Arizona Public Service Company
CCR Program
Environmental Policy & Programs

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October 21, 2022

CCR Program Documentation
Closure – Notification of Closure Completion
CH_ClosProgComplete_004_20221021

Subject: Closure – Notification of Closure Completion; Sedimentation Pond - Cholla Power Plant

Pursuant to 40 C.F.R. §§ 257.102(h), APS is providing notice of its completion of closure of the Sedimentation Pond located at the Cholla Power Plant, Joseph City, Arizona. This notification includes the appended qualified professional engineer certification statements in the form of two supporting documents:

- CCR Groundwater Assessment Monitoring; Statistical Evaluation of Appendix IV Constituent Data, October 10, 2022
- SEDI Pond Closure by Removal and Construction Certification, October 13, 2021

In accordance with 40 CFR 257.101(a)(1), the unit was closed in accordance with its Closure Plan and the provisions of 40 CFR 257.102(c).

For questions regarding this Notification, please consult the CCR information webpage located within APS.com or contact neal.brown@aps.com.

Confidential

TECHNICAL MEMORANDUM

To:	Arizona Public Service Company	**Project No.**	14-2022-2007
By:	Samantha O'Shea	**Reviewed by:**	Maren Henley, PE Tim Glover
Tel:	602-733-6000	**CC: File**	
Date:	October 10, 2022		

Re: **CCR Groundwater Assessment Monitoring**
Statistical Evaluation of Appendix IV Constituent Data
Collected From the Sedimentation Pond Through April 2022
Arizona Public Service Company Cholla Power Plant – Navajo County, Arizona

Please be advised that, effective September 21, 2022, Wood Environment & Infrastructure Solutions, Inc. was acquired by WSP. due to the acquisition, we have changed our name to WSP USA Environment & Infrastructure Inc. no other aspects of our legal entity or capabilities have changed for this report, including our Federal Tax ID which remains 91-1641772. correspondence for this report should continue to be addressed to the undersigned.

INTRODUCTION

This Technical Memorandum (Tech Memo) presents the results of a statistical evaluation of groundwater monitoring data collected from monitoring wells downgradient of the Sedimentation Pond (SEDI) located at the Arizona Public Service Company (APS) Cholla Power Plant (Site) in Navajo County, Arizona. The statistical evaluation was performed by Geoscience Consulting Strategies LLC (Geoscience Consulting), a subcontractor to Wood Environment and Infrastructure Solutions, Inc. (Wood) pursuant to Coal Combustion Residuals (CCR) Rule requirements for groundwater monitoring and corrective action detailed in 40 Code of Federal Regulations Sections 257.90 through 257.98 (CCR Rule) (Federal Register, 2020).

The SEDI is a Site CCR unit that is currently in the assessment monitoring program. The SEDI stopped receiving wastes in October 2020 and, by October 2021, the unit was demolished and excavated. CCR removal activities associated with closing the SEDI were certified as complete by a professional engineer on October 13, 2021. The CCR Rule currently requires ongoing evaluation on a semiannual basis of Appendix IV constituent data collected from SEDI downgradient wells to determine if an Appendix IV constituent exceeds its respective groundwater protection standard (GWPS) at a statistically significant level (SSL) following removal of CCR from the unit. The SEDI will be considered closed when groundwater monitoring indicates that all Appendix IV constituents are less than GWPSs for a minimum of two consecutive sampling events. The statistical evaluation documented herein incorporates Appendix IV constituent data collected from SEDI downgradient wells M-56A, M-57A, and M-58A through April 25, 2022 to determine if a GWPS has been

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exceeded. The April 2022 sampling event constitutes the ninth sampling round under the SEDI Groundwater Assessment Monitoring Program, and the second sampling event conducted after removal of CCR from the unit.

STATISTICAL EVALUATION RESULTS

Attachment A presents the statistical evaluation conducted by Geoscience Consulting. The results of the evaluation are summarized as follows:

- There are no GWPS exceedances for Appendix IV constituents at the SEDI downgradient wells for the last two sampling events.
- Chromium and cobalt were detected above the background threshold value (BTV) at M-57A at concentrations of 0.0820 and 0.0035 mg/L, respectively. These constituent detections remained below the GWPSs.
- A statistically significant decreasing temporal trend is evident for barium and molybdenum at M-56A; for cobalt at M-57A; and for molybdenum at M-58A. A statistically significant increasing temporal trend is evident for arsenic at M-56A and M-58A and for chromium at M-57A.

CONCLUSIONS

Based on the results of the statistical evaluation presented in Attachment A and pursuant to the CCR Rule (257.102[c]), there are currently no GWPS exceedances or exceedances of respective background threshold values in Appendix IV constituent concentrations based on evaluation of the groundwater monitoring data collected in April 2022. Assessment monitoring for Appendix IV constituents at the SEDI have been below GWPSs for the minimum of two consecutive sampling events following CCR removal from the unit as of October 2021. As documented in the Geoscience Technical Memorandum, the SEDI has shown routine compliance under Assessment Monitoring since 2015, including two consecutive semi-annual sampling events post-closure certification. These findings are consistent with the Federal Register (2020), which states the SEDI can achieve clean closure status if, for two consecutive sampling events following CCR waste removal, Appendix IV groundwater constituent concentrations are compliant with their respective GWPSs. CCR removal and decontamination of the CCR unit are complete and constituent concentrations throughout the CCR unit and any areas affected by releases from the CCR unit have been removed and groundwater monitoring concentrations do not exceed the groundwater protection standard established pursuant to § 257.95(h) for constituents listed in appendix IV to this part.

BIBLIOGRAPHY

— Federal Register, 2020. 40 Code of Federal Regulations Part 257 – Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule promulgated April 17, 2015 with Amendments issued through November 12, 2020.

CERTIFICATION STATEMENT

This limited certification for closing the Sedi Pond CCR unit addresses only the groundwater quality monitoring concentrations relative to groundwater quality protection standards. This limited certification does not address removal of CCR from the CCR unit.

I, Rebecca Weaver, being a Registered Professional Engineer in good standing in the State of Arizona, do hereby certify, to the best of my knowledge, information, and belief that the concentrations of all Appendix IV concentrations have remained less than applicable Groundwater Protection Standards in CCR compliance wells located downgradient of the Sedimentation Pond for two consecutive sampling events following removal of the CCR from the unit based on the statistical analysis contained in the Wood Technical Memo titled, CCR Groundwater Assessment Monitoring Statistical Evaluation of Appendix IV Constituent Data Collected from the Sedimentation Pond through April 2022. Further, I certify that the referenced statistical analysis has been prepared in accordance with the accepted practice of engineering and that the work was completed in accordance with the requirements of 40 CFR § 257.95 and 40 CFR § 257.102.

Signed:
Rebecca Weaver

Dated: October 5, 2022

ATTACHMENT

A CCR GROUNDWATER ASSESSMENT MONITORING – GEOSCIENCE CONSULTING STRATEGIES LLC

Technical Memorandum

To: Maren Henley, PE
Wood Environment & Infrastructure Solutions, Inc.

From: Carla Landrum, PhD
Geoscience Consulting Strategies LLC

Date: August 24, 2022

Subject: **CCR Groundwater Assessment Monitoring**
Statistical Evaluation of April 2022 Sedimentation Pond Data
Arizona Public Service Company Cholla Power Plant– Navajo County, Arizona

1.0 INTRODUCTION

This Technical Memorandum (Tech Memo) documents the routine statistical evaluation of assessment monitoring groundwater data collected in April 2022 from the Sedimentation Pond (SEDI) located at the Arizona Public Service Company (APS) Cholla Power Plant (Cholla) in Navajo County, Arizona. The SEDI is being closed by removal. The SEDI stopped receiving wastes in October 2020 and, by October 2021, the unit was demolished and excavated. The objectives of the subject statistical evaluation are to assess groundwater monitoring compliance and to determine closure status for the SEDI.

This statistical evaluation is completed by Geoscience Consulting Strategies LLC in accordance with the Statistical Data Analysis Work Plan (SDAWP) for the Cholla Power Plant and the Coal Combustion Residuals (CCR) Rule (Federal Register, 2018; Wood, 2018).

2.0 STATISTICAL EVALUATION APPROACH

The subject analysis was completed using ProUCL software (United States Environmental Protection Agency [US EPA], 2015). Appendix A contains the ProUCL data upload table Wood Environment & Infrastructure Solutions, Inc. (Wood) put forth to complete the subject analysis, which includes SEDI compliance well data collected from November 2015 through April 2022.

The Appendix IV analytes are listed by name as column headers in the ProUCL data upload table. Each analyte has a corresponding data column (indicated with a "D_" prefix) that indicates if the analyte was detected or not at a concentration that exceeds the analytical reporting limit, where detectable concentrations are symbolized by a "1" and non-detectable concentrations are symbolized by a "0". The non-detectable concentration corresponds to the analyte's reporting limit value for the corresponding sample date. Field and split sample duplicates were retracted from the analysis.

Table 1 presents the concentrations of Appendix IV constituents in samples collected from SEDI background (i.e., M-62A) and compliance monitoring wells (i.e., M-56A, M-57A and M-58A) in April 2022. Additionally, Table 1 reflects BTVs that reflect groundwater samples collected between November 2015 and April 2022. The April 2022 sampling event constitutes the ninth sampling round under the SEDI Groundwater Assessment Monitoring program.

Appendix B presents the raw outputs from the Exploratory Data Analysis (EDA) of SEDI Appendix IV groundwater data incorporating the April 2022 sampling event, including temporal trend analysis for constituents exhibiting a non-detect frequency less than 50%, goodness of fit tests and summary statistics.

3.0 EXCEEDANCE ASSESSMENT

Table 2 summarizes the Groundwater Protection Standards (GWPS) for each Appendix IV constituent (Wood, 2019). GWPS selection is documented in the January 2019 Tech Memo and constitutes either the statistically calculated Background Threshold Value (BTV) (Table 1), the US EPA's promulgated Maximum Contaminant Level (MCL) for Drinking Water, or the risk-based alternative GWPS identified for constituents without MCLs, whichever value is highest. The updated BTV for antimony and lithium are higher than the respective US EPA promulgated, or risk-based alternative value, and constitute the GWPS shown in Table 2.

Table 2 summarizes: 1) compliance well lower confidence limit (LCL) comparisons to their respective GWPS for Appendix IV constituents, 2) which compliance wells exhibit statistically significant temporal trends, and 3) the type of LCL test applied after incorporating the October 2021 sampling event for each monitoring well. The addition of data to the sample population over time can cause the type of statistical test in Table 2 to change from previous evaluations.

This statistical analysis indicates there is insufficient evidence to declare a GWPS exceedance for SEDI monitoring wells M-56A, M-57A, and M-58A. Several compliance monitoring wells exhibit statistically significant ($p<0.05$) temporal trends, including statistically significant ($p<0.05$) decreasing temporal trends in M-56A (barium and molybdenum), M-57A (cobalt) and M-58A (molybdenum) in addition to statistically significant ($p<0.05$) increasing temporal trends in M-56A (arsenic), M-57A (chromium) and M-58A (arsenic). Temporal trends can be present without an SSI exceedance because the current concentration trends fall below their respective GWPS.

4.0 RECOMMENDATION

The SEDI has shown routine compliance under Assessment Monitoring since 2015, including two consecutive semi-annual sampling events post-closure certification. These findings are consistent with the Federal Register (2015), which states the SEDI can achieve clean closure status if, for two consecutive sampling events following CCR waste removal, Appendix IV groundwater constituent concentrations are compliant with their respective GWPSs. On this basis, there is no statistical justification to suspect the SEDI is a source of contamination in groundwater for Appendix IV constituents.

5.0 REFERENCES

Federal Register, 2018. *40 Code of Federal Regulations Part 257 – Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule promulgated April 17, 2015, with Amendments to the National Minimum Criteria (Phase One, Part One) effective August 29, 2018.*

Federal Register, 2018. *Part II. Environmental Protection Agency. 40 CFR Parts 257 and 261.* Volume 80, Number 74, pp. 21302-21638.

US Environmental Protection Agency (US EPA), 2015. ProUCL (Version 5.1.1) *User Guide, Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations*. EPA/600/R-07/041. Washington D.C. October 2015.

Wood Environment & Infrastructure Solutions, Inc. (Wood), 2018. *Statistical Data Analysis Work Plan*. Coal Combustion Residual Rule Groundwater Monitoring System Compliance, Cholla Power Plant, Navajo County, Arizona. Prepared for Arizona Public Service. October 2018.

Wood, 2019. *CCR Groundwater Assessment Monitoring Statistical Analysis and Results for the Sedimentation Pond*. Arizona Public Service Cholla Power Plant, Navajo County, Arizona. Technical Memorandum dated January 14, 2019.

ATTACHMENTS

Table 1 – Assessment Monitoring Data Collected from the Sedimentation Pond
Table 2 – GWPS Exceedance Summary for Data Collected from the Sedimentation Pond through April 2021
Appendix A – ProUCL Data Upload Table
Appendix B – ProUCL EDA Output Files

TABLES

Table 1
Assessment Monitoring Data Collected from the Sedimentation Pond

				Analyte Concentration by Location and Date								
				M-56A (Compliance)								
Constituent	**Analyte**	**Units**	**BTV**	**2/15/19**	**4/18/19**	**8/9/19**	**11/25/19**	**4/16/20**	**10/21/20**	**4/14/21**	**10/21/21**	**4/25/22**
Appendix III	Boron	mg/L	0.23	0.30	---	---	---	---	---	---	---	---
Appendix III	Calcium	mg/L	600	300	---	---	---	---	---	---	---	---
Appendix III	Chloride	mg/L	3700	2000	---	---	---	---	---	---	---	---
Appendix III	pH	SU	7.5	7.3	---	---	---	---	---	---	---	---
Appendix III	Sulfate	mg/L	630	850	---	---	---	---	---	---	---	---
Appendix III	TDS	mg/L	7800	---	---	---	---	---	---	---	---	
Appendix IV	Antimony	mg/L	0.05	NA	<0.0010	NA	NA	<0.005	<0.002	<0.002	0.00022	<0.001
Appendix IV	Arsenic	mg/L	0.008	**0.0082**	0.0011	**0.0085**	**0.0088**	<0.0025	0.0044	0.0029	0.0031	0.0025
Appendix IV	Barium	mg/L	0.16	0.067	0.055	0.078	0.063	0.052	0.05	0.05	0.05	0.043
Appendix IV	Beryllium	mg/L	0.001	---	<0.0010	NA	---	<0.0010	<0.0010	<0.0010	<0.001	<0.0010
Appendix IV	Cadmium	mg/L	0.002	---	<0.0001	NA	---	<0.0005	<0.0002	<0.0002	<0.0001	<0.0001
Appendix IV	Chromium	mg/L	0.018	0.0052	**0.0760**	**0.0230**	0.0086	**0.0340**	0.0041	0.0140	0.0060	0.0018
Appendix IV	Cobalt	mg/L	0.003	0.00073	0.0013	0.0012	0.00064	<0.0025	<0.001	0.00073	0.00076	0.00072
Appendix IV	Fluoride	mg/L	0.8	<0.4000	<0.4000	<0.8000	<0.4000	<0.8000	<0.8000	0.39	0.41	<0.8000
Appendix IV	Lead	mg/L	0.01	---	<0.00050	NA	---	<0.0025	<0.0010	<0.0010	<0.0005	<0.0005
Appendix IV	Lithium	mg/L	0.2	---	<0.20	<0.20	---	**<1***	0.097	0.10	0.11	0.11
Appendix IV	Mercury	mg/L	0.0002	---	<0.00020	NA	---	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Appendix IV	Molybdenum	mg/L	0.015	0.0074	0.014	0.011	0.0087	0.012	0.008	0.0097	0.0083	0.0081
Appendix IV	Total Radium	pCi/L	2.5	0.9000	NA	0.6000	---	NA	<0.8000	<0.8000	0.7000	1.1000
Appendix IV	Selenium	mg/L	0.01	---	0.0006	NA	---	<0.0025	<0.0010	0.0016	0.0008	<0.0005
Appendix IV	Thallium	mg/L	0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	0.0002	<0.0002	0.0001	<0.0001

Notes:
Constituent concentrations that exceed BTVs are presented in bold text.

*The non-detectable sample concentration exceeds the corresponding BTV.

Acronyms:
--- = not applicable or evaluated
BTV = Background Threshold Value
mg/L = milligrams per liter
NA = not available at the time of assessment
SU = standard units
NS = no standard
pCi/L = picocuries per liter
< = sample concentration below the reporting limit value
SEDI = Sedimentation Pond
TDS = total dissolved solids

Table 1
Assessment Monitoring Data Collected from the Sedimentation Pond

				Analyte Concentration by Location and Date								
				M-57A (Compliance)								
Constituent	**Analyte**	**Units**	**BTV**	**2/15/19**	**4/17/19**	**8/9/20**	**11/25/19**	**4/16/20**	**10/21/20**	**4/14/21**	**10/21/21**	**4/25/22**
Appendix III	Boron	mg/L	0.23	0.63	---	---	---	---	---	---	---	---
Appendix III	Calcium	mg/L	600	490	---	---	---	---	---	---	---	---
Appendix III	Chloride	mg/L	3700	2100	---	---	---	---	---	---	---	---
Appendix III	pH	SU	7.5	7.1	---	---	---	---	---	---	---	---
Appendix III	Sulfate	mg/L	630	1300	---	---	---	---	---	---	---	---
Appendix III	TDS	mg/L	7800	---	---	---	---	---	---	---	---	
Appendix IV	Antimony	mg/L	0.05	NA	NA	NA	NA	<0.005	<0.002	<0.002	0.00011	<0.001
Appendix IV	Arsenic	mg/L	0.008	0.0017	0.0026	0.0019	**0.021**	0.0037	0.0061	0.0037	0.0033	0.0023
Appendix IV	Barium	mg/L	0.16	0.041	0.041	0.039	0.047	0.042	0.046	0.043	0.055	0.045
Appendix IV	Beryllium	mg/L	0.001	---	<0.0010	NA	---	<0.0010	<0.001	<0.001	<0.001	<0.001
Appendix IV	Cadmium	mg/L	0.002	---	<0.0001	NA	---	<0.0005	<0.0002	<0.0002	0.00012	<0.0001
Appendix IV	Chromium	mg/L	0.018	0.0074	**0.0450**	**0.0380**	0.0038	<0.005	**0.1600**	0.0170	**0.0560**	**0.0820**
Appendix IV	Cobalt	mg/L	0.003	**0.0049**	**0.005**	**0.004**	**0.0044**	0.0028	0.0028	0.0026	0.0029	**0.0035**
Appendix IV	Fluoride	mg/L	0.8	<0.4000	0.53	<0.8000	<0.4000	<0.8000	<0.8000	0.35	0.38	<0.8
Appendix IV	Lead	mg/L	0.01	---	<0.00050	NA	---	<0.0025	<0.0010	<0.0010	<0.0005	<0.0005
Appendix IV	Lithium	mg/L	0.2	---	<0.20	<0.2	---	**<1***	0.092	0.096	0.1	0.1
Appendix IV	Mercury	mg/L	0.0002	---	<0.00020	NA	---	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Appendix IV	Molybdenum	mg/L	0.015	0.0029	0.0078	0.0068	0.012	<0.0025	**0.018**	0.0044	0.0069	0.0097
Appendix IV	Total Radium	pCi/L	2.5	<0.7000	NA	<0.7000	---	NA	<0.8000	<0.8000	<0.6	1.1000
Appendix IV	Selenium	mg/L	0.01	---	0.0007	NA	---	<0.0025	<0.0010	0.0014	0.0010	<0.0005
Appendix IV	Thallium	mg/L	0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0002	<0.0002	0.0001	<0.0001

Notes:
Constituent concentrations that exceed BTVs are presented in bold text.

*The non-detectable sample concentration exceeds the corresponding BTV.

Acronyms:
--- = not applicable or evaluated
BTV = Background Threshold Value
mg/L = milligrams per liter
NA = not available at the time of assessment
SU = standard units
NS = no standard
pCi/L = picocuries per liter
< = sample concentration below the reporting limit value
SEDI = Sedimentation Pond
TDS = total dissolved solids

Table 1
Assessment Monitoring Data Collected from the Sedimentation Pond

				Analyte Concentration by Location and Date								
				M-58A (Compliance)								
Constituent	**Analyte**	**Units**	**BTV**	**2/15/19**	**4/18/19**	**8/9/19**	**11/25/19**	**4/16/20**	**10/21/20**	**4/14/21**	**10/21/21**	**4/25/22**
Appendix III	Boron	mg/L	0.23	0.23	---	---	---	---	---	---	---	---
Appendix III	Calcium	mg/L	600	310	---	---	---	---	---	---	---	---
Appendix III	Chloride	mg/L	3700	2100	---	---	---	---	---	---	---	---
Appendix III	pH	SU	7.5	7.5	---	---	---	---	---	---	---	---
Appendix III	Sulfate	mg/L	630	540	---	---	---	---	---	---	---	---
Appendix III	TDS	mg/L	7800	---	---	---	---	---	---	---	---	
Appendix IV	Antimony	mg/L	0.05	NA	<0.0010	NA	NA	<0.005	<0.002	<0.002	<0.001	<0.001
Appendix IV	Arsenic	mg/L	0.008	0.0043	0.0039	0.0038	0.0046	0.0042	0.0066	0.0061	0.0054	0.0057
Appendix IV	Barium	mg/L	0.16	0.063	0.059	0.066	0.079	0.069	0.073	0.07	0.062	0.062
Appendix IV	Beryllium	mg/L	0.001	---	<0.0010	NA	---	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Appendix IV	Cadmium	mg/L	0.002	---	<0.0001	NA	---	<0.0005	<0.0002	<0.0002	<0.0001	<0.0001
Appendix IV	Chromium	mg/L	0.018	<0.0010	<0.0010	<0.001	<0.001	<0.005	<0.002	<0.002	<0.001	<0.001
Appendix IV	Cobalt	mg/L	0.003	<0.00050	<0.00050	<0.0005	**<0.005***	<0.0025	<0.001	<0.001	0.00024	<0.0005
Appendix IV	Fluoride	mg/L	0.8	<0.4000	<0.4000	<0.8000	<0.4000	<0.8000	<0.8000	0.32	0.34	<0.8
Appendix IV	Lead	mg/L	0.01	---	<0.00050	NA	---	<0.0025	<0.0010	<0.0010	<0.0005	<0.0005
Appendix IV	Lithium	mg/L	0.2	---	<0.20	<0.2	---	**<1***	0.07	0.071	0.069	0.08
Appendix IV	Mercury	mg/L	0.0002	---	<0.00020	NA	---	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Appendix IV	Molybdenum	mg/L	0.015	0.0018	0.0018	0.0018	0.0018	<0.0025	0.0017	0.002	0.0016	0.0017
Appendix IV	Total Radium	pCi/L	2.5	<0.7000	NA	<0.7000	---	NA	0.5000	<0.8	0.8000	1.6000
Appendix IV	Selenium	mg/L	0.01	---	<0.00050	NA	---	<0.0025	<0.0010	0.0010	0.0005	<0.0005
Appendix IV	Thallium	mg/L	0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0005	<0.0002	<0.0002	0.0000	0.0001

Notes:
Constituent concentrations that exceed BTVs are presented in bold text.

*The non-detectable sample concentration exceeds the corresponding BTV.

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--- = not applicable or evaluated
BTV = Background Threshold Value
mg/L = milligrams per liter
NA = not available at the time of assessment
SU = standard units
NS = no standard
pCi/L = picocuries per liter
< = sample concentration below the reporting limit value
SEDI = Sedimentation Pond
TDS = total dissolved solids

Table 1
Assessment Monitoring Data Collected from the Sedimentation Pond

				Analyte Concentration by Location and Date								
				M-62A (Background)								
Constituent	**Analyte**	**Units**	**BTV**	**2/15/19**	**4/18/19**	**8/9/19**	**11/25/19**	**4/16/20**	**10/21/20**	**4/14/21**	**10/21/21**	**4/25/22**
Appendix III	Boron	mg/L	0.23	0.23	---	---	---	---	---	---	---	---
Appendix III	Calcium	mg/L	600	490	---	---	---	---	---	---	---	---
Appendix III	Chloride	mg/L	3700	2900	---	---	---	---	---	---	---	---
Appendix III	pH	SU	7.5	7.3	---	---	---	---	---	---	---	---
Appendix III	Sulfate	mg/L	630	560	---	---	---	---	---	---	---	---
Appendix III	TDS	mg/L	7800	---	---	---	---	---	---	---	---	
Appendix IV	Antimony	mg/L	0.05	NA	<0.0010	NA	NA	<0.005	<0.002	<0.002	0.00018	<0.001
Appendix IV	Arsenic	mg/L	0.008	0.003	0.0033	0.0031	0.0048	0.0043	0.0048	0.0052	0.0054	0.0038
Appendix IV	Barium	mg/L	0.16	0.068	0.068	0.067	0.15	0.078	0.12	0.063	0.13	0.05
Appendix IV	Beryllium	mg/L	0.001	---	<0.0010	NA	---	<0.0010	<0.0010	<0.0010	0.00016	<0.001
Appendix IV	Cadmium	mg/L	0.002	---	<0.0001	NA	---	<0.0005	<0.0002	<0.0002	0.00013	<0.0001
Appendix IV	Chromium	mg/L	0.018	<0.0010	<0.0010	0.0037	0.0044	0.0053	0.0059	0.0012	0.0031	<0.001
Appendix IV	Cobalt	mg/L	0.003	<0.00050	<0.00050	<0.0005	0.0012	<0.0025	0.0011	<0.001	0.0011	<0.0005
Appendix IV	Fluoride	mg/L	0.8	<0.4000	0.47	<0.4000	<0.4000	<0.8000	<0.8000	0.29	0.35	<0.8
Appendix IV	Lead	mg/L	0.01	---	<0.00050	NA	---	<0.0025	0.002	<0.001	0.0017	<0.0005
Appendix IV	Lithium	mg/L	0.2	---	<0.20	<0.2	---	**<1***	0.09	0.092	0.087	0.088
Appendix IV	Mercury	mg/L	0.0002	---	<0.00020	NA	---	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Appendix IV	Molybdenum	mg/L	0.015	0.0024	0.0026	0.0028	0.0091	0.004	0.015	0.0041	0.0053	0.0032
Appendix IV	Total Radium	pCi/L	2.5	<0.7000	NA	0.8000	---	NA	<0.8000	<0.8000	<0.6000	<0.6
Appendix IV	Selenium	mg/L	0.01	---	<0.0005	NA	---	<0.0025	<0.0010	0.0016	0.0010	<0.0005
Appendix IV	Thallium	mg/L	0.0005	<0.0001	<0.0001	<0.0001	0.0002	<0.0005	<0.0002	<0.0002	0.0000	<0.0001

Notes:
Constituent concentrations that exceed BTVs are presented in bold text.

*The non-detectable sample concentration exceeds the corresponding BTV.

Acronyms:
--- = not applicable or evaluated
BTV = Background Threshold Value
mg/L = milligrams per liter
NA = not available at the time of assessment
SU = standard units
NS = no standard
pCi/L = picocuries per liter
< = sample concentration below the reporting limit value
SEDI = Sedimentation Pond
TDS = total dissolved solids

Table 2
GWPS Exceedance Summary for Data Collected from the Sedimentation Pond through April 2022

			Lower Confidence Limit (LCL) Results - Appendix IV Constituents						
			M-56A		M-57A		M-58A		Exceedance
Analyte	Units	GWPS	LCL	Recent Test	LCL	Recent Test	LCL	Recent Test	
Antimony	mg/L	0.05	0.0010	NP-LCL	0.0010	NP-LCL	0.0500	DQR	No
Arsenic	mg/L	0.01	0.0008	NP-LCL	0.0028	P-LCL	0.0038	P-LCLT	No
Barium	mg/L	2	0.0388	P-LCLT	0.0420	NP-LCL	0.0614	P-LCL	No
Beryllium	mg/L	0.004	0.0010	DQR	0.0010	DQR	0.0010	DQR	No
Cadmium	mg/L	0.005	0.0001	DQR	0.0001	DQR	0.0001	DQR	No
Chromium	mg/L	0.1	0.0024	P-LCL	0.0014	P-LCLT	0.0010	NP-LCL	No
Cobalt	mg/L	0.006	0.0006	P-LCL	0.0049	NP-LCL	0.0010	NP-LCL	No
Fluoride	mg/L	4	0.4000	NP-LCL	0.4000	NP-LCL	0.4000	NP-LCL	No
Lead	mg/L	0.015	0.0005	DQR	0.0005	NP-LCL	0.0005	NP-LCL	No
Lithium	mg/L	0.2	0.2000	NP-LCL	0.2000	NP-LCL	0.2000	NP-LCL	No
Mercury	mg/L	0.002	0.0002	DQR	0.0002	DQR	0.0002	DQR	No
Molybdenum	mg/L	0.1	0.0052	P-LCLT	0.0035	P-LCL	0.0017	NP-LCL	No
Total Radium	pCi/L	5	0.6275	P-LCL	0.6000	NP-LCL	0.7000	NP-LCL	No
Selenium	mg/L	0.05	0.0005	NP-LCL	0.0005	NP-LCL	0.0005	NP-LCL	No
Thallium	mg/L	0.002	0.0001	NP-LCL	0.0001	DQR	0.0001	DQR	No

Notes:

Statistically significant temporal trend (p<0.05)

Acronymns:

GWPS = Groundwater Protection Standard
mg/L = milligrams per liter
pCi/L = picocuries per liter
P-LCL = Parametric Lower Confidence Limit
NP-LCL = Non-Parametric Lower Confidence Limit
P-LCLT = Parametric Lower Confidence Limit with a Trend
DQR = Double Quantification Rule

