7)
Upper limit is 1875 = Q(22)
600 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/18/2005	17000	1
8/10/2005	18400	3
11/21/2005	18800	4
2/15/2006	17900	2
5/22/2006	20300	5
8/29/2006	20800	6
11/7/2006	26800	8
2/27/2007	25400	7

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von Neumann ratio v = 0.571429 = 24/42
99% Critical Value = 0.62
0.571429 <= 0.62
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.157303	0.107143	0.683	None

Loc.	Date	Conc.	Outlier
12342E	5/18/2005	17000	FALSE
	8/10/2005	18400	FALSE
	11/21/2005	18800	FALSE
	2/15/2006	17900	FALSE
	5/22/2006	20300	FALSE
	8/29/2006	20800	FALSE
	11/7/2006	26800	FALSE
	2/27/2007	25400	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12343D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	372000	440000	68000	0.6052	41153.6
2	375000	438000	63000	0.3164	19933.2
3	379000	427000	48000	0.1743	8366.4
4	408000	416000	8000	0.0561	448.8
5	416000	408000	-8000		
6	427000	379000	-48000		
7	438000	375000	-63000		
8	440000	372000	-68000		

Sum of b values = 69902
Sample Standard Deviation = 28195.4
W Statistic = 0.878059

5% Critical value of 0.818 is less than 0.878059
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.878059
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
440000	438000	2000	1	0
408000	438000	-30000	1	1
427000	438000	-11000	1	2
416000	438000	-22000	1	3
372000	438000	-66000	1	4
375000	438000	-63000	1	5
379000	438000	-59000	1	6
408000	440000	-32000	1	7
427000	440000	-13000	1	8
416000	440000	-24000	1	9
372000	440000	-68000	1	10
375000	440000	-65000	1	11
379000	440000	-61000	1	12
427000	408000	19000	2	12
416000	408000	8000	2	12
372000	408000	-36000	3	13
375000	408000	-33000	3	14
379000	408000	-29000	3	15
416000	427000	-11000	3	16
372000	427000	-55000	3	17
375000	427000	-52000	3	18
379000	427000	-48000	3	19
372000	416000	-44000	3	20
375000	416000	-41000	3	21
379000	416000	-37000	3	22
375000	372000	3000	4	22
379000	372000	7000	5	22
379000	375000	4000	6	22

ChemStat
Trial Version

S Statistic = 6 - 22 = -16
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 16 is 0.031
S < 0 and 0.031 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: Na
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
440000 (8/10/2005)	438000 (5/9/2005)	(440000 - 438000)/(2 - 1)	2000
408000 (11/15/2005)	438000 (5/9/2005)	(408000 - 438000)/(3 - 1)	-15000
427000 (2/20/2006)	438000 (5/9/2005)	(427000 - 438000)/(4 - 1)	-3666.67
416000 (5/23/2006)	438000 (5/9/2005)	(416000 - 438000)/(5 - 1)	-5500
372000 (8/28/2006)	438000 (5/9/2005)	(372000 - 438000)/(6 - 1)	-13200
375000 (11/2/2006)	438000 (5/9/2005)	(375000 - 438000)/(7 - 1)	-10500
379000 (2/20/2007)	438000 (5/9/2005)	(379000 - 438000)/(8 - 1)	-8428.57
408000 (11/15/2005)	440000 (8/10/2005)	(408000 - 440000)/(3 - 2)	-32000
427000 (2/20/2006)	440000 (8/10/2005)	(427000 - 440000)/(4 - 2)	-6500
416000 (5/23/2006)	440000 (8/10/2005)	(416000 - 440000)/(5 - 2)	-8000
372000 (8/28/2006)	440000 (8/10/2005)	(372000 - 440000)/(6 - 2)	-17000
375000 (11/2/2006)	440000 (8/10/2005)	(375000 - 440000)/(7 - 2)	-13000
379000 (2/20/2007)	440000 (8/10/2005)	(379000 - 440000)/(8 - 2)	-10166.7
427000 (2/20/2006)	408000 (11/15/2005)	(427000 - 408000)/(4 - 3)	19000
416000 (5/23/2006)	408000 (11/15/2005)	(416000 - 408000)/(5 - 3)	4000
372000 (8/28/2006)	408000 (11/15/2005)	(372000 - 408000)/(6 - 3)	-12000
375000 (11/2/2006)	408000 (11/15/2005)	(375000 - 408000)/(7 - 3)	-8250
379000 (2/20/2007)	408000 (11/15/2005)	(379000 - 408000)/(8 - 3)	-5800
416000 (5/23/2006)	427000 (2/20/2006)	(416000 - 427000)/(5 - 4)	-11000
372000 (8/28/2006)	427000 (2/20/2006)	(372000 - 427000)/(6 - 4)	-27500
375000 (11/2/2006)	427000 (2/20/2006)	(375000 - 427000)/(7 - 4)	-17333.3
379000 (2/20/2007)	427000 (2/20/2006)	(379000 - 427000)/(8 - 4)	-12000
372000 (8/28/2006)	416000 (5/23/2006)	(372000 - 416000)/(6 - 5)	-44000
375000 (11/2/2006)	416000 (5/23/2006)	(375000 - 416000)/(7 - 5)	-20500
379000 (2/20/2007)	416000 (5/23/2006)	(379000 - 416000)/(8 - 5)	-12333.3
375000 (11/2/2006)	372000 (8/28/2006)	(375000 - 372000)/(7 - 6)	3000
379000 (2/20/2007)	372000 (8/28/2006)	(379000 - 372000)/(8 - 6)	3500
379000 (2/20/2007)	375000 (11/2/2006)	(379000 - 375000)/(8 - 7)	4000

GraphPad Prism Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-44000
2	-32000
3	-27500
4	-20500
5	-17333.3
6	-17000
7	-15000

8	-13200
9	-13000
10	-12333.3
11	-12000
12	-12000
13	-11000
14	-10500
15	-10166.7
16	-8428.57
17	-8250
18	-8000
19	-6500
20	-5800
21	-5500
22	-3666.67
23	2000
24	3000
25	3500
26	4000
27	4000
28	19000

Sen's Estimator (Median Q) is -10333.3

Time Period	**Observations**
5/9/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/2/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -15000 = Q(7)
Upper limit is -3666.67 = Q(22)
-3666.67 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/9/2005	438000	7
8/10/2005	440000	8
11/15/2005	408000	4
2/20/2006	427000	6
5/23/2006	416000	5
8/28/2006	372000	1
11/2/2006	375000	2
2/20/2007	379000	3

---

von Neumann ratio v = 0.952381 = 40/42
99% Critical Value = 0.62
0.952381 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0307692	0.0454545	0.683	None

Loc.	Date	Conc.	Outlier
12343D	5/9/2005	438000	FALSE
	8/10/2005	440000	FALSE
	11/15/2005	408000	FALSE
	2/20/2006	427000	FALSE
	5/23/2006	416000	FALSE
	8/28/2006	372000	FALSE
	11/2/2006	375000	FALSE
	2/20/2007	379000	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12343E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	33900	65700	31800	0.6233	19820.9
2	37600	59700	22100	0.3031	6698.51
3	39500	56600	17100	0.1401	2395.71
4	52100	52100	0		
5	56600	39500	-17100		
6	59700	37600	-22100		
7	65700	33900	-31800		

Sum of b values = 28915.2
Sample Standard Deviation = 12304.1
W Statistic = 0.920455

5% Critical value of 0.803 is less than 0.920455
Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less than 0.920455
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
65700	59700	6000	1	0
33900	59700	-25800	1	1
37600	59700	-22100	1	2
39500	59700	-20200	1	3
52100	59700	-7600	1	4
56600	59700	-3100	1	5
33900	65700	-31800	1	6
37600	65700	-28100	1	7
39500	65700	-26200	1	8
52100	65700	-13600	1	9
56600	65700	-9100	1	10
37600	33900	3700	2	10
39500	33900	[illegible]	3	[illegible]
52100	33900	18200	[illegible]	10
56600	33900	22700	[illegible]	[illegible]
39500	37600	1900	6	10
52100	37600	14500	[illegible]	10
56600	37600	19000	8	[illegible]
52100	39500	12600	9	10
56600	39500	17100	10	10
56600	52100	4500	11	10

ChemStat
Trial Version

S Statistic = 11 - 10 = 1
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |1| is 1
1 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: Na
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
65700 (11/21/2005)	59700 (8/9/2005)	(65700 - 59700)/(2 - 1)	6000
33900 (2/15/2006)	59700 (8/9/2005)	(33900 - 59700)/(3 - 1)	-12900
37600 (5/22/2006)	59700 (8/9/2005)	(37600 - 59700)/(4 - 1)	-7366.67
39500 (8/29/2006)	59700 (8/9/2005)	(39500 - 59700)/(5 - 1)	-5050
52100 (11/7/2006)	59700 (8/9/2005)	(52100 - 59700)/(6 - 1)	-1520
56600 (2/27/2007)	59700 (8/9/2005)	(56600 - 59700)/(7 - 1)	-516.667
33900 (2/15/2006)	65700 (11/21/2005)	(33900 - 65700)/(3 - 2)	-31800
37600 (5/22/2006)	65700 (11/21/2005)	(37600 - 65700)/(4 - 2)	-14050
39500 (8/29/2006)	65700 (11/21/2005)	(39500 - 65700)/(5 - 2)	-8733.33
52100 (11/7/2006)	65700 (11/21/2005)	(52100 - 65700)/(6 - 2)	-3400
56600 (2/27/2007)	65700 (11/21/2005)	(56600 - 65700)/(7 - 2)	-1820
37600 (5/22/2006)	33900 (2/15/2006)	(37600 - 33900)/(4 - 3)	3700
39500 (8/29/2006)	33900 (2/15/2006)	(39500 - 33900)/(5 - 3)	2800
52100 (11/7/2006)	33900 (2/15/2006)	(52100 - 33900)/(6 - 3)	6066.67
56600 (2/27/2007)	33900 (2/15/2006)	(56600 - 33900)/(7 - 3)	5675
39500 (8/29/2006)	37600 (5/22/2006)	(39500 - 37600)/(5 - 4)	1900
52100 (11/7/2006)	37600 (5/22/2006)	(52100 - 37600)/(6 - 4)	7250
56600 (2/27/2007)	37600 (5/22/2006)	(56600 - 37600)/(7 - 4)	6333.33
52100 (11/7/2006)	39500 (8/29/2006)	(52100 - 39500)/(6 - 5)	12600
56600 (2/27/2007)	39500 (8/29/2006)	(56600 - 39500)/(7 - 5)	8550
56600 (2/27/2007)	52100 (11/7/2006)	(56600 - 52100)/(7 - 6)	4500

ChemStat Trial Version

Number of Q values = 21

Ordered Q Values

n	Q
1	-31800
2	-14050
3	-12900
4	-8733.33
5	-7366.67
6	-5050
7	-3400
8	-1820
9	-1520
10	-516.667
11	1900
12	2800
13	3700
14	4500
15	5675

16	6000
17	6066.67
18	6333.33
19	7250
20	8550
21	12600

Sen's Estimator (Median Q) is 1900

Time Period	Observations
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02404
M2 = (21 + 10.952)/2.0 + 1 = 16.976
Lower limit is -7366.67 = Q(5)
Upper limit is 6066.67 = Q(17)
-7366.67 < 0 < 6066.67 indicating no trend in data.

ChemStat Trial Version

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
8/9/2005	59700	6
11/21/2005	65700	7
2/15/2006	33900	1
5/22/2006	37600	2
8/29/2006	39500	3
11/7/2006	52100	4
2/27/2007	56600	5

---

von Neumann ratio v = 1.46429 = 41/28
99% Critical Value = 0.54
1.46429 > 0.54
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 7 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.188679	0.116352	0.637	None

Loc.	Date	Conc.	Outlier
12343E	8/9/2005	59700	FALSE
	11/21/2005	65700	FALSE
	2/15/2006	33900	FALSE
	5/22/2006	37600	FALSE
	8/29/2006	39500	FALSE
	11/7/2006	52100	FALSE
	2/27/2007	56600	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12344D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	485000	913000	428000	0.6052	259026
2	524000	756000	232000	0.3164	73404.8
3	534000	732000	198000	0.1743	34511.4
4	535000	639000	104000	0.0561	5834.4
5	639000	535000	-104000		
6	732000	534000	-198000		
7	756000	524000	-232000		
8	913000	485000	-428000		

Sum of b values = 372776
Sample Standard Deviation = 149376
W Statistic = 0.889691

5% Critical value of 0.818 is less than 0.889691
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.889691
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
639000	913000	-274000	0	1
732000	913000	-181000	0	2
756000	913000	-157000	0	3
534000	913000	-379000	0	4
524000	913000	-389000	0	5
535000	913000	-378000	0	6
485000	913000	-428000	0	7
732000	639000	93000	1	7
756000	639000	117000	2	7
534000	639000	-105000	2	8
524000	639000	-115000	2	9
535000	639000	-104000	2	10
485000	639000	-154000	2	11
756000	732000	24000	[illegible]	[illegible]
534000	732000	-198000	3	12
524000	732000	-208000	3	13
535000	732000	-197000	3	14
485000	732000	-247000	[illegible]	15
534000	756000	-22000	3	16
524000	756000	-232000	3	17
535000	756000	-221000	3	18
485000	756000	-271000	3	19
524000	534000	-10000	3	20
535000	534000	1000	4	20
485000	534000	-49000	4	21
535000	524000	11000	5	21
485000	524000	-39000	5	22
485000	535000	-50000	5	23

ChemStat
Trial Version

S Statistic = 5 - 23 = -18
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 18 is 0.016
S < 0 and 0.016 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: Na
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
639000 (8/23/2005)	913000 (5/31/2005)	(639000 - 913000)/(2 - 1)	-274000
732000 (11/16/2005)	913000 (5/31/2005)	(732000 - 913000)/(3 - 1)	-90500
756000 (2/21/2006)	913000 (5/31/2005)	(756000 - 913000)/(4 - 1)	-52333.3
534000 (5/30/2006)	913000 (5/31/2005)	(534000 - 913000)/(5 - 1)	-94750
524000 (8/23/2006)	913000 (5/31/2005)	(524000 - 913000)/(6 - 1)	-77800
535000 (11/2/2006)	913000 (5/31/2005)	(535000 - 913000)/(7 - 1)	-63000
485000 (2/21/2007)	913000 (5/31/2005)	(485000 - 913000)/(8 - 1)	-61142.9
732000 (11/16/2005)	639000 (8/23/2005)	(732000 - 639000)/(3 - 2)	93000
756000 (2/21/2006)	639000 (8/23/2005)	(756000 - 639000)/(4 - 2)	58500
534000 (5/30/2006)	639000 (8/23/2005)	(534000 - 639000)/(5 - 2)	-35000
524000 (8/23/2006)	639000 (8/23/2005)	(524000 - 639000)/(6 - 2)	-28750
535000 (11/2/2006)	639000 (8/23/2005)	(535000 - 639000)/(7 - 2)	-20800
485000 (2/21/2007)	639000 (8/23/2005)	(485000 - 639000)/(8 - 2)	-25666.7
756000 (2/21/2006)	732000 (11/16/2005)	(756000 - 732000)/(4 - 3)	24000
534000 (5/30/2006)	732000 (11/16/2005)	(534000 - 732000)/(5 - 3)	-99000
524000 (8/23/2006)	732000 (11/16/2005)	(524000 - 732000)/(6 - 3)	-69333.3
535000 (11/2/2006)	732000 (11/16/2005)	(535000 - 732000)/(7 - 3)	-49250
485000 (2/21/2007)	732000 (11/16/2005)	(485000 - 732000)/(8 - 3)	-49400
534000 (5/30/2006)	756000 (2/21/2006)	(534000 - 756000)/(5 - 4)	-222000
524000 (8/23/2006)	756000 (2/21/2006)	(524000 - 756000)/(6 - 4)	-116000
535000 (11/2/2006)	756000 (2/21/2006)	(535000 - 756000)/(7 - 4)	-73666.7
485000 (2/21/2007)	756000 (2/21/2006)	(485000 - 756000)/(8 - 4)	-67750
524000 (8/23/2006)	534000 (5/30/2006)	(524000 - 534000)/(6 - 5)	-10000
535000 (11/2/2006)	534000 (5/30/2006)	(535000 - 534000)/(7 - 5)	500
485000 (2/21/2007)	534000 (5/30/2006)	(485000 - 534000)/(8 - 5)	-16333.3
535000 (11/2/2006)	524000 (8/23/2006)	(535000 - 524000)/(7 - 6)	11000
485000 (2/21/2007)	524000 (8/23/2006)	(485000 - 524000)/(8 - 6)	-19500
485000 (2/21/2007)	535000 (11/2/2006)	(485000 - 535000)/(8 - 7)	-50000

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-274000
2	-222000
3	-116000
4	-99000
5	-94750
6	-90500
7	-77800

8	-73666.7
9	-69333.3
10	-67750
11	-63000
12	-61142.9
13	-52333.3
14	-50000
15	-49400
16	-49250
17	-35000
18	-28750
19	-25666.7
20	-20800
21	-19500
22	-16333.3
23	-10000
24	500
25	11000
26	24000
27	58500
28	93000

Sen's Estimator (Median Q) is -49700

Time Period	Observations
5/31/2005	1
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
8/23/2006	1
11/2/2006	1
2/21/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -77800 = Q(7)
Upper limit is -16333.3 = Q(22)
-16333.3 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
5/31/2005	913000	8
8/23/2005	639000	5
11/16/2005	732000	6
2/21/2006	756000	7
5/30/2006	534000	3
8/23/2006	524000	2
11/2/2006	535000	4
2/21/2007	485000	1

---

von Neumann ratio v = 0.97619 = 41/42
99% Critical Value = 0.62
0.97619 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.403599	0.143911	0.683	None

Loc.	Date	Conc.	Outlier
12344D	5/31/2005	913000	FALSE
	8/23/2005	639000	FALSE
	11/16/2005	732000	FALSE
	2/21/2006	756000	FALSE
	5/30/2006	534000	FALSE
	8/23/2006	524000	FALSE
	11/2/2006	535000	FALSE
	2/21/2007	485000	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12344E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	19800	25100	5300	0.6052	3207.56
2	20100	22400	2300	0.3164	727.72
3	20900	22200	1300	0.1743	226.59
4	21000	21400	400	0.0561	22.44
5	21400	21000	-400		
6	22200	20900	-1300		
7	22400	20100	-2300		
8	25100	19800	-5300		

Sum of b values = 4184.31
Sample Standard Deviation = 1674.55
W Statistic = 0.89198

5% Critical value of 0.818 is less than 0.89198
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.89198
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
22400	25100	-2700	0	1
21000	25100	-4100	0	2
22200	25100	-2900	0	3
19800	25100	-5300	0	4
20900	25100	-4200	0	5
21400	25100	-3700	0	6
20100	25100	-5000	0	7
21000	22400	-1400	0	8
22200	22400	-200	0	9
19800	22400	-2600	0	10
20900	22400	-1500	0	11
21400	22400	-1000	0	12
20100	22400	-2300	0	13
22200	21000	1200	1	13
19800	21000	-1200	1	14
20900	21000	-100	1	15
21400	21000	400	2	15
20100	21000	-900	2	16
19800	22200	-400	2	17
20900	22200	-1300	2	18
21400	22200	-800	2	19
20100	22200	-2100	2	20
20900	19800	1100	3	20
21400	19800	1600	4	20
20100	19800	300	5	20
21400	20900	500	6	20
20100	20900	-800	6	21
20100	21400	-1300	6	22

ChemStat
Trial Version

S Statistic = 6 - 22 = -16
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 16 is 0.031
S < 0 and 0.031 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: Na
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
22400 (10/11/2005)	25100 (8/24/2005)	(22400 - 25100)/(2 - 1)	-2700
21000 (12/13/2005)	25100 (8/24/2005)	(21000 - 25100)/(3 - 1)	-2050
22200 (2/14/2006)	25100 (8/24/2005)	(22200 - 25100)/(4 - 1)	-966.667
19800 (5/31/2006)	25100 (8/24/2005)	(19800 - 25100)/(5 - 1)	-1325
20900 (8/21/2006)	25100 (8/24/2005)	(20900 - 25100)/(6 - 1)	-840
21400 (11/7/2006)	25100 (8/24/2005)	(21400 - 25100)/(7 - 1)	-616.667
20100 (2/27/2007)	25100 (8/24/2005)	(20100 - 25100)/(8 - 1)	-714.286
21000 (12/13/2005)	22400 (10/11/2005)	(21000 - 22400)/(3 - 2)	-1400
22200 (2/14/2006)	22400 (10/11/2005)	(22200 - 22400)/(4 - 2)	-100
19800 (5/31/2006)	22400 (10/11/2005)	(19800 - 22400)/(5 - 2)	-866.667
20900 (8/21/2006)	22400 (10/11/2005)	(20900 - 22400)/(6 - 2)	-375
21400 (11/7/2006)	22400 (10/11/2005)	(21400 - 22400)/(7 - 2)	-200
20100 (2/27/2007)	22400 (10/11/2005)	(20100 - 22400)/(8 - 2)	-383.333
22200 (2/14/2006)	21000 (12/13/2005)	(22200 - 21000)/(4 - 3)	1200
19800 (5/31/2006)	21000 (12/13/2005)	(19800 - 21000)/(5 - 3)	-600
20900 (8/21/2006)	21000 (12/13/2005)	(20900 - 21000)/(6 - 3)	-33.3333
21400 (11/7/2006)	21000 (12/13/2005)	(21400 - 21000)/(7 - 3)	100
20100 (2/27/2007)	21000 (12/13/2005)	(20100 - 21000)/(8 - 3)	-180
19800 (5/31/2006)	22200 (2/14/2006)	(19800 - 22200)/(5 - 4)	-2400
20900 (8/21/2006)	22200 (2/14/2006)	(20900 - 22200)/(6 - 4)	-650
21400 (11/7/2006)	22200 (2/14/2006)	(21400 - 22200)/(7 - 4)	-266.667
20100 (2/27/2007)	22200 (2/14/2006)	(20100 - 22200)/(8 - 4)	-525
20900 (8/21/2006)	19800 (5/31/2006)	(20900 - 19800)/(6 - 5)	1100
21400 (11/7/2006)	19800 (5/31/2006)	(21400 - 19800)/(7 - 5)	800
20100 (2/27/2007)	19800 (5/31/2006)	(20100 - 19800)/(8 - 5)	100
21400 (11/7/2006)	20900 (8/21/2006)	(21400 - 20900)/(7 - 6)	500
20100 (2/27/2007)	20900 (8/21/2006)	(20100 - 20900)/(8 - 6)	-400
20100 (2/27/2007)	21400 (11/7/2006)	(20100 - 21400)/(8 - 7)	-1300

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-2700
2	-2400
3	-2050
4	-1400
5	-1325
6	-1300
7	-966.667

8	-866.667
9	-840
10	-714.286
11	-650
12	-616.667
13	-600
14	-525
15	-400
16	-383.333
17	-375
18	-266.667
19	-200
20	-180
21	-100
22	-33.3333
23	100
24	100
25	500
26	800
27	1100
28	1200

Sen's Estimator (Median Q) is -462.5

Time Period	Observations
8/24/2005	1
10/11/2005	1
12/13/2005	1
2/14/2006	1
5/31/2006	1
8/21/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -966.667 = Q(7)
Upper limit is -33.3333 = Q(22)
-33.3333 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
8/24/2005	25100	8
10/11/2005	22400	7
12/13/2005	21000	4
2/14/2006	22200	6
5/31/2006	19800	1
8/21/2006	20900	3
11/7/2006	21400	5
2/27/2007	20100	2

---

von Neumann ratio v = 1.33333 = 56/42
99% Critical Value = 0.62
1.33333 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.54	0.115385	0.683	None

Loc.	Date	Conc.	Outlier
12344E	8/24/2005	25100	FALSE
	10/11/2005	22400	FALSE
	12/13/2005	21000	FALSE
	2/14/2006	22200	FALSE
	5/31/2006	19800	FALSE
	8/21/2006	20900	FALSE
	11/7/2006	21400	FALSE
	2/27/2007	20100	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12345D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 2 for 5 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	76600	762000	685400	0.6646	455517
2	95500	429000	333500	0.2413	80473.5
3	343000	343000	0		
4	429000	95500	-333500		
5	762000	76600	-685400		

Sum of b values = 535990
Sample Standard Deviation = 280698
W Statistic = 0.911537

5% Critical value of 0.762 is less than 0.911537
Data is normally distributed at 95% level of significance

1% Critical value of 0.686 is less than 0.911537
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12345D
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
95500	76600	18900	1	0
343000	76600	266400	2	0
429000	76600	352400	3	0
762000	76600	685400	4	0
343000	95500	247500	5	0
429000	95500	333500	6	0
762000	95500	666500	7	0
429000	343000	86000	8	0
762000	343000	419000	9	0
762000	429000	333000	10	0

S Statistic = 10 - 0 = 10
Comparing at 95% confidence level: upward trend
Probability of obtaining S >= 10 is 0.0083
S > 0 and 0.0083 < 0.05 indicating an upward trend

ChemStat
Trial Version

Sen's Slope Analysis
Parameter: Na
Location: 12345D
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
95500 (11/16/2005)	76600 (8/23/2005)	(95500 - 76600)/(2 - 1)	18900
343000 (2/21/2006)	76600 (8/23/2005)	(343000 - 76600)/(3 - 1)	133200
429000 (5/30/2006)	76600 (8/23/2005)	(429000 - 76600)/(4 - 1)	117467
762000 (2/21/2007)	76600 (8/23/2005)	(762000 - 76600)/(5 - 1)	171350
343000 (2/21/2006)	95500 (11/16/2005)	(343000 - 95500)/(3 - 2)	247500
429000 (5/30/2006)	95500 (11/16/2005)	(429000 - 95500)/(4 - 2)	166750
762000 (2/21/2007)	95500 (11/16/2005)	(762000 - 95500)/(5 - 2)	222167
429000 (5/30/2006)	343000 (2/21/2006)	(429000 - 343000)/(4 - 3)	86000
762000 (2/21/2007)	343000 (2/21/2006)	(762000 - 343000)/(5 - 3)	209500
762000 (2/21/2007)	429000 (5/30/2006)	(762000 - 429000)/(5 - 4)	333000

Number of Q values = 10

ChemStat
Trial Version

Ordered Q Values

n	Q
1	18900
2	86000
3	117467
4	133200
5	166750
6	171350
7	209500
8	222167
9	247500
10	333000

Sen's Estimator (Median Q) is 169050

Time Period	Observations
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
2/21/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 300
b = 540

c = 40
Group Variance = 16.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 6.71508
M1 = (10 - 6.71508)/2.0 = 1.64246
M2 = (10 + 6.71508)/2.0 + 1 = 9.35754
Lower limit is 86000 = Q(2)
Upper limit is 247500 = Q(9)
86000 > 0 indicating an upward trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12345D
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
8/23/2005	76600	1
11/16/2005	95500	2
2/21/2006	343000	3
5/30/2006	429000	4
2/21/2007	762000	5

---

von Neumann ratio v = 0.4 = 4/10
Insufficient Measurements
A minimum of six measurements is required.

