

ANNEX E AIR QUALITY



CALIBRATION CERTIFICATES FOR AIR QUALITY

### **ALS Technichem (HK) Pty Ltd**

### **ALS Laboratory Group**





#### SUB-CONTRACTING REPORT

CONTACT

: MR MAGNUM FAN

WORK ORDER

HK2342916

CLIENT ADDRESS

PROJECT

: ENVIROTECH SERVICES CO.

: RM 712, 7/F, MY LOFT 9 HOI WING ROAD,

TUEN MUN, N.T. HK

SUB-BATCH

DATE RECEIVED : 26-OCT-2023

DATE OF ISSUE : 2-NOV-2023

NO. OF SAMPLES : 1

CLIENT ORDER

General Comments

Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition.

Sample information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified. The result(s) is/are related only to the item(s) tested.

Calibration was subcontracted to Envirotech Services Company.

Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

WORK ORDER

CLIENT

: HK2342916

SUB-BATCH

1 : ENVIROTECH SERVICES CO.

PROJECT



ALS Lab	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2342916-001	Sibata LD-3B (436553)	Equipments	21-Oct-2023	S/N: 436553



#### Envirotech Services Co.

Rm. 712, 7/F My Loft, 9 Hoi Wing Road, Tuen Mun. H.K. Tel: 2560 8450 Fax: 2560 6553

E-mail: envirotech@netvigetor.com

#### **Equipment Verification Report (TSP)**

Easti	pment	Calib	rated	
Euui	oment	Callin	n ateu	١.

Type:

Laser Dust Monitor

Manufacturer:

Sibata LD-3B

Serial No.:

436553

Equipment Ref.:

N/A

ALS Job Order:

HK2342309

Standard Equipment

Standard Equipment:

High Volume Sampler (TSP)

Location:

Envirotech Room (Calibration Room)

Equipment Ref.:

HVS 8162

Last Calibration Date:

21-Oct-2023

#### **Equipment Verification Results:**

Verification Date:

14-Oct-2023

		Mean	Mean	Concentration in µg/m³	Concentration in µg/m <sup>3</sup>
Hour	Time	Temp °C	Pressure	(Standard Equipment)	(Calibrated Equipment)
			(hpa)	(Y-Axis)	(X-Axis)
1hr 00mins	0910-1010	21.8	1019	10	17
2hr 00mins	1015-1215	21.8	1019	30	38
3hr 00mins	. 1410-1710	23.5	1019	71	67

80

#### Linear Regression of Y or X

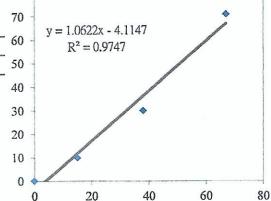
Slope (K-factor):

 $1.0622(\mu g/m^3)/CPM$ 

Correlation Coefficient (R):

Date of Issue:

0.9872 26-Oct-2023



#### Remarks:

- 1. Strong Correlation (>0.8)
- Factor 1.0622 (µg/m³)/CPM should be applied for TSP monitoring

Operator:

P.F.Yeung Signature

Da

Date: 26 October 2023

QC Reviewer:

K.F.Ho

Signature

Fail

Date: 26 October 2023

<sup>\*</sup>If R<0.5, repair or verification is required for the equipment

#### TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location: Rm. 712, My Loft, Tuen Mun Date of Calibration: 13-Oct-23 HVS ID: 8162 Next Calibration Date: 12-Dec-23 Name and Model: TISCH HVS Model TE-5170 Operator: P.F. Yeung CONDITIONS Sea Level Pressure (hpa) 1015 Corrected Pressure (mm Hg) 762.1 28.9 Temperature (°C) Temperature (K) 293 CALIBRATION ORIFICE Make: TISCH **Qstd Slope** 2.06918 Model: TE-5025A **Qstd** Intercept -0.04220Serial#: 2454 CALIBRATION Plate H2O(L) H20(R) H<sub>2</sub>O IC I Qstd LINEAR No. (in) (in) (m3/min) (in) (chart) (corrected) REGRESSION 18 6.5 6.5 13.0 1.806 62 63.54 Slope= 32.843 13 4.7 4.7 9.4 1.539 56 57.39 Intercept= 5.518 10 3.4 3.4 6.8 1.312 49 50.22 Corr. Coeff.= 0.9939 7 2.3 2.2 4.5 1.071 40 40.99 5 1.6 1.5 3.1 0.892 33 33.82 IC Flow Rate Calulations: 70 Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]65 IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]60 Qstd = standard flow rate 55 IC = corrected chart response 50 I = actual chart response m = calibrator Qstd slope 45 b = calibrator Qstd intercept 40 Ta = actual temperature during calibration (deg K)

