

**Detects Only Probability Plot Correlation Coefficient
Arsenic Concentrations Detected in Krum Complex Soils
Camp Stanley Storage Activity, Texas**

Order(i)	Uniform Order	Normal Order		
	Statistic Medians	Statistic Medians	$M_i - M_{avg}$	$(M_i - M_{avg})^2$
i	m_i	M_i	$M_i - M_{avg}$	$(M_i - M_{avg})^2$
1	0.12945	-1.12900	-1.12900	1.275
2	0.31361	-0.48565	-0.48565	0.236
3	0.50000	0.00000	0.00000	0.000
4	0.68639	0.48565	0.48565	0.236
5	0.87055	1.12900	1.12900	1.275
			Total:	3.021
$M_{avg} =$		0.0000		

Normal			
Ordered Concentrations (mg/kg)	$X_i - X_{avg}$	$(X_i - X_{avg})^2$	$(X_i - X_{avg}) * (M_i - M_{avg})$
$x_{(i)}$			
1.2			
1.3			
1.3			
1.4			
2.7	-1.080	1.166	1.219316
3	-0.780	0.608	0.378809
4.3	0.520	0.270	0.000000
4.3	0.520	0.270	0.252539
4.6	0.820	0.672	0.925777
13			
Totals:		2.988	2.776441
$X_{avg} =$		3.7800	
$r =$		0.924111	

Lognormal			
Ln of Ordered Concentrations (mg/kg)	$X_i - X_{avg}$	$(X_i - X_{avg})^2$	$(X_i - X_{avg}) * (M_i - M_{avg})$
$\ln(x_{(i)})$			
0.18			
0.22			
0.26			
0.30			
0.99	-0.314	0.098	0.354255
1.10	-0.208	0.043	0.101219
1.46	0.152	0.023	0.000000
1.46	0.152	0.023	0.073618
1.53	0.219	0.048	0.247280
2.56			
Totals:		0.236	0.776371
$X_{avg} =$		1.3070	
$r =$		0.919817	

Nondetect
Nondetect
Nondetect
Nondetect
Nondetect

Probability Plot Correlation Coefficient^{a,b}

$$r = \frac{\sum_{i=1}^n (X_i - X_{avg}) * (M_i - M_{avg})}{\sqrt{\sum_{i=1}^n (X_i - X_{avg})^2 * \sum_{i=1}^n (M_i - M_{avg})^2}}$$

$M_i = \Phi^{-1}(m_i)$ = ith Normal order statistic median
where Φ^{-1} = inverse of standard Normal cumulative distribution
 $= f(z, 0, 1)^{-1} = \sqrt{2\pi} e^{z^2/2}$

$$m_i = \begin{cases} 1 - (.5)^{1/n} & \text{for } i = 1 \\ (i - .3175) / (n + .365) & \text{for } 1 < i < n \\ (.5)^{1/n} & \text{for } i = n \end{cases}$$

M_{avg} = average of M_i
 X_{avg} = average of X_i

^a The Probability Plot Correlation Coefficient Test for Normality, James J. Filliben, Technometrics, Vol. 17, No. 1, February 1975

^b Statistical Training Course for Ground-Water Monitoring Data Analysis-Draft Addendum to Interim Final Guidance, EPA /530-R-93-003, 1992