Worksheet Names	Mean	UCL
RST 1	641.6333333	698.4959054
RST 2	673.3666667	692.2144736
RST 3	273.4	293.4319187
RST 4	194.0285714	207.0584896
RST 5	437.95	499.3783511
RST 6	408.8333333	441.8227654
RST 7	1651.666667	1723.090902
RST 8	32.58	33.54617592
RST 9	27.76428571	30.69260795

9956455

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not tot/ion the Fe/Mn/ Mn/ etc read)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh -mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DMC
Analyst Date: 6-Nov-2017

Clerical: DMC
Read Bag lot = PO:321861

Run time applies to the Main filter (only filter being run)

DI-2 IN: mean	UCL	%RSD	mrct	UCL	%RSD
441.4	499.5	10.4	NA	#VALUE!	#VALUE!

Bag Lots d-d list — **particle size drop-down list**

name	bulk
WM-4837PCS	<10-mesh
PO 321861	<100-mesh

DU or Bag ID: RST 1 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	1101	484	15	775.0	13.2	
2	1102	485	15	585.2	11.4	
3	1103	486	15	502.9	10.8	
4	1104	487	15	515.7	11.2	
5 (optional)	1105	488	15	454.9	12.7	
6 (optional)	1106	489	15	326.9	17.4	
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	551.6	LOD =	37.42
			SD	151.8	**To %RSD**	19.77
			n =	8		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Subsample CI range	#VALUE!	%RSD	
			Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	10.60	instrument error =	1.54	as %RSD

Duplicate Bag Analysis

Operator: Run date: Run by: Run date:

For duplicate sample analysis (repeat analysis of same bag)

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided	1-sided	Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
			95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
Hypothesis Test for Duplicate Agreement, p-value =			**SD**	NA	**To %RSD**	#VALUE!
			n =	0		
#DIV/0!			PNoCL distribution =			
#DIV/0!	2-sided	2-sided	Bag 95% t-LCL =	#VALUE!		
	2-sided	2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			ID # =			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			Orig. Mean - 10% =	577.5		
			Orig. Mean + 10% =	706.6		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

DU or Bag ID: **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Operator:			Analytical Date:			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Duplicate Bag Analysis

Operator: Run date: Run by: Run date:

For duplicate sample analysis (repeat analysis of same bag)

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided	1-sided	Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
			95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
Hypothesis Test for Duplicate Agreement, p-value =			**SD**	NA	**To %RSD**	#VALUE!
			n =	0		
#DIV/0!			PNoCL distribution =			
#DIV/0!	2-sided	2-sided	Bag 95% t-LCL =	#VALUE!		
	2-sided	2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses			ID # =	1		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

RTeX Form Partitioning of Variability for XRF Sample Analysis

Original bag: within-sample bag variability			**Replicate readings: analytical variability**	
Pb	more bins vlgs	#VALUE! %RSD	Pb-Intra-Mean High	#VALUE! %RSD
As	w-n of 2 subs	#VALUE! %RSD		
			Mg/Mn/Al	#VALUE! %RSD
Between 1.5g subsamples variability				
Pb	v-w betw 2 sub	#DIV/0! %RSD	**Within-subsample bag variability**	
As	sample means	#DIV/0! %RSD	Pb	#VALUE! %RSD
			As	#VALUE! %RSD
Sample duplicate mean variability				
Pb	v-w betw means	#DIV/0! %RSD		
As	of 2 ind. analy.res	#DIV/0! %RSD		

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not tot/cor the Fe/cor/ Mn/ cnt/ nnd)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh -mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DMC
Analyst Date: 6-Nov-2017

Clerical: DMC
Read Bag lot = PO:321861

Run time applies to the Main filter (only filter being run)

DI-D TN: Nton:	UCL	%RSD	REnt	UCL	%RSD
671.4	692.2	3.4	NA	#VALUE!	#VALUE!

Bag Lots d-d list

	particle size drop-down list
	bulk
name	<10-mesh
WM-M07PCS	<100-mesh
PO 321861	

DU or Bag ID: RST 2 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	1626	763	15	662.8	13.9	
2	1630	764	15	671.9	13.4	
3	1634	765	15	680.3	13.6	
4	1625	766	15	669.3	13.1	
5 (optional)	1632	767	15	658.3	12.8	
6 (optional)	1623	768	15	677.5	13.4	
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	673.4	LOD = 30.9	
			SD	9.4	**Tit %RSD** 1.4	
			n =	6		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	NA		
		2-sided	Bag 95% t-UCL =	NA		
	1-sided	1-sided	Subsample CI range	692.2		
			1-sided Bag 95% Chebyshev LCL =	NA		
			1-sided Bag 95% Chebyshev UCL =	NA		
		2.91	instrument error =	1.92	as %RSD	