35

30

25

20 15

10

0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9

Qstd(m3/min)

Pa = actual pressure during calibration (mm Hg)

For subsequent calculation of sampler flow:

1/m((I)[Sqrt(298/Tav)(Pav/760)]-b)

Tav = daily average temperature
Pav = daily average pressure

m = sampler slope
b = sampler intercept

I = chart response



# RECALIBRATION DUE DATE:

December 15, 2023

# Certificate of Calibration

**Calibration Certification Information** 

Cal. Date: December 15, 2022

Rootsmeter S/N: 438320

Ta: 295

Pa: 748.0

°K

Operator: Jim Tisch

Calibrator S/N: 4064

mm Hg

Calibration Model #: TE-5025A

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4430	3.2	2.00
2	3	4	1	1.0210	6.4	4.00
3	5	6	1	0.9170	7.9	5.00
4	7	8	1	0.8730	8.8	5.50
	0	10	1	0.7210	12.8	8.00

		Data Tabula	tion		1
Vstd	Qstd	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$		Qa	√∆H(Ta/Pa)
(m3)	(x-axis)	(y-axis)	Va	(x-axis)	(y-axis)
0.9900	0.6861	1.4101	0.9957	0.6900	0.8881
0.9858	0.9655	1.9943	0.9914	0.9711	1.2560
0.9838	1.0728	2.2296	0.9894	1.0790	1.4042
0.9826	1.1255	2.3385	0.9882	1.1320	1.4728
0.9772	1.3554	2.8203	0.9829	1.3632	1.7762
	m=	2.10977		m=	1.32110
QSTD	b=	-0.03782	QA	b=	-0.02382
~	r=	0.99998		r=	0.99998

	Calculation	ns		
Vstd=	ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	Va=	ΔVol((Pa-ΔP)/Pa)	
Qstd=	Vstd/ΔTime	<b>Qa=</b> Va/ΔTime		
	For subsequent flow rat	e calculatio	ns:	
Qstd=	$1/m\left(\left(\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}\right)-b\right)$	Qa=	$1/m\left(\left(\sqrt{\Delta H\left(Ta/Pa\right)}\right)-b\right)$	

	Standard Conditions
Tstd:	298.15 °K
Pstd:	760 mm Hg
	Key
ΔH: calibrator	manometer reading (in H2O)
ΔP: rootsmete	er manometer reading (mm Hg)
Ta: actual abs	olute temperature (°K)
Pa: actual bar	ometric pressure (mm Hg)
b: intercept	
m: slope	

#### RECALIBRATION

US EPA recommends annual recalibration per 1998
40 Code of Federal Regulations Part 50 to 51,
Appendix B to Part 50, Reference Method for the
Determination of Suspended Particulate Matter in
the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc. 145 South Miami Avenue Village of Cleves, OH 45002 www.tisch-env.con

TOLL FREE: (877)263-7610 FAX: (513)467-900!

# **ALS Technichem (HK) Pty Ltd**

## **ALS Laboratory Group**

ANALYTICAL CHEMISTRY & TESTING SERVICES



#### SUB-CONTRACTING REPORT

CONTACT

: MR MAGNUM FAN

WORK ORDER

HK2419606

CLIENT ADDRESS

ENVIROTECH SERVICES CO.

: RM 712, 7/F, MY LOFT 9 HOI WING ROAD,

SUB-BATCH

: 1

TUEN MUN, N.T. HK

DATE RECEIVED : 20-MAY-2024

DATE OF ISSUE : 24-MAY-2024

NO. OF SAMPLES : 1

CLIENT ORDER

**PROJECT** 

#### General Comments

Sample Information (Project name, Sample ID, Sampling date/time, etc.) is provided by client.

- Result(s) of sample(s) is/are reported on as received basis, unless otherwise specified. The result(s) is/are related only to the item(s) tested.
- Calibration was subcontracted to Envirotech Services Company.
- Sample(s) was/ were submitted by client. Sample(s) arrived laboratory in ambient condition.