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12345D
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 5 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.485848	0.0275751	0.78	None

Loc.	Date	Conc.	Outlier
12345D	8/23/2005	76600	FALSE
	11/16/2005	95500	FALSE
	2/21/2006	343000	FALSE
	5/30/2006	429000	FALSE
	2/21/2007	762000	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: Na
Location: 12345E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with 0
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	277000	383000	106000	0.6052	64151.2
2	301000	383000	82000	0.3164	25944.8
3	347000	367000	20000	0.1743	3486
4	353000	362000	9000	0.0561	504.9
5	362000	353000	-9000		
6	367000	347000	-20000		
7	383000	301000	-82000		
8	383000	277000	-106000		

Sum of b values = 94086.9
Sample Standard Deviation = 38299.3
W Statistic = 0.86214

5% Critical value of 0.818 is less than 0.86214
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.86214
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: Na
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with 0

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
383000	383000	0	0	0
367000	383000	-16000	0	1
353000	383000	-30000	0	2
362000	383000	-21000	0	3
347000	383000	-36000	0	4
301000	383000	-82000	0	5
277000	383000	-106000	0	6
367000	383000	-16000	0	7
353000	383000	-30000	0	8
362000	383000	-21000	0	9
347000	383000	-36000	0	10
301000	383000	-82000	0	11
277000	383000	-106000	0	12
353000	367000	-14000	0	13
362000	367000	-5000	1	14
347000	367000	-20000	0	15
301000	367000	-66000	0	16
277000	367000	-90000	0	17
362000	353000	9000	1	17
347000	353000	-6000	1	18
301000	353000	-52000	1	19
277000	353000	-76000	1	20
347000	362000	-15000	1	21
301000	362000	-61000	1	22
277000	362000	-85000	1	23
301000	347000	-46000	1	24
277000	347000	-70000	1	25
277000	301000	-24000	1	26

ChemStat
Trial Version

S Statistic = 1 - 26 = -25
Comparing at 95% confidence level (downward trend)
Failed to calculate probability for S = -25
Table out of range

Sen's Slope Analysis

Parameter: Na
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with 0

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
383000 (10/11/2005)	383000 (8/24/2005)	(383000 - 383000)/(2 - 1)	0
367000 (12/13/2005)	383000 (8/24/2005)	(367000 - 383000)/(3 - 1)	-8000
353000 (2/14/2006)	383000 (8/24/2005)	(353000 - 383000)/(4 - 1)	-10000
362000 (4/21/2006)	383000 (8/24/2005)	(362000 - 383000)/(5 - 1)	-5250
347000 (6/27/2006)	383000 (8/24/2005)	(347000 - 383000)/(6 - 1)	-7200
301000 (8/21/2006)	383000 (8/24/2005)	(301000 - 383000)/(7 - 1)	-13666.7
277000 (2/28/2007)	383000 (8/24/2005)	(277000 - 383000)/(8 - 1)	-15142.9
367000 (12/13/2005)	383000 (10/11/2005)	(367000 - 383000)/(3 - 2)	-16000
353000 (2/14/2006)	383000 (10/11/2005)	(353000 - 383000)/(4 - 2)	-15000
362000 (4/21/2006)	383000 (10/11/2005)	(362000 - 383000)/(5 - 2)	-7000
347000 (6/27/2006)	383000 (10/11/2005)	(347000 - 383000)/(6 - 2)	-9000
301000 (8/21/2006)	383000 (10/11/2005)	(301000 - 383000)/(7 - 2)	-16400
277000 (2/28/2007)	383000 (10/11/2005)	(277000 - 383000)/(8 - 2)	-17666.7
353000 (2/14/2006)	367000 (12/13/2005)	(353000 - 367000)/(4 - 3)	-14000
362000 (4/21/2006)	367000 (12/13/2005)	(362000 - 367000)/(5 - 3)	-2500
347000 (6/27/2006)	367000 (12/13/2005)	(347000 - 367000)/(6 - 3)	-6666.67
301000 (8/21/2006)	367000 (12/13/2005)	(301000 - 367000)/(7 - 3)	-16500
277000 (2/28/2007)	367000 (12/13/2005)	(277000 - 367000)/(8 - 3)	-18000
362000 (4/21/2006)	353000 (2/14/2006)	(362000 - 353000)/(5 - 4)	9000
347000 (6/27/2006)	353000 (2/14/2006)	(347000 - 353000)/(6 - 4)	-3000
301000 (8/21/2006)	353000 (2/14/2006)	(301000 - 353000)/(7 - 4)	-17333.3
277000 (2/28/2007)	353000 (2/14/2006)	(277000 - 353000)/(8 - 4)	-19000
347000 (6/27/2006)	362000 (4/21/2006)	(347000 - 362000)/(6 - 5)	-15000
301000 (8/21/2006)	362000 (4/21/2006)	(301000 - 362000)/(7 - 5)	-30500
277000 (2/28/2007)	362000 (4/21/2006)	(277000 - 362000)/(8 - 5)	-28333.3
301000 (8/21/2006)	347000 (6/27/2006)	(301000 - 347000)/(7 - 6)	-46000
277000 (2/28/2007)	347000 (6/27/2006)	(277000 - 347000)/(8 - 6)	-35000
277000 (2/28/2007)	301000 (8/21/2006)	(277000 - 301000)/(8 - 7)	-24000

GraphStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-46000
2	-35000
3	-30500
4	-28333.3
5	-24000
6	-19000
7	-18000

8	-17666.7
9	-17333.3
10	-16500
11	-16400
12	-16000
13	-15142.9
14	-15000
15	-15000
16	-14000
17	-13666.7
18	-10000
19	-9000
20	-8000
21	-7200
22	-7000
23	-6666.67
24	-5250
25	-3000
26	-2500
27	0
28	9000

Sen's Estimator (Median Q) is -15000

Tied Group	Value	Members
1	383000	2

ChemStat Trial Version

Time Period	Observations
8/24/2005	
10/11/2005	1
12/13/2005	1
2/14/2006	1
4/21/2006	1
6/27/2006	1
8/21/2006	1
2/28/2007	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -18000 = Q(7)
Upper limit is -7000 = Q(22)
-7000 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: Na
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with 0

Values

Date	Value	Rank
8/24/2005	383000	7.5
10/11/2005	383000	7.5
12/13/2005	367000	6
2/14/2006	353000	4
4/21/2006	362000	5
6/27/2006	347000	3
8/21/2006	301000	2
2/28/2007	277000	1

---

von Neumann ratio v = 0.315476 = 13.25/42
99% Critical Value = 0.62
0.315476 <= 0.62
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: Na
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with 0

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0	0.226415	0.683	None

Loc.	Date	Conc.	Outlier
12345E	8/24/2005	383000	FALSE
	10/11/2005	383000	FALSE
	12/13/2005	367000	FALSE
	2/14/2006	353000	FALSE
	4/21/2006	362000	FALSE
	6/27/2006	347000	FALSE
	8/21/2006	301000	FALSE
	2/28/2007	277000	FALSE

ChemStat
Trial Version

Summary of Statistical Tests for Sulfate
LDS and HTW Monitoring Horizons of the OSDF

	Horizon	Distribution	Trend	Serial Correlation	Outliers	
					Present	Removed
Cell 1	LDS	NC	NC	NC	NC	NC
	HTW	NC	NC	NC	NC	NC
Cell 2	LDS	NC	NC	NC	NC	NC
	HTW	normal	none	no	no	NA
Cell 3	LDS	NC	NC	NC	NC	NC
	HTW	NC	NC	NC	NC	NC
Cell 4	LDS	NC	NC	NC	NC	NC
	HTW	normal	up	no	no	NA
Cell 5	LDS	NC	NC	NC	NC	NC
	HTW	normal	up	yes	no	NA
Cell 6	LDS	NC	NC	NC	NC	NC
	HTW	normal	down	yes	no	NA
Cell 7	LDS	NC	NC	NC	NC	NC
	HTW	log normal	down	no	no	NA
Cell 8	LDS	NC	NC	NC	NC	NC
	HTW	log normal	up	yes	no	NA

Distribution determined by Shapiro-Wilks Test of Normality
Trend determined by Mann-Kendall Trend Analysis & Sens Slope Analysis
Serial Correlation determined by Rank Von Neumann Ratio Test
Outliers determined by Dixon's Test. Outliers were removed if Shapiro-Wilks test failed.
NA – not applicable
NC – not considered because the sulfate concentration is inappropriate for use as a detection ion in this horizon

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12338D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.303e+006	2.604e+006	1.301e+006	0.6431	836673
2	1.82157e+006	2.082e+006	260430	0.2806	73076.7
3	1.825e+006	2.034e+006	209000	0.0875	18287.5
4	2.034e+006	1.825e+006	-209000		
5	2.082e+006	1.82157e+006	-260430		
6	2.604e+006	1.303e+006	-1.301e+006		

Sum of b values = 928037
Sample Standard Deviation = 424916
W Statistic = 0.954012

5% Critical value of 0.788 is less than 0.954012
Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.954012
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.825e+006	1.303e+006	522000	1	0
2.604e+006	1.303e+006	1.301e+006	2	0
2.034e+006	1.303e+006	731000	3	0
2.082e+006	1.303e+006	779000	4	0
1.82157e+006	1.303e+006	518570	5	0
2.604e+006	1.825e+006	779000	6	0
2.034e+006	1.825e+006	209000	7	0
2.082e+006	1.825e+006	257000	8	0
1.82157e+006	1.825e+006	-3430	8	1
2.034e+006	2.604e+006	-570000	8	2
2.082e+006	2.604e+006	-522000	8	3
1.82157e+006	2.604e+006	-782430	8	4
2.082e+006	2.034e+006	48000	[illegible]	4
1.82157e+006	2.034e+006	-2[illegible]24[illegible]0	[illegible]	5
1.82157e+006	2.082e+006	-260430	9	6

ChemStat
Trial Version

S Statistic = 9 - 6 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.72
0.72 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: SO4
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.825e+006 (8/10/2005)	1.303e+006 (5/11/2005)	(1.825e+006 - 1.303e+006)/(2 -	1522000
2.604e+006 (11/16/2005)	1.303e+006 (5/11/2005)	(2.604e+006 - 1.303e+006)/(3 -	1650500
2.034e+006 (2/20/2006)	1.303e+006 (5/11/2005)	(2.034e+006 - 1.303e+006)/(4 -	1243667
2.082e+006 (5/30/2006)	1.303e+006 (5/11/2005)	(2.082e+006 - 1.303e+006)/(5 -	1194750
1.82157e+006 (2/21/2007)	1.303e+006 (5/11/2005)	(1.82157e+006 - 1.303e+006)/(6	103714
2.604e+006 (11/16/2005)	1.825e+006 (8/10/2005)	(2.604e+006 - 1.825e+006)/(3 -	2779000
2.034e+006 (2/20/2006)	1.825e+006 (8/10/2005)	(2.034e+006 - 1.825e+006)/(4 -	2104500
2.082e+006 (5/30/2006)	1.825e+006 (8/10/2005)	(2.082e+006 - 1.825e+006)/(5 -	285666.7
1.82157e+006 (2/21/2007)	1.825e+006 (8/10/2005)	(1.82157e+006 - 1.825e+006)/(6	-857.5
2.034e+006 (2/20/2006)	2.604e+006 (11/16/2005)	(2.034e+006 - 2.604e+006)/(4 -	3-570000
2.082e+006 (5/30/2006)	2.604e+006 (11/16/2005)	(2.082e+006 - 2.604e+006)/(5 -	3-261000
1.82157e+006 (2/21/2007)	2.604e+006 (11/16/2005)	(1.82157e+006 - 2.604e+006)/(6	-260810
2.082e+006 (5/30/2006)	2.034e+006 (2/20/2006)	(2.082e+006 - 2.034e+006)/(5 -	448000
1.82157e+006 (2/21/2007)	2.034e+006 (2/20/2006)	(1.82157e+006 - 2.034e+006)/(6	-106215
1.82157e+006 (2/21/2007)	2.082e+006 (5/30/2006)	(1.82157e+006 - 2.082e+006)/(6	-260430

ChemStat Trial Version

Number of Q values = 1

Ordered Q Values

n	Q
1	-570000
2	-261000
3	-260810
4	-260430
5	-106215
6	-857.5
7	48000
8	85666.7
9	103714
10	104500
11	194750
12	243667
13	522000
14	650500
15	779000

Sen's Estimator (Median Q) is 85666.7

Time Period	Observations
5/11/2005	1
8/10/2005	1
11/16/2005	1
2/20/2006	1

5/30/2006 1
2/21/2007 1
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 510
b = 1080
c = 60
Group Variance = 28.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 8.7554
M1 = (15 - 8.7554)/2.0 = 3.1223
M2 = (15 + 8.7554)/2.0 + 1 = 12.8777
Lower limit is -260810 = Q(3)
Upper limit is 522000 = Q(13)
-260810 < 0 < 522000 indicating no trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/11/2005	1.303e+006	1
8/10/2005	1.825e+006	3
11/16/2005	2.604e+006	6
2/20/2006	2.034e+006	4
5/30/2006	2.082e+006	5
2/21/2007	1.82157e+006	2

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von Neumann ratio v = 1.54286 = 27/17.5
99% Critical Value = 0.46
1.54286 > 0.46
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 6 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.40123	0.398593	0.698	None

Loc.	Date	Conc.	Outlier
12338D	5/11/2005	1.303e+006	FALSE
	8/10/2005	1.825e+006	FALSE
	11/16/2005	2.604e+006	FALSE
	2/20/2006	2.034e+006	FALSE
	5/30/2006	2.082e+006	FALSE
	2/21/2007	1.82157e+006	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12338E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	725000	887000	162000	0.6052	98042.4
2	740000	860000	120000	0.3164	37968
3	740012	803000	62988	0.1743	10978.8
4	770000	800000	30000	0.0561	1683
5	800000	770000	-30000		
6	803000	740012	-62988		
7	860000	740000	-120000		
8	887000	725000	-162000		

Sum of b values = 148672
Sample Standard Deviation = 58795.8
W Statistic = 0.913415

5% Critical value of 0.818 is less than 0.913415
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.913415
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
770000	860000	-90000	0	1
803000	860000	-57000	0	2
740000	860000	-120000	0	3
725000	860000	-135000	0	4
887000	860000	27000	1	4
800000	860000	-60000	1	5
740012	860000	-119988	1	6
803000	770000	33000	2	6
740000	770000	-30000	2	7
725000	770000	-45000	2	8
887000	770000	117000	3	8
800000	770000	30000	4	8
740012	770000	-29988	4	9
740000	803000	-63000	[illegible]	10
725000	803000	-78000	4	11
887000	803000	84000	5	11
800000	803000	-3000	5	12
740012	803000	-62988	[illegible]	13
725000	740000	-15000	5	14
887000	740000	147000	6	14
800000	740000	60000	7	14
740012	740000	12	8	14
887000	725000	162000	9	14
800000	725000	75000	10	14
740012	725000	15012	11	14
800000	887000	-87000	11	15
740012	887000	-146988	11	16
740012	800000	-59988	11	17

ChemStat
Trial Version

S Statistic = 11 - 17 = -6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-6| is 0.548
0.548 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: SO4
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
770000 (8/8/2005)	860000 (5/24/2005)	(770000 - 860000)/(2 - 1)	-90000
803000 (11/14/2005)	860000 (5/24/2005)	(803000 - 860000)/(3 - 1)	-28500
740000 (2/14/2006)	860000 (5/24/2005)	(740000 - 860000)/(4 - 1)	-40000
725000 (5/24/2006)	860000 (5/24/2005)	(725000 - 860000)/(5 - 1)	-33750
887000 (8/17/2006)	860000 (5/24/2005)	(887000 - 860000)/(6 - 1)	5400
800000 (11/6/2006)	860000 (5/24/2005)	(800000 - 860000)/(7 - 1)	-10000
740012 (2/27/2007)	860000 (5/24/2005)	(740012 - 860000)/(8 - 1)	-17141.1
803000 (11/14/2005)	770000 (8/8/2005)	(803000 - 770000)/(3 - 2)	33000
740000 (2/14/2006)	770000 (8/8/2005)	(740000 - 770000)/(4 - 2)	-15000
725000 (5/24/2006)	770000 (8/8/2005)	(725000 - 770000)/(5 - 2)	-15000
887000 (8/17/2006)	770000 (8/8/2005)	(887000 - 770000)/(6 - 2)	29250
800000 (11/6/2006)	770000 (8/8/2005)	(800000 - 770000)/(7 - 2)	6000
740012 (2/27/2007)	770000 (8/8/2005)	(740012 - 770000)/(8 - 2)	-4998
740000 (2/14/2006)	803000 (11/14/2005)	(740000 - 803000)/(4 - 3)	-63000
725000 (5/24/2006)	803000 (11/14/2005)	(725000 - 803000)/(5 - 3)	-39000
887000 (8/17/2006)	803000 (11/14/2005)	(887000 - 803000)/(6 - 3)	28000
800000 (11/6/2006)	803000 (11/14/2005)	(800000 - 803000)/(7 - 3)	-750
740012 (2/27/2007)	803000 (11/14/2005)	(740012 - 803000)/(8 - 3)	-12597.6
725000 (5/24/2006)	740000 (2/14/2006)	(725000 - 740000)/(5 - 4)	-15000
887000 (8/17/2006)	740000 (2/14/2006)	(887000 - 740000)/(6 - 4)	73500
800000 (11/6/2006)	740000 (2/14/2006)	(800000 - 740000)/(7 - 4)	20000
740012 (2/27/2007)	740000 (2/14/2006)	(740012 - 740000)/(8 - 4)	3
887000 (8/17/2006)	725000 (5/24/2006)	(887000 - 725000)/(6 - 5)	162000
800000 (11/6/2006)	725000 (5/24/2006)	(800000 - 725000)/(7 - 5)	37500
740012 (2/27/2007)	725000 (5/24/2006)	(740012 - 725000)/(8 - 5)	5004
800000 (11/6/2006)	887000 (8/17/2006)	(800000 - 887000)/(7 - 6)	-87000
740012 (2/27/2007)	887000 (8/17/2006)	(740012 - 887000)/(8 - 6)	-73494
740012 (2/27/2007)	800000 (11/6/2006)	(740012 - 800000)/(8 - 7)	-59988

GhamStat
TrialVersion

Number of Q values = 28

Ordered Q Values

n	Q
1	-90000
2	-87000
3	-73494
4	-63000
5	-59988
6	-40000
7	-39000

8	-33750
9	-28500
10	-17141.1
11	-15000
12	-15000
13	-15000
14	-12597.6
15	-10000
16	-4998
17	-750
18	3
19	5004
20	5400
21	6000
22	20000
23	28000
24	29250
25	33000
26	37500
27	73500
28	162000

Sen's Estimator (Median Q) is -11298.8

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/14/2006	1
5/24/2006	1
8/17/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -39000 = Q(7)
Upper limit is 20000 = Q(22)
-39000 < 0 < 20000 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/24/2005	860000	7
8/8/2005	770000	4
11/14/2005	803000	6
2/14/2006	740000	2
5/24/2006	725000	1
8/17/2006	887000	8
11/6/2006	800000	5
2/27/2007	740012	3

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von Neumann ratio v = 2.19048 = 92/42
99% Critical Value = 0.62
2.19048 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.183673	0.111111	0.683	None

Loc.	Date	Conc.	Outlier
12338E	5/24/2005	860000	FALSE
	8/8/2005	770000	FALSE
	11/14/2005	803000	FALSE
	2/14/2006	740000	FALSE
	5/24/2006	725000	FALSE
	8/17/2006	887000	FALSE
	11/6/2006	800000	FALSE
	2/27/2007	740012	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12339E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	653000	782000	129000	0.6052	78070.8
2	665000	775964	110964	0.3164	35109
3	668000	761000	93000	0.1743	16209.9
4	671000	725000	54000	0.0561	3029.4
5	725000	671000	-54000		
6	761000	668000	-93000		
7	775964	665000	-110964		
8	782000	653000	-129000		

Sum of b values = 132419
Sample Standard Deviation = 54596.3
W Statistic = 0.840381

5% Critical value of 0.818 is less than 0.840381
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.840381
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
671000	668000	3000	1	0
665000	668000	-3000	1	1
653000	668000	-15000	1	2
725000	668000	57000	2	2
782000	668000	114000	3	2
761000	668000	93000	4	2
775964	668000	107964	5	2
665000	671000	-6000	5	3
653000	671000	-18000	5	4
725000	671000	54000	6	4
782000	671000	111000	7	4
761000	671000	90000	8	4
775964	671000	104964	9	4
653000	665000	-12000	[illegible]	5
725000	665000	60000	10	5
782000	665000	117000	11	5
761000	665000	96000	12	5
775964	665000	110964	[illegible]	5
725000	653000	72000	14	5
782000	653000	129000	15	5
761000	653000	108000	16	5
775964	653000	122964	17	5
782000	725000	57000	18	5
761000	725000	36000	19	5
775964	725000	50964	20	5
761000	782000	-21000	20	6
775964	782000	-6036	20	7
775964	761000	14964	21	7

ChemStat
Trial Version

S Statistic = 21 - 7 = 14
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |14| is 0.108
0.108 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: SO4
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
671000 (8/8/2005)	668000 (5/24/2005)	(671000 - 668000)/(2 - 1)	3000
665000 (11/14/2005)	668000 (5/24/2005)	(665000 - 668000)/(3 - 1)	-1500
653000 (2/16/2006)	668000 (5/24/2005)	(653000 - 668000)/(4 - 1)	-5000
725000 (5/24/2006)	668000 (5/24/2005)	(725000 - 668000)/(5 - 1)	14250
782000 (8/22/2006)	668000 (5/24/2005)	(782000 - 668000)/(6 - 1)	22800
761000 (11/6/2006)	668000 (5/24/2005)	(761000 - 668000)/(7 - 1)	15500
775964 (2/27/2007)	668000 (5/24/2005)	(775964 - 668000)/(8 - 1)	15423.4
665000 (11/14/2005)	671000 (8/8/2005)	(665000 - 671000)/(3 - 2)	-6000
653000 (2/16/2006)	671000 (8/8/2005)	(653000 - 671000)/(4 - 2)	-9000
725000 (5/24/2006)	671000 (8/8/2005)	(725000 - 671000)/(5 - 2)	18000
782000 (8/22/2006)	671000 (8/8/2005)	(782000 - 671000)/(6 - 2)	27750
761000 (11/6/2006)	671000 (8/8/2005)	(761000 - 671000)/(7 - 2)	18000
775964 (2/27/2007)	671000 (8/8/2005)	(775964 - 671000)/(8 - 2)	17494
653000 (2/16/2006)	665000 (11/14/2005)	(653000 - 665000)/(4 - 3)	-12000
725000 (5/24/2006)	665000 (11/14/2005)	(725000 - 665000)/(5 - 3)	30000
782000 (8/22/2006)	665000 (11/14/2005)	(782000 - 665000)/(6 - 3)	39000
761000 (11/6/2006)	665000 (11/14/2005)	(761000 - 665000)/(7 - 3)	24000
775964 (2/27/2007)	665000 (11/14/2005)	(775964 - 665000)/(8 - 3)	22192.8
725000 (5/24/2006)	653000 (2/16/2006)	(725000 - 653000)/(5 - 4)	72000
782000 (8/22/2006)	653000 (2/16/2006)	(782000 - 653000)/(6 - 4)	64500
761000 (11/6/2006)	653000 (2/16/2006)	(761000 - 653000)/(7 - 4)	36000
775964 (2/27/2007)	653000 (2/16/2006)	(775964 - 653000)/(8 - 4)	30741
782000 (8/22/2006)	725000 (5/24/2006)	(782000 - 725000)/(6 - 5)	57000
761000 (11/6/2006)	725000 (5/24/2006)	(761000 - 725000)/(7 - 5)	18000
775964 (2/27/2007)	725000 (5/24/2006)	(775964 - 725000)/(8 - 5)	16988
761000 (11/6/2006)	782000 (8/22/2006)	(761000 - 782000)/(7 - 6)	-21000
775964 (2/27/2007)	782000 (8/22/2006)	(775964 - 782000)/(8 - 6)	-3018
775964 (2/27/2007)	761000 (11/6/2006)	(775964 - 761000)/(8 - 7)	14964

ChemStat
TrialVersion

Number of Q values = 28

Ordered Q Values

n	Q
1	-21000
2	-12000
3	-9000
4	-6000
5	-5000
6	-3018
7	-1500

8	3000
9	14250
10	14964
11	15423.4
12	15500
13	16988
14	17494
15	18000
16	18000
17	18000
18	22192.8
19	22800
20	24000
21	27750
22	30000
23	30741
24	36000
25	39000
26	57000
27	64500
28	72000

Sen's Estimator (Median Q) is 17747

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/16/2006	1
5/24/2006	1
8/22/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -1500 = Q(7)
Upper limit is 30000 = Q(22)
-1500 < 0 < 30000 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/24/2005	668000	3
8/8/2005	671000	4
11/14/2005	665000	2
2/16/2006	653000	1
5/24/2006	725000	5
8/22/2006	782000	8
11/6/2006	761000	6
2/27/2007	775964	7

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von Neumann ratio v = 0.857143 = 36/42
99% Critical Value = 0.62
0.857143 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0515897	0.0975895	0.683	None

Loc.	Date	Conc.	Outlier
12339E	5/24/2005	668000	FALSE
	8/8/2005	671000	FALSE
	11/14/2005	665000	FALSE
	2/16/2006	653000	FALSE
	5/24/2006	725000	FALSE
	8/22/2006	782000	FALSE
	11/6/2006	761000	FALSE
	2/27/2007	775964	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12340D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.055e+006	1.468e+006	413000	0.6052	249948
2	1.106e+006	1.348e+006	242000	0.3164	76568.8
3	1.189e+006	1.3452e+006	156200	0.1743	27225.7
4	1.234e+006	1.24e+006	6000	0.0561	336.6
5	1.24e+006	1.234e+006	-6000		
6	1.3452e+006	1.189e+006	-156200		
7	1.348e+006	1.106e+006	-242000		
8	1.468e+006	1.055e+006	-413000		

Sum of b values = 354079
Sample Standard Deviation = 135753
W Statistic = 0.971861

5% Critical value of 0.818 is less than 0.971861
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.971861
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis
Parameter: SO4
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.189e+006	1.468e+006	-279000	0	1
1.234e+006	1.468e+006	-234000	0	2
1.24e+006	1.468e+006	-228000	0	3
1.106e+006	1.468e+006	-362000	0	4
1.055e+006	1.468e+006	-413000	0	5
1.348e+006	1.468e+006	-120000	0	6
1.3452e+006	1.468e+006	-122800	0	7
1.234e+006	1.189e+006	45000	1	7
1.24e+006	1.189e+006	51000	2	7
1.106e+006	1.189e+006	-83000	2	8
1.055e+006	1.189e+006	-134000	2	9
1.348e+006	1.189e+006	159000	3	9
1.3452e+006	1.189e+006	156200	4	9
1.24e+006	1.234e+006	6000	[illegible]	[illegible]
1.106e+006	1.234e+006	[illegible]	[illegible]	[illegible]
1.055e+006	1.234e+006	-179000	5	[illegible]
1.348e+006	1.234e+006	114000	6	11
1.3452e+006	[illegible]	[illegible]1200	[illegible]	11
1.106e+006	1.24e+006	[illegible]	7	12
1.055e+006	1.24e+006	-185000	7	13
1.348e+006	1.24e+006	108000	8	13
1.3452e+006	1.24e+006	105200	9	13
1.055e+006	1.106e+006	-51000	9	14
1.348e+006	1.106e+006	242000	10	14
1.3452e+006	1.106e+006	239200	11	14
1.348e+006	1.055e+006	293000	12	14
1.3452e+006	1.055e+006	290200	13	14
1.3452e+006	1.348e+006	-2800	13	15

ChemStat Trial Version

S Statistic = 13 - 15 = -2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-2| is 0.904
0.904 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: SO4
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.189e+006 (8/9/2005)	1.468e+006 (5/16/2005)	(1.189e+006 - 1.468e+006)/(2 - 1	-279000
1.234e+006 (11/28/2005)	1.468e+006 (5/16/2005)	(1.234e+006 - 1.468e+006)/(3 - 1	-117000
1.24e+006 (2/20/2006)	1.468e+006 (5/16/2005)	(1.24e+006 - 1.468e+006)/(4 - 1)	-76000
1.106e+006 (5/30/2006)	1.468e+006 (5/16/2005)	(1.106e+006 - 1.468e+006)/(5 - 1	-90500
1.055e+006 (8/25/2006)	1.468e+006 (5/16/2005)	(1.055e+006 - 1.468e+006)/(6 - 1	-82600
1.348e+006 (11/1/2006)	1.468e+006 (5/16/2005)	(1.348e+006 - 1.468e+006)/(7 - 1	-20000
1.3452e+006 (2/20/2007)	1.468e+006 (5/16/2005)	(1.3452e+006 - 1.468e+006)/(8 -	-17542.9
1.234e+006 (11/28/2005)	1.189e+006 (8/9/2005)	(1.234e+006 - 1.189e+006)/(3 -	245000
1.24e+006 (2/20/2006)	1.189e+006 (8/9/2005)	(1.24e+006 - 1.189e+006)/(4 - 2)	25500
1.106e+006 (5/30/2006)	1.189e+006 (8/9/2005)	(1.106e+006 - 1.189e+006)/(5 - 2	-27666.7
1.055e+006 (8/25/2006)	1.189e+006 (8/9/2005)	(1.055e+006 - 1.189e+006)/(6 - 2	-33500
1.348e+006 (11/1/2006)	1.189e+006 (8/9/2005)	(1.348e+006 - 1.189e+006)/(7 -	231800
1.3452e+006 (2/20/2007)	1.189e+006 (8/9/2005)	(1.3452e+006 - 1.189e+006)/(8 -	26033.3
1.24e+006 (2/20/2006)	1.234e+006 (11/28/2005)	(1.24e+006 - 1.234e+006)/(4 - 3)	6000
1.106e+006 (5/30/2006)	1.234e+006 (11/28/2005)	(1.106e+006 - 1.234e+006)/(5 - 3	-64000
1.055e+006 (8/25/2006)	1.234e+006 (11/28/2005)	(1.055e+006 - 1.234e+006)/(6 - 3	-59666.7
1.348e+006 (11/1/2006)	1.234e+006 (11/28/2005)	(1.348e+006 - 1.234e+006)/(7 -	328500
1.3452e+006 (2/20/2007)	1.234e+006 (11/28/2005)	(1.3452e+006 - 1.234e+006)/(8 -	22240
1.106e+006 (5/30/2006)	1.24e+006 (2/20/2006)	(1.106e+006 - 1.24e+006)/(5 - 4)	-134000
1.055e+006 (8/25/2006)	1.24e+006 (2/20/2006)	(1.055e+006 - 1.24e+006)/(6 - 4)	-92500
1.348e+006 (11/1/2006)	1.24e+006 (2/20/2006)	(1.348e+006 - 1.24e+006)/(7 - 4)	36000
1.3452e+006 (2/20/2007)	1.24e+006 (2/20/2006)	(1.3452e+006 - 1.24e+006)/(8 -	426300
1.055e+006 (8/25/2006)	1.106e+006 (5/30/2006)	(1.055e+006 - 1.106e+006)/(6 - 5	-51000
1.348e+006 (11/1/2006)	1.106e+006 (5/30/2006)	(1.348e+006 - 1.106e+006)/(7 - 5	121000
1.3452e+006 (2/20/2007)	1.106e+006 (5/30/2006)	(1.3452e+006 - 1.106e+006)/(8 -	79733.3
1.348e+006 (11/1/2006)	1.055e+006 (8/25/2006)	(1.348e+006 - 1.055e+006)/(7 -	629300
1.3452e+006 (2/20/2007)	1.055e+006 (8/25/2006)	(1.3452e+006 - 1.055e+006)/(8 -	145100
1.3452e+006 (2/20/2007)	1.348e+006 (11/1/2006)	(1.3452e+006 - 1.348e+006)/(8 -	-2800