Duplicate Bag Analysis

Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided		**Bag 95% t-LCL =**	**#VALUE!**	%	
	1-sided		**Bag 95% t-UCL =**	**#VALUE!**		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
		1-sided	95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
Hypothesis Test for Duplicate Agreement, p-value =			**Mean**	NA		
			SD	NA	**Tit %RSD** #VALUE!	
#DIV/0!			n =	0		
#DIV/0!			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Intended Lab Analysis:		ID # =			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	806.5		
			Orig. Mean + 10% =	1007.9		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Intended Lab Analysis:					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Intended Lab Analysis:					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Intended Lab Analysis:					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

DU or Bag ID: **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Operator:		Analytical Date:			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Duplicate Bag Analysis

Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided		**Bag 95% t-LCL =**	**#VALUE!**	%	
	1-sided		**Bag 95% t-UCL =**	**#VALUE!**		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
		1-sided	95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
Hypothesis Test for Duplicate Agreement, p-value =			**Mean**	NA		
			SD	NA	**Tit %RSD** #VALUE!	
#DIV/0!			n =	0		
#DIV/0!			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Intended Lab Analyses		ID # =	1		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD = #DIV/0!	
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Intended Lab Analyses					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Intended Lab Analyses					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Intended Lab Analyses					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD** #VALUE!	
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error = #VALUE!	instrument error =	#DIV/0!	as %RSD	

RTeX Form Partitioning of Variability for XRF Sample Analysis

Original bag: within-sample bag variability		**Replicate readings: analytical variability**	
Pb	more bins vlgs	#VALUE! %RSD	no bins e-bins >lgs
As	a-n of 2 subs	#VALUE! %RSD	
			triplicate #VALUE! %RSD
Between 1.5g subsamples variability		**Within-subsample bag variability**	
Pb	v-sv bins 2 sub-	#DIV/0! %RSD	as RSD of 2 sub- #VALUE! %RSD
As	sample means	#DIV/0! %RSD	sample RSDs #VALUE! %RSD
Sample duplicate mean variability			
Pb	v-sv bins means	#DIV/0! %RSD	
As	of 2 sub. analy.res	#DIV/0! %RSD	

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not bkd on the Fe-Nickel files are read)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh -mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DMC
Analyst Date: 6-Nov-2017

Clerical: DMC
Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

D-2 Pb mean:	UCL	%RSD	mrct	UCL	%RSD
231.4	263.4	8.4	NA	#VALUE!	#VALUE!

DU or Bag ID: RST 3 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	1615	771	15	257.8	8.3	
2	1628	772	15	267.8	8.7	
3	1639	773	15	248.4	8.1	
4	1653	774	15	248.4	7.9	
5 (optional)	1702	775	15	268.1	8.5	
6 (optional)	1622	776	15	276.5	9.1	
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	263.4	LOD =	20.3
			SD	9.9	**To %RSD**	3.8
			n =	8	n =	8
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided	1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	283.4		
			Orig. Mean + 10% =	243.4		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	8.37	instrument error =	3.59	as %RSD

Duplicate Bag Analysis Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
			PNorDL distribution =			
T-test p-value =			Mean - 2 SD =	#VALUE!		
#DIV/0!	-2SD Lower bag limit		Mean + 2 SD =	#VALUE!		
#DIV/0!	+2 SD Upper bag limit	2-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
		1-sided	95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
Hypothesis Test for Duplicate Agreement, p-value =			**SD**	NA	**To %RSD**	#VALUE!
			n =	0		
#DIV/0!			PNorDL distribution =			
#DIV/0!		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			ID # =			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	246.1		
			Orig. Mean + 10% =	268.4		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

DU or Bag ID: **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Operator:			Analytical Date:			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Duplicate Bag Analysis Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
			PNorDL distribution =			
T-test p-value =			Mean - 2 SD =	#VALUE!		
#DIV/0!	-2SD Lower bag limit		Mean + 2 SD =	#VALUE!		
#DIV/0!	+2 SD Upper bag limit	2-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
		1-sided	95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
Hypothesis Test for Duplicate Agreement, p-value =			**SD**	NA	**To %RSD**	#VALUE!
			n =	0		
#DIV/0!			PNorDL distribution =			
#DIV/0!		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses			ID # =	1		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNorDL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

RTeX Form Partitioning of Variability for XRF Sample Analysis

Original bag: within-sample bag variability		**Replicate readings: analytical variability**	
Pb	more lame digs	#VALUE! %RSD	no-blow-a-blow digs
As	a-o of 2 auger	#VALUE! %RSD	
		#VALUE! %RSD	triplicate
Between 1.5-g subsamples variability		**Within-subsample bag variability**	
Pb	v-ar lame 2 sub-	#DIV/0! %RSD	as RSD of 2 sub-
As	sample means	#DIV/0! %RSD	sample PSDs
Sample duplicate mean variability			
Pb	v-ar lame means	#DIV/0! %RSD	
As	of 2 ind. analy-ses	#DIV/0! %RSD	

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not tot/cor the Fe/cor/ Mn/ cnt/ nnd)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh -mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DMC
Analyst Date: 7-Nov-2017

Clerical: DMC
Read Bag lot = PO:321861

Run time applies to the Main filter (only filter being run)

DI-D TN: Nasm	UCL	%RSD	mnt	UCL	%RSD
191.5	207.1	5.1	NA	#VALUE!	#VALUE!