#### Signatories

This document has been signed by those names that appear on this report and are the authorised signatories

Signatories

Position

Richard Fung

Managing Director

WORK ORDER

: HK2419606

SUB-BATCH

: 1 : ENVIROTECH SERVICES CO. CLIENT

PROJECT



ALS Lab	Client's Sample ID	Sample Type	Sample Date	External Lab Report No.
HK2419606-001	Sibata LD-3B (436560)	Equipments	11-May-2024	S/N: 436560

----- END OF REPORT -----



#### Envirotech Services Co.

Rm. 712, 7/F Mn. 716, 77 My Left, 9 Not Wing Road. Tuen Mun, H.K. Tel: 2560 8450 Fax: 2560 6553

#### **Equipment Verification Report (TSP)**

				-			
þ	CHILL	mm	en	t Ca	IIIO	rate	O.

Type:

**Laser Dust Monitor** 

Manufacturer:

Sibata LD-3B

Serial No.:

436560

Equipment Ref.:

N/A

ALS Job Order:

HK2418944

**Standard Equipment** 

Standard Equipment:

High Volume Sampler (TSP)

Location:

**Envirotech Room (Calibration Room)** 

Equipment Ref.:

HVS 8162

Last Calibration Date:

25-Mar-2024

#### **Equipment Verification Results:**

Verification Date:

11-May-2024

Hour	Time	Mean Temp <sup>e</sup> C	Mean Pressure (hpa)	Concentration in µg/m³ (Standard Equipment) (Y-Axis)	Concentration in µg/m³ (Calibrated Equipment) (X-Axis)
1hr 00mins	0830-0930	26.8	1015	34	27
2hr 00mins	0935-1135	28.5	1015	53	53
3hr 00mins	1310-1610	29.5	1016	133	106

#### Linear Regression of Y or X

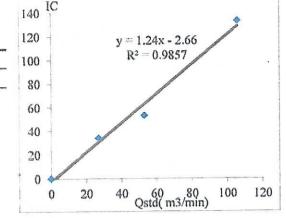
Slope (K-factor):

1.2400(µg/m<sup>3</sup>)/CPM

Correlation Coefficient (R):

Date of Issue:

0.9928 19-May-2024



#### Remarks:

- 1. Strong Correlation (>0.8)
- Factor 1.2400(ug/m³)/CPM should be applied for TSP monitoring
- \*If R<0.5, repair or verification is required for the equipment

Operator:

P.F.Yeung

Signature

Date: 19 May 2024

QC Reviewer:

K.F.Ho

Signature

Date: 19 May 2024

## TSP SAMPLER CALIBRATION CACULATION SPREADSHEET

Location: Rm. 712, My Loft, Tuen Mun. Date of Calibration: 25-Mar-24 HVS ID: 8162 Next Calibration Date: 24-May-24 Name and Model: TISCH HVS Model TE-5170 Operator: P.F. Yeung CONDITIONS Sea Level Pressure (hpa) 1016 Corrected Pressure (mm Hg) 762.1 Temperature (°C) 24.5 Temperature (K) 297.5 CALIBRATION ORIFICE Make: TISCH **Qstd Slope** 2.07544 Model: TE-5025A **Qstd Intercept** -0.03205 Serial#: 2454 CALIBRATION Plate H2O(L) H20(R) H20 **Qstd** I IC LINEAR No. (in) (in) (in) (m3/min) (chart) (corrected) REGRESSION 18 6.7 6.8 13.5 1.790 60 60.15 Slope= 30.471 13 5.5 5.6 11.1 1.625 55 55.13 Intercept= 5.514 10 4.3 4.5 8.8 1.448 49 49.12 Corr. Coeff.= 0.9994 7 2.5 2.7 5.2 1.117 40 40.10 5 1.5 1.7 3.2 0.879 32 32.08 Calulations: IC Flow Rate Qstd = 1/m[Sqrt(H2O(Pa/Pstd)(Tstd/Ta))-b]65 IC = I[Sqrt(Pa/Pstd)(Tstd/Ta)]60 Qstd = standard flow rate 55 IC = corrected chart response 50 I = actual chart response m = calibrator Qstd slope 45 b = calibrator Qstd intercept 40 Ta = actual temperature during calibration (deg K) Pa = actual pressure during calibration (mm Hg) 35 30 For subsequent calculation of sampler flow: 25 1/m((I)[Sqrt(298/Tav)(Pav/760)]-b) 20 m = sampler slope 15 b = sampler intercept I = chart response 10 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 Tav = daily average temperature Pav = daily average pressure Qstd(m3/min)





