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APPENDIX

TABLE A-1 Breakthrough curve for TCE adsorption step on virgin carbon

System : Flow Rate of Air-TCE vapor = 1.0843 L/sec
Activated Carbon = 25 g.

Time (min)	Concentration of TCE (ppm)
0	0
45.00	0.92
275.00	0
495.00	3.56
528.00	6.94
578.00	3.21
661.00	4.89
840.00	7.61
1190.00	2.78
1389.00	14.42
1458.00	15.66
1485.00	52.15
1524.00	90.18
1564.00	143.09
1637.00	336.30
1670.00	416.97
1709.00	562.75
1740.00	634.20
1780.00	719.44
1805.00	805.62
1858.00	889.00
1931.00	978.00
1965.00	993.45
2010.00	1021.52
2040.00	1015.46

TCE loading = 9.9848 grams/ 25 grams of Activated Carbon
= 0.3938 g of TCE /g. of Activated Carbon

TABLE A-2 Breakthrough curve for TCE adsorption step on virgin carbon

System : Flow Rate of Air-TCE vapor = 1.1134 L/sec
 Activated Carbon = 25 g.

Time (min)	Concentration of TCE (ppm)
0	0
100.00	5.66
174.00	5.45
495.00	0
528.00	6.94
578.00	3.21
661.00	4.89
840.00	7.61
1318.00	7.23
1470.00	31.05
1490.00	46.51
1520.00	85.26
1550.00	158.03
1591.00	275.23
1664.00	659.72
1705.00	759.80
1728.00	889.87
1752.00	958.89
1782.00	989.76
1809.00	1023.75
1843.00	1020.50
1868.00	1023.52
1917.00	1021.77

TCE loading = 9.9182 grams/ 25 grams of Activated Carbon
 = 0.397 grams of TCE /gram of Activated Carbon

TABLE A-3 Breakthrough curve for TCE adsorption on virgin carbon

System : Flow Rate of Air-TCE vapor = 1.0843 L/sec
 Activated Carbon = 25 g.

Time (min)	Concentration of TCE (ppm)
0	0
87.00	0
176.00	0
810.00	0.54
880.00	2.04
927.00	4.55
983.00	0.74
1086.00	3.19
1137.00	0.00
1300.00	14.26
1339.00	24.24
1384.00	75.65
1421.00	140.33
1530.00	217.50
1586.00	425.12
1657.00	697.35
1696.00	870.86
1732.00	981.22
1778.00	988.28
1823.00	995.96
1848.00	1003.91
1909.00	1011.58
1968.00	1009.61

TCE loading = 9.9636 grams/ 25 grams of Activated Carbon
 = 0.3925 g of TCE /g. of Activated Carbon

TABLE A-4 Breakthrough curve for subsequent adsorption step on virgin carbon

System : Flow Rate of Air-TCE vapor = 1.0843 L/sec
 Activated Carbon = 25 g.

Time (min)	Concentration of TCE (ppm)
0	0
87.00	0
176.00	0
689.00	0.74
742.00	3.21
1071.00	7.61
1080.00	4.89
1155.00	2.78
1285.00	9.15
1342.00	14.78
1389.00	23.98
1394.00	29.13
1428.00	42.91
1460.00	75.70
1495.00	135.68
1530.00	217.50
1586.00	425.12
1657.00	697.35
1696.00	870.86
1732.00	981.22
1778.00	988.28
1823.00	995.96
1848.00	1003.91
1909.00	1011.58
1968.00	1009.61

TCE loading = 9.3636 grams/ 25 grams of Activated Carbon
 = 0.375 g of TCE /g. of Activated Carbon

TABLE A-5 Breakthrough Curve for subsequent adsorption step on regenerated carbon

System : Flow Rate of Air-TCE vapor = 1.1368 L/sec
Activated Carbon = 25 g.

Time (min)	Concentration of TCE (ppm)
0	0
21.00	39.10
50.00	26.73
71.00	28.26
88.00	30.92
161.00	30.35
210.00	27.04
302.00	28.14
360.00	34.60
447.00	19.22
546.00	21.58
713.00	17.69
936.00	18.21
965.00	20.22
1034.00	41.28
1099.00	110.28
1160.00	200.30
1336.00	254.36
1460.00	308.03
1495.00	353.21
1530.00	425.12
1586.00	566.90
1657.00	697.35
1696.00	881.22
1732.00	988.28
1778.00	995.96
1823.00	1009.61

TCE loading = 8.8937 grams/ 25 grams of Activated Carbon
= 0.356 g of TCE /g. of Activated Carbon

Table A-6 % TCE Recovery at Flow Rate 20 mL/min
System SDS Concentration =0.025 M

