June 12, 2017

University of Toronto
255 McCaul Street, Level 4
Toronto, Ontario M5T 1W7

Attn: Mr. Irfan Miraj, P.Eng., MHSc.
Manager, Hazardous Construction Materials Group

Re: Results of PCM and TEM Air Monitoring Program
June 5-9, 2017
University of Toronto – Medical Sciences Building
1 King's College Circle, Toronto, Ontario

1.0 INTRODUCTION

Safetech Environmental Limited (SEL) has been retained from June 5 to June 9, 2017 to provide air monitoring services for the University of Toronto's Medical Sciences Building located at 1 King's College Circle, Toronto, Ontario M5S 1A8. Air sampling has been performed at the request of Mr. Irfan Miraj, Manager, Hazardous Construction Materials Group, to determine if airborne asbestos fibre concentrations are within acceptable and applicable limits. This report provides detail of air sampling conducted from June 5-June 9, 2017.

From June 5 to June 9, SEL has collected a total of 50 representative samples, 0 location specific samples and 10 outdoor samples:

- Representative samples refer to locations that were uniformly selected and also upon occupant request. These "building-wide" air samples provide an overview of air quality with regard to airborne fibres.
- Location samples refer to samples taken pre- and post-asbestos clean-up in locations where asbestos-containing dust (>0.5%) were present.
- Outdoor reference samples were collected because asbestos fibres are naturally occurring.

2.0 SUMMARY OF CONCLUSIONS

The Medical Sciences Building air quality is not being negatively impacted by the presence of asbestos-containing building materials existing within the building. The building is deemed to be safe for general occupancy. In addition, although construction related work is being conducted at various locations within the Medical Sciences Building it does not appear that airborne fibres are being drawn into the heating, ventilation and air conditioning systems and negatively impacting the quality of air.

SEL has based above conclusions on the facts briefly described below:

- Of the 50 representative samples; all 50 samples indicate that at the time of sampling the airborne fiber concentrations were well below the TWA (time weighted average) of 0.1 fibers per cubic centimeter (f/cc), in accordance with Ontario Regulation 490/09, Designated Substances and also below 50% TWA; an action level followed by SEL.

- All 10 outdoor samples also indicated that at the time of sampling the airborne fiber concentrations were well below 0.1f/cc.

Please refer to Appendix A detailed spread sheets and technical reports of aforementioned samples. As explained in next section (3.1), other non-asbestos fibres and particles may interfere and result in higher fibre counts. Therefore the results shown in Appendix A do not reflect airborne concentrations of asbestos alone but for the purpose of this assessment, it is compared to the TWA for asbestos. Actual airborne asbestos fibre concentration may be lower than the values in Appendix A.

3.0 METHODOLOGY

3.1 Air Monitoring for Airborne Fibres

Phase contrast microscopy (PCM) air samples were retrieved within designated locations. The air samples were collected using a 25-mm three-piece filter cassettes containing a 0.8 µm cellulose ester membrane filter and equipped with a 50-mm electrically conductive extension cowl. The filter cassettes were attached to a high volume air sampling pump calibrated with a filter cassette in line to a known flow rate.

The air sampling pumps were calibrated to a flow rate of approximately 15 litres per minute. The air samples were collected using 25 mm three piece cassette with 50 mm electrically conductive extension cowl and mixed cellulose ester filter, 0.8 µm (recommended 0.45 to 1.2 in method) effective pore size, and back-up pad. The air samples were analyzed in accordance with U.S. National Institute of Occupational Safety and Health (NIOSH) Manual of Analytical Methods, Method 7400, Issue 2: Asbestos and other Fibres by PCM (August 15, 1994), using the asbestos fibre counting rules.

The quantitative working range of this method is 0.04 to 0.5 fibre/cc for a 1000 L air sample. The Limit of Detection (LOD) depends on sample volume and quantity of interfering dust, and is < 0.01 fibre/cc for atmospheres free of interferences. The method gives an index of airborne fibres. Fibres less than approximately 0.25 µm in diameter will not be detected by this method. In addition, other airborne fibres and particles that fall within the counting range criteria may act as possible interferences. Demolition and construction related work areas where high levels of dust are present might overload

the membrane and/or interfere with the analysis. As required by NIOSH Method 7400, blank filters were submitted for analysis to ensure that no contamination of the filters occurred during sampling or analytical procedures. Analytical results, as reported in the result table of this report have been field blank corrected.