## RECALIBRATION DUE DATE:

December 15, 2024

# Certificate of Calibration

**Calibration Certification Information** 

Cal. Date: December 15, 2023

Rootsmeter S/N: 438320

Ta: 295

°K

Operator: Jim Tisch

Pa: 748.5

mm Hg

Calibration Model #:

TE-5025A

Calibrator S/N: 2454

Run	Vol. Init (m3)	Vol. Final (m3)	ΔVol. (m3)	ΔTime (min)	ΔP (mm Hg)	ΔH (in H2O)
1	1	2	1	1.4250	3.2	2.00
2	3	4	1	1.0090	6.4	4.00
3	5	6	1	0.9040	7.9	5.00
4	7	8	1	0.8610	8.8	5.50
5	9	10	1	0.7110	12.8	8.00

	Data Tabulation								
Vstd	Qstd	$\sqrt{\Delta H\left(\frac{Pa}{Pstd}\right)\left(\frac{Tstd}{Ta}\right)}$		Qa	$\sqrt{\Delta H (Ta/Pa)}$				
(m3)	(x-axis)	(y-axis)	Va	(x-axis)	(y-axis)				
0.9907	0.6952	1.4106	0.9957	0.6988	0.8878				
0.9864	0.9776	1.9949	0.9914	0.9826	1.2556				
0.9844	1.0890	2.2304	0.9894	1.0945	1.4037				
0.9832	1.1420	2.3393	0.9882	1.1478	1.4723				
0.9779	1.3754	2.8213	0.9829	1.3824	1.7756				
	m=	2.07544		m=	1.29961				
QSTD[	b=	-0.03205	QA	b=	-0.02017				
	r=	0.99999		r=	0.99999				

Calcula	tions
Vstd= ΔVol((Pa-ΔP)/Pstd)(Tstd/Ta)	<b>Va=</b> ΔVol((Pa-ΔP)/Pa)
<b>Qstd=</b> Vstd/ΔTime	Qa= Va/ΔTime
For subsequent flow	rate calculations:
Qstd= $1/m \left( \sqrt{\Delta H \left( \frac{Pa}{Pstd} \right) \left( \frac{Tstd}{Ta} \right)} \right) - b$	$Qa = 1/m \left( \left( \sqrt{\Delta H \left( Ta/Pa \right)} \right) - b \right)$

\*

	Standard Conditions
Tstd:	298.15 °K
Pstd:	760 mm Hg
	Key
ΔH: calibrator	manometer reading (in H2O)
ΔP: rootsmete	er manometer reading (mm Hg)
Ta: actual abs	olute temperature (°K)
Pa: actual bar	ometric pressure (mm Hg)
b: intercept	
m: slope	

#### RECALIBRATION

US EPA recommends annual recalibration per 1998 40 Code of Federal Regulations Part 50 to 51, Appendix B to Part 50, Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere, 9.2.17, page 30

Tisch Environmental, Inc. 145 South Miami Avenue Village of Cleves, OH 45002 www.tisch-env.com

TOLL FREE: (877)263-7610

FAX: (513)467-9009



MONITORING SCHEDULE FOR AIR QUALITY

## **Tung Chung New Town Extension (East)**

Air Quality Monitoring Schedule (October 2024)

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1-Oct	2-Oct	3-Oct	4-Oct	5-Oct
						Air Quality Monitoring
6-Oct	7-Oct	8-Oct	9-Oct	10-Oct	11-Oct	12-Oct
				Air Quality Monitoring		
13-Oct	14-Oct	15-Oct	16-Oct	17-Oct	18-Oct	19-Oct
			Air Quality Monitoring			
20-Oct	21-Oct	22-Oct	23-Oct	24-Oct	25-Oct	26-Oct
		Air Quality Monitoring				
27-Oct	28-Oct	29-Oct	30-Oct	31-Oct		<u> </u>
	Air Quality Monitoring					