DU or Bag ID: RST 4 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	0755	39	15	187.7	6.7	
2	0758	40	15	205.9	7.4	
3	0759	41	15	192.9	6.9	
4	0759	42	15	181.3	6.5	
5 (optional)	0800	43	15	212.7	7.1	
6 (optional)	0801	44	15	213.1	7.5	
7 (optional)	0803	45	15	223.2	7.5	
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	194.3	LOD =	21.4
			SD	17	**Tit %RSD**	9.1
			n =	8		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	n/a		
		2-sided	Bag 95% t-UCL =			
	1-sided		Subsample CI range	207.1		
			Orig. Mean - 10% =	174.9		
			Orig. Mean + 10% =	213.8		
		subsampling error =	8.37	instrument error =	3.58	as %RSD

Duplicate Bag Analysis

Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided		**Bag 95% t-LCL =**	**#VALUE!**	%	
	1-sided		**Bag 95% t-UCL =**	**#VALUE!**		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
		1-sided	95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
Hypothesis Test for Duplicate Agreement, p-value =			**Mean**	NA		
			SD	NA	**Tit %RSD**	#VALUE!
#DIV/0!			n =	0		
#DIV/0!			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			ID # =			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	174.9		
			Orig. Mean + 10% =	213.8		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

DU or Bag ID: **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Operator:			Analytical Date:			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Duplicate Bag Analysis

Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided		**Bag 95% t-LCL =**	**#VALUE!**	%	
	1-sided		**Bag 95% t-UCL =**	**#VALUE!**		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
		1-sided	95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
Hypothesis Test for Duplicate Agreement, p-value =			**Mean**	NA		
			SD	NA	**Tit %RSD**	#VALUE!
#DIV/0!			n =	0		
#DIV/0!			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			ID # =	0		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**Tit %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

RTeX Form Partitioning of Variability for XRF Sample Analysis

Original bag: within-sample bag variability		**Replicate readings: analytical variability**	
Pb	more bins +0js	#VALUE! %RSD	no bins e.bins +0js
As	a-n of 2 subs	#VALUE! %RSD	
		Implicate: #VALUE! %RSD	
Between 1.5g subsamples variability		**Within-subsample bag variability**	
Pb	v.w bins 2 sub	#DIV/0! %RSD	as RSD of 2 sub: #VALUE! %RSD
As	sample means	#DIV/0! %RSD	sample RSDs #VALUE! %RSD
Sample duplicate mean variability			
Pb	v.w bins means	#DIV/0! %RSD	
As	of 2 ind. analy.res	#DIV/0! %RSD	

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not tot/ion the Fe/Mn/ Mn/ etc read)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh -mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DMC
Analyst Date: 6-Nov-2017

Clerical: DMC
Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

DI-D TN Nton	UCL	±RSD	Hint	UCL	±RSD
435.5	499.4	17.1	NA	#VALUE!	#VALUE!

Bag Lots d-d list

	particle size drop-down list
	bulk
name	<10-mesh
WM 460765/3	<100-mesh
PO 321861	

DU or Bag ID: RST 5 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	1624	773	15	585.3	12.5	
2	1624	774	15	435.5	10.5	
3	1625	775	15	384.1	9.7	
4	1626	776	15	364.1	9.2	
5 (optional)	1627	777	15	351.4	8.8	
6 (optional)	1627	778	15	424.3	10.4	
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	438.3	LOD =	31.2
			SD	84.1	**To %RSD**	17.2
			n =	6		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
		1-sided	Bag 95% t-LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	31.88	instrument error =	2.37	as %RSD

Duplicate Bag Analysis — Run by: — Run date:

For duplicate sample analysis (repeat analysis of same bag)

Hypothesis Test for Duplicate Agreement: T-test p-value = #DIV/0! #DIV/0!

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

For duplicate sample analysis (repeat analysis of same bag)

Hypothesis Test for Duplicate Agreement, p-value = #DIV/0! #DIV/0!

Replicate Bag Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			ID # =			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
		1-sided	Bag 95% t-LCL =	#VALUE!		
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings — Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

Intended Lab Analysis

Subsample #3 Replicate Readings — Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

Intended Lab Analysis

Subsample #4 Replicate Readings — Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

Intended Lab Analysis

DU or Bag ID: **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Operator:			Analytical Date:			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
		1-sided	Bag 95% t-LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Duplicate Bag Analysis — Run by: — Run date:

For duplicate sample analysis (repeat analysis of same bag)

Hypothesis Test for Duplicate Agreement: T-test p-value = #DIV/0! #DIV/0!