APPENDIX A

PROUCL DATA UPLOAD TABLE

Appendix A
ProUCL Upload Table

StationName	QC_SampleID	NumDate	Antimony	D_Antimony	Arsenic	D_Arsenic	Barium	D_Barium	Beryllium	D_Beryllium	Cadmium	D_Cadmium	Chromium	D_Chromium	Cobalt	D_Cobalt	Fluoride	D_Fluoride	Lead	D_Lead	Lithium	D_Lithium	Mercury	D_Mercury	Molybdenum	D_Molybdenum	Total Radium	D_Total Radium	Selenium	D_Selenium	Thallium	D_Thallium
M-56A	7873_O	11/30/2015	0.0025	0	0.0019	1	0.081	1	0.001	0	0.0001	0	0.00051	1	0.0012	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0096	1	0.9	0	0.00033	1	0.0001	0
M-56A	CH-M-56A-0316_O	3/8/2016	0.05	0	0.01	0	0.084	1	0.001	0	0.002	0	0.01	0	0.002	1	0.43	1	0.01	0	0.2	0	0.0002	0	0.029	1	0.4	0	0.01	0	0.002	0
M-56A	CH-CCR-M56A-05102016_O	5/10/2016	0.0001	0	0.00093	1	0.075	1	0.001	0	0.0001	0	0.0005	0	0.0013	1	0.42	1	0.0005	0	0.2	0	0.0002	0	0.023	1	0.6	1	0.0005	0	0.0001	0
M-56A	CH-CCR-M56A-816_O	8/29/2016	0.00013	1	0.00082	1	0.082	1	0.001	0	0.0001	0	0.0005	0	0.0013	1	0.46	1	0.0005	0	0.2	0	0.0002	0	0.021	1	1.6	1	0.0005	0	0.0001	0
M-56A	CH-CCR-M56A-916_O	9/21/2016	0.0005	0	0.00083	1	0.076	1	0.001	0	0.0001	0	0.0012	1	0.0012	1	0.4	1	0.0001	0	0.2	0	0.0002	0	0.016	1	0.6	1	0.0006	0	0.0001	0
M-56A	CH-CCR-M56A-217_O	2/20/2017	0.001	0	0.00068	1	0.071	1	0.001	0	0.0001	0	0.0093	1	0.00077	1	0.4	1	0.0005	0	0.2	0	0.0002	0	0.013	1	1.8	1	0.0005	0	0.0001	0
M-56A	CH-CCR-M56A-41317_O	4/13/2017	0.001	0	0.00076	1	0.07	1	0.001	0	0.0001	0	0.0091	1	0.00065	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.011	1	1.2	1	0.0005	0	0.0001	0
M-56A	CH-CCR-M56A-42517_O	4/25/2017	0.001	0	0.00075	1	0.086	1	0.001	0	0.0001	0	0.0067	1	0.00061	1	0.8	0	0.0005	0	0.2	0	0.0002	0	0.013	1	1.9	1	0.00056	1	0.0001	0
M-56A	CH-CCR-M56A-51817_O	5/18/2017	0.001	0	0.0006	1	0.062	1	0.001	0	0.0001	0	0.0063	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0095	1	1.2	0	0.0005	0	0.0001	0
M-56A	CH-CCR-M56A-52517_O	5/25/2017	0.001	0	0.0007	1	0.073	1	0.001	0	0.0001	0	0.02	1	0.00075	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.011	1	1.5	1	0.00057	1	0.0001	0
M-56A	CH-CCR-M56A-70117_O	7/1/2017	0.001	0	0.00065	1	0.068	1	0.001	0	0.0001	0	0.0034	1	0.0005	0	0.41	1	0.0005	0	0.2	0	0.0002	0	0.0098	1	0.7	0	0.0005	0	0.0001	0
M-56A	CH-CCR-M56A-72617_O	7/26/2017	0.002	0	0.001	0	0.066	1	0.001	0	0.0002	0	0.0028	1	0.001	0	0.4	0	0.001	0	0.2	0	0.0002	0	0.009	1	1.7	1	0.001	0	0.0002	0
M-56A	CH-CCR-M56A-90817_O	9/8/2017	0.004	0	0.002	0	0.07	1	0.001	0	0.0004	0	0.004	0	0.002	0	0.47	1	0.002	0	0.2	0	0.0002	0	0.0093	1	0.5	1	0.002	0	0.0004	0
M-56A	CH-CCR-M56A-120817_O	12/8/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.49	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
M-56A	CH-CCR-M-56A-52118_O	5/21/2018	0.001	0	0.00081	1	0.061	1	0.001	0	0.0001	0	0.0046	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0079	1	1.4	1	0.0005	0	0.00012	1
M-56A	CH-CCR-M56A-082818_O	8/28/2018	NA	NA	0.0013	1	0.065	1	NA	NA	NA	NA	0.0042	1	0.0005	0	NA	NA	NA	NA	NA	NA	NA	NA	0.0057	1	0.5	1	NA	NA	0.0001	0
M-56A	CH-CCR-M56A-21519	2/15/2019	NA	NA	0.0082	1	0.067	1	NA	NA	NA	NA	0.0052	1	0.00073	1	0.4	0	NA	NA	NA	NA	NA	NA	0.0074	1	NA	NA	NA	NA	0.0001	0
M-56A	CH-CCR-M56A-41819	4/18/2019	0.001	0	0.0011	1	0.055	1	0.001	0	0.0001	0	0.076	1	0.0013	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.014	1	0.7	0	0.00062	1	0.0001	0
M-56A	CH-CCR-M56A-8919	8/9/2019	NA	NA	0.0085	1	0.078	1	NA	NA	NA	NA	0.023	1	0.0012	1	0.8	0	NA	NA	0.2	0	NA	NA	0.011	1	0.6	1	NA	NA	0.0001	0
M-56A	CH-CCR-M56A-112519	11/25/2019	NA	NA	0.0088	1	0.063	1	NA	NA	NA	NA	0.0086	1	0.00064	1	0.4	0	NA	NA	NA	NA	NA	NA	0.0087	1	NA	NA	NA	NA	0.0001	0
M-56A	CH-CCR-M56-0420	4/16/2020	0.005	0	0.0025	0	0.052	1	0.001	0	0.0005	0	0.034	1	0.0025	0	0.8	0	0.0025	0	1	0	0.0002	0	0.012	1	NA	NA	0.0025	0	0.0005	0
M-56A	CH-CCR-M56-1020	10/21/2020	0.002	0	0.0044	1	0.05	1	0.001	0	0.0002	0	0.0041	1	0.001	0	0.8	0	0.001	0	0.097	1	0.0002	0	0.008	1	0.8	0	0.001	0	0.0002	0
M-56A	CH-CCR-M56-0421	4/14/2021	0.002	0	0.0029	1	0.05	1	0.001	0	0.0002	0	0.014	1	0.00073	1	0.39	1	0.001	0	0.1	1	0.0002	0	0.0097	1	0.8	0	0.0016	1	0.0002	0
M-56A	CH-CCR-M56-1021	10/21/2021	0.00022	1	0.0031	1	0.05	1	0.001	0	0.0001	0	0.006	1	0.00076	1	0.41	1	0.0005	0	0.11	1	0.0002	0	0.0083	1	0.7	1	0.00081	1	0.000098	1
M-56A	CH-CCR-M56A-0422	4/25/2022	0.001	0	0.0025	1	0.043	1	0.001	0	0.0001	0	0.0018	1	0.00072	1	0.8	0	0.0005	0	0.11	1	0.0002	0	0.0081	1	1.1	1	0.0005	0	0.0001	0
M-57A	7874_O	11/30/2015	0.0025	0	0.0048	1	0.072	1	0.001	0	0.0001	0	0.00074	1	0.0077	1	0.4	0	0.00086	1	0.2	0	0.0002	0	0.008	1	0.9	0	0.00029	1	0.0001	0
M-57A	CH-M-57A-0316_O	3/8/2016	0.05	0	0.0064	1	0.063	1	0.001	0	0.002	0	0.01	0	0.0082	1	0.4	0	0.01	0	0.2	0	0.0002	0	0.004	1	0.4	0	0.01	0	0.002	0
M-57A	CH-CCR-M57A-05112016_O	5/11/2016	0.0001	0	0.0027	1	0.047	1	0.001	0	0.0001	0	0.0005	0	0.0065	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0011	1	0.6	0	0.0005	0	0.0001	0
M-57A	CH-CCR-M57A-816_O	8/25/2016	0.00012	1	0.0042	1	0.055	1	0.001	0	0.0001	0	0.00066	1	0.0078	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.022	1	0.6	0	0.0005	0	0.0001	0
M-57A	CH-CCR-M57A-916_O	9/21/2016	0.0005	0	0.0019	1	0.051	1	0.001	0	0.0001	0	0.016	1	0.0067	1	0.4	0	0.00021	1	0.2	0	0.0002	0	0.0029	1	0.7	0	0.0006	0	0.0001	0
M-57A	CH-CCR-M57A-217_O	2/20/2017	0.001	0	0.0051	1	0.041	1	0.001	0	0.0001	0	0.042	1	0.0086	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0048	1	1.1	1	0.0005	0	0.0001	0
M-57A	CH-CCR-M57A-41217_O	4/12/2017	0.001	0	0.0042	1	0.042	1	0.001	0	0.0001	0	0.031	1	0.0087	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0047	1	0.6	0	0.0005	0	0.0001	0
M-57A	CH-CCR-M57A-42517_O	4/25/2017	0.001	0	0.0039	1	0.042	1	0.001	0	0.0001	0	0.019	1	0.0077	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0042	1	0.6	0	0.0005	0	0.0001	0
M-57A	CH-CCR-M57A-51817_O	5/18/2017	0.001	0	0.0098	1	0.038	1	0.001	0	0.0001	0	0.024	1	0.0076	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0041	1	1.5	1	0.0005	0	0.0001	0
M-57A	CH-CCR-M57A-52517_O	5/25/2017	0.001	0	0.0066	1	0.044	1	0.001	0	0.0001	0	0.035	1	0.0083	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0063	1	0.5	1	0.0005	0	0.0001	0
M-57A	CH-CCR-M57A-70117_O	7/1/2017	0.001	0	0.0038	1	0.043	1	0.001	0	0.0001	0	0.012	1	0.0075	1	0.42	1	0.0005	0	0.2	0	0.0002	0	0.0037	1	0.7	0	0.0005	0	0.0001	0
M-57A	CH-CCR-M57A-72617_O	7/26/2017	0.002	0	0.0027	1	0.042	1	0.001	0	0.0002	0	0.028	1	0.0088	1	0.4	0	0.001	0	0.2	0	0.0002	0	0.0058	1	0.7	0	0.001	0	0.0002	0
M-57A	CH-CCR-M57A-90817_O	9/8/2017	0.004	0	0.0027	1	0.045	1	0.001	0	0.0004	0	0.015	1	0.0082	1	0.4	0	0.002	0	0.2	0	0.0002	0	0.0046	1	0.6	1	0.002	0	0.0004	0
M-57A	CH-CCR-M57A-120817_O	12/8/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
M-57A	CH-CCR-M-57A-52118_O	5/21/2018	0.002	0	0.0022	1	0.043	1	0.001	0	0.0002	0	0.0023	1	0.0058	1	0.4	0	0.001	0	0.2	0	0.0002	0	0.0026	1	0.7	0	0.001	0	0.0002	0
M-57A	CH-CCR-M57A-082818_O	8/28/2018	NA	NA	0.0021	1	0.045	1	NA	NA	NA	NA	0.0067	1	0.0057	1	NA	NA	NA	NA	NA	NA	NA	NA	0.003	1	0.7	1	NA	NA	0.0001	0
M-57A	CH-CCR-M57A-21519	2/15/2019	NA	NA	0.0017	1	0.041	1	NA	NA	NA	NA	0.0074	1	0.0049	1	0.4	0	NA	NA	NA	NA	NA	NA	0.0029	1	NA	NA	NA	NA	0.0001	0
M-57A	CH-CCR-M57A-41719	4/17/2019	0.001	0	0.0026	1	0.041	1	0.001	0	0.0001	0	0.045	1	0.005	1	0.53	1	0.0005	0	0.2	0	0.0002	0	0.0078	1	0.7	0	0.00069	1	0.0001	0
M-57A	CH-CCR-M57A-8919	8/9/2019	NA	NA	0.0019	1	0.039	1	NA	NA	NA	NA	0.038	1	0.004	1	0.8	0	NA	NA	0.2	0	NA	NA	0.0068	1	0.7	0	NA	NA	0.0001	0
M-57A	CH-CCR-M57A-112519	11/25/2019	NA	NA	0.021	1	0.047	1	NA	NA	NA	NA	0.0038	1	0.0044	1	0.4	0	NA	NA	NA	NA	NA	NA	0.012	1	NA	NA	NA	NA	0.0001	0
M-57A	CH-CCR-M57-0420	4/16/2020	0.005	0	0.0037	1	0.042	1	0.001	0	0.0005	0	0.005	0	0.0028	1	0.8	0	0.0025	0	1	0	0.0002	0	0.0025	0	NA	NA	0.0025	0	0.0005	0
M-57A	CH-CCR-M57-1020	10/21/2020	0.002	0	0.0061	1	0.046	1	0.001	0	0.0002	0	0.16	1	0.0028	1	0.8	0	0.001	0	0.092	1	0.0002	0	0.018	1	0.8	0	0.001	0	0.0002	0
M-57A	CH-CCR-M57A-011321	1/13/2021	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.013	1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
M-57A	CH-CCR-M57-0421	4/14/2021	0.002	0	0.0037	1	0.043	1	0.001	0	0.0002	0	0.017	1	0.0026	1	0.35	1	0.001	0	0.096	1	0.0002	0	0.0044	1	0.8	0	0.0014	1	0.0002	0
M-57A	CH-CCR-M57-1021	10/21/2021	0.00011	1	0.0033	1	0.055	1	0.001	0	0.00012	1	0.056	1	0.0029	1	0.38	1	0.0005	0	0.1	1	0.0002	0	0.0069	1	0.6	0	0.001	1	0.00006	1
M-57A	CH-CCR-M57A-0422	4/25/2022	0.001	0	0.0023	1	0.045	1	0.001	0	0.0001	0	0.082	1	0.0035	1	0.8	0	0.0005	0	0.1	1	0.0002	0	0.0097	1	1.1	1	0.0005	0	0.0001	0
M-58A	7876_O	11/30/2015	0.0025	0	0.0032	1	0.1	1	0.001	0	0.0001	0	0.0005	0	0.0011	1	0.43	1	0.00056	1	0.2	0	0.0002	0	0.0047	1	0.9	0	0.00024	1	0.0001	0
M-58A	CH-M-58A-0316_O	3/8/2016	0.05	0	0.01	0	0.081	1	0.001	0	0.002	0	0.01	0	0.01	0	0.4	0	0.01	0	0.2	0	0.0002	0	0.01	0	0.6	0	0.01	0	0.002	0
M-58A	CH-CCR-M58A-05112016_O	5/11/2016	0.0001	0	0.0025	1	0.055	1	0.001	0	0.0001	0	0.0005	0	0.00051	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0018	1	0.9	1	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-816_O	8/25/2016	0.0001	0	0.0045	1	0.097	1	0.001	0	0.0001	0	0.00097	1	0.00079	1	0.4	0	0.00059	1	0.2	0	0.0002	0	0.02	1	2.6	1	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-916_O	9/21/2016	0.0005	0	0.0039	1	0.076	1	0.001	0	0.0001	0	0.0018	1	0.00057	1	0.4	0	0.0001	0	0.2	0	0.0002	0	0.0025	1	1.2	1	0.0006	0	0.0001	0
M-58A	CH-CCR-M58A-217_O	2/20/2017	0.001	0	0.0027	1	0.064	1	0.001	0	0.0001	0	0.0033	1	0.00097	1	0.4	0	0.00078	1	0.2	0	0.0002	0	0.0022	1	0.8	1	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-41217_O	4/12/2017	0.001	0	0.0037	1	0.048	1	0.001	0	0.0001	0	0.00091	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0017	1	1.9	1	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-42517_O	4/25/2017	0.001	0	0.004	1	0.049	1	0.001	0	0.0001	0	0.001	1	0.0005	0	0.8	0	0.0005	0	0.2	0	0.0002	0	0.0015	1	0.9	1	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-51817_O	5/18/2017	0.001	0	0.003	1	0.043	1	0.001	0	0.0001	0	0.00052	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0014	1	0.6	0	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-52517_O	5/25/2017	0.001	0	0.0051	1	0.055	1	0.001	0	0.0001	0	0.00055	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0016	1	2.2	1	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-70117_O	7/1/2017	0.001	0	0.0047	1	0.063	1	0.001	0	0.0001	0	0.0005	0	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0018	1	0.7	0	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-72617_O	7/26/2017	0.002	0	0.0057	1	0.11	1	0.001	0	0.0002	0	0.003	1	0.001	1	0.4	0	0.0011	1	0.2	0	0.0002	0	0.0021	1	0.7	0	0.001	0	0.0002	0
M-58A	CH-CCR-M58A-90817_O	9/8/2017	0.004	0	0.0048	1	0.08	1	0.001	0	0.0004	0	0.004	0	0.002	0	0.4	0	0.002	0	0.2	0	0.0002	0	0.0022	1	0.7	0	0.002	0	0.0004	0
M-58A	CH-CCR-M58A-120817_O	12/8/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
M-58A	CH-CCR-M-58A-52118_O	5/21/2018	0.002	0	0.0042	1	0.071	1	0.001	0	0.0002	0	0.002	0	0.001	0	0.4	0	0.001	0	0.2	0	0.0002	0	0.0018	1	0.7	1	0.001	0	0.0002	0
M-58A	CH-CCR-M58A-082818_O	8/28/2018	NA	NA	0.0037	1	0.075	1	NA	NA	NA	NA	0.001	0	0.0005	0	NA	NA	NA	NA	NA	NA	NA	NA	0.0017	1	0.6	0	NA	NA	0.0001	0
M-58A	CH-CCR-M58A-21519	2/15/2019	NA	NA	0.0043	1	0.063	1	NA	NA	NA	NA	0.001	0	0.0005	0	0.4	0	NA	NA	NA	NA	NA	NA	0.0018	NA	NA	NA	NA	NA	0.0001	0
M-58A	CH-CCR-M58A-41719	4/17/2019	0.001	0	0.0039	1	0.059	1	0.001	0	0.0001	0	0.001	0	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0018	1	0.7	0	0.0005	0	0.0001	0
M-58A	CH-CCR-M58A-8919	8/9/2019	NA	NA	0.0038	1	0.066	1	NA	NA	NA	NA	0.001	0	0.0005	0	0.8	0	NA	NA	0.2	0	NA	NA	0.0018	1	0.7	0	NA	NA	0.0001	0
M-58A	CH-CCR-M58A-112519	11/25/2019	NA	NA	0.0046	1	0.079	1	NA	NA	NA	NA	0.001	0	0.0005	0	0.4	0	NA	NA	NA	NA	NA	NA	0.0018	1	NA	NA	NA	NA	0.0001	0
M-58A	CH-CCR-M58-0420	4/16/2020	0.005	0	0.0042	1	0.069	1	0.001	0	0.0005	0	0.005	0	0.0025	0	0.8	0	0.0025	0	1	0	0.0002	0	0.0025	0	NA	NA	0.0025	0	0.0005	0
M-58A	CH-CCR-M58-1020	10/21/2020	0.002	0	0.0066	1	0.073	1	0.001	0	0.0002	0	0.002	0	0.001	0	0.8	0	0.001	0	0.07	1	0.0002	0	0.0017	1	0.5	1	0.001	0	0.0002	0
M-58A	CH-CCR-M58-0421	4/14/2021	0.002	0	0.0061	1	0.07	1	0.001	0	0.0002	0	0.002	0	0.001	0	0.32	1	0.001	0	0.071	1	0.0002	0	0.002	1	0.8	0	0.00099	1	0.0002	0
M-58A	CH-CCR-M58-1021	10/21/2021	0.001	0	0.0054	1	0.062	1	0.001	0	0.0001	0	0.001	0	0.00024	1	0.34	1	0.0005	0	0.069	1	0.0002	0	0.0016	1	0.8	1	0.00054	1	0.00002	1
M-58A	CH-CCR-M58A-0422	4/26/2022	0.001	0	0.0057	1	0.062	1	0.001	0	0.0001	0	0.001	0	0.0005	0	0.8	0	0.0005	0	0.08	1	0.0002	0	0.0017	1	1.6	1	0.0005	0	0.0001	0

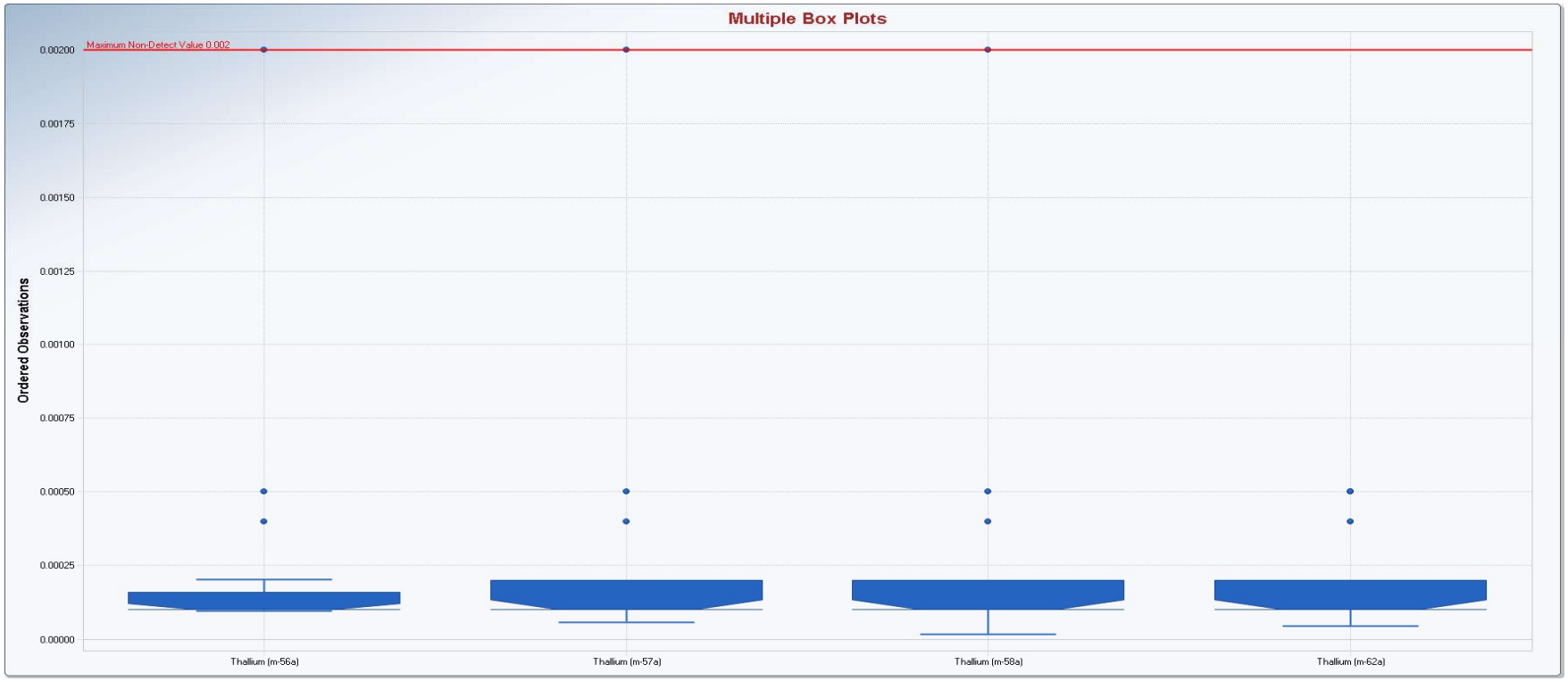
Appendix A
ProUCL Upload Table

StationName	QC_SampleID	NumDate	Antimony	D_Antimony	Arsenic	D_Arsenic	Barium	D_Barium	Beryllium	D_Beryllium	Cadmium	D_Cadmium	Chromium	D_Chromium	Cobalt	D_Cobalt	Fluoride	D_Fluoride	Lead	D_Lead	Lithium	D_Lithium	Mercury	D_Mercury	Molybdenum	D_Molybdenum	Total Radium	D_Total Radium	Selenium	D_Selenium	Thallium	D_Thallium
M-62A	7872_O	11/30/2015	0.0025	0	0.002	1	0.082	1	0.001	0	0.0001	0	0.00078	1	0.00054	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.011	1	0.7	0	0.00071	1	0.0001	0
M-62A	CH-M-62A-0316_O	3/8/2016	0.05	0	0.01	0	0.16	1	0.001	0	0.002	0	0.01	0	0.0022	1	0.8	0	0.01	0	0.2	0	0.0002	0	0.0044	1	1	1	0.01	0	0.0005	1
M-62A	CH-CCR-MW62A-50516_O	5/5/2016	0.0001	0	0.003	1	0.084	1	0.001	0	0.0001	0	0.0014	1	0.0012	1	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0026	1	0.5	1	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-816_O	8/29/2016	0.0001	0	0.0031	1	0.082	1	0.001	0	0.0001	0	0.0005	0	0.0005	0	0.8	0	0.0005	0	0.2	0	0.0002	0	0.0023	1	0.9	1	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-916_O	9/21/2016	0.0005	0	0.0028	1	0.075	1	0.001	0	0.0001	0	0.00099	1	0.00046	1	0.8	0	0.0001	0	0.2	0	0.0002	0	0.0022	1	2	1	0.00078	1	0.0001	0
M-62A	CH-CCR-M62A-217_O	2/20/2017	0.001	0	0.0029	1	0.064	1	0.001	0	0.0001	0	0.002	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0019	1	1.4	1	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-41317_O	4/13/2017	0.001	0	0.0021	1	0.074	1	0.001	0	0.0001	0	0.0015	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0023	1	1.2	1	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-42517_O	4/25/2017	0.001	0	0.0017	1	0.079	1	0.001	0	0.0001	0	0.0017	1	0.0005	0	0.8	0	0.0005	0	0.2	0	0.0002	0	0.0022	1	0.9	1	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-51817_O	5/18/2017	0.001	0	0.0016	1	0.072	1	0.001	0	0.0001	0	0.00063	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.002	1	1.2	1	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-52517_O	5/25/2017	0.001	0	0.0019	1	0.077	1	0.001	0	0.0001	0	0.00096	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0022	1	1.5	1	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-70117_O	7/1/2017	0.001	0	0.0026	1	0.076	1	0.001	0	0.0001	0	0.0011	1	0.0005	0	0.4	0	0.0005	0	0.2	0	0.0002	0	0.0022	1	0.7	0	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-72617_O	7/26/2017	0.002	0	0.0024	1	0.075	1	0.001	0	0.0002	0	0.001	0	0.001	0	0.4	0	0.001	0	0.2	0	0.0002	0	0.0021	1	1.3	1	0.001	0	0.0002	0
M-62A	CH-CCR-M62A-90717_O	9/7/2017	0.004	0	0.0031	1	0.079	1	0.001	0	0.0004	0	0.004	0	0.002	0	0.4	0	0.002	0	0.2	0	0.0002	0	0.003	1	0.9	1	0.002	0	0.0004	0
M-62A	CH-CCR-M62A-120817_O	12/8/2017	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.4	0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
M-62A	CH-CCR-M-62A-52118_O	5/21/2018	0.002	0	0.0029	1	0.072	1	0.001	0	0.0002	0	0.002	0	0.001	0	0.4	0	0.001	0	0.2	0	0.0002	0	0.0024	1	0.7	1	0.001	0	0.0002	0
M-62A	CH-CCR-M62A-082818_O	8/28/2018	NA	NA	0.0029	1	0.074	1	NA	NA	NA	NA	0.001	0	0.0005	0	NA	NA	NA	NA	NA	NA	NA	NA	0.0023	1	0.5	1	NA	NA	0.0001	0
M-62A	CH-CCR-M62A-21519	2/15/2019	NA	NA	0.003	1	0.068	1	NA	NA	NA	NA	0.001	0	0.0005	0	0.4	0	NA	NA	NA	NA	NA	NA	0.0024	1	NA	NA	NA	NA	0.0001	0
M-62A	CH-CCR-M62A-112519	11/25/2019	NA	NA	0.0048	1	0.15	1	NA	NA	NA	NA	0.0044	1	0.0012	1	0.4	0	NA	NA	NA	NA	NA	NA	0.0091	1	NA	NA	NA	NA	0.00016	1
M-62A	CH-CCR-M62A-41819	4/18/2019	0.001	0	0.0033	1	0.068	1	0.001	0	0.0001	0	0.001	0	0.0005	0	0.47	1	0.0005	0	0.2	0	0.0002	0	0.0026	1	0.8	1	0.0005	0	0.0001	0
M-62A	CH-CCR-M62A-8919	8/9/2019	NA	NA	0.0031	1	0.067	1	NA	NA	NA	NA	0.0037	1	0.0005	0	0.4	0	NA	NA	0.2	0	NA	NA	0.0028	1	NA	NA	NA	NA	0.0001	0
M-62A	CH-CCR-M62-0420	4/16/2020	0.005	0	0.0043	1	0.078	1	0.001	0	0.0005	0	0.0053	1	0.0025	0	0.8	0	0.0025	0	1	0	0.0002	0	0.004	1	NA	NA	0.0025	0	0.0005	0
M-62A	CH-CCR-M62-1020	10/20/2020	0.002	0	0.0048	1	0.12	1	0.001	0	0.0002	0	0.0059	1	0.0011	1	0.8	0	0.002	1	0.09	1	0.0002	0	0.015	1	0.8	0	0.001	0	0.0002	0
M-62A	CH-CCR-M62-0421	4/14/2021	0.002	0	0.0052	1	0.063	1	0.001	0	0.0002	0	0.0012	1	0.001	0	0.29	1	0.001	0	0.092	1	0.0002	0	0.0041	1	0.8	0	0.0016	1	0.0002	0
M-62A	CH-CCR-M62-1021	10/21/2021	0.00018	1	0.0054	1	0.13	1	0.00016	1	0.00013	1	0.0031	1	0.0011	1	0.35	1	0.0017	1	0.087	1	0.0002	0	0.0053	1	0.6	0	0.00099	1	0.000048	1
M-62A	CH-CCR-M62A-0422	4/25/2022	0.001	0	0.0038	1	0.05	1	0.001	0	0.0001	0	0.001	0	0.0005	0	0.8	0	0.0005	0	0.088	1	0.0002	0	0.0032	1	0.6	0	0.0005	0	0.0001	0