3.2 Transmission Electron Microscopy

Where PCM results indicate airborne fibres to be greater than 50% of the TWA, a secondary analysis of air samples was conducted using NIOSH Method 7402, Issue 2: Asbestos by TEM (August 15, 1994). This method is used to determine asbestos fibres in the optically visible range and has the ability to distinguish asbestos fibres from other types of fibres (e.g. clothing fibres). It is intended to complement the results obtained by phase contrast microscopy (NIOSH Method 7400).

In accordance with this method, a sample is analyzed at a magnification of 10,000 times. Only fibres with an aspect ratio of >3:1 and only those fibres greater than 5 µm in length are counted. The quantitative working range of this method is 0.04 to 0.5 fibres per cubic centimetre (f/cc) for a 1000 litre (L) air sample. The Limit of Detection (LOD) depends on sample volume and quantity of interfering dust, and is < 0.01 fibres per cubic centimetre (f/cc) for atmospheres free of interferences. Other amphibole particles that have asbestos ratios greater than 3:1 and elemental compositions similar to the asbestos minerals may interfere in the TEM analysis. Some non-amphibole minerals may give electron diffraction patterns similar to amphiboles. High concentrations of background dust may also interfere with fibre identification.

4.0 LIMITATIONS

The investigation, assessments and recommendations detailed in this report were carried out in a manner consistent with the level of care and skill normally exercised by reasonable members of the environmental and industrial hygiene consulting profession currently practicing under similar conditions in the area. Furthermore, the investigation, assessments and recommendations in this report have been made based on conditions observed at the time of the assessment and are limited to the areas investigated.

In preparing this report, Safetech Environmental Limited (SEL) relied on information supplied by others. Except as expressly set-out in this report, SEL has not made any independent verification of such information.

The analytical method used meets the requirements of O.Reg. 278/05. However, it is important to note that this method is not specific to the identification of asbestos fibres. All particles with a length greater than 5 micrometres, less than 3 micrometres in diameter and a length to diameter ratio of 3 to 1 or greater are included in the count. Fibres with diameters less than about 0.3 micrometres cannot be detected using this method regardless of length.

This report has been prepared for the sole use of the person or entity to who it is addressed. No other person or entity is entitled to use or rely upon this report without the express written consent of Safetech Environmental Limited and the person or entity to who it is addressed. Any use that a third party makes of this report, or any reliance based on conclusions and recommendations made, are the responsibility of such third parties. SEL accepts no responsibility for damages suffered by third parties as a result of actions based on this report.

Should you have any questions regarding this project, please contact our office.
Sincerely,

SAFETECH ENVIRONMENTAL LIMITED

Josh Hamilton
OH&S Technician

D. Glenn Smith, BA, CRSP, AMRT
Senior Project Manager

Appendices:

Appendix A – PCM Air Sample Spreadsheets – SEL
Appendix B – Pump Calibration Sheets
Appendix C – PCM Analysis Example Calculation Sheet

Appendix A
PCM AIR SAMPLE SPREADSHEET-SEL

Phase Contrast Microscopy Air Sampling Program, Medical Sciences Building, Floor 2, University of Toronto, June 9, 2017

