

# LANDFILL LEACHATE QUANTITATIVE ANALYSIS

- Increase workplace safety
- Create less waste
- Lower the costs of spills and leaks



# SpillFix®

*Environmentally responsible solutions for a safer workplace*



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# LANDFILL LEACHATE QUANTITATIVE ANALYSIS REPORTS



Landfill leachate occurs as a result of water flowing through waste landfills' especially uncontrolled landfills which are not capped properly. It is common to find soluble zinc, phenols, cyanide, and ammonium in landfill leachates.

**a) RCRA Metals in TCLP Leachate Solution by EPA 6020  
Quantitative Analysis Report  
Inductively Coupled Plasma - Mass Spectrometry**

Sample Preparation: 10 grams of sample were tumbled with 200 mL of extraction fluid #1 for 18 hours. The entire leachate was then filtered through Whatman #41 filter paper. 10 grams were further filtered through a 0.45  $\mu$ m filter into a plastic bottle. 2 mL of nitric acid were added and then internal standard was added. The samples were diluted to a final mass of 100 grams.

**b) Quality Control Summary**

**c) CCR Metals by SOP 7040, Rev 10  
Quantitative Analysis Report  
Inductively Coupled Plasma - Mass Spectrometry**

Sample Preparation: 0.2 grams of sample were digested in 1 mL of nitric acid and 3 mL of hydrochloric acid for 1 hour on a HotBlock set at 110°C. The samples were allowed to cool, internal standards were added, and then the digestates were diluted to a final mass of 100 grams. The samples mostly dissolved.

**d) Quality Control Summary**

Spillfix is well below the acceptable EPA leachate testing limits for landfill disposal as specified under:

- Toxicity characteristic leaching procedure (TCLP)
- Total Threshold Limit Concentration (TTLC)
- Soluble Threshold Limit Concentration (STLC)

(See following test results)

## a) QUANTITATIVE ANALYSIS REPORT

### RCRA Metals in TCLP Leachate Solution by EPA 6020 Inductively Coupled Plasma - Mass Spectrometry

Sample Preparation: 10 grams of sample were tumbled with 200 mL of extraction fluid #1 for 18 hours. The entire leachate was then filtered through Whatman #41 filter paper. 10 grams were further filtered through a 0.45 µm filter into a plastic bottle. 2 mL of nitric acid were added and then internal standard was added. The samples were diluted to a final mass of 100 grams.

Leachate Metals Concentration - Parts Per Million (mg/L)

\* Exceeds TCLP Limit

	<b>SpillFix 7lb Bag</b>	<b>Detection Limit</b>	<b>TCLP Limit</b>
<b>Arsenic</b>	ND	0.003	5
<b>Barium</b>	0.054	0.02	100
<b>Cadmium</b>	ND	0.0003	1
<b>Chromium</b>	ND	0.002	5
<b>Lead</b>	ND	0.0005	5
<b>Mercury</b>	ND	0.0009	0.2
<b>Selenium</b>	ND	0.02	5
<b>Silver</b>	ND	0.0001	5

(1) Chromium is reported above as total chromium in sample leachate.

(2) Detection Limit is the background equivalent concentration in the Leachate Blank.

## b) QUALITY CONTROL SUMMARY



Analyte	<b>Sample Matrix</b> SpillFix 7lb Bag TCLP Leachate						
	Sample Result	Duplicate Result	Average Result	Sample RPD	Spike Conc	Spike Result	Spike % Rec
<b>Arsenic</b>	ND	ND	ND	NA	1	0.94	94
<b>Barium</b>	0.0539	0.0546	0.0543	NA	1	1.09	104
<b>Cadmium</b>	ND	ND	ND	NA	1	0.92	92
<b>Chromium</b>	ND	ND	ND	NA	1	1.01	101
<b>Lead</b>	ND	ND	ND	NA	1	0.90	90
<b>Mercury</b>	ND	ND	ND	NA	0.1	0.09	88
<b>Selenium</b>	ND	ND	ND	NA	10	9.07	91
<b>Silver</b>	ND	ND	ND	NA	1	0.92	92

b) QUALITY CONTROL SUMMARY (cont.)

Analyte	Sample Matrix	Laboratory Fortified Blank (LFB) TCLP Leachate		
	Blank Result	Spike Conc	Spike Result	Spike % Rec
<b>Arsenic</b>	ND		0.94	94
<b>Barium</b>	0.0225		1.07	105
<b>Cadmium</b>	ND		0.939	94
<b>Chromium</b>	ND		1.00	100
<b>Lead</b>	ND		0.90	90
<b>Mercury</b>	ND	0.1	0.0885	88
<b>Selenium</b>	ND		9.34	93
<b>Silver</b>	ND		0.937	94

c) CCR Metals by SOP 7040, Rev 10  
Inductively Coupled Plasma - Mass Spectrometry

Sample Preparation: 0.2 grams of sample were digested in 1 mL of nitric acid and 3 mL of hydrochloric acid for 1 hour on a HotBlock set at 110°C. The samples were allowed to cool, internal standards were added, and then the digestates were diluted to a final mass of 100 grams. The samples mostly dissolved.