Dup or Trip Rdg Set 1 of 1

Replicate Bag Readings — Sample or Location ID =

Replicate Bag Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

For duplicate sample analysis (repeat analysis of same bag)

Hypothesis Test for Duplicate Agreement, p-value = #DIV/0! #DIV/0!

Replicate Bag Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
		1-sided	Bag 95% t-LCL =	#VALUE!		
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

Intended Lab Analysis

Subsample #3 Replicate Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

Intended Lab Analysis

Subsample #4 Replicate Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

Intended Lab Analysis

RTeX Form Partitioning of Variability for XRF Sample Analysis

Original bag: within-sample bag variability		**Replicate readings: analytical variability**	
Pb	more bins->lgs	#VALUE! %RSD no-time-limits->high	#VALUE! %RSD
As	w-n of 2 subs		#VALUE! %RSD
			Implicate: #VALUE! %RSD
Between 1.5g subsamples variability		**Within-subsample bag variability**	
Pb	v-w bins 2 sub	#DIV/0! %RSD as RSD of 2 sub	#VALUE! %RSD
As	sample means	#DIV/0! %RSD sample RSDs	#VALUE! %RSD
Sample duplicate mean variability			
Pb	v-w bins means	#DIV/0! %RSD	
As	of 2 ind. analy.res	#DIV/0! %RSD	

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not bkd on the Fe-Nickel files are read)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DMC
Analyst Date: 6-Nov-2017

Clerical: DMC
Read Bag lot = PO 321861

Run time applies to the Main filter (only filter being run)

DI-2 TN Nton	UCL	%RSD	nbrd	UCL	%RSD
401.8	441.8	9.4	NA	#VALUE!	#VALUE!

Bag Lots d-d list

	particle size drop-down list
	bulk
name	<10-mesh
WM 4837RCS	<100-mesh
PO 321861	

DU or Bag ID: RST 6 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	1815	765	15	420.0	10.5	
2	1816	766	15	396.9	10.0	
3	1817	767	15	415.7	10.4	
4	1818	768	15	475.7	11.9	
5 (optional)	1817	769	15	360.0	9.7	
6 (optional)	1817	770	15	426.0	10.6	
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	408.8	LOD =	30.8
			SD	44.9	**To %RSD**	9.8
			n =	6		
			PNoCL distribution =	N		
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	368.0		
			Orig. Mean + 10% =	449.7		
		subsampling error =	8.48	instrument error =	2.51	as %RSD

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			ID # =			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

DU or Bag ID: **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Operator:			Analytical Date:			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis			ID # =	0		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Original bag: within-sample bag variability

Pb	more beta vdgs	#VALUE! %RSD
As	as in 2' Ziplok	#VALUE! %RSD

Between 1.5g subsamples variability

Pb	v se beta 2 sub-	#DIV/0! %RSD
As	sample means	#DIV/0! %RSD

Sample duplicate mean variability

Pb	v se beta means	#DIV/0! %RSD
As	of 2 ind. analy.sis	#DIV/0! %RSD

RTeX Form Partitioning of Variability for XRF Sample Analysis

Replicate readings: analytical variability

Pb	#VALUE! %RSD
As	#VALUE! %RSD

Within-subsample bag variability

Pb	#VALUE! %RSD
As	#VALUE! %RSD

Duplicate Bag Analysis Operator: Run date: Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!	%	
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings — Intended Lab Analysis

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings — Intended Lab Analysis

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings — Intended Lab Analysis

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #1 Replicate Readings — Intended Lab Analysis

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings — Intended Lab Analysis

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings — Intended Lab Analysis

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings — Intended Lab Analysis

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

For duplicate sample analysis (repeat analysis of same bag)

Replicate reading 1; 2; 3; 4; 5 (optional); 6 (optional); 7 (optional); 8 (optional); 9 (optional); 10 (optional)

Mean; SD; n =; PNoCL distribution =; 2-sided Bag 95% t-LCL =; 2-sided Bag 95% t-UCL =; 1-sided Bag 95% t-LCL =; 1-sided Bag 95% t-UCL =; 1-sided Bag 95% Chebyshev LCL =; 1-sided Bag 95% Chebyshev UCL =; subsampling error =; instrument error =; #DIV/0!; as %RSD

Replicate Bag Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

Replicate reading 1; 2; 3; 4; 5 (optional); 6 (optional); 7 (optional); 8 (optional); 9 (optional); 10 (optional)

Mean; SD; n =; PNoCL distribution =; 2-sided Bag 95% t-LCL =; 2-sided Bag 95% t-UCL =; 1-sided Bag 95% t-LCL =; 1-sided Bag 95% t-UCL =; 1-sided Bag 95% Chebyshev LCL =; 1-sided Bag 95% Chebyshev UCL =; subsampling error =; instrument error =; #DIV/0!; as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

For duplicate sample analysis (repeat analysis of same bag)

Replicate reading 1; 2; 3; 4; 5 (optional); 6 (optional); 7 (optional); 8 (optional); 9 (optional); 10 (optional)

Mean; SD; n =; PNoCL distribution =; 2-sided Bag 95% t-LCL =; 2-sided Bag 95% t-UCL =; 1-sided Bag 95% t-LCL =; 1-sided Bag 95% t-UCL =; 1-sided Bag 95% Chebyshev LCL =; 1-sided Bag 95% Chebyshev UCL =; subsampling error =; instrument error =; #DIV/0!; as %RSD

Replicate Bag Readings — Date & Time — Reading No. — Run Time (sec) — Instrument Result (ppm) — Instrument Error (as 1 Std Dev) — Note?