Floor	Room	Description	Sample Location	Sample Number	Pump Number	Litres Per Minute	Time On	Time Off	Duration	Total Litres	Total Fibres	Results f/cc	Analyst	Within Acceptable Limits	Comments
2	2175K	Hallway	Central	2017-06-1295	8	14.94	11:45	13:20	95	1419	6.5	0.002	SC/GS	Yes	Occupied.
2	2284K	Hallway	Central	2017-06-1296	5	15.03	11:53	13:28	95	1428	12.5	0.004	SC/GS	Yes	Occupied.
2	2388K	Hallway	Central	2017-06-1297	7	15.02	11:49	13:24	95	1427	4	0.001	SC/GS	Yes	Occupied.
2	2375K	Hallway	Central	2017-06-1298	6	15.04	11:56	13:32	96	1444	8	0.002	SC/GS	Yes	Occupied.
2	2375V	Elevator Lobby	Central	2017-06-1299	10	14.94	13:55	15:38	103	1539	4.5	0.001	SC/GS	Yes	Occupied.
2	2377	Lab	Central	2017-06-1300	9	14.94	14:02	15:42	100	1494	6	0.002	SC/GS	Yes	Occupied.
2	2282	Lab	Central	2017-06-1301	5	15.03	14:09	15:50	101	1518	3.5	0.001	SC/GS	Yes	Occupied.
2	2384	Lab	Central	2017-06-1302	6	15.04	14:13	15:54	101	1519	3	0.001	SC/GS	Yes	Occupied.
2	2279	Lab	Central	2017-06-1303	8	14.94	14:27	16:02	95	1419	3.5	0.001	SC/GS	Yes	Occupied.
2	2182	Lab	Central	2017-06-1304	7	15.02	14:35	16:05	90	1352	2.5	0.001	SC/GS	Yes	Occupied.
	Exterior Control	NA	South of Medical Sciences Building	2017-06-1305	10	14.94	12:03	13:45	102	1524	3	0.001	SC/GS	Yes	Exterior sample for comparison.
	Exterior Control	NA	North of Medical Sciences Building	2017-06-1306	9	14.94	12:08	13:42	94	1404	2	0.001	SC/GS	Yes	Exterior sample for comparison.
2	Field blank	NA	NA	2017-06-1307	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1308	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1309	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1310	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.

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Interpretation of Results
1) Within Ontario, the Occupational Health and Safety Act - Ontario Regulation 490/09 Designated Substances adopts the ACGIH TWA of 0.1 fibres/cc.

2) For each area tested compare the "Results f/cc" column to your area and how it compares to the above noted regulation.

Phase Contrast Microscopy Air Sampling Program, Medical Sciences Building, Floor 3, University of Toronto, June 8, 2017

Floor	Room	Description	Sample Location	Sample Number	Pump Number	Litres Per Minute	Time On	Time Off	Duration	Total Litres	Total Fibres	Results f/cc	Analyst	Within Acceptable Limits	Comments
3	3270	Dark Room	Central	2017-06-1279	8	15.03	11:02	12:17	75	1127	6	0.002	SC/GS	Yes	Adjacent to construction.
3	3269K	Hallway	Central	2017-06-1280	7	15.04	11:06	12:20	74	1113	7	0.003	SC/GS	Yes	Occupied.
3	3379	Lab	Central	2017-06-1281	9	14.99	11:10	12:37	87	1304	3.5	0.001	SC/GS	Yes	Occupied.
3	3279	Janitorial Room	Central	2017-06-1282	10	15.07	11:14	12:42	88	1326	4	0.001	SC/GS	Yes	Not Occupied.
3	3234	Elevator Lobby	Central	2017-06-1283	6	14.98	12:10	14:54	104	1558	10	0.003	SC/GS	Yes	Occupied.
3	3348K	Hallway	Central	2017-06-1284	9	15	12:14	14:59	105	1575	10.5	0.003	SC/GS	Yes	Adjacent to construction. Occupied.
3	3360	Lab	Central	2017-06-1285	8	15.07	12:28	15:03	91	1371	3.5	0.001	SC/GS	Yes	Occupied.
3	3336	Lab	Central	2017-06-1286	7	15.01	12:33	15:06	93	1396	6	0.002	SC/GS	Yes	Adjacent to construction. Occupied.
3	3320K	Hallway	Central	2017-06-1287	9	14.99	12:39	15:10	91	1364	8.5	0.003	SC/GS	Yes	Adjacent to construction. Occupied.
3	3222K	Hallway	Central	2017-06-1288	10	15.07	12:49	15:17	88	1326	4	0.001	SC/GS	Yes	Occupied.
	Exterior Control	NA	South of Medical Sciences Building	2017-06-1289	6	15.08	10:36	11:52	76	1146	1.5	0.001	SC/GS	Yes	Exterior sample for comparison.
	Exterior Control	NA	North of Medical Sciences Building	2017-06-1290	5	14.98	10:41	11:58	77	1153	3	0.001	SC/GS	Yes	Exterior sample for comparison.
2	Field blank	NA	NA	2017-06-1291	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1292	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1293	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1294	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.