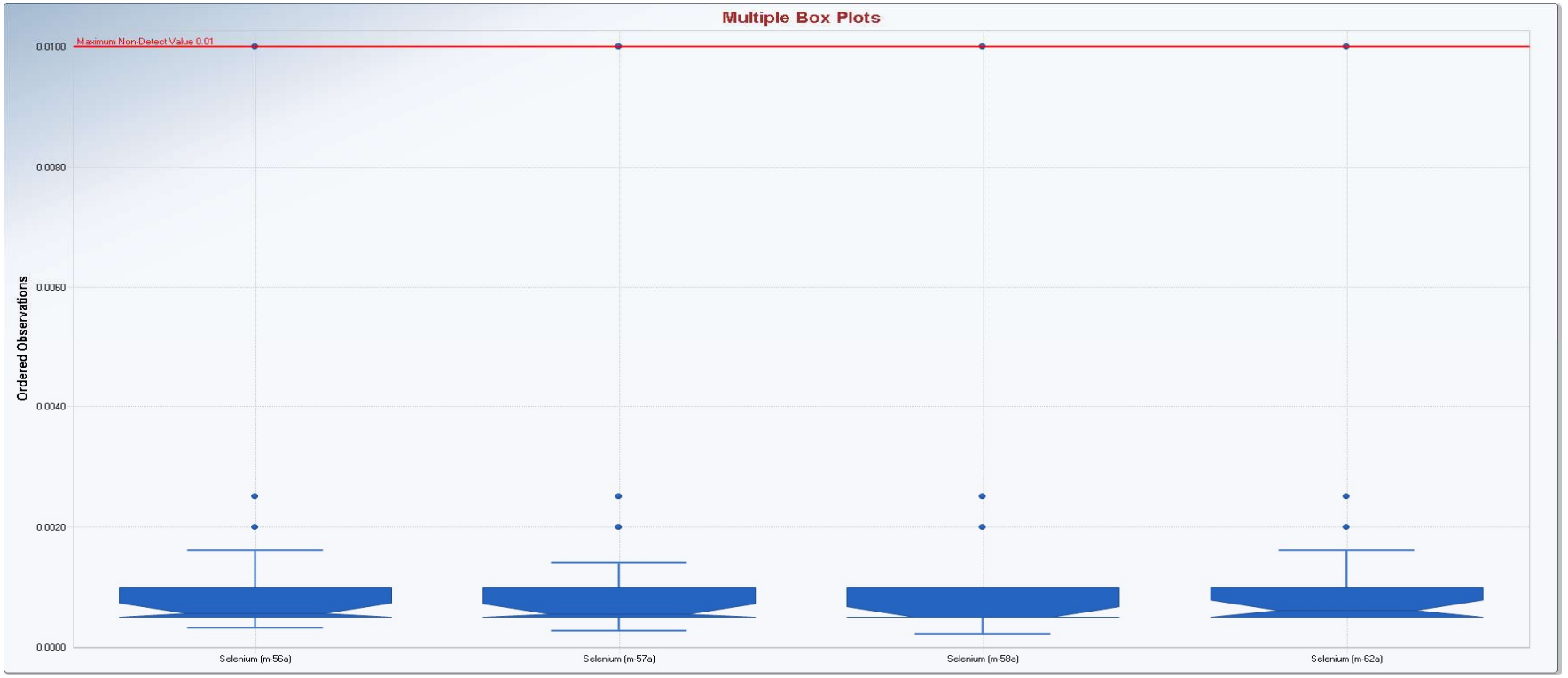
APPENDIX B

PROUCL EDA OUTPUT FILES

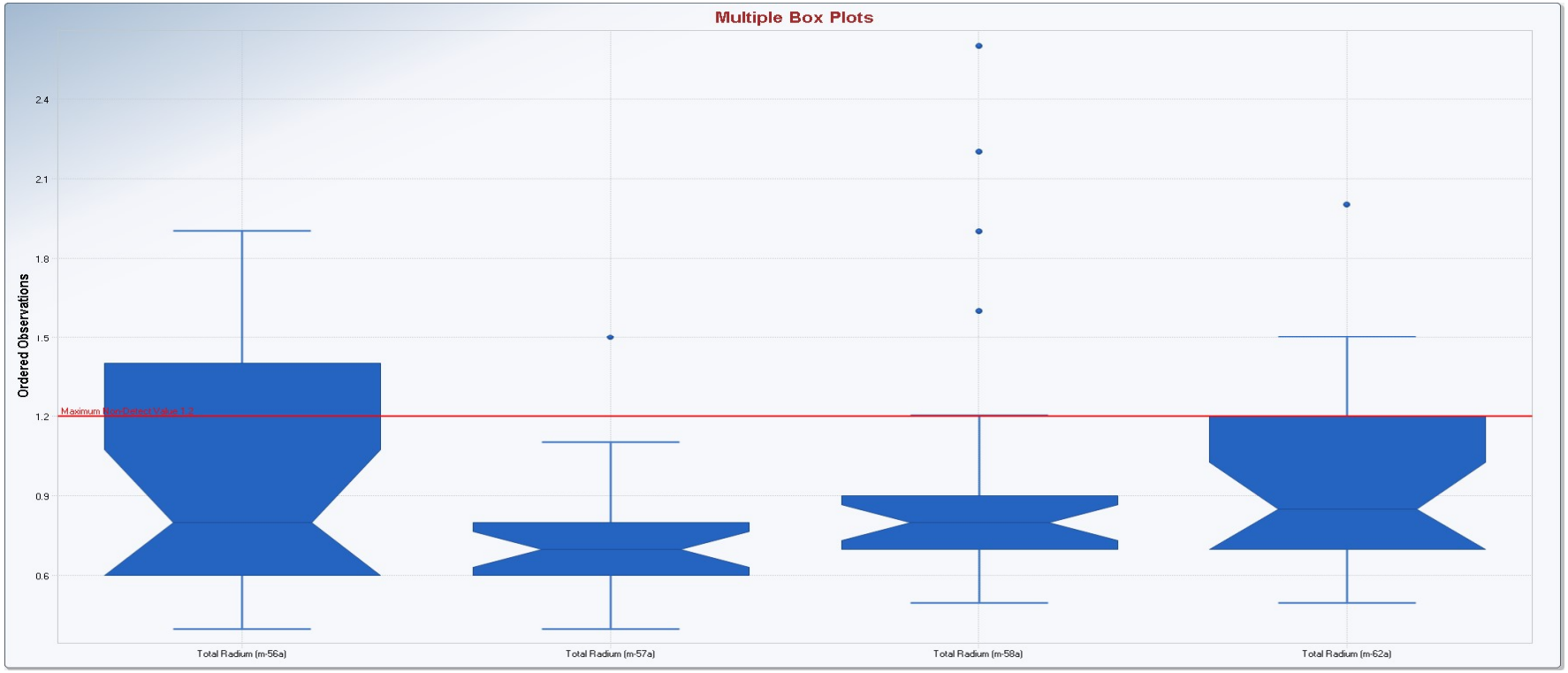
Appendix B
Box and Whisker Plots



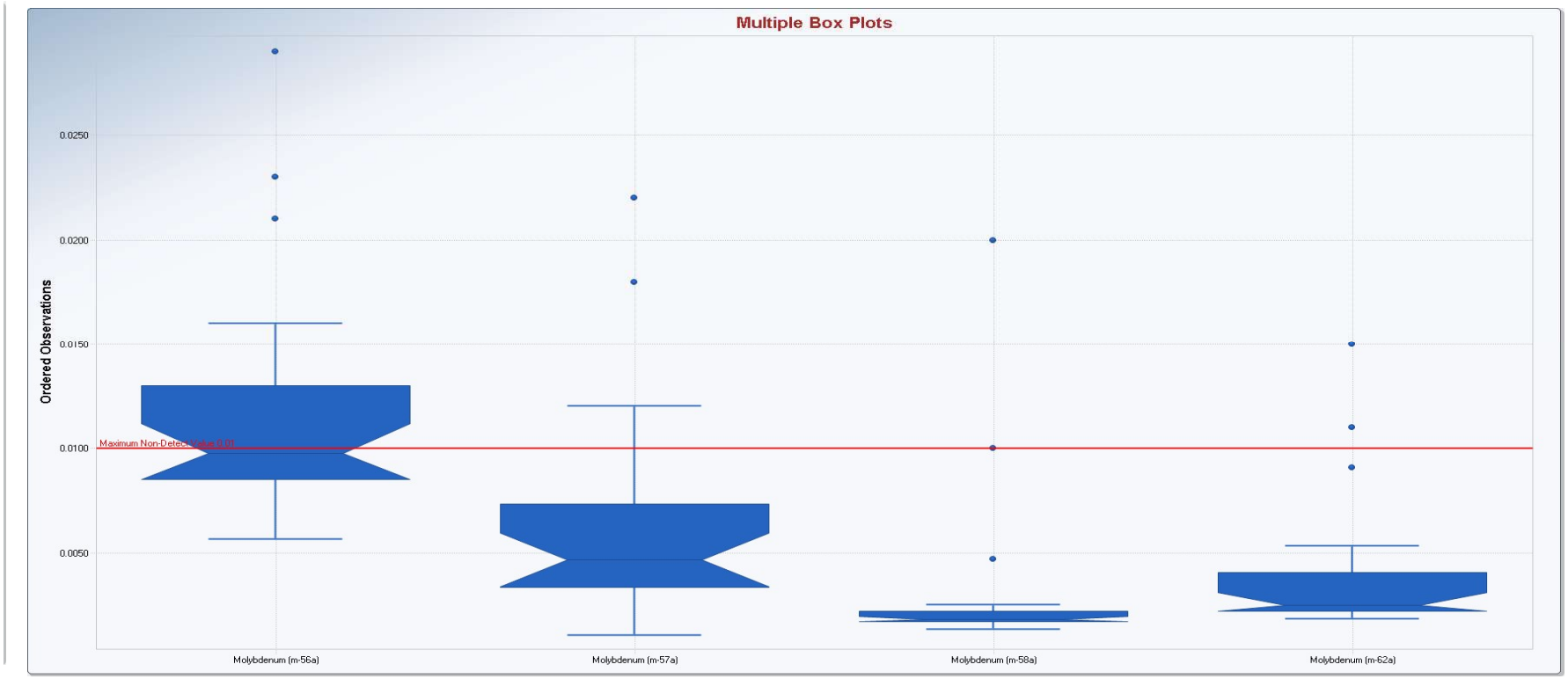
Appendix B
Box and Whisker Plots



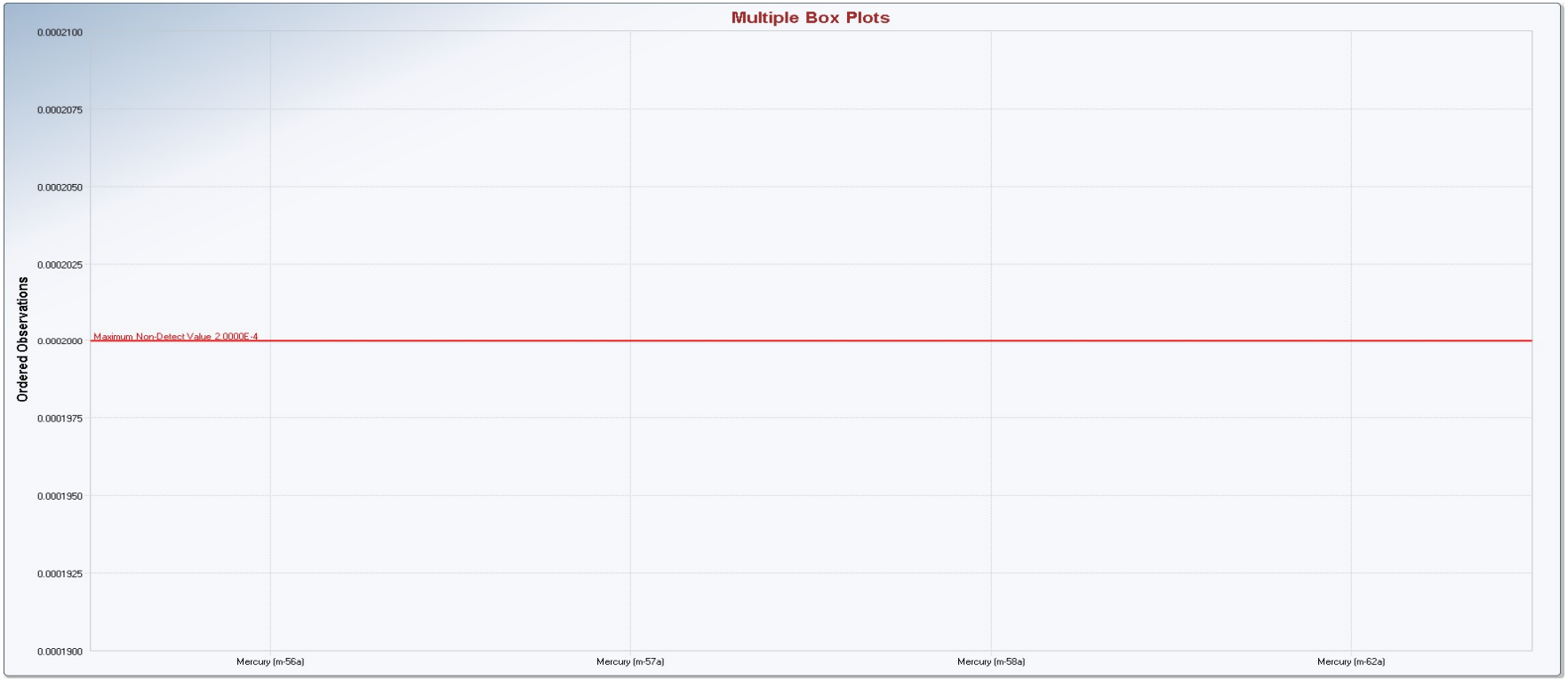
Appendix B
Box and Whisker Plots



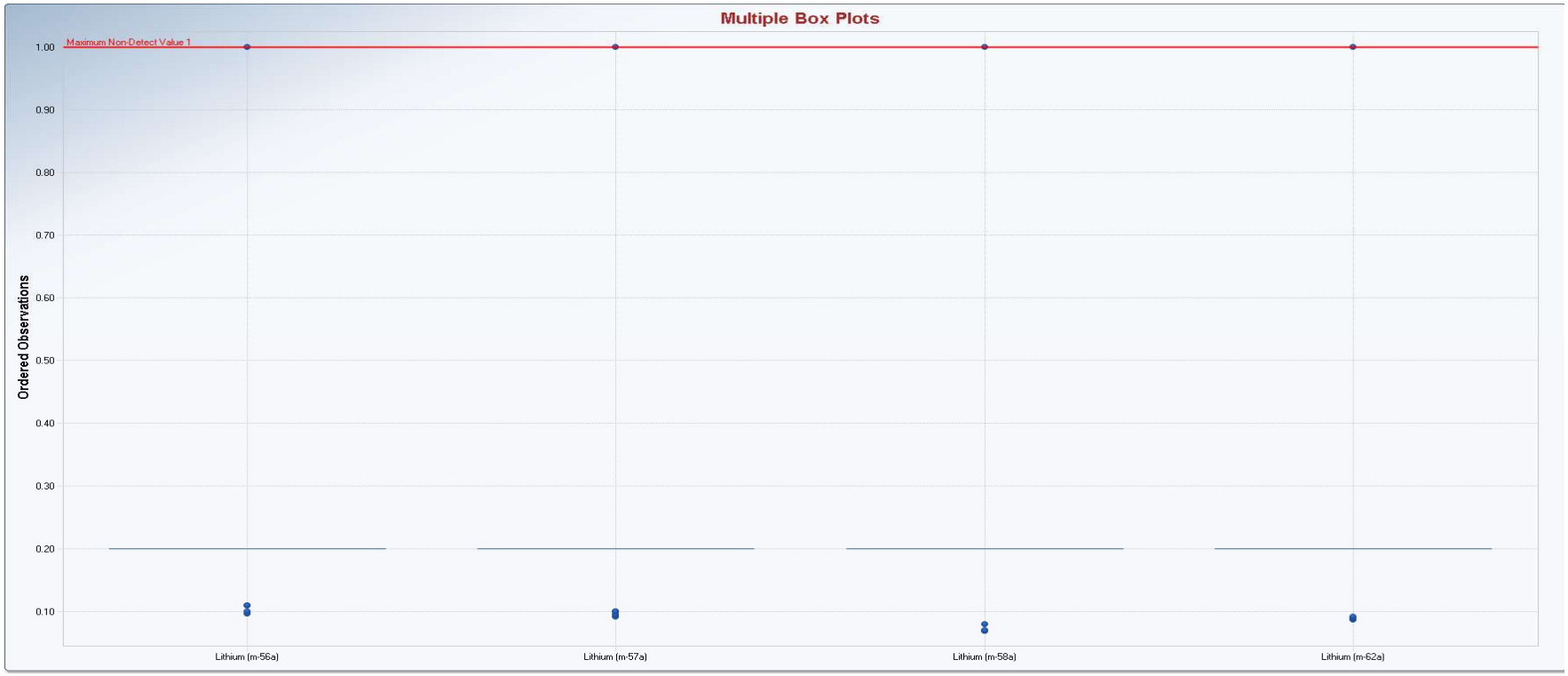
Appendix B
Box and Whisker Plots



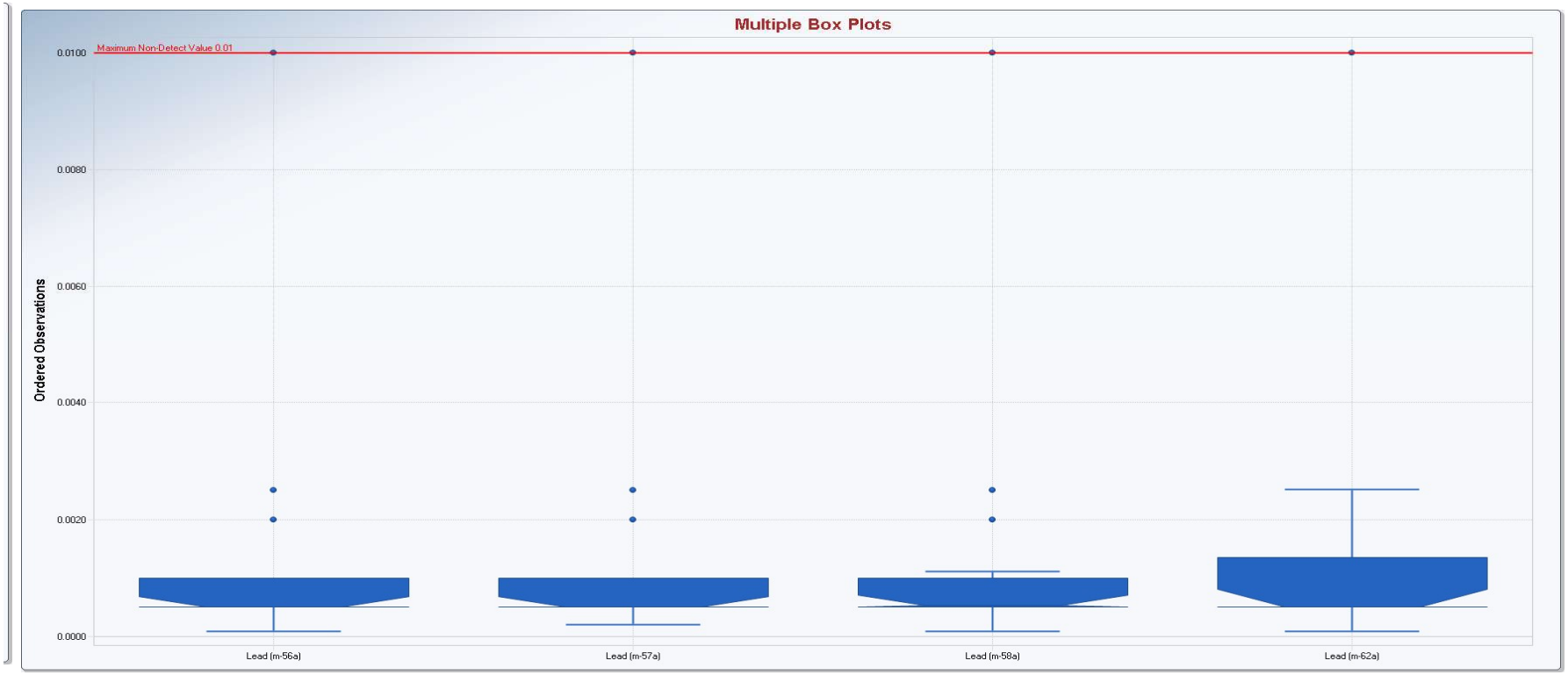
Appendix B
Box and Whisker Plots



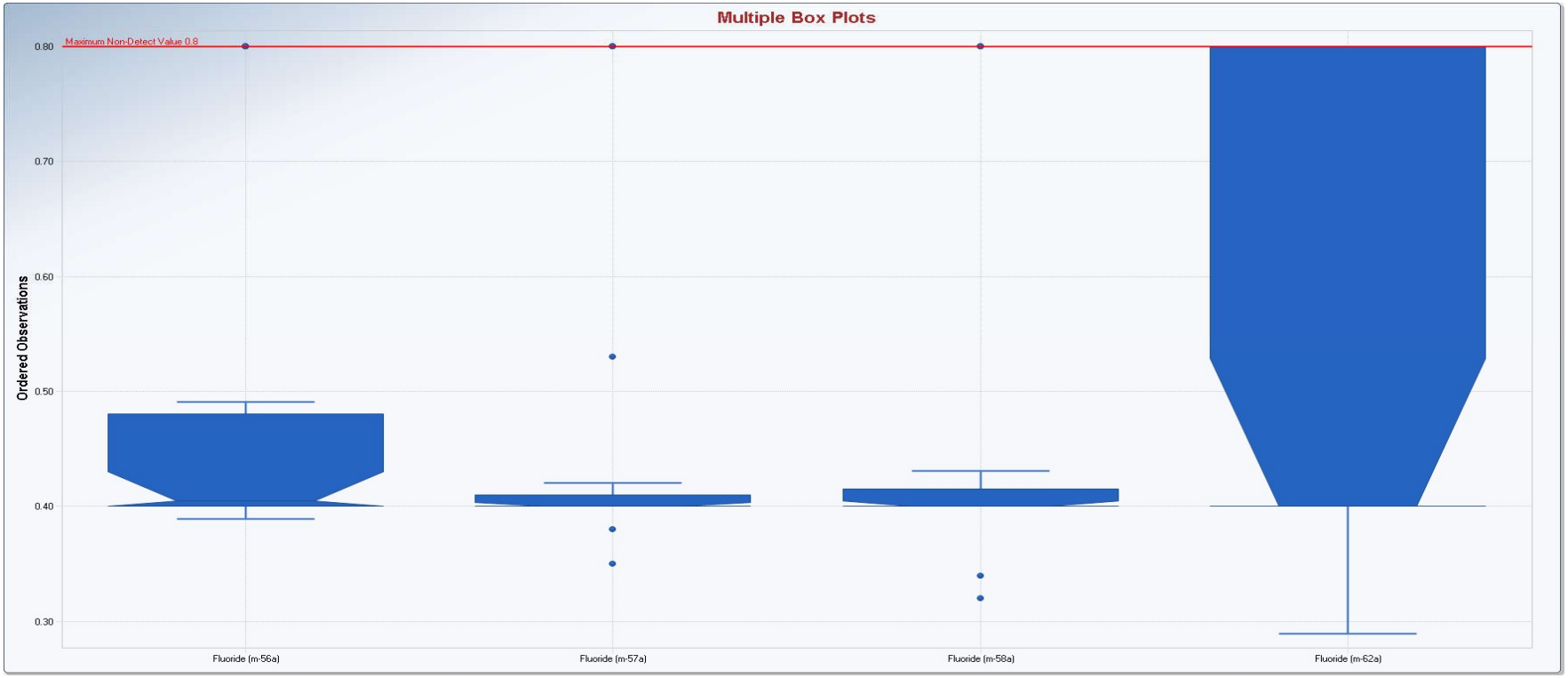
Appendix B
Box and Whisker Plots



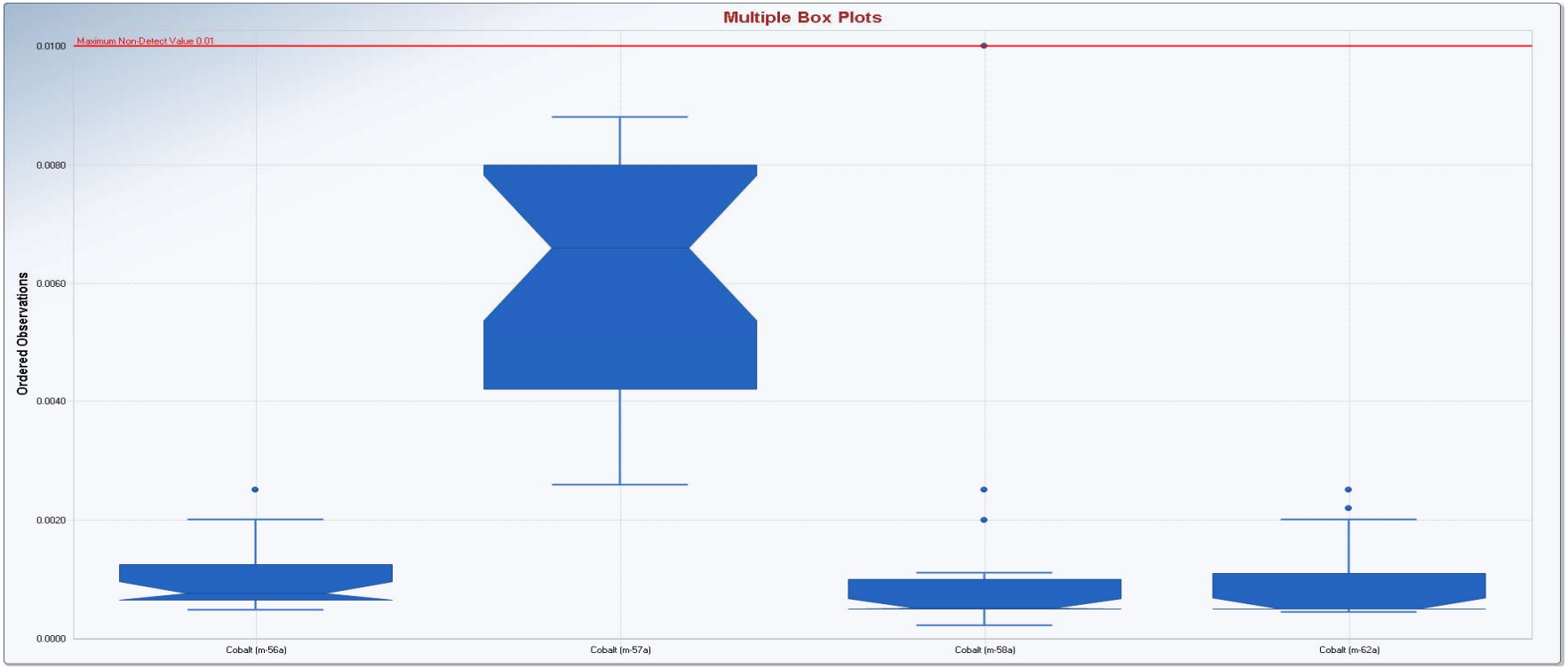
Appendix B
Box and Whisker Plots



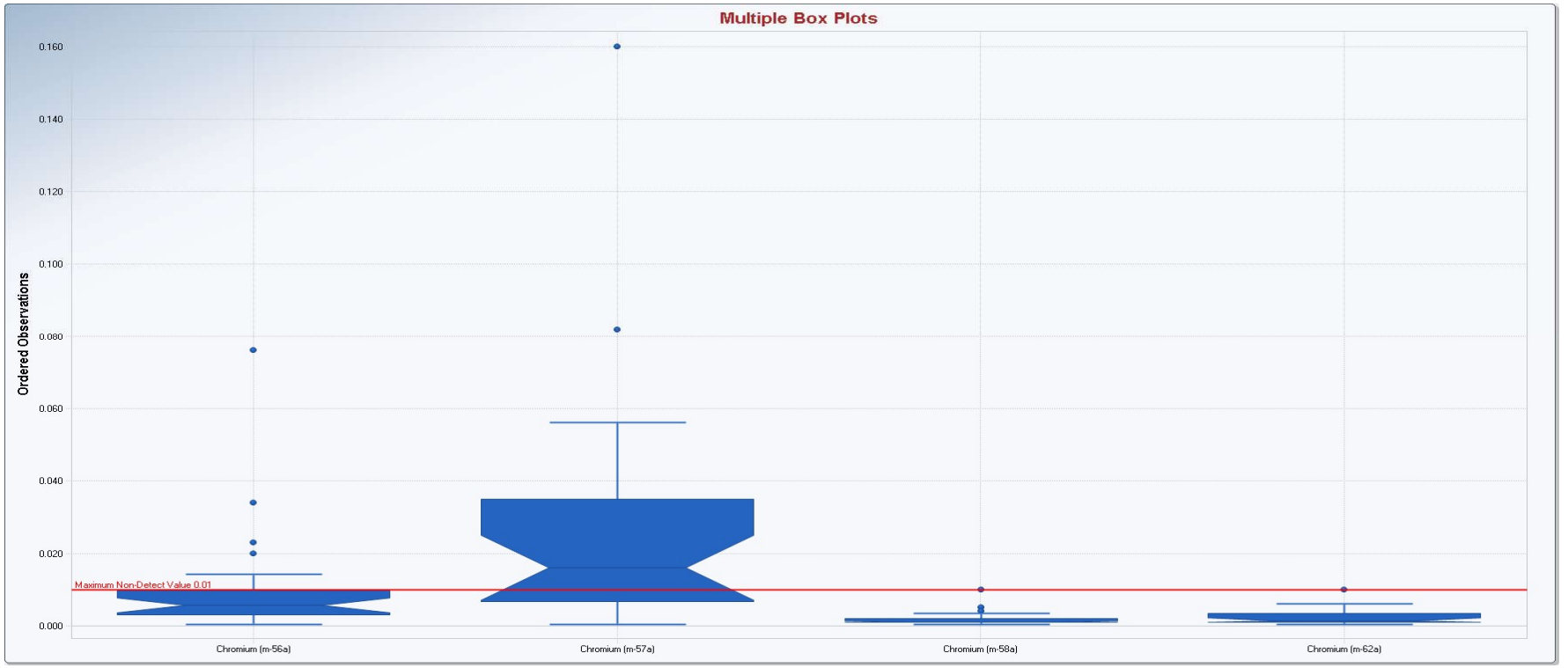
Appendix B
Box and Whisker Plots



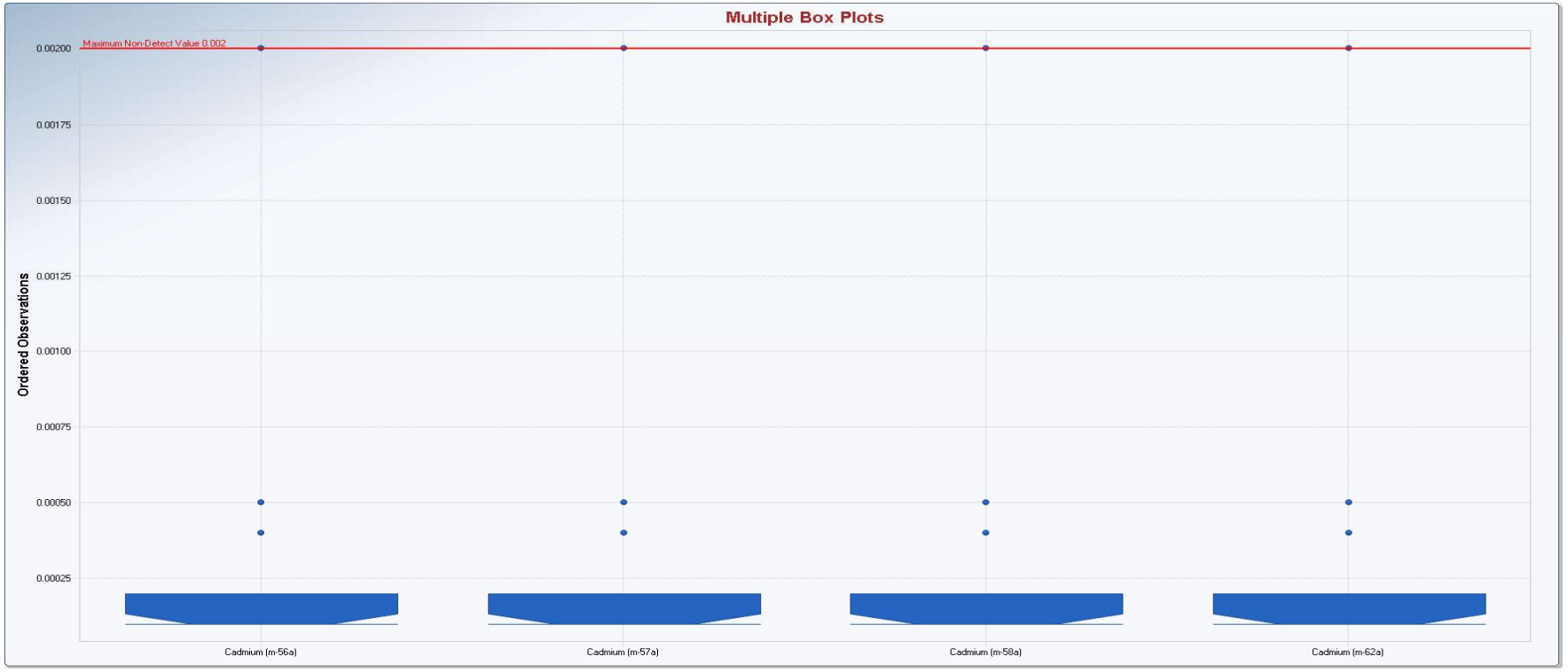
Appendix B
Box and Whisker Plots



Appendix B
Box and Whisker Plots



Appendix B
Box and Whisker Plots



Appendix B
Box and Whisker Plots

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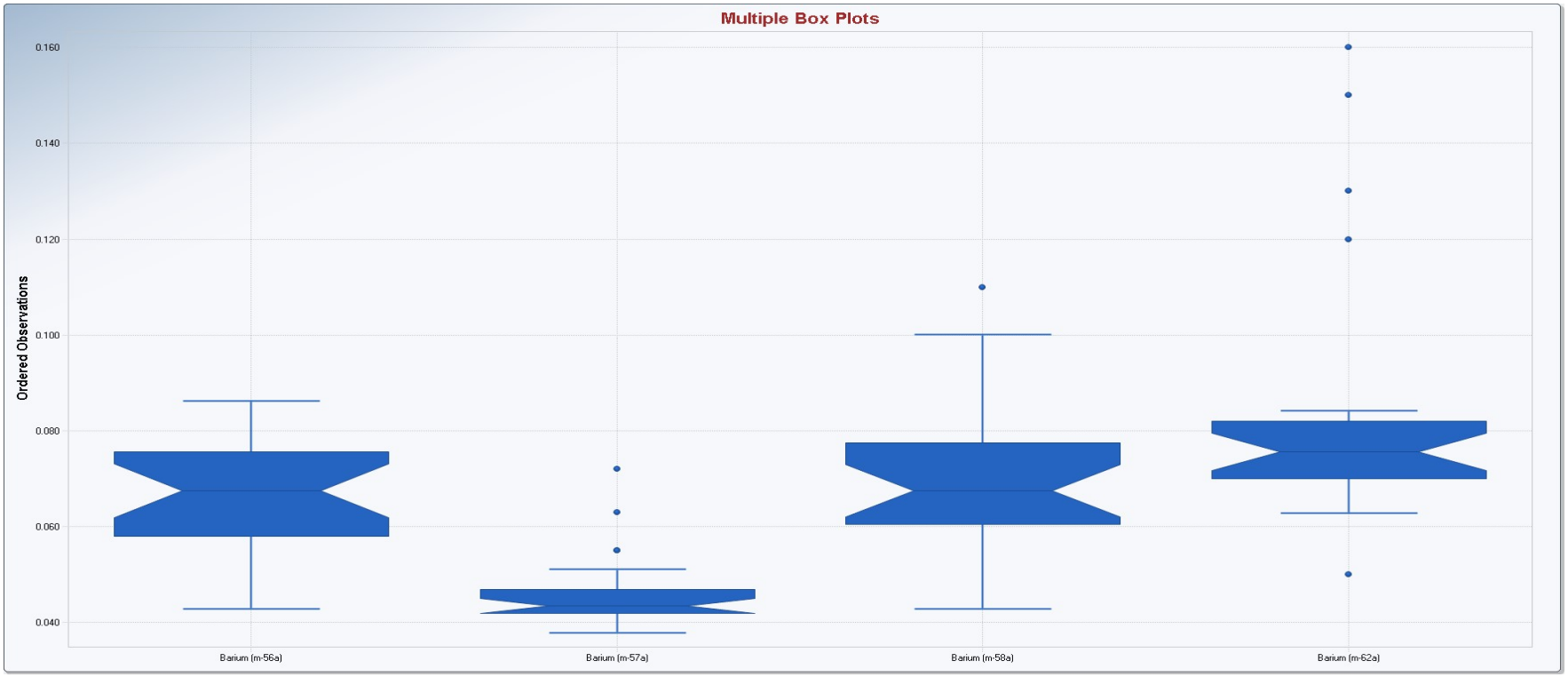
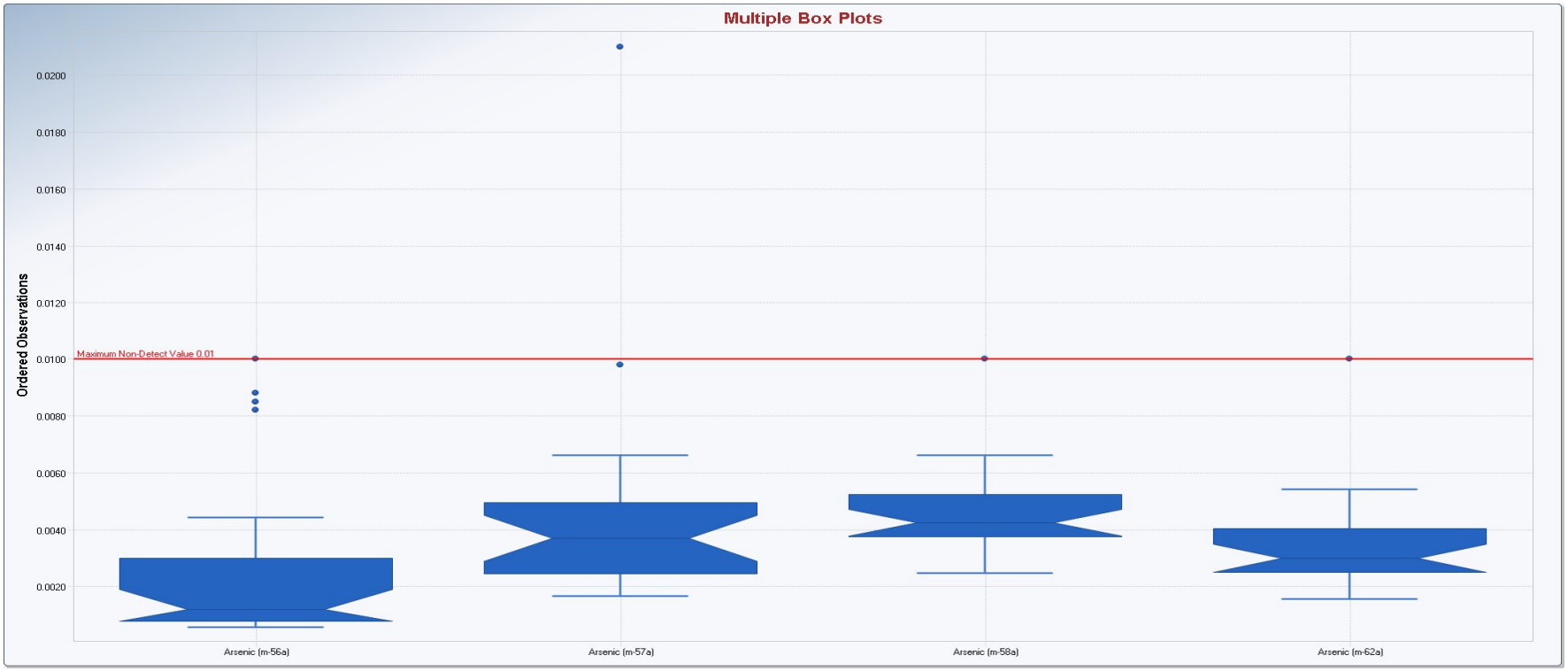
Box and Whisker Plots



Appendix B
Box and Whisker Plots



Appendix B
Box and Whisker Plots

Appendix B
Goodness of Fit Statistics

	Goodness-of-Fit Test Statistics for Data Sets with Non-Detects					
User Selected Options						
Date/Time of Computation	ProUCL 5.17/25/2022 12:16:55 PM					
From File	Cholla_SEDI_ProUCL_2022-07.xls					
Full Precision	OFF					
Confidence Coefficient	0.95					

Antimony (m-56a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	5	20	2	18	90.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	1.0000E-4	0.05	0.00428	0.001	0.0115
Statistics (Non-Detects Only)	2	1.3000E-4	2.2000E-4	1.7500E-4	1.7500E-4	6.3640E-5
Statistics (All: NDs treated as DL value)	20	1.0000E-4	0.05	0.00387	0.001	0.0109
Statistics (All: NDs treated as DL/2 value)	20	5.0000E-5	0.025	0.00195	5.0000E-4	0.00546
Statistics (Normal ROS Imputed Data)	20	-7.466E-5	2.9443E-4	1.0943E-4	1.0988E-4	9.2439E-5
Statistics (Gamma ROS Imputed Data)	20	N/A	N/A	N/A	N/A	N/A
Statistics (Lognormal ROS Imputed Data)	20	3.9299E-5	3.3991E-4	1.3205E-4	1.1558E-4	7.2903E-5

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	N/A	N/A	N/A	N/A	N/A	N/A
Statistics (NDs = DL)	0.531	0.484	0.0073	-6.74	1.333	-0.198
Statistics (NDs = DL/2)	0.557	0.507	0.00349	-7.364	1.241	-0.168
Statistics (Gamma ROS Estimates)	N/A	N/A	N/A	N/A	N/A	N/A
Statistics (Lognormal ROS Estimates)	--	--	--	-9.068	0.54	-0.0596

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	1	0.54	0.538	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (NDs = DL)	0.321	0.905	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.319	0.905	Data Not Normal
Shapiro-Wilk (Normal ROS Estimates)	0.963	0.905	Data Appear Normal
Lilliefors (Detects Only)	N/A	N/A	
Lilliefors (NDs = DL)	0.409	0.192	Data Not Normal

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Lilliefors (NDs = DL/2)	0.41	0.192	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.202	0.192	Data Not Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	N/A	0.812	0.807	0.384				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Anderson-Darling (Detects Only)	N/A	N/A						
Kolmogorov-Smirnov (Detects Only)	N/A	N/A						
Anderson-Darling (NDs = DL)	2.442	0.8						
Kolmogorov-Smirnov (NDs = DL)	0.283	0.204	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL/2)	2.675	0.797						
Kolmogorov-Smirnov (NDs = DL/2)	0.292	0.204	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	N/A	0.74						
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	0.193						
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	1	0.931	0.923	N/A				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (NDs = DL)	0.887	0.905	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.88	0.905	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.963	0.905	Data Appear Lognormal					
Lilliefors (Detects Only)	N/A	N/A						
Lilliefors (NDs = DL)	0.25	0.192	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.226	0.192	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.202	0.192	Data Not Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Antimony (m-57a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	26	6	20	2	18	90.00%		

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	18	1.0000E-4	0.05	0.00434	0.001	0.0115
Statistics (Non-Detects Only)	2	1.1000E-4	1.2000E-4	1.1500E-4	1.1500E-4	7.0711E-6
Statistics (All: NDs treated as DL value)	20	1.0000E-4	0.05	0.00392	0.001	0.0109
Statistics (All: NDs treated as DL/2 value)	20	5.0000E-5	0.025	0.00196	5.0000E-4	0.00546
Statistics (Normal ROS Imputed Data)	20	8.8234E-5	1.2729E-4	1.0771E-4	1.0776E-4	1.0149E-5
Statistics (Gamma ROS Imputed Data)	20	N/A	N/A	N/A	N/A	N/A
Statistics (Lognormal ROS Imputed Data)	20	9.1021E-5	1.2786E-4	1.0823E-4	1.0788E-4	9.5327E-6

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	N/A	N/A	N/A	N/A	N/A	N/A
Statistics (NDs = DL)	0.525	0.479	0.00746	-6.744	1.399	-0.207
Statistics (NDs = DL/2)	0.551	0.502	0.00356	-7.368	1.29	-0.175
Statistics (Gamma ROS Estimates)	N/A	N/A	N/A	N/A	N/A	N/A
Statistics (Lognormal ROS Estimates)	--	--	--	-9.135	0.0883	-0.00967

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	1	0.542	0.541	0.984

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (NDs = DL)	0.324	0.905	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.322	0.905	Data Not Normal
Shapiro-Wilk (Normal ROS Estimates)	0.967	0.905	Data Appear Normal
Lilliefors (Detects Only)	N/A	N/A	
Lilliefors (NDs = DL)	0.41	0.192	Data Not Normal
Lilliefors (NDs = DL/2)	0.411	0.192	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.152	0.192	Data Appear Normal

Gamma GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.813	0.808	0.373

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	2.216	0.8	

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Kolmogorov-Smirnov (NDs = DL)	0.283	0.205	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL/2)	2.373	0.798						
Kolmogorov-Smirnov (NDs = DL/2)	0.293	0.204	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	N/A	0.74						
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	0.193						
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	1	0.932	0.936	N/A				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (NDs = DL)	0.883	0.905	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.899	0.905	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.967	0.905	Data Appear Lognormal					
Lilliefors (Detects Only)	N/A	N/A						
Lilliefors (NDs = DL)	0.253	0.192	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.228	0.192	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.152	0.192	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Antimony (m-58a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	5	20	0	20	100.00%		
Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!								
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!								
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).								
The data set for variable Antimony (m-58a) was not processed!								
Arsenic (m-56a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	1	24	20	4	16.67%		

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	0.001	0.01	0.00388	0.00225	0.00413
Statistics (Non-Detects Only)	20	6.0000E-4	0.0088	0.00251	0.00102	0.00278
Statistics (All: NDs treated as DL value)	24	6.0000E-4	0.01	0.00274	0.0012	0.00298
Statistics (All: NDs treated as DL/2 value)	24	5.0000E-4	0.0088	0.00242	0.00105	0.00264
Statistics (Normal ROS Imputed Data)	24	6.0000E-4	0.0088	0.00233	0.0012	0.00257
Statistics (Gamma ROS Imputed Data)	24	6.0000E-4	0.01	0.00376	0.0016	0.00381
Statistics (Lognormal ROS Imputed Data)	24	6.0000E-4	0.0088	0.00227	0.00101	0.00259
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	1.213	1.064	0.00207	-6.453	0.933	-0.145
Statistics (NDs = DL)	1.214	1.09	0.00226	-6.366	0.938	-0.147
Statistics (NDs = DL/2)	1.238	1.111	0.00195	-6.481	0.919	-0.142
Statistics (Gamma ROS Estimates)	1.025	0.925	0.00367	-6.145	1.102	-0.179
Statistics (Lognormal ROS Estimates)	--	--	--	-6.52	0.866	-0.133
Normal GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Normal ROS		
Correlation Coefficient R	0.834	0.844	0.841	0.819		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.689	0.905	Data Not Normal			
Shapiro-Wilk (NDs = DL)	0.707	0.916	Data Not Normal			
Shapiro-Wilk (NDs = DL/2)	0.701	0.916	Data Not Normal			
Shapiro-Wilk (Normal ROS Estimates)	0.668	0.916	Data Not Normal			
Lilliefors (Detects Only)	0.269	0.192	Data Not Normal			
Lilliefors (NDs = DL)	0.243	0.177	Data Not Normal			
Lilliefors (NDs = DL/2)	0.289	0.177	Data Not Normal			
Lilliefors (Normal ROS Estimates)	0.276	0.177	Data Not Normal			
Gamma GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	0.944	0.95	0.953	0.898		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	1.631	0.764				

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Kolmogorov-Smirnov (Detects Only)	0.234	0.199	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL)	1.631	0.767				
Kolmogorov-Smirnov (NDs = DL)	0.209	0.182	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	1.742	0.767				
Kolmogorov-Smirnov (NDs = DL/2)	0.247	0.182	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	1.803	0.771				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.213	0.183	Data Not Gamma Distributed			

Lognormal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.927	0.941	0.94	0.919

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.842	0.905	Data Not Lognormal
Shapiro-Wilk (NDs = DL)	0.869	0.916	Data Not Lognormal
Shapiro-Wilk (NDs = DL/2)	0.869	0.916	Data Not Lognormal
Shapiro-Wilk (Lognormal ROS Estimates)	0.832	0.916	Data Not Lognormal
Lilliefors (Detects Only)	0.214	0.192	Data Not Lognormal
Lilliefors (NDs = DL)	0.183	0.177	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.196	0.177	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.215	0.177	Data Not Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Arsenic (m-57a)

Raw Statistics	
Number of Valid Observations	24
Number of Missing Observations	2
Number of Distinct Observations	19
Minimum	0.0017
Maximum	0.021
Mean of Raw Data	0.00456
Standard Deviation of Raw Data	0.00399
Khat	2.634
Theta hat	0.00173
Kstar	2.332
Theta star	0.00195

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Mean of Log Transformed Data		-5.593						
Standard Deviation of Log Transformed Data		0.582						
Normal GOF Test Results								
Correlation Coefficient R		0.768						
Shapiro Wilk Test Statistic		0.614						
Shapiro Wilk Critical (0.05) Value		0.916						
Approximate Shapiro Wilk P Value		1.5190E-7						
Lilliefors Test Statistic		0.244						
Lilliefors Critical (0.05) Value		0.177						
Data not Normal at (0.05) Significance Level								
Gamma GOF Test Results								
Correlation Coefficient R		0.886						
A-D Test Statistic		1.043						
A-D Critical (0.05) Value		0.753						
K-S Test Statistic		0.178						
K-S Critical(0.05) Value		0.18						
Data follow Appr. Gamma Distribution at (0.05) Significance Level								
Lognormal GOF Test Results								
Correlation Coefficient R		0.956						
Shapiro Wilk Test Statistic		0.92						
Shapiro Wilk Critical (0.05) Value		0.916						
Approximate Shapiro Wilk P Value		0.0577						
Lilliefors Test Statistic		0.127						
Lilliefors Critical (0.05) Value		0.177						
Data appear Lognormal at (0.05) Significance Level								
Arsenic (m-58a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	1	24	23	1	4.17%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	1	0.01	0.01	0.01	0.01	N/A		

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Statistics (Non-Detects Only)	23	0.0025	0.0066	0.00436	0.0042	0.00106
Statistics (All: NDs treated as DL value)	24	0.0025	0.01	0.0046	0.00425	0.00155
Statistics (All: NDs treated as DL/2 value)	24	0.0025	0.0066	0.00439	0.00425	0.00105
Statistics (Normal ROS Imputed Data)	24	0.0025	0.0066	0.00436	0.00425	0.00104
Statistics (Gamma ROS Imputed Data)	24	0.0025	0.01	0.0046	0.00425	0.00155
Statistics (Lognormal ROS Imputed Data)	24	0.0025	0.0066	0.00436	0.00422	0.00104

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	17.25	15.03	2.5284E-4	-5.464	0.25	-0.0458
Statistics (NDs = DL)	11.05	9.693	4.1607E-4	-5.429	0.301	-0.0555
Statistics (NDs = DL/2)	17.75	15.56	2.4723E-4	-5.457	0.247	-0.0453
Statistics (Gamma ROS Estimates)	11.05	9.693	4.1607E-4	-5.429	0.301	-0.0555
Statistics (Lognormal ROS Estimates)	--	--	--	-5.464	0.245	-0.0448

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.992	0.915	0.994	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.979	0.914	Data Appear Normal
Shapiro-Wilk (NDs = DL)	0.856	0.916	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.984	0.916	Data Appear Normal
Shapiro-Wilk (Normal ROS Estimates)	0.978	0.916	Data Appear Normal
Lilliefors (Detects Only)	0.0931	0.18	Data Appear Normal
Lilliefors (NDs = DL)	0.156	0.177	Data Appear Normal
Lilliefors (NDs = DL/2)	0.0892	0.177	Data Appear Normal
Lilliefors (Normal ROS Estimates)	0.0958	0.177	Data Appear Normal

Gamma GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.994	0.951	0.994	0.951

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.173	0.743	
Kolmogorov-Smirnov (Detects Only)	0.106	0.181	Detected Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.378	0.744	
Kolmogorov-Smirnov (NDs = DL)	0.111	0.178	Data Appear Gamma Distributed

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Anderson-Darling (NDs = DL/2)	0.154	0.743				
Kolmogorov-Smirnov (NDs = DL/2)	0.102	0.178	Data Appear Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	0.378	0.744				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.111	0.178	Data Appear Gamma Distributed			

Lognormal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.991	0.979	0.99	0.99

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.978	0.914	Data Appear Lognormal
Shapiro-Wilk (NDs = DL)	0.968	0.916	Data Appear Lognormal
Shapiro-Wilk (NDs = DL/2)	0.977	0.916	Data Appear Lognormal
Shapiro-Wilk (Lognormal ROS Estimates)	0.976	0.916	Data Appear Lognormal
Lilliefors (Detects Only)	0.121	0.18	Data Appear Lognormal
Lilliefors (NDs = DL)	0.119	0.177	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.116	0.177	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.124	0.177	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Barium (m-56a)

Raw Statistics	
Number of Valid Observations	24
Number of Missing Observations	1
Number of Distinct Observations	21
Minimum	0.043
Maximum	0.086
Mean of Raw Data	0.0666
Standard Deviation of Raw Data	0.012
Khat	30.45
Theta hat	0.00219
Kstar	26.67
Theta star	0.0025
Mean of Log Transformed Data	-2.726
Standard Deviation of Log Transformed Data	0.189

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Normal GOF Test Results								
Correlation Coefficient R		0.988						
Shapiro Wilk Test Statistic		0.965						
Shapiro Wilk Critical (0.05) Value		0.916						
Approximate Shapiro Wilk P Value		0.55						
Lilliefors Test Statistic		0.0967						
Lilliefors Critical (0.05) Value		0.177						
Data appear Normal at (0.05) Significance Level								
Gamma GOF Test Results								
Correlation Coefficient R		0.978						
A-D Test Statistic		0.403						
A-D Critical (0.05) Value		0.742						
K-S Test Statistic		0.102						
K-S Critical(0.05) Value		0.177						
Data appear Gamma Distributed at (0.05) Significance Level								
Lognormal GOF Test Results								
Correlation Coefficient R		0.977						
Shapiro Wilk Test Statistic		0.946						
Shapiro Wilk Critical (0.05) Value		0.916						
Approximate Shapiro Wilk P Value		0.231						
Lilliefors Test Statistic		0.109						
Lilliefors Critical (0.05) Value		0.177						
Data appear Lognormal at (0.05) Significance Level								
Barium (m-57a)								
Raw Statistics								
Number of Valid Observations		24						
Number of Missing Observations		2						
Number of Distinct Observations		13						
Minimum		0.038						
Maximum		0.072						
Mean of Raw Data		0.0463						
Standard Deviation of Raw Data		0.00791						

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
		Khat	42.25						
		Theta hat	0.0011						
		Kstar	37						
		Theta star	0.00125						
		Mean of Log Transformed Data	-3.084						
		Standard Deviation of Log Transformed Data	0.152						
Normal GOF Test Results									
		Correlation Coefficient R	0.871						
		Shapiro Wilk Test Statistic	0.771						
		Shapiro Wilk Critical (0.05) Value	0.916						
		Approximate Shapiro Wilk P Value	4.9427E-5						
		Lilliefors Test Statistic	0.258						
		Lilliefors Critical (0.05) Value	0.177						
Data not Normal at (0.05) Significance Level									
Gamma GOF Test Results									
		Correlation Coefficient R	0.901						
		A-D Test Statistic	1.669						
		A-D Critical (0.05) Value	0.742						
		K-S Test Statistic	0.234						
		K-S Critical(0.05) Value	0.177						
Data not Gamma Distributed at (0.05) Significance Level									
Lognormal GOF Test Results									
		Correlation Coefficient R	0.908						
		Shapiro Wilk Test Statistic	0.831						
		Shapiro Wilk Critical (0.05) Value	0.916						
		Approximate Shapiro Wilk P Value	7.0482E-4						
		Lilliefors Test Statistic	0.223						
		Lilliefors Critical (0.05) Value	0.177						
Data not Lognormal at (0.05) Significance Level									
Non-parametric GOF Test Results									
Data do not follow a discernible distribution at (0.05) Level of Significance									

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Barium (m-58a)								
Raw Statistics								
Number of Valid Observations		24						
Number of Missing Observations		1						
Number of Distinct Observations		21						
Minimum		0.043						
Maximum		0.11						
Mean of Raw Data		0.0696						
Standard Deviation of Raw Data		0.0163						
Khat		20						
Theta hat		0.00348						
Kstar		17.53						
Theta star		0.00397						
Mean of Log Transformed Data		-2.69						
Standard Deviation of Log Transformed Data		0.228						
Normal GOF Test Results								
Correlation Coefficient R		0.973						
Shapiro Wilk Test Statistic		0.948						
Shapiro Wilk Critical (0.05) Value		0.916						
Approximate Shapiro Wilk P Value		0.25						
Lilliefors Test Statistic		0.117						
Lilliefors Critical (0.05) Value		0.177						
Data appear Normal at (0.05) Significance Level								
Gamma GOF Test Results								
Correlation Coefficient R		0.986						
A-D Test Statistic		0.257						
A-D Critical (0.05) Value		0.742						
K-S Test Statistic		0.0954						
K-S Critical(0.05) Value		0.178						
Data appear Gamma Distributed at (0.05) Significance Level								
Lognormal GOF Test Results								

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Correlation Coefficient R		0.991						
Shapiro Wilk Test Statistic		0.981						
Shapiro Wilk Critical (0.05) Value		0.916						
Approximate Shapiro Wilk P Value		0.908						
Lilliefors Test Statistic		0.0963						
Lilliefors Critical (0.05) Value		0.177						
Data appear Lognormal at (0.05) Significance Level								

Beryllium (m-56a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	5	20	0	20	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Beryllium (m-56a) was not processed!