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-279000
2	-134000
3	-117000
4	-92500
5	-90500
6	-82600
7	-76000

8	-64000
9	-59666.7
10	-51000
11	-33500
12	-27666.7
13	-20000
14	-17542.9
15	-2800
16	6000
17	22240
18	25500
19	26033.3
20	26300
21	28500
22	31800
23	36000
24	45000
25	79733.3
26	121000
27	145100
28	293000

Sen's Estimator (Median Q) is -10171.4

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/28/2005	1
2/20/2006	1
5/30/2006	1
8/25/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -76000 = Q(7)
Upper limit is 31800 = Q(22)
-76000 < 0 < 31800 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/16/2005	1.468e+006	8
8/9/2005	1.189e+006	3
11/28/2005	1.234e+006	4
2/20/2006	1.24e+006	5
5/30/2006	1.106e+006	2
8/25/2006	1.055e+006	1
11/1/2006	1.348e+006	7
2/20/2007	1.3452e+006	6

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von Neumann ratio v = 1.7619 = 74/42
99% Critical Value = 0.62
1.7619 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.331492	0.174061	0.683	None

Loc.	Date	Conc.	Outlier
12340D	5/16/2005	1.468e+006	FALSE
	8/9/2005	1.189e+006	FALSE
	11/28/2005	1.234e+006	FALSE
	2/20/2006	1.24e+006	FALSE
	5/30/2006	1.106e+006	FALSE
	8/25/2006	1.055e+006	FALSE
	11/1/2006	1.348e+006	FALSE
	2/20/2007	1.3452e+006	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12340E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	392000	829892	437892	0.6052	265012
2	452000	809000	357000	0.3164	112955
3	488000	692000	204000	0.1743	35557.2
4	623000	662000	39000	0.0561	2187.9
5	662000	623000	-39000		
6	692000	488000	-204000		
7	809000	452000	-357000		
8	829892	392000	-437892		

Sum of b values = 415712
Sample Standard Deviation = 162281
W Statistic = 0.937456

5% Critical value of 0.818 is less than 0.937456
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.937456
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
623000	692000	-69000	0	1
452000	692000	-240000	0	2
392000	692000	-300000	0	3
488000	692000	-204000	0	4
662000	692000	-30000	0	5
809000	692000	117000	1	5
829892	692000	137892	2	5
452000	623000	-171000	2	6
392000	623000	-231000	2	7
488000	623000	-135000	2	8
662000	623000	39000	3	8
809000	623000	186000	4	8
829892	623000	206892	5	8
392000	452000	-60000	6	9
488000	452000	36000	6	9
662000	452000	210000	7	9
809000	452000	357000	8	9
829892	452000	377892	9	9
488000	392000	96000	10	9
662000	392000	270000	11	9
809000	392000	417000	12	9
829892	392000	437892	13	9
662000	488000	174000	14	9
809000	488000	321000	15	9
829892	488000	341892	16	9
809000	662000	147000	17	9
829892	662000	167892	18	9
829892	809000	20892	19	9

ChemStat Trial Version

S Statistic = 19 - 9 = 10
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |10| is 0.276
0.276 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: SO4
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
623000 (8/8/2005)	692000 (5/18/2005)	(623000 - 692000)/(2 - 1)	-69000
452000 (11/14/2005)	692000 (5/18/2005)	(452000 - 692000)/(3 - 1)	-120000
392000 (2/15/2006)	692000 (5/18/2005)	(392000 - 692000)/(4 - 1)	-100000
488000 (5/24/2006)	692000 (5/18/2005)	(488000 - 692000)/(5 - 1)	-51000
662000 (8/25/2006)	692000 (5/18/2005)	(662000 - 692000)/(6 - 1)	-6000
809000 (11/6/2006)	692000 (5/18/2005)	(809000 - 692000)/(7 - 1)	19500
829892 (2/27/2007)	692000 (5/18/2005)	(829892 - 692000)/(8 - 1)	19698.9
452000 (11/14/2005)	623000 (8/8/2005)	(452000 - 623000)/(3 - 2)	-171000
392000 (2/15/2006)	623000 (8/8/2005)	(392000 - 623000)/(4 - 2)	-115500
488000 (5/24/2006)	623000 (8/8/2005)	(488000 - 623000)/(5 - 2)	-45000
662000 (8/25/2006)	623000 (8/8/2005)	(662000 - 623000)/(6 - 2)	9750
809000 (11/6/2006)	623000 (8/8/2005)	(809000 - 623000)/(7 - 2)	37200
829892 (2/27/2007)	623000 (8/8/2005)	(829892 - 623000)/(8 - 2)	34482
392000 (2/15/2006)	452000 (11/14/2005)	(392000 - 452000)/(4 - 3)	-60000
488000 (5/24/2006)	452000 (11/14/2005)	(488000 - 452000)/(5 - 3)	18000
662000 (8/25/2006)	452000 (11/14/2005)	(662000 - 452000)/(6 - 3)	70000
809000 (11/6/2006)	452000 (11/14/2005)	(809000 - 452000)/(7 - 3)	89250
829892 (2/27/2007)	452000 (11/14/2005)	(829892 - 452000)/(8 - 3)	75578.4
488000 (5/24/2006)	392000 (2/15/2006)	(488000 - 392000)/(5 - 4)	96000
662000 (8/25/2006)	392000 (2/15/2006)	(662000 - 392000)/(6 - 4)	135000
809000 (11/6/2006)	392000 (2/15/2006)	(809000 - 392000)/(7 - 4)	139000
829892 (2/27/2007)	392000 (2/15/2006)	(829892 - 392000)/(8 - 4)	109473
662000 (8/25/2006)	488000 (5/24/2006)	(662000 - 488000)/(6 - 5)	174000
809000 (11/6/2006)	488000 (5/24/2006)	(809000 - 488000)/(7 - 5)	160500
829892 (2/27/2007)	488000 (5/24/2006)	(829892 - 488000)/(8 - 5)	113964
809000 (11/6/2006)	662000 (8/25/2006)	(809000 - 662000)/(7 - 6)	147000
829892 (2/27/2007)	662000 (8/25/2006)	(829892 - 662000)/(8 - 6)	83946
829892 (2/27/2007)	809000 (11/6/2006)	(829892 - 809000)/(8 - 7)	20892

GremStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-171000
2	-120000
3	-115500
4	-100000
5	-69000
6	-60000
7	-51000

8	-45000
9	-6000
10	9750
11	18000
12	19500
13	19698.9
14	20892
15	34482
16	37200
17	70000
18	75578.4
19	83946
20	89250
21	96000
22	109473
23	113964
24	135000
25	139000
26	147000
27	160500
28	174000

Sen's Estimator (Median Q) is 27687

Time Period	Observations
5/18/2005	1
8/8/2005	1
11/14/2005	1
2/15/2006	1
5/24/2006	1
8/25/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -51000 = Q(7)
Upper limit is 109473 = Q(22)
-51000 < 0 < 109473 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	692000	6
8/8/2005	623000	4
11/14/2005	452000	2
2/15/2006	392000	1
5/24/2006	488000	3
8/25/2006	662000	5
11/6/2006	809000	7
2/27/2007	829892	8

---

von Neumann ratio v = 0.52381 = 22/42
99% Critical Value = 0.62
0.52381 <= 0.62
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0552856	0.143885	0.683	None

Loc.	Date	Conc.	Outlier
12340E	5/18/2005	692000	FALSE
	8/8/2005	623000	FALSE
	11/14/2005	452000	FALSE
	2/15/2006	392000	FALSE
	5/24/2006	488000	FALSE
	8/25/2006	662000	FALSE
	11/6/2006	809000	FALSE
	2/27/2007	829892	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12341D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.579e+006	2.05226e+006	473260	0.6052	286417
2	1.633e+006	1.926e+006	293000	0.3164	92705.2
3	1.753e+006	1.881e+006	128000	0.1743	22310.4
4	1.774e+006	1.795e+006	21000	0.0561	1178.1
5	1.795e+006	1.774e+006	-21000		
6	1.881e+006	1.753e+006	-128000		
7	1.926e+006	1.633e+006	-293000		
8	2.05226e+006	1.579e+006	-473260		

Sum of b values = 402611
Sample Standard Deviation = 153858
W Statistic = 0.978208

5% Critical value of 0.818 is less than 0.978208
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.978208
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis
Parameter: SO4
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.579e+006	1.795e+006	-216000	0	1
1.774e+006	1.795e+006	-21000	0	2
1.753e+006	1.795e+006	-42000	0	3
1.633e+006	1.795e+006	-162000	0	4
1.926e+006	1.795e+006	131000	1	4
1.881e+006	1.795e+006	86000	2	4
2.05226e+006	1.795e+006	257260	3	4
1.774e+006	1.579e+006	195000	4	4
1.753e+006	1.579e+006	174000	5	4
1.633e+006	1.579e+006	54000	6	4
1.926e+006	1.579e+006	347000	7	4
1.881e+006	1.579e+006	302000	8	4
2.05226e+006	1.579e+006	473260	9	4
1.753e+006	1.774e+006	-2100[illegible]	[illegible]	5
1.633e+006	1.774e+006	-1[illegible]0	[illegible]	6
1.926e+006	1.774e+006	152000	10	6
1.881e+006	1.774e+006	107000	11	6
2.05226e+006	1.774e+006	2[illegible]8260	[illegible]	6
1.633e+006	1.753e+006	-120000	12	7
1.926e+006	1.753e+006	173000	13	7
1.881e+006	1.753e+006	128000	14	7
2.05226e+006	1.753e+006	299260	15	7
1.926e+006	1.633e+006	293000	16	7
1.881e+006	1.633e+006	248000	17	7
2.05226e+006	1.633e+006	419260	18	7
1.881e+006	1.926e+006	-45000	18	8
2.05226e+006	1.926e+006	126260	19	8
2.05226e+006	1.881e+006	171260	20	8

ChemStat
Trial Version

S Statistic = 20 - 8 = 12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |12| is 0.178
0.178 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: SO4
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.579e+006 (8/9/2005)	1.795e+006 (5/16/2005)	(1.579e+006 - 1.795e+006)/(2 - 1	-216000
1.774e+006 (11/15/2005)	1.795e+006 (5/16/2005)	(1.774e+006 - 1.795e+006)/(3 - 1	-10500
1.753e+006 (2/20/2006)	1.795e+006 (5/16/2005)	(1.753e+006 - 1.795e+006)/(4 - 1	-14000
1.633e+006 (5/23/2006)	1.795e+006 (5/16/2005)	(1.633e+006 - 1.795e+006)/(5 - 1	-40500
1.926e+006 (8/28/2006)	1.795e+006 (5/16/2005)	(1.926e+006 - 1.795e+006)/(6 - 1	26200
1.881e+006 (11/1/2006)	1.795e+006 (5/16/2005)	(1.881e+006 - 1.795e+006)/(7 - 1	14333.3
2.05226e+006 (2/20/2007)	1.795e+006 (5/16/2005)	(2.05226e+006 - 1.795e+006)/(8	36751.4
1.774e+006 (11/15/2005)	1.579e+006 (8/9/2005)	(1.774e+006 - 1.579e+006)/(3 - 2	195000
1.753e+006 (2/20/2006)	1.579e+006 (8/9/2005)	(1.753e+006 - 1.579e+006)/(4 - 2	87000
1.633e+006 (5/23/2006)	1.579e+006 (8/9/2005)	(1.633e+006 - 1.579e+006)/(5 - 2	18000
1.926e+006 (8/28/2006)	1.579e+006 (8/9/2005)	(1.926e+006 - 1.579e+006)/(6 - 2	86750
1.881e+006 (11/1/2006)	1.579e+006 (8/9/2005)	(1.881e+006 - 1.579e+006)/(7 - 2	60400
2.05226e+006 (2/20/2007)	1.579e+006 (8/9/2005)	(2.05226e+006 - 1.579e+006)/(8	78876.7
1.753e+006 (2/20/2006)	1.774e+006 (11/15/2005)	(1.753e+006 - 1.774e+006)/(4 - 3	-21000
1.633e+006 (5/23/2006)	1.774e+006 (11/15/2005)	(1.633e+006 - 1.774e+006)/(5 - 3	-70500
1.926e+006 (8/28/2006)	1.774e+006 (11/15/2005)	(1.926e+006 - 1.774e+006)/(6 - 3	350666.7
1.881e+006 (11/1/2006)	1.774e+006 (11/15/2005)	(1.881e+006 - 1.774e+006)/(7 - 3	326750
2.05226e+006 (2/20/2007)	1.774e+006 (11/15/2005)	(2.05226e+006 - 1.774e+006)/(8	55652
1.633e+006 (5/23/2006)	1.753e+006 (2/20/2006)	(1.633e+006 - 1.753e+006)/(5 - 4	-120000
1.926e+006 (8/28/2006)	1.753e+006 (2/20/2006)	(1.926e+006 - 1.753e+006)/(6 - 4	486500
1.881e+006 (11/1/2006)	1.753e+006 (2/20/2006)	(1.881e+006 - 1.753e+006)/(7 - 4	442666.7
2.05226e+006 (2/20/2007)	1.753e+006 (2/20/2006)	(2.05226e+006 - 1.753e+006)/(8	74815
1.926e+006 (8/28/2006)	1.633e+006 (5/23/2006)	(1.926e+006 - 1.633e+006)/(6 - 5	293000
1.881e+006 (11/1/2006)	1.633e+006 (5/23/2006)	(1.881e+006 - 1.633e+006)/(7 - 5	124000
2.05226e+006 (2/20/2007)	1.633e+006 (5/23/2006)	(2.05226e+006 - 1.633e+006)/(8	139753
1.881e+006 (11/1/2006)	1.926e+006 (8/28/2006)	(1.881e+006 - 1.926e+006)/(7 - 6	-45000
2.05226e+006 (2/20/2007)	1.926e+006 (8/28/2006)	(2.05226e+006 - 1.926e+006)/(8	63130
2.05226e+006 (2/20/2007)	1.881e+006 (11/1/2006)	(2.05226e+006 - 1.881e+006)/(8	171260

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-216000
2	-120000
3	-70500
4	-45000
5	-40500
6	-21000
7	-14000

8	-10500
9	14333.3
10	18000
11	26200
12	26750
13	36751.4
14	42666.7
15	50666.7
16	55652
17	60400
18	63130
19	74815
20	78876.7
21	86500
22	86750
23	87000
24	124000
25	139753
26	171260
27	195000
28	293000

Sen's Estimator (Median Q) is 46666.7

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -14000 = Q(7)
Upper limit is 86750 = Q(22)
-14000 < 0 < 86750 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/16/2005	1.795e+006	5
8/9/2005	1.579e+006	1
11/15/2005	1.774e+006	4
2/20/2006	1.753e+006	3
5/23/2006	1.633e+006	2
8/28/2006	1.926e+006	7
11/1/2006	1.881e+006	6
2/20/2007	2.05226e+006	8

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von Neumann ratio v = 1.35714 = 57/42
99% Critical Value = 0.62
1.35714 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.30115	0.15562	0.683	None

Loc.	Date	Conc.	Outlier
12341D	5/16/2005	1.795e+006	FALSE
	8/9/2005	1.579e+006	FALSE
	11/15/2005	1.774e+006	FALSE
	2/20/2006	1.753e+006	FALSE
	5/23/2006	1.633e+006	FALSE
	8/28/2006	1.926e+006	FALSE
	11/1/2006	1.881e+006	FALSE
	2/20/2007	2.05226e+006	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12341E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	161000	209121	48121	0.6052	29122.8
2	167000	202000	35000	0.3164	11074
3	173000	188000	15000	0.1743	2614.5
4	173000	177000	4000	0.0561	224.4
5	177000	173000	-4000		
6	188000	173000	-15000		
7	202000	167000	-35000		
8	209121	161000	-48121		

Sum of b values = 43035.7
Sample Standard Deviation = 16988.4
W Statistic = 0.916765

5% Critical value of 0.818 is less than 0.916765
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.916765
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
161000	188000	-27000	0	1
167000	188000	-21000	0	2
173000	188000	-15000	0	3
173000	188000	-15000	0	4
177000	188000	-11000	0	5
202000	188000	14000	1	5
209121	188000	21121	2	5
167000	161000	6000	3	5
173000	161000	12000	4	5
173000	161000	12000	5	5
177000	161000	16000	6	5
202000	161000	41000	7	5
209121	161000	48121	8	5
173000	167000	6000	[illegible]	5
173000	167000	6000	10	5
177000	167000	10000	11	5
202000	167000	35000	12	5
209121	167000	42121	[illegible]	5
173000	173000	0	13	5
177000	173000	4000	14	5
202000	173000	29000	15	5
209121	173000	36121	16	5
177000	173000	4000	17	5
202000	173000	29000	18	5
209121	173000	36121	19	5
202000	177000	25000	20	5
209121	177000	32121	21	5
209121	202000	7121	22	5

ChemStat
Trial Version

S Statistic = 22 - 5 = 17
Comparing at 95% confidence level (upward trend)
Failed to calculate probability for S = 17
Table out of range

Sen's Slope Analysis
Parameter: SO4
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
161000 (8/9/2005)	188000 (5/18/2005)	(161000 - 188000)/(2 - 1)	-27000
167000 (11/21/2005)	188000 (5/18/2005)	(167000 - 188000)/(3 - 1)	-10500
173000 (2/15/2006)	188000 (5/18/2005)	(173000 - 188000)/(4 - 1)	-5000
173000 (5/22/2006)	188000 (5/18/2005)	(173000 - 188000)/(5 - 1)	-3750
177000 (8/29/2006)	188000 (5/18/2005)	(177000 - 188000)/(6 - 1)	-2200
202000 (11/7/2006)	188000 (5/18/2005)	(202000 - 188000)/(7 - 1)	2333.33
209121 (2/27/2007)	188000 (5/18/2005)	(209121 - 188000)/(8 - 1)	3017.29
167000 (11/21/2005)	161000 (8/9/2005)	(167000 - 161000)/(3 - 2)	6000
173000 (2/15/2006)	161000 (8/9/2005)	(173000 - 161000)/(4 - 2)	6000
173000 (5/22/2006)	161000 (8/9/2005)	(173000 - 161000)/(5 - 2)	4000
177000 (8/29/2006)	161000 (8/9/2005)	(177000 - 161000)/(6 - 2)	4000
202000 (11/7/2006)	161000 (8/9/2005)	(202000 - 161000)/(7 - 2)	8200
209121 (2/27/2007)	161000 (8/9/2005)	(209121 - 161000)/(8 - 2)	8020.17
173000 (2/15/2006)	167000 (11/21/2005)	(173000 - 167000)/(4 - 3)	6000
173000 (5/22/2006)	167000 (11/21/2005)	(173000 - 167000)/(5 - 3)	3000
177000 (8/29/2006)	167000 (11/21/2005)	(177000 - 167000)/(6 - 3)	3333.33
202000 (11/7/2006)	167000 (11/21/2005)	(202000 - 167000)/(7 - 3)	8750
209121 (2/27/2007)	167000 (11/21/2005)	(209121 - 167000)/(8 - 3)	8424.2
173000 (5/22/2006)	173000 (2/15/2006)	(173000 - 173000)/(5 - 4)	0
177000 (8/29/2006)	173000 (2/15/2006)	(177000 - 173000)/(6 - 4)	2000
202000 (11/7/2006)	173000 (2/15/2006)	(202000 - 173000)/(7 - 4)	9666.67
209121 (2/27/2007)	173000 (2/15/2006)	(209121 - 173000)/(8 - 4)	9030.25
177000 (8/29/2006)	173000 (5/22/2006)	(177000 - 173000)/(6 - 5)	4000
202000 (11/7/2006)	173000 (5/22/2006)	(202000 - 173000)/(7 - 5)	14500
209121 (2/27/2007)	173000 (5/22/2006)	(209121 - 173000)/(8 - 5)	12040.3
202000 (11/7/2006)	177000 (8/29/2006)	(202000 - 177000)/(7 - 6)	25000
209121 (2/27/2007)	177000 (8/29/2006)	(209121 - 177000)/(8 - 6)	16060.5
209121 (2/27/2007)	202000 (11/7/2006)	(209121 - 202000)/(8 - 7)	7121

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-27000
2	-10500
3	-5000
4	-3750
5	-2200
6	0
7	2000

8	2333.33
9	3000
10	3017.29
11	3333.33
12	4000
13	4000
14	4000
15	6000
16	6000
17	6000
18	7121
19	8020.17
20	8200
21	8424.2
22	8750
23	9030.25
24	9666.67
25	12040.3
26	14500
27	16060.5
28	25000

Sen's Estimator (Median Q) is 5000

Tied Group	Value	Members
1	173000	2

ChemStat
Trial Version

Time Period	Observations
5/18/2005	
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is 2000 = Q(7)
Upper limit is 8750 = Q(22)
2000 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	188000	6
8/9/2005	161000	1
11/21/2005	167000	2
2/15/2006	173000	3.5
5/22/2006	173000	3.5
8/29/2006	177000	5
11/7/2006	202000	7
2/27/2007	209121	8

---

von Neumann ratio v = 0.845238 = 35.5/42
99% Critical Value = 0.62
0.845238 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.169061	0.146341	0.683	None

Loc.	Date	Conc.	Outlier
12341E	5/18/2005	188000	FALSE
	8/9/2005	161000	FALSE
	11/21/2005	167000	FALSE
	2/15/2006	173000	FALSE
	5/22/2006	173000	FALSE
	8/29/2006	177000	FALSE
	11/7/2006	202000	FALSE
	2/27/2007	209121	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality
Parameter: SO4
Location: 12342D
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.08493	6.20085	0.115917	0.6052	0.0701529
2	6.086	6.14395	0.0579474	0.3164	0.0183346
3	6.08707	6.13735	0.0502829	0.1743	0.00876431
4	6.09979	6.10175	0.00195597	0.0561	0.00010973
5	6.10175	6.09979	-0.00195597		
6	6.13735	6.08707	-0.0502829		
7	6.14395	6.086	-0.0579474		
8	6.20085	6.08493	-0.115917		

Sum of b values = 0.0973615
Sample Standard Deviation = 0.0406748
W Statistic = 0.818515

5% Critical value of 0.818 is less than 0.818515
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.818515
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12342D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
6.14395	6.20085	-0.0568994	0	1
6.13735	6.20085	-0.0634964	0	2
6.10175	6.20085	-0.0991034	0	3
6.08707	6.20085	-0.113779	0	4
6.08493	6.20085	-0.115917	0	5
6.086	6.20085	-0.114847	0	6
6.09979	6.20085	-0.101059	0	7
6.13735	6.14395	-0.00659701	0	8
6.10175	6.14395	-0.042204	0	9
6.08707	6.14395	-0.0568799	0	10
6.08493	6.14395	-0.0590175	0	11
6.086	6.14395	-0.0579474	0	12
6.09979	6.14395	-0.04416	0	13
6.10175	6.13735	[illegible]	[illegible]	14
6.08707	6.13735	[illegible]	[illegible]	15
6.08493	6.13735	-0.0524205	0	16
6.086	6.13735	-0.0513504	0	17
6.09979	[illegible]	-0.037563	[illegible]	18
6.08707	6.10175	[illegible]	0	19
6.08493	6.10175	-0.0168135	0	20
6.086	6.10175	-0.0157434	0	21
6.09979	6.10175	-0.00195597	0	22
6.08493	6.08707	-0.00213763	0	23
6.086	6.08707	-0.0010675	0	24
6.09979	6.08707	0.0127199	1	24
6.086	6.08493	0.00107013	2	24
6.09979	6.08493	0.0148575	3	24
6.09979	6.086	0.0137874	4	24

S Statistic = 4 - 24 = -20
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 20 is 0.0071
S < 0 and 0.0071 < 0.05 indicating a downward trend

ChemStat Trial Version

Sen's Slope Analysis
Parameter: SO4
Location: 12342D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
6.14395 (8/10/2005)	6.20085 (5/10/2005)	(6.14395 - 6.20085)/(2 - 1)	-0.0568994
6.13735 (11/15/2005)	6.20085 (5/10/2005)	(6.13735 - 6.20085)/(3 - 1)	-0.0317482
6.10175 (2/20/2006)	6.20085 (5/10/2005)	(6.10175 - 6.20085)/(4 - 1)	-0.0330345
6.08707 (5/23/2006)	6.20085 (5/10/2005)	(6.08707 - 6.20085)/(5 - 1)	-0.0284448
6.08493 (8/28/2006)	6.20085 (5/10/2005)	(6.08493 - 6.20085)/(6 - 1)	-0.0231834
6.086 (11/1/2006)	6.20085 (5/10/2005)	(6.086 - 6.20085)/(7 - 1)	-0.0191411
6.09979 (2/20/2007)	6.20085 (5/10/2005)	(6.09979 - 6.20085)/(8 - 1)	-0.0144371
6.13735 (11/15/2005)	6.14395 (8/10/2005)	(6.13735 - 6.14395)/(3 - 2)	-0.00659701
6.10175 (2/20/2006)	6.14395 (8/10/2005)	(6.10175 - 6.14395)/(4 - 2)	-0.021102
6.08707 (5/23/2006)	6.14395 (8/10/2005)	(6.08707 - 6.14395)/(5 - 2)	-0.01896
6.08493 (8/28/2006)	6.14395 (8/10/2005)	(6.08493 - 6.14395)/(6 - 2)	-0.0147544
6.086 (11/1/2006)	6.14395 (8/10/2005)	(6.086 - 6.14395)/(7 - 2)	-0.0115895
6.09979 (2/20/2007)	6.14395 (8/10/2005)	(6.09979 - 6.14395)/(8 - 2)	-0.00736
6.10175 (2/20/2006)	6.13735 (11/15/2005)	(6.10175 - 6.13735)/(4 - 3)	-0.035607
6.08707 (5/23/2006)	6.13735 (11/15/2005)	(6.08707 - 6.13735)/(5 - 3)	-0.0251415
6.08493 (8/28/2006)	6.13735 (11/15/2005)	(6.08493 - 6.13735)/(6 - 3)	-0.0174735
6.086 (11/1/2006)	6.13735 (11/15/2005)	(6.086 - 6.13735)/(7 - 3)	-0.0128376
6.09979 (2/20/2007)	6.13735 (11/15/2005)	(6.09979 - 6.13735)/(8 - 3)	-0.0075126
6.08707 (5/23/2006)	6.10175 (2/20/2006)	(6.08707 - 6.10175)/(5 - 4)	-0.0146759
6.08493 (8/28/2006)	6.10175 (2/20/2006)	(6.08493 - 6.10175)/(6 - 4)	-0.00840675
6.086 (11/1/2006)	6.10175 (2/20/2006)	(6.086 - 6.10175)/(7 - 4)	-0.00524779
6.09979 (2/20/2007)	6.10175 (2/20/2006)	(6.09979 - 6.10175)/(8 - 4)	-0.000488994
6.08493 (8/28/2006)	6.08707 (5/23/2006)	(6.08493 - 6.08707)/(6 - 5)	-0.00213763
6.086 (11/1/2006)	6.08707 (5/23/2006)	(6.086 - 6.08707)/(7 - 5)	-0.00053375
6.09979 (2/20/2007)	6.08707 (5/23/2006)	(6.09979 - 6.08707)/(8 - 5)	0.00423996
6.086 (11/1/2006)	6.08493 (8/28/2006)	(6.086 - 6.08493)/(7 - 6)	0.00107013
6.09979 (2/20/2007)	6.08493 (8/28/2006)	(6.09979 - 6.08493)/(8 - 6)	0.00742876
6.09979 (2/20/2007)	6.086 (11/1/2006)	(6.09979 - 6.086)/(8 - 7)	0.0137874

ChemStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.0568994
2	-0.035607
3	-0.0330345
4	-0.0317482
5	-0.0284448
6	-0.0251415
7	-0.0231834

8	-0.021102
9	-0.0191411
10	-0.01896
11	-0.0174735
12	-0.0147544
13	-0.0146759
14	-0.0144371
15	-0.0128376
16	-0.0115895
17	-0.00840675
18	-0.0075126
19	-0.00736
20	-0.00659701
21	-0.00524779
22	-0.00213763
23	-0.00053375
24	-0.000488994
25	0.00107013
26	0.00423996
27	0.00742876
28	0.0137874

Sen's Estimator (Median Q) is -0.0136373

Time Period	**Observations**
5/10/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0231834 = Q(7)
Upper limit is -0.00213763 = Q(22)
-0.00213763 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12342D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/10/2005	6.20085	8
8/10/2005	6.14395	7
11/15/2005	6.13735	6
2/20/2006	6.10175	5
5/23/2006	6.08707	3
8/28/2006	6.08493	1
11/1/2006	6.086	2
2/20/2007	6.09979	4

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von Neumann ratio v = 0.380952 = 16/42
99% Critical Value = 0.62
0.380952 <= 0.62
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12342D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.495437	0.0181324	0.683	None

Loc.	Date	Conc.	Outlier
12342D	5/10/2005	6.20085	FALSE
	8/10/2005	6.14395	FALSE
	11/15/2005	6.13735	FALSE
	2/20/2006	6.10175	FALSE
	5/23/2006	6.08707	FALSE
	8/28/2006	6.08493	FALSE
	11/1/2006	6.086	FALSE
	2/20/2007	6.09979	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12342E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	106000	154294	48294	0.6052	29227.5
2	108000	150000	42000	0.3164	13288.8
3	111000	142000	31000	0.1743	5403.3
4	117000	132000	15000	0.0561	841.5
5	132000	117000	-15000		
6	142000	111000	-31000		
7	150000	108000	-42000		
8	154294	106000	-48294		

