

**COMPREHENSIVE VALIDATION PACKAGE**

ATL Applications

INVENTORY SHEET

WORK ORDER # 0909559B

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Completed by:

*Kara McKiernan*

(Signature)

Kara McKiernan/ Document Control

(Print Name & Title)

10/20/09

(Date)

**WORK ORDER #: 0909559B**

Work Order Summary

<b>CLIENT:</b>	Mr. Taeko Minegishi Environmental Health & Engineering, Inc. 117 Fourth Avenue Needham, MA 02494	<b>BILL TO:</b>	Accounts Payable Environmental Health & Engineering, Inc. 117 Fourth Avenue Needham, MA 02494
<b>PHONE:</b>	800-825-5343	<b>P.O. #</b>	16512
<b>FAX:</b>	781-247-4305	<b>PROJECT #</b>	16512
<b>DATE RECEIVED:</b>	09/25/2009	<b>CONTACT:</b>	Ausha Scott
<b>DATE COMPLETED:</b>	10/16/2009		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>
16A	103210	ATL Applications
17A	103211	ATL Applications
18A	106675	ATL Applications
19A	106676	ATL Applications
19AA	106676 Lab Duplicate	ATL Applications
20A	106677	ATL Applications
21A	106678	ATL Applications
22A	106679	ATL Applications
23A	106680	ATL Applications
24A	106704	ATL Applications
25A	106705	ATL Applications
26A	106706	ATL Applications
27A	106707	ATL Applications
28A	106708	ATL Applications
29A	106709	ATL Applications
30A	106733	ATL Applications
30AA	106733 Lab Duplicate	ATL Applications
31A	106734	ATL Applications

Continued on next page



**LABORATORY NARRATIVE  
Hydrogen Sulfide by Radiello 170  
Environmental Health & Engineering, Inc.  
Workorder# 0909559B**

Sixteen Radiello 170 (H<sub>2</sub>S) samples were received on September 25, 2009. The procedure involves adsorption of H<sub>2</sub>S by zinc acetate to form zinc sulfide. The sulfide is then recovered by extraction with water and addition of ferric chloride in a strongly acidic solution to produce methylene blue. Methylene blue absorbance is then measured at 665 nm using a spectrophotometer. Results are reported in uG and uG/m<sup>3</sup>.

Sampling rate of 69 mL/min for H<sub>2</sub>S was provided by the manufacturer.

**Receiving Notes**

There were no receiving discrepancies.

**Analytical Notes**

Results were calculated based on 25 deg C without temperature correction. The actual exposure time was used to calculate sample concentrations and reporting limits.

An exposure time of 20160 minutes was used for the QC samples.

All media used for the sampling were supplied by the client. Blank subtraction was not performed on the sample results since the media used for Method Blanks may be from a different lot than the media used for the samples.

**Definition of Data Qualifying Flags**

Eight qualifiers may have been used on the data analysis sheets and indicate as follows:

- B - Compound present in laboratory blank greater than reporting limit.
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.
- U - Compound analyzed for but not detected above the detection limit.
- M - Reported value may be biased due to apparent matrix interferences.
- N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue

## **Sample Results and Raw Data**

# AIR TOXICS LTD.

## ATL Application # 59 for RAD 170 (Hydrogen Sulfide)

Spectrophotometer

Field	Lab	Collection Date	Analysis Date	Dilution Factor	Reporting Limit (ug)	Reporting Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
103210	0909559B-16A	9/21/2009	10/1/2009	1.00	0.80	0.58	2.2	1.6
103211	0909559B-17A	NA	10/1/2009	1.00	0.80	0.54	ND	ND
106675	0909559B-18A	9/21/2009	10/1/2009	1.00	0.80	0.58	1.7	1.2
106676	0909559B-19A	9/21/2009	10/1/2009	1.00	0.80	0.58	1.4	1.0
106676 Lab Duplicate	0909559B-19AA	9/21/2009	10/1/2009	1.00	0.80	0.58	1.6	1.1
106677	0909559B-20A	9/21/2009	10/1/2009	1.00	0.80	0.58	1.3	0.96
106678	0909559B-21A	9/21/2009	10/1/2009	1.00	0.80	0.58	1.6	1.2
106679	0909559B-22A	9/21/2009	10/1/2009	1.00	0.80	0.58	1.9	1.4
106680	0909559B-23A	NA	10/1/2009	1.00	0.80	0.54	ND	ND
106704	0909559B-24A	9/21/2009	10/1/2009	1.00	0.80	0.58	ND	ND
106705	0909559B-25A	9/21/2009	10/1/2009	1.00	0.80	0.58	ND	ND
106706	0909559B-26A	9/21/2009	10/1/2009	1.00	0.80	0.58	2.1	1.5
106707	0909559B-27A	9/21/2009	10/1/2009	1.00	0.80	0.58	ND	ND
106708	0909559B-28A	9/21/2009	10/1/2009	1.00	0.80	0.58	ND	ND
106709	0909559B-29A	NA	10/1/2009	1.00	0.80	0.54	ND	ND
106733	0909559B-30A	9/22/2009	10/1/2009	1.00	0.80	0.54	1.7	1.2
106733 Lab Duplicate	0909559B-30AA	9/22/2009	10/1/2009	1.00	0.80	0.54	1.8	1.2
106734	0909559B-31A	9/22/2009	10/1/2009	1.00	0.80	0.54	1.6	1.1
Method Blank	0909559B-32A	NA	10/1/2009	1.00	0.80	0.54	ND	ND
Method Blank	0909559B-32B	NA	10/1/2009	1.00	0.80	0.54	ND	ND
CCV	0909559B-33A	NA	10/1/2009	1.00	0.80	0.54	%Rec 103	