Beryllium (m-57a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	26	6	20	0	20	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Beryllium (m-57a) was not processed!

Beryllium (m-58a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	5	20	0	20	100.00%

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Beryllium (m-58a) was not processed!

Cadmium (m-56a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	5	20	0	20	100.00%		

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Cadmium (m-56a) was not processed!

Cadmium (m-57a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	26	6	20	1	19	95.00%		

Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Cadmium (m-57a) was not processed!

Cadmium (m-58a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	5	20	0	20	100.00%		

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		

Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!

The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Cadmium (m-58a) was not processed!

Chromium (m-56a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	1	24	20	4	16.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	4	5.0000E-4	0.01	0.00375	0.00225	0.00448
Statistics (Non-Detects Only)	20	5.1000E-4	0.076	0.012	0.00615	0.0172
Statistics (All: NDs treated as DL value)	24	5.0000E-4	0.076	0.0107	0.0056	0.016
Statistics (All: NDs treated as DL/2 value)	24	2.5000E-4	0.076	0.0103	0.0051	0.0161
Statistics (Normal ROS Imputed Data)	24	-0.0223	0.076	0.00826	0.0049	0.0183
Statistics (Gamma ROS Imputed Data)	24	5.1000E-4	0.076	0.0117	0.00765	0.0157
Statistics (Lognormal ROS Imputed Data)	24	3.6326E-4	0.076	0.0103	0.0049	0.0162

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	0.922	0.817	0.0131	-5.052	1.153	-0.228
Statistics (NDs = DL)	0.818	0.743	0.013	-5.265	1.278	-0.243
Statistics (NDs = DL/2)	0.741	0.676	0.014	-5.381	1.4	-0.26
Statistics (Gamma ROS Estimates)	1.081	0.974	0.0108	-4.977	1.061	-0.213
Statistics (Lognormal ROS Estimates)	--	--	--	-5.367	1.318	-0.246

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.767	0.754	0.75	0.858

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.611	0.905	Data Not Normal
Shapiro-Wilk (NDs = DL)	0.591	0.916	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.586	0.916	Data Not Normal
Shapiro-Wilk (Normal ROS Estimates)	0.766	0.916	Data Not Normal
Lilliefors (Detects Only)	0.313	0.192	Data Not Normal

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Lilliefors (NDs = DL)	0.308	0.177	Data Not Normal			
Lilliefors (NDs = DL/2)	0.318	0.177	Data Not Normal			
Lilliefors (Normal ROS Estimates)	0.269	0.177	Data Not Normal			

Gamma GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.946	0.943	0.947	0.922

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.636	0.772	
Kolmogorov-Smirnov (Detects Only)	0.202	0.2	Detected Data appear Approximate Gamma Distribution
Anderson-Darling (NDs = DL)	0.584	0.78	
Kolmogorov-Smirnov (NDs = DL)	0.167	0.184	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.543	0.783	
Kolmogorov-Smirnov (NDs = DL/2)	0.172	0.185	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.696	0.77	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.225	0.183	Detected Data appear Approximate Gamma Distribution

Lognormal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.988	0.981	0.98	0.991

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.986	0.905	Data Appear Lognormal
Shapiro-Wilk (NDs = DL)	0.96	0.916	Data Appear Lognormal
Shapiro-Wilk (NDs = DL/2)	0.96	0.916	Data Appear Lognormal
Shapiro-Wilk (Lognormal ROS Estimates)	0.981	0.916	Data Appear Lognormal
Lilliefors (Detects Only)	0.123	0.192	Data Appear Lognormal
Lilliefors (NDs = DL)	0.129	0.177	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.134	0.177	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0992	0.177	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chromium (m-57a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Raw Statistics	26	1	25	22	3	12.00%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	3	5.0000E-4	0.01	0.00517	0.005	0.00475		
Statistics (Non-Detects Only)	22	6.6000E-4	0.16	0.0298	0.018	0.0354		
Statistics (All: NDs treated as DL value)	25	5.0000E-4	0.16	0.0268	0.016	0.0341		
Statistics (All: NDs treated as DL/2 value)	25	2.5000E-4	0.16	0.0265	0.016	0.0343		
Statistics (Normal ROS Imputed Data)	25	-0.0459	0.16	0.0233	0.016	0.038		
Statistics (Gamma ROS Imputed Data)	25	6.6000E-4	0.16	0.0274	0.016	0.0338		
Statistics (Lognormal ROS Imputed Data)	25	4.9527E-4	0.16	0.0264	0.016	0.0344		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	0.873	0.784	0.0341	-4.187	1.392	-0.333		
Statistics (NDs = DL)	0.778	0.711	0.0345	-4.385	1.483	-0.338		
Statistics (NDs = DL/2)	0.719	0.659	0.0368	-4.468	1.582	-0.354		
Statistics (Gamma ROS Estimates)	0.912	0.83	0.03	-4.237	1.31	-0.309		
Statistics (Lognormal ROS Estimates)	--	--	--	-4.478	1.552	-0.347		
Normal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.836	0.824	0.826	0.898				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.717	0.911	Data Not Normal					
Shapiro-Wilk (NDs = DL)	0.699	0.918	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.701	0.918	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.836	0.918	Data Not Normal					
Lilliefors (Detects Only)	0.206	0.184	Data Not Normal					
Lilliefors (NDs = DL)	0.22	0.173	Data Not Normal					
Lilliefors (NDs = DL/2)	0.222	0.173	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.164	0.173	Data Appear Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	0.973	0.974	0.977	0.967				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Anderson-Darling (Detects Only)	0.189	0.777				
Kolmogorov-Smirnov (Detects Only)	0.0873	0.192	Detected Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	0.17	0.782				
Kolmogorov-Smirnov (NDs = DL)	0.0728	0.181	Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL/2)	0.144	0.786				
Kolmogorov-Smirnov (NDs = DL/2)	0.0709	0.182	Data Appear Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	0.242	0.777				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0871	0.18	Data Appear Gamma Distributed			

Lognormal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.967	0.971	0.973	0.976

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.934	0.911	Data Appear Lognormal
Shapiro-Wilk (NDs = DL)	0.939	0.918	Data Appear Lognormal
Shapiro-Wilk (NDs = DL/2)	0.947	0.918	Data Appear Lognormal
Shapiro-Wilk (Lognormal ROS Estimates)	0.945	0.918	Data Appear Lognormal
Lilliefors (Detects Only)	0.16	0.184	Data Appear Lognormal
Lilliefors (NDs = DL)	0.13	0.173	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.151	0.173	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.154	0.173	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Chromium (m-58a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	1	24	8	16	66.67%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	16	5.0000E-4	0.01	0.00209	0.001	0.00246
Statistics (Non-Detects Only)	8	5.2000E-4	0.0033	0.00151	9.8500E-4	0.00109
Statistics (All: NDs treated as DL value)	24	5.0000E-4	0.01	0.0019	0.001	0.00209
Statistics (All: NDs treated as DL/2 value)	24	2.5000E-4	0.005	0.0012	7.3000E-4	0.00118
Statistics (Normal ROS Imputed Data)	24	-0.00153	0.0033	4.4967E-4	4.1858E-4	0.00118
Statistics (Gamma ROS Imputed Data)	24	5.2000E-4	0.01	0.00717	0.01	0.00413
Statistics (Lognormal ROS Imputed Data)	24	1.5763E-4	0.0033	8.2031E-4	5.7863E-4	8.0370E-4

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	2.409	1.589	6.2517E-4	-6.72	0.706	-0.105
Statistics (NDs = DL)	1.545	1.379	0.00123	-6.624	0.795	-0.12
Statistics (NDs = DL/2)	1.53	1.367	7.8411E-4	-7.086	0.835	-0.118
Statistics (Gamma ROS Estimates)	1.489	1.33	0.00482	-5.31	1.09	-0.205
Statistics (Lognormal ROS Estimates)	--	--	--	-7.428	0.784	-0.106
Normal GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Normal ROS		
Correlation Coefficient R	0.915	0.79	0.856	0.969		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.821	0.818	Data Appear Normal			
Shapiro-Wilk (NDs = DL)	0.643	0.916	Data Not Normal			
Shapiro-Wilk (NDs = DL/2)	0.74	0.916	Data Not Normal			
Shapiro-Wilk (Normal ROS Estimates)	0.941	0.916	Data Appear Normal			
Lilliefors (Detects Only)	0.304	0.283	Data Not Normal			
Lilliefors (NDs = DL)	0.291	0.177	Data Not Normal			
Lilliefors (NDs = DL/2)	0.317	0.177	Data Not Normal			
Lilliefors (Normal ROS Estimates)	0.156	0.177	Data Appear Normal			
Gamma GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	0.958	0.936	0.973	0.639		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	0.492	0.723				
Kolmogorov-Smirnov (Detects Only)	0.27	0.297	Detected Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	1.445	0.761				
Kolmogorov-Smirnov (NDs = DL)	0.294	0.181	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	1.229	0.761				
Kolmogorov-Smirnov (NDs = DL/2)	0.227	0.181	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	4.047	0.762				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.424	0.181	Data Not Gamma Distributed			
Lognormal GOF Test Results						

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	No NDs	NDs = DL	NDs = DL/2	Log ROS		
Correlation Coefficient R	0.962	0.95	0.963	0.979		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.903	0.818	Data Appear Lognormal			
Shapiro-Wilk (NDs = DL)	0.899	0.916	Data Not Lognormal			
Shapiro-Wilk (NDs = DL/2)	0.919	0.916	Data Appear Lognormal			
Shapiro-Wilk (Lognormal ROS Estimates)	0.955	0.916	Data Appear Lognormal			
Lilliefors (Detects Only)	0.23	0.283	Data Appear Lognormal			
Lilliefors (NDs = DL)	0.264	0.177	Data Not Lognormal			
Lilliefors (NDs = DL/2)	0.192	0.177	Data Not Lognormal			
Lilliefors (Lognormal ROS Estimates)	0.136	0.177	Data Appear Lognormal			

Note: Substitution methods such as DL or DL/2 are not recommended.

Cobalt (m-56a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	1	24	16	8	33.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	8	5.0000E-4	0.0025	0.00106	7.5000E-4	7.7632E-4
Statistics (Non-Detects Only)	16	6.1000E-4	0.002	9.9125E-4	7.6500E-4	3.8211E-4
Statistics (All: NDs treated as DL value)	24	5.0000E-4	0.0025	0.00102	7.6500E-4	5.2899E-4
Statistics (All: NDs treated as DL/2 value)	24	2.5000E-4	0.002	8.3792E-4	7.4000E-4	4.3606E-4
Statistics (Normal ROS Imputed Data)	24	-4.420E-5	0.002	8.0197E-4	7.4561E-4	4.4815E-4
Statistics (Gamma ROS Imputed Data)	24	6.1000E-4	0.01	0.00399	0.00125	0.00435
Statistics (Lognormal ROS Imputed Data)	24	3.5303E-4	0.002	8.5042E-4	7.4364E-4	3.8085E-4

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	8.285	6.774	1.1964E-4	-6.978	0.353	-0.0506
Statistics (NDs = DL)	4.695	4.136	2.1617E-4	-7.003	0.465	-0.0664
Statistics (NDs = DL/2)	3.501	3.091	2.3936E-4	-7.234	0.593	-0.082
Statistics (Gamma ROS Estimates)	0.882	0.8	0.00453	-6.187	1.178	-0.19
Statistics (Lognormal ROS Estimates)	--	--	--	-7.156	0.417	-0.0583

Normal GOF Test Results

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.902	0.914	0.959	0.963				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.818	0.887	Data Not Normal					
Shapiro-Wilk (NDs = DL)	0.834	0.916	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.92	0.916	Data Appear Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.937	0.916	Data Appear Normal					
Lilliefors (Detects Only)	0.281	0.213	Data Not Normal					
Lilliefors (NDs = DL)	0.22	0.177	Data Not Normal					
Lilliefors (NDs = DL/2)	0.187	0.177	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.214	0.177	Data Not Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	0.939	0.968	0.969	0.816				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Anderson-Darling (Detects Only)	1.089	0.74						
Kolmogorov-Smirnov (Detects Only)	0.281	0.215	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL)	0.784	0.747						
Kolmogorov-Smirnov (NDs = DL)	0.202	0.178	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL/2)	0.665	0.75						
Kolmogorov-Smirnov (NDs = DL/2)	0.146	0.179	Data Appear Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	3.137	0.777						
Kolmogorov-Smirnov (Gamma ROS Est.)	0.32	0.184	Data Not Gamma Distributed					
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.934	0.969	0.955	0.974				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.867	0.887	Data Not Lognormal					
Shapiro-Wilk (NDs = DL)	0.927	0.916	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.903	0.916	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.95	0.916	Data Appear Lognormal					
Lilliefors (Detects Only)	0.268	0.213	Data Not Lognormal					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Lilliefors (NDs = DL)	0.181	0.177	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.139	0.177	Data Appear Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.214	0.177	Data Not Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Cobalt (m-57a)								
Raw Statistics								
Number of Valid Observations	24							
Number of Missing Observations	2							
Number of Distinct Observations	21							
Minimum	0.0026							
Maximum	0.0088							
Mean of Raw Data	0.00611							
Standard Deviation of Raw Data	0.00217							
Khat	6.892							
Theta hat	8.8684E-4							
Kstar	6.059							
Theta star	0.00101							
Mean of Log Transformed Data	-5.172							
Standard Deviation of Log Transformed Data	0.416							
Normal GOF Test Results								
Correlation Coefficient R	0.955							
Shapiro Wilk Test Statistic	0.891							
Shapiro Wilk Critical (0.05) Value	0.916							
Approximate Shapiro Wilk P Value	0.0129							
Lilliefors Test Statistic	0.197							
Lilliefors Critical (0.05) Value	0.177							
Data not Normal at (0.05) Significance Level								
Gamma GOF Test Results								
Correlation Coefficient R	0.916							
A-D Test Statistic	1.145							
A-D Critical (0.05) Value	0.745							
K-S Test Statistic	0.21							

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
K-S Critical(0.05) Value		0.178						
Data not Gamma Distributed at (0.05) Significance Level								
Lognormal GOF Test Results								
Correlation Coefficient R		0.936						
Shapiro Wilk Test Statistic		0.858						
Shapiro Wilk Critical (0.05) Value		0.916						
Approximate Shapiro Wilk P Value		0.00248						
Lilliefors Test Statistic		0.207						
Lilliefors Critical (0.05) Value		0.177						
Data not Lognormal at (0.05) Significance Level								
Non-parametric GOF Test Results								
Data do not follow a discernible distribution at (0.05) Level of Significance								
Cobalt (m-58a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	1	24	7	17	70.83%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	17	5.0000E-4	0.01	0.00135	5.0000E-4	0.0023		
Statistics (Non-Detects Only)	7	2.4000E-4	0.0011	7.4000E-4	7.9000E-4	3.1209E-4		
Statistics (All: NDs treated as DL value)	24	2.4000E-4	0.01	0.00117	5.0500E-4	0.00195		
Statistics (All: NDs treated as DL/2 value)	24	2.4000E-4	0.005	6.9500E-4	3.7500E-4	9.7412E-4		
Statistics (Normal ROS Imputed Data)	24	-2.745E-4	0.0011	3.8190E-4	3.7363E-4	3.4177E-4		
Statistics (Gamma ROS Imputed Data)	24	2.4000E-4	0.01	0.0073	0.01	0.0043		
Statistics (Lognormal ROS Imputed Data)	24	1.1582E-4	0.0011	4.2692E-4	3.5449E-4	2.7393E-4		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	4.983	2.943	1.4849E-4	-7.313	0.536	-0.0733		
Statistics (NDs = DL)	1.295	1.161	9.0655E-4	-7.181	0.752	-0.105		
Statistics (NDs = DL/2)	1.394	1.247	4.9874E-4	-7.671	0.783	-0.102		
Statistics (Gamma ROS Estimates)	1.192	1.071	0.00612	-5.395	1.287	-0.238		
Statistics (Lognormal ROS Estimates)	--	--	--	-7.931	0.589	-0.0743		
Normal GOF Test Results								

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.975	0.601	0.667	0.983				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.939	0.803	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.392	0.916	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.473	0.916	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.965	0.916	Data Appear Normal					
Lilliefors (Detects Only)	0.198	0.304	Data Appear Normal					
Lilliefors (NDs = DL)	0.39	0.177	Data Not Normal					
Lilliefors (NDs = DL/2)	0.32	0.177	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.124	0.177	Data Appear Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	0.926	0.796	0.841	0.575				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Anderson-Darling (Detects Only)	0.377	0.71						
Kolmogorov-Smirnov (Detects Only)	0.211	0.313	Detected Data Appear Gamma Distributed					
Anderson-Darling (NDs = DL)	3.185	0.766						
Kolmogorov-Smirnov (NDs = DL)	0.286	0.182	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL/2)	2.231	0.764						
Kolmogorov-Smirnov (NDs = DL/2)	0.267	0.182	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	4.884	0.768						
Kolmogorov-Smirnov (Gamma ROS Est.)	0.455	0.182	Data Not Gamma Distributed					
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.934	0.864	0.888	0.987				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.874	0.803	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL)	0.77	0.916	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.792	0.916	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.969	0.916	Data Appear Lognormal					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Lilliefors (Detects Only)	0.195	0.304	Data Appear Lognormal					
Lilliefors (NDs = DL)	0.246	0.177	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.287	0.177	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.124	0.177	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Fluoride (m-56a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	1	24	10	14	58.33%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	14	0.4	0.8	0.543	0.4	0.199		
Statistics (Non-Detects Only)	10	0.39	0.49	0.428	0.415	0.0339		
Statistics (All: NDs treated as DL value)	24	0.39	0.8	0.495	0.405	0.162		
Statistics (All: NDs treated as DL/2 value)	24	0.2	0.49	0.337	0.4	0.111		
Statistics (Normal ROS Imputed Data)	24	0.318	0.49	0.397	0.395	0.0422		
Statistics (Gamma ROS Imputed Data)	24	0.322	0.49	0.397	0.395	0.0415		
Statistics (Lognormal ROS Imputed Data)	24	0.332	0.49	0.399	0.396	0.0393		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	182.4	127.7	0.00235	-0.851	0.0775	-0.091		
Statistics (NDs = DL)	12.17	10.68	0.0407	-0.745	0.279	-0.375		
Statistics (NDs = DL/2)	8.426	7.401	0.04	-1.149	0.368	-0.32		
Statistics (Gamma ROS Estimates)	97.3	85.16	0.00408	-0.928	0.103	-0.111		
Statistics (Lognormal ROS Estimates)	--	--	--	-0.923	0.097	-0.105		
Normal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.95	0.781	0.883	0.993				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.892	0.842	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.599	0.916	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.761	0.916	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.984	0.916	Data Appear Normal					
Lilliefors (Detects Only)	0.202	0.262	Data Appear Normal					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Lilliefors (NDs = DL)	0.323	0.177	Data Not Normal			
Lilliefors (NDs = DL/2)	0.31	0.177	Data Not Normal			
Lilliefors (Normal ROS Estimates)	0.0943	0.177	Data Appear Normal			
Gamma GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	0.956	0.825	0.863	0.995		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	0.524	0.724				
Kolmogorov-Smirnov (Detects Only)	0.209	0.266	Detected Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	4.337	0.744				
Kolmogorov-Smirnov (NDs = DL)	0.316	0.178	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	3.177	0.745				
Kolmogorov-Smirnov (NDs = DL/2)	0.334	0.178	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	0.138	0.742				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0842	0.177	Data Appear Gamma Distributed			
Lognormal GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Log ROS		
Correlation Coefficient R	0.956	0.801	0.861	0.993		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.902	0.842	Data Appear Lognormal			
Shapiro-Wilk (NDs = DL)	0.63	0.916	Data Not Lognormal			
Shapiro-Wilk (NDs = DL/2)	0.721	0.916	Data Not Lognormal			
Shapiro-Wilk (Lognormal ROS Estimates)	0.984	0.916	Data Appear Lognormal			
Lilliefors (Detects Only)	0.198	0.262	Data Appear Lognormal			
Lilliefors (NDs = DL)	0.305	0.177	Data Not Lognormal			
Lilliefors (NDs = DL/2)	0.339	0.177	Data Not Lognormal			
Lilliefors (Lognormal ROS Estimates)	0.0962	0.177	Data Appear Lognormal			
Note: Substitution methods such as DL or DL/2 are not recommended.						
Fluoride (m-57a)						
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Raw Statistics	26	2	24	4	20	83.33%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	20	0.4	0.8	0.48	0.4	0.164		
Statistics (Non-Detects Only)	4	0.35	0.53	0.42	0.4	0.0787		
Statistics (All: NDs treated as DL value)	24	0.35	0.8	0.47	0.4	0.154		
Statistics (All: NDs treated as DL/2 value)	24	0.2	0.53	0.27	0.2	0.105		
Statistics (Normal ROS Imputed Data)	24	0.269	0.53	0.372	0.372	0.0554		
Statistics (Gamma ROS Imputed Data)	24	0.282	0.53	0.373	0.37	0.0528		
Statistics (Lognormal ROS Imputed Data)	24	0.291	0.53	0.374	0.371	0.0503		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	40.34	10.25	0.0104	-0.88	0.18	-0.204		
Statistics (NDs = DL)	12.76	11.2	0.0368	-0.795	0.269	-0.339		
Statistics (NDs = DL/2)	8.1	7.115	0.0333	-1.372	0.349	-0.254		
Statistics (Gamma ROS Estimates)	54.39	47.62	0.00685	-0.996	0.138	-0.138		
Statistics (Lognormal ROS Estimates)	--	--	--	-0.992	0.129	-0.13		
Normal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.954	0.744	0.824	0.976				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.914	0.748	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.551	0.916	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.674	0.916	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.965	0.916	Data Appear Normal					
Lilliefors (Detects Only)	0.25	0.375	Data Appear Normal					
Lilliefors (NDs = DL)	0.426	0.177	Data Not Normal					
Lilliefors (NDs = DL/2)	0.414	0.177	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.089	0.177	Data Appear Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	0.974	0.794	0.875	0.977				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Anderson-Darling (Detects Only)	0.306	0.656				
Kolmogorov-Smirnov (Detects Only)	0.229	0.394	Detected Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	5.234	0.744				
Kolmogorov-Smirnov (NDs = DL)	0.43	0.178	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	4.143	0.745				
Kolmogorov-Smirnov (NDs = DL/2)	0.423	0.178	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	0.188	0.742				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0801	0.177	Data Appear Gamma Distributed			

Lognormal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.97	0.764	0.819	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.942	0.748	Data Appear Lognormal
Shapiro-Wilk (NDs = DL)	0.582	0.916	Data Not Lognormal
Shapiro-Wilk (NDs = DL/2)	0.66	0.916	Data Not Lognormal
Shapiro-Wilk (Lognormal ROS Estimates)	0.97	0.916	Data Appear Lognormal
Lilliefors (Detects Only)	0.222	0.375	Data Appear Lognormal
Lilliefors (NDs = DL)	0.424	0.177	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.418	0.177	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0849	0.177	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Fluoride (m-58a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	1	24	3	21	87.50%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	21	0.4	0.8	0.495	0.4	0.175
Statistics (Non-Detects Only)	3	0.32	0.43	0.363	0.34	0.0586
Statistics (All: NDs treated as DL value)	24	0.32	0.8	0.479	0.4	0.17
Statistics (All: NDs treated as DL/2 value)	24	0.2	0.43	0.262	0.2	0.0919
Statistics (Normal ROS Imputed Data)	24	0.26	0.43	0.336	0.335	0.0396
Statistics (Gamma ROS Imputed Data)	24	0.269	0.43	0.336	0.334	0.0375
Statistics (Lognormal ROS Imputed Data)	24	0.274	0.43	0.337	0.334	0.0361

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	N/A	N/A	N/A	N/A	N/A	N/A
Statistics (NDs = DL)	10.5	9.217	0.0456	-0.785	0.3	-0.382
Statistics (NDs = DL/2)	9.714	8.528	0.027	-1.391	0.32	-0.23
Statistics (Gamma ROS Estimates)	85.35	74.71	0.00394	-1.096	0.11	-0.101
Statistics (Lognormal ROS Estimates)	--	--	--	-1.094	0.106	-0.0966
Normal GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Normal ROS		
Correlation Coefficient R	0.939	0.769	0.814	0.994		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.881	0.767	Data Appear Normal			
Shapiro-Wilk (NDs = DL)	0.586	0.916	Data Not Normal			
Shapiro-Wilk (NDs = DL/2)	0.648	0.916	Data Not Normal			
Shapiro-Wilk (Normal ROS Estimates)	0.991	0.916	Data Appear Normal			
Lilliefors (Detects Only)	0.321	0.425	Data Appear Normal			
Lilliefors (NDs = DL)	0.429	0.177	Data Not Normal			
Lilliefors (NDs = DL/2)	0.417	0.177	Data Not Normal			
Lilliefors (Normal ROS Estimates)	0.0625	0.177	Data Appear Normal			
Gamma GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	N/A	0.811	0.852	0.995		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	N/A	N/A				
Kolmogorov-Smirnov (Detects Only)	N/A	N/A				
Anderson-Darling (NDs = DL)	4.913	0.744				
Kolmogorov-Smirnov (NDs = DL)	0.428	0.178	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	4.325	0.744				
Kolmogorov-Smirnov (NDs = DL/2)	0.424	0.178	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	0.0994	0.742				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0607	0.177	Data Appear Gamma Distributed			
Lognormal GOF Test Results						

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.947	0.794	0.81	0.994				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.896	0.767	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL)	0.626	0.916	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.641	0.916	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.991	0.916	Data Appear Lognormal					
Lilliefors (Detects Only)	0.312	0.425	Data Appear Lognormal					
Lilliefors (NDs = DL)	0.419	0.177	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.419	0.177	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.0625	0.177	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Lead (m-56a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	5	20	0	20	100.00%		
Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!								
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!								
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).								
The data set for variable Lead (m-56a) was not processed!								
Lead (m-57a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	26	6	20	2	18	90.00%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	18	5.0000E-4	0.01	0.00133	5.0000E-4	0.00224		
Statistics (Non-Detects Only)	2	2.1000E-4	8.6000E-4	5.3500E-4	5.3500E-4	4.5962E-4		
Statistics (All: NDs treated as DL value)	20	2.1000E-4	0.01	0.00125	5.0000E-4	0.00213		
Statistics (All: NDs treated as DL/2 value)	20	2.1000E-4	0.005	6.5350E-4	2.5000E-4	0.00106		

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Statistics (Normal ROS Imputed Data)	20	-2.533E-4	8.6000E-4	2.4794E-4	2.4365E-4	2.5996E-4
Statistics (Gamma ROS Imputed Data)	20	N/A	N/A	N/A	N/A	N/A
Statistics (Lognormal ROS Imputed Data)	20	7.6883E-5	8.6000E-4	2.6741E-4	2.2590E-4	1.7598E-4

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	N/A	N/A	N/A	N/A	N/A	N/A
Statistics (NDs = DL)	1.144	1.005	0.0011	-7.179	0.824	-0.115
Statistics (NDs = DL/2)	1.204	1.057	5.4277E-4	-7.803	0.799	-0.102
Statistics (Gamma ROS Estimates)	N/A	N/A	N/A	N/A	N/A	N/A
Statistics (Lognormal ROS Estimates)	--	--	--	-8.386	0.564	-0.0672

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	1	0.621	0.631	0.987

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (NDs = DL)	0.416	0.905	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.426	0.905	Data Not Normal
Shapiro-Wilk (Normal ROS Estimates)	0.982	0.905	Data Appear Normal
Lilliefors (Detects Only)	N/A	N/A	
Lilliefors (NDs = DL)	0.397	0.192	Data Not Normal
Lilliefors (NDs = DL/2)	0.357	0.192	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.107	0.192	Data Appear Normal

Gamma GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	N/A	0.825	0.832	0.414

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	N/A	N/A	
Kolmogorov-Smirnov (Detects Only)	N/A	N/A	
Anderson-Darling (NDs = DL)	2.758	0.765	
Kolmogorov-Smirnov (NDs = DL)	0.315	0.199	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	2.832	0.764	
Kolmogorov-Smirnov (NDs = DL/2)	0.321	0.199	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	N/A	0.74	
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	0.193	

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	1	0.868	0.843	N/A				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (NDs = DL)	0.776	0.905	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.722	0.905	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.982	0.905	Data Appear Lognormal					
Lilliefors (Detects Only)	N/A	N/A						
Lilliefors (NDs = DL)	0.296	0.192	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.331	0.192	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.107	0.192	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Lead (m-58a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	5	20	4	16	80.00%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	16	1.0000E-4	0.01	0.00138	5.0000E-4	0.00238		
Statistics (Non-Detects Only)	4	5.6000E-4	0.0011	7.5750E-4	6.8500E-4	2.4824E-4		
Statistics (All: NDs treated as DL value)	20	1.0000E-4	0.01	0.00126	5.3000E-4	0.00213		
Statistics (All: NDs treated as DL/2 value)	20	5.0000E-5	0.005	7.0400E-4	3.7500E-4	0.00106		
Statistics (Normal ROS Imputed Data)	20	-5.831E-4	0.0011	1.6172E-4	1.5021E-4	3.9979E-4		
Statistics (Gamma ROS Imputed Data)	20	5.6000E-4	0.01	0.00815	0.01	0.00379		
Statistics (Lognormal ROS Imputed Data)	20	1.3828E-4	0.0011	3.9468E-4	3.4347E-4	2.2614E-4		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	13.53	3.548	5.6000E-5	-7.223	0.31	-0.0429		
Statistics (NDs = DL)	1.093	0.962	0.00115	-7.202	0.894	-0.124		
Statistics (NDs = DL/2)	1.142	1.004	6.1656E-4	-7.757	0.935	-0.121		
Statistics (Gamma ROS Estimates)	1.714	1.491	0.00475	-5.129	1.081	-0.211		
Statistics (Lognormal ROS Estimates)	--	--	--	-7.962	0.496	-0.0623		
Normal GOF Test Results								

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.94	0.629	0.677	0.986				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.878	0.748	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.426	0.905	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.489	0.905	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.978	0.905	Data Appear Normal					
Lilliefors (Detects Only)	0.25	0.375	Data Appear Normal					
Lilliefors (NDs = DL)	0.379	0.192	Data Not Normal					
Lilliefors (NDs = DL/2)	0.293	0.192	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.153	0.192	Data Appear Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	0.975	0.832	0.861	0.521				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Anderson-Darling (Detects Only)	0.366	0.657						
Kolmogorov-Smirnov (Detects Only)	0.285	0.395	Detected Data Appear Gamma Distributed					
Anderson-Darling (NDs = DL)	2.398	0.766						
Kolmogorov-Smirnov (NDs = DL)	0.275	0.199	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL/2)	1.525	0.765						
Kolmogorov-Smirnov (NDs = DL/2)	0.229	0.199	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	5.294	0.755						
Kolmogorov-Smirnov (Gamma ROS Est.)	0.502	0.197	Data Not Gamma Distributed					
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.956	0.89	0.929	0.986				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.905	0.748	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL)	0.823	0.905	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.888	0.905	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.978	0.905	Data Appear Lognormal					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Lilliefors (Detects Only)	0.254	0.375	Data Appear Lognormal					
Lilliefors (NDs = DL)	0.278	0.192	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.233	0.192	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.153	0.192	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Lithium (m-56a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	4	21	4	17	80.95%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	17	0.2	1	0.247	0.2	0.194		
Statistics (Non-Detects Only)	4	0.097	0.11	0.104	0.105	0.00675		
Statistics (All: NDs treated as DL value)	21	0.097	1	0.22	0.2	0.183		
Statistics (All: NDs treated as DL/2 value)	21	0.097	0.5	0.12	0.1	0.0872		
Statistics (Normal ROS Imputed Data)	21	0.0906	0.118	0.104	0.104	0.0071		
Statistics (Gamma ROS Imputed Data)	21	0.091	0.118	0.104	0.104	0.00709		
Statistics (Lognormal ROS Imputed Data)	21	0.0912	0.119	0.104	0.104	0.00714		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	316.3	79.25	3.2955E-4	-2.263	0.065	-0.0287		
Statistics (NDs = DL)	3.669	3.177	0.0599	-1.657	0.462	-0.279		
Statistics (NDs = DL/2)	5.323	4.594	0.0225	-2.218	0.351	-0.158		
Statistics (Gamma ROS Estimates)	226.4	194.1	4.6062E-4	-2.263	0.0682	-0.0301		
Statistics (Lognormal ROS Estimates)	--	--	--	-2.263	0.0685	-0.0303		
Normal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.922	0.578	0.468	0.997				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.823	0.748	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.364	0.908	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.245	0.908	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.991	0.908	Data Appear Normal					
Lilliefors (Detects Only)	0.303	0.375	Data Appear Normal					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Lilliefors (NDs = DL)	0.496	0.188	Data Not Normal			
Lilliefors (NDs = DL/2)	0.497	0.188	Data Not Normal			
Lilliefors (Normal ROS Estimates)	0.0803	0.188	Data Appear Normal			
Gamma GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	0.915	0.675	0.579	0.997		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	0.523	0.657				
Kolmogorov-Smirnov (Detects Only)	0.337	0.394	Detected Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	4.216	0.748				
Kolmogorov-Smirnov (NDs = DL)	0.453	0.19	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	7.065	0.745				
Kolmogorov-Smirnov (NDs = DL/2)	0.472	0.19	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	0.12	0.74				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0866	0.189	Data Appear Gamma Distributed			
Lognormal GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Log ROS		
Correlation Coefficient R	0.924	0.748	0.494	0.997		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.827	0.748	Data Appear Lognormal			
Shapiro-Wilk (NDs = DL)	0.589	0.908	Data Not Lognormal			
Shapiro-Wilk (NDs = DL/2)	0.271	0.908	Data Not Lognormal			
Shapiro-Wilk (Lognormal ROS Estimates)	0.991	0.908	Data Appear Lognormal			
Lilliefors (Detects Only)	0.302	0.375	Data Appear Lognormal			
Lilliefors (NDs = DL)	0.411	0.188	Data Not Lognormal			
Lilliefors (NDs = DL/2)	0.452	0.188	Data Not Lognormal			
Lilliefors (Lognormal ROS Estimates)	0.0803	0.188	Data Appear Lognormal			
Note: Substitution methods such as DL or DL/2 are not recommended.						
Lithium (m-57a)						
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Raw Statistics	26	5	21	4	17	80.95%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	17	0.2	1	0.247	0.2	0.194		
Statistics (Non-Detects Only)	4	0.092	0.1	0.097	0.098	0.00383		
Statistics (All: NDs treated as DL value)	21	0.092	1	0.218	0.2	0.184		
Statistics (All: NDs treated as DL/2 value)	21	0.092	0.5	0.118	0.1	0.0874		
Statistics (Normal ROS Imputed Data)	21	0.0892	0.105	0.097	0.097	0.00408		
Statistics (Gamma ROS Imputed Data)	21	0.0893	0.105	0.097	0.097	0.00407		
Statistics (Lognormal ROS Imputed Data)	21	0.0894	0.105	0.097	0.0969	0.00411		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	845.2	211.5	1.1477E-4	-2.334	0.0398	-0.0171		
Statistics (NDs = DL)	3.499	3.031	0.0624	-1.671	0.48	-0.287		
Statistics (NDs = DL/2)	5.221	4.507	0.0227	-2.232	0.353	-0.158		
Statistics (Gamma ROS Estimates)	595.7	510.6	1.6287E-4	-2.334	0.042	-0.018		
Statistics (Lognormal ROS Estimates)	--	--	--	-2.334	0.0424	-0.0182		
Normal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.937	0.585	0.46	0.997				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.865	0.748	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.373	0.908	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.238	0.908	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.991	0.908	Data Appear Normal					
Lilliefors (Detects Only)	0.283	0.375	Data Appear Normal					
Lilliefors (NDs = DL)	0.492	0.188	Data Not Normal					
Lilliefors (NDs = DL/2)	0.536	0.188	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.0807	0.188	Data Appear Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	0.931	0.682	0.569	0.997				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Anderson-Darling (Detects Only)	0.428	0.657				
Kolmogorov-Smirnov (Detects Only)	0.316	0.394	Detected Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	4.119	0.748				
Kolmogorov-Smirnov (NDs = DL)	0.445	0.191	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	7.335	0.745				
Kolmogorov-Smirnov (NDs = DL/2)	0.543	0.19	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	0.117	0.74				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0864	0.189	Data Appear Gamma Distributed			

Lognormal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.936	0.757	0.478	0.997

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.864	0.748	Data Appear Lognormal
Shapiro-Wilk (NDs = DL)	0.602	0.908	Data Not Lognormal
Shapiro-Wilk (NDs = DL/2)	0.256	0.908	Data Not Lognormal
Shapiro-Wilk (Lognormal ROS Estimates)	0.991	0.908	Data Appear Lognormal
Lilliefors (Detects Only)	0.282	0.375	Data Appear Lognormal
Lilliefors (NDs = DL)	0.402	0.188	Data Not Lognormal
Lilliefors (NDs = DL/2)	0.532	0.188	Data Not Lognormal
Lilliefors (Lognormal ROS Estimates)	0.0806	0.188	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Lithium (m-58a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	4	21	4	17	80.95%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	17	0.2	1	0.247	0.2	0.194
Statistics (Non-Detects Only)	4	0.069	0.08	0.0725	0.0705	0.00507
Statistics (All: NDs treated as DL value)	21	0.069	1	0.214	0.2	0.187
Statistics (All: NDs treated as DL/2 value)	21	0.069	0.5	0.114	0.1	0.0892
Statistics (Normal ROS Imputed Data)	21	0.0629	0.0821	0.0725	0.072	0.00506
Statistics (Gamma ROS Imputed Data)	21	0.0631	0.0824	0.0725	0.072	0.00508
Statistics (Lognormal ROS Imputed Data)	21	0.0636	0.0824	0.0725	0.0719	0.00496

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	284.3	71.25	2.5498E-4	-2.626	0.0678	-0.0258
Statistics (NDs = DL)	2.877	2.498	0.0743	-1.726	0.568	-0.329
Statistics (NDs = DL/2)	4.534	3.918	0.0251	-2.288	0.388	-0.17
Statistics (Gamma ROS Estimates)	214.9	184.3	3.3744E-4	-2.626	0.0699	-0.0266
Statistics (Lognormal ROS Estimates)	--	--	--	-2.626	0.068	-0.0259
Normal GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Normal ROS		
Correlation Coefficient R	0.875	0.611	0.529	0.995		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.775	0.748	Data Appear Normal			
Shapiro-Wilk (NDs = DL)	0.404	0.908	Data Not Normal			
Shapiro-Wilk (NDs = DL/2)	0.308	0.908	Data Not Normal			
Shapiro-Wilk (Normal ROS Estimates)	0.985	0.908	Data Appear Normal			
Lilliefors (Detects Only)	0.366	0.375	Data Appear Normal			
Lilliefors (NDs = DL)	0.482	0.188	Data Not Normal			
Lilliefors (NDs = DL/2)	0.514	0.188	Data Not Normal			
Lilliefors (Normal ROS Estimates)	0.0833	0.188	Data Appear Normal			
Gamma GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	0.888	0.707	0.63	0.994		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	0.612	0.657				
Kolmogorov-Smirnov (Detects Only)	0.38	0.394	Detected Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	3.842	0.75				
Kolmogorov-Smirnov (NDs = DL)	0.418	0.191	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	5.242	0.746				
Kolmogorov-Smirnov (NDs = DL/2)	0.496	0.19	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	0.156	0.74				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.0835	0.189	Data Appear Gamma Distributed			
Lognormal GOF Test Results						

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.88	0.787	0.649	0.995				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.785	0.748	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL)	0.643	0.908	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.453	0.908	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.985	0.908	Data Appear Lognormal					
Lilliefors (Detects Only)	0.361	0.375	Data Appear Lognormal					
Lilliefors (NDs = DL)	0.391	0.188	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.468	0.188	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.0833	0.188	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Mercury (m-56a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	5	20	0	20	100.00%		
Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!								
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!								
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).								
The data set for variable Mercury (m-56a) was not processed!								
Mercury (m-57a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	26	6	20	0	20	100.00%		
Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!								
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!								
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).								
The data set for variable Mercury (m-57a) was not processed!								

