

**Censored 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	0.06697	-1.49877		
2	0.16233	-0.98495		
3	0.25880	-0.64704		
4	0.35528	-0.37110		
5	0.45176	-0.12121	-0.52183	0.272
6	0.54824	0.12121	-0.27940	0.078
7	0.64472	0.37110	-0.02952	0.001
8	0.74120	0.64704	0.24642	0.061
9	0.83767	0.98495	0.58433	0.341
10	0.93415	1.50746		
Total:				0.753
$M_{avg} =$		0.4006		

Normal			
Ordered Concentrations (mg/kg)	$X_i - X_{avg}$	$(X_i - X_{avg})^2$	$(X_i - X_{avg}) * (M_i - M_{avg})$
1.2			
1.3			
1.3			
1.4			
2.7	-1.080	1.166	0.563577
3	-0.780	0.608	0.217934
4.3	0.520	0.270	-0.015349
4.3	0.520	0.270	0.128139
4.6	0.820	0.672	0.479151
1.3			
Totals:		2.988	1.373451
$X_{avg} =$		3.7800	
$r =$		0.915393	

Lognormal			
Ln of Ordered Concentrations (mg/kg)	$X_i - X_{avg}$	$(X_i - X_{avg})^2$	$(X_i - X_{avg}) * (M_i - M_{avg})$
0.18			
0.22			
0.26			
0.30			
0.99	-0.314	0.098	0.163739
1.10	-0.208	0.043	0.058232
1.46	0.152	0.023	-0.004474
1.46	0.152	0.023	0.037354
1.53	0.219	0.048	0.127984
2.56			
Sum:		0.236	0.382834
$X_{avg} =$		1.3070	
$r =$		0.908243	

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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 $\Phi^{-1} =$ inverse of standard Normal cumulative distribution
 $= f(z, 0, 1)^{-1} = \sqrt{2\pi} e^{z^2/2}$

$$m_i = \begin{cases} 1 - (.5)^{1/n} & \text{for } i = 1 \\ (i - 3.175)/(n + 3.65) & \text{for } 1 < i < n \\ (.5)^{1/n} & \text{for } i = n \end{cases}$$

$M_{avg} =$ 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