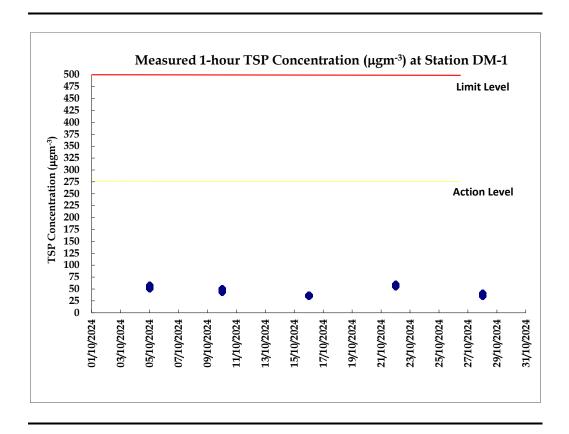


MONITORING RESULTS FOR AIR QUALITY

Table E3Data for 1-hr TSP Monitoring at Station DM-1

Date	Start Time	Finish Time	Weather	1-hour TSP (μg/m³)
10/5/2024	13:02	14:02	Sunny	55
10/5/2024	14:02	15:02	Sunny	51
10/5/2024	15:02	16:02	Sunny	58
10/10/2024	13:00	14:00	Sunny	44
10/10/2024	14:00	15:00	Sunny	49
10/10/2024	15:00	16:00	Sunny	51
10/16/2024	9:03	10:03	Sunny	37
10/16/2024	10:03	11:03	Sunny	37
10/16/2024	11:03	12:03	Sunny	35
10/22/2024	13:55	14:55	Sunny	60
10/22/2024	14:55	15:55	Sunny	56
10/22/2024	15:55	16:55	Sunny	59
10/28/2024	13:52	14:52	Cloudy	41
10/28/2024	14:52	15:52	Cloudy	35
10/28/2024	15:52	16:52	Cloudy	36

Figure E3 Graphical Presentation for 1-hr TSP Monitoring at Station DM-1





EVENT AND ACTION PLAN FOR AIR QUALITY

Annex E4 Event and Action Plan for Air Quality

Event	Action					
Event	ET	IEC	ER	Contractor		
Action level exceedance for one sample	<ol> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform IEC and ER;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase monitoring frequency to daily.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method.</li> </ol>	1. Notify Contractor.	<ol> <li>Rectify any unacceptable practice;</li> <li>Amend working methods if appropriate.</li> </ol>		
Action level exceedance for two or more consecutive samples	<ol> <li>Identify source;</li> <li>Inform IEC and ER;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Repeat measurements to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Discuss with IEC and Contractor on remedial actions required;</li> <li>If exceedance continues, arrange meeting with IEC and ER;</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ET on the effectiveness of the proposed remedial measures;</li> <li>Supervise Implementation of remedial measures.</li> </ol>	<ul><li>failure in writing;</li><li>2. Notify Contractor;</li><li>3. Ensure remedial measures properly implemented.</li></ul>	<ol> <li>Submit proposals for remedial to ER within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ol>		

Frank	Action					
Event	ET	IEC	ER	Contractor		
Limit level exceedance for one sample	<ol> <li>Identify source, investigate the causes of exceedance and propose remedial measures;</li> <li>Inform ER, Contractor and EPD;</li> <li>Repeat measurement to confirm finding;</li> <li>Increase monitoring frequency to daily;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results.</li> </ol>	<ol> <li>Check monitoring data submitted by ET;</li> <li>Check Contractor's working method;</li> <li>Discuss with ET and Contractor on possible remedial measures;</li> <li>Advise the ER on the effectiveness of the proposed remedial measures;</li> <li>Supervise implementation of remedial measures.</li> </ol>	<ul><li>failure in writing;</li><li>Notify Contractor;</li><li>Ensure remedial measures properly implemented.</li></ul>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Amend proposal if appropriate.</li> </ol>		
Limit level exceedance for two or more consecutive samples	<ol> <li>Notify IEC, ER, Contractor and EPD;</li> <li>Identify source;</li> <li>Repeat measurement to confirm findings;</li> <li>Increase monitoring frequency to daily;</li> <li>Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented;</li> <li>Arrange meeting with IEC and ER to discuss the remedial actions to be taken;</li> <li>Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results;</li> <li>If exceedance stops, cease additional monitoring.</li> </ol>	<ol> <li>Discuss amongst ER, ET, and Contractor on the potential remedial actions;</li> <li>Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly;</li> <li>Supervise the implementation of remedial measures.</li> </ol>	<ol> <li>Confirm receipt of notification of failure in writing;</li> <li>Notify Contractor;</li> <li>In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented;</li> <li>Ensure remedial measures properly implemented;</li> <li>If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.</li> </ol>	<ol> <li>Take immediate action to avoid further exceedance;</li> <li>Submit proposals for remedial actions to IEC within 3 working days of notification;</li> <li>Implement the agreed proposals;</li> <li>Resubmit proposals if problem still not under control;</li> <li>Stop the relevant portion of works as determined by the ER until the exceedance is abated.</li> </ol>		