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		

Mercury (m-58a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	5	20	0	20	100.00%

Warning: All observations are Non-Detects (NDs), therefore all statistics and estimates should also be NDs!
Specifically, sample mean, UCLs, UPLs, and other statistics are also NDs lying below the largest detection limit!
The Project Team may decide to use alternative site specific values to estimate environmental parameters (e.g., EPC, BTV).

The data set for variable Mercury (m-58a) was not processed!

Molybdenum (m-56a)

Raw Statistics	
Number of Valid Observations	24
Number of Missing Observations	1
Number of Distinct Observations	21
Minimum	0.0057
Maximum	0.029
Mean of Raw Data	0.0119
Standard Deviation of Raw Data	0.00547
Khat	6.598
Theta hat	0.0018
Kstar	5.801
Theta star	0.00205
Mean of Log Transformed Data	-4.511
Standard Deviation of Log Transformed Data	0.38

Normal GOF Test Results	
Correlation Coefficient R	0.88
Shapiro Wilk Test Statistic	0.785
Shapiro Wilk Critical (0.05) Value	0.916
Approximate Shapiro Wilk P Value	8.9642E-5

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Lilliefors Test Statistic		0.23						
Lilliefors Critical (0.05) Value		0.177						
Data not Normal at (0.05) Significance Level								
Gamma GOF Test Results								
Correlation Coefficient R		0.942						
A-D Test Statistic		1.114						
A-D Critical (0.05) Value		0.746						
K-S Test Statistic		0.192						
K-S Critical(0.05) Value		0.178						
Data not Gamma Distributed at (0.05) Significance Level								
Lognormal GOF Test Results								
Correlation Coefficient R		0.957						
Shapiro Wilk Test Statistic		0.921						
Shapiro Wilk Critical (0.05) Value		0.916						
Approximate Shapiro Wilk P Value		0.0623						
Lilliefors Test Statistic		0.165						
Lilliefors Critical (0.05) Value		0.177						
Data appear Lognormal at (0.05) Significance Level								
Molybdenum (m-57a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	26	2	24	23	1	4.17%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	1	0.0025	0.0025	0.0025	0.0025	N/A		
Statistics (Non-Detects Only)	23	0.0011	0.022	0.00653	0.0047	0.00495		
Statistics (All: NDs treated as DL value)	24	0.0011	0.022	0.00637	0.00465	0.00491		
Statistics (All: NDs treated as DL/2 value)	24	0.0011	0.022	0.00631	0.00465	0.00496		
Statistics (Normal ROS Imputed Data)	24	-0.0024	0.022	0.00616	0.00465	0.00518		
Statistics (Gamma ROS Imputed Data)	24	0.0011	0.022	0.00668	0.00475	0.00489		
Statistics (Lognormal ROS Imputed Data)	24	0.0011	0.022	0.00632	0.00465	0.00496		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	2.495	2.199	0.00262	-5.244	0.656	-0.125		

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Statistics (NDs = DL)	2.441	2.163	0.00261	-5.275	0.66	-0.125
Statistics (NDs = DL/2)	2.242	1.989	0.00282	-5.304	0.706	-0.133
Statistics (Gamma ROS Estimates)	2.549	2.258	0.00262	-5.218	0.655	-0.126
Statistics (Lognormal ROS Estimates)	--	--	--	-5.3	0.697	-0.132

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.873	0.87	0.878	0.903

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.772	0.914	Data Not Normal
Shapiro-Wilk (NDs = DL)	0.768	0.916	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.781	0.916	Data Not Normal
Shapiro-Wilk (Normal ROS Estimates)	0.833	0.916	Data Not Normal
Lilliefors (Detects Only)	0.21	0.18	Data Not Normal
Lilliefors (NDs = DL)	0.208	0.177	Data Not Normal
Lilliefors (NDs = DL/2)	0.203	0.177	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.195	0.177	Data Not Normal

Gamma GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.962	0.962	0.967	0.97

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.642	0.753	
Kolmogorov-Smirnov (Detects Only)	0.162	0.183	Detected Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	0.645	0.753	
Kolmogorov-Smirnov (NDs = DL)	0.163	0.18	Data Appear Gamma Distributed
Anderson-Darling (NDs = DL/2)	0.523	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.148	0.18	Data Appear Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.524	0.753	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.154	0.18	Data Appear Gamma Distributed

Lognormal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.978	0.981	0.983	0.985

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.967	0.914	Data Appear Lognormal
Shapiro-Wilk (NDs = DL)	0.971	0.916	Data Appear Lognormal
Shapiro-Wilk (NDs = DL/2)	0.969	0.916	Data Appear Lognormal
Shapiro-Wilk (Lognormal ROS Estimates)	0.974	0.916	Data Appear Lognormal
Lilliefors (Detects Only)	0.123	0.18	Data Appear Lognormal
Lilliefors (NDs = DL)	0.122	0.177	Data Appear Lognormal
Lilliefors (NDs = DL/2)	0.103	0.177	Data Appear Lognormal
Lilliefors (Lognormal ROS Estimates)	0.106	0.177	Data Appear Lognormal

Note: Substitution methods such as DL or DL/2 are not recommended.

Molybdenum (m-58a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	1	24	21	3	12.50%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	3	0.0018	0.01	0.00477	0.0025	0.00455
Statistics (Non-Detects Only)	21	0.0014	0.02	0.00283	0.0018	0.00399
Statistics (All: NDs treated as DL value)	24	0.0014	0.02	0.00307	0.0018	0.00401
Statistics (All: NDs treated as DL/2 value)	24	9.0000E-4	0.02	0.00277	0.0018	0.00379
Statistics (Normal ROS Imputed Data)	24	7.1998E-4	0.02	0.00271	0.0018	0.00375
Statistics (Gamma ROS Imputed Data)	24	0.0014	0.02	0.00373	0.0018	0.00444
Statistics (Lognormal ROS Imputed Data)	24	0.0014	0.02	0.0027	0.0018	0.00374

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	1.89	1.652	0.0015	-6.155	0.571	-0.0927
Statistics (NDs = DL)	1.789	1.593	0.00172	-6.091	0.621	-0.102
Statistics (NDs = DL/2)	1.877	1.67	0.00148	-6.177	0.599	-0.0969
Statistics (Gamma ROS Estimates)	1.501	1.341	0.00248	-5.961	0.747	-0.125
Statistics (Lognormal ROS Estimates)	--	--	--	-6.178	0.538	-0.0871

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.547	0.62	0.585	0.554

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.326	0.908	Data Not Normal			
Shapiro-Wilk (NDs = DL)	0.41	0.916	Data Not Normal			
Shapiro-Wilk (NDs = DL/2)	0.373	0.916	Data Not Normal			
Shapiro-Wilk (Normal ROS Estimates)	0.339	0.916	Data Not Normal			
Lilliefors (Detects Only)	0.438	0.188	Data Not Normal			
Lilliefors (NDs = DL)	0.432	0.177	Data Not Normal			
Lilliefors (NDs = DL/2)	0.404	0.177	Data Not Normal			
Lilliefors (Normal ROS Estimates)	0.435	0.177	Data Not Normal			
Gamma GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	0.72	0.8	0.752	0.897		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	4.596	0.755				
Kolmogorov-Smirnov (Detects Only)	0.39	0.192	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL)	4.727	0.758				
Kolmogorov-Smirnov (NDs = DL)	0.379	0.181	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	3.915	0.757				
Kolmogorov-Smirnov (NDs = DL/2)	0.355	0.18	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	4.059	0.762				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.371	0.181	Data Not Gamma Distributed			
Lognormal GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Log ROS		
Correlation Coefficient R	0.719	0.77	0.817	0.715		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.542	0.908	Data Not Lognormal			
Shapiro-Wilk (NDs = DL)	0.609	0.916	Data Not Lognormal			
Shapiro-Wilk (NDs = DL/2)	0.697	0.916	Data Not Lognormal			
Shapiro-Wilk (Lognormal ROS Estimates)	0.54	0.916	Data Not Lognormal			
Lilliefors (Detects Only)	0.332	0.188	Data Not Lognormal			
Lilliefors (NDs = DL)	0.312	0.177	Data Not Lognormal			
Lilliefors (NDs = DL/2)	0.295	0.177	Data Not Lognormal			
Lilliefors (Lognormal ROS Estimates)	0.332	0.177	Data Not Lognormal			

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		

Note: Substitution methods such as DL or DL/2 are not recommended.

Total Radium (m-56a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	4	21	14	7	33.33%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	7	0.4	1.2	0.786	0.8	0.241
Statistics (Non-Detects Only)	14	0.5	1.9	1.121	1.15	0.528
Statistics (All: NDs treated as DL value)	21	0.4	1.9	1.01	0.8	0.474
Statistics (All: NDs treated as DL/2 value)	21	0.2	1.9	0.879	0.6	0.556
Statistics (Normal ROS Imputed Data)	21	-0.187	1.9	0.893	0.661	0.566
Statistics (Gamma ROS Imputed Data)	21	0.133	1.9	0.916	0.654	0.531
Statistics (Lognormal ROS Imputed Data)	21	0.279	1.9	0.924	0.637	0.518

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	4.454	3.547	0.252	-0.00183	0.515	-281.7
Statistics (NDs = DL)	4.883	4.217	0.207	-0.0964	0.474	-4.917
Statistics (NDs = DL/2)	2.68	2.329	0.328	-0.327	0.655	-1.999
Statistics (Gamma ROS Estimates)	2.966	2.574	0.309	-0.266	0.648	-2.435
Statistics (Lognormal ROS Estimates)	--	--	--	-0.225	0.553	-2.458

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.95	0.959	0.935	0.961

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.877	0.874	Data Appear Normal
Shapiro-Wilk (NDs = DL)	0.906	0.908	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.86	0.908	Data Not Normal
Shapiro-Wilk (Normal ROS Estimates)	0.92	0.908	Data Appear Normal
Lilliefors (Detects Only)	0.216	0.226	Data Appear Normal
Lilliefors (NDs = DL)	0.194	0.188	Data Not Normal
Lilliefors (NDs = DL/2)	0.263	0.188	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.228	0.188	Data Not Normal

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	0.94	0.973	0.954	0.957				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Anderson-Darling (Detects Only)	0.8	0.739						
Kolmogorov-Smirnov (Detects Only)	0.206	0.23	Detected Data appear Approximate Gamma Distribution					
Anderson-Darling (NDs = DL)	0.558	0.746						
Kolmogorov-Smirnov (NDs = DL)	0.157	0.19	Data Appear Gamma Distributed					
Anderson-Darling (NDs = DL/2)	0.851	0.751						
Kolmogorov-Smirnov (NDs = DL/2)	0.218	0.191	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	0.78	0.75						
Kolmogorov-Smirnov (Gamma ROS Est.)	0.203	0.191	Data Not Gamma Distributed					
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.943	0.979	0.969	0.958				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.862	0.874	Data Not Lognormal					
Shapiro-Wilk (NDs = DL)	0.946	0.908	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.93	0.908	Data Appear Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.91	0.908	Data Appear Lognormal					
Lilliefors (Detects Only)	0.196	0.226	Data Appear Lognormal					
Lilliefors (NDs = DL)	0.137	0.188	Data Appear Lognormal					
Lilliefors (NDs = DL/2)	0.182	0.188	Data Appear Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.213	0.188	Data Not Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Total Radium (m-57a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	26	5	21	6	15	71.43%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	15	0.4	0.9	0.673	0.7	0.116		

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Statistics (Non-Detects Only)	6	0.5	1.5	0.917	0.9	0.382
Statistics (All: NDs treated as DL value)	21	0.4	1.5	0.743	0.7	0.242
Statistics (All: NDs treated as DL/2 value)	21	0.2	1.5	0.502	0.35	0.333
Statistics (Normal ROS Imputed Data)	21	-0.381	1.5	0.337	0.269	0.492
Statistics (Gamma ROS Imputed Data)	21	0.01	1.5	0.417	0.304	0.408
Statistics (Lognormal ROS Imputed Data)	21	0.194	1.5	0.517	0.406	0.337

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	6.942	3.582	0.132	-0.161	0.423	-2.633
Statistics (NDs = DL)	12.04	10.35	0.0617	-0.339	0.287	-0.847
Statistics (NDs = DL/2)	3.581	3.101	0.14	-0.834	0.51	-0.611
Statistics (Gamma ROS Estimates)	0.769	0.691	0.542	-1.651	1.613	-0.977
Statistics (Lognormal ROS Estimates)	--	--	--	-0.822	0.559	-0.681

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.964	0.893	0.832	0.98

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.92	0.788	Data Appear Normal
Shapiro-Wilk (NDs = DL)	0.813	0.908	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.701	0.908	Data Not Normal
Shapiro-Wilk (Normal ROS Estimates)	0.957	0.908	Data Appear Normal
Lilliefors (Detects Only)	0.215	0.325	Data Appear Normal
Lilliefors (NDs = DL)	0.285	0.188	Data Not Normal
Lilliefors (NDs = DL/2)	0.287	0.188	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.106	0.188	Data Appear Normal

Gamma GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.974	0.933	0.925	0.981

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.328	0.698	
Kolmogorov-Smirnov (Detects Only)	0.233	0.333	Detected Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.093	0.743	
Kolmogorov-Smirnov (NDs = DL)	0.257	0.189	Data Not Gamma Distributed

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Anderson-Darling (NDs = DL/2)	1.854	0.748						
Kolmogorov-Smirnov (NDs = DL/2)	0.26	0.191	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	0.469	0.782						
Kolmogorov-Smirnov (Gamma ROS Est.)	0.135	0.197	Data Appear Gamma Distributed					
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.974	0.947	0.919	0.98				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.937	0.788	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL)	0.911	0.908	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.85	0.908	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.955	0.908	Data Appear Lognormal					
Lilliefors (Detects Only)	0.227	0.325	Data Appear Lognormal					
Lilliefors (NDs = DL)	0.238	0.188	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.235	0.188	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.123	0.188	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Total Radium (m-58a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	4	21	11	10	47.62%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	10	0.6	0.9	0.7	0.7	0.0943		
Statistics (Non-Detects Only)	11	0.5	2.6	1.282	0.9	0.691		
Statistics (All: NDs treated as DL value)	21	0.5	2.6	1.005	0.8	0.576		
Statistics (All: NDs treated as DL/2 value)	21	0.3	2.6	0.838	0.5	0.684		
Statistics (Normal ROS Imputed Data)	21	-0.677	2.6	0.671	0.5	0.854		
Statistics (Gamma ROS Imputed Data)	21	0.01	2.6	0.762	0.5	0.75		
Statistics (Lognormal ROS Imputed Data)	21	0.236	2.6	0.871	0.585	0.663		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	4.088	3.034	0.314	0.121	0.526	4.348		
Statistics (NDs = DL)	4.512	3.899	0.223	-0.11	0.456	-4.138		

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
Statistics (NDs = DL/2)	2.048	1.787	0.409	-0.44	0.714	-1.622
Statistics (Gamma ROS Estimates)	0.751	0.676	1.014	-1.069	1.706	-1.597
Statistics (Lognormal ROS Estimates)	--	--	--	-0.367	0.672	-1.831

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.946	0.849	0.885	0.978

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Shapiro-Wilk (Detects Only)	0.886	0.85	Data Appear Normal
Shapiro-Wilk (NDs = DL)	0.725	0.908	Data Not Normal
Shapiro-Wilk (NDs = DL/2)	0.78	0.908	Data Not Normal
Shapiro-Wilk (Normal ROS Estimates)	0.955	0.908	Data Appear Normal
Lilliefors (Detects Only)	0.255	0.251	Data Not Normal
Lilliefors (NDs = DL)	0.334	0.188	Data Not Normal
Lilliefors (NDs = DL/2)	0.226	0.188	Data Not Normal
Lilliefors (Normal ROS Estimates)	0.156	0.188	Data Appear Normal

Gamma GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Gamma ROS
Correlation Coefficient R	0.979	0.928	0.973	0.979

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)
Anderson-Darling (Detects Only)	0.435	0.733	
Kolmogorov-Smirnov (Detects Only)	0.239	0.256	Detected Data Appear Gamma Distributed
Anderson-Darling (NDs = DL)	1.821	0.746	
Kolmogorov-Smirnov (NDs = DL)	0.29	0.19	Data Not Gamma Distributed
Anderson-Darling (NDs = DL/2)	1.16	0.754	
Kolmogorov-Smirnov (NDs = DL/2)	0.193	0.192	Data Not Gamma Distributed
Anderson-Darling (Gamma ROS Estimates)	0.359	0.783	
Kolmogorov-Smirnov (Gamma ROS Est.)	0.109	0.197	Data Appear Gamma Distributed

Lognormal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Log ROS
Correlation Coefficient R	0.977	0.919	0.947	0.982

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.945	0.85	Data Appear Lognormal			
Shapiro-Wilk (NDs = DL)	0.843	0.908	Data Not Lognormal			
Shapiro-Wilk (NDs = DL/2)	0.882	0.908	Data Not Lognormal			
Shapiro-Wilk (Lognormal ROS Estimates)	0.956	0.908	Data Appear Lognormal			
Lilliefors (Detects Only)	0.212	0.251	Data Appear Lognormal			
Lilliefors (NDs = DL)	0.258	0.188	Data Not Lognormal			
Lilliefors (NDs = DL/2)	0.184	0.188	Data Appear Lognormal			
Lilliefors (Lognormal ROS Estimates)	0.123	0.188	Data Appear Lognormal			

Note: Substitution methods such as DL or DL/2 are not recommended.

Selenium (m-56a)

	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	5	20	6	14	70.00%

	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	14	5.0000E-4	0.01	0.00151	5.0000E-4	0.00252
Statistics (Non-Detects Only)	6	3.3000E-4	0.0016	7.4833E-4	5.9500E-4	4.4450E-4
Statistics (All: NDs treated as DL value)	20	3.3000E-4	0.01	0.00128	5.6500E-4	0.00213
Statistics (All: NDs treated as DL/2 value)	20	2.5000E-4	0.005	7.5200E-4	4.1500E-4	0.00107
Statistics (Normal ROS Imputed Data)	20	-3.779E-4	0.0016	3.5071E-4	3.3737E-4	4.0634E-4
Statistics (Gamma ROS Imputed Data)	20	3.3000E-4	0.01	0.00722	0.01	0.00436
Statistics (Lognormal ROS Imputed Data)	20	1.5360E-4	0.0016	4.5627E-4	3.8868E-4	3.1057E-4

	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV
Statistics (Non-Detects Only)	4.27	2.246	1.7527E-4	-7.319	0.521	-0.0712
Statistics (NDs = DL)	1.187	1.042	0.00108	-7.138	0.796	-0.112
Statistics (NDs = DL/2)	1.302	1.14	5.7760E-4	-7.624	0.813	-0.107
Statistics (Gamma ROS Estimates)	1.161	1.02	0.00623	-5.419	1.304	-0.241
Statistics (Lognormal ROS Estimates)	--	--	--	-7.835	0.512	-0.0653

Normal GOF Test Results

	No NDs	NDs = DL	NDs = DL/2	Normal ROS
Correlation Coefficient R	0.884	0.627	0.691	0.936

	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Shapiro-Wilk (Detects Only)	0.804	0.788	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.422	0.905	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.503	0.905	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.9	0.905	Data Not Normal					
Lilliefors (Detects Only)	0.28	0.325	Data Appear Normal					
Lilliefors (NDs = DL)	0.352	0.192	Data Not Normal					
Lilliefors (NDs = DL/2)	0.319	0.192	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.154	0.192	Data Appear Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	0.949	0.83	0.874	0.582				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Anderson-Darling (Detects Only)	0.436	0.699						
Kolmogorov-Smirnov (Detects Only)	0.251	0.333	Detected Data Appear Gamma Distributed					
Anderson-Darling (NDs = DL)	2.778	0.764						
Kolmogorov-Smirnov (NDs = DL)	0.299	0.199	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL/2)	1.796	0.762						
Kolmogorov-Smirnov (NDs = DL/2)	0.227	0.198	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	4.021	0.765						
Kolmogorov-Smirnov (Gamma ROS Est.)	0.45	0.199	Data Not Gamma Distributed					
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.954	0.859	0.904	0.968				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.933	0.788	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL)	0.753	0.905	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.818	0.905	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.953	0.905	Data Appear Lognormal					
Lilliefors (Detects Only)	0.217	0.325	Data Appear Lognormal					
Lilliefors (NDs = DL)	0.272	0.192	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.205	0.192	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.147	0.192	Data Appear Lognormal					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Note: Substitution methods such as DL or DL/2 are not recommended.								
Selenium (m-57a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	26	6	20	4	16	80.00%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	16	5.0000E-4	0.01	0.00141	5.0000E-4	0.00237		
Statistics (Non-Detects Only)	4	2.9000E-4	0.0014	8.4500E-4	8.4500E-4	4.7050E-4		
Statistics (All: NDs treated as DL value)	20	2.9000E-4	0.01	0.0013	5.5000E-4	0.00212		
Statistics (All: NDs treated as DL/2 value)	20	2.5000E-4	0.005	7.3400E-4	2.9500E-4	0.00107		
Statistics (Normal ROS Imputed Data)	20	-3.761E-4	0.0014	3.5342E-4	3.3023E-4	3.9801E-4		
Statistics (Gamma ROS Imputed Data)	20	2.9000E-4	0.01	0.00817	0.01	0.00376		
Statistics (Lognormal ROS Imputed Data)	20	1.1507E-4	0.0014	4.1692E-4	3.3440E-4	3.0644E-4		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	3.498	1.041	2.4157E-4	-7.226	0.678	-0.0938		
Statistics (NDs = DL)	1.21	1.062	0.00107	-7.113	0.8	-0.112		
Statistics (NDs = DL/2)	1.25	1.096	5.8738E-4	-7.668	0.829	-0.108		
Statistics (Gamma ROS Estimates)	1.701	1.479	0.0048	-5.129	1.109	-0.216		
Statistics (Lognormal ROS Estimates)	--	--	--	-7.968	0.595	-0.0747		
Normal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	1	0.632	0.683	0.968				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	1	0.748	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.429	0.905	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.492	0.905	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.951	0.905	Data Appear Normal					
Lilliefors (Detects Only)	0.131	0.375	Data Appear Normal					
Lilliefors (NDs = DL)	0.356	0.192	Data Not Normal					
Lilliefors (NDs = DL/2)	0.325	0.192	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.164	0.192	Data Appear Normal					
Gamma GOF Test Results								

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS		
Correlation Coefficient R	0.967	0.829	0.869	0.521		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Anderson-Darling (Detects Only)	0.231	0.659				
Kolmogorov-Smirnov (Detects Only)	0.192	0.396	Detected Data Appear Gamma Distributed			
Anderson-Darling (NDs = DL)	2.424	0.764				
Kolmogorov-Smirnov (NDs = DL)	0.285	0.199	Data Not Gamma Distributed			
Anderson-Darling (NDs = DL/2)	2.1	0.763				
Kolmogorov-Smirnov (NDs = DL/2)	0.26	0.198	Data Not Gamma Distributed			
Anderson-Darling (Gamma ROS Estimates)	5.102	0.756				
Kolmogorov-Smirnov (Gamma ROS Est.)	0.501	0.197	Data Not Gamma Distributed			
Lognormal GOF Test Results						
	No NDs	NDs = DL	NDs = DL/2	Log ROS		
Correlation Coefficient R	0.973	0.882	0.883	0.978		
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)			
Shapiro-Wilk (Detects Only)	0.95	0.748	Data Appear Lognormal			
Shapiro-Wilk (NDs = DL)	0.795	0.905	Data Not Lognormal			
Shapiro-Wilk (NDs = DL/2)	0.78	0.905	Data Not Lognormal			
Shapiro-Wilk (Lognormal ROS Estimates)	0.963	0.905	Data Appear Lognormal			
Lilliefors (Detects Only)	0.219	0.375	Data Appear Lognormal			
Lilliefors (NDs = DL)	0.229	0.192	Data Not Lognormal			
Lilliefors (NDs = DL/2)	0.254	0.192	Data Not Lognormal			
Lilliefors (Lognormal ROS Estimates)	0.164	0.192	Data Appear Lognormal			
Note: Substitution methods such as DL or DL/2 are not recommended.						
Selenium (m-58a)						
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs
Raw Statistics	25	5	20	3	17	85.00%
	Number	Minimum	Maximum	Mean	Median	SD
Statistics (Non-Detects Only)	17	5.0000E-4	0.01	0.00136	5.0000E-4	0.0023
Statistics (Non-Detects Only)	3	2.4000E-4	9.9000E-4	5.9000E-4	5.4000E-4	3.7749E-4

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Statistics (All: NDs treated as DL value)	20	2.4000E-4	0.01	0.00124	5.0000E-4	0.00213		
Statistics (All: NDs treated as DL/2 value)	20	2.4000E-4	0.005	6.6600E-4	2.5000E-4	0.00106		
Statistics (Normal ROS Imputed Data)	20	-2.297E-4	9.9000E-4	2.6900E-4	2.6244E-4	2.6133E-4		
Statistics (Gamma ROS Imputed Data)	20	2.4000E-4	0.01	0.00859	0.01	0.00345		
Statistics (Lognormal ROS Imputed Data)	20	9.9243E-5	9.9000E-4	3.0598E-4	2.6340E-4	1.9386E-4		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	N/A	N/A	N/A	N/A	N/A	N/A		
Statistics (NDs = DL)	1.144	1.005	0.00109	-7.187	0.813	-0.113		
Statistics (NDs = DL/2)	1.222	1.072	5.4489E-4	-7.776	0.798	-0.103		
Statistics (Gamma ROS Estimates)	1.839	1.596	0.00467	-5.053	1.118	-0.221		
Statistics (Lognormal ROS Estimates)	--	--	--	-8.229	0.513	-0.0623		
Normal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	0.993	0.617	0.636	0.96				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.987	0.767	Data Appear Normal					
Shapiro-Wilk (NDs = DL)	0.411	0.905	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.433	0.905	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.94	0.905	Data Appear Normal					
Lilliefors (Detects Only)	0.219	0.425	Data Appear Normal					
Lilliefors (NDs = DL)	0.395	0.192	Data Not Normal					
Lilliefors (NDs = DL/2)	0.347	0.192	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.16	0.192	Data Appear Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	N/A	0.823	0.835	0.465				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Anderson-Darling (Detects Only)	N/A	N/A						
Kolmogorov-Smirnov (Detects Only)	N/A	N/A						
Anderson-Darling (NDs = DL)	2.928	0.765						
Kolmogorov-Smirnov (NDs = DL)	0.312	0.199	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL/2)	2.765	0.763						

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Kolmogorov-Smirnov (NDs = DL/2)	0.279	0.199	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	5.893	0.754						
Kolmogorov-Smirnov (Gamma ROS Est.)	0.526	0.197	Data Not Gamma Distributed					
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	0.997	0.856	0.843	0.974				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (Detects Only)	0.993	0.767	Data Appear Lognormal					
Shapiro-Wilk (NDs = DL)	0.755	0.905	Data Not Lognormal					
Shapiro-Wilk (NDs = DL/2)	0.718	0.905	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.962	0.905	Data Appear Lognormal					
Lilliefors (Detects Only)	0.205	0.425	Data Appear Lognormal					
Lilliefors (NDs = DL)	0.262	0.192	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.292	0.192	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.16	0.192	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Thallium (m-56a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	1	24	2	22	91.67%		
	Number	Minimum	Maximum	Mean	Median	SD		
Statistics (Non-Detects Only)	22	1.0000E-4	0.002	2.3182E-4	1.0000E-4	4.0870E-4		
Statistics (Non-Detects Only)	2	9.8000E-5	1.2000E-4	1.0900E-4	1.0900E-4	1.5556E-5		
Statistics (All: NDs treated as DL value)	24	9.8000E-5	0.002	2.2158E-4	1.0000E-4	3.9207E-4		
Statistics (All: NDs treated as DL/2 value)	24	5.0000E-5	0.001	1.1533E-4	5.0000E-5	1.9530E-4		
Statistics (Normal ROS Imputed Data)	24	8.1108E-5	1.2000E-4	9.8889E-5	9.8773E-5	8.7736E-6		
Statistics (Gamma ROS Imputed Data)	24	N/A	N/A	N/A	N/A	N/A		
Statistics (Lognormal ROS Imputed Data)	24	8.3886E-5	1.2000E-4	9.9116E-5	9.8700E-5	8.0916E-6		
	K hat	K Star	Theta hat	Log Mean	Log Stdv	Log CV		
Statistics (Non-Detects Only)	N/A	N/A	N/A	N/A	N/A	N/A		
Statistics (NDs = DL)	1.245	1.117	1.7798E-4	-8.867	0.726	-0.0819		
Statistics (NDs = DL/2)	1.291	1.157	8.9361E-5	-9.503	0.731	-0.0769		

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Statistics (Gamma ROS Estimates)	N/A	N/A	N/A	N/A	N/A	N/A		
Statistics (Lognormal ROS Estimates)	--	--	--	-9.222	0.0808	-0.00876		
Normal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Normal ROS				
Correlation Coefficient R	1	0.567	0.584	0.989				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (NDs = DL)	0.35	0.916	Data Not Normal					
Shapiro-Wilk (NDs = DL/2)	0.37	0.916	Data Not Normal					
Shapiro-Wilk (Normal ROS Estimates)	0.984	0.916	Data Appear Normal					
Lilliefors (Detects Only)	N/A	N/A						
Lilliefors (NDs = DL)	0.397	0.177	Data Not Normal					
Lilliefors (NDs = DL/2)	0.369	0.177	Data Not Normal					
Lilliefors (Normal ROS Estimates)	0.13	0.177	Data Appear Normal					
Gamma GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Gamma ROS				
Correlation Coefficient R	N/A	0.78	0.79	0.357				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Anderson-Darling (Detects Only)	N/A	N/A						
Kolmogorov-Smirnov (Detects Only)	N/A	N/A						
Anderson-Darling (NDs = DL)	5.105	0.767						
Kolmogorov-Smirnov (NDs = DL)	0.388	0.182	Data Not Gamma Distributed					
Anderson-Darling (NDs = DL/2)	4.289	0.766						
Kolmogorov-Smirnov (NDs = DL/2)	0.366	0.182	Data Not Gamma Distributed					
Anderson-Darling (Gamma ROS Estimates)	N/A	0.742						
Kolmogorov-Smirnov (Gamma ROS Est.)	N/A	0.177						
Lognormal GOF Test Results								
	No NDs	NDs = DL	NDs = DL/2	Log ROS				
Correlation Coefficient R	1	0.738	0.782	N/A				
	Test value	Crit. (0.05)	Conclusion with Alpha(0.05)					
Shapiro-Wilk (NDs = DL)	0.561	0.916	Data Not Lognormal					

Appendix B
Goodness of Fit Statistics

Raw Statistics	25	5	20	2	18	90.00%		
Shapiro-Wilk (NDs = DL/2)	0.624	0.916	Data Not Lognormal					
Shapiro-Wilk (Lognormal ROS Estimates)	0.984	0.916	Data Appear Lognormal					
Lilliefors (Detects Only)	N/A	N/A						
Lilliefors (NDs = DL)	0.39	0.177	Data Not Lognormal					
Lilliefors (NDs = DL/2)	0.375	0.177	Data Not Lognormal					
Lilliefors (Lognormal ROS Estimates)	0.13	0.177	Data Appear Lognormal					
Note: Substitution methods such as DL or DL/2 are not recommended.								
Thallium (m-57a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	26	2	24	1	23	95.83%		
Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!								
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).								
The data set for variable Thallium (m-57a) was not processed!								
Thallium (m-58a)								
	Num Obs	Num Miss	Num Valid	Detects	NDs	% NDs		
Raw Statistics	25	1	24	1	23	95.83%		
Warning: Only one distinct data value was detected! ProUCL (or any other software) should not be used on such a data set!								
It is suggested to use alternative site specific values determined by the Project Team to estimate environmental parameters (e.g., EPC, BTV).								
The data set for variable Thallium (m-58a) was not processed!								

Appendix B
Outlier Statistics

	Outlier Tests for Selected Uncensored Variables
User Selected Options	
Date/Time of Computation	ProUCL 5.17/26/2022 12:47:51 PM
From File	Cholla_SEDI_ProUCL_2022-07_a.xls
Full Precision	OFF

Dixon's Outlier Test for Barium (m-56a)

Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497

1. Observation Value 0.086 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.111

For 10% significance level, 0.086 is not an outlier.
For 5% significance level, 0.086 is not an outlier.
For 1% significance level, 0.086 is not an outlier.

2. Observation Value 0.043 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.179

For 10% significance level, 0.043 is not an outlier.
For 5% significance level, 0.043 is not an outlier.
For 1% significance level, 0.043 is not an outlier.

Dixon's Outlier Test for Barium (m-57a)

Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497

1. Observation Value 0.072 is a Potential Outlier (Upper Tail)?

Appendix B
Outlier Statistics

5% critical value: 0.413							
Test Statistic: 0.548							
For 10% significance level, 0.072 is an outlier.							
For 5% significance level, 0.072 is an outlier.							
For 1% significance level, 0.072 is an outlier.							
2. Observation Value 0.038 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.176							
For 10% significance level, 0.038 is not an outlier.							
For 5% significance level, 0.038 is not an outlier.							
For 1% significance level, 0.038 is not an outlier.							
Dixon's Outlier Test for Barium (m-58a)							
Number of Observations = 24							
10% critical value: 0.367							
5% critical value: 0.413							
1% critical value: 0.497							
1. Observation Value 0.11 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.213							
For 10% significance level, 0.11 is not an outlier.							
For 5% significance level, 0.11 is not an outlier.							
For 1% significance level, 0.11 is not an outlier.							
2. Observation Value 0.043 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.111							
For 10% significance level, 0.043 is not an outlier.							
For 5% significance level, 0.043 is not an outlier.							
For 1% significance level, 0.043 is not an outlier.							

Appendix B
Outlier Statistics

5% critical value: 0.413
Dixon's Outlier Test for Barium (m-62a)
Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497
1. Observation Value 0.16 is a Potential Outlier (Upper Tail)?
Test Statistic: 0.313
For 10% significance level, 0.16 is not an outlier.
For 5% significance level, 0.16 is not an outlier.
For 1% significance level, 0.16 is not an outlier.
2. Observation Value 0.05 is a Potential Outlier (Lower Tail)?
Test Statistic: 0.175
For 10% significance level, 0.05 is not an outlier.
For 5% significance level, 0.05 is not an outlier.
For 1% significance level, 0.05 is not an outlier.
Dixon's Outlier Test for Chromium (m-56a)
Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497
1. Observation Value 0.076 is a Potential Outlier (Upper Tail)?
Test Statistic: 0.702
For 10% significance level, 0.076 is an outlier.
For 5% significance level, 0.076 is an outlier.
For 1% significance level, 0.076 is an outlier.