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Interpretation of Results

1) Within Ontario, the Occupational Health and Safety Act - Ontario Regulation 490/09 Designated Substances adopts the ACGIH TWA of 0.1 fibres/cc.

2) For each area tested compare the "Results f/cc" column to your area and how it compares to the above noted regulation.

Phase Contrast Microscopy Air Sampling Program, Medical Sciences Building, Floor 4, University of Toronto, June 7, 2017

Floor	Room	Description	Sample Location	Sample Number	Pump Number	Litres Per Minute	Time On	Time Off	Duration	Total Litres	Total Fibres	Results f/cc	Analyst	Within Acceptable Limits	Comments
4	4185K	Hallway	Central	2017-06-1264	9	15	12:59	14:36	97	1455	4.5	0.001	SC/GS	Yes	Occupied.
4	4374K	Hallway	Central	2017-06-1265	7	14.99	13:04	14:47	103	1544	8	0.002	SC/GS	Yes	Occupied.
4	4369K	Hallway	Central	2017-06-1266	8	15	13:07	14:50	103	1545	6.5	0.002	SC/GS	Yes	Occupied.
4	4350K	Hallway	Central	2017-06-1267	5	14.96	14:23	15:31	68	1017	8.5	0.004	SC/GS	Yes	Occupied.
4	4349K	Hallway	Central	2017-06-1268	6	15.09	14:27	15:36	69	1041	4	0.002	SC/GS	Yes	Occupied.
4	4255K	Hallway	Central	2017-06-1269	9	15	14:41	15:50	69	1035	5.5	0.002	SC/GS	Yes	Occupied.
4	4243K	Hallway	Central	2017-06-1270	10	15.01	14:44	15:55	71	1066	5.5	0.002	SC/GS	Yes	Occupied.
4	4222K	Hallway	Central	2017-06-1271	7	14.99	14:54	16:03	69	1034	3.5	0.001	SC/GS	Yes	Occupied.
4	4322K	Hallway	Central	2017-06-1272	8	15	14:58	16:09	71	1065	3	0.001	SC/GS	Yes	Occupied.
	Exterior Control	NA	South of Medical Sciences Building	2017-06-1273	5	14.96	12:35	14:09	94	1406	3.5	0.001	SC/GS	Yes	Exterior sample for comparison.
	Exterior Control	NA	North of Medical Sciences Building	2017-06-1274	6	15.09	12:40	14:13	93	1403	1	0.001	SC/GS	Yes	Exterior sample for comparison.
6	Field blank	NA	NA	2017-06-1275	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1276	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1277	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1278	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.

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Interpretation of Results
1) Within Ontario, the Occupational Health and Safety Act - Ontario Regulation 490/09 Designated Substances adopts the ACGIH TWA of 0.1 fibres/cc.

2) For each area tested compare the "Results f/cc" column to your area and how it compares to the above noted regulation.

Phase Contrast Microscopy Air Sampling Program, Medical Sciences Building, Floor 2, University of Toronto, June 7, 2017

Floor	Room	Description	Sample Location	Sample Number	Pump Number	Litres Per Minute	Time On	Time Off	Duration	Total Litres	Total Fibres	Results f/cc	Analyst	Within Acceptable Limits	Comments
2	2269	Equipment Room	Central	2017-06-1263	10	15.01	12:54	14:31	97	1456	3.5	0.001	SC/GS	Yes	Not Occupied.
	Exterior Control	NA	South of Medical Sciences Building	2017-06-1273	5	14.96	12:35	14:09	94	1406	3.5	0.001	SC/GS	Yes	Exterior sample for comparison.
	Exterior Control	NA	North of Medical Sciences Building	2017-06-1274	6	15.09	12:40	14:13	93	1403	1	0.001	SC/GS	Yes	Exterior sample for comparison.
6	Field blank	NA	NA	2017-06-1275	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1276	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1277	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1278	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.