Total Metals Concentration -  
Parts Per Million (mg/kg)

\*\*\*\* Exceeds TTLC Limits \* May Exceed STLC

	SpillFix 7lb Bag	Detection Limit	10 X STLC Limits	TTLC Limits
<b>Antimony</b>	ND	0.08	150	500
<b>Arsenic</b>	ND	0.10	50	500
<b>Barium</b>	19.40	0.02	1000	10000
<b>Beryllium</b>	ND	0.07	7.5	75
<b>Cadmium</b>	0.019	0.01	10	100
<b>Chromium</b>	2.90	0.07	(Cr VI) 50 (Cr III) 5600	500 2500
<b>Cobalt</b>	0.48	0.01	800	8000
<b>Copper</b>	4.39	0.04	250	2500
<b>Lead</b>	0.60	0.02	50	1000
<b>Mercury</b>	ND	0.04	2	20
<b>Molybdenum</b>	0.09	0.02	3500	3500
<b>Nickel</b>	1.10	0.10	200	2000
<b>Selenium</b>	ND	0.80	50	500
<b>Silver</b>	ND	0.02	50	500
<b>Thallium</b>	0.23	0.10	70	700
<b>Vanadium</b>	2.60	0.10	240	2400
<b>Zinc</b>	15.40	0.20	2500	5000

(1) Chromium is reported above as total chromium in sample.

(2) 10 X STLC Limits are used for comparison due to the 1/10 dilution of the sample during leachate preparation.

d) QUALITY CONTROL SUMMARY

Analyte	Sample			SpillFix 7lb Bag Parts Per Million (mg/kg)			
	Sample Result	Duplicate Result	Average Result	Sample RPD	Spike Conc	Spike Result	Spike % Rec
<b>Antimony</b>	ND	ND	ND	NA	50	43.1	86
<b>Arsenic</b>	ND	ND	ND	NA	50	52.4	105
<b>Barium</b>	19.4	18.3	18.9	5.8	50	68.0	98
<b>Beryllium</b>	ND	ND	ND	NA	50	47.5	95
<b>Cadmium</b>	0.019	ND	ND	NA	50	51.0	102
<b>Chromium</b>	2.90	3.03	2.97	4.4	50	57.9	110
<b>Cobalt</b>	ND	ND	ND	0.2	50	50.5	100
<b>Copper</b>	ND	ND	ND	5.1	50	68.6	129*
<b>Lead</b>	0.596	0.644	0.620	7.7	50	47.9	95
<b>Mercury</b>	ND	ND	ND	NA	5	4.83	97
<b>Molybdenum</b>	0.090	0.091	0.091	NA	50	41.9	84
<b>Nickel</b>	1.05	1.40	1.23	NA	50	60.2	118
<b>Selenium</b>	ND	ND	ND	NA		50.6	101
<b>Silver</b>	ND	ND	ND	NA	50	50.1	100
<b>Thallium</b>	0.228	ND	NA	NA	50	49.8	99
<b>Vanadium</b>	2.56	2.40	2.48	6.5	50	67.9	131*
<b>Zinc</b>	15.4	12.9	14.2	17.7	50	66.4	105



\*Spike recovery is outside expected range (compared to LFB) due to a probable sample matrix or solubility effect.

d) QUALITY CONTROL  
SUMMARY (cont.)



Analyte	Sample			
	Blank Result	Spike Conc	Spike Result	Spike % Rec
<b>Antimony</b>	ND	50	49.4	99
<b>Arsenic</b>	ND	50	47.7	95
<b>Barium</b>	ND	50	50.0	100
<b>Beryllium</b>	ND	50	47.8	96
<b>Cadmium</b>	ND	50	49.9	100
<b>Chromium</b>	ND	50	52.4	105
<b>Cobalt</b>	ND	50	49.0	98
<b>Copper</b>	ND	50	55.2	110
<b>Lead</b>	ND	50	47.8	96
<b>Mercury</b>	0.027	5	4.94	98
<b>Molybdenum</b>	ND	50	53.1	106
<b>Nickel</b>	0.112	50	54.9	110
<b>Selenium</b>	ND	500	465	93
<b>Silver</b>	0.017	50	50.7	101
<b>Thallium</b>	0.06	50	52.9	106
<b>Vanadium</b>	ND	50	49.5	99
<b>Zinc</b>	0.134	50	51.4	103

Always check with appropriate local authorities for disposal requirements.