Sum of b values = 48761.1
Sample Standard Deviation = 19565.5
W Statistic = 0.887295

5% Critical value of 0.818 is less than 0.887295
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.887295
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
108000	106000	2000	1	0
117000	106000	11000	2	0
111000	106000	5000	3	0
132000	106000	26000	4	0
150000	106000	44000	5	0
142000	106000	36000	6	0
154294	106000	48294	7	0
117000	108000	9000	8	0
111000	108000	3000	9	0
132000	108000	24000	10	0
150000	108000	42000	11	0
142000	108000	34000	12	0
154294	108000	46294	13	0
111000	117000	-6000	13	1
132000	117000	15000	14	1
150000	117000	33000	15	1
142000	117000	25000	16	1
154294	117000	37294	17	1
132000	111000	21000	18	1
150000	111000	39000	19	1
142000	111000	31000	20	1
154294	111000	43294	21	1
150000	132000	18000	22	1
142000	132000	10000	23	1
154294	132000	22294	24	1
142000	150000	-8000	24	2
154294	150000	4294	25	2
154294	142000	12294	26	2

ChemStat
Trial Version

S Statistic = 26 - 2 = 24
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 24 is 0.00087
S > 0 and 0.00087 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: SO4
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
108000 (8/10/2005)	106000 (5/18/2005)	(108000 - 106000)/(2 - 1)	2000
117000 (11/21/2005)	106000 (5/18/2005)	(117000 - 106000)/(3 - 1)	5500
111000 (2/15/2006)	106000 (5/18/2005)	(111000 - 106000)/(4 - 1)	1666.67
132000 (5/22/2006)	106000 (5/18/2005)	(132000 - 106000)/(5 - 1)	6500
150000 (8/29/2006)	106000 (5/18/2005)	(150000 - 106000)/(6 - 1)	8800
142000 (11/7/2006)	106000 (5/18/2005)	(142000 - 106000)/(7 - 1)	6000
154294 (2/27/2007)	106000 (5/18/2005)	(154294 - 106000)/(8 - 1)	6899.14
117000 (11/21/2005)	108000 (8/10/2005)	(117000 - 108000)/(3 - 2)	9000
111000 (2/15/2006)	108000 (8/10/2005)	(111000 - 108000)/(4 - 2)	1500
132000 (5/22/2006)	108000 (8/10/2005)	(132000 - 108000)/(5 - 2)	8000
150000 (8/29/2006)	108000 (8/10/2005)	(150000 - 108000)/(6 - 2)	10500
142000 (11/7/2006)	108000 (8/10/2005)	(142000 - 108000)/(7 - 2)	6800
154294 (2/27/2007)	108000 (8/10/2005)	(154294 - 108000)/(8 - 2)	7715.67
111000 (2/15/2006)	117000 (11/21/2005)	(111000 - 117000)/(4 - 3)	-6000
132000 (5/22/2006)	117000 (11/21/2005)	(132000 - 117000)/(5 - 3)	7500
150000 (8/29/2006)	117000 (11/21/2005)	(150000 - 117000)/(6 - 3)	11000
142000 (11/7/2006)	117000 (11/21/2005)	(142000 - 117000)/(7 - 3)	6250
154294 (2/27/2007)	117000 (11/21/2005)	(154294 - 117000)/(8 - 3)	7458.8
132000 (5/22/2006)	111000 (2/15/2006)	(132000 - 111000)/(5 - 4)	21000
150000 (8/29/2006)	111000 (2/15/2006)	(150000 - 111000)/(6 - 4)	19500
142000 (11/7/2006)	111000 (2/15/2006)	(142000 - 111000)/(7 - 4)	10333.3
154294 (2/27/2007)	111000 (2/15/2006)	(154294 - 111000)/(8 - 4)	10823.5
150000 (8/29/2006)	132000 (5/22/2006)	(150000 - 132000)/(6 - 5)	18000
142000 (11/7/2006)	132000 (5/22/2006)	(142000 - 132000)/(7 - 5)	5000
154294 (2/27/2007)	132000 (5/22/2006)	(154294 - 132000)/(8 - 5)	7431.33
142000 (11/7/2006)	150000 (8/29/2006)	(142000 - 150000)/(7 - 6)	-8000
154294 (2/27/2007)	150000 (8/29/2006)	(154294 - 150000)/(8 - 6)	2147
154294 (2/27/2007)	142000 (11/7/2006)	(154294 - 142000)/(8 - 7)	12294

ChemStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-8000
2	-6000
3	1500
4	1666.67
5	2000
6	2147
7	5000

8	5500
9	6000
10	6250
11	6500
12	6800
13	6899.14
14	7431.33
15	7458.8
16	7500
17	7715.67
18	8000
19	8800
20	9000
21	10333.3
22	10500
23	10823.5
24	11000
25	12294
26	18000
27	19500
28	21000

Sen's Estimator (Median Q) is 7445.07

Time Period	Observations
5/18/2005	1
8/10/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 5000 = Q(7)
Upper limit is 10500 = Q(22)
5000 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	106000	1
8/10/2005	108000	2
11/21/2005	117000	4
2/15/2006	111000	3
5/22/2006	132000	5
8/29/2006	150000	7
11/7/2006	142000	6
2/27/2007	154294	8

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von Neumann ratio v = 0.452381 = 19/42
99% Critical Value = 0.62
0.452381 <= 0.62
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.092755	0.0454545	0.683	None

Loc.	Date	Conc.	Outlier
12342E	5/18/2005	106000	FALSE
	8/10/2005	108000	FALSE
	11/21/2005	117000	FALSE
	2/15/2006	111000	FALSE
	5/22/2006	132000	FALSE
	8/29/2006	150000	FALSE
	11/7/2006	142000	FALSE
	2/27/2007	154294	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12343D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.672e+006	1.92643e+006	254430	0.6052	153981
2	1.69e+006	1.902e+006	212000	0.3164	67076.8
3	1.735e+006	1.858e+006	123000	0.1743	21438.9
4	1.756e+006	1.78e+006	24000	0.0561	1346.4
5	1.78e+006	1.756e+006	-24000		
6	1.858e+006	1.735e+006	-123000		
7	1.902e+006	1.69e+006	-212000		
8	1.92643e+006	1.672e+006	-254430		

Sum of b values = 243843
Sample Standard Deviation = 95607.9
W Statistic = 0.929256

5% Critical value of 0.818 is less than 0.929256
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.929256
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.735e+006	1.672e+006	63000	1	0
1.902e+006	1.672e+006	230000	2	0
1.69e+006	1.672e+006	18000	3	0
1.78e+006	1.672e+006	108000	4	0
1.756e+006	1.672e+006	84000	5	0
1.858e+006	1.672e+006	186000	6	0
1.92643e+006	1.672e+006	254430	7	0
1.902e+006	1.735e+006	167000	8	0
1.69e+006	1.735e+006	-45000	8	1
1.78e+006	1.735e+006	45000	9	1
1.756e+006	1.735e+006	21000	10	1
1.858e+006	1.735e+006	123000	11	1
1.92643e+006	1.735e+006	191430	12	1
1.69e+006	1.902e+006	-212000	12	2
1.78e+006	1.902e+006	-122000	12	3
1.756e+006	1.902e+006	-146000	12	4
1.858e+006	1.902e+006	-44000	12	5
1.92643e+006	1.902e+006	24430	[illegible]	5
1.78e+006	1.69e+006	90000	14	5
1.756e+006	1.69e+006	66000	15	5
1.858e+006	1.69e+006	168000	16	5
1.92643e+006	1.69e+006	236430	17	5
1.756e+006	1.78e+006	-24000	17	6
1.858e+006	1.78e+006	78000	18	6
1.92643e+006	1.78e+006	146430	19	6
1.858e+006	1.756e+006	102000	20	6
1.92643e+006	1.756e+006	170430	21	6
1.92643e+006	1.858e+006	68430	22	6

ChemStat Trial Version

S Statistic = 22 - 6 = 16
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 16 is 0.031
S > 0 and 0.031 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: SO4
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.735e+006 (8/10/2005)	1.672e+006 (5/9/2005)	(1.735e+006 - 1.672e+006)/(2 -	163000
1.902e+006 (11/15/2005)	1.672e+006 (5/9/2005)	(1.902e+006 - 1.672e+006)/(3 -	1115000
1.69e+006 (2/20/2006)	1.672e+006 (5/9/2005)	(1.69e+006 - 1.672e+006)/(4 - 1)	6000
1.78e+006 (5/23/2006)	1.672e+006 (5/9/2005)	(1.78e+006 - 1.672e+006)/(5 - 1)	27000
1.756e+006 (8/28/2006)	1.672e+006 (5/9/2005)	(1.756e+006 - 1.672e+006)/(6 -	116800
1.858e+006 (11/2/2006)	1.672e+006 (5/9/2005)	(1.858e+006 - 1.672e+006)/(7 -	131000
1.92643e+006 (2/20/2007)	1.672e+006 (5/9/2005)	(1.92643e+006 - 1.672e+006)/(8	36347.1
1.902e+006 (11/15/2005)	1.735e+006 (8/10/2005)	(1.902e+006 - 1.735e+006)/(3 -	2167000
1.69e+006 (2/20/2006)	1.735e+006 (8/10/2005)	(1.69e+006 - 1.735e+006)/(4 - 2)	-22500
1.78e+006 (5/23/2006)	1.735e+006 (8/10/2005)	(1.78e+006 - 1.735e+006)/(5 - 2)	15000
1.756e+006 (8/28/2006)	1.735e+006 (8/10/2005)	(1.756e+006 - 1.735e+006)/(6 -	25250
1.858e+006 (11/2/2006)	1.735e+006 (8/10/2005)	(1.858e+006 - 1.735e+006)/(7 -	224600
1.92643e+006 (2/20/2007)	1.735e+006 (8/10/2005)	(1.92643e+006 - 1.735e+006)/(8	31905
1.69e+006 (2/20/2006)	1.902e+006 (11/15/2005)	(1.69e+006 - 1.902e+006)/(4 - 3)	-212000
1.78e+006 (5/23/2006)	1.902e+006 (11/15/2005)	(1.78e+006 - 1.902e+006)/(5 - 3)	-61000
1.756e+006 (8/28/2006)	1.902e+006 (11/15/2005)	(1.756e+006 - 1.902e+006)/(6 - 3	-48666.7
1.858e+006 (11/2/2006)	1.902e+006 (11/15/2005)	(1.858e+006 - 1.902e+006)/(7 - 3	-11000
1.92643e+006 (2/20/2007)	1.902e+006 (11/15/2005)	(1.92643e+006 - 1.902e+006)/(8	4886
1.78e+006 (5/23/2006)	1.69e+006 (2/20/2006)	(1.78e+006 - 1.69e+006)/(5 - 4)	90000
1.756e+006 (8/28/2006)	1.69e+006 (2/20/2006)	(1.756e+006 - 1.69e+006)/(6 - 4)	33000
1.858e+006 (11/2/2006)	1.69e+006 (2/20/2006)	(1.858e+006 - 1.69e+006)/(7 - 4)	56000
1.92643e+006 (2/20/2007)	1.69e+006 (2/20/2006)	(1.92643e+006 - 1.69e+006)/(8 -	59107.5
1.756e+006 (8/28/2006)	1.78e+006 (5/23/2006)	(1.756e+006 - 1.78e+006)/(6 - 5)	-24000
1.858e+006 (11/2/2006)	1.78e+006 (5/23/2006)	(1.858e+006 - 1.78e+006)/(7 - 5)	39000
1.92643e+006 (2/20/2007)	1.78e+006 (5/23/2006)	(1.92643e+006 - 1.78e+006)/(8 -	48810
1.858e+006 (11/2/2006)	1.756e+006 (8/28/2006)	(1.858e+006 - 1.756e+006)/(7 -	6102000
1.92643e+006 (2/20/2007)	1.756e+006 (8/28/2006)	(1.92643e+006 - 1.756e+006)/(8	85215
1.92643e+006 (2/20/2007)	1.858e+006 (11/2/2006)	(1.92643e+006 - 1.858e+006)/(8	68430

Demo Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-212000
2	-61000
3	-48666.7
4	-24000
5	-22500
6	-11000
7	4886

8	5250
9	6000
10	15000
11	16800
12	24600
13	27000
14	31000
15	31905
16	33000
17	36347.1
18	39000
19	48810
20	56000
21	59107.5
22	63000
23	68430
24	85215
25	90000
26	102000
27	115000
28	167000

Sen's Estimator (Median Q) is 31452.5

Time Period	Observations
5/9/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/2/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 4886 = Q(7)
Upper limit is 63000 = Q(22)
4886 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/9/2005	1.672e+006	1
8/10/2005	1.735e+006	3
11/15/2005	1.902e+006	7
2/20/2006	1.69e+006	2
5/23/2006	1.78e+006	5
8/28/2006	1.756e+006	4
11/2/2006	1.858e+006	6
2/20/2007	1.92643e+006	8

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von Neumann ratio v = 1.5 = 63/42
99% Critical Value = 0.62
1.5 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.103329	0.0782609	0.683	None

Loc.	Date	Conc.	Outlier
12343D	5/9/2005	1.672e+006	FALSE
	8/10/2005	1.735e+006	FALSE
	11/15/2005	1.902e+006	FALSE
	2/20/2006	1.69e+006	FALSE
	5/23/2006	1.78e+006	FALSE
	8/28/2006	1.756e+006	FALSE
	11/2/2006	1.858e+006	FALSE
	2/20/2007	1.92643e+006	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12343E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	345000	500000	155000	0.6233	96611.5
2	375000	497000	122000	0.3031	36978.2
3	383000	419000	36000	0.1401	5043.6
4	404460	404460	0		
5	419000	383000	-36000		
6	497000	375000	-122000		
7	500000	345000	-155000		

Sum of b values = 138633
Sample Standard Deviation = 59932.5
W Statistic = 0.891784

5% Critical value of 0.803 is less than 0.891784
Data is normally distributed at 95% level of significance

1% Critical value of 0.73 is less [illegible] 0.891784
Data is normally distributed at [illegible]9% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis
Parameter: SO4
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
497000	500000	-3000	0	1
419000	500000	-81000	0	2
383000	500000	-117000	0	3
345000	500000	-155000	0	4
375000	500000	-125000	0	5
404460	500000	-95540	0	6
419000	497000	-78000	0	7
383000	497000	-114000	0	8
345000	497000	-152000	0	9
375000	497000	-122000	0	10
404460	497000	-92540	0	11
383000	419000	-36000	0	12
345000	419000	[illegible]	0	[illegible]
375000	419000	-4400[illegible]	[illegible]	14
404460	419000	-1[illegible]54[illegible]	[illegible]	1[illegible]
345000	383000	-38000	0	16
375000	383000	[illegible]000		17
404460	383000	[illegible]	1	[illegible]
375000	345000	30000	2	17
404460	345000	59460	3	17
404460	375000	29460	4	17

ChemStat
Trial Version

S Statistic = 4 - 17 = -13
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 13 is 0.035
S < 0 and 0.035 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: SO4
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
497000 (11/21/2005)	500000 (8/9/2005)	(497000 - 500000)/(2 - 1)	-3000
419000 (2/15/2006)	500000 (8/9/2005)	(419000 - 500000)/(3 - 1)	-40500
383000 (5/22/2006)	500000 (8/9/2005)	(383000 - 500000)/(4 - 1)	-39000
345000 (8/29/2006)	500000 (8/9/2005)	(345000 - 500000)/(5 - 1)	-38750
375000 (11/7/2006)	500000 (8/9/2005)	(375000 - 500000)/(6 - 1)	-25000
404460 (2/27/2007)	500000 (8/9/2005)	(404460 - 500000)/(7 - 1)	-15923.3
419000 (2/15/2006)	497000 (11/21/2005)	(419000 - 497000)/(3 - 2)	-78000
383000 (5/22/2006)	497000 (11/21/2005)	(383000 - 497000)/(4 - 2)	-57000
345000 (8/29/2006)	497000 (11/21/2005)	(345000 - 497000)/(5 - 2)	-50666.7
375000 (11/7/2006)	497000 (11/21/2005)	(375000 - 497000)/(6 - 2)	-30500
404460 (2/27/2007)	497000 (11/21/2005)	(404460 - 497000)/(7 - 2)	-18508
383000 (5/22/2006)	419000 (2/15/2006)	(383000 - 419000)/(4 - 3)	-36000
345000 (8/29/2006)	419000 (2/15/2006)	(345000 - 419000)/(5 - 3)	-37000
375000 (11/7/2006)	419000 (2/15/2006)	(375000 - 419000)/(6 - 3)	-14666.7
404460 (2/27/2007)	419000 (2/15/2006)	(404460 - 419000)/(7 - 3)	-3635
345000 (8/29/2006)	383000 (5/22/2006)	(345000 - 383000)/(5 - 4)	-38000
375000 (11/7/2006)	383000 (5/22/2006)	(375000 - 383000)/(6 - 4)	-4000
404460 (2/27/2007)	383000 (5/22/2006)	(404460 - 383000)/(7 - 4)	7153.33
375000 (11/7/2006)	345000 (8/29/2006)	(375000 - 345000)/(6 - 5)	30000
404460 (2/27/2007)	345000 (8/29/2006)	(404460 - 345000)/(7 - 5)	29730
404460 (2/27/2007)	375000 (11/7/2006)	(404460 - 375000)/(7 - 6)	29460

Number of Q values = 21

ChemStat Trial Version

Ordered Q Values

n	Q
1	-78000
2	-57000
3	-50666.7
4	-40500
5	-39000
6	-38750
7	-38000
8	-37000
9	-36000
10	-30500
11	-25000
12	-18508
13	-15923.3
14	-14666.7
15	-4000

16	-3635
17	-3000
18	7153.33
19	29460
20	29730
21	30000

Sen's Estimator (Median Q) is -25000

Time Period	Observations
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 798
b = 1890
c = 84
Group Variance = 44.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 10.952
M1 = (21 - 10.952)/2.0 = 5.02404
M2 = (21 + 10.952)/2.0 + 1 = 16.976
Lower limit is -39000 = Q(5)
Upper limit is -3000 = Q(17)
-3000 < 0 indicating a downward trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/9/2005	500000	7
11/21/2005	497000	6
2/15/2006	419000	5
5/22/2006	383000	3
8/29/2006	345000	1
11/7/2006	375000	2
2/27/2007	404460	4

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von Neumann ratio v = 0.535714 = 15/28
99% Critical Value = 0.54
0.535714 <= 0.54
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 7 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0193548	0.193548	0.637	None

Loc.	Date	Conc.	Outlier
12343E	8/9/2005	500000	FALSE
	11/21/2005	497000	FALSE
	2/15/2006	419000	FALSE
	5/22/2006	383000	FALSE
	8/29/2006	345000	FALSE
	11/7/2006	375000	FALSE
	2/27/2007	404460	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12344D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.477e+006	2.205e+006	728000	0.6052	440586
2	1.50699e+006	1.878e+006	371010	0.3164	117388
3	1.561e+006	1.81e+006	249000	0.1743	43400.7
4	1.579e+006	1.732e+006	153000	0.0561	8583.3
5	1.732e+006	1.579e+006	-153000		
6	1.81e+006	1.561e+006	-249000		
7	1.878e+006	1.50699e+006	-371010		
8	2.205e+006	1.477e+006	-728000		

Sum of b values = 609957
Sample Standard Deviation = 244366
W Statistic = 0.890062

5% Critical value of 0.818 is less than 0.890062
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.890062
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis
Parameter: SO4
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.81e+006	2.205e+006	-395000	0	1
1.732e+006	2.205e+006	-473000	0	2
1.878e+006	2.205e+006	-327000	0	3
1.561e+006	2.205e+006	-644000	0	4
1.579e+006	2.205e+006	-626000	0	5
1.477e+006	2.205e+006	-728000	0	6
1.50699e+006	2.205e+006	-698010	0	7
1.732e+006	1.81e+006	-78000	0	8
1.878e+006	1.81e+006	68000	1	8
1.561e+006	1.81e+006	-249000	1	9
1.579e+006	1.81e+006	-231000	1	10
1.477e+006	1.81e+006	-333000	1	11
1.50699e+006	1.81e+006	-303010	1	12
1.878e+006	1.732e+006	146000	2	12
1.561e+006	1.732e+006	-171000	2	13
1.579e+006	1.732e+006	-153000	2	14
1.477e+006	1.732e+006	-255000	2	15
1.50699e+006	1.732e+006	-225010	2	16
1.561e+006	1.878e+006	-317000	2	17
1.579e+006	1.878e+006	-299000	2	18
1.477e+006	1.878e+006	-401000	2	19
1.50699e+006	1.878e+006	-371010	2	20
1.579e+006	1.561e+006	18000	3	20
1.477e+006	1.561e+006	-84000	3	21
1.50699e+006	1.561e+006	-54010	3	22
1.477e+006	1.579e+006	-102000	3	23
1.50699e+006	1.579e+006	-72010	3	24
1.50699e+006	1.477e+006	29990	4	24

ChemStat Trial Version

S Statistic = 4 - 24 = -20
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 20 is 0.0071
S < 0 and 0.0071 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: SO4
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.81e+006 (8/23/2005)	2.205e+006 (5/31/2005)	(1.81e+006 - 2.205e+006)/(2 - 1)	-395000
1.732e+006 (11/16/2005)	2.205e+006 (5/31/2005)	(1.732e+006 - 2.205e+006)/(3 - 1	-236500
1.878e+006 (2/21/2006)	2.205e+006 (5/31/2005)	(1.878e+006 - 2.205e+006)/(4 - 1	-109000
1.561e+006 (5/30/2006)	2.205e+006 (5/31/2005)	(1.561e+006 - 2.205e+006)/(5 - 1	-161000
1.579e+006 (8/23/2006)	2.205e+006 (5/31/2005)	(1.579e+006 - 2.205e+006)/(6 - 1	-125200
1.477e+006 (11/2/2006)	2.205e+006 (5/31/2005)	(1.477e+006 - 2.205e+006)/(7 - 1	-121333
1.50699e+006 (2/21/2007)	2.205e+006 (5/31/2005)	(1.50699e+006 - 2.205e+006)/(8	-99715.7
1.732e+006 (11/16/2005)	1.81e+006 (8/23/2005)	(1.732e+006 - 1.81e+006)/(3 - 2)	-78000
1.878e+006 (2/21/2006)	1.81e+006 (8/23/2005)	(1.878e+006 - 1.81e+006)/(4 - 2)	34000
1.561e+006 (5/30/2006)	1.81e+006 (8/23/2005)	(1.561e+006 - 1.81e+006)/(5 - 2)	-83000
1.579e+006 (8/23/2006)	1.81e+006 (8/23/2005)	(1.579e+006 - 1.81e+006)/(6 - 2)	-57750
1.477e+006 (11/2/2006)	1.81e+006 (8/23/2005)	(1.477e+006 - 1.81e+006)/(7 - 2)	-66600
1.50699e+006 (2/21/2007)	1.81e+006 (8/23/2005)	(1.50699e+006 - 1.81e+006)/(8 -	-50501.7
1.878e+006 (2/21/2006)	1.732e+006 (11/16/2005)	(1.878e+006 - 1.732e+006)/(4 -	3146000
1.561e+006 (5/30/2006)	1.732e+006 (11/16/2005)	(1.561e+006 - 1.732e+006)/(5 -	3-85500
1.579e+006 (8/23/2006)	1.732e+006 (11/16/2005)	(1.579e+006 - 1.732e+006)/(6 -	3-51000
1.477e+006 (11/2/2006)	1.732e+006 (11/16/2005)	(1.477e+006 - 1.732e+006)/(7 -	3-63750
1.50699e+006 (2/21/2007)	1.732e+006 (11/16/2005)	(1.50699e+006 - 1.732e+006)/(8	-45002
1.561e+006 (5/30/2006)	1.878e+006 (2/21/2006)	(1.561e+006 - 1.878e+006)/(5 -	4-317000
1.579e+006 (8/23/2006)	1.878e+006 (2/21/2006)	(1.579e+006 - 1.878e+006)/(6 -	4-149500
1.477e+006 (11/2/2006)	1.878e+006 (2/21/2006)	(1.477e+006 - 1.878e+006)/(7 -	4-133667
1.50699e+006 (2/21/2007)	1.878e+006 (2/21/2006)	(1.50699e+006 - 1.878e+006)/(8	-92752.5
1.579e+006 (8/23/2006)	1.561e+006 (5/30/2006)	(1.579e+006 - 1.561e+006)/(6 -	518000
1.477e+006 (11/2/2006)	1.561e+006 (5/30/2006)	(1.477e+006 - 1.561e+006)/(7 -	5-42000
1.50699e+006 (2/21/2007)	1.561e+006 (5/30/2006)	(1.50699e+006 - 1.561e+006)/(8	-18003.3
1.477e+006 (11/2/2006)	1.579e+006 (8/23/2006)	(1.477e+006 - 1.579e+006)/(7 -	6-102000
1.50699e+006 (2/21/2007)	1.579e+006 (8/23/2006)	(1.50699e+006 - 1.579e+006)/(8	-36005
1.50699e+006 (2/21/2007)	1.477e+006 (11/2/2006)	(1.50699e+006 - 1.477e+006)/(8	29990

Chemstat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-395000
2	-317000
3	-236500
4	-161000
5	-149500
6	-133667
7	-125200

8	-121333
9	-109000
10	-102000
11	-99715.7
12	-92752.5
13	-85500
14	-83000
15	-78000
16	-66600
17	-63750
18	-57750
19	-51000
20	-50501.7
21	-45002
22	-42000
23	-36005
24	-18003.3
25	18000
26	29990
27	34000
28	146000

Sen's Estimator (Median Q) is -80500

Time Period	**Observations**
5/31/2005	1
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
8/23/2006	1
11/2/2006	1
2/21/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -125200 = Q(7)
Upper limit is -42000 = Q(22)
-42000 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/31/2005	2.205e+006	8
8/23/2005	1.81e+006	6
11/16/2005	1.732e+006	5
2/21/2006	1.878e+006	7
5/30/2006	1.561e+006	3
8/23/2006	1.579e+006	4
11/2/2006	1.477e+006	1
2/21/2007	1.50699e+006	2

---

von Neumann ratio v = 0.857143 = 36/42
99% Critical Value = 0.62
0.857143 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.468475	0.074788	0.683	None

Loc.	Date	Conc.	Outlier
12344D	5/31/2005	2.205e+006	FALSE
	8/23/2005	1.81e+006	FALSE
	11/16/2005	1.732e+006	FALSE
	2/21/2006	1.878e+006	FALSE
	5/30/2006	1.561e+006	FALSE
	8/23/2006	1.579e+006	FALSE
	11/2/2006	1.477e+006	FALSE
	2/21/2007	1.50699e+006	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12344E
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	4.93952	5.21219	0.272668	0.6052	0.165019
2	4.94489	5.09691	0.152021	0.3164	0.0480994
3	4.95424	5.0569	0.102662	0.1743	0.017894
4	4.97313	4.99123	0.0180982	0.0561	0.00101531
5	4.99123	4.97313	-0.0180982		
6	5.0569	4.95424	-0.102662		
7	5.09691	4.94489	-0.152021		
8	5.21219	4.93952	-0.272668		

Sum of b values = 0.232028
Sample Standard Deviation = 0.0953721
W Statistic = 0.845549

5% Critical value of 0.818 is less than 0.845549
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.845549
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12344E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
5.21219	5.09691	0.115278	1	0
5.0569	5.09691	-0.0400052	1	1
4.95424	5.09691	-0.142668	1	2
4.99123	5.09691	-0.105684	1	3
4.97313	5.09691	-0.123782	1	4
4.93952	5.09691	-0.157391	1	5
4.94489	5.09691	-0.152021	1	6
5.0569	5.21219	-0.155283	1	7
4.95424	5.21219	-0.257945	1	8
4.99123	5.21219	-0.220962	1	9
4.97313	5.21219	-0.23906	1	10
4.93952	5.21219	-0.272668	1	11
4.94489	5.21219	-0.267298	1	12
4.95424	5.0569	-0.10[illegible]	1	13
4.99123	5.0569	-0.065[illegible]78	1	14
4.97313	5.0569	-0.083777	1	15
4.93952	5.0569	-0.117386	1	16
4.94489	5.056[illegible]	-0.112016	1	17
4.99123	4.9542[illegible]	0.0319[illegible]6	2	17
4.97313	4.95424	0.0188853	3	17
4.93952	4.95424	-0.0147233	3	18
4.94489	4.95424	-0.00935337	3	19
4.97313	4.99123	-0.0180982	3	20
4.93952	4.99123	-0.0517068	3	21
4.94489	4.99123	-0.0463369	3	22
4.93952	4.97313	-0.0336086	3	23
4.94489	4.97313	-0.0282387	3	24
4.94489	4.93952	0.00536989	4	24

ChemStat
Trial Version

S Statistic = 4 - 24 = -20
Comparing at 95% confidence level (downward trend)
Probability of obtaining S >= 20 is 0.0071
S < 0 and 0.0071 < 0.05 indicating a downward trend