Replicate reading 1; 2; 3; 4; 5 (optional); 6 (optional); 7 (optional); 8 (optional); 9 (optional); 10 (optional)

Mean; SD; n =; PNoCL distribution =; 2-sided Bag 95% t-LCL =; 2-sided Bag 95% t-UCL =; 1-sided Bag 95% t-LCL =; 1-sided Bag 95% t-UCL =; 1-sided Bag 95% Chebyshev LCL =; 1-sided Bag 95% Chebyshev UCL =; subsampling error =; instrument error =; #DIV/0!; as %RSD

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not tot/ion the Fe/Mn/ Mn/ etc read)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DMC
Analyst Date: 6-Nov-2017

Clerical: DMC
Read Bag Tot = PO:32861

Run time applies to the Main filter (only filter being run)

D-2 Pb mean:	UCL	%RSD	mrct	UCL	%RSD
1401.7	1773.1	9.1	NA	#VALUE!	#VALUE!

DU or Bag ID: RST 7 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	1636	769	15	1728	21	
2	1637	790	15	1693	21	
3	1638	791	15	1726	21	
4	1638	792	15	1705	21	
5 (optional)	1639	793	15	1642	20	
6 (optional)	1639	794	15	1645	20	
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	1852	LOD =	51
			SD	1773	**% %RSD**	9.1
			n =	8		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	1511.1		
			Bag 95% t-UCL =	2193.9		
	1-sided		Subsample CI range	1153.1		
			Org. Mean - 10% =			
			Org. Mean + 10% =			
		subsampling error =	9.1%	instrument error =	1.13	as %RSD

Duplicate Bag Analysis

Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided		**Bag 95% t-LCL =**	#VALUE!	%	
	1-sided		**Bag 95% t-UCL =**	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
		1-sided	95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
Hypothesis Test for Duplicate Agreement, p-value =			**Mean**	NA		
			SD	NA	**% %RSD**	#VALUE!
#DIV/0!			n =	0		
#DIV/0!			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			**ID #:**			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Org. Mean - 10% =	1499.5		
			Org. Mean + 10% =	1903.9		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Org. Mean - 10% =	#VALUE!		
			Org. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Org. Mean - 10% =	#VALUE!		
			Org. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag Lots d-d list — particle size drop-down list

bulk	
name	<10-mesh
WM-4837PCS	<100-mesh
PO 32861	

DU or Bag ID: **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Operator:			**Analytical Date:**			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Duplicate Bag Analysis

Run by: Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
T-test p-value =			PNoCL distribution =			
#DIV/0!		-2SD Lower bag limit	Mean - 2 SD =	#VALUE!		
#DIV/0!		+2 SD Upper bag limit	Mean + 2 SD =	#VALUE!		
	1-sided		**Bag 95% t-LCL =**	#VALUE!	%	
	1-sided		**Bag 95% t-UCL =**	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	95% t-LCL =	#VALUE!		
		1-sided	95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Bag ID: **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sample or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
Hypothesis Test for Duplicate Agreement, p-value =			**Mean**	NA		
			SD	NA	**% %RSD**	#VALUE!
#DIV/0!			n =	0		
#DIV/0!			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses			**ID #:**	0		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Org. Mean - 10% =	#VALUE!		
			Org. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Org. Mean - 10% =	#VALUE!		
			Org. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			Subsample CI range	#VALUE!	%	
			Org. Mean - 10% =	#VALUE!		
			Org. Mean + 10% =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**% %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD

RTeX Form Partitioning of Variability for XRF Sample Analysis

Original bag: within-sample bag variability		**Replicate readings: analytical variability**	
Pb	more bins vlgs	#VALUE! %RSD	no-bins-4-bins-high
As	w-n of 2 subs	#VALUE! %RSD	
		Implicate: #VALUE! %RSD	
Between 1.5g subsamples variability		**Within-subsample bag variability**	
Pb	v-w bins 2 sub	#DIV/0! %RSD	as RSD of 2 sub
As	sample means	#DIV/0! %RSD	sample RSDs
Sample duplicate mean variability			
Pb	v-w bins means	#DIV/0! %RSD	
As	of 2 ind. analy.res	#DIV/0! %RSD	

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not bid on the Freybird files are real)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DAIC — Clerical: DAIC

Analyte Date: 7-Nov-2017 — Read Bag Set = PO:321861

Run time applies to the Main filter (only filter being run)

DI-D TN: mean:	UCL	%RSD	mext	UCL	%RSD
10.4	15.5	3.1	NA	#VALUE!	#VALUE!