Appendix B
Outlier Statistics

5% critical value: 0.413

2. Observation Value 0.0005 is a Potential Outlier (Lower Tail)?

Test Statistic: 0.000

For 10% significance level, 0.0005 is not an outlier.
For 5% significance level, 0.0005 is not an outlier.
For 1% significance level, 0.0005 is not an outlier.

Rosner's Outlier Test for Chromium (m-57a)

Mean	**0.0268**
Standard Deviation	**0.0341**
Number of data	**25**
Number of suspected outliers	**1**

#	Mean	sd	Potential outlier	Obs. Number	Test value	Critical value (5%)	Critical value (1%)
1	0.0268	0.0334	0.16	21	3.982	2.82	3.14

For 5% Significance Level, there is 1 Potential Outlier
Potential outliers is: 0.16

For 1% Significance Level, there is 1 Potential Outlier
Potential outliers is: 0.16

Dixon's Outlier Test for Chromium (m-58a)

Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497

1. Observation Value 0.01 is a Potential Outlier (Upper Tail)?

Test Statistic: 0.632

Appendix B
Outlier Statistics

5% critical value: 0.413
For 10% significance level, 0.01 is an outlier.
For 5% significance level, 0.01 is an outlier.
For 1% significance level, 0.01 is an outlier.
2. Observation Value 0.0005 is a Potential Outlier (Lower Tail)?
Test Statistic: 0.000
For 10% significance level, 0.0005 is not an outlier.
For 5% significance level, 0.0005 is not an outlier.
For 1% significance level, 0.0005 is not an outlier.
Dixon's Outlier Test for Chromium (m-62a)
Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497
1. Observation Value 0.01 is a Potential Outlier (Upper Tail)?
Test Statistic: 0.510
For 10% significance level, 0.01 is an outlier.
For 5% significance level, 0.01 is an outlier.
For 1% significance level, 0.01 is an outlier.
2. Observation Value 0.0005 is a Potential Outlier (Lower Tail)?
Test Statistic: 0.058
For 10% significance level, 0.0005 is not an outlier.
For 5% significance level, 0.0005 is not an outlier.
For 1% significance level, 0.0005 is not an outlier.
Dixon's Outlier Test for Cobalt (m-56a)

Appendix B
Outlier Statistics

5% critical value: 0.413							
Number of Observations = 24							
10% critical value: 0.367							
5% critical value: 0.413							
1% critical value: 0.497							
1. Observation Value 0.0025 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.250							
For 10% significance level, 0.0025 is not an outlier.							
For 5% significance level, 0.0025 is not an outlier.							
For 1% significance level, 0.0025 is not an outlier.							
2. Observation Value 0.0005 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.000							
For 10% significance level, 0.0005 is not an outlier.							
For 5% significance level, 0.0005 is not an outlier.							
For 1% significance level, 0.0005 is not an outlier.							
Dixon's Outlier Test for Cobalt (m-57a)							
Number of Observations = 24							
10% critical value: 0.367							
5% critical value: 0.413							
1% critical value: 0.497							
1. Observation Value 0.0088 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.033							
For 10% significance level, 0.0088 is not an outlier.							
For 5% significance level, 0.0088 is not an outlier.							
For 1% significance level, 0.0088 is not an outlier.							
2. Observation Value 0.0026 is a Potential Outlier (Lower Tail)?							

Appendix B
Outlier Statistics

5% critical value: 0.413							
Test Statistic: 0.033							
For 10% significance level, 0.0026 is not an outlier.							
For 5% significance level, 0.0026 is not an outlier.							
For 1% significance level, 0.0026 is not an outlier.							
Dixon's Outlier Test for Cobalt (m-58a)							
Number of Observations = 24							
10% critical value: 0.367							
5% critical value: 0.413							
1% critical value: 0.497							
1. Observation Value 0.01 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.842							
For 10% significance level, 0.01 is an outlier.							
For 5% significance level, 0.01 is an outlier.							
For 1% significance level, 0.01 is an outlier.							
2. Observation Value 0.00024 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.148							
For 10% significance level, 0.00024 is not an outlier.							
For 5% significance level, 0.00024 is not an outlier.							
For 1% significance level, 0.00024 is not an outlier.							
Dixon's Outlier Test for Cobalt (m-62a)							
Number of Observations = 24							
10% critical value: 0.367							
5% critical value: 0.413							
1% critical value: 0.497							
1. Observation Value 0.0025 is a Potential Outlier (Upper Tail)?							

Appendix B
Outlier Statistics

5% critical value: 0.413
Test Statistic: 0.250
For 10% significance level, 0.0025 is not an outlier.
For 5% significance level, 0.0025 is not an outlier.
For 1% significance level, 0.0025 is not an outlier.
2. Observation Value 0.00046 is a Potential Outlier (Lower Tail)?
Test Statistic: 0.026
For 10% significance level, 0.00046 is not an outlier.
For 5% significance level, 0.00046 is not an outlier.
For 1% significance level, 0.00046 is not an outlier.
Dixon's Outlier Test for Molybdenum (m-56a)
Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497
1. Observation Value 0.029 is a Potential Outlier (Upper Tail)?
Test Statistic: 0.379
For 10% significance level, 0.029 is an outlier.
For 5% significance level, 0.029 is not an outlier.
For 1% significance level, 0.029 is not an outlier.
2. Observation Value 0.0057 is a Potential Outlier (Lower Tail)?
Test Statistic: 0.144
For 10% significance level, 0.0057 is not an outlier.
For 5% significance level, 0.0057 is not an outlier.
For 1% significance level, 0.0057 is not an outlier.

Appendix B
Outlier Statistics

5% critical value: 0.413
Dixon's Outlier Test for Molybdenum (m-57a)
Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497
1. Observation Value 0.022 is a Potential Outlier (Upper Tail)?
Test Statistic: 0.515
For 10% significance level, 0.022 is an outlier.
For 5% significance level, 0.022 is an outlier.
For 1% significance level, 0.022 is an outlier.
2. Observation Value 0.0011 is a Potential Outlier (Lower Tail)?
Test Statistic: 0.138
For 10% significance level, 0.0011 is not an outlier.
For 5% significance level, 0.0011 is not an outlier.
For 1% significance level, 0.0011 is not an outlier.
Dixon's Outlier Test for Molybdenum (m-58a)
Number of Observations = 24
10% critical value: 0.367
5% critical value: 0.413
1% critical value: 0.497
1. Observation Value 0.02 is a Potential Outlier (Upper Tail)?
Test Statistic: 0.832
For 10% significance level, 0.02 is an outlier.
For 5% significance level, 0.02 is an outlier.
For 1% significance level, 0.02 is an outlier.

Appendix B
Outlier Statistics

5% critical value: 0.413							
2. Observation Value 0.0014 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.061							
For 10% significance level, 0.0014 is not an outlier.							
For 5% significance level, 0.0014 is not an outlier.							
For 1% significance level, 0.0014 is not an outlier.							
Dixon's Outlier Test for Molybdenum (m-62a)							
Number of Observations = 24							
10% critical value: 0.367							
5% critical value: 0.413							
1% critical value: 0.497							
1. Observation Value 0.015 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.457							
For 10% significance level, 0.015 is an outlier.							
For 5% significance level, 0.015 is an outlier.							
For 1% significance level, 0.015 is not an outlier.							
2. Observation Value 0.0019 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.028							
For 10% significance level, 0.0019 is not an outlier.							
For 5% significance level, 0.0019 is not an outlier.							
For 1% significance level, 0.0019 is not an outlier.							
Dixon's Outlier Test for Total Radium (m-56a)							
Number of Observations = 21							
10% critical value: 0.391							
5% critical value: 0.44							

Appendix B
Outlier Statistics

5% critical value: 0.413							
1% critical value: 0.524							
1. Observation Value 1.9 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.143							
For 10% significance level, 1.9 is not an outlier.							
For 5% significance level, 1.9 is not an outlier.							
For 1% significance level, 1.9 is not an outlier.							
2. Observation Value 0.4 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.077							
For 10% significance level, 0.4 is not an outlier.							
For 5% significance level, 0.4 is not an outlier.							
For 1% significance level, 0.4 is not an outlier.							
Dixon's Outlier Test for Total Radium (m-57a)							
Number of Observations = 21							
10% critical value: 0.391							
5% critical value: 0.44							
1% critical value: 0.524							
1. Observation Value 1.5 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.444							
For 10% significance level, 1.5 is an outlier.							
For 5% significance level, 1.5 is an outlier.							
For 1% significance level, 1.5 is not an outlier.							
2. Observation Value 0.4 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.286							
For 10% significance level, 0.4 is not an outlier.							

Appendix B
Outlier Statistics

5% critical value: 0.413							
For 5% significance level, 0.4 is not an outlier.							
For 1% significance level, 0.4 is not an outlier.							
Dixon's Outlier Test for Total Radium (m-58a)							
Number of Observations = 21							
10% critical value: 0.391							
5% critical value: 0.44							
1% critical value: 0.524							
1. Observation Value 2.6 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.350							
For 10% significance level, 2.6 is not an outlier.							
For 5% significance level, 2.6 is not an outlier.							
For 1% significance level, 2.6 is not an outlier.							
2. Observation Value 0.5 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.071							
For 10% significance level, 0.5 is not an outlier.							
For 5% significance level, 0.5 is not an outlier.							
For 1% significance level, 0.5 is not an outlier.							
Dixon's Outlier Test for Total Radium (m-62a)							
Number of Observations = 20							
10% critical value: 0.401							
5% critical value: 0.45							
1% critical value: 0.535							
1. Observation Value 2 is a Potential Outlier (Upper Tail)?							
Test Statistic: 0.429							

Appendix B
Outlier Statistics

5% critical value: 0.413							
For 10% significance level, 2 is an outlier.							
For 5% significance level, 2 is not an outlier.							
For 1% significance level, 2 is not an outlier.							
2. Observation Value 0.5 is a Potential Outlier (Lower Tail)?							
Test Statistic: 0.111							
For 10% significance level, 0.5 is not an outlier.							
For 5% significance level, 0.5 is not an outlier.							
For 1% significance level, 0.5 is not an outlier.							

Appendix B
Summary Statistics

	General Statistics on Uncensored Data
Date/Time of Computation	ProUCL 5.17/24/2022 7:29:10 PM
User Selected Options	
From File	Cholla_SEDI_ProUCL_2022-07.xls
Full Precision	OFF

From File: Cholla_SEDI_ProUCL_2022-07.xls

General Statistics for Censored Data Set (with NDs) using Kaplan Meier Method

Variable	NumObs	# Missing	Num Ds	NumNDs	% NDs	Min ND	Max ND	KM Mean	KM Var	KM SD	KM CV
Antimony (m-56a)	20	5	2	18	90.00%	1.0000E-4	0.05	1.5000E-4	2.6000E-9	5.0990E-5	0.34
Antimony (m-57a)	20	6	2	18	90.00%	1.0000E-4	0.05	1.1000E-4	6.667E-11	8.1650E-6	0.0742
Antimony (m-58a)	20	5	0	20	100.00%	1.0000E-4	0.05	N/A	N/A	N/A	N/A
Arsenic (m-56a)	24	1	20	4	16.67%	0.001	0.01	0.00229	6.7007E-6	0.00259	1.128
Arsenic (m-57a)	24	2	24	0	0.00%	N/A	N/A	0.00456	1.5896E-5	0.00399	0.875
Arsenic (m-58a)	24	1	23	1	4.17%	0.01	0.01	0.00436	1.0806E-6	0.00104	0.238
Barium (m-56a)	24	1	24	0	0.00%	N/A	N/A	0.0666	1.4338E-4	0.012	0.18
Barium (m-57a)	24	2	24	0	0.00%	N/A	N/A	0.0463	6.2493E-5	0.00791	0.171
Barium (m-58a)	24	1	24	0	0.00%	N/A	N/A	0.0696	2.6530E-4	0.0163	0.234
Beryllium (m-56a)	20	5	0	20	100.00%	0.001	0.001	N/A	N/A	N/A	N/A
Beryllium (m-57a)	20	6	0	20	100.00%	0.001	0.001	N/A	N/A	N/A	N/A
Beryllium (m-58a)	20	5	0	20	100.00%	0.001	0.001	N/A	N/A	N/A	N/A
Cadmium (m-56a)	20	5	0	20	100.00%	1.0000E-4	0.002	N/A	N/A	N/A	N/A
Cadmium (m-57a)	20	6	1	19	95.00%	1.0000E-4	0.002	1.0154E-4	2.840E-11	5.3294E-6	0.0525
Cadmium (m-58a)	20	5	0	20	100.00%	1.0000E-4	0.002	N/A	N/A	N/A	N/A
Chromium (m-56a)	24	1	20	4	16.67%	5.0000E-4	0.01	0.0103	2.5018E-4	0.0158	1.533
Chromium (m-57a)	25	1	22	3	12.00%	5.0000E-4	0.01	0.0264	0.00114	0.0337	1.278
Chromium (m-58a)	24	1	8	16	66.67%	5.0000E-4	0.01	9.6161E-4	6.1190E-7	7.8224E-4	0.813
Cobalt (m-56a)	24	1	16	8	33.33%	5.0000E-4	0.0025	8.6794E-4	1.3848E-7	3.7213E-4	0.429
Cobalt (m-57a)	24	2	24	0	0.00%	N/A	N/A	0.00611	4.6924E-6	0.00217	0.354
Cobalt (m-58a)	24	1	7	17	70.83%	5.0000E-4	0.01	4.2345E-4	8.6589E-8	2.9426E-4	0.695
Fluoride (m-56a)	24	1	10	14	58.33%	0.4	0.8	0.41	9.0526E-4	0.0301	0.0734
Fluoride (m-57a)	24	2	4	20	83.33%	0.4	0.8	0.376	0.00159	0.0399	0.106
Fluoride (m-58a)	24	1	3	21	87.50%	0.4	0.8	0.335	5.9335E-4	0.0244	0.0727
Lead (m-56a)	20	5	0	20	100.00%	1.0000E-4	0.01	N/A	N/A	N/A	N/A
Lead (m-57a)	20	6	2	18	90.00%	5.0000E-4	0.01	2.6000E-4	3.0000E-8	1.7321E-4	0.666
Lead (m-58a)	20	5	4	16	80.00%	1.0000E-4	0.01	2.7683E-4	9.3733E-8	3.0616E-4	1.106

Appendix B
Summary Statistics

Lithium (m-56a)	21	4	4	17	80.95%	0.2	1	0.104	3.4188E-5	0.00585	0.0561
Lithium (m-57a)	21	5	4	17	80.95%	0.2	1	0.097	1.1000E-5	0.00332	0.0342
Lithium (m-58a)	21	4	4	17	80.95%	0.2	1	0.0725	1.9250E-5	0.00439	0.0605
Mercury (m-56a)	20	5	0	20	100.00%	2.0000E-4	2.0000E-4	N/A	N/A	N/A	N/A
Mercury (m-57a)	20	6	0	20	100.00%	2.0000E-4	2.0000E-4	N/A	N/A	N/A	N/A
Mercury (m-58a)	20	5	0	20	100.00%	2.0000E-4	2.0000E-4	N/A	N/A	N/A	N/A
lolybdenum (m-56a)	24	1	24	0	0.00%	N/A	N/A	0.0119	2.9892E-5	0.00547	0.46
lolybdenum (m-57a)	24	2	23	1	4.17%	0.0025	0.0025	0.00631	2.3659E-5	0.00486	0.771
lolybdenum (m-58a)	24	1	21	3	12.50%	0.0018	0.01	0.0027	1.3424E-5	0.00366	1.358
otal Radium (m-56a)	21	4	14	7	33.33%	0.4	1.2	0.925	0.254	0.504	0.545
otal Radium (m-57a)	21	5	6	15	71.43%	0.4	0.9	0.591	0.0804	0.284	0.48
otal Radium (m-58a)	21	4	11	10	47.62%	0.6	0.9	0.913	0.378	0.615	0.673
Selenium (m-56a)	20	5	6	14	70.00%	5.0000E-4	0.01	4.9094E-4	9.8222E-8	3.1340E-4	0.638
Selenium (m-57a)	20	6	4	16	80.00%	5.0000E-4	0.01	4.2647E-4	9.5270E-8	3.0866E-4	0.724
Selenium (m-58a)	20	5	3	17	85.00%	5.0000E-4	0.01	3.1679E-4	4.1247E-8	2.0309E-4	0.641
Thallium (m-56a)	24	1	2	22	91.67%	1.0000E-4	0.002	9.9222E-5	2.540E-11	5.0394E-6	0.0508
Thallium (m-57a)	24	2	1	23	95.83%	1.0000E-4	0.002	6.0000E-5	0	0	N/A
Thallium (m-58a)	24	1	1	23	95.83%	1.0000E-4	0.002	2.0000E-5	0	0	N/A

General Statistics for Raw Data Sets using Detected Data Only

Variable	NumObs	# Missing	Minimum	Maximum	Mean	Median	Var	SD	MAD/0.675	Skewness	CV
Antimony (m-56a)	2	5	1.3000E-4	2.2000E-4	1.7500E-4	1.7500E-4	4.0500E-9	6.3640E-5	6.6716E-5	N/A	0.364
Antimony (m-57a)	2	6	1.1000E-4	1.2000E-4	1.1500E-4	1.1500E-4	5.000E-11	7.0711E-6	7.4129E-6	N/A	0.0615
Antimony (m-58a)	0	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arsenic (m-56a)	20	1	6.0000E-4	0.0088	0.00251	0.00102	7.7197E-6	0.00278	5.1890E-4	1.622	1.106
Arsenic (m-57a)	24	2	0.0017	0.021	0.00456	0.0037	1.5896E-5	0.00399	0.00185	3.35	0.875
Arsenic (m-58a)	23	1	0.0025	0.0066	0.00436	0.0042	1.1298E-6	0.00106	7.4129E-4	0.284	0.244
Barium (m-56a)	24	1	0.043	0.086	0.0666	0.0675	1.4338E-4	0.012	0.0119	-0.253	0.18
Barium (m-57a)	24	2	0.038	0.072	0.0463	0.0435	6.2493E-5	0.00791	0.00371	2.022	0.171
Barium (m-58a)	24	1	0.043	0.11	0.0696	0.0675	2.6530E-4	0.0163	0.0126	0.791	0.234
Beryllium (m-56a)	0	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Beryllium (m-57a)	0	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Beryllium (m-58a)	0	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cadmium (m-56a)	0	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Cadmium (m-57a)	1	6	1.2000E-4	1.2000E-4	1.2000E-4	1.2000E-4	N/A	N/A	0	N/A	N/A
Cadmium (m-58a)	0	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Appendix B
Summary Statistics

Chromium (m-56a)	20	1	5.1000E-4	0.076	0.012	0.00615	2.9623E-4	0.0172	0.00452	3.055	1.429
Chromium (m-57a)	22	1	6.6000E-4	0.16	0.0298	0.018	0.00125	0.0354	0.0202	2.65	1.19
Chromium (m-58a)	8	1	5.2000E-4	0.0033	0.00151	9.8500E-4	1.1888E-6	0.00109	6.6716E-4	0.999	0.724
Cobalt (m-56a)	16	1	6.1000E-4	0.002	9.9125E-4	7.6500E-4	1.4601E-7	3.8211E-4	2.0756E-4	1.244	0.385
Cobalt (m-57a)	24	2	0.0026	0.0088	0.00611	0.0066	4.6924E-6	0.00217	0.00245	-0.396	0.354
Cobalt (m-58a)	7	1	2.4000E-4	0.0011	7.4000E-4	7.9000E-4	9.7400E-8	3.1209E-4	3.2617E-4	-0.503	0.422
Fluoride (m-56a)	10	1	0.39	0.49	0.428	0.415	0.00115	0.0339	0.0222	0.833	0.0793
Fluoride (m-57a)	4	2	0.35	0.53	0.42	0.4	0.0062	0.0787	0.0519	1.262	0.187
Fluoride (m-58a)	3	1	0.32	0.43	0.363	0.34	0.00343	0.0586	0.0297	1.508	0.161
Lead (m-56a)	0	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Lead (m-57a)	2	6	2.1000E-4	8.6000E-4	5.3500E-4	5.3500E-4	2.1125E-7	4.5962E-4	4.8184E-4	N/A	0.859
Lead (m-58a)	4	5	5.6000E-4	0.0011	7.5750E-4	6.8500E-4	6.1625E-8	2.4824E-4	1.6308E-4	1.211	0.328
Lithium (m-56a)	4	4	0.097	0.11	0.104	0.105	4.5583E-5	0.00675	0.00741	-0.168	0.0648
Lithium (m-57a)	4	5	0.092	0.1	0.097	0.098	1.4667E-5	0.00383	0.00297	-0.855	0.0395
Lithium (m-58a)	4	4	0.069	0.08	0.0725	0.0705	2.5667E-5	0.00507	0.00148	1.846	0.0699
Mercury (m-56a)	0	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mercury (m-57a)	0	6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Mercury (m-58a)	0	5	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
lolybdenum (m-56a)	24	1	0.0057	0.029	0.0119	0.00975	2.9892E-5	0.00547	0.00252	1.909	0.46
lolybdenum (m-57a)	23	2	0.0011	0.022	0.00653	0.0047	2.4523E-5	0.00495	0.00267	2.029	0.758
lolybdenum (m-58a)	21	1	0.0014	0.02	0.00283	0.0018	1.5937E-5	0.00399	2.9652E-4	4.384	1.411
otal Radium (m-56a)	14	4	0.5	1.9	1.121	1.15	0.279	0.528	0.815	0.112	0.471
otal Radium (m-57a)	6	5	0.5	1.5	0.917	0.9	0.146	0.382	0.371	0.521	0.416
otal Radium (m-58a)	11	4	0.5	2.6	1.282	0.9	0.478	0.691	0.445	0.86	0.539
Selenium (m-56a)	6	5	3.3000E-4	0.0016	7.4833E-4	5.9500E-4	1.9758E-7	4.4450E-4	1.8532E-4	1.812	0.594
Selenium (m-57a)	4	6	2.9000E-4	0.0014	8.4500E-4	8.4500E-4	2.2137E-7	4.7050E-4	5.2632E-4	-7.29E-16	0.557
Selenium (m-58a)	3	5	2.4000E-4	9.9000E-4	5.9000E-4	5.4000E-4	1.4250E-7	3.7749E-4	4.4477E-4	0.586	0.64
Thallium (m-56a)	2	1	9.8000E-5	1.2000E-4	1.0900E-4	1.0900E-4	2.420E-10	1.5556E-5	1.6308E-5	N/A	0.143
Thallium (m-57a)	1	2	6.0000E-5	6.0000E-5	6.0000E-5	6.0000E-5	N/A	N/A	0	N/A	N/A
Thallium (m-58a)	1	1	2.0000E-5	2.0000E-5	2.0000E-5	2.0000E-5	N/A	N/A	0	N/A	N/A

Percentiles using all Detects (Ds) and Non-Detects (NDs)

Variable	NumObs	# Missing	10%ile	20%ile	25%ile(Q1)	50%ile(Q2)	75%ile(Q3)	80%ile	90%ile	95%ile	99%ile
Antimony (m-56a)	20	5	2.1100E-4	9.0000E-4	0.001	0.001	0.002	0.0021	0.0041	0.00725	0.0414
Antimony (m-57a)	20	6	1.1900E-4	9.0000E-4	0.001	0.001	0.002	0.0021	0.0041	0.00725	0.0414
Antimony (m-58a)	20	5	4.6000E-4	0.001	0.001	0.001	0.002	0.0021	0.0041	0.00725	0.0414

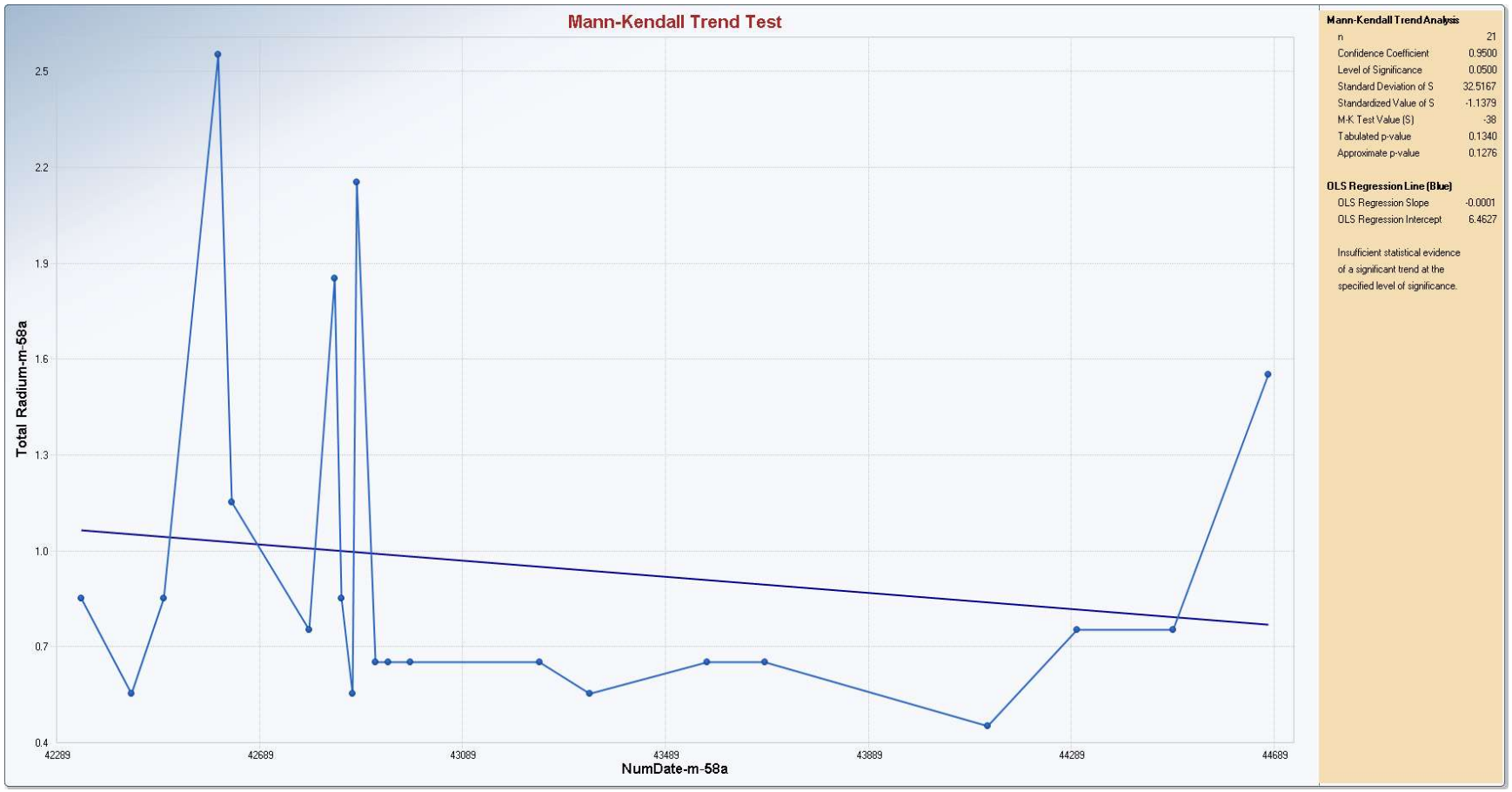
Appendix B
Summary Statistics

Arsenic (m-56a)	24	1	6.8600E-4	7.5600E-4	7.9750E-4	0.0012	0.00295	0.00362	0.00841	0.00876	0.00972
Arsenic (m-57a)	24	2	0.00196	0.00226	0.00253	0.0037	0.00488	0.0055	0.00654	0.00932	0.0184
Arsenic (m-58a)	24	1	0.00306	0.0037	0.00378	0.00425	0.00518	0.00552	0.00598	0.00653	0.00922
Barium (m-56a)	24	1	0.05	0.0538	0.0595	0.0675	0.0753	0.0768	0.0817	0.0837	0.0855
Barium (m-57a)	24	2	0.041	0.0416	0.042	0.0435	0.047	0.0486	0.055	0.0618	0.0699
Barium (m-58a)	24	1	0.0508	0.0574	0.0613	0.0675	0.0768	0.0794	0.0922	0.0996	0.108
Beryllium (m-56a)	20	5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Beryllium (m-57a)	20	6	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Beryllium (m-58a)	20	5	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Cadmium (m-56a)	20	5	1.0000E-4	1.0000E-4	1.0000E-4	1.0000E-4	2.0000E-4	2.0000E-4	4.1000E-4	5.7500E-4	0.00172
Cadmium (m-57a)	20	6	1.0000E-4	1.0000E-4	1.0000E-4	1.0000E-4	2.0000E-4	2.0000E-4	4.1000E-4	5.7500E-4	0.00172
Cadmium (m-58a)	20	5	1.0000E-4	1.0000E-4	1.0000E-4	1.0000E-4	2.0000E-4	2.0000E-4	4.1000E-4	5.7500E-4	0.00172
Chromium (m-56a)	24	1	7.1700E-4	0.0024	0.00325	0.0056	0.00948	0.0116	0.0221	0.0324	0.0663
Chromium (m-57a)	25	1	0.00136	0.00476	0.0067	0.016	0.035	0.0388	0.0516	0.0768	0.141
Chromium (m-58a)	24	1	5.0600E-4	7.6600E-4	9.5500E-4	0.001	0.002	0.0024	0.00379	0.00485	0.00885
Cobalt (m-56a)	24	1	5.0000E-4	6.2800E-4	6.4750E-4	7.6500E-4	0.00123	0.0013	0.00179	0.002	0.00239
Cobalt (m-57a)	24	2	0.00283	0.0038	0.0043	0.0066	0.0079	0.0082	0.00851	0.00869	0.00878
Cobalt (m-58a)	24	1	5.0000E-4	5.0000E-4	5.0000E-4	5.0500E-4	0.001	0.001	0.00173	0.00243	0.00828
Fluoride (m-56a)	24	1	0.4	0.4	0.4	0.405	0.475	0.614	0.8	0.8	0.8
Fluoride (m-57a)	24	2	0.4	0.4	0.4	0.4	0.405	0.464	0.8	0.8	0.8
Fluoride (m-58a)	24	1	0.4	0.4	0.4	0.4	0.408	0.578	0.8	0.8	0.8
Lead (m-56a)	20	5	5.0000E-4	5.0000E-4	5.0000E-4	5.0000E-4	0.001	0.001	0.00205	0.00288	0.00857
Lead (m-57a)	20	6	5.0000E-4	5.0000E-4	5.0000E-4	5.0000E-4	0.001	0.001	0.00205	0.00288	0.00857
Lead (m-58a)	20	5	5.0000E-4	5.0000E-4	5.0000E-4	5.3000E-4	0.001	0.00102	0.00205	0.00288	0.00857
Lithium (m-56a)	21	4	0.11	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.84
Lithium (m-57a)	21	5	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.84
Lithium (m-58a)	21	4	0.071	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.84
Mercury (m-56a)	20	5	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4
Mercury (m-57a)	20	6	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4
Mercury (m-58a)	20	5	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4	2.0000E-4
lolybdenum (m-56a)	24	1	0.00793	0.00822	0.0086	0.00975	0.013	0.0134	0.0195	0.0227	0.0276
lolybdenum (m-57a)	24	2	0.00269	0.00296	0.00353	0.00465	0.00713	0.00788	0.0113	0.0171	0.0211
lolybdenum (m-58a)	24	1	0.0016	0.0017	0.0017	0.0018	0.0022	0.00232	0.00404	0.0092	0.0177
otal Radium (m-56a)	21	4	0.5	0.6	0.6	0.8	1.4	1.5	1.7	1.8	1.88
otal Radium (m-57a)	21	5	0.6	0.6	0.6	0.7	0.8	0.8	1.1	1.1	1.42
otal Radium (m-58a)	21	4	0.6	0.7	0.7	0.8	0.9	1.2	1.9	2.2	2.52
Selenium (m-56a)	20	5	5.0000E-4	5.0000E-4	5.0000E-4	5.6500E-4	0.001	0.00112	0.00205	0.00288	0.00857

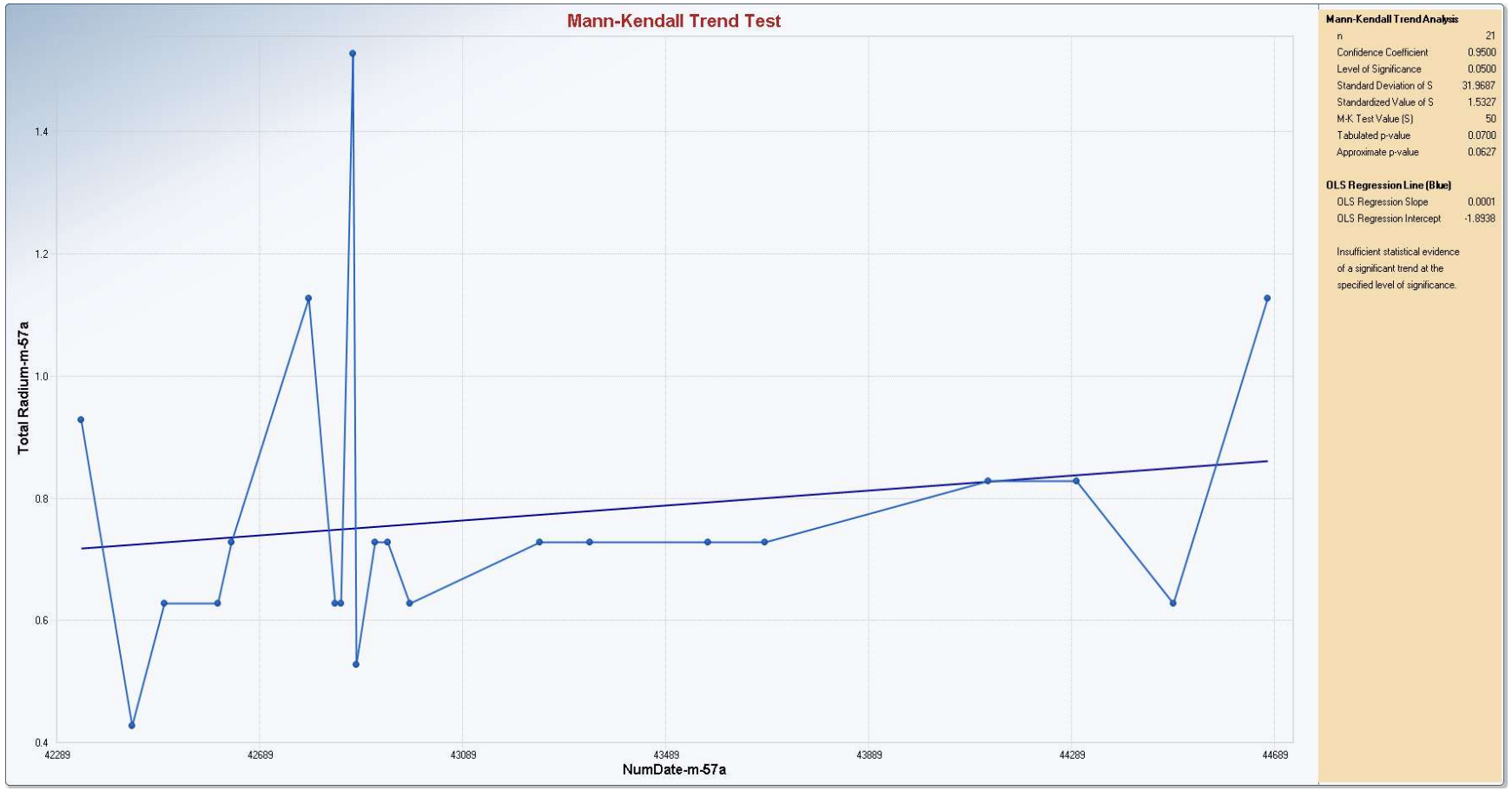
Appendix B
Summary Statistics

Selenium (m-57a)	20	6	5.0000E-4	5.0000E-4	5.0000E-4	5.5000E-4	0.001	0.00108	0.00205	0.00288	0.00857
Selenium (m-58a)	20	5	5.0000E-4	5.0000E-4	5.0000E-4	5.0000E-4	0.001	0.001	0.00205	0.00288	0.00857
Thallium (m-56a)	24	1	1.0000E-4	1.0000E-4	1.0000E-4	1.0000E-4	1.4000E-4	2.0000E-4	3.4000E-4	4.8500E-4	0.00166
Thallium (m-57a)	24	2	1.0000E-4	1.0000E-4	1.0000E-4	1.0000E-4	2.0000E-4	2.0000E-4	3.4000E-4	4.8500E-4	0.00166
Thallium (m-58a)	24	1	1.0000E-4	1.0000E-4	1.0000E-4	1.0000E-4	2.0000E-4	2.0000E-4	3.4000E-4	4.8500E-4	0.00166