Sen's Slope Analysis
Parameter: SO4
Location: 12344E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
5.21219 (10/11/2005)	5.09691 (8/24/2005)	(5.21219 - 5.09691)/(2 - 1)	0.115278
5.0569 (12/13/2005)	5.09691 (8/24/2005)	(5.0569 - 5.09691)/(3 - 1)	-0.0200026
4.95424 (2/14/2006)	5.09691 (8/24/2005)	(4.95424 - 5.09691)/(4 - 1)	-0.0475558
4.99123 (5/31/2006)	5.09691 (8/24/2005)	(4.99123 - 5.09691)/(5 - 1)	-0.026421
4.97313 (8/21/2006)	5.09691 (8/24/2005)	(4.97313 - 5.09691)/(6 - 1)	-0.0247564
4.93952 (11/7/2006)	5.09691 (8/24/2005)	(4.93952 - 5.09691)/(7 - 1)	-0.0262318
4.94489 (2/27/2007)	5.09691 (8/24/2005)	(4.94489 - 5.09691)/(8 - 1)	-0.0217173
5.0569 (12/13/2005)	5.21219 (10/11/2005)	(5.0569 - 5.21219)/(3 - 2)	-0.155283
4.95424 (2/14/2006)	5.21219 (10/11/2005)	(4.95424 - 5.21219)/(4 - 2)	-0.128973
4.99123 (5/31/2006)	5.21219 (10/11/2005)	(4.99123 - 5.21219)/(5 - 2)	-0.0736538
4.97313 (8/21/2006)	5.21219 (10/11/2005)	(4.97313 - 5.21219)/(6 - 2)	-0.0597649
4.93952 (11/7/2006)	5.21219 (10/11/2005)	(4.93952 - 5.21219)/(7 - 2)	-0.0545337
4.94489 (2/27/2007)	5.21219 (10/11/2005)	(4.94489 - 5.21219)/(8 - 2)	-0.0445497
4.95424 (2/14/2006)	5.0569 (12/13/2005)	(4.95424 - 5.0569)/(4 - 3)	-0.102662
4.99123 (5/31/2006)	5.0569 (12/13/2005)	(4.99123 - 5.0569)/(5 - 3)	-0.0328394
4.97313 (8/21/2006)	5.0569 (12/13/2005)	(4.97313 - 5.0569)/(6 - 3)	-0.0279257
4.93952 (11/7/2006)	5.0569 (12/13/2005)	(4.93952 - 5.0569)/(7 - 3)	-0.0293464
4.94489 (2/27/2007)	5.0569 (12/13/2005)	(4.94489 - 5.0569)/(8 - 3)	-0.0224031
4.99123 (5/31/2006)	4.95424 (2/14/2006)	(4.99123 - 4.95424)/(5 - 4)	0.0369836
4.97313 (8/21/2006)	4.95424 (2/14/2006)	(4.97313 - 4.95424)/(6 - 4)	0.00944267
4.93952 (11/7/2006)	4.95424 (2/14/2006)	(4.93952 - 4.95424)/(7 - 4)	-0.00490775
4.94489 (2/27/2007)	4.95424 (2/14/2006)	(4.94489 - 4.95424)/(8 - 4)	-0.00233834
4.97313 (8/21/2006)	4.99123 (5/31/2006)	(4.97313 - 4.99123)/(6 - 5)	-0.0180982
4.93952 (11/7/2006)	4.99123 (5/31/2006)	(4.93952 - 4.99123)/(7 - 5)	-0.0258534
4.94489 (2/27/2007)	4.99123 (5/31/2006)	(4.94489 - 4.99123)/(8 - 5)	-0.0154456
4.93952 (11/7/2006)	4.97313 (8/21/2006)	(4.93952 - 4.97313)/(7 - 6)	-0.0336086
4.94489 (2/27/2007)	4.97313 (8/21/2006)	(4.94489 - 4.97313)/(8 - 6)	-0.0141194
4.94489 (2/27/2007)	4.93952 (11/7/2006)	(4.94489 - 4.93952)/(8 - 7)	0.00536989

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.155283
2	-0.128973
3	-0.102662
4	-0.0736538
5	-0.0597649
6	-0.0545337
7	-0.0475558

8	-0.0445497
9	-0.0336086
10	-0.0328394
11	-0.0293464
12	-0.0279257
13	-0.026421
14	-0.0262318
15	-0.0258534
16	-0.0247564
17	-0.0224031
18	-0.0217173
19	-0.0200026
20	-0.0180982
21	-0.0154456
22	-0.0141194
23	-0.00490775
24	-0.00233834
25	0.00536989
26	0.00944267
27	0.0369836
28	0.115278

Sen's Estimator (Median Q) is -0.0260426

Time Period	Observations
8/24/2005	1
10/11/2005	1
12/13/2005	1
2/14/2006	1
5/31/2006	1
8/21/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.0475558 = Q(7)
Upper limit is -0.0141194 = Q(22)
-0.0141194 < 0 indicating a downward trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12344E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/24/2005	5.09691	7
10/11/2005	5.21219	8
12/13/2005	5.0569	6
2/14/2006	4.95424	3
5/31/2006	4.99123	5
8/21/2006	4.97313	4
11/7/2006	4.93952	1
2/27/2007	4.94489	2

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von Neumann ratio v = 0.690476 = 29/42
99% Critical Value = 0.62
0.690476 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers
Parameter: SO4
Location: 12344E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.431269	0.0341182	0.683	None

Loc.	Date	Conc.	Outlier
12344E	8/24/2005	5.09691	FALSE
	10/11/2005	5.21219	FALSE
	12/13/2005	5.0569	FALSE
	2/14/2006	4.95424	FALSE
	5/31/2006	4.99123	FALSE
	8/21/2006	4.97313	FALSE
	11/7/2006	4.93952	FALSE
	2/27/2007	4.94489	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12345D
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 2 for 5 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.31534	6.50188	0.18654	0.6646	0.123974
2	6.36021	6.39094	0.0307205	0.2413	0.00741286
3	6.37475	6.37475	0		
4	6.39094	6.36021	-0.0307205		
5	6.50188	6.31534	-0.18654		

Sum of b values = 0.131387
Sample Standard Deviation = 0.0692865
W Statistic = 0.89898

5% Critical value of 0.762 is less than 0.89898
Data is normally distributed at 95% level of significance

1% Critical value of 0.686 is less than 0.89898
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis
Parameter: SO4
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
6.50188	6.36021	0.141666	1	0
6.37475	6.36021	0.0145337	2	0
6.31534	6.36021	-0.0448741	2	1
6.39094	6.36021	0.0307205	3	1
6.37475	6.50188	-0.127132	3	2
6.31534	6.50188	-0.18654	3	3
6.39094	6.50188	-0.110945	3	4
6.31534	6.37475	-0.0594079	3	5
6.39094	6.37475	0.0161868	4	5
6.39094	6.31534	0.0755946	5	5

S Statistic = 5 - 5 = 0
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |0| is 1.184
1.184 >= 0.025 indicating no evidence of a trend

ChemStat
Trial Version

Sen's Slope Analysis
Parameter: SO4
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
6.50188 (11/16/2005)	6.36021 (8/23/2005)	(6.50188 - 6.36021)/(2 - 1)	0.141666
6.37475 (2/21/2006)	6.36021 (8/23/2005)	(6.37475 - 6.36021)/(3 - 1)	0.00726687
6.31534 (5/30/2006)	6.36021 (8/23/2005)	(6.31534 - 6.36021)/(4 - 1)	-0.014958
6.39094 (2/21/2007)	6.36021 (8/23/2005)	(6.39094 - 6.36021)/(5 - 1)	0.00768012
6.37475 (2/21/2006)	6.50188 (11/16/2005)	(6.37475 - 6.50188)/(3 - 2)	-0.127132
6.31534 (5/30/2006)	6.50188 (11/16/2005)	(6.31534 - 6.50188)/(4 - 2)	-0.09327
6.39094 (2/21/2007)	6.50188 (11/16/2005)	(6.39094 - 6.50188)/(5 - 2)	-0.0369818
6.31534 (5/30/2006)	6.37475 (2/21/2006)	(6.31534 - 6.37475)/(4 - 3)	-0.0594079
6.39094 (2/21/2007)	6.37475 (2/21/2006)	(6.39094 - 6.37475)/(5 - 3)	0.00809338
6.39094 (2/21/2007)	6.31534 (5/30/2006)	(6.39094 - 6.31534)/(5 - 4)	0.0755946

Number of Q values = 10

ChemStat
Trial Version

Ordered Q Values

n	Q
1	-0.127132
2	-0.09327
3	-0.0594079
4	-0.0369818
5	-0.014958
6	0.00726687
7	0.00768012
8	0.00809338
9	0.0755946
10	0.141666

Sen's Estimator (Median Q) is -0.00384559

Time Period	Observations
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
2/21/2007	1

There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 300
b = 540

c = 40
Group Variance = 16.6667
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 6.71508
M1 = (10 - 6.71508)/2.0 = 1.64246
M2 = (10 + 6.71508)/2.0 + 1 = 9.35754
Lower limit is -0.09327 = Q(2)
Upper limit is 0.0755946 = Q(9)
-0.09327 < 0 < 0.0755946 indicating no trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/23/2005	6.36021	2
11/16/2005	6.50188	5
2/21/2006	6.37475	3
5/30/2006	6.31534	1
2/21/2007	6.39094	4

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von Neumann ratio v = 2.6 = 26/10
Insufficient Measurements
A minimum of six measurements is required.

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 5 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.594754	0.24056	0.78	None

Loc.	Date	Conc.	Outlier
12345D	8/23/2005	6.36021	FALSE
	11/16/2005	6.50188	FALSE
	2/21/2006	6.37475	FALSE
	5/30/2006	6.31534	FALSE
	2/21/2007	6.39094	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: SO4
Location: 12345E
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	4.99564	5.14679	0.151153	0.6052	0.0914778
2	5	5.14301	0.143015	0.3164	0.0452499
3	5.01703	5.06819	0.0511525	0.1743	0.00891588
4	5.03342	5.0607	0.0272741	0.0561	0.00153008
5	5.0607	5.03342	-0.0272741		
6	5.06819	5.01703	-0.0511525		
7	5.14301	5	-0.143015		
8	5.14679	4.99564	-0.151153		

Sum of b values = 0.147174
Sample Standard Deviation = 0.0594708
W Statistic = 0.874892

5% Critical value of 0.818 is less than 0.874892
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.874892
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: SO4
Location: 12345E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
4.99564	5	-0.00436481	0	1
5.03342	5	0.0334238	1	1
5.01703	5	0.0170333	2	1
5.0607	5	0.0606978	3	1
5.06819	5	0.0681859	4	1
5.14301	5	0.143015	5	1
5.14679	5	0.146788	6	1
5.03342	4.99564	0.0377886	7	1
5.01703	4.99564	0.0213981	8	1
5.0607	4.99564	0.0650626	9	1
5.06819	4.99564	0.0725507	10	1
5.14301	4.99564	0.14738	11	1
5.14679	4.99564	0.151153	12	1
5.01703	5.03342	[illegible]	12	2
5.0607	5.03342	[illegible]	13	2
5.06819	5.03342	0.0347621	14	2
5.14301	5.03342	0.109591	15	2
5.14679	5.03[illegible]	0.113365	[illegible]	2
5.0607	5.0170[illegible]	[illegible]	17	2
5.06819	5.01703	0.0511525	18	2
5.14301	5.01703	0.125981	19	2
5.14679	5.01703	0.129755	20	2
5.06819	5.0607	0.00748802	21	2
5.14301	5.0607	0.082317	22	2
5.14679	5.0607	0.0860904	23	2
5.14301	5.06819	0.0748289	24	2
5.14679	5.06819	0.0786024	25	2
5.14679	5.14301	0.00377348	26	2

ChemStat
Trial Version

S Statistic = 26 - 2 = 24
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 24 is 0.00087
S > 0 and 0.00087 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: SO4
Location: 12345E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
4.99564 (10/11/2005)	5 (8/24/2005)	(4.99564 - 5)/(2 - 1)	-0.00436481
5.03342 (12/13/2005)	5 (8/24/2005)	(5.03342 - 5)/(3 - 1)	0.0167119
5.01703 (2/14/2006)	5 (8/24/2005)	(5.01703 - 5)/(4 - 1)	0.00567778
5.0607 (4/21/2006)	5 (8/24/2005)	(5.0607 - 5)/(5 - 1)	0.0151745
5.06819 (6/27/2006)	5 (8/24/2005)	(5.06819 - 5)/(6 - 1)	0.0136372
5.14301 (8/21/2006)	5 (8/24/2005)	(5.14301 - 5)/(7 - 1)	0.0238358
5.14679 (2/28/2007)	5 (8/24/2005)	(5.14679 - 5)/(8 - 1)	0.0209698
5.03342 (12/13/2005)	4.99564 (10/11/2005)	(5.03342 - 4.99564)/(3 - 2)	0.0377886
5.01703 (2/14/2006)	4.99564 (10/11/2005)	(5.01703 - 4.99564)/(4 - 2)	0.0106991
5.0607 (4/21/2006)	4.99564 (10/11/2005)	(5.0607 - 4.99564)/(5 - 2)	0.0216875
5.06819 (6/27/2006)	4.99564 (10/11/2005)	(5.06819 - 4.99564)/(6 - 2)	0.0181377
5.14301 (8/21/2006)	4.99564 (10/11/2005)	(5.14301 - 4.99564)/(7 - 2)	0.0294759
5.14679 (2/28/2007)	4.99564 (10/11/2005)	(5.14679 - 4.99564)/(8 - 2)	0.0251922
5.01703 (2/14/2006)	[illegible] (12/13/2005)	(5.01703 - 5.03342)/(4 - 3)	-0.0163904
5.0607 (4/21/2006)	5.033[illegible]	[illegible]/(5 - 3)	0.013637
5.06819 (6/27/2006)	[illegible]	[illegible]/(6 - 3)	0.0115874
5.14301 (8/21/2006)	5.03342 (12/13/2005)	(5.14301 - 5.03342)/(7 - 3)	0.0273978
5.14679 (2/28/2007)	5.03342 (12/13/2005)	(5.14679 - 5.03342)/(8 - 3)	0.0226729
5.0607 (4/21/2006)	[illegible]	[illegible]	0.0436645
5.06819 (6/27/2006)	[illegible]	[illegible]	0.0255763
5.14301 (8/21/2006)	5.01703 (2/14/2006)	(5.14301 - 5.01703)/(7 - 4)	0.0419938
5.14679 (2/28/2007)	5.01703 (2/14/2006)	(5.14679 - 5.01703)/(8 - 4)	0.0324387
5.06819 (6/27/2006)	5.0607 (4/21/2006)	(5.06819 - 5.0607)/(6 - 5)	0.00748802
5.14301 (8/21/2006)	5.0607 (4/21/2006)	(5.14301 - 5.0607)/(7 - 5)	0.0411585
5.14679 (2/28/2007)	5.0607 (4/21/2006)	(5.14679 - 5.0607)/(8 - 5)	0.0286968
5.14301 (8/21/2006)	5.06819 (6/27/2006)	(5.14301 - 5.06819)/(7 - 6)	0.0748289
5.14679 (2/28/2007)	5.06819 (6/27/2006)	(5.14679 - 5.06819)/(8 - 6)	0.0393012
5.14679 (2/28/2007)	5.14301 (8/21/2006)	(5.14679 - 5.14301)/(8 - 7)	0.00377348

Number of Q values = 28

ChemStat Trial Version

Ordered Q Values

n	Q
1	-0.0163904
2	-0.00436481
3	0.00377348
4	0.00567778
5	0.00748802
6	0.0106991
7	0.0115874

8	0.013637
9	0.0136372
10	0.0151745
11	0.0167119
12	0.0181377
13	0.0209698
14	0.0216875
15	0.0226729
16	0.0238358
17	0.0251922
18	0.0255763
19	0.0273978
20	0.0286968
21	0.0294759
22	0.0324387
23	0.0377886
24	0.0393012
25	0.0411585
26	0.0419938
27	0.0436645
28	0.0748289

Sen's Estimator (Median Q) is 0.0221802

Time Period	Observations
8/24/2005	1
10/11/2005	1
12/13/2005	1
2/14/2006	
4/21/2006	1
6/27/2006	1
8/21/2006	1
2/28/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 0.0115874 = Q(7)
Upper limit is 0.0324387 = Q(22)
0.0115874 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: SO4
Location: 12345E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/24/2005	5	2
10/11/2005	4.99564	1
12/13/2005	5.03342	4
2/14/2006	5.01703	3
4/21/2006	5.0607	5
6/27/2006	5.06819	6
8/21/2006	5.14301	7
2/28/2007	5.14679	8

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von Neumann ratio v = 0.428571 = 18/42
99% Critical Value = 0.62
0.428571 <= 0.62
Test for statistical independence fails at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: SO4
Location: 12345E
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.025707	0.0296161	0.683	None

Loc.	Date	Conc.	Outlier
12345E	8/24/2005	5	FALSE
	10/11/2005	4.99564	FALSE
	12/13/2005	5.03342	FALSE
	2/14/2006	5.01703	FALSE
	4/21/2006	5.0607	FALSE
	6/27/2006	5.06819	FALSE
	8/21/2006	5.14301	FALSE
	2/28/2007	5.14679	FALSE

ChemStat
Trial Version

Summary of Statistical Tests for Uranium
LDS and HTW Monitoring Horizons of the OSDF

	Horizon	Distribution	Trend	Serial Correlation	Outliers	
					Present	Removed
Cell 1	LDS	normal	upward	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 2	LDS	Insuf. data	Insuf. data	Insuf. data	Insuf. data	Insuf. Data
	HTW	NC	NC	NC	NC	NC
Cell 3	LDS	normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 4	LDS	normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 5	LDS	normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 6	LDS	normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC
Cell 7	LDS	normal	none	no	no	NA
	HTW	normal	none	no	no	NA
Cell 8	LDS	log normal	none	no	no	NA
	HTW	NC	NC	NC	NC	NC

Distribution determined by Shapiro-Wilks Test of Normality
Trend determined by Mann-Kendall Trend Analysis & Sens Slope Analysis
Serial Correlation determined by Rank Von Neumann Ratio Test
Outliers determined by Dixon's Test. Outliers were removed if Shapiro-Wilks test failed.
NA – not applicable
NC – not considered because the uranium concentration is inappropriate for use as a detection ion in this horizon

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12338D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	9.59	18	8.41	0.6431	5.40847
2	10.6	17.2	6.6	0.2806	1.85196
3	14.5	15.7	1.2	0.0875	0.105
4	15.7	14.5	-1.2		
5	17.2	10.6	-6.6		
6	18	9.59	-8.41		

Sum of b values = 7.36543
Sample Standard Deviation = 3.46314
W Statistic = 0.904661

5% Critical value of 0.788 is less than 0.904661
Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.904661
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
10.6	9.59	1.01	1	0
14.5	9.59	4.91	2	0
17.2	9.59	7.61	3	0
18	9.59	8.41	4	0
15.7	9.59	6.11	5	0
14.5	10.6	3.9	6	0
17.2	10.6	6.6	7	0
18	10.6	7.4	8	0
15.7	10.6	5.1	9	0
17.2	14.5	2.7	10	0
18	14.5	3.5	11	0
15.7	14.5	1.2	12	0
18	17.2	0.8	13	0
15.7	17.2	-1.5	13	1
15.7	18	-2.3	13	2

ChemStat
Trial Version

S Statistic = 13 - 2 = 11
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 11 is 0.028
S > 0 and 0.028 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: U
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
10.6 (8/10/2005)	9.59 (5/11/2005)	(10.6 - 9.59)/(2 - 1)	1.01
14.5 (11/16/2005)	9.59 (5/11/2005)	(14.5 - 9.59)/(3 - 1)	2.455
17.2 (2/20/2006)	9.59 (5/11/2005)	(17.2 - 9.59)/(4 - 1)	2.53667
18 (5/30/2006)	9.59 (5/11/2005)	(18 - 9.59)/(5 - 1)	2.1025
15.7 (2/21/2007)	9.59 (5/11/2005)	(15.7 - 9.59)/(6 - 1)	1.222
14.5 (11/16/2005)	10.6 (8/10/2005)	(14.5 - 10.6)/(3 - 2)	3.9
17.2 (2/20/2006)	10.6 (8/10/2005)	(17.2 - 10.6)/(4 - 2)	3.3
18 (5/30/2006)	10.6 (8/10/2005)	(18 - 10.6)/(5 - 2)	2.46667
15.7 (2/21/2007)	10.6 (8/10/2005)	(15.7 - 10.6)/(6 - 2)	1.275
17.2 (2/20/2006)	14.5 (11/16/2005)	(17.2 - 14.5)/(4 - 3)	2.7
18 (5/30/2006)	14.5 (11/16/2005)	(18 - 14.5)/(5 - 3)	1.75
15.7 (2/21/2007)	14.5 (11/16/2005)	(15.7 - 14.5)/(6 - 3)	0.4
18 (5/30/2006)	17.2 (2/20/2006)	(18 - 17.2)/(5 - 4)	0.8
15.7 (2/21/2007)	17.2 [illegible]	[illegible]	-0.75
15.7 (2/21/2007)	18 (5/30/2006)	(15.7 - 18)/(6 - 5)	-2.3

ChemStat
Trial Version

Number of Q values = 1

Ordered Q Values

n	Q
1	-2.3
2	-0.75
3	0.4
4	0.8
5	1.01
6	1.222
7	1.275
8	1.75
9	2.1025
10	2.455
11	2.46667
12	2.53667
13	2.7
14	3.3
15	3.9

Sen's Estimator (Median Q) is 1.75

Time Period	Observations
5/11/2005	1
8/10/2005	1
11/16/2005	1
2/20/2006	1

5/30/2006 1
2/21/2007 1
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 510
b = 1080
c = 60
Group Variance = 28.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 8.7554
M1 = (15 - 8.7554)/2.0 = 3.1223
M2 = (15 + 8.7554)/2.0 + 1 = 12.8777
Lower limit is 0.4 = Q(3)
Upper limit is 2.7 = Q(13)
0.4 > 0 indicating an upward trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: U
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/11/2005	9.59	1
8/10/2005	10.6	2
11/16/2005	14.5	3
2/20/2006	17.2	5
5/30/2006	18	6
2/21/2007	15.7	4

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von Neumann ratio v = 0.628571 = 11/17.5
99% Critical Value = 0.46
0.628571 > 0.46
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12338D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 6 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0951249	0.120095	0.698	None

Loc.	Date	Conc.	Outlier
12338D	5/11/2005	9.59	FALSE
	8/10/2005	10.6	FALSE
	11/16/2005	14.5	FALSE
	2/20/2006	17.2	FALSE
	5/30/2006	18	FALSE
	2/21/2007	15.7	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12338E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	0.608	10.8	10.192	0.6052	6.1682
2	6.32	9.68	3.36	0.3164	1.0631
3	6.62	9.6	2.98	0.1743	0.519414
4	7.13	8.38	1.25	0.0561	0.070125
5	8.38	7.13	-1.25		
6	9.6	6.62	-2.98		
7	9.68	6.32	-3.36		
8	10.8	0.608	-10.192		

Sum of b values = 7.82084
Sample Standard Deviation = 3.17439
W Statistic = 0.867138

5% Critical value of 0.818 is less than 0.867138
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.867138
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
6.32	0.608	5.712	1	0
6.62	0.608	6.012	2	0
8.38	0.608	7.772	3	0
9.68	0.608	9.072	4	0
7.13	0.608	6.522	5	0
9.6	0.608	8.992	6	0
10.8	0.608	10.192	7	0
6.62	6.32	0.3	8	0
8.38	6.32	2.06	9	0
9.68	6.32	3.36	10	0
7.13	6.32	0.81	11	0
9.6	6.32	3.28	12	0
10.8	6.32	4.48	13	0
8.38	6.62	1.76	14	0
9.68	6.62	3.06	15	0
7.13	6.62	0.51	16	0
9.6	6.62	2.98	17	0
10.8	6.62	4.18	18	0
9.68	8.38	1.3	19	0
7.13	8.38	-1.25	19	1
9.6	8.38	1.22	20	1
10.8	8.38	2.42	21	1
7.13	9.68	-2.55	21	2
9.6	9.68	-0.08	21	3
10.8	9.68	1.12	22	3
9.6	7.13	2.47	23	3
10.8	7.13	3.67	24	3
10.8	9.6	1.2	25	3

ChemStat
Trial Version

S Statistic = 25 - 3 = 22
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 22 is 0.0028
S > 0 and 0.0028 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: U
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
6.32 (8/8/2005)	0.608 (5/24/2005)	(6.32 - 0.608)/(2 - 1)	5.712
6.62 (11/14/2005)	0.608 (5/24/2005)	(6.62 - 0.608)/(3 - 1)	3.006
8.38 (2/14/2006)	0.608 (5/24/2005)	(8.38 - 0.608)/(4 - 1)	2.59067
9.68 (5/24/2006)	0.608 (5/24/2005)	(9.68 - 0.608)/(5 - 1)	2.268
7.13 (8/17/2006)	0.608 (5/24/2005)	(7.13 - 0.608)/(6 - 1)	1.3044
9.6 (11/6/2006)	0.608 (5/24/2005)	(9.6 - 0.608)/(7 - 1)	1.49867
10.8 (2/27/2007)	0.608 (5/24/2005)	(10.8 - 0.608)/(8 - 1)	1.456
6.62 (11/14/2005)	6.32 (8/8/2005)	(6.62 - 6.32)/(3 - 2)	0.3
8.38 (2/14/2006)	6.32 (8/8/2005)	(8.38 - 6.32)/(4 - 2)	1.03
9.68 (5/24/2006)	6.32 (8/8/2005)	(9.68 - 6.32)/(5 - 2)	1.12
7.13 (8/17/2006)	6.32 (8/8/2005)	(7.13 - 6.32)/(6 - 2)	0.2025
9.6 (11/6/2006)	6.32 (8/8/2005)	(9.6 - 6.32)/(7 - 2)	0.656
10.8 (2/27/2007)	6.32 (8/8/2005)	(10.8 - 6.32)/(8 - 2)	0.746667
8.38 (2/14/2006)	6.62 (11/14/2005)	(8.38 - 6.62)/(4 - 3)	1.76
9.68 (5/24/2006)	6.62 (11/14/2005)	(9.68 - 6.62)/(5 - 3)	1.53
7.13 (8/17/2006)	6.62 (11/14/2005)	(7.13 - 6.62)/(6 - 3)	0.17
9.6 (11/6/2006)	6.62 (11/14/2005)	(9.6 - 6.62)/(7 - 3)	0.745
10.8 (2/27/2007)	6.62 (11/14/2005)	(10.8 - 6.62)/(8 - 3)	0.836
9.68 (5/24/2006)	8.38 (2/14/2006)	(9.68 - 8.38)/(5 - 4)	1.3
7.13 (8/17/2006)	8.38 (2/14/2006)	(7.13 - 8.38)/(6 - 4)	-0.625
9.6 (11/6/2006)	8.38 (2/14/2006)	(9.6 - 8.38)/(7 - 4)	0.406667
10.8 (2/27/2007)	8.38 (2/14/2006)	(10.8 - 8.38)/(8 - 4)	0.605
7.13 (8/17/2006)	9.68 (5/24/2006)	(7.13 - 9.68)/(6 - 5)	-2.55
9.6 (11/6/2006)	9.68 (5/24/2006)	(9.6 - 9.68)/(7 - 5)	-0.04
10.8 (2/27/2007)	9.68 (5/24/2006)	(10.8 - 9.68)/(8 - 5)	0.373333
9.6 (11/6/2006)	7.13 (8/17/2006)	(9.6 - 7.13)/(7 - 6)	2.47
10.8 (2/27/2007)	7.13 (8/17/2006)	(10.8 - 7.13)/(8 - 6)	1.835
10.8 (2/27/2007)	9.6 (11/6/2006)	(10.8 - 9.6)/(8 - 7)	1.2

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-2.55
2	-0.625
3	-0.04
4	0.17
5	0.2025
6	0.3
7	0.373333

8	0.406667
9	0.605
10	0.656
11	0.745
12	0.746667
13	0.836
14	1.03
15	1.12
16	1.2
17	1.3
18	1.3044
19	1.456
20	1.49867
21	1.53
22	1.76
23	1.835
24	2.268
25	2.47
26	2.59067
27	3.006
28	5.712

Sen's Estimator (Median Q) is 1.075

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/14/2006	1
5/24/2006	1
8/17/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 0.373333 = Q(7)
Upper limit is 1.76 = Q(22)
0.373333 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/24/2005	0.608	1
8/8/2005	6.32	2
11/14/2005	6.62	3
2/14/2006	8.38	5
5/24/2006	9.68	7
8/17/2006	7.13	4
11/6/2006	9.6	6
2/27/2007	10.8	8

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von Neumann ratio v = 0.642857 = 27/42
99% Critical Value = 0.62
0.642857 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12338E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.25	0.62963	0.683	None

Loc.	Date	Conc.	Outlier
12338E	5/24/2005	0.608	FALSE
	8/8/2005	6.32	FALSE
	11/14/2005	6.62	FALSE
	2/14/2006	8.38	FALSE
	5/24/2006	9.68	FALSE
	8/17/2006	7.13	FALSE
	11/6/2006	9.6	FALSE
	2/27/2007	10.8	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12339E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	6.16	10.7	4.54	0.6052	2.74761
2	7.74	8.6	0.86	0.3164	0.272104
3	7.77	8.24	0.47	0.1743	0.081921
4	8.16	8.22	0.06	0.0561	0.003366
5	8.22	8.16	-0.06		
6	8.24	7.77	-0.47		
7	8.6	7.74	-0.86		
8	10.7	6.16	-4.54		