DU or Bag ID: RST 8 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	27:09	25	15	32.2	3.4	
2	27:40	26	15	34.1	3.5	
3	27:51	27	15	32.8	3.4	
4	27:52	28	15	31.9	3.3	
5 (optional)	27:53	29	15	31.7	3.3	
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	32.8	LOD =	10.4
			SD	1.2	**Tit %RSD**	3.1
			n =	5		
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			sample RSDs t-UCL =	15.5		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	rmxt error	instrument error =	10.68	as %RSD	

Duplicate Bag Analysis — Run by: — Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			PNoCL distribution =			
T-test p-value =			Mean - 2 SD =	#VALUE!		
#DIV/0!	-2SD Lower bag limit		Mean + 2 SD =	#VALUE!		
#DIV/0!	+2 SD Upper bag limit		Bag 95% t-LCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
	1-sided		sample RSDs t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Dup or Trip Rdg Set 1 of 1	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		95% t-LCL =	#VALUE!		
	2-sided		95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Bag Lots d-d list — **particle size drop-down list**

none	bulk
WW-M07PCS	<10-mesh
PO 321861	<100-mesh

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			**ID #:**			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	29.5		
			Orig. Mean + 10% =	35.8		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

DU or Bag ID: — **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Operator:			**Analytical Date:**			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			sample RSDs t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses			**ID #:**	0		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

RTeX Form Partitioning of Variability for XRF Sample Analysis

Original bag: within-sample bag variability		**Replicate readings: analytical variability**	
Pb	more later-dgs	#VALUE! %RSD	no-time-where-high
As	w-n of 2 subs	#VALUE! %RSD	
		Replicate	#VALUE! %RSD
Between 1.5g subsamples variability		**Within-subsample bag variability**	
Pb	v-w lame 2 sub	#DIV/0! %RSD	as RSD of 2 sub
As	sample means	#DIV/0! %RSD	sample RSDs
Sample duplicate mean variability			
Pb	v-w lame means	#DIV/0! %RSD	
As	of 2 ind. analy-ses	#DIV/0! %RSD	

Bag ID: — **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sampler or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
Hypothesis Test for Duplicate Agreement, p-value =			**SD**	NA		
#DIV/0!			n =	0	**Tit %RSD**	#VALUE!
#DIV/0!	2-sided		PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA		
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

XRF on Comparability Subsamples

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Bag ID: — **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sampler or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA		
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
Hypothesis Test for Duplicate Agreement, p-value =			**SD**	NA		
#DIV/0!			n =	0	**Tit %RSD**	#VALUE!
#DIV/0!	2-sided		PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA		
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses				0		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #2 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #3 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Subsample CI range	#VALUE!	%	
			Orig. Mean - 10% =	#VALUE!		
			Orig. Mean + 10% =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

Subsample #4 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	LOD =	#DIV/0!
			n =	0	**Tit %RSD**	#VALUE!
			PNoCL distribution =			
	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
	1-sided		Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
	subsampling error =	#VALUE!	instrument error =	#DIV/0!	as %RSD	

RTeX = Real-Time Excel for XRF (spreadsheet) form for use with XRF instruments capable of reporting & nd error as 1 SD

sheet PM = XRF

When the XRF result and instrument error (as 1 SD) are entered, the spreadsheet calculates the mean, 2-sided and 1-sided Student's t LCLs and UCLs (for data with a normal distribution) and 1-sided Chebyshev LCLs and UCLs (for non-normal data).

Note: LCLs = lower confidence limits; UCLs = upper confidence limits. The spreadsheet partitions data error between analytical (XRF instrument precision) and sampling error (data variability due to matrix heterogeneity within the sample/bag).

LOD = sample-specific limit of detection

"Run Time" refers to the run time for the (time specific) to the target analyte (not lab/run the Fricke/ Mes are read)

This sheet records XRF concentration results for DU bags & for subsamples for comparability analysis.

Project: Willcox Oil Site Pb Delineation

Property ID: **Road Sample Test (RST)**

Particle Fraction Being Read: <10-mesh -mesh [click in cell for drop-down]

Instrument: TIB Nton GOLDD Ultra (S/N 92959)

Operator: DAIC — Clerical: DAIC

Analyst Date: 7-Nov-2017 — Read Bag Set = PO:321861

Run time applies to the Main filter (only filter being run)

D-32 Pb Mean:	UCL	%RSD	mext	UCL	%RSD
27.8	30.7	14.4	NA	#VALUE!	#VALUE!