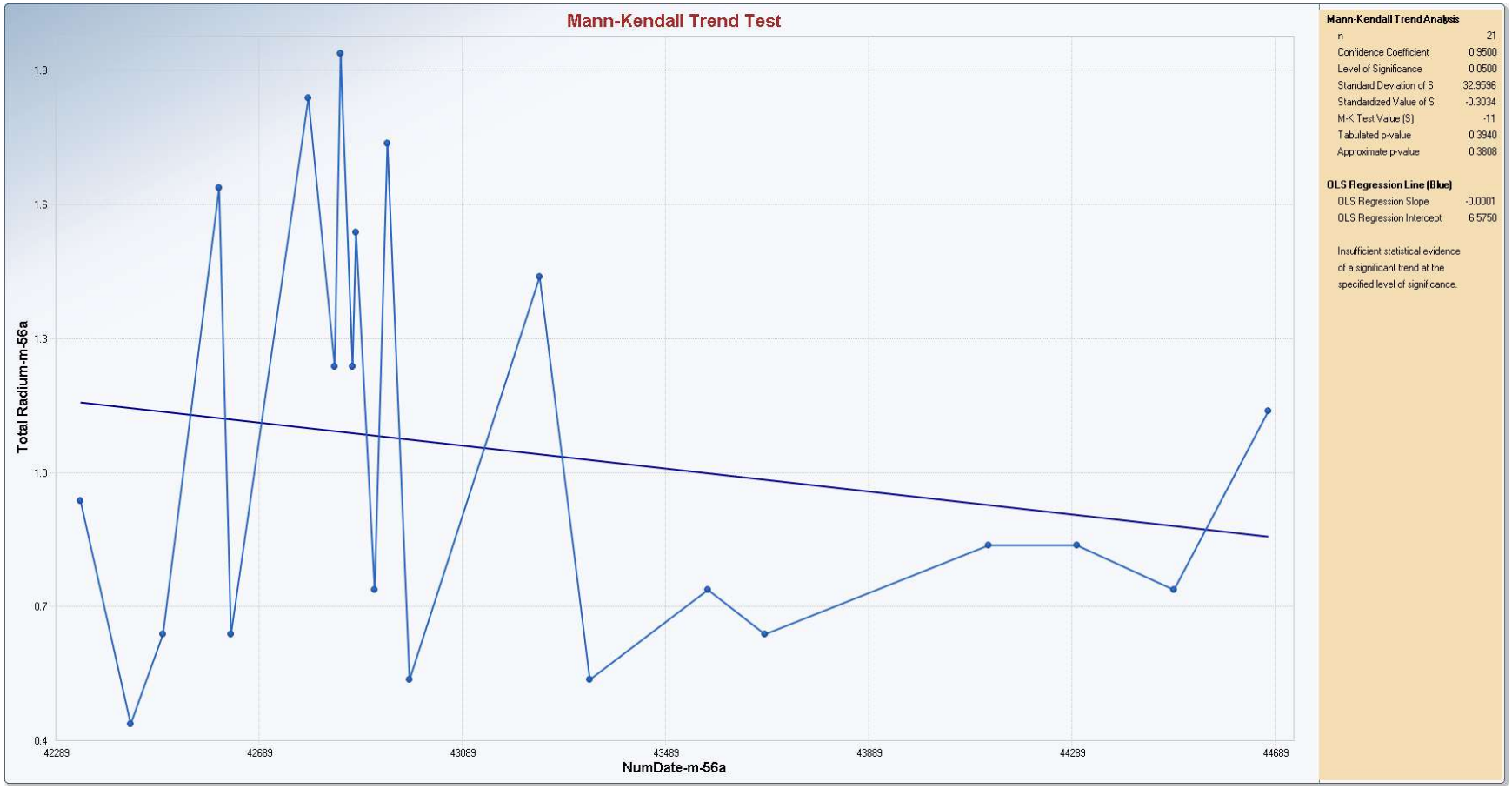
Appendix B
Time Series Plots



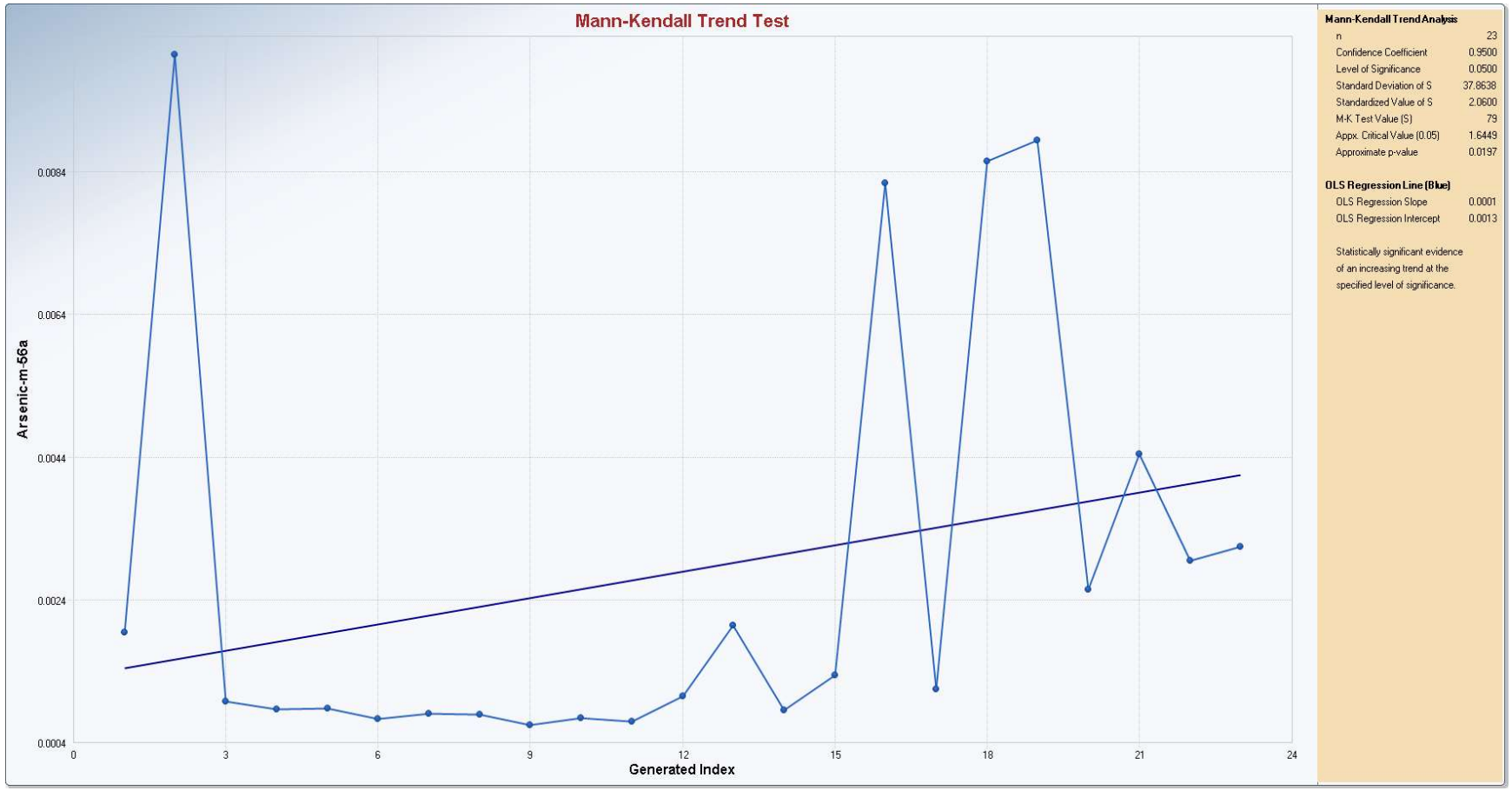
Appendix B
Time Series Plots



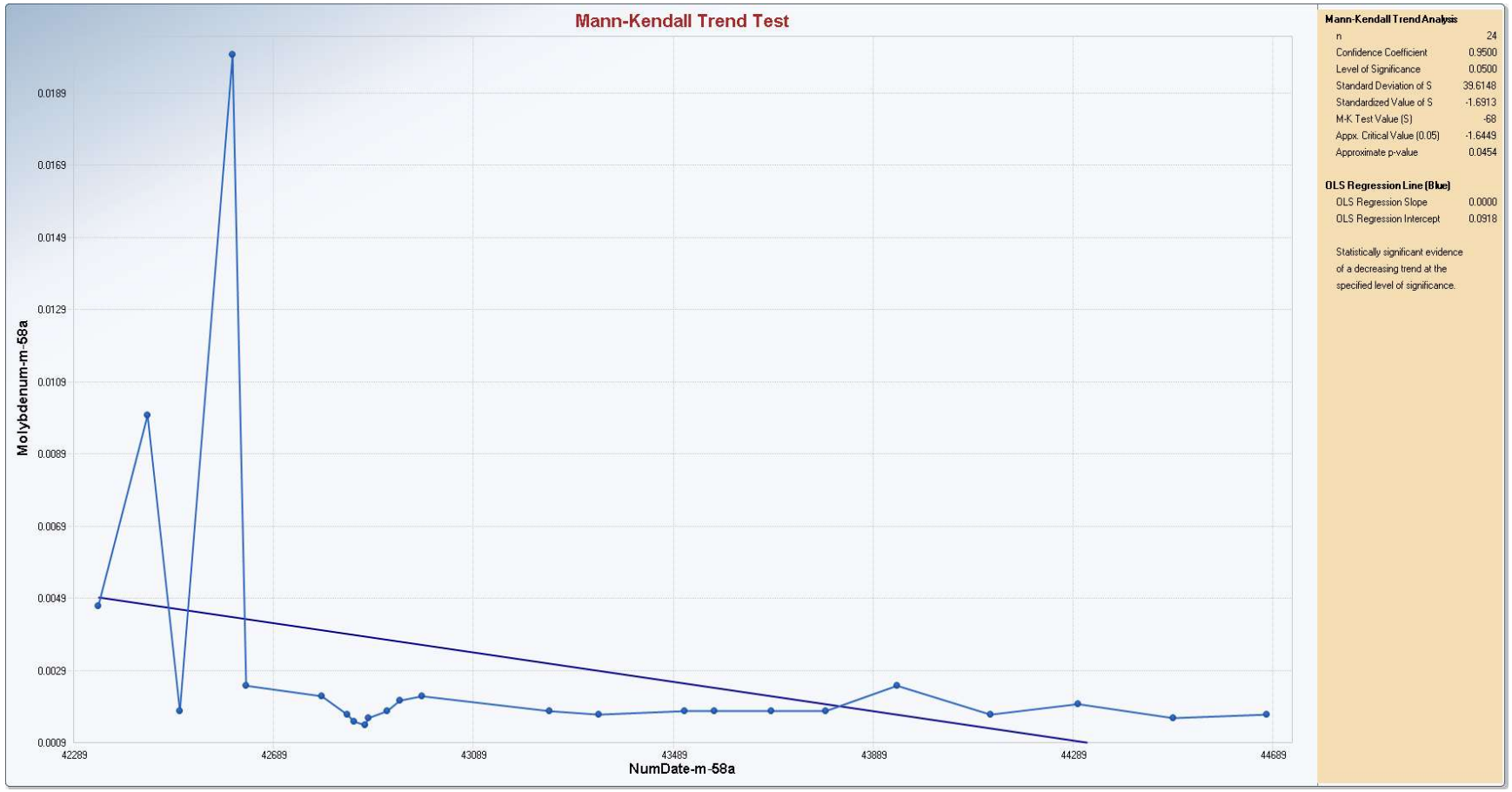
Appendix B
Time Series Plots



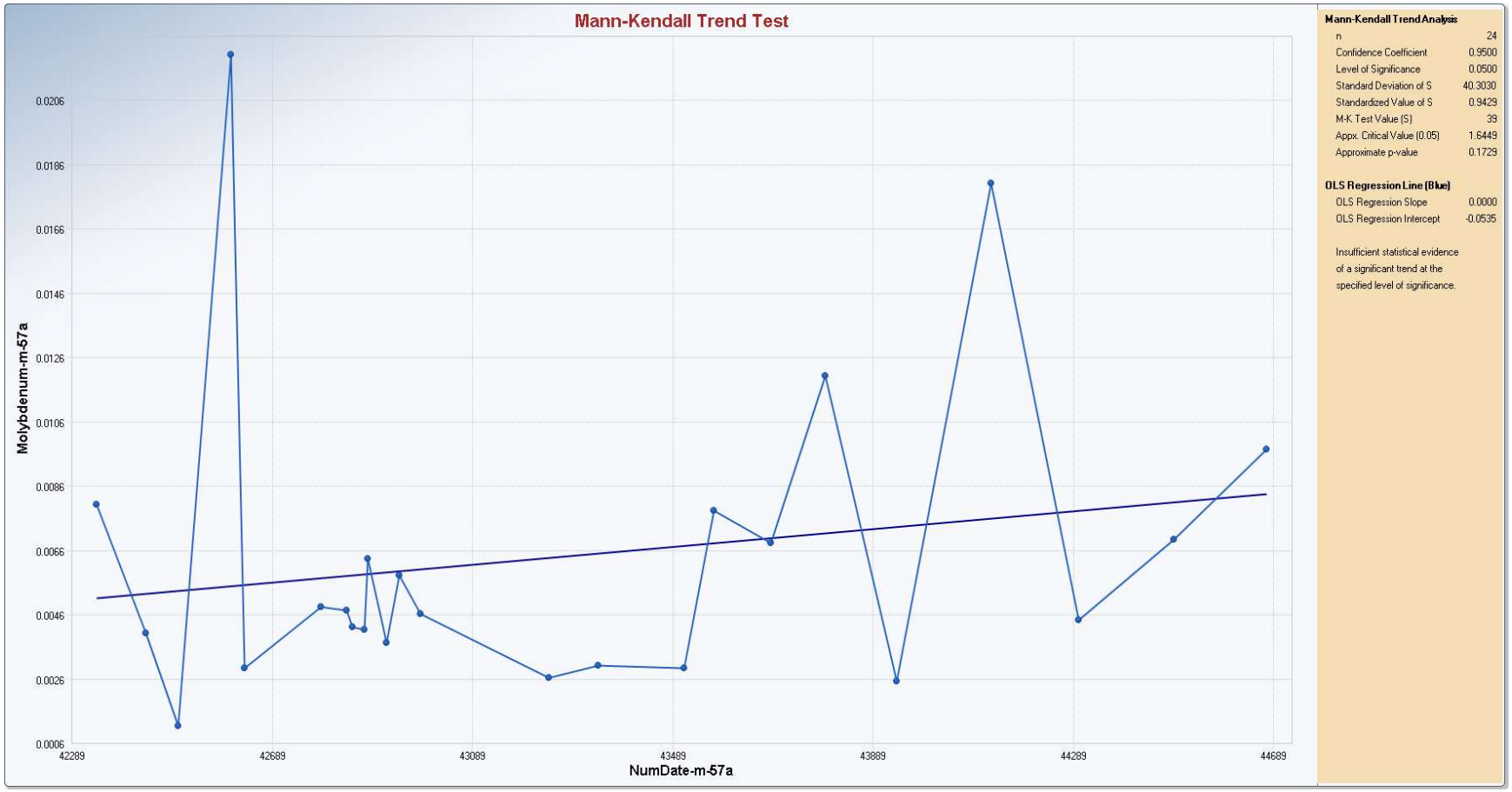
Appendix B
Time Series Plots



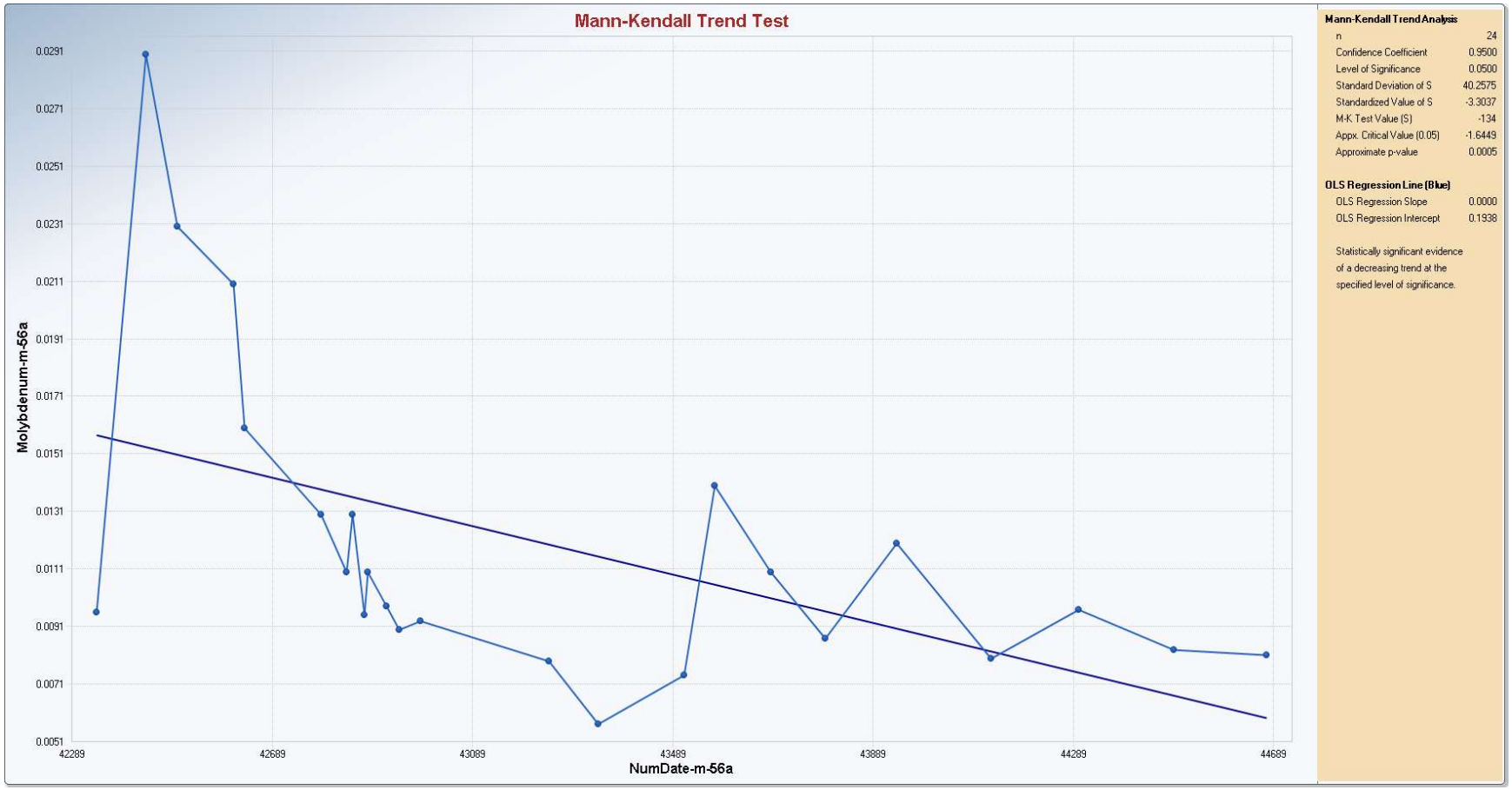
Appendix B
Time Series Plots



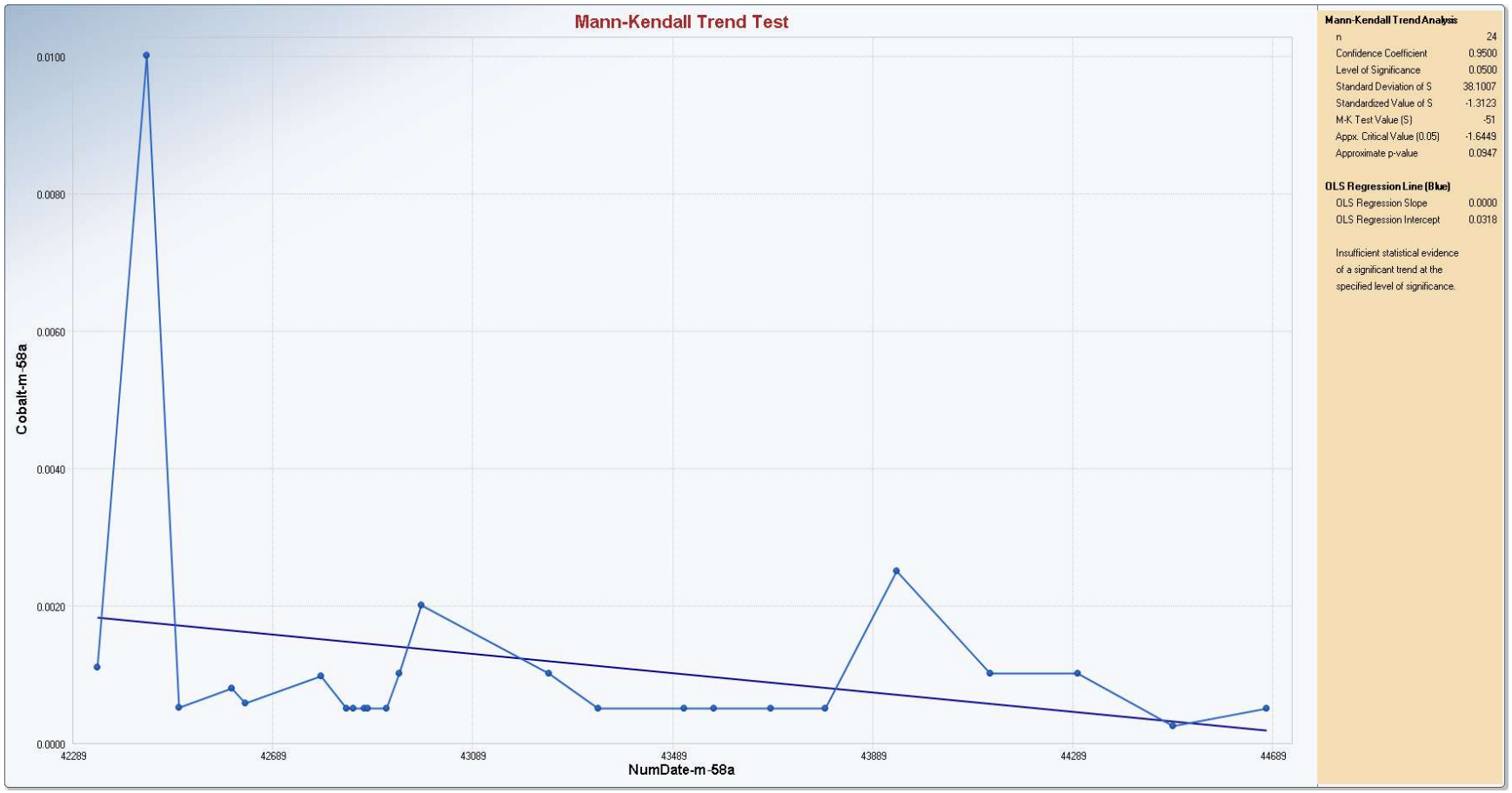
Appendix B
Time Series Plots



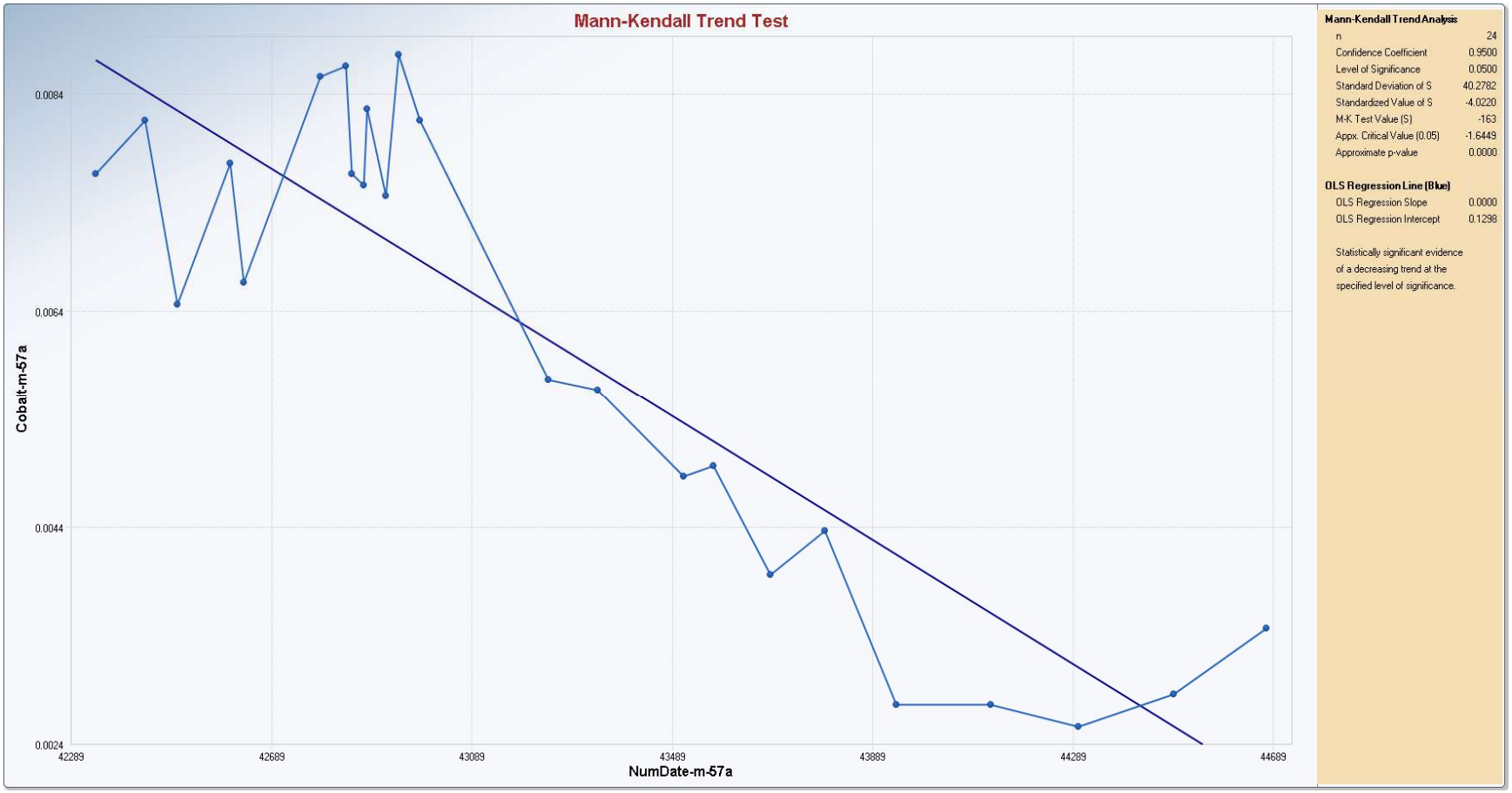
Appendix B
Time Series Plots



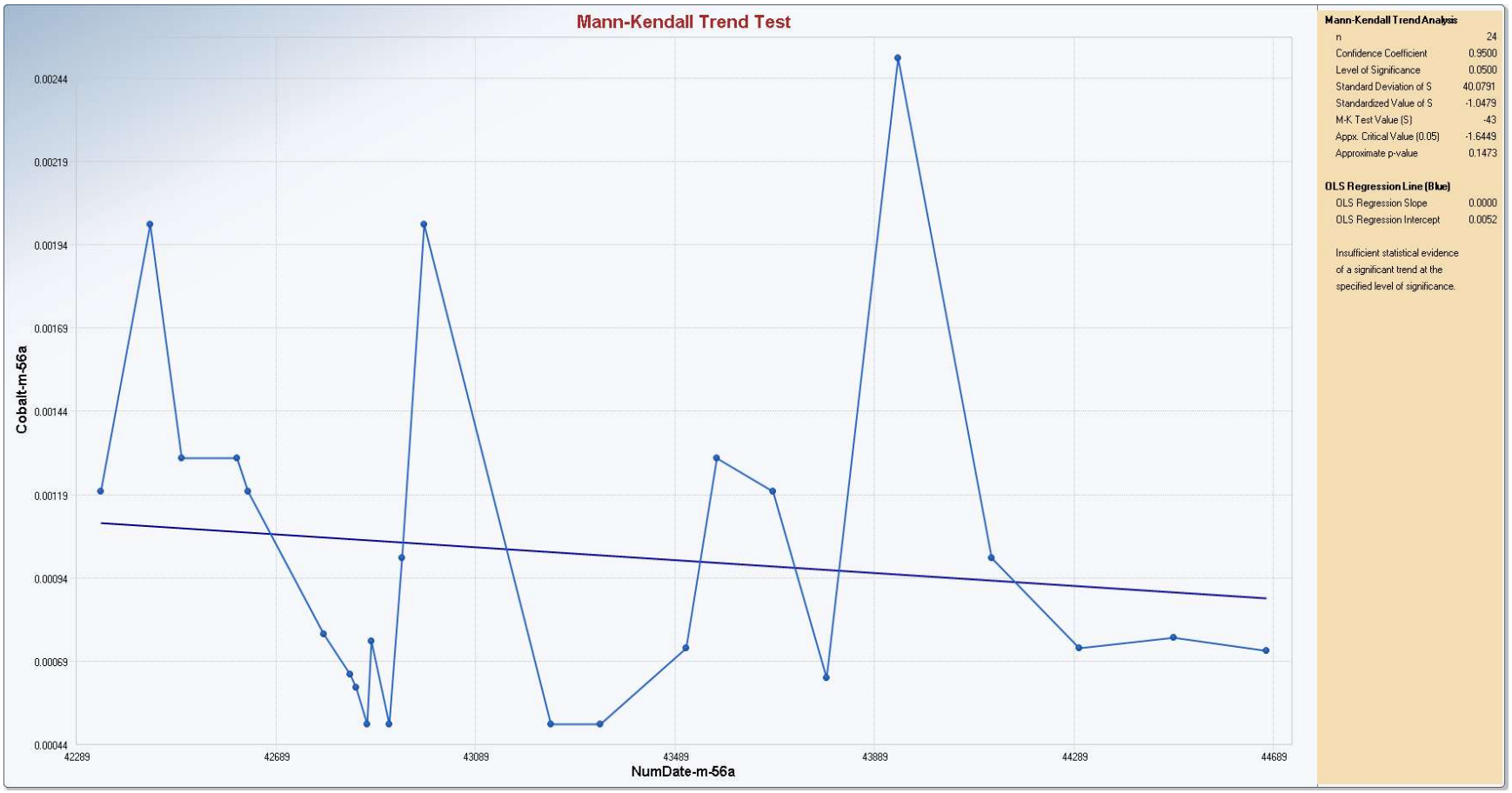
Appendix B
Time Series Plots



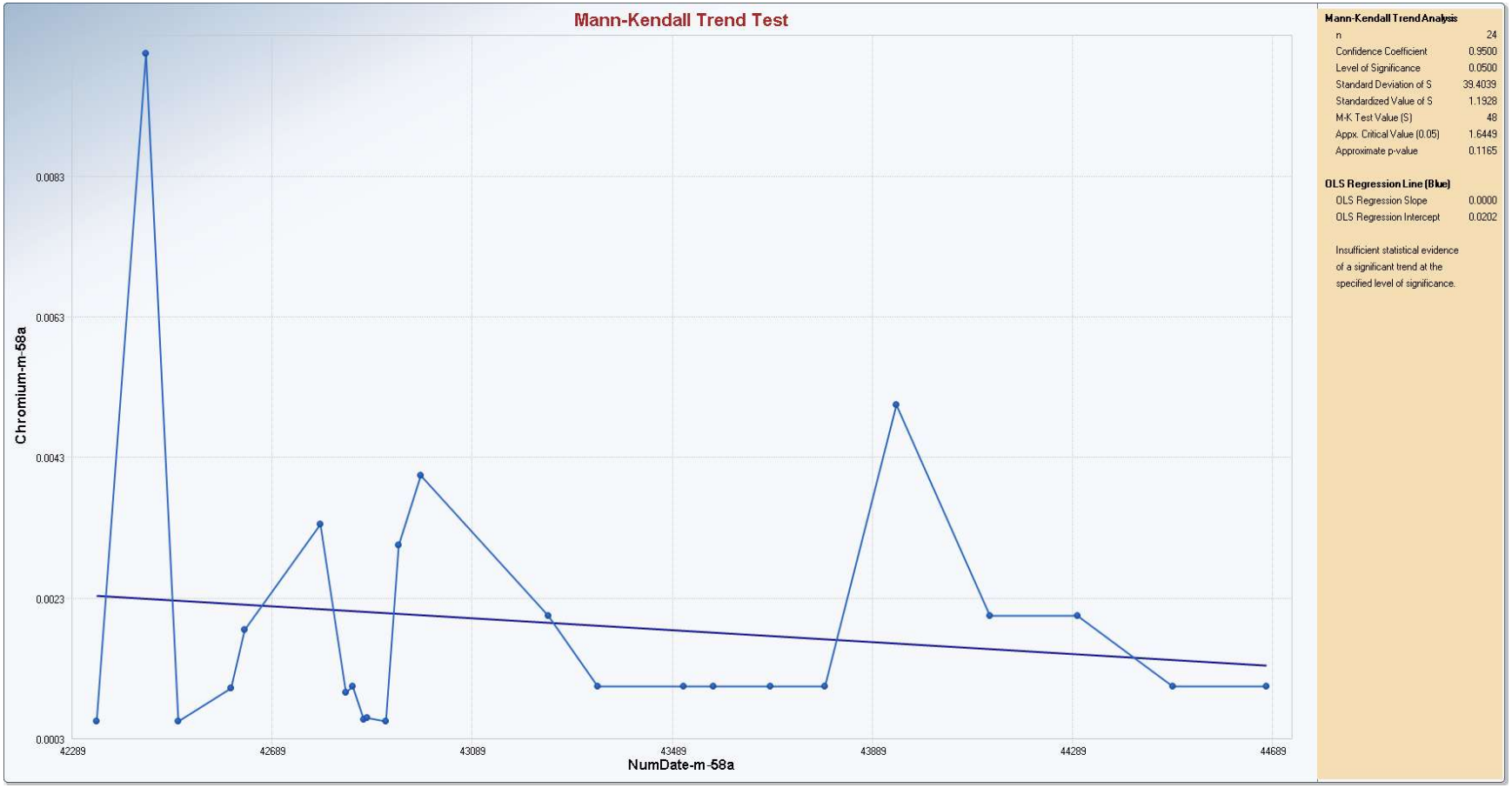
Appendix B
Time Series Plots



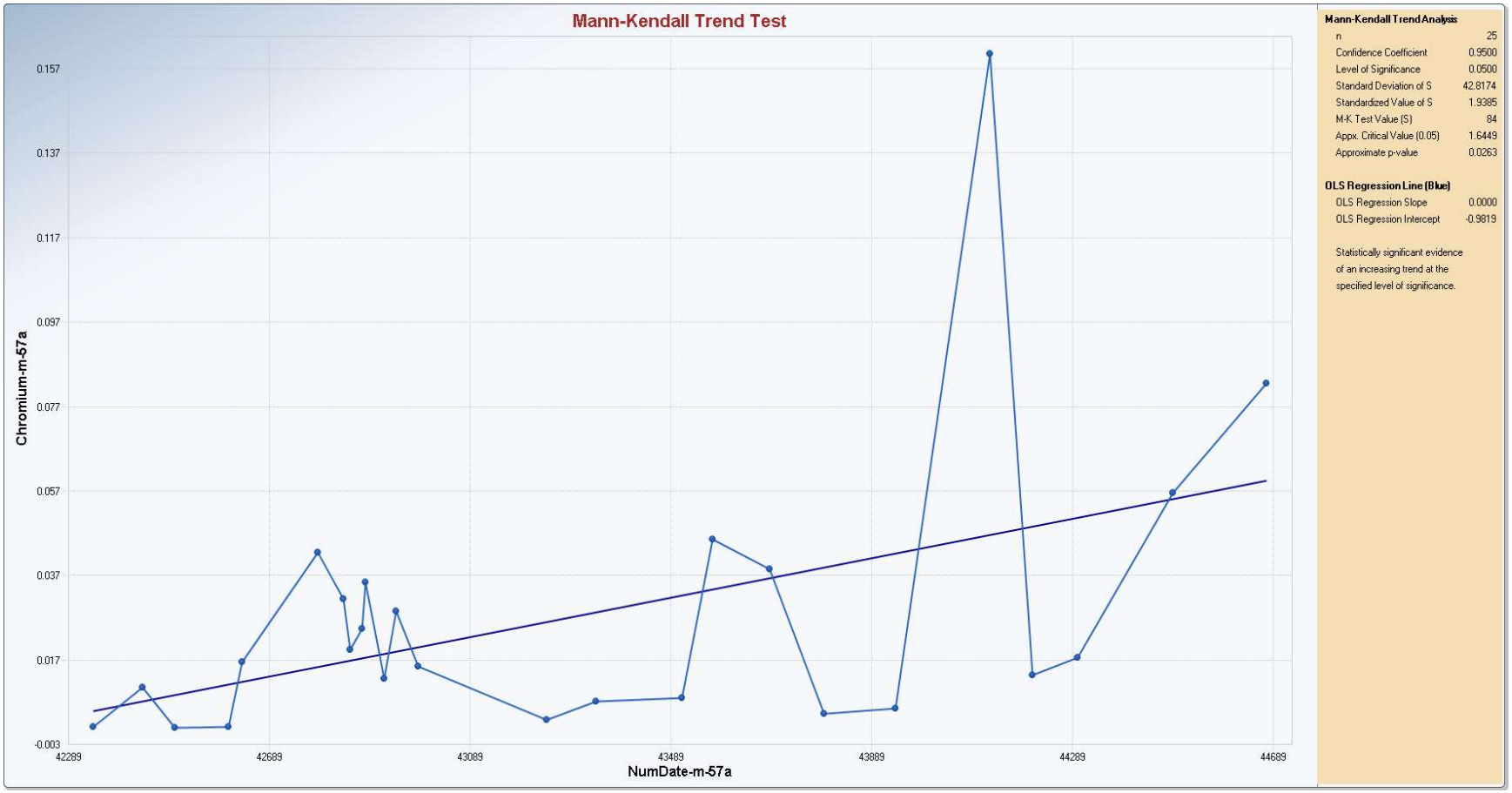
Appendix B
Time Series Plots



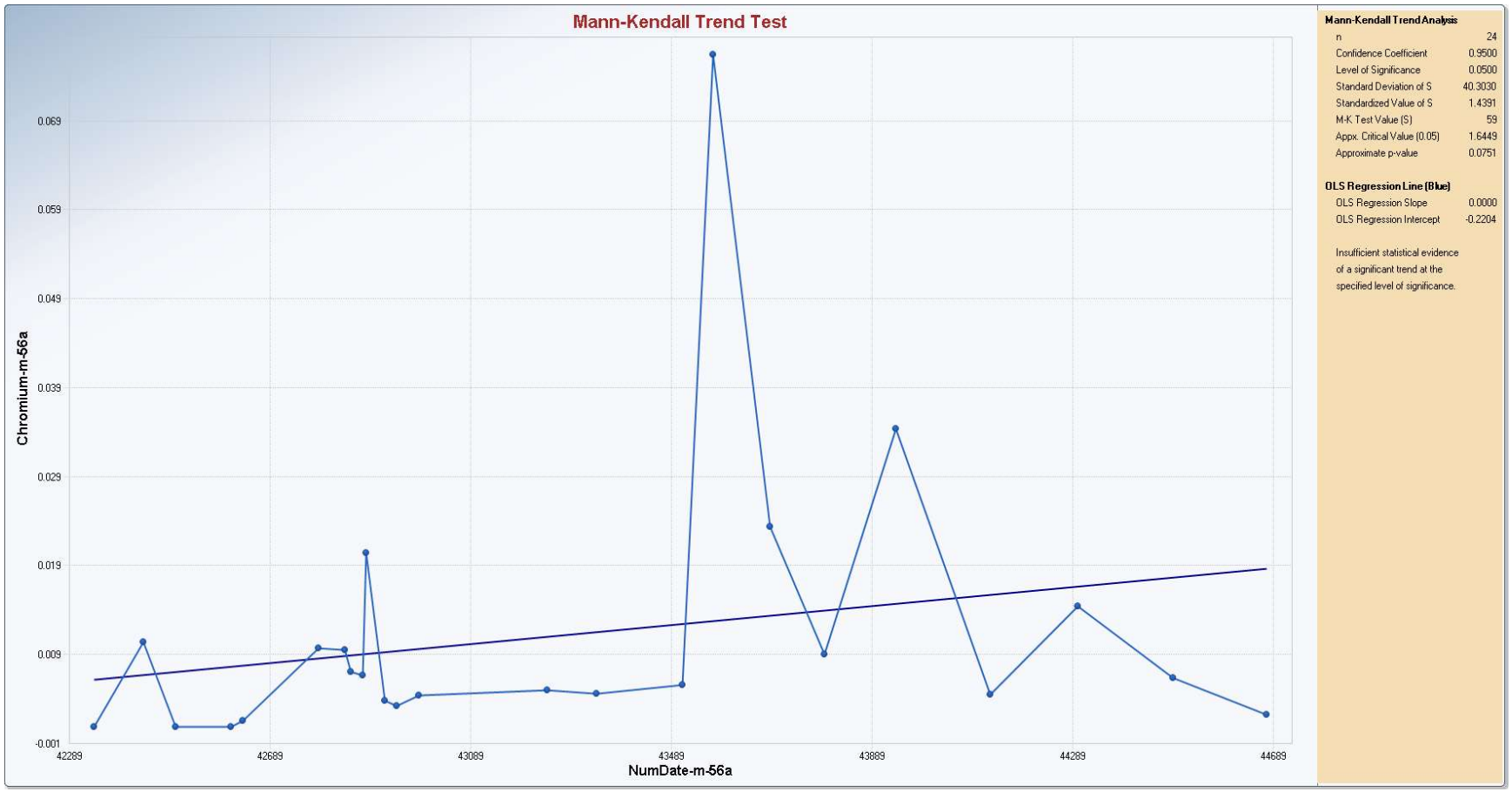
Appendix B
Time Series Plots



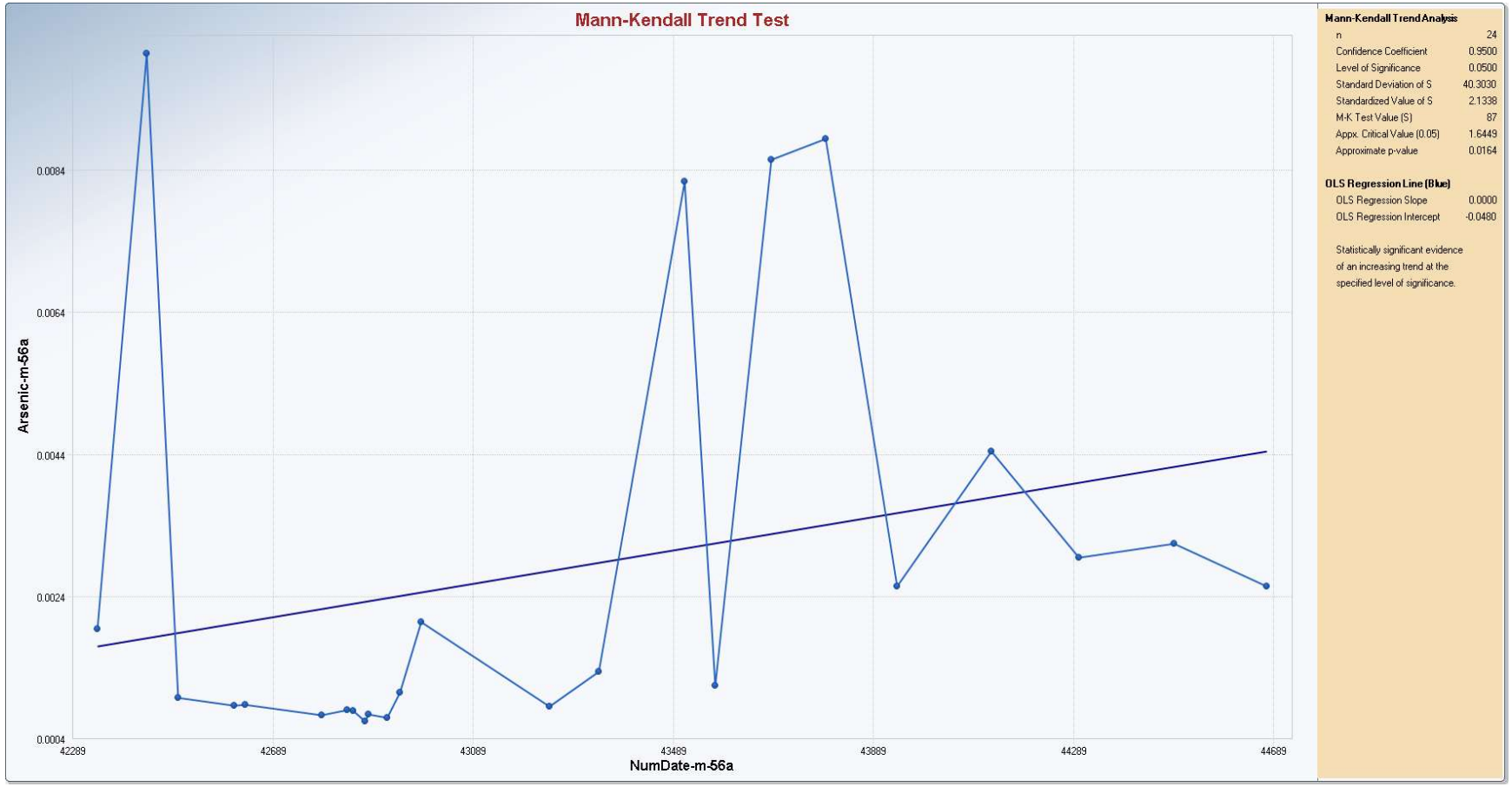
Appendix B
Time Series Plots



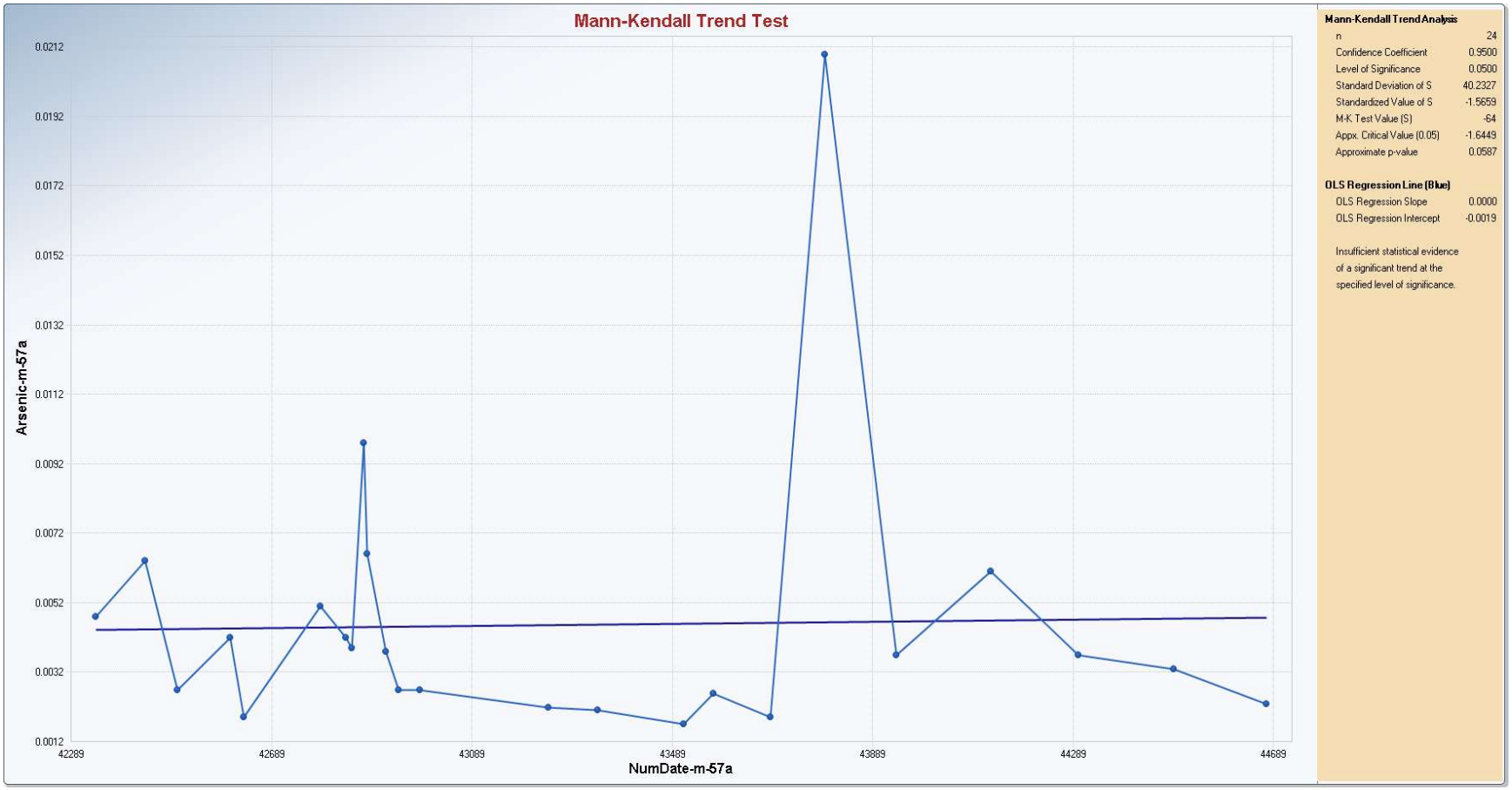
Appendix B
Time Series Plots



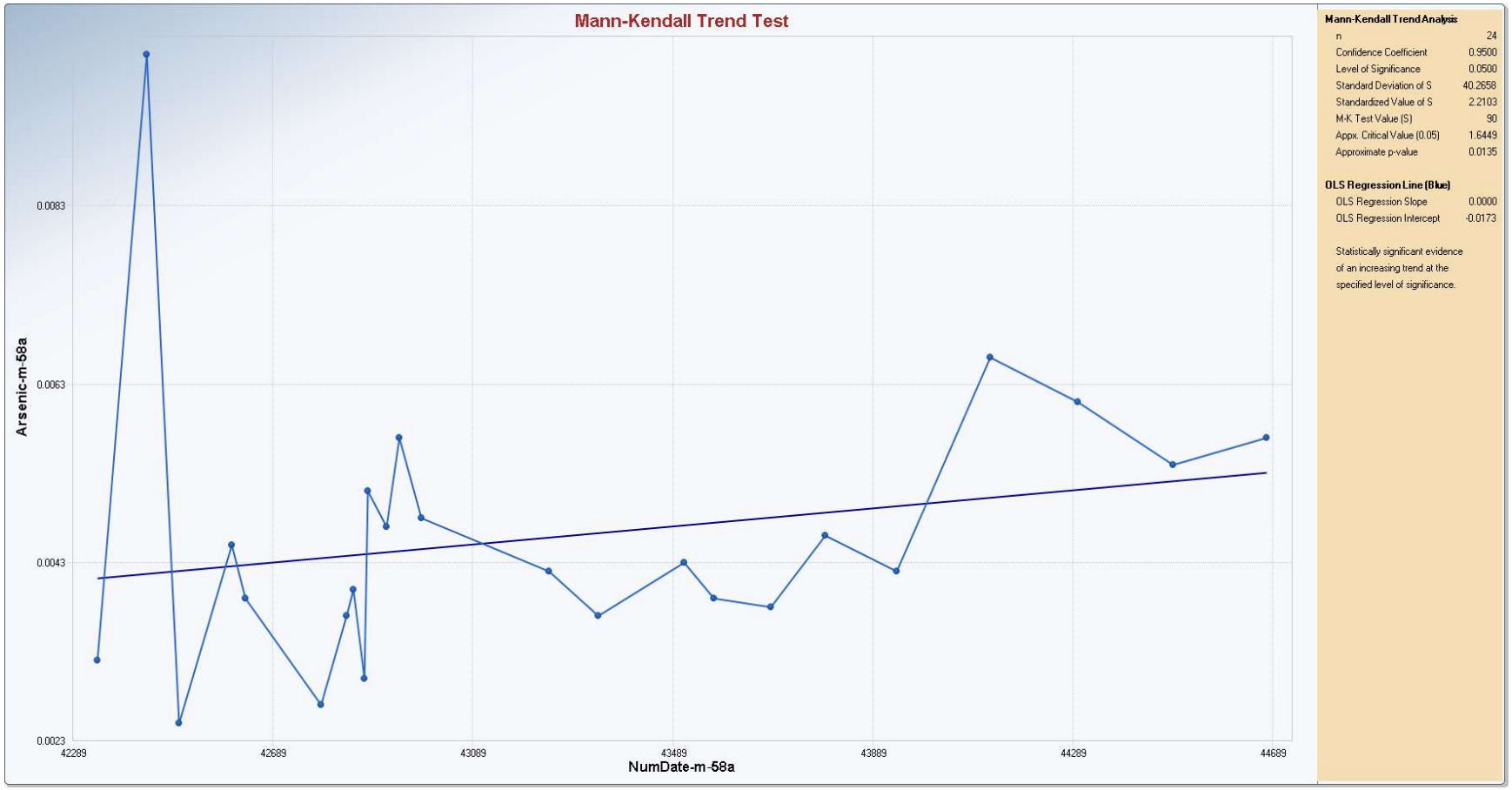
Appendix B
Time Series Plots



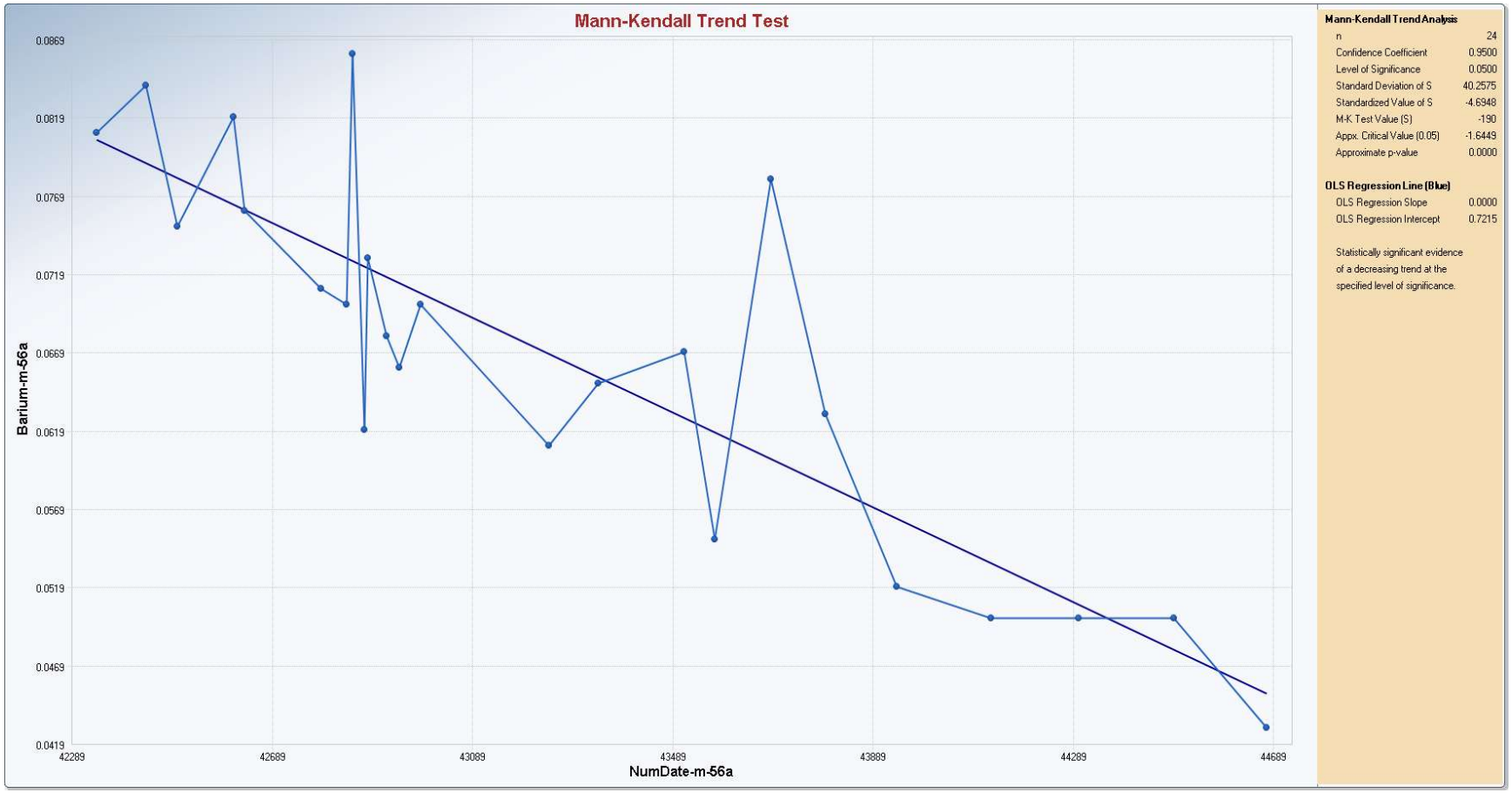
Appendix B
Time Series Plots



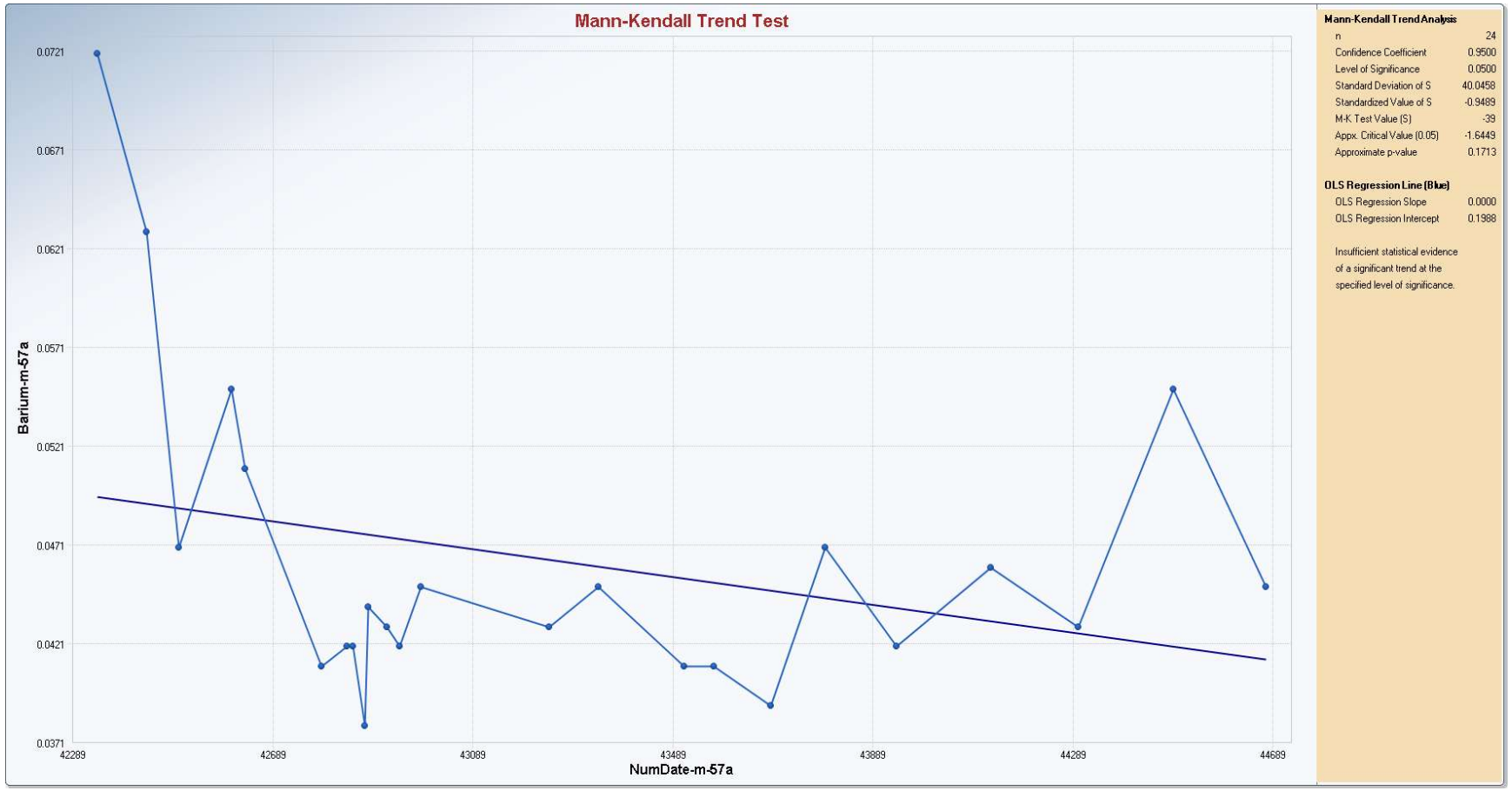
Appendix B
Time Series Plots



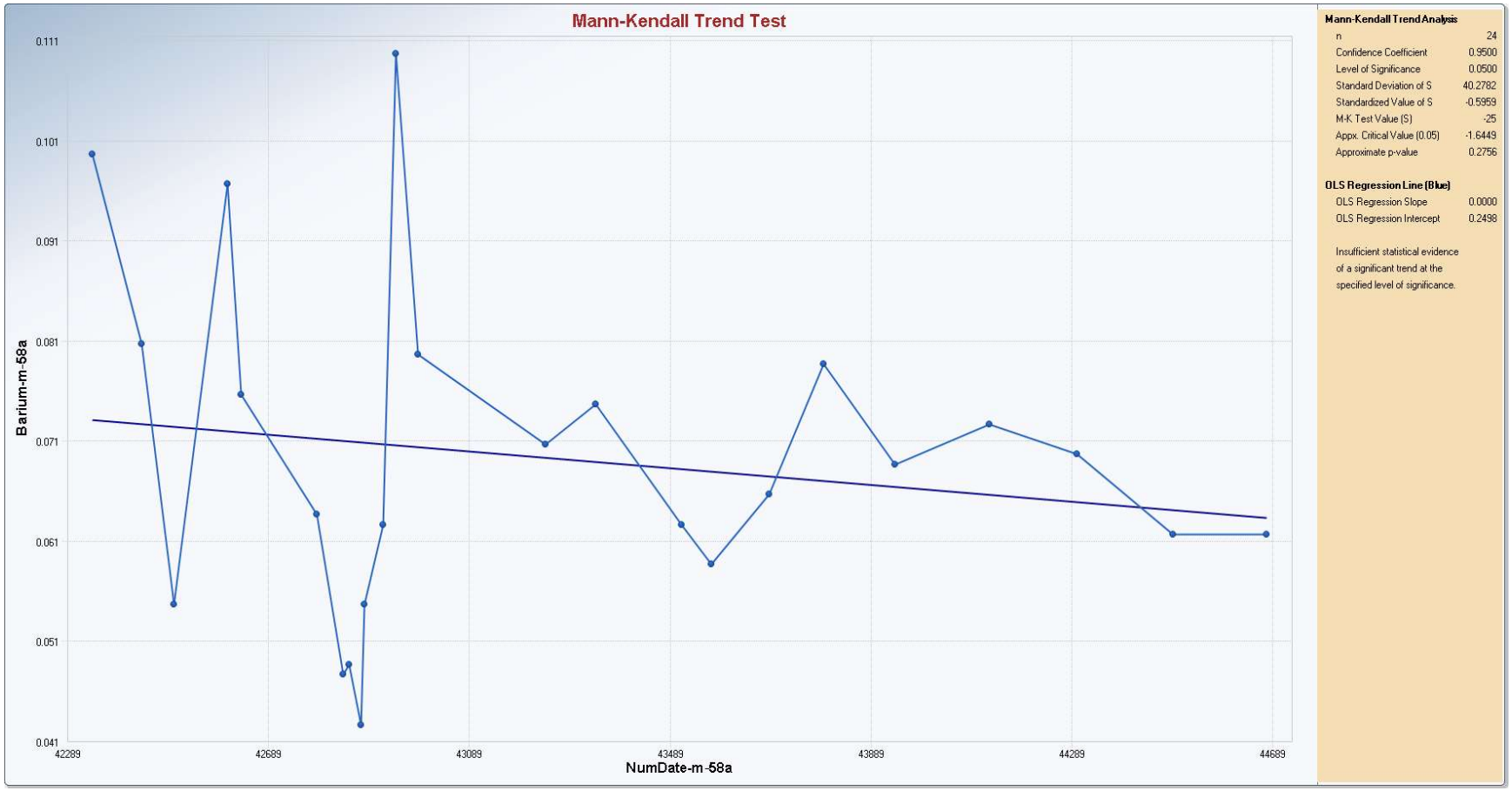
Appendix B
Time Series Plots



Appendix B
Time Series Plots



Appendix B
Time Series Plots



Appendix B
Time Series Statistics

	Mann-Kendall Trend Test Analysis
User Selected Options	
Date/Time of Computation	ProUCL 5.17/24/2022 7:40:08 PM
From File	Cholla_SEDI_ProUCL_2022-07.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

Arsenic-m-56a

General Statistics

Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	6.0000E-4
Maximum	0.01
Mean	0.00274
Geometric Mean	0.00172
Median	0.0012
Standard Deviation	0.00298
Coefficient of Variation	1.088

Mann-Kendall Test

M-K Test Value (S)	87
Critical Value (0.05)	1.645
Standard Deviation of S	40.3
Standardized Value of S	2.134
Approximate p-value	0.0164

Statistically significant evidence of an increasing trend at the specified level of significance.

Arsenic-m-57a

General Statistics

Number of Events Reported (m)	26
Number of Missing Events	2
Number or Reported Events Used	24

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Number Values Reported (n)	26
Number Values Missing	2
Number Values Used	24
Minimum	0.0017
Maximum	0.021
Mean	0.00456
Geometric Mean	0.00373
Median	0.0037
Standard Deviation	0.00399
Coefficient of Variation	0.875
Mann-Kendall Test	
M-K Test Value (S)	-64
Critical Value (0.05)	-1.645
Standard Deviation of S	40.23
Standardized Value of S	-1.566
Approximate p-value	0.0587
Insufficient evidence to identify a significant	
trend at the specified level of significance.	
Arsenic-m-58a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	0.0025
Maximum	0.01
Mean	0.0046
Geometric Mean	0.00439
Median	0.00425
Standard Deviation	0.00155
Coefficient of Variation	0.337
Mann-Kendall Test	
M-K Test Value (S)	90

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Critical Value (0.05)	1.645
Standard Deviation of S	40.27
Standardized Value of S	2.21
Approximate p-value	0.0135
Statistically significant evidence of an increasing trend at the specified level of significance.	

	Mann-Kendall Trend Test Analysis
User Selected Options	
Date/Time of Computation	ProUCL 5.17/24/2022 7:43:36 PM
From File	Cholla_SEDI_ProUCL_2022-07.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

Barium-m-56a

General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	0.043
Maximum	0.086
Mean	0.0666
Geometric Mean	0.0655
Median	0.0675
Standard Deviation	0.012
Coefficient of Variation	0.18

Mann-Kendall Test	
M-K Test Value (S)	-190
Critical Value (0.05)	-1.645
Standard Deviation of S	40.26
Standardized Value of S	-4.695
Approximate p-value	1.3345E-6

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Statistically significant evidence of a decreasing trend at the specified level of significance.	
Barium-m-57a	
General Statistics	
Number of Events Reported (m)	26
Number of Missing Events	2
Number or Reported Events Used	24
Number Values Reported (n)	26
Number Values Missing	2
Number Values Used	24
Minimum	0.038
Maximum	0.072
Mean	0.0463
Geometric Mean	0.0458
Median	0.0435
Standard Deviation	0.00791
Coefficient of Variation	0.171
Mann-Kendall Test	
M-K Test Value (S)	-39
Critical Value (0.05)	-1.645
Standard Deviation of S	40.05
Standardized Value of S	-0.949
Approximate p-value	0.171
Insufficient evidence to identify a significant trend at the specified level of significance.	
Barium-m-58a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	0.043

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Maximum	0.11
Mean	0.0696
Geometric Mean	0.0679
Median	0.0675
Standard Deviation	0.0163
Coefficient of Variation	0.234
Mann-Kendall Test	
M-K Test Value (S)	-25
Critical Value (0.05)	-1.645
Standard Deviation of S	40.28
Standardized Value of S	-0.596
Approximate p-value	0.276
Insufficient evidence to identify a significant trend at the specified level of significance.	

	Mann-Kendall Trend Test Analysis
User Selected Options	
Date/Time of Computation	ProUCL 5.17/24/2022 7:46:57 PM
From File	Cholla_SEDI_ProUCL_2022-07.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05

Chromium-m-56a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	5.0000E-4
Maximum	0.076
Mean	0.0107
Geometric Mean	0.00517
Median	0.0056

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Standard Deviation	0.016
Coefficient of Variation	1.505
Mann-Kendall Test	
M-K Test Value (S)	59
Critical Value (0.05)	1.645
Standard Deviation of S	40.3
Standardized Value of S	1.439
Approximate p-value	0.0751
Insufficient evidence to identify a significant	
trend at the specified level of significance.	
Chromium-m-57a	
General Statistics	
Number of Events Reported (m)	26
Number of Missing Events	1
Number or Reported Events Used	25
Number Values Reported (n)	26
Number Values Missing	1
Number Values Used	25
Minimum	5.0000E-4
Maximum	0.16
Mean	0.0268
Geometric Mean	0.0125
Median	0.016
Standard Deviation	0.0341
Coefficient of Variation	1.274
Mann-Kendall Test	
M-K Test Value (S)	84
Critical Value (0.05)	1.645
Standard Deviation of S	42.82
Standardized Value of S	1.938
Approximate p-value	0.0263
Statistically significant evidence of an increasing	
trend at the specified level of significance.	
Chromium-m-58a	

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	5.0000E-4
Maximum	0.01
Mean	0.0019
Geometric Mean	0.00133
Median	0.001
Standard Deviation	0.00209
Coefficient of Variation	1.103
Mann-Kendall Test	
M-K Test Value (S)	48
Critical Value (0.05)	1.645
Standard Deviation of S	39.4
Standardized Value of S	1.193
Approximate p-value	0.116
Insufficient evidence to identify a significant trend at the specified level of significance.	
	Mann-Kendall Trend Test Analysis
User Selected Options	
Date/Time of Computation	ProUCL 5.17/24/2022 7:56:04 PM
From File	Cholla_SEDI_ProUCL_2022-07.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05
Cobalt-m-56a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	5.0000E-4
Maximum	0.0025
Mean	0.00102
Geometric Mean	9.0904E-4
Median	7.6500E-4
Standard Deviation	5.2899E-4
Coefficient of Variation	0.521
Mann-Kendall Test	
M-K Test Value (S)	-43
Critical Value (0.05)	-1.645
Standard Deviation of S	40.08
Standardized Value of S	-1.048
Approximate p-value	0.147
Insufficient evidence to identify a significant trend at the specified level of significance.	
Cobalt-m-57a	
General Statistics	
Number of Events Reported (m)	26
Number of Missing Events	2
Number or Reported Events Used	24
Number Values Reported (n)	26
Number Values Missing	2
Number Values Used	24
Minimum	0.0026
Maximum	0.0088
Mean	0.00611
Geometric Mean	0.00567
Median	0.0066
Standard Deviation	0.00217
Coefficient of Variation	0.354
Mann-Kendall Test	

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