Sum of b values = 3.105
Sample Standard Deviation = 1.25195
W Statistic = 0.878718

5% Critical value of 0.818 is less than 0.878718
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.878718
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.74	6.16	1.58	1	0
8.16	6.16	2	2	0
8.24	6.16	2.08	3	0
8.22	6.16	2.06	4	0
7.77	6.16	1.61	5	0
8.6	6.16	2.44	6	0
10.7	6.16	4.54	7	0
8.16	7.74	0.42	8	0
8.24	7.74	0.5	9	0
8.22	7.74	0.48	10	0
7.77	7.74	0.03	11	0
8.6	7.74	0.86	12	0
10.7	7.74	2.96	13	0
8.24	8.16	0.08	14	0
8.22	8.16	0.06	15	0
7.77	8.16	-0.39	15	1
8.6	8.16	0.44	16	1
10.7	8.16	2.54	[illegible]	1
8.22	8.24	-0.02	17	2
7.77	8.24	-0.47	17	3
8.6	8.24	0.36	18	3
10.7	8.24	2.46	19	3
7.77	8.22	-0.45	19	4
8.6	8.22	0.38	20	4
10.7	8.22	2.48	21	4
8.6	7.77	0.83	22	4
10.7	7.77	2.93	23	4
10.7	8.6	2.1	24	4

ChemStat
Trial Version

S Statistic = 24 - 4 = 20
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 20 is 0.0071
S > 0 and 0.0071 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: U
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
7.74 (8/8/2005)	6.16 (5/24/2005)	(7.74 - 6.16)/(2 - 1)	1.58
8.16 (11/14/2005)	6.16 (5/24/2005)	(8.16 - 6.16)/(3 - 1)	1
8.24 (2/16/2006)	6.16 (5/24/2005)	(8.24 - 6.16)/(4 - 1)	0.693333
8.22 (5/24/2006)	6.16 (5/24/2005)	(8.22 - 6.16)/(5 - 1)	0.515
7.77 (8/22/2006)	6.16 (5/24/2005)	(7.77 - 6.16)/(6 - 1)	0.322
8.6 (11/6/2006)	6.16 (5/24/2005)	(8.6 - 6.16)/(7 - 1)	0.406667
10.7 (2/27/2007)	6.16 (5/24/2005)	(10.7 - 6.16)/(8 - 1)	0.648571
8.16 (11/14/2005)	7.74 (8/8/2005)	(8.16 - 7.74)/(3 - 2)	0.42
8.24 (2/16/2006)	7.74 (8/8/2005)	(8.24 - 7.74)/(4 - 2)	0.25
8.22 (5/24/2006)	7.74 (8/8/2005)	(8.22 - 7.74)/(5 - 2)	0.16
7.77 (8/22/2006)	7.74 (8/8/2005)	(7.77 - 7.74)/(6 - 2)	0.0075
8.6 (11/6/2006)	7.74 (8/8/2005)	(8.6 - 7.74)/(7 - 2)	0.172
10.7 (2/27/2007)	7.74 (8/8/2005)	(10.7 - 7.74)/(8 - 2)	0.493333
8.24 (2/16/2006)	8.16 (11/14/2005)	(8.24 - 8.16)/(4 - 3)	0.08
8.22 (5/24/2006)	8.16 (11/14/2005)	(8.22 - 8.16)/(5 - 3)	0.03
7.77 (8/22/2006)	8.16 (11/14/2005)	(7.77 - 8.16)/(6 - 3)	-0.13
8.6 (11/6/2006)	8.16 (11/14/2005)	(8.6 - 8.16)/(7 - 3)	0.11
10.7 (2/27/2007)	8.16 (11/14/2005)	(10.7 - 8.16)/(8 - 3)	0.508
8.22 (5/24/2006)	8.24 (2/16/2006)	(8.22 - 8.24)/(5 - 4)	-0.02
7.77 (8/22/2006)	8.24 (2/16/2006)	(7.77 - 8.24)/(6 - 4)	-0.235
8.6 (11/6/2006)	8.24 (2/16/2006)	(8.6 - 8.24)/(7 - 4)	0.12
10.7 (2/27/2007)	8.24 (2/16/2006)	(10.7 - 8.24)/(8 - 4)	0.615
7.77 (8/22/2006)	8.22 (5/24/2006)	(7.77 - 8.22)/(6 - 5)	-0.45
8.6 (11/6/2006)	8.22 (5/24/2006)	(8.6 - 8.22)/(7 - 5)	0.19
10.7 (2/27/2007)	8.22 (5/24/2006)	(10.7 - 8.22)/(8 - 5)	0.826667
8.6 (11/6/2006)	7.77 (8/22/2006)	(8.6 - 7.77)/(7 - 6)	0.83
10.7 (2/27/2007)	7.77 (8/22/2006)	(10.7 - 7.77)/(8 - 6)	1.465
10.7 (2/27/2007)	8.6 (11/6/2006)	(10.7 - 8.6)/(8 - 7)	2.1

ChemStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.45
2	-0.235
3	-0.13
4	-0.02
5	0.0075
6	0.03
7	0.08

8	0.11
9	0.12
10	0.16
11	0.172
12	0.19
13	0.25
14	0.322
15	0.406667
16	0.42
17	0.493333
18	0.508
19	0.515
20	0.615
21	0.648571
22	0.693333
23	0.826667
24	0.83
25	1
26	1.465
27	1.58
28	2.1

Sen's Estimator (Median Q) is 0.364333

Time Period	Observations
5/24/2005	1
8/8/2005	1
11/14/2005	1
2/16/2006	1
5/24/2006	1
8/22/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 0.08 = Q(7)
Upper limit is 0.693333 = Q(22)
0.08 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/24/2005	6.16	1
8/8/2005	7.74	2
11/14/2005	8.16	4
2/16/2006	8.24	6
5/24/2006	8.22	5
8/22/2006	7.77	3
11/6/2006	8.6	7
2/27/2007	10.7	8

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von Neumann ratio v = 0.738095 = 31/42
99% Critical Value = 0.62
0.738095 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12339E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.709459	0.647541	0.683	10.7
2	0.147541	0.647541	0.637	6.16
3	0.418605	0.0348837	0.698	None

Loc.	Date	Conc.	Outlier
12339E	5/24/2005	**6.16**	**TRUE**
	8/8/2005	7.74	FALSE
	11/14/2005	8.16	FALSE
	2/16/2006	8.24	FALSE
	5/24/2006	8.22	FALSE
	8/22/2006	7.77	FALSE
	11/6/2006	8.6	FALSE
	2/27/2007	**10.7**	**TRUE**

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12340D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	12.5	19.8	7.3	0.6052	4.41796
2	13.3	18.7	5.4	0.3164	1.70856
3	13.7	16	2.3	0.1743	0.40089
4	13.7	15.4	1.7	0.0561	0.09537
5	15.4	13.7	-1.7		
6	16	13.7	-2.3		
7	18.7	13.3	-5.4		
8	19.8	12.5	-7.3		

Sum of b values = 6.62278
Sample Standard Deviation = 2.65138
W Statistic = 0.89133

5% Critical value of 0.818 is less than 0.89133
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.89133
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
16	13.7	2.3	1	0
19.8	13.7	6.1	2	0
18.7	13.7	5	3	0
12.5	13.7	-1.2	3	1
13.3	13.7	-0.4	3	2
15.4	13.7	1.7	4	2
13.7	13.7	0	4	2
19.8	16	3.8	5	2
18.7	16	2.7	6	2
12.5	16	-3.5	6	3
13.3	16	-2.7	6	4
15.4	16	-0.6	6	5
13.7	16	-2.3	6	6
18.7	19.8	-1.1	[illegible]	7
12.5	19.8	-7.3	[illegible]	8
13.3	19.8	-6.5	6	9
15.4	19.8	-4.4	6	10
13.7	19.8	-6.1	[illegible]	11
12.5	18.7	-6.2	6	12
13.3	18.7	-5.4	6	13
15.4	18.7	-3.3	6	14
13.7	18.7	-5	6	15
13.3	12.5	0.8	7	15
15.4	12.5	2.9	8	15
13.7	12.5	1.2	9	15
15.4	13.3	2.1	10	15
13.7	13.3	0.4	11	15
13.7	15.4	-1.7	11	16

ChemStat
Trial Version

S Statistic = 11 - 16 = -5
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Failed to calculate probability for S = -5
Table out of range

Sen's Slope Analysis
Parameter: U
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
16 (8/9/2005)	13.7 (5/16/2005)	(16 - 13.7)/(2 - 1)	2.3
19.8 (11/28/2005)	13.7 (5/16/2005)	(19.8 - 13.7)/(3 - 1)	3.05
18.7 (2/20/2006)	13.7 (5/16/2005)	(18.7 - 13.7)/(4 - 1)	1.66667
12.5 (5/30/2006)	13.7 (5/16/2005)	(12.5 - 13.7)/(5 - 1)	-0.3
13.3 (8/25/2006)	13.7 (5/16/2005)	(13.3 - 13.7)/(6 - 1)	-0.08
15.4 (11/1/2006)	13.7 (5/16/2005)	(15.4 - 13.7)/(7 - 1)	0.283333
13.7 (2/20/2007)	13.7 (5/16/2005)	(13.7 - 13.7)/(8 - 1)	0
19.8 (11/28/2005)	16 (8/9/2005)	(19.8 - 16)/(3 - 2)	3.8
18.7 (2/20/2006)	16 (8/9/2005)	(18.7 - 16)/(4 - 2)	1.35
12.5 (5/30/2006)	16 (8/9/2005)	(12.5 - 16)/(5 - 2)	-1.16667
13.3 (8/25/2006)	16 (8/9/2005)	(13.3 - 16)/(6 - 2)	-0.675
15.4 (11/1/2006)	16 (8/9/2005)	(15.4 - 16)/(7 - 2)	-0.12
13.7 (2/20/2007)	16 (8/9/2005)	(13.7 - 16)/(8 - 2)	-0.383333
18.7 (2/20/2006)	19.8 (11/28/2005)	(18.7 - 19.8)/(4 - 3)	-1.1
12.5 (5/30/2006)	19.8 (11/28/2005)	(12.5 - 19.8)/(5 - 3)	-3.65
13.3 (8/25/2006)	19.8 (11/28/2005)	(13.3 - 19.8)/(6 - 3)	-2.16667
15.4 (11/1/2006)	19.8 (11/28/2005)	(15.4 - 19.8)/(7 - 3)	-1.1
13.7 (2/20/2007)	19.8 (11/28/2005)	(13.7 - 19.8)/(8 - 3)	-1.22
12.5 (5/30/2006)	18.7 (2/20/2006)	(12.5 - 18.7)/(5 - 4)	-6.2
13.3 (8/25/2006)	18.7 (2/20/2006)	(13.3 - 18.7)/(6 - 4)	-2.7
15.4 (11/1/2006)	18.7 (2/20/2006)	(15.4 - 18.7)/(7 - 4)	-1.1
13.7 (2/20/2007)	18.7 (2/20/2006)	(13.7 - 18.7)/(8 - 4)	-1.25
13.3 (8/25/2006)	12.5 (5/30/2006)	(13.3 - 12.5)/(6 - 5)	0.8
15.4 (11/1/2006)	12.5 (5/30/2006)	(15.4 - 12.5)/(7 - 5)	1.45
13.7 (2/20/2007)	12.5 (5/30/2006)	(13.7 - 12.5)/(8 - 5)	0.4
15.4 (11/1/2006)	13.3 (8/25/2006)	(15.4 - 13.3)/(7 - 6)	2.1
13.7 (2/20/2007)	13.3 (8/25/2006)	(13.7 - 13.3)/(8 - 6)	0.2
13.7 (2/20/2007)	15.4 (11/1/2006)	(13.7 - 15.4)/(8 - 7)	-1.7

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-6.2
2	-3.65
3	-2.7
4	-2.16667
5	-1.7
6	-1.25
7	-1.22

8	-1.16667
9	-1.1
10	-1.1
11	-1.1
12	-0.675
13	-0.383333
14	-0.3
15	-0.12
16	-0.08
17	0
18	0.2
19	0.283333
20	0.4
21	0.8
22	1.35
23	1.45
24	1.66667
25	2.1
26	2.3
27	3.05
28	3.8

Sen's Estimator (Median Q) is -0.21

Tied Group	Value	Members
1	13.7	2

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/28/2005	1
2/20/2006	1
5/30/2006	1
8/25/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -1.22 = Q(7)
Upper limit is 1.35 = Q(22)
-1.22 < 0 < 1.35 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/16/2005	13.7	3.5
8/9/2005	16	6
11/28/2005	19.8	8
2/20/2006	18.7	7
5/30/2006	12.5	1
8/25/2006	13.3	2
11/1/2006	15.4	5
2/20/2007	13.7	3.5

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von Neumann ratio v = 1.41667 = 59.5/42
99% Critical Value = 0.62
1.41667 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12340D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.169231	0.129032	0.683	None

Loc.	Date	Conc.	Outlier
12340D	5/16/2005	13.7	FALSE
	8/9/2005	16	FALSE
	11/28/2005	19.8	FALSE
	2/20/2006	18.7	FALSE
	5/30/2006	12.5	FALSE
	8/25/2006	13.3	FALSE
	11/1/2006	15.4	FALSE
	2/20/2007	13.7	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12340E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	16.5	23.6	7.1	0.6052	4.29692
2	16.9	21.3	4.4	0.3164	1.39216
3	17.7	19.8	2.1	0.1743	0.36603
4	19.7	19.8	0.1	0.0561	0.00561
5	19.8	19.7	-0.1		
6	19.8	17.7	-2.1		
7	21.3	16.9	-4.4		
8	23.6	16.5	-7.1		

Sum of b values = 6.06072
Sample Standard Deviation = 2.3667
W Statistic = 0.93684

5% Critical value of 0.818 is less than 0.93684
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.93684
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
16.5	21.3	-4.8	0	1
19.7	21.3	-1.6	0	2
16.9	21.3	-4.4	0	3
17.7	21.3	-3.6	0	4
19.8	21.3	-1.5	0	5
19.8	21.3	-1.5	0	6
23.6	21.3	2.3	1	6
19.7	16.5	3.2	2	6
16.9	16.5	0.4	3	6
17.7	16.5	1.2	4	6
19.8	16.5	3.3	5	6
19.8	16.5	3.3	6	6
23.6	16.5	7.1	7	6
16.9	19.7	-2.8	7	7
17.7	19.7	-2.[illegible]	7	8
19.8	19.7	0.1	8	8
19.8	19.7	0.1	9	8
23.6	19.7	3.9	10	8
17.7	16.9	0.8	11	8
19.8	16.9	2.9	12	8
19.8	16.9	2.9	13	8
23.6	16.9	6.7	14	8
19.8	17.7	2.1	15	8
19.8	17.7	2.1	16	8
23.6	17.7	5.9	17	8
19.8	19.8	0	17	8
23.6	19.8	3.8	18	8
23.6	19.8	3.8	19	8

ChemStat
Trial Version

S Statistic = 19 - 8 = 11
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Failed to calculate probability for S = 11
Table out of range

Sen's Slope Analysis
Parameter: U
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
16.5 (8/8/2005)	21.3 (5/18/2005)	(16.5 - 21.3)/(2 - 1)	-4.8
19.7 (11/14/2005)	21.3 (5/18/2005)	(19.7 - 21.3)/(3 - 1)	-0.8
16.9 (2/15/2006)	21.3 (5/18/2005)	(16.9 - 21.3)/(4 - 1)	-1.46667
17.7 (5/24/2006)	21.3 (5/18/2005)	(17.7 - 21.3)/(5 - 1)	-0.9
19.8 (8/25/2006)	21.3 (5/18/2005)	(19.8 - 21.3)/(6 - 1)	-0.3
19.8 (11/6/2006)	21.3 (5/18/2005)	(19.8 - 21.3)/(7 - 1)	-0.25
23.6 (2/27/2007)	21.3 (5/18/2005)	(23.6 - 21.3)/(8 - 1)	0.328571
19.7 (11/14/2005)	16.5 (8/8/2005)	(19.7 - 16.5)/(3 - 2)	3.2
16.9 (2/15/2006)	16.5 (8/8/2005)	(16.9 - 16.5)/(4 - 2)	0.2
17.7 (5/24/2006)	16.5 (8/8/2005)	(17.7 - 16.5)/(5 - 2)	0.4
19.8 (8/25/2006)	16.5 (8/8/2005)	(19.8 - 16.5)/(6 - 2)	0.825
19.8 (11/6/2006)	16.5 (8/8/2005)	(19.8 - 16.5)/(7 - 2)	0.66
23.6 (2/27/2007)	16.5 (8/8/2005)	(23.6 - 16.5)/(8 - 2)	1.18333
16.9 (2/15/2006)	19.7 (11/14/2005)	(16.9 - 19.7)/(4 - 3)	-2.8
17.7 (5/24/2006)	19.7 (11/14/2005)	(17.7 - 19.7)/(5 - 3)	-1
19.8 (8/25/2006)	19.7 (11/14/2005)	(19.8 - 19.7)/(6 - 3)	0.0333333
19.8 (11/6/2006)	19.7 (11/14/2005)	(19.8 - 19.7)/(7 - 3)	0.025
23.6 (2/27/2007)	19.7 (11/14/2005)	(23.6 - 19.7)/(8 - 3)	0.78
17.7 (5/24/2006)	16.9 (2/15/2006)	(17.7 - 16.9)/(5 - 4)	0.8
19.8 (8/25/2006)	16.9 (2/15/2006)	(19.8 - 16.9)/(6 - 4)	1.45
19.8 (11/6/2006)	16.9 (2/15/2006)	(19.8 - 16.9)/(7 - 4)	0.966667
23.6 (2/27/2007)	16.9 (2/15/2006)	(23.6 - 16.9)/(8 - 4)	1.675
19.8 (8/25/2006)	17.7 (5/24/2006)	(19.8 - 17.7)/(6 - 5)	2.1
19.8 (11/6/2006)	17.7 (5/24/2006)	(19.8 - 17.7)/(7 - 5)	1.05
23.6 (2/27/2007)	17.7 (5/24/2006)	(23.6 - 17.7)/(8 - 5)	1.96667
19.8 (11/6/2006)	19.8 (8/25/2006)	(19.8 - 19.8)/(7 - 6)	0
23.6 (2/27/2007)	19.8 (8/25/2006)	(23.6 - 19.8)/(8 - 6)	1.9
23.6 (2/27/2007)	19.8 (11/6/2006)	(23.6 - 19.8)/(8 - 7)	3.8

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-4.8
2	-2.8
3	-1.46667
4	-1
5	-0.9
6	-0.8
7	-0.3

8	-0.25
9	0
10	0.025
11	0.0333333
12	0.2
13	0.328571
14	0.4
15	0.66
16	0.78
17	0.8
18	0.825
19	0.966667
20	1.05
21	1.18333
22	1.45
23	1.675
24	1.9
25	1.96667
26	2.1
27	3.2
28	3.8

Sen's Estimator (Median Q) is 0.53

Tied Group	Value	Members
1	19.8	2

ChemStat Trial Version

Time Period	Observations
5/18/2005	1
8/8/2005	1
11/14/2005	1
2/15/2006	1
5/24/2006	1
8/25/2006	1
11/6/2006	1
2/27/2007	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -0.3 = Q(7)
Upper limit is 1.45 = Q(22)
-0.3 < 0 < 1.45 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	21.3	7
8/8/2005	16.5	1
11/14/2005	19.7	4
2/15/2006	16.9	2
5/24/2006	17.7	3
8/25/2006	19.8	5.5
11/6/2006	19.8	5.5
2/27/2007	23.6	8

---

von Neumann ratio v = 1.4881 = 62.5/42
99% Critical Value = 0.62
1.4881 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12340E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.343284	0.0833333	0.683	None

Loc.	Date	Conc.	Outlier
12340E	5/18/2005	21.3	FALSE
	8/8/2005	16.5	FALSE
	11/14/2005	19.7	FALSE
	2/15/2006	16.9	FALSE
	5/24/2006	17.7	FALSE
	8/25/2006	19.8	FALSE
	11/6/2006	19.8	FALSE
	2/27/2007	23.6	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: *U*

Location: 12341D

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	11.8	21.3	9.5	0.6052	5.7494
2	12.3	17.5	5.2	0.3164	1.64528
3	14.3	17.2	2.9	0.1743	0.50547
4	15.4	16.3	0.9	0.0561	0.05049
5	16.3	15.4	-0.9		
6	17.2	14.3	-2.9		
7	17.5	12.3	-5.2		
8	21.3	11.8	-9.5		

Sum of b values = 7.95064

Sample Standard Deviation = 3.07057

W Statistic = 0.957786

5% Critical value of 0.818 is less than 0.957786

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.957786

Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
14.3	11.8	2.5	1	0
12.3	11.8	0.5	2	0
21.3	11.8	9.5	3	0
17.2	11.8	5.4	4	0
16.3	11.8	4.5	5	0
15.4	11.8	3.6	6	0
17.5	11.8	5.7	7	0
12.3	14.3	-2	7	1
21.3	14.3	7	8	1
17.2	14.3	2.9	9	1
16.3	14.3	2	10	1
15.4	14.3	1.1	11	1
17.5	14.3	3.2	12	1
21.3	12.3	9	13	1
17.2	12.3	4.9	14	1
16.3	12.3	4	15	1
15.4	12.3	3.1	16	1
17.5	12.3	5.2	17	1
17.2	21.3	-4.1	17	2
16.3	21.3	-5	17	3
15.4	21.3	-5.9	17	4
17.5	21.3	-3.8	17	5
16.3	17.2	-0.9	17	6
15.4	17.2	-1.8	17	7
17.5	17.2	0.3	18	7
15.4	16.3	-0.9	18	8
17.5	16.3	1.2	19	8
17.5	15.4	2.1	20	8

ChemStat
Trial Version

S Statistic = 20 - 8 = 12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |12| is 0.178
0.178 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: U
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
14.3 (8/9/2005)	11.8 (5/16/2005)	(14.3 - 11.8)/(2 - 1)	2.5
12.3 (11/15/2005)	11.8 (5/16/2005)	(12.3 - 11.8)/(3 - 1)	0.25
21.3 (2/20/2006)	11.8 (5/16/2005)	(21.3 - 11.8)/(4 - 1)	3.16667
17.2 (5/23/2006)	11.8 (5/16/2005)	(17.2 - 11.8)/(5 - 1)	1.35
16.3 (8/28/2006)	11.8 (5/16/2005)	(16.3 - 11.8)/(6 - 1)	0.9
15.4 (11/1/2006)	11.8 (5/16/2005)	(15.4 - 11.8)/(7 - 1)	0.6
17.5 (2/20/2007)	11.8 (5/16/2005)	(17.5 - 11.8)/(8 - 1)	0.814286
12.3 (11/15/2005)	14.3 (8/9/2005)	(12.3 - 14.3)/(3 - 2)	-2
21.3 (2/20/2006)	14.3 (8/9/2005)	(21.3 - 14.3)/(4 - 2)	3.5
17.2 (5/23/2006)	14.3 (8/9/2005)	(17.2 - 14.3)/(5 - 2)	0.966667
16.3 (8/28/2006)	14.3 (8/9/2005)	(16.3 - 14.3)/(6 - 2)	0.5
15.4 (11/1/2006)	14.3 (8/9/2005)	(15.4 - 14.3)/(7 - 2)	0.22
17.5 (2/20/2007)	14.3 (8/9/2005)	(17.5 - 14.3)/(8 - 2)	0.533333
21.3 (2/20/2006)	[illegible] (11/15/2005)	[illegible] 12.3)/(4 - 3)	9
17.2 (5/23/2006)	12.3 [illegible]	[illegible]	2.45
16.3 (8/28/2006)	[illegible]	[illegible]	1.33333
15.4 (11/1/2006)	12.3 (11/15/2005)	(15.4 - 12.3)/(7 - 3)	0.775
17.5 (2/20/2007)	12.3 (11/15/2005)	(17.5 - 12.3)/(8 - 3)	1.04
17.2 (5/23/2006)	[illegible]	[illegible]	-4.1
16.3 (8/28/2006)	[illegible]	[illegible]	-2.5
15.4 (11/1/2006)	21.3 (2/20/2006)	(15.4 - 21.3)/(7 - 4)	-1.96667
17.5 (2/20/2007)	21.3 (2/20/2006)	(17.5 - 21.3)/(8 - 4)	-0.95
16.3 (8/28/2006)	17.2 (5/23/2006)	(16.3 - 17.2)/(6 - 5)	-0.9
15.4 (11/1/2006)	17.2 (5/23/2006)	(15.4 - 17.2)/(7 - 5)	-0.9
17.5 (2/20/2007)	17.2 (5/23/2006)	(17.5 - 17.2)/(8 - 5)	0.1
15.4 (11/1/2006)	16.3 (8/28/2006)	(15.4 - 16.3)/(7 - 6)	-0.9
17.5 (2/20/2007)	16.3 (8/28/2006)	(17.5 - 16.3)/(8 - 6)	0.6
17.5 (2/20/2007)	15.4 (11/1/2006)	(17.5 - 15.4)/(8 - 7)	2.1

ChemStat
TrialVersion

Number of Q values = 28

Ordered Q Values

n	Q
1	-4.1
2	-2.5
3	-2
4	-1.96667
5	-0.95
6	-0.9
7	-0.9

8	-0.9
9	0.1
10	0.22
11	0.25
12	0.5
13	0.533333
14	0.6
15	0.6
16	0.775
17	0.814286
18	0.9
19	0.966667
20	1.04
21	1.33333
22	1.35
23	2.1
24	2.45
25	2.5
26	3.16667
27	3.5
28	9

Sen's Estimator (Median Q) is 0.6

Time Period	Observations
5/16/2005	1
8/9/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.9 = Q(7)
Upper limit is 1.35 = Q(22)
-0.9 < 0 < 1.35 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/16/2005	11.8	1
8/9/2005	14.3	3
11/15/2005	12.3	2
2/20/2006	21.3	8
5/23/2006	17.2	6
8/28/2006	16.3	5
11/1/2006	15.4	4
2/20/2007	17.5	7

---

von Neumann ratio v = 1.33333 = 56/42
99% Critical Value = 0.62
1.33333 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12341D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.422222	0.0877193	0.683	None

Loc.	Date	Conc.	Outlier
12341D	5/16/2005	11.8	FALSE
	8/9/2005	14.3	FALSE
	11/15/2005	12.3	FALSE
	2/20/2006	21.3	FALSE
	5/23/2006	17.2	FALSE
	8/28/2006	16.3	FALSE
	11/1/2006	15.4	FALSE
	2/20/2007	17.5	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U

Location: 12341E

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	5.01	5.7	0.69	0.6052	0.417588
2	5.14	5.6	0.46	0.3164	0.145544
3	5.15	5.39	0.24	0.1743	0.041832
4	5.25	5.32	0.07	0.0561	0.003927
5	5.32	5.25	-0.07		
6	5.39	5.15	-0.24		
7	5.6	5.14	-0.46		
8	5.7	5.01	-0.69		

Sum of b values = 0.608891

Sample Standard Deviation = 0.236039

W Statistic = 0.950637

5% Critical value of 0.818 is less than 0.950637

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.950637

Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
5.25	5.39	-0.14	0	1
5.32	5.39	-0.07	0	2
5.14	5.39	-0.25	0	3
5.15	5.39	-0.24	0	4
5.01	5.39	-0.38	0	5
5.6	5.39	0.21	1	5
5.7	5.39	0.31	2	5
5.32	5.25	0.07	3	5
5.14	5.25	-0.11	3	6
5.15	5.25	-0.1	3	7
5.01	5.25	-0.24	3	8
5.6	5.25	0.35	4	8
5.7	5.25	0.45	5	8
5.14	5.32	-0.18	[illegible]	[illegible]
5.15	5.32	-0.17	[illegible]	10
5.01	5.32	-0.31	5	11
5.6	5.32	0.28	6	11
5.7	5.32	0.38	[illegible]	11
5.15	5.14	0.0[illegible]	8	11
5.01	5.14	-0.13	8	12
5.6	5.14	0.46	9	12
5.7	5.14	0.56	10	12
5.01	5.15	-0.14	10	13
5.6	5.15	0.45	11	13
5.7	5.15	0.55	12	13
5.6	5.01	0.59	13	13
5.7	5.01	0.69	14	13
5.7	5.6	0.1	15	13