DU or Bag ID: RST 9 (0-3) **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1	9:30	88	15	31.55	3.4	
2	9:36	89	15	25.29	3.3	
3	9:38	90	15	26.97	3.3	
4	9:40	91	15	30.8	3.3	
5 (optional)	9:42	92	15	25.68	3.3	
6 (optional)	9:44	93	15	25.31	3.3	
7 (optional)	9:45	94	15	20.1	3.3	
8 (optional)						
9 (optional)						
10 (optional)						
11 (optional)						
12 (optional)						
			Mean	27.8	LOD =	20.1
			SD	4.0	**To %RSD**	14.4
			n =	7		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	30.7		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
		7.64		instrument error =	12.10	as %RSD

Duplicate Bag Analysis — Run by: — Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
			PNoCL distribution =			
T-test p-value =			Mean - 2 SD =	#VALUE!		
#DIV/0!	-2SD Lower bag limit		Mean + 2 SD =	#VALUE!		
#DIV/0!	+2 SD Upper bag limit		Bag 95% t-LCL =	#VALUE!	%	
1-sided			Subsample CI range	#VALUE!		
			Org. Mean - 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
			95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Bag ID: — **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sampler or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
Hypothesis Test for Duplicate Agreement, p-value =			**SD**	NA	**To %RSD**	#VALUE!
			n =	0		
#DIV/0!			PNoCL distribution =			
#DIV/0!	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Operator: Run date:

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analysis:			**ID #:**			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Org. Mean - 10% =	25.0		
			Org. Mean + 10% =	30.8		
				instrument error =	#DIV/0!	as %RSD

DU or Bag ID: — **Element:** **Pb**

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Operator:			**Analytical Date:**			
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses			**ID #:**	1		
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Org. Mean - 10% =	#VALUE!		
			Org. Mean + 10% =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Original bag: within-sample bag variability

Pb	more beta vdgs	#VALUE!	%RSD
As	w-n of 2 subs	#VALUE!	%RSD

Between 1.5g subsamples variability

Pb	v-ar beta 2 sub	#DIV/0!	%RSD
As	sample means	#DIV/0!	%RSD

Sample duplicate mean variability

Pb	v-ar beta means	#DIV/0!	%RSD
As	of 2 ind. analy-ses	#DIV/0!	%RSD

RTeX Form Partitioning of Variability for XRF Sample Analysis

Replicate readings: analytical variability

Pb	no-time-dep	#VALUE!	%RSD
	time-dep	#VALUE!	%RSD
As		#VALUE!	%RSD

Within-subsample bag variability

Pb	as RSD of 2 sub-	#VALUE!	%RSD
As	sample PSDs	#VALUE!	%RSD

Duplicate Bag Analysis — Run by: — Run date:

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
Hypothesis Test for Duplicate Agreement			n =	0		
			PNoCL distribution =			
T-test p-value =			Mean - 2 SD =	#VALUE!		
#DIV/0!	-2SD Lower bag limit		Mean + 2 SD =	#VALUE!		
#DIV/0!	+2 SD Upper bag limit		Bag 95% t-LCL =	#VALUE!	%	
1-sided			Subsample CI range	#VALUE!		
			Org. Mean - 10% =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Dup or Trip Rdg Set 1 of 1

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA	LOD =	#DIV/0!
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	95% t-LCL =	#VALUE!		
		2-sided	95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
			95% t-UCL =	#VALUE!		
			1-sided 95% Chebyshev LCL =	#VALUE!		
			1-sided 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings

Replicate Bag Readings	Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Bag ID: — **Element:**

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
	Sampler or Location ID =					
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
For duplicate sample analysis (repeat analysis of same bag)						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
Hypothesis Test for Duplicate Agreement, p-value =			**SD**	NA	**To %RSD**	#VALUE!
			n =	0		
#DIV/0!			PNoCL distribution =			
#DIV/0!	2-sided		Bag 95% t-LCL =	#VALUE!		
	2-sided		Bag 95% t-UCL =	#VALUE!		
	1-sided		Bag 95% t-LCL =	#VALUE!		
			Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Replicate Bag Readings

Replicate Bag Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Bag 95% t-LCL =	#VALUE!		
		1-sided	Bag 95% t-UCL =	#VALUE!		
			1-sided Bag 95% Chebyshev LCL =	#VALUE!		
			1-sided Bag 95% Chebyshev UCL =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

XRF on Comparability Subsamples

Subsample #1 Replicate Readings	Date & Time	Reading No.	Run Time (sec)	Instrument Result (ppm)	Instrument Error (as 1 Std Dev)	Note?
Intended Lab Analyses						
Replicate reading 1						
2						
3						
4						
5 (optional)						
6 (optional)						
7 (optional)						
8 (optional)						
9 (optional)						
10 (optional)						
			Mean	NA		
			SD	NA	**To %RSD**	#VALUE!
			n =	0		
			PNoCL distribution =			
		2-sided	Bag 95% t-LCL =	#VALUE!		
		2-sided	Bag 95% t-UCL =	#VALUE!		
		1-sided	Subsample CI range	#VALUE!	%	
			Bag 95% t-LCL =	#VALUE!		
			Org. Mean - 10% =	#VALUE!		
			Org. Mean + 10% =	#VALUE!		
				instrument error =	#DIV/0!	as %RSD