M-K Test Value (S)	-163
Critical Value (0.05)	-1.645
Standard Deviation of S	40.28
Standardized Value of S	-4.022
Approximate p-value	2.8850E-5
Statistically significant evidence of a decreasing trend at the specified level of significance.	
Cobalt-m-58a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	2.4000E-4
Maximum	0.01
Mean	0.00117
Geometric Mean	7.6128E-4
Median	5.0500E-4
Standard Deviation	0.00195
Coefficient of Variation	1.66
Mann-Kendall Test	
M-K Test Value (S)	-51
Critical Value (0.05)	-1.645
Standard Deviation of S	38.1
Standardized Value of S	-1.312
Approximate p-value	0.0947
Insufficient evidence to identify a significant trend at the specified level of significance.	
Mann-Kendall Trend Test Analysis	
User Selected Options	
Date/Time of Computation	ProUCL 5.17/24/2022 8:22:37 PM
From File	Cholla_SEDI_ProUCL_2022-07.xls

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05
Molybdenum-m-56a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	0.0057
Maximum	0.029
Mean	0.0119
Geometric Mean	0.011
Median	0.00975
Standard Deviation	0.00547
Coefficient of Variation	0.46
Mann-Kendall Test	
M-K Test Value (S)	-134
Critical Value (0.05)	-1.645
Standard Deviation of S	40.26
Standardized Value of S	-3.304
Approximate p-value	4.7704E-4
Statistically significant evidence of a decreasing trend at the specified level of significance.	
Molybdenum-m-57a	
General Statistics	
Number of Events Reported (m)	26
Number of Missing Events	2
Number or Reported Events Used	24
Number Values Reported (n)	26
Number Values Missing	2
Number Values Used	24

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Minimum	0.0011
Maximum	0.022
Mean	0.00637
Geometric Mean	0.00512
Median	0.00465
Standard Deviation	0.00491
Coefficient of Variation	0.772
Mann-Kendall Test	
M-K Test Value (S)	39
Critical Value (0.05)	1.645
Standard Deviation of S	40.3
Standardized Value of S	0.943
Approximate p-value	0.173
Insufficient evidence to identify a significant	
trend at the specified level of significance.	
Molybdenum-m-58a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	1
Number or Reported Events Used	24
Number Values Reported (n)	25
Number Values Missing	1
Number Values Used	24
Minimum	0.0014
Maximum	0.02
Mean	0.00307
Geometric Mean	0.00226
Median	0.0018
Standard Deviation	0.00401
Coefficient of Variation	1.306
Mann-Kendall Test	
M-K Test Value (S)	-68
Critical Value (0.05)	-1.645
Standard Deviation of S	39.61
Standardized Value of S	-1.691

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Approximate p-value	0.0454
Statistically significant evidence of a decreasing trend at the specified level of significance.	
	Mann-Kendall Trend Test Analysis
User Selected Options	
Date/Time of Computation	ProUCL 5.17/24/2022 8:27:54 PM
From File	Cholla_SEDI_ProUCL_2022-07.xls
Full Precision	OFF
Confidence Coefficient	0.95
Level of Significance	0.05
Total Radium-m-56a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	4
Number or Reported Events Used	21
Number Values Reported (n)	25
Number Values Missing	4
Number Values Used	21
Minimum	0.4
Maximum	1.9
Mean	1.01
Geometric Mean	0.908
Median	0.8
Standard Deviation	0.474
Coefficient of Variation	0.47
Mann-Kendall Test	
M-K Test Value (S)	-11
Tabulated p-value	0.394
Standard Deviation of S	32.96
Standardized Value of S	-0.303
Approximate p-value	0.381
Insufficient evidence to identify a significant trend at the specified level of significance.	

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Total Radium-m-57a	
General Statistics	
Number of Events Reported (m)	26
Number of Missing Events	5
Number or Reported Events Used	21
Number Values Reported (n)	26
Number Values Missing	5
Number Values Used	21
Minimum	0.4
Maximum	1.5
Mean	0.743
Geometric Mean	0.712
Median	0.7
Standard Deviation	0.242
Coefficient of Variation	0.326
Mann-Kendall Test	
M-K Test Value (S)	50
Tabulated p-value	0.07
Standard Deviation of S	31.97
Standardized Value of S	1.533
Approximate p-value	0.0627
Insufficient evidence to identify a significant	
trend at the specified level of significance.	
Total Radium-m-58a	
General Statistics	
Number of Events Reported (m)	25
Number of Missing Events	4
Number or Reported Events Used	21
Number Values Reported (n)	25
Number Values Missing	4
Number Values Used	21
Minimum	0.5
Maximum	2.6
Mean	1.005
Geometric Mean	0.896

Appendix B
Time Series Statistics

Number of Events Reported (m)	25
Median	0.8
Standard Deviation	0.576
Coefficient of Variation	0.573
Mann-Kendall Test	
M-K Test Value (S)	-38
Tabulated p-value	0.134
Standard Deviation of S	32.52
Standardized Value of S	-1.138
Approximate p-value	0.128
Insufficient evidence to identify a significant trend at the specified level of significance.	

AECOM
7720 North 16th Street
Phoenix, AZ 85020
aecom.com

October 13, 2021

Byron Conrad, PE
Arizona Public Service
400 North 5th Street
Mail Station 9219
Phoenix, AZ 85004

Subject: Sedi Pond Closure by Removal and Construction Certification

Dear Mr. Conrad:

Coal Combustion Residual (CCR) removal and construction activities associated with closing the Sedi Pond CCR unit started on May 3, 2021 and were completed on October 8, 2021. These activities were completed consistent with the amended closure plan dated November 4, 2020, with the exception of the completion date. The amended closure plan for the Sedi Pond estimated a completion of closure construction activities prior to October 2021. The actual completion of construction was October 8, 2021.

A summary of Closure by Removal (CbR) construction activities is provided below:

1. Decontamination of all the existing concrete structures (divider wall, spillway, inlet structure, and outlet structure) within or associated with the CCR unit. The concrete structures were decontaminated by removing any CCR material that was adhered to the walls or footings of the structures. Upon completing decontamination activities, the concrete structures were visually inspected to verify all CCR material had been removed.
2. Demolishing and removing the decontaminated concrete structures and old pumphouse associated with the CCR unit. The concrete structures were demolished and hauled to the on-site inert landfill for disposal. The old pumphouse was cleared of any asbestos and lead paint, then was demolished for disposal or recycling.
3. Excavating and removing any remaining CCR sediments within the Sedi Pond footprint. CCR removal within the excavation was accomplished by removal of any underlying material that, by visual inspection, appeared possibly to be impacted by CCR or non-native. The CCR material and impacted soil were removed and transported to the Bottom Ash Monofill.
4. Backfilling and compacting the excavation with clean soil to fill the basin and grading the final surface to drain into existing drainage facilities.

This limited certification for closing the Sedi Pond CCR unit addresses only the removal of CCR from the CCR unit. This limited certification does not address groundwater quality monitoring concentrations relative to groundwater quality protection standards.

I, David E. Mickanen, being a Registered Professional Engineer in good standing in the State of Arizona, do hereby certify, to the best of my knowledge, information, and belief that the information contained in this certification has been prepared in accordance with the accepted practice of engineering. I certify, for the removal of CCR from the above-referenced CCR Unit, that the work was completed in accordance with the Closure Plan (CH_ClosPlan_004_20201104_Sedi Pond) and the requirements of 40 CFR § 257.102

If you require additional information, please do not hesitate to contact me at (602) 648-2310.

Yours sincerely,

AECOM Technical Services, Inc

David E. Mickanen, PE, REM
Principal Civil Engineer
AECOM

cc: Sandy Gourlay