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2) For each area tested compare the "Results f/cc" column to your area and how it compares to the above noted regulation.

Phase Contrast Microscopy Air Sampling Program, Medical Sciences Building, Floor 5, University of Toronto, June 6, 2017

Floor	Room	Description	Sample Location	Sample Number	Pump Number	Litres Per Minute	Time On	Time Off	Duration	Total Litres	Total Fibres	Results f/cc	Analyst	Within Acceptable Limits	Comments
5	5369K	Hallway	Central	2017-06-1247	9	14.96	12:09	13:20	71	1062	4	0.002	SC/GS	Yes	Occupied.
5	5350K	Hallway	Central	2017-06-1248	10	15.11	12:15	13:32	77	1163	5	0.002	SC/GS	Yes	Occupied.
5	5348K	Hallway	Central	2017-06-1249	8	15	12:20	13:47	87	1305	4	0.001	SC/GS	Yes	Occupied.
5	5234	Elevator Lobby	Central	2017-06-1250	7	14.96	12:26	13:53	87	1302	7.5	0.003	SC/GS	Yes	Occupied.
5	5234K	Hallway	Central	2017-06-1251	5	14.91	13:11	15:22	71	1059	4	0.002	SC/GS	Yes	Occupied.
5	5201K	Hallway	Central	2017-06-1252	6	14.91	13:16	15:19	123	1834	10	0.002	SC/GS	Yes	Occupied.
5	5322K	Hallway	Central	2017-06-1253	9	14.96	13:40	15:19	99	1481	4	0.001	SC/GS	Yes	Occupied.
5	5369K	Hallway	Central	2017-06-1254	10	15.11	13:44	15:16	92	1390	13.5	0.004	SC/GS	Yes	Occupied.
5	5246K	Hallway	Central	2017-06-1255	8	15	13:50	15:20	90	1350	7.5	0.002	SC/GS	Yes	Occupied.
5	5223	Janitorial Room	Central	2017-06-1256	7	14.96	13:56	15:24	98	1466	8	0.002	SC/GS	Yes	Not Occupied.
	Exterior Control	NA	South of Medical Sciences Building	2017-06-1257	6	14.91	11:52	13:00	68	1014	3.5	0.002	SC/GS	Yes	Exterior sample for comparison.
	Exterior Control	NA	North of Medical Sciences Building	2017-06-1258	5	14.91	11:57	13:06	69	1029	4	0.002	SC/GS	Yes	Exterior sample for comparison.
6	Field blank	NA	NA	2017-06-1259	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1260	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1261	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
6	Field Blank	NA	NA	2017-06-1262	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.

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Interpretation of Results
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2) For each area tested compare the "Results f/cc" column to your area and how it compares to the above noted regulation.

Phase Contrast Microscopy Air Sampling Program, Medical Sciences Building, Floor 6, University of Toronto, June 5, 2017

Floor	Room	Description	Sample Location	Sample Number	Pump Number	Litres Per Minute	Time On	Time Off	Duration	Total Litres	Total Fibres	Results f/cc	Analyst	Within Acceptable Limits	Comments
6	6374K	Hallway	Central	2017-06-1231	7	15.05	11:37	12:57	80	1204	5.5	0.002	SC/GS	Yes	Occupied.
6	6254K	Hallway	Central	2017-06-1232	8	14.97	11:40	13:00	80	1198	5.5	0.002	SC/GS	Yes	Occupied.
6	6369K	Hallway	Central	2017-06-1233	6	14.94	11:49	13:04	75	1121	6.5	0.003	SC/GS	Yes	Occupied.
6	6250K	Hallway	Central	2017-06-1234	5	14.98	11:45	13:03	78	1168	4.5	0.002	SC/GS	Yes	Occupied.
6	6239K	Hallway	Central	2017-06-1235	5	14.98	13:13	15:06	113	1693	10	0.003	SC/GS	Yes	Occupied.
6	6348K	Hallway	Central	2017-06-1236	7	15.05	13:22	15:14	112	1686	7.5	0.002	SC/GS	Yes	Occupied.
6	6221K	Hallway	Central	2017-06-1237	10	14.97	13:48	15:23	95	1422	4.5	0.001	SC/GS	Yes	Occupied.
6	6324K	Hallway	Central	2017-06-1238	8	14.97	13:30	15:15	105	1572	14.5	0.004	SC/GS	Yes	Occupied.
6	6201K	Hallway	Central	2017-06-1239	9	14.97	13:51	15:25	94	1407	11.5	0.004	SC/GS	Yes	Occupied.
6	6234	Elevator Lobby	Central	2017-06-1240	6	14.94	13:17	15:09	112	1673	10	0.003	SC/GS	Yes	Occupied.
	Exterior Control	NA	South of Medical Sciences Building	2017-06-1241	10	14.97	11:59	13:40	101	1512	3	0.001	SC/GS	Yes	Exterior sample for comparison.
	Exterior Control	NA	North of Medical Sciences Building	2017-06-1242	9	14.97	12:05	13:36	91	1362	1	0.001	SC/GS	Yes	EXterior sample for comparison.
2	Field blank	NA	NA	2017-06-1243	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1244	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1245	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.
2	Field Blank	NA	NA	2017-06-1246	NA	NA	NA	NA	NA	NA	0	Not applicable	Not applicable	Not applicable	Required as per NIOSH Method 7400.