ChemStat
Trial Version

S Statistic = 15 - 13 = 2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |2| is 0.904
0.904 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: U
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
5.25 (8/9/2005)	5.39 (5/18/2005)	(5.25 - 5.39)/(2 - 1)	-0.14
5.32 (11/21/2005)	5.39 (5/18/2005)	(5.32 - 5.39)/(3 - 1)	-0.035
5.14 (2/15/2006)	5.39 (5/18/2005)	(5.14 - 5.39)/(4 - 1)	-0.0833333
5.15 (5/22/2006)	5.39 (5/18/2005)	(5.15 - 5.39)/(5 - 1)	-0.06
5.01 (8/29/2006)	5.39 (5/18/2005)	(5.01 - 5.39)/(6 - 1)	-0.076
5.6 (11/7/2006)	5.39 (5/18/2005)	(5.6 - 5.39)/(7 - 1)	0.035
5.7 (2/27/2007)	5.39 (5/18/2005)	(5.7 - 5.39)/(8 - 1)	0.0442857
5.32 (11/21/2005)	5.25 (8/9/2005)	(5.32 - 5.25)/(3 - 2)	0.07
5.14 (2/15/2006)	5.25 (8/9/2005)	(5.14 - 5.25)/(4 - 2)	-0.055
5.15 (5/22/2006)	5.25 (8/9/2005)	(5.15 - 5.25)/(5 - 2)	-0.0333333
5.01 (8/29/2006)	5.25 (8/9/2005)	(5.01 - 5.25)/(6 - 2)	-0.06
5.6 (11/7/2006)	5.25 (8/9/2005)	(5.6 - 5.25)/(7 - 2)	0.07
5.7 (2/27/2007)	5.25 (8/9/2005)	(5.7 - 5.25)/(8 - 2)	0.075
5.14 (2/15/2006)	5.32 (11/21/2005)	(5.14 - 5.32)/(4 - 3)	-0.18
5.15 (5/22/2006)	5.32 (11/21/2005)	(5.15 - 5.32)/(5 - 3)	-0.085
5.01 (8/29/2006)	5.32 (11/21/2005)	(5.01 - 5.32)/(6 - 3)	-0.103333
5.6 (11/7/2006)	5.32 (11/21/2005)	(5.6 - 5.32)/(7 - 3)	0.07
5.7 (2/27/2007)	5.32 (11/21/2005)	(5.7 - 5.32)/(8 - 3)	0.076
5.15 (5/22/2006)	5.14 (2/15/2006)	(5.15 - 5.14)/(5 - 4)	0.01
5.01 (8/29/2006)	5.14 (2/15/2006)	(5.01 - 5.14)/(6 - 4)	-0.065
5.6 (11/7/2006)	5.14 (2/15/2006)	(5.6 - 5.14)/(7 - 4)	0.153333
5.7 (2/27/2007)	5.14 (2/15/2006)	(5.7 - 5.14)/(8 - 4)	0.14
5.01 (8/29/2006)	5.15 (5/22/2006)	(5.01 - 5.15)/(6 - 5)	-0.14
5.6 (11/7/2006)	5.15 (5/22/2006)	(5.6 - 5.15)/(7 - 5)	0.225
5.7 (2/27/2007)	5.15 (5/22/2006)	(5.7 - 5.15)/(8 - 5)	0.183333
5.6 (11/7/2006)	5.01 (8/29/2006)	(5.6 - 5.01)/(7 - 6)	0.59
5.7 (2/27/2007)	5.01 (8/29/2006)	(5.7 - 5.01)/(8 - 6)	0.345
5.7 (2/27/2007)	5.6 (11/7/2006)	(5.7 - 5.6)/(8 - 7)	0.1

GhamStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.18
2	-0.14
3	-0.14
4	-0.103333
5	-0.085
6	-0.0833333
7	-0.076

8	-0.065
9	-0.06
10	-0.06
11	-0.055
12	-0.035
13	-0.0333333
14	0.01
15	0.035
16	0.0442857
17	0.07
18	0.07
19	0.07
20	0.075
21	0.076
22	0.1
23	0.14
24	0.153333
25	0.183333
26	0.225
27	0.345
28	0.59

Sen's Estimator (Median Q) is 0.0225

Time Period	Observations
5/18/2005	1
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.076 = Q(7)
Upper limit is 0.1 = Q(22)
-0.076 < 0 < 0.1 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	5.39	6
8/9/2005	5.25	4
11/21/2005	5.32	5
2/15/2006	5.14	2
5/22/2006	5.15	3
8/29/2006	5.01	1
11/7/2006	5.6	7
2/27/2007	5.7	8

---

von Neumann ratio v = 1.33333 = 56/42
99% Critical Value = 0.62
1.33333 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12341E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.178571	0.220339	0.683	None

Loc.	Date	Conc.	Outlier
12341E	5/18/2005	5.39	FALSE
	8/9/2005	5.25	FALSE
	11/21/2005	5.32	FALSE
	2/15/2006	5.14	FALSE
	5/22/2006	5.15	FALSE
	8/29/2006	5.01	FALSE
	11/7/2006	5.6	FALSE
	2/27/2007	5.7	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U

Location: 12342D

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	20.9	24.4	3.5	0.6052	2.1182
2	21.4	24.2	2.8	0.3164	0.88592
3	21.5	22.8	1.3	0.1743	0.22659
4	22.4	22.8	0.4	0.0561	0.02244
5	22.8	22.4	-0.4		
6	22.8	21.5	-1.3		
7	24.2	21.4	-2.8		
8	24.4	20.9	-3.5		

Sum of b values = 3.25315

Sample Standard Deviation = 1.27839

W Statistic = 0.925086

5% Critical value of 0.818 is less than 0.925086

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.925086

Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
24.4	22.4	2	1	0
21.5	22.4	-0.9	1	1
24.2	22.4	1.8	2	1
21.4	22.4	-1	2	2
22.8	22.4	0.4	3	2
20.9	22.4	-1.5	3	3
22.8	22.4	0.4	4	3
21.5	24.4	-2.9	4	4
24.2	24.4	-0.2	4	5
21.4	24.4	-3	4	6
22.8	24.4	-1.6	4	7
20.9	24.4	-3.5	4	8
22.8	24.4	-1.6	4	9
24.2	21.5	2.7	[illegible]	[illegible]
21.4	21.5	-0.1	[illegible]	1[illegible]
22.8	21.5	1.3	6	10
20.9	21.5	-0.6	6	11
22.8	21.5	1.3	[illegible]	11
21.4	24.2	-2.8	7	12
22.8	24.2	-1.4	7	13
20.9	24.2	-3.3	7	14
22.8	24.2	-1.4	7	15
22.8	21.4	1.4	8	15
20.9	21.4	-0.5	8	16
22.8	21.4	1.4	9	16
20.9	22.8	-1.9	9	17
22.8	22.8	0	9	17
22.8	20.9	1.9	10	17

ChemStat
Trial Version

S Statistic = 10 - 17 = -7
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Failed to calculate probability for S = -7
Table out of range

Sen's Slope Analysis
Parameter: U
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
24.4 (8/10/2005)	22.4 (5/10/2005)	(24.4 - 22.4)/(2 - 1)	2
21.5 (11/15/2005)	22.4 (5/10/2005)	(21.5 - 22.4)/(3 - 1)	-0.45
24.2 (2/20/2006)	22.4 (5/10/2005)	(24.2 - 22.4)/(4 - 1)	0.6
21.4 (5/23/2006)	22.4 (5/10/2005)	(21.4 - 22.4)/(5 - 1)	-0.25
22.8 (8/28/2006)	22.4 (5/10/2005)	(22.8 - 22.4)/(6 - 1)	0.08
20.9 (11/1/2006)	22.4 (5/10/2005)	(20.9 - 22.4)/(7 - 1)	-0.25
22.8 (2/20/2007)	22.4 (5/10/2005)	(22.8 - 22.4)/(8 - 1)	0.0571429
21.5 (11/15/2005)	24.4 (8/10/2005)	(21.5 - 24.4)/(3 - 2)	-2.9
24.2 (2/20/2006)	24.4 (8/10/2005)	(24.2 - 24.4)/(4 - 2)	-0.1
21.4 (5/23/2006)	24.4 (8/10/2005)	(21.4 - 24.4)/(5 - 2)	-1
22.8 (8/28/2006)	24.4 (8/10/2005)	(22.8 - 24.4)/(6 - 2)	-0.4
20.9 (11/1/2006)	24.4 (8/10/2005)	(20.9 - 24.4)/(7 - 2)	-0.7
22.8 (2/20/2007)	24.4 (8/10/2005)	(22.8 - 24.4)/(8 - 2)	-0.266667
24.2 (2/20/2006)	21.5 (11/15/2005)	(24.2 - 21.5)/(4 - 3)	2.7
21.4 (5/23/2006)	21.5 (11/15/2005)	(21.4 - 21.5)/(5 - 3)	-0.05
22.8 (8/28/2006)	21.5 (11/15/2005)	(22.8 - 21.5)/(6 - 3)	0.433333
20.9 (11/1/2006)	21.5 (11/15/2005)	(20.9 - 21.5)/(7 - 3)	-0.15
22.8 (2/20/2007)	21.5 (11/15/2005)	(22.8 - 21.5)/(8 - 3)	0.26
21.4 (5/23/2006)	24.2 (2/20/2006)	(21.4 - 24.2)/(5 - 4)	-2.8
22.8 (8/28/2006)	24.2 (2/20/2006)	(22.8 - 24.2)/(6 - 4)	-0.7
20.9 (11/1/2006)	24.2 (2/20/2006)	(20.9 - 24.2)/(7 - 4)	-1.1
22.8 (2/20/2007)	24.2 (2/20/2006)	(22.8 - 24.2)/(8 - 4)	-0.35
22.8 (8/28/2006)	21.4 (5/23/2006)	(22.8 - 21.4)/(6 - 5)	1.4
20.9 (11/1/2006)	21.4 (5/23/2006)	(20.9 - 21.4)/(7 - 5)	-0.25
22.8 (2/20/2007)	21.4 (5/23/2006)	(22.8 - 21.4)/(8 - 5)	0.466667
20.9 (11/1/2006)	22.8 (8/28/2006)	(20.9 - 22.8)/(7 - 6)	-1.9
22.8 (2/20/2007)	22.8 (8/28/2006)	(22.8 - 22.8)/(8 - 6)	0
22.8 (2/20/2007)	20.9 (11/1/2006)	(22.8 - 20.9)/(8 - 7)	1.9

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-2.9
2	-2.8
3	-1.9
4	-1.1
5	-1
6	-0.7
7	-0.7

8	-0.45
9	-0.4
10	-0.35
11	-0.266667
12	-0.25
13	-0.25
14	-0.25
15	-0.15
16	-0.1
17	-0.05
18	0
19	0.0571429
20	0.08
21	0.26
22	0.433333
23	0.466667
24	0.6
25	1.4
26	1.9
27	2
28	2.7

Sen's Estimator (Median Q) is -0.2

Tied Group	Value	Members
1	22.8	2

Time Period	Observations
5/10/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/1/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 64.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.193
M1 = (28 - 13.193)/2.0 = 7.40348
M2 = (28 + 13.193)/2.0 + 1 = 21.5965
Lower limit is -0.7 = Q(7)
Upper limit is 0.433333 = Q(22)
-0.7 < 0 < 0.433333 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/10/2005	22.4	4
8/10/2005	24.4	8
11/15/2005	21.5	3
2/20/2006	24.2	7
5/23/2006	21.4	2
8/28/2006	22.8	5.5
11/1/2006	20.9	1
2/20/2007	22.8	5.5

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von Neumann ratio v = 3.20833 = 134.75/42
99% Critical Value = 0.62
3.20833 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12342D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.0666667	0.151515	0.683	None

Loc.	Date	Conc.	Outlier
12342D	5/10/2005	22.4	FALSE
	8/10/2005	24.4	FALSE
	11/15/2005	21.5	FALSE
	2/20/2006	24.2	FALSE
	5/23/2006	21.4	FALSE
	8/28/2006	22.8	FALSE
	11/1/2006	20.9	FALSE
	2/20/2007	22.8	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U

Location: 12342E

Normality Test of Parameter Concentrations

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	7.45	8.6	1.15	0.6052	0.69598
2	7.98	8.5	0.52	0.3164	0.164528
3	8	8.29	0.29	0.1743	0.050547
4	8.1	8.18	0.08	0.0561	0.004488
5	8.18	8.1	-0.08		
6	8.29	8	-0.29		
7	8.5	7.98	-0.52		
8	8.6	7.45	-1.15		

Sum of b values = 0.915543

Sample Standard Deviation = 0.3562

W Statistic = 0.943781

5% Critical value of 0.818 is less than 0.943781

Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.943781

Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
7.98	7.45	0.53	1	0
8.1	7.45	0.65	2	0
8.18	7.45	0.73	3	0
8.5	7.45	1.05	4	0
8.29	7.45	0.84	5	0
8	7.45	0.55	6	0
8.6	7.45	1.15	7	0
8.1	7.98	0.12	8	0
8.18	7.98	0.2	9	0
8.5	7.98	0.52	10	0
8.29	7.98	0.31	11	0
8	7.98	0.02	12	0
8.6	7.98	0.62	13	0
8.18	8.1	0.08	14	0
8.5	8.1	0.4	15	0
8.29	8.1	0.19	16	0
8	8.1	-0.1	16	1
8.6	8.1	0.5	17	1
8.5	8.18	0.32	18	1
8.29	8.18	0.11	19	1
8	8.18	-0.18	19	2
8.6	8.18	0.42	20	2
8.29	8.5	-0.21	20	3
8	8.5	-0.5	20	4
8.6	8.5	0.1	21	4
8	8.29	-0.29	21	5
8.6	8.29	0.31	22	5
8.6	8	0.6	23	5

ChemStat
Trial Version

S Statistic = 23 - 5 = 18
Comparing at 95% confidence level (upward trend)
Probability of obtaining S >= 18 is 0.016
S > 0 and 0.016 < 0.05 indicating an upward trend

Sen's Slope Analysis
Parameter: U
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
7.98 (8/10/2005)	7.45 (5/18/2005)	(7.98 - 7.45)/(2 - 1)	0.53
8.1 (11/21/2005)	7.45 (5/18/2005)	(8.1 - 7.45)/(3 - 1)	0.325
8.18 (2/15/2006)	7.45 (5/18/2005)	(8.18 - 7.45)/(4 - 1)	0.243333
8.5 (5/22/2006)	7.45 (5/18/2005)	(8.5 - 7.45)/(5 - 1)	0.2625
8.29 (8/29/2006)	7.45 (5/18/2005)	(8.29 - 7.45)/(6 - 1)	0.168
8 (11/7/2006)	7.45 (5/18/2005)	(8 - 7.45)/(7 - 1)	0.0916667
8.6 (2/27/2007)	7.45 (5/18/2005)	(8.6 - 7.45)/(8 - 1)	0.164286
8.1 (11/21/2005)	7.98 (8/10/2005)	(8.1 - 7.98)/(3 - 2)	0.12
8.18 (2/15/2006)	7.98 (8/10/2005)	(8.18 - 7.98)/(4 - 2)	0.1
8.5 (5/22/2006)	7.98 (8/10/2005)	(8.5 - 7.98)/(5 - 2)	0.173333
8.29 (8/29/2006)	7.98 (8/10/2005)	(8.29 - 7.98)/(6 - 2)	0.0775
8 (11/7/2006)	7.98 (8/10/2005)	(8 - 7.98)/(7 - 2)	0.004
8.6 (2/27/2007)	7.98 (8/10/2005)	(8.6 - 7.98)/(8 - 2)	0.103333
8.18 (2/15/2006)	8.1 (11/21/2005)	(8.18 - 8.1)/(4 - 3)	0.08
8.5 (5/22/2006)	8.1 (11/21/2005)	(8.5 - 8.1)/(5 - 3)	0.2
8.29 (8/29/2006)	8.1 (11/21/2005)	(8.29 - 8.1)/(6 - 3)	0.0633333
8 (11/7/2006)	8.1 (11/21/2005)	(8 - 8.1)/(7 - 3)	-0.025
8.6 (2/27/2007)	8.1 (11/21/2005)	(8.6 - 8.1)/(8 - 3)	0.1
8.5 (5/22/2006)	8.18 (2/15/2006)	(8.5 - 8.18)/(5 - 4)	0.32
8.29 (8/29/2006)	8.18 (2/15/2006)	(8.29 - 8.18)/(6 - 4)	0.055
8 (11/7/2006)	8.18 (2/15/2006)	(8 - 8.18)/(7 - 4)	-0.06
8.6 (2/27/2007)	8.18 (2/15/2006)	(8.6 - 8.18)/(8 - 4)	0.105
8.29 (8/29/2006)	8.5 (5/22/2006)	(8.29 - 8.5)/(6 - 5)	-0.21
8 (11/7/2006)	8.5 (5/22/2006)	(8 - 8.5)/(7 - 5)	-0.25
8.6 (2/27/2007)	8.5 (5/22/2006)	(8.6 - 8.5)/(8 - 5)	0.0333333
8 (11/7/2006)	8.29 (8/29/2006)	(8 - 8.29)/(7 - 6)	-0.29
8.6 (2/27/2007)	8.29 (8/29/2006)	(8.6 - 8.29)/(8 - 6)	0.155
8.6 (2/27/2007)	8 (11/7/2006)	(8.6 - 8)/(8 - 7)	0.6

ChemStat
Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.29
2	-0.25
3	-0.21
4	-0.06
5	-0.025
6	0.004
7	0.0333333

8	0.055
9	0.0633333
10	0.0775
11	0.08
12	0.0916667
13	0.1
14	0.1
15	0.103333
16	0.105
17	0.12
18	0.155
19	0.164286
20	0.168
21	0.173333
22	0.2
23	0.243333
24	0.2625
25	0.32
26	0.325
27	0.53
28	0.6

Sen's Estimator (Median Q) is 0.101667

Time Period	Observations
5/18/2005	1
8/10/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1
8/29/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is 0.0333333 = Q(7)
Upper limit is 0.2 = Q(22)
0.0333333 > 0 indicating an upward trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/18/2005	7.45	1
8/10/2005	7.98	2
11/21/2005	8.1	4
2/15/2006	8.18	5
5/22/2006	8.5	7
8/29/2006	8.29	6
11/7/2006	8	3
2/27/2007	8.6	8

---

von Neumann ratio v = 1.07143 = 45/42
99% Critical Value = 0.62
1.07143 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12342E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.16129	0.504762	0.683	None

Loc.	Date	Conc.	Outlier
12342E	5/18/2005	7.45	FALSE
	8/10/2005	7.98	FALSE
	11/21/2005	8.1	FALSE
	2/15/2006	8.18	FALSE
	5/22/2006	8.5	FALSE
	8/29/2006	8.29	FALSE
	11/7/2006	8	FALSE
	2/27/2007	8.6	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12343D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	18.4	29.5	11.1	0.6052	6.71772
2	19.7	28.1	8.4	0.3164	2.65776
3	21.3	26.3	5	0.1743	0.8715
4	21.6	21.7	0.1	0.0561	0.00561
5	21.7	21.6	-0.1		
6	26.3	21.3	-5		
7	28.1	19.7	-8.4		
8	29.5	18.4	-11.1		

Sum of b values = 10.2526
Sample Standard Deviation = 4.08648
W Statistic = 0.899231

5% Critical value of 0.818 is less than 0.899231
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.899231
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
28.1	29.5	-1.4	0	1
21.6	29.5	-7.9	0	2
19.7	29.5	-9.8	0	3
18.4	29.5	-11.1	0	4
21.7	29.5	-7.8	0	5
26.3	29.5	-3.2	0	6
21.3	29.5	-8.2	0	7
21.6	28.1	-6.5	0	8
19.7	28.1	-8.4	0	9
18.4	28.1	-9.7	0	10
21.7	28.1	-6.4	0	11
26.3	28.1	-1.8	0	12
21.3	28.1	-6.8	0	13
19.7	21.6	-1.9	[illegible]	14
18.4	21.6	-3.[illegible]	[illegible]	1[illegible]
21.7	21.6	0.1	1	15
26.3	21.6	4.7	2	15
21.3	21.6	-[illegible].3	[illegible]	16
18.4	19.7	-1.3	2	17
21.7	19.7	2	3	17
26.3	19.7	6.6	4	17
21.3	19.7	1.6	5	17
21.7	18.4	3.3	6	17
26.3	18.4	7.9	7	17
21.3	18.4	2.9	8	17
26.3	21.7	4.6	9	17
21.3	21.7	-0.4	9	18
21.3	26.3	-5	9	19

ChemStat
Trial Version

S Statistic = 9 - 19 = -10
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-10| is 0.276
0.276 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: U
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
28.1 (8/10/2005)	29.5 (5/9/2005)	(28.1 - 29.5)/(2 - 1)	-1.4
21.6 (11/15/2005)	29.5 (5/9/2005)	(21.6 - 29.5)/(3 - 1)	-3.95
19.7 (2/20/2006)	29.5 (5/9/2005)	(19.7 - 29.5)/(4 - 1)	-3.26667
18.4 (5/23/2006)	29.5 (5/9/2005)	(18.4 - 29.5)/(5 - 1)	-2.775
21.7 (8/28/2006)	29.5 (5/9/2005)	(21.7 - 29.5)/(6 - 1)	-1.56
26.3 (11/2/2006)	29.5 (5/9/2005)	(26.3 - 29.5)/(7 - 1)	-0.533333
21.3 (2/20/2007)	29.5 (5/9/2005)	(21.3 - 29.5)/(8 - 1)	-1.17143
21.6 (11/15/2005)	28.1 (8/10/2005)	(21.6 - 28.1)/(3 - 2)	-6.5
19.7 (2/20/2006)	28.1 (8/10/2005)	(19.7 - 28.1)/(4 - 2)	-4.2
18.4 (5/23/2006)	28.1 (8/10/2005)	(18.4 - 28.1)/(5 - 2)	-3.23333
21.7 (8/28/2006)	28.1 (8/10/2005)	(21.7 - 28.1)/(6 - 2)	-1.6
26.3 (11/2/2006)	28.1 (8/10/2005)	(26.3 - 28.1)/(7 - 2)	-0.36
21.3 (2/20/2007)	28.1 (8/10/2005)	(21.3 - 28.1)/(8 - 2)	-1.13333
19.7 (2/20/2006)	21.6 (11/15/2005)	(19.7 - 21.6)/(4 - 3)	-1.9
18.4 (5/23/2006)	21.6 (11/15/2005)	(18.4 - 21.6)/(5 - 3)	-1.6
21.7 (8/28/2006)	21.6 (11/15/2005)	(21.7 - 21.6)/(6 - 3)	0.0333333
26.3 (11/2/2006)	21.6 (11/15/2005)	(26.3 - 21.6)/(7 - 3)	1.175
21.3 (2/20/2007)	21.6 (11/15/2005)	(21.3 - 21.6)/(8 - 3)	-0.06
18.4 (5/23/2006)	19.7 (2/20/2006)	(18.4 - 19.7)/(5 - 4)	-1.3
21.7 (8/28/2006)	19.7 (2/20/2006)	(21.7 - 19.7)/(6 - 4)	1
26.3 (11/2/2006)	19.7 (2/20/2006)	(26.3 - 19.7)/(7 - 4)	2.2
21.3 (2/20/2007)	19.7 (2/20/2006)	(21.3 - 19.7)/(8 - 4)	0.4
21.7 (8/28/2006)	18.4 (5/23/2006)	(21.7 - 18.4)/(6 - 5)	3.3
26.3 (11/2/2006)	18.4 (5/23/2006)	(26.3 - 18.4)/(7 - 5)	3.95
21.3 (2/20/2007)	18.4 (5/23/2006)	(21.3 - 18.4)/(8 - 5)	0.966667
26.3 (11/2/2006)	21.7 (8/28/2006)	(26.3 - 21.7)/(7 - 6)	4.6
21.3 (2/20/2007)	21.7 (8/28/2006)	(21.3 - 21.7)/(8 - 6)	-0.2
21.3 (2/20/2007)	26.3 (11/2/2006)	(21.3 - 26.3)/(8 - 7)	-5

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-6.5
2	-5
3	-4.2
4	-3.95
5	-3.26667
6	-3.23333
7	-2.775

8	-1.9
9	-1.6
10	-1.6
11	-1.56
12	-1.4
13	-1.3
14	-1.17143
15	-1.13333
16	-0.533333
17	-0.36
18	-0.2
19	-0.06
20	0.0333333
21	0.4
22	0.966667
23	1
24	1.175
25	2.2
26	3.3
27	3.95
28	4.6

Sen's Estimator (Median Q) is -1.15238

Time Period	Observations
5/9/2005	1
8/10/2005	1
11/15/2005	1
2/20/2006	1
5/23/2006	1
8/28/2006	1
11/2/2006	1
2/20/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -2.775 = Q(7)
Upper limit is 0.966667 = Q(22)
-2.775 < 0 < 0.966667 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/9/2005	29.5	8
8/10/2005	28.1	7
11/15/2005	21.6	4
2/20/2006	19.7	2
5/23/2006	18.4	1
8/28/2006	21.7	5
11/2/2006	26.3	6
2/20/2007	21.3	3

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von Neumann ratio v = 0.97619 = 41/42
99% Critical Value = 0.62
0.97619 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12343D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.142857	0.134021	0.683	None

Loc.	Date	Conc.	Outlier
12343D	5/9/2005	29.5	FALSE
	8/10/2005	28.1	FALSE
	11/15/2005	21.6	FALSE
	2/20/2006	19.7	FALSE
	5/23/2006	18.4	FALSE
	8/28/2006	21.7	FALSE
	11/2/2006	26.3	FALSE
	2/20/2007	21.3	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12343E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 3 for 6 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	9.23	10.7	1.47	0.6431	0.945357
2	9.7	10.6	0.9	0.2806	0.25254
3	9.9	10.1	0.2	0.0875	0.0175
4	10.1	9.9	-0.2		
5	10.6	9.7	-0.9		
6	10.7	9.23	-1.47		

Sum of b values = 1.2154
Sample Standard Deviation = 0.555713
W Statistic = 0.956678

5% Critical value of 0.788 is less than 0.956678
Data is normally distributed at 95% level of significance

1% Critical value of 0.713 is less than 0.956678
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
10.6	9.23	1.37	1	0
9.9	9.23	0.67	2	0
10.7	9.23	1.47	3	0
9.7	9.23	0.47	4	0
10.1	9.23	0.87	5	0
9.9	10.6	-0.7	5	1
10.7	10.6	0.1	6	1
9.7	10.6	-0.9	6	2
10.1	10.6	-0.5	6	3
10.7	9.9	0.8	7	3
9.7	9.9	-0.2	7	4
10.1	9.9	0.2	8	4
9.7	10.7	-1	8	5
10.1	10.7	-0.6	8	6
10.1	9.7	0.4	9	6

ChemStat
Trial Version

S Statistic = 9 - 6 = 3
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |3| is 0.72
0.72 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: U
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
10.6 (11/21/2005)	9.23 (8/9/2005)	(10.6 - 9.23)/(2 - 1)	1.37
9.9 (2/15/2006)	9.23 (8/9/2005)	(9.9 - 9.23)/(3 - 1)	0.335
10.7 (5/22/2006)	9.23 (8/9/2005)	(10.7 - 9.23)/(4 - 1)	0.49
9.7 (8/29/2006)	9.23 (8/9/2005)	(9.7 - 9.23)/(5 - 1)	0.1175
10.1 (11/7/2006)	9.23 (8/9/2005)	(10.1 - 9.23)/(6 - 1)	0.174
9.9 (2/15/2006)	10.6 (11/21/2005)	(9.9 - 10.6)/(3 - 2)	-0.7
10.7 (5/22/2006)	10.6 (11/21/2005)	(10.7 - 10.6)/(4 - 2)	0.05
9.7 (8/29/2006)	10.6 (11/21/2005)	(9.7 - 10.6)/(5 - 2)	-0.3
10.1 (11/7/2006)	10.6 (11/21/2005)	(10.1 - 10.6)/(6 - 2)	-0.125
10.7 (5/22/2006)	9.9 (2/15/2006)	(10.7 - 9.9)/(4 - 3)	0.8
9.7 (8/29/2006)	9.9 (2/15/2006)	(9.7 - 9.9)/(5 - 3)	-0.1
10.1 (11/7/2006)	9.9 (2/15/2006)	(10.1 - 9.9)/(6 - 3)	0.0666667
9.7 (8/29/2006)	[illegible] (5/22/2006)	[illegible] - 10.7)/(5 - 4)	-1
10.1 (11/7/2006)	10.7 [illegible]	[illegible]	-0.3
10.1 (11/7/2006)	9.7 (8/29/2006)	(10.1 - 9.7)/(6 - 5)	0.4

ChemStat Trial Version

Number of Q values = 1[illegible]

Ordered Q Values

n	Q
1	-1
2	-0.7
3	-0.3
4	-0.3
5	-0.125
6	-0.1
7	0.05
8	0.0666667
9	0.1175
10	0.174
11	0.335
12	0.4
13	0.49
14	0.8
15	1.37

Sen's Estimator (Median Q) is 0.0666667

Time Period	Observations
8/9/2005	1
11/21/2005	1
2/15/2006	1
5/22/2006	1

8/29/2006 1
11/7/2006 1
There are 0 time periods with multiple data

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 510
b = 1080
c = 60
Group Variance = 28.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 8.7554
M1 = (15 - 8.7554)/2.0 = 3.1223
M2 = (15 + 8.7554)/2.0 + 1 = 12.8777
Lower limit is -0.3 = Q(3)
Upper limit is 0.49 = Q(13)
-0.3 < 0 < 0.49 indicating no trend in data.