Subsample #2 Replicate Readings — Intended Lab Analyses — Replicate reading 1 … 10 (optional) — Mean, SD, n = 0, PNoCL distribution = — 2-sided Bag 95% t-LCL = #VALUE!, 2-sided Bag 95% t-UCL = #VALUE!, 1-sided Subsample CI range #VALUE! %, Bag 95% t-LCL = #VALUE!, Org. Mean - 10% = #VALUE!, Org. Mean + 10% = #VALUE!, 1-sided Bag 95% Chebyshev LCL = #VALUE!, 1-sided Bag 95% Chebyshev UCL = #VALUE! — instrument error = #DIV/0! as %RSD

Subsample #3 Replicate Readings — Intended Lab Analyses — Replicate reading 1 … 10 (optional) — Mean, SD, n = 0, PNoCL distribution = — 2-sided Bag 95% t-LCL = #VALUE!, 2-sided Bag 95% t-UCL = #VALUE!, 1-sided Subsample CI range #VALUE! %, Bag 95% t-LCL = #VALUE!, Org. Mean - 10% = #VALUE!, Org. Mean + 10% = #VALUE!, 1-sided Bag 95% Chebyshev LCL = #VALUE!, 1-sided Bag 95% Chebyshev UCL = #VALUE! — instrument error = #DIV/0! as %RSD

Subsample #4 Replicate Readings — Intended Lab Analyses — Replicate reading 1 … 10 (optional) — Mean, SD, n = 0, PNoCL distribution = — 2-sided Bag 95% t-LCL = #VALUE!, 2-sided Bag 95% t-UCL = #VALUE!, 1-sided Subsample CI range #VALUE! %, Bag 95% t-LCL = #VALUE!, Org. Mean - 10% = #VALUE!, Org. Mean + 10% = #VALUE!, 1-sided Bag 95% Chebyshev LCL = #VALUE!, 1-sided Bag 95% Chebyshev UCL = #VALUE! — instrument error = #DIV/0! as %RSD

Subsample #1 Replicate Readings — Intended Lab Analyses — Replicate reading 1 … 10 (optional) — Mean, SD, n = 0, PNoCL distribution = — 2-sided Bag 95% t-LCL = #VALUE!, 2-sided Bag 95% t-UCL = #VALUE!, 1-sided Subsample CI range #VALUE! %, Bag 95% t-LCL = #VALUE!, Org. Mean - 10% = #VALUE!, Org. Mean + 10% = #VALUE!, 1-sided Bag 95% Chebyshev LCL = #VALUE!, 1-sided Bag 95% Chebyshev UCL = #VALUE! — instrument error = #DIV/0! as %RSD

Subsample #2 Replicate Readings — Intended Lab Analyses — Replicate reading 1 … 10 (optional) — Mean, SD, n = 0, PNoCL distribution = — 2-sided Bag 95% t-LCL = #VALUE!, 2-sided Bag 95% t-UCL = #VALUE!, 1-sided Subsample CI range #VALUE! %, Bag 95% t-LCL = #VALUE!, Org. Mean - 10% = #VALUE!, Org. Mean + 10% = #VALUE!, 1-sided Bag 95% Chebyshev LCL = #VALUE!, 1-sided Bag 95% Chebyshev UCL = #VALUE! — instrument error = #DIV/0! as %RSD

Subsample #3 Replicate Readings — Intended Lab Analyses — Replicate reading 1 … 10 (optional) — Mean, SD, n = 0, PNoCL distribution = — 2-sided Bag 95% t-LCL = #VALUE!, 2-sided Bag 95% t-UCL = #VALUE!, 1-sided Subsample CI range #VALUE! %, Bag 95% t-LCL = #VALUE!, Org. Mean - 10% = #VALUE!, Org. Mean + 10% = #VALUE!, 1-sided Bag 95% Chebyshev LCL = #VALUE!, 1-sided Bag 95% Chebyshev UCL = #VALUE! — instrument error = #DIV/0! as %RSD

Subsample #4 Replicate Readings — Intended Lab Analyses — Replicate reading 1 … 10 (optional) — Mean, SD, n = 0, PNoCL distribution = — 2-sided Bag 95% t-LCL = #VALUE!, 2-sided Bag 95% t-UCL = #VALUE!, 1-sided Subsample CI range #VALUE! %, Bag 95% t-LCL = #VALUE!, Org. Mean - 10% = #VALUE!, Org. Mean + 10% = #VALUE!, 1-sided Bag 95% Chebyshev LCL = #VALUE!, 1-sided Bag 95% Chebyshev UCL = #VALUE! — instrument error = #DIV/0! as %RSD

particle size drop-down list

Bag Lots d-d list bulk

none <10-mesh

4837815 <10-mesh

PO 321861