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Appendix B
PUMP CALIBRATION SHEET

safeTECH ENVIRONMENTAL LTD.

Pump Calibration Form

Calibration Device: BIOS DryCal DC Lite HV

Date: June 5th, 2017

Name: Travis McLennan

Temperature: 22°C

Barometric Pressure: 100.7 kPa

Pump Number	Flow Rate (L/min)			Average Flow Rate (L/min)	Average Flow Rate (L/min) +10%	Average Flow Rate (L/min) - 10%
	Trial #1	Trial #2	Trial #3			
MSB -1						
MSB-2						
MSB -3						
MSB -4						
MSB-5	14.99	14.97	14.99	14.98	16.48	13.48
MSB -6	14.95	14.93	14.93	14.94	16.43	13.45
MSB -7	15.07	15.05	15.04	15.05	16.56	13.55
MSB-8	15.05	14.96	14.91	14.97	16.47	13.47
MSB -9	14.99	14.97	14.95	14.97	16.47	13.47
MSB -10	15.01	14.96	14.93	14.97	16.47	13.47

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Pump Calibration Form

Calibration Device: BIOS DryCal DC Lite HV

Date: June 9, 2017

Name: Travis McLennon

Temperature: 22°C

Barometric Pressure: 100.9kPa

Pump Number	Flow Rate (L/min)			Average Flow Rate (L/min)	Average Flow Rate (L/min) +10%	Average Flow Rate (L/min) - 10%
	Trial #1	Trial #2	Trial #3			
MSB -1						
MSB-2						
MSB -3						
MSB -4						
MSB-5	15.03	15.03	15.03	15.03	16.53	13.53
MSB -6	15.04	15.04	15.03	15.04	16.54	13.54
MSB -7	15.05	15.00	15.00	15.02	16.52	13.52
MSB-8	14.97	15.00	14.84	14.94	16.43	13.45
MSB -9	15.01	14.87	14.93	14.94	16.43	13.45
MSB -10	14.97	14.93	14.92	14.94	16.43	13.45

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Pump Calibration Form

Calibration Device: BIOS DryCal DC Lite HV

Date: June 7, 2017

Name: Josh Hamilton

Temperature: 22°C

Barometric Pressure: 102.0 kPa

Pump Number	Flow Rate (L/min)			Average Flow Rate (L/min)	Average Flow Rate (L/min) +10%	Average Flow Rate (L/min) - 10%
	Trial #1	Trial #2	Trial #3			
MSB -1						
MSB-2						
MSB -3						
MSB -4						
MSB-5	14.96	14.96	14.96	14.96	16.46	13.46
MSB -6	15.10	15.08	15.10	15.09	16.59	13.59
MSB -7	15.07	14.85	15.05	14.99	16.49	13.49
MSB-8	15.01	15.01	14.97	15.00	16.50	13.50
MSB -9	14.95	15.01	15.03	15.00	16.50	13.50
MSB -10	15.01	15.01	15.00	15.01	16.51	13.51