Time (min)	Cumulative Pore Volume	TCE Recovered (g)	Cumulative TCE Recovered	% TCE Recovery
0	0	0	0	0
102.00	68.00	308.73	308.73	3.11
127.00	84.67	126.40	435.14	4.39
157.00	104.67	137.38	572.52	5.77
186.00	124.00	97.69	670.21	6.76
216.00	144.00	103.76	773.96	7.80
308.00	205.33	323.82	1097.78	11.07
337.00	224.67	99.07	1196.85	12.07
366.00	244.00	82.36	1279.22	12.90
395.00	263.33	89.69	1368.91	13.80
424.00	282.67	70.06	1438.97	14.51
453.00	302.00	75.06	1514.03	15.27
482.00	321.33	96.30	1610.33	16.24
511.00	340.67	70.65	1680.98	16.95
607.00	404.67	302.06	1983.03	19.99
637.00	424.67	76.13	2059.16	20.76
668.00	445.33	87.48	2146.65	21.64
713.00	475.33	111.22	2257.87	22.76
760.00	506.67	137.19	2395.06	24.15
790.00	526.67	81.21	2476.27	24.97
811.00	540.67	50.90	2527.17	25.48
861.00	574.00	114.26	2641.42	26.63
934.00	622.67	185.33	2826.75	28.50
964.00	642.67	75.15	2901.91	29.26
994.00	662.67	82.75	2984.66	30.09
1084.00	722.67	267.99	3252.64	32.79
1188.00	792.00	267.37	3520.01	35.49
1290.00	860.00	405.23	3925.23	39.58
1392.00	928.00	273.44	4198.68	42.33
1488.00	992.00	267.54	4466.22	45.03
1620.00	1080.00	464.78	4931.00	49.72
1870.00	1246.67	929.90	5860.90	59.09

Table A-7 % TCE Recovery at SDS Concentration = 0.025 M
System Regeneration solution flow rate = 40 mL/min

Time (min)	Cumulative Pore Volume	TCE Recovered (g)	Cumulative TCE Recovered	% TCE Recovery
0	0	0	0	0
42.75	57.00	442.14	442.14	4.72
160.75	214.33	371.71	813.85	8.69
242.75	323.67	286.17	1100.02	11.75
323.75	431.67	703.16	1803.17	19.26
403.75	538.33	529.21	2332.38	24.91
485.75	647.67	533.47	2865.85	30.61
598.25	797.67	468.02	3333.87	35.60
699.25	932.33	331.38	3665.26	39.14
828.25	1104.33	378.99	4044.25	43.19
932.25	1243.00	321.38	4365.63	46.62
1039.25	1385.67	289.84	4655.47	49.72
1228.25	1519.00	194.30	5105.55	54.53
1344.25	1637.67	266.09	5371.64	57.37
1458.25	1792.33	315.04	5686.68	60.73
1664.25	1944.33	276.58	6223.37	66.46
1781.25	2081.67	265.15	6488.52	69.29
1914.25	2219.00	256.92	6745.43	72.04
2074.25	2375.00	183.57	7103.63	75.86
2128.25	2552.33	85.24	7188.87	76.77
2260.25	2661.67	87.93	7416.30	79.20
2333.25	2765.67	102.34	7518.64	80.30
2444.25	2837.67	196.79	7715.43	82.40
2543.25	3013.67	123.07	7838.50	83.71
2664.25	3259.00	192.63	8031.13	85.77
2742.25	3391.00	75.89	8107.02	86.58
2823.25	3764.33	76.34	8183.36	87.40
2958.25	3944.33	151.12	8334.49	89.01
3079.50	4106.00	101.33	8435.81	90.09
3202.50	4270.00	100.41	8536.22	91.16
3313.00	4417.33	93.20	8629.42	92.16
3413.50	4551.33	79.80	8709.23	93.01
3526.00	4701.33	60.14	8769.37	93.65

Table A-8 % TCE Recovery at SDS Concentration = 0.025 M
System Regenerant solution flow rate = 5 mL/min

Time (min)	Cumulative Pore Volume	TCE Recovered (g)	Cumulative TCE Recovered	% TCE Recovery
0	0	0	0	0
82.00	13.67	27.04	27.04	0.30
177.00	29.50	53.00	80.05	0.90
290.00	48.33	101.31	181.36	2.04
385.00	64.17	129.48	310.83	3.50
541.00	90.17	239.45	550.29	6.19
682.00	113.67	259.37	809.66	9.10
1070.00	178.33	791.31	1600.97	18.00
1303.00	217.17	575.97	2176.94	24.48
1472.00	245.33	472.66	2649.60	29.79
1672.00	278.67	426.17	3075.77	34.58
1821.00	303.50	278.76	3354.53	37.72
2253.00	375.50	817.38	4171.91	46.91
2531.00	421.83	473.94	4645.85	52.24
2890.00	481.67	567.00	5212.85	58.61
2957.00	492.83	23.14	5236.00	58.87
3118.00	519.67	50.82	5286.82	59.44
3365.00	560.83	343.73	5630.54	63.31
3580.00	596.67	317.40	5947.95	66.88
3956.00	659.33	495.15	6443.10	72.45
4286.00	714.33	486.14	6929.24	77.91
4528.00	754.67	272.64	7201.88	80.98
4793.00	798.83	207.59	7409.47	83.31
5073.00	845.50	157.32	7566.79	85.08
5413.00	902.17	204.43	7771.22	87.38
5742.00	957.00	140.97	7912.19	88.96
6042.00	1007.00	153.85	8066.04	90.69
6942.00	1157.00	150.62	8216.65	92.39

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