ChemStat
Trial Version

Rank Von Neumann Ratio Test

Parameter: U

Location: 12343E

Original Data (Not Transformed)

Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/9/2005	9.23	1
11/21/2005	10.6	5
2/15/2006	9.9	3
5/22/2006	10.7	6
8/29/2006	9.7	2
11/7/2006	10.1	4

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von Neumann ratio v = 2.8 = 49/17.5

99% Critical Value = 0.46

2.8 > 0.46

Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12343E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 7 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.901804	0.0313961	0.637	24.2
2	0.0680272	0.319728	0.698	None

Loc.	Date	Conc.	Outlier
12343E	8/9/2005	9.23	FALSE
	11/21/2005	10.6	FALSE
	2/15/2006	9.9	FALSE
	5/22/2006	10.7	FALSE
	8/29/2006	9.7	FALSE
	11/7/2006	10.1	FALSE
	2/27/2007	**24.2**	**TRUE**

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12344D
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	17.3	33.7	16.4	0.6052	9.92528
2	20.1	28.9	8.8	0.3164	2.78432
3	21.6	27.4	5.8	0.1743	1.01094
4	24.2	26.3	2.1	0.0561	0.11781
5	26.3	24.2	-2.1		
6	27.4	21.6	-5.8		
7	28.9	20.1	-8.8		
8	33.7	17.3	-16.4		

Sum of b values = 13.8384
Sample Standard Deviation = 5.26198
W Statistic = 0.988036

5% Critical value of 0.818 is less than 0.988036
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.988036
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
26.3	33.7	-7.4	0	1
27.4	33.7	-6.3	0	2
28.9	33.7	-4.8	0	3
20.1	33.7	-13.6	0	4
17.3	33.7	-16.4	0	5
21.6	33.7	-12.1	0	6
24.2	33.7	-9.5	0	7
27.4	26.3	1.1	1	7
28.9	26.3	2.6	2	7
20.1	26.3	-6.2	2	8
17.3	26.3	-9	2	9
21.6	26.3	-4.7	2	10
24.2	26.3	-2.1	2	11
28.9	27.4	1.5	3	11
20.1	27.4	-7.3	3	12
17.3	27.4	-10.1	3	13
21.6	27.4	-5.8	3	14
24.2	27.4	-3.2	3	15
20.1	28.9	-8.8	3	16
17.3	28.9	-11.6	3	17
21.6	28.9	-7.3	3	18
24.2	28.9	-4.7	3	19
17.3	20.1	-2.8	3	20
21.6	20.1	1.5	4	20
24.2	20.1	4.1	5	20
21.6	17.3	4.3	6	20
24.2	17.3	6.9	7	20
24.2	21.6	2.6	8	20

ChemStat
Trial Version

S Statistic = 8 - 20 = -12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-12| is 0.178
0.178 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: U
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
26.3 (8/23/2005)	33.7 (5/31/2005)	(26.3 - 33.7)/(2 - 1)	-7.4
27.4 (11/16/2005)	33.7 (5/31/2005)	(27.4 - 33.7)/(3 - 1)	-3.15
28.9 (2/21/2006)	33.7 (5/31/2005)	(28.9 - 33.7)/(4 - 1)	-1.6
20.1 (5/30/2006)	33.7 (5/31/2005)	(20.1 - 33.7)/(5 - 1)	-3.4
17.3 (8/23/2006)	33.7 (5/31/2005)	(17.3 - 33.7)/(6 - 1)	-3.28
21.6 (11/2/2006)	33.7 (5/31/2005)	(21.6 - 33.7)/(7 - 1)	-2.01667
24.2 (2/21/2007)	33.7 (5/31/2005)	(24.2 - 33.7)/(8 - 1)	-1.35714
27.4 (11/16/2005)	26.3 (8/23/2005)	(27.4 - 26.3)/(3 - 2)	1.1
28.9 (2/21/2006)	26.3 (8/23/2005)	(28.9 - 26.3)/(4 - 2)	1.3
20.1 (5/30/2006)	26.3 (8/23/2005)	(20.1 - 26.3)/(5 - 2)	-2.06667
17.3 (8/23/2006)	26.3 (8/23/2005)	(17.3 - 26.3)/(6 - 2)	-2.25
21.6 (11/2/2006)	26.3 (8/23/2005)	(21.6 - 26.3)/(7 - 2)	-0.94
24.2 (2/21/2007)	26.3 (8/23/2005)	(24.2 - 26.3)/(8 - 2)	-0.35
28.9 (2/21/2006)	27.4 (11/16/2005)	(28.9 - 27.4)/(4 - 3)	1.5
20.1 (5/30/2006)	27.4 (11/16/2005)	(20.1 - 27.4)/(5 - 3)	-3.65
17.3 (8/23/2006)	27.4 (11/16/2005)	(17.3 - 27.4)/(6 - 3)	-3.36667
21.6 (11/2/2006)	27.4 (11/16/2005)	(21.6 - 27.4)/(7 - 3)	-1.45
24.2 (2/21/2007)	27.4 (11/16/2005)	(24.2 - 27.4)/(8 - 3)	-0.64
20.1 (5/30/2006)	28.9 (2/21/2006)	(20.1 - 28.9)/(5 - 4)	-8.8
17.3 (8/23/2006)	28.9 (2/21/2006)	(17.3 - 28.9)/(6 - 4)	-5.8
21.6 (11/2/2006)	28.9 (2/21/2006)	(21.6 - 28.9)/(7 - 4)	-2.43333
24.2 (2/21/2007)	28.9 (2/21/2006)	(24.2 - 28.9)/(8 - 4)	-1.175
17.3 (8/23/2006)	20.1 (5/30/2006)	(17.3 - 20.1)/(6 - 5)	-2.8
21.6 (11/2/2006)	20.1 (5/30/2006)	(21.6 - 20.1)/(7 - 5)	0.75
24.2 (2/21/2007)	20.1 (5/30/2006)	(24.2 - 20.1)/(8 - 5)	1.36667
21.6 (11/2/2006)	17.3 (8/23/2006)	(21.6 - 17.3)/(7 - 6)	4.3
24.2 (2/21/2007)	17.3 (8/23/2006)	(24.2 - 17.3)/(8 - 6)	3.45
24.2 (2/21/2007)	21.6 (11/2/2006)	(24.2 - 21.6)/(8 - 7)	2.6

ChemStat
TrialVersion

Number of Q values = 28

Ordered Q Values

n	Q
1	-8.8
2	-7.4
3	-5.8
4	-3.65
5	-3.4
6	-3.36667
7	-3.28

8	-3.15
9	-2.8
10	-2.43333
11	-2.25
12	-2.06667
13	-2.01667
14	-1.6
15	-1.45
16	-1.35714
17	-1.175
18	-0.94
19	-0.64
20	-0.35
21	0.75
22	1.1
23	1.3
24	1.36667
25	1.5
26	2.6
27	3.45
28	4.3

Sen's Estimator (Median Q) is -1.525

Time Period	Observations
5/31/2005	1
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
8/23/2006	1
11/2/2006	1
2/21/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -3.28 = Q(7)
Upper limit is 1.1 = Q(22)
-3.28 < 0 < 1.1 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
5/31/2005	33.7	8
8/23/2005	26.3	5
11/16/2005	27.4	6
2/21/2006	28.9	7
5/30/2006	20.1	2
8/23/2006	17.3	1
11/2/2006	21.6	3
2/21/2007	24.2	4

---

von Neumann ratio v = 1 = 42/42
99% Critical Value = 0.62
1 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12344D
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.352941	0.241379	0.683	None

Loc.	Date	Conc.	Outlier
12344D	5/31/2005	33.7	FALSE
	8/23/2005	26.3	FALSE
	11/16/2005	27.4	FALSE
	2/21/2006	28.9	FALSE
	5/30/2006	20.1	FALSE
	8/23/2006	17.3	FALSE
	11/2/2006	21.6	FALSE
	2/21/2007	24.2	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12344E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	2.16	2.9	0.74	0.6052	0.447848
2	2.3	2.87	0.57	0.3164	0.180348
3	2.48	2.79	0.31	0.1743	0.054033
4	2.53	2.56	0.03	0.0561	0.001683
5	2.56	2.53	-0.03		
6	2.79	2.48	-0.31		
7	2.87	2.3	-0.57		
8	2.9	2.16	-0.74		

Sum of b values = 0.683912
Sample Standard Deviation = 0.266723
W Statistic = 0.939252

5% Critical value of 0.818 is less than 0.939252
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.939252
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
2.87	2.53	0.34	1	0
2.79	2.53	0.26	2	0
2.56	2.53	0.03	3	0
2.48	2.53	-0.05	3	1
2.16	2.53	-0.37	3	2
2.3	2.53	-0.23	3	3
2.9	2.53	0.37	4	3
2.79	2.87	-0.08	4	4
2.56	2.87	-0.31	4	5
2.48	2.87	-0.39	4	6
2.16	2.87	-0.71	4	7
2.3	2.87	-0.57	4	8
2.9	2.87	0.03	5	8
2.56	2.79	-0.23	[illegible]	[illegible]
2.48	2.79	-0.31	[illegible]	10
2.16	2.79	-0.63	5	11
2.3	2.79	-0.49	5	12
2.9	2.79	0.11	[illegible]	12
2.48	2.56	-0.08	6	13
2.16	2.56	-0.4	6	14
2.3	2.56	-0.26	6	15
2.9	2.56	0.34	7	15
2.16	2.48	-0.32	7	16
2.3	2.48	-0.18	7	17
2.9	2.48	0.42	8	17
2.3	2.16	0.14	9	17
2.9	2.16	0.74	10	17
2.9	2.3	0.6	11	17

ChemStat
Trial Version

S Statistic = 11 - 17 = -6
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-6| is 0.548
0.548 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis
Parameter: U
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
2.87 (10/11/2005)	2.53 (8/24/2005)	(2.87 - 2.53)/(2 - 1)	0.34
2.79 (12/13/2005)	2.53 (8/24/2005)	(2.79 - 2.53)/(3 - 1)	0.13
2.56 (2/14/2006)	2.53 (8/24/2005)	(2.56 - 2.53)/(4 - 1)	0.01
2.48 (5/31/2006)	2.53 (8/24/2005)	(2.48 - 2.53)/(5 - 1)	-0.0125
2.16 (8/21/2006)	2.53 (8/24/2005)	(2.16 - 2.53)/(6 - 1)	-0.074
2.3 (11/7/2006)	2.53 (8/24/2005)	(2.3 - 2.53)/(7 - 1)	-0.0383333
2.9 (2/27/2007)	2.53 (8/24/2005)	(2.9 - 2.53)/(8 - 1)	0.0528571
2.79 (12/13/2005)	2.87 (10/11/2005)	(2.79 - 2.87)/(3 - 2)	-0.08
2.56 (2/14/2006)	2.87 (10/11/2005)	(2.56 - 2.87)/(4 - 2)	-0.155
2.48 (5/31/2006)	2.87 (10/11/2005)	(2.48 - 2.87)/(5 - 2)	-0.13
2.16 (8/21/2006)	2.87 (10/11/2005)	(2.16 - 2.87)/(6 - 2)	-0.1775
2.3 (11/7/2006)	2.87 (10/11/2005)	(2.3 - 2.87)/(7 - 2)	-0.114
2.9 (2/27/2007)	2.87 (10/11/2005)	(2.9 - 2.87)/(8 - 2)	0.005
2.56 (2/14/2006)	2.79 (12/13/2005)	(2.56 - 2.79)/(4 - 3)	-0.23
2.48 (5/31/2006)	2.79 (12/13/2005)	(2.48 - 2.79)/(5 - 3)	-0.155
2.16 (8/21/2006)	2.79 (12/13/2005)	(2.16 - 2.79)/(6 - 3)	-0.21
2.3 (11/7/2006)	2.79 (12/13/2005)	(2.3 - 2.79)/(7 - 3)	-0.1225
2.9 (2/27/2007)	2.79 (12/13/2005)	(2.9 - 2.79)/(8 - 3)	0.022
2.48 (5/31/2006)	2.56 (2/14/2006)	(2.48 - 2.56)/(5 - 4)	-0.08
2.16 (8/21/2006)	2.56 (2/14/2006)	(2.16 - 2.56)/(6 - 4)	-0.2
2.3 (11/7/2006)	2.56 (2/14/2006)	(2.3 - 2.56)/(7 - 4)	-0.0866667
2.9 (2/27/2007)	2.56 (2/14/2006)	(2.9 - 2.56)/(8 - 4)	0.085
2.16 (8/21/2006)	2.48 (5/31/2006)	(2.16 - 2.48)/(6 - 5)	-0.32
2.3 (11/7/2006)	2.48 (5/31/2006)	(2.3 - 2.48)/(7 - 5)	-0.09
2.9 (2/27/2007)	2.48 (5/31/2006)	(2.9 - 2.48)/(8 - 5)	0.14
2.3 (11/7/2006)	2.16 (8/21/2006)	(2.3 - 2.16)/(7 - 6)	0.14
2.9 (2/27/2007)	2.16 (8/21/2006)	(2.9 - 2.16)/(8 - 6)	0.37
2.9 (2/27/2007)	2.3 (11/7/2006)	(2.9 - 2.3)/(8 - 7)	0.6

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.32
2	-0.23
3	-0.21
4	-0.2
5	-0.1775
6	-0.155
7	-0.155

8	-0.13
9	-0.1225
10	-0.114
11	-0.09
12	-0.0866667
13	-0.08
14	-0.08
15	-0.074
16	-0.0383333
17	-0.0125
18	0.005
19	0.01
20	0.022
21	0.0528571
22	0.085
23	0.13
24	0.14
25	0.14
26	0.34
27	0.37
28	0.6

Sen's Estimator (Median Q) is -0.077

Time Period	Observations
8/24/2005	1
10/11/2005	1
12/13/2005	1
2/14/2006	
5/31/2006	1
8/21/2006	1
11/7/2006	1
2/27/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.155 = Q(7)
Upper limit is 0.085 = Q(22)
-0.155 < 0 < 0.085 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/24/2005	2.53	4
10/11/2005	2.87	7
12/13/2005	2.79	6
2/14/2006	2.56	5
5/31/2006	2.48	3
8/21/2006	2.16	1
11/7/2006	2.3	2
2/27/2007	2.9	8

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von Neumann ratio v = 1.33333 = 56/42
99% Critical Value = 0.62
1.33333 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12344E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.05	0.197183	0.683	None

Loc.	Date	Conc.	Outlier
12344E	8/24/2005	2.53	FALSE
	10/11/2005	2.87	FALSE
	12/13/2005	2.79	FALSE
	2/14/2006	2.56	FALSE
	5/31/2006	2.48	FALSE
	8/21/2006	2.16	FALSE
	11/7/2006	2.3	FALSE
	2/27/2007	2.9	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12345D
Normality Test of Parameter Concentrations
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit
K = 3 for 7 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	1.15534	1.5611	0.405765	0.6233	0.252914
2	1.15534	1.47857	0.32323	0.3031	0.0979712
3	1.17609	1.22011	0.0440168	0.1401	0.00616676
4	1.21484	1.21484	0		
5	1.22011	1.17609	-0.0440168		
6	1.47857	1.15534	-0.32323		
7	1.5611	1.15534	-0.405765		

Sum of b values = 0.357051
Sample Standard Deviation = 0.167411
W Statistic = 0.758131

5% Critical value of 0.803 exceeds 0.758131
Evidence of non-normality at 95% level of significance

1% Critical value of 0.73 is less than 0.758131
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis

Parameter: U
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
1.15534	1.22011	-0.0647721	0	1
1.15534	1.22011	-0.0647721	0	2
1.17609	1.22011	-0.0440168	0	3
1.21484	1.22011	-0.00526424	0	4
1.47857	1.22011	0.258458	1	4
1.5611	1.22011	0.340993	2	4
1.15534	1.15534	0	2	4
1.17609	1.15534	0.0207552	3	4
1.21484	1.15534	0.0595078	4	4
1.47857	1.15534	0.32323	5	4
1.5611	1.15534	0.405765	6	4
1.17609	1.15534	0.0207552	7	4
1.21484	1.15534	[illegible]	8	[illegible]
1.47857	1.15534	[illegible]	[illegible]	[illegible]
1.5611	1.15534	[illegible]	[illegible]	4
1.21484	1.17609	0.0387526	11	4
1.47857	[illegible]	[illegible]	[illegible]	4
1.5611	[illegible]	[illegible]	[illegible]	[illegible]
1.47857	1.21484	0.263723	14	4
1.5611	1.21484	0.346258	15	4
1.5611	1.47857	0.0825349	16	4

ChemStat
Trial Version

S Statistic = 16 - 4 = 12
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Failed to calculate probability for S = 12
Table out of range

Sen's Slope Analysis

Parameter: U
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
1.15534 (11/16/2005)	1.22011 (8/23/2005)	(1.15534 - 1.22011)/(2 - 1)	-0.0647721
1.15534 (2/21/2006)	1.22011 (8/23/2005)	(1.15534 - 1.22011)/(3 - 1)	-0.032386
1.17609 (5/30/2006)	1.22011 (8/23/2005)	(1.17609 - 1.22011)/(4 - 1)	-0.0146723
1.21484 (8/23/2006)	1.22011 (8/23/2005)	(1.21484 - 1.22011)/(5 - 1)	-0.00131606
1.47857 (11/6/2006)	1.22011 (8/23/2005)	(1.47857 - 1.22011)/(6 - 1)	0.0516917
1.5611 (2/21/2007)	1.22011 (8/23/2005)	(1.5611 - 1.22011)/(7 - 1)	0.0568322
1.15534 (2/21/2006)	1.15534 (11/16/2005)	(1.15534 - 1.15534)/(3 - 2)	0
1.17609 (5/30/2006)	1.15534 (11/16/2005)	(1.17609 - 1.15534)/(4 - 2)	0.0103776
1.21484 (8/23/2006)	1.15534 (11/16/2005)	(1.21484 - 1.15534)/(5 - 2)	0.0198359
1.47857 (11/6/2006)	1.15534 (11/16/2005)	(1.47857 - 1.15534)/(6 - 2)	0.0808076
1.5611 (2/21/2007)	1.15534 (11/16/2005)	(1.5611 - 1.15534)/(7 - 2)	0.0811531
1.17609 (5/30/2006)	1.15534 (2/21/2006)	(1.17609 - 1.15534)/(4 - 3)	0.0207552
1.21484 (8/23/2006)	1.15534 (2/21/2006)	(1.21484 - 1.15534)/(5 - 3)	0.0297539
1.47857 (11/6/2006)	1.15534 (2/21/2006)	(1.47857 - 1.15534)/(6 - 3)	0.107743
1.5611 (2/21/2007)	1.155[illegible]	(1.56[illegible])/(7 - 3)	0.101441
1.21484 (8/23/2006)	1.17609 (5/30/2006)	(1.21484 - 1.17609)/(5 - 4)	0.0387526
1.47857 (11/6/2006)	1.17609 (5/30/2006)	(1.47857 - 1.17609)/(6 - 4)	0.151238
1.5611 (2/21/2007)	1.17609 (5/30/2006)	(1.5611 - 1.17609)/(7 - 4)	0.128337
1.47857 (11/6/2006)	1.21484 (8/23/2006)	(1.478[illegible] - 1.2[illegible])/(6 - 5)	0.263723
1.5611 (2/21/2007)	1.21484 (8/23/2006)	(1.5611 - 1.21484)/(7 - 5)	0.173129
1.5611 (2/21/2007)	1.47857 (11/6/2006)	(1.5611 - 1.47857)/(7 - 6)	0.0825349

ChemStat Trial Version

Number of Q values = 21

Ordered Q Values

n	Q
1	-0.0647721
2	-0.032386
3	-0.0146723
4	-0.00131606
5	0
6	0.0103776
7	0.0198359
8	0.0207552
9	0.0297539
10	0.0387526
11	0.0516917
12	0.0568322
13	0.0808076
14	0.0811531
15	0.0825349

16	0.101441
17	0.107743
18	0.128337
19	0.151238
20	0.173129
21	0.263723

Sen's Estimator (Median Q) is 0.0516917

Tied Group	Value	Members
1	1.15534	2

Time Period	Observations
8/23/2005	1
11/16/2005	1
2/21/2006	1
5/30/2006	1
8/23/2006	1
11/6/2006	1
2/21/2007	1

There are 0 time periods with multiple data

A = 18
B = 0
C = 0
D = 0
E = 2
F = 0
a = 798
b = 1890
c = 84
Group Variance = 43.33[illegible]3
For 90% confidence interval (two-tailed), a (1-0.9)/2 = 1[illegible]5
C = 10.8277
M1 = (21 - 10.8277)/2.0 = 5.08613
M2 = (21 + 10.8277)/2.0 + 1 = 16.9139
Lower limit is 0 = Q(5)
Upper limit is 0.107743 = Q(17)
0 < 0 < 0.107743 indicating no trend in data.

ChemStat Trial Version

Rank Von Neumann Ratio Test

Parameter: U
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/23/2005	1.22011	5
11/16/2005	1.15534	1.5
2/21/2006	1.15534	1.5
5/30/2006	1.17609	3
8/23/2006	1.21484	4
11/6/2006	1.47857	6
2/21/2007	1.5611	7

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von Neumann ratio v = 0.732143 = 20.5/28
99% Critical Value = 0.54
0.732143 > 0.54
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12345D
Log Base 10 Transformation
Non-Detects Replaced with Detection Limit

For 7 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.203405	0	0.637	None

Loc.	Date	Conc.	Outlier
12345D	8/23/2005	1.22011	FALSE
	11/16/2005	1.15534	FALSE
	2/21/2006	1.15534	FALSE
	5/30/2006	1.17609	FALSE
	8/23/2006	1.21484	FALSE
	11/6/2006	1.47857	FALSE
	2/21/2007	1.5611	FALSE

ChemStat
Trial Version

Shapiro-Wilks Test of Normality

Parameter: U
Location: 12345E
Normality Test of Parameter Concentrations
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit
K = 4 for 8 measurements

i	x(i)	x(n-i+1)	x(n-1+1)-x(i)	a(n-i+1)	b(i)
1	4.28	5.03	0.75	0.6052	0.4539
2	4.37	4.82	0.45	0.3164	0.14238
3	4.39	4.8	0.41	0.1743	0.071463
4	4.4	4.53	0.13	0.0561	0.007293
5	4.53	4.4	-0.13		
6	4.8	4.39	-0.41		
7	4.82	4.37	-0.45		
8	5.03	4.28	-0.75		

Sum of b values = 0.675036
Sample Standard Deviation = 0.270858
W Statistic = 0.887301

5% Critical value of 0.818 is less than 0.887301
Data is normally distributed at 95% level of significance

1% Critical value of 0.749 is less than 0.887301
Data is normally distributed at 99% level of significance

ChemStat
Trial Version

Mann-Kendall Trend Analysis
Parameter: U
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

95% Confidence Level

Xj	Xk	Xj - Xk	Positives	Negatives
4.82	4.37	0.45	1	0
5.03	4.37	0.66	2	0
4.4	4.37	0.03	3	0
4.39	4.37	0.02	4	0
4.53	4.37	0.16	5	0
4.28	4.37	-0.09	5	1
4.8	4.37	0.43	6	1
5.03	4.82	0.21	7	1
4.4	4.82	-0.42	7	2
4.39	4.82	-0.43	7	3
4.53	4.82	-0.29	7	4
4.28	4.82	-0.54	7	5
4.8	4.82	-0.02	7	6
4.4	5.03	-0.63	7	7
4.39	5.03	-0.64	7	8
4.53	5.03	-0.5	7	9
4.28	5.03	-0.75	7	10
4.8	5.03	-0.23	7	11
4.39	4.4	-0.01	7	12
4.53	4.4	0.13	8	12
4.28	4.4	-0.12	8	13
4.8	4.4	0.4	9	13
4.53	4.39	0.14	10	13
4.28	4.39	-0.11	10	14
4.8	4.39	0.41	11	14
4.28	4.53	-0.25	11	15
4.8	4.53	0.27	12	15
4.8	4.28	0.52	13	15

ChemStat
Trial Version

S Statistic = 13 - 15 = -2
Comparing at 1.0 - (0.05 / 2) = 97.5% confidence level (two-tailed)
Probability of obtaining S >= |-2| is 0.904
0.904 >= 0.025 indicating no evidence of a trend

Sen's Slope Analysis

Parameter: U
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

90% Confidence Level

Xj	Xk	(Xj - Xk)/(j-k)	Q
4.82 (10/11/2005)	4.37 (8/24/2005)	(4.82 - 4.37)/(2 - 1)	0.45
5.03 (12/13/2005)	4.37 (8/24/2005)	(5.03 - 4.37)/(3 - 1)	0.33
4.4 (2/14/2006)	4.37 (8/24/2005)	(4.4 - 4.37)/(4 - 1)	0.01
4.39 (4/21/2006)	4.37 (8/24/2005)	(4.39 - 4.37)/(5 - 1)	0.005
4.53 (6/27/2006)	4.37 (8/24/2005)	(4.53 - 4.37)/(6 - 1)	0.032
4.28 (8/21/2006)	4.37 (8/24/2005)	(4.28 - 4.37)/(7 - 1)	-0.015
4.8 (2/28/2007)	4.37 (8/24/2005)	(4.8 - 4.37)/(8 - 1)	0.0614286
5.03 (12/13/2005)	4.82 (10/11/2005)	(5.03 - 4.82)/(3 - 2)	0.21
4.4 (2/14/2006)	4.82 (10/11/2005)	(4.4 - 4.82)/(4 - 2)	-0.21
4.39 (4/21/2006)	4.82 (10/11/2005)	(4.39 - 4.82)/(5 - 2)	-0.143333
4.53 (6/27/2006)	4.82 (10/11/2005)	(4.53 - 4.82)/(6 - 2)	-0.0725
4.28 (8/21/2006)	4.82 (10/11/2005)	(4.28 - 4.82)/(7 - 2)	-0.108
4.8 (2/28/2007)	4.82 (10/11/2005)	(4.8 - 4.82)/(8 - 2)	-0.00333333
4.4 (2/14/2006)	5.03 (12/13/2005)	(4.4 - 5.03)/(4 - 3)	-0.63
4.39 (4/21/2006)	5.03 (12/13/2005)	(4.39 - 5.03)/(5 - 3)	-0.32
4.53 (6/27/2006)	5.03 (12/13/2005)	(4.53 - 5.03)/(6 - 3)	-0.166667
4.28 (8/21/2006)	5.03 (12/13/2005)	(4.28 - 5.03)/(7 - 3)	-0.1875
4.8 (2/28/2007)	5.03 (12/13/2005)	(4.8 - 5.03)/(8 - 3)	-0.046
4.39 (4/21/2006)	4.4 (2/14/2006)	(4.39 - 4.4)/(5 - 4)	-0.01
4.53 (6/27/2006)	4.4 (2/14/2006)	(4.53 - 4.4)/(6 - 4)	0.065
4.28 (8/21/2006)	4.4 (2/14/2006)	(4.28 - 4.4)/(7 - 4)	-0.04
4.8 (2/28/2007)	4.4 (2/14/2006)	(4.8 - 4.4)/(8 - 4)	0.1
4.53 (6/27/2006)	4.39 (4/21/2006)	(4.53 - 4.39)/(6 - 5)	0.14
4.28 (8/21/2006)	4.39 (4/21/2006)	(4.28 - 4.39)/(7 - 5)	-0.055
4.8 (2/28/2007)	4.39 (4/21/2006)	(4.8 - 4.39)/(8 - 5)	0.136667
4.28 (8/21/2006)	4.53 (6/27/2006)	(4.28 - 4.53)/(7 - 6)	-0.25
4.8 (2/28/2007)	4.53 (6/27/2006)	(4.8 - 4.53)/(8 - 6)	0.135
4.8 (2/28/2007)	4.28 (8/21/2006)	(4.8 - 4.28)/(8 - 7)	0.52

ChemStat Trial Version

Number of Q values = 28

Ordered Q Values

n	Q
1	-0.63
2	-0.32
3	-0.25
4	-0.21
5	-0.1875
6	-0.166667
7	-0.143333

8	-0.108
9	-0.0725
10	-0.055
11	-0.046
12	-0.04
13	-0.015
14	-0.01
15	-0.00333333
16	0.005
17	0.01
18	0.032
19	0.0614286
20	0.065
21	0.1
22	0.135
23	0.136667
24	0.14
25	0.21
26	0.33
27	0.45
28	0.52

Sen's Estimator (Median Q) is -0.00666667

Time Period	Observations
8/24/2005	1
10/11/2005	1
12/13/2005	1
2/14/2006	1
4/21/2006	1
6/27/2006	1
8/21/2006	1
2/28/2007	1

There are 0 time periods with multiple data

ChemStat Trial Version

A = 0
B = 0
C = 0
D = 0
E = 0
F = 0
a = 1176
b = 3024
c = 112
Group Variance = 65.3333
For 90% confidence interval (two-tailed), Z at (1-0.9)/2 = 1.64485
C = 13.2952
M1 = (28 - 13.2952)/2.0 = 7.35241
M2 = (28 + 13.2952)/2.0 + 1 = 21.6476
Lower limit is -0.143333 = Q(7)
Upper limit is 0.135 = Q(22)
-0.143333 < 0 < 0.135 indicating no trend in data.

Rank Von Neumann Ratio Test

Parameter: U
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

Values

Date	Value	Rank
8/24/2005	4.37	2
10/11/2005	4.82	7
12/13/2005	5.03	8
2/14/2006	4.4	4
4/21/2006	4.39	3
6/27/2006	4.53	5
8/21/2006	4.28	1
2/28/2007	4.8	6

---

von Neumann ratio v = 2.09524 = 88/42
99% Critical Value = 0.62
2.09524 > 0.62
Data are shown to be statistical independent at 99% confidence level

ChemStat
Trial Version

Dixon's Test for Outliers

Parameter: U
Location: 12345E
Original Data (Not Transformed)
Non-Detects Replaced with Detection Limit

For 8 Measurements...
1% Level of Significance

Iteration	Highest	Lowest	Critical	Outlier
1	0.318182	0.166667	0.683	None

Loc.	Date	Conc.	Outlier
12345E	8/24/2005	4.37	FALSE
	10/11/2005	4.82	FALSE
	12/13/2005	5.03	FALSE
	2/14/2006	4.4	FALSE
	4/21/2006	4.39	FALSE
	6/27/2006	4.53	FALSE
	8/21/2006	4.28	FALSE
	2/28/2007	4.8	FALSE

ChemStat
Trial Version