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Pump Calibration Form

Calibration Device: BIOS DryCal DC Lite HV

Date: June 8, 2017

Name: Josh Hamilton

Temperature: 22°C

Barometric Pressure: 101.8 kPa

Pump Number	Flow Rate (L/min)			Average Flow Rate (L/min)	Average Flow Rate (L/min) +10%	Average Flow Rate (L/min) - 10%
	Trial #1	Trial #2	Trial #3			
MSB -1						
MSB-2						
MSB -3						
MSB -4						
MSB-5	15.08	15.08	15.08	15.08	16.58	13.58
MSB -6	14.99	14.97	14.99	14.98	16.48	13.48
MSB -7	15.01	14.97	15.04	15.01	16.51	13.51
MSB-8	15.11	15.07	15.03	15.07	16.57	13.57
MSB -9	14.97	15.00	15.01	14.99	16.49	13.49
MSB -10	15.07	15.10	15.05	15.07	16.57	13.57

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safeTECH ENVIRONMENTAL LTD.

Pump Calibration Form

Calibration Device: BIOS DryCal DC Lite HV

Date: June 6, 2017

Name: Josh Hamilton

Temperature: 22°C

Barometric Pressure: 100.9 kPa

Pump Number	Flow Rate (L/min)			Average Flow Rate (L/min)	Average Flow Rate (L/min) +10%	Average Flow Rate (L/min) - 10%
	Trial #1	Trial #2	Trial #3			
MSB -1						
MSB-2						
MSB -3						
MSB -4						
MSB-5	14.89	14.91	14.92	14.91	16.41	13.41
MSB -6	14.91	14.92	14.89	14.91	16.41	13.41
MSB -7	15.01	14.88	14.99	14.96	16.46	13.46
MSB-8	15.11	15.00	14.88	15.00	16.50	13.50
MSB -9	14.96	14.96	14.95	14.96	16.46	13.46
MSB -10	15.07	15.15	15.12	15.11	16.51	13.51

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Appendix C
PCM ANALYSIS EXAMPLE CALCULATION SHEET

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PCM Air Sample Analysis

June 8/17.

Project Name:	UofT Medical Sciences Building		
Project Number:	119917		
Sample ID:	2017-06-1290	Sample Type:	Ambient
Sample Collected By:	JH	Date:	June 8 2017
Sample Analyzed By:	JC/GS	Date:	June 8 2017
Sample Location:	Extension - North of MSB		
Start Time:	10:41	Sample Duration (min)	77
Finish Time:	11:58	Flow Rate (L/min)	14.98

Volume (V)	1153	L	
Total Fibres Counted in Sample (FCS)	3	fibres	
Total Fields Counted in Sample (FLS)	100	fields	
Reticle Field Area (RFA)	0.00801	mm²	
Area of Filter (AF)	385	mm²	
NIOSH 7400 Counting Rules Used	A		
Fibre Density (E)	—	fibres/mm²	E = (FCS/FLS)/RFA
Fibre Concentration (C)	0.001	fibres/cc	C = (E*385)/(V*1000)

1	—	11	—	21	—	31	—	41	—	51	—	61	5	71	—	81	—	91	—
2	—	12	—	22	—	32	—	42	—	52	—	62	—	72	—	82	—	92	—
3	—	13	—	23	—	33	—	43	—	53	—	63	—	73	—	83	—	93	—
4	—	14	—	24	—	34	—	44	—	54	—	64	—	74	—	84	—	94	—
5	5	15	—	25	—	35	—	45	—	55	—	65	—	75	—	85	—	95	—
6	—	16	—	26	—	36	—	46	—	56	—	66	—	76	—	86	—	96	—
7	—	17	—	27	—	37	—	47	—	57	—	67	—	77	—	87	—	97	—
8	—	18	—	28	—	38	—	48	—	58	—	68	—	78	—	88	—	98	—
9	—	19	—	29	—	39	—	49	—	59	—	69	—	79	—	89	—	99	—
10	—	20	—	30	—	40	—	50	—	60	—	70	—	80	—	90	—	100	—

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