COMMENTS: 1. NA=Not Applicable

2. ND=Not Detected

3. Exposure time of 20160 minutes was assumed for the QC samples.

4. Background subtraction not performed.

# Hydrogen Sulfide Radiello Calculation Worksheet

Workorder #: 09095598

0.096 Typically 0.096 for H2S

Sampling Rate (ng/ppb/min) 25 Typically 25

Sampling T (deg C) 10.5 Typically 10.5 for H2S

Volume (ml) 10.1/2009

Date of Analysis: 10/1/2009

Corrected Q 0.096 Takes into account temp

Q Includes conversion from Sulfide to H2S

Conc (ug) x 1000  
Q x Duration

dpbx mw  
24.45

T Corrected, no Blank correction

LabSampleID	Client	Date of Collection	Abs	Duration (min)	DF	Conc (ug/ml) of sulfide	Conc (ug) of sulfide	Conc (ug) of H2S	Conc (ppb) of H2S	Conc (ug/m3) of H2S
16A	103210	9/21/2009	0.232	18720	1.00	0.197807921	2.076983175	2.207288449	1.156	1.611
17A	103211	NA	0.012	20160	1.00	-0.00679714	-0.071369972	-0.075847565	-0.037	-0.051
18A	106675	9/21/2009	0.180	18720	1.00	0.149446725	1.569190613	1.667638119	0.873	1.217
19A	106676	9/21/2009	0.157	18720	1.00	0.128056196	1.344590056	1.428946676	0.748	1.043
19AA	106678 Lab Duplicate	9/21/2009	0.171	18720	1.00	0.141076518	1.481303439	1.5742371	0.824	1.149
20A	106677	9/21/2009	0.146	18720	1.00	0.117825943	1.237172399	1.314789826	0.688	0.960
21A	106678	9/21/2009	0.174	18720	1.00	0.143886687	1.510599163	1.605370773	0.841	1.177
22A	106679	9/21/2009	0.207	18720	1.00	0.174557946	1.832852135	1.947841175	1.020	1.422
23A	106680	NA	0.016	20160	1.00	-0.003077048	-0.032309006	-0.034336001	-0.017	-0.023
24A	106704	9/21/2009	0.061	18720	1.00	0.038773987	0.407126885	0.432669093	0.227	0.316
25A	106705	9/21/2009	0.071	18720	1.00	0.048074217	0.504779281	0.536448003	0.281	0.392
26A	106706	9/21/2009	0.22	18720	1.00	0.186647645	1.959800276	2.082753758	1.091	1.520
27A	106707	9/21/2009	0.07	18720	1.00	0.047144194	0.495014039	0.526070112	0.275	0.384
28A	106708	9/21/2009	0.082	18720	1.00	0.05830447	0.612196938	0.650604803	0.341	0.475
29A	106709	NA	0.015	20160	1.00	-0.004007071	-0.042074248	-0.044713892	-0.022	-0.030
30A	106733	9/22/2009	0.185	20160	1.00	0.15409684	1.618016821	1.719527574	0.836	1.165
30AA	106733 Lab Duplicate	9/22/2009	0.196	20160	1.00	0.164327093	1.725434478	1.833684374	0.892	1.243
31A	106734	9/22/2009	0.176	20160	1.00	0.145726653	1.530129646	1.626126555	0.791	1.102
32A	Method Blank	NA	0.013	20160	1.00	-0.017957416	-0.188552871	-0.200382256	#DIV/0!	#DIV/0!
32B	Method Blank	NA	0.011	20160	1.00	-0.017957416	-0.188552871	-0.200382256	#DIV/0!	#DIV/0!
33A	CCV	NA	0.337	20160	1.00	-0.017957416	-0.188552871	-0.200382256	#DIV/0!	#DIV/0!
						-0.005867117	-0.061604731	-0.065469674	-0.032	-0.044
						-0.007727163	-0.081135214	-0.086225456	-0.042	-0.058
						0.295460337	3.102333541	3.298967001	1.603	2.234

QC Duration  
20160

CCV Spike Amt  
0.286



## **QC Results and Raw Data**

Work Order: 0909559BDate: 10/01/09Method: Rad 170Analyst: M. SkidmoreWavelength: 665nm

Standard ID	Concentration	ABS
Level 1 1858-70-E	0,0716 µg/mL	0,086
Level 2 -D	0,143 µg/mL	0,169
Level 3 -C	0,286 µg/mL	0,338
Level 4 -B	0,572 µg/mL	0,644
Level 5 -A	1,145 µg/mL	1,244
ICV 1858-71	0,286 µg/mL	0,324

$$r = \frac{0,9996}{1,075}$$

$$b = \frac{0,019}{1,075}$$

ICV % Recovery = 100

Fraction	Dilution	ABS	Sample ID	Sample Volume	Comments
16A	1,00	0,232	103210	10,5 mL	
17A		0,012	103211		
18A		0,180	106675		
19A		0,157	106676		
19AA		0,171	106676		
20A		0,146	106677		
21A		0,174	106678		
22A		0,207	106679		
23A		0,016	106680		
24A		0,061	106704		
25A		0,071	106705		
26A		0,220	106706		
27A		0,070	106707		
28A		0,082	106708		
29A		0,015	106709		
30A		0,185	106733		
30AA		0,196	106733		
31A		0,176	106734		
BIK		0,013	N/A		tot: 09075
BIK		0,011			↓
LCS		0,164			0,133 µg/mL
LCV	↓	0,337	↓	↓	0,286 µg/mL

Procedure:

*Mike Skidmore*  
Signed

10/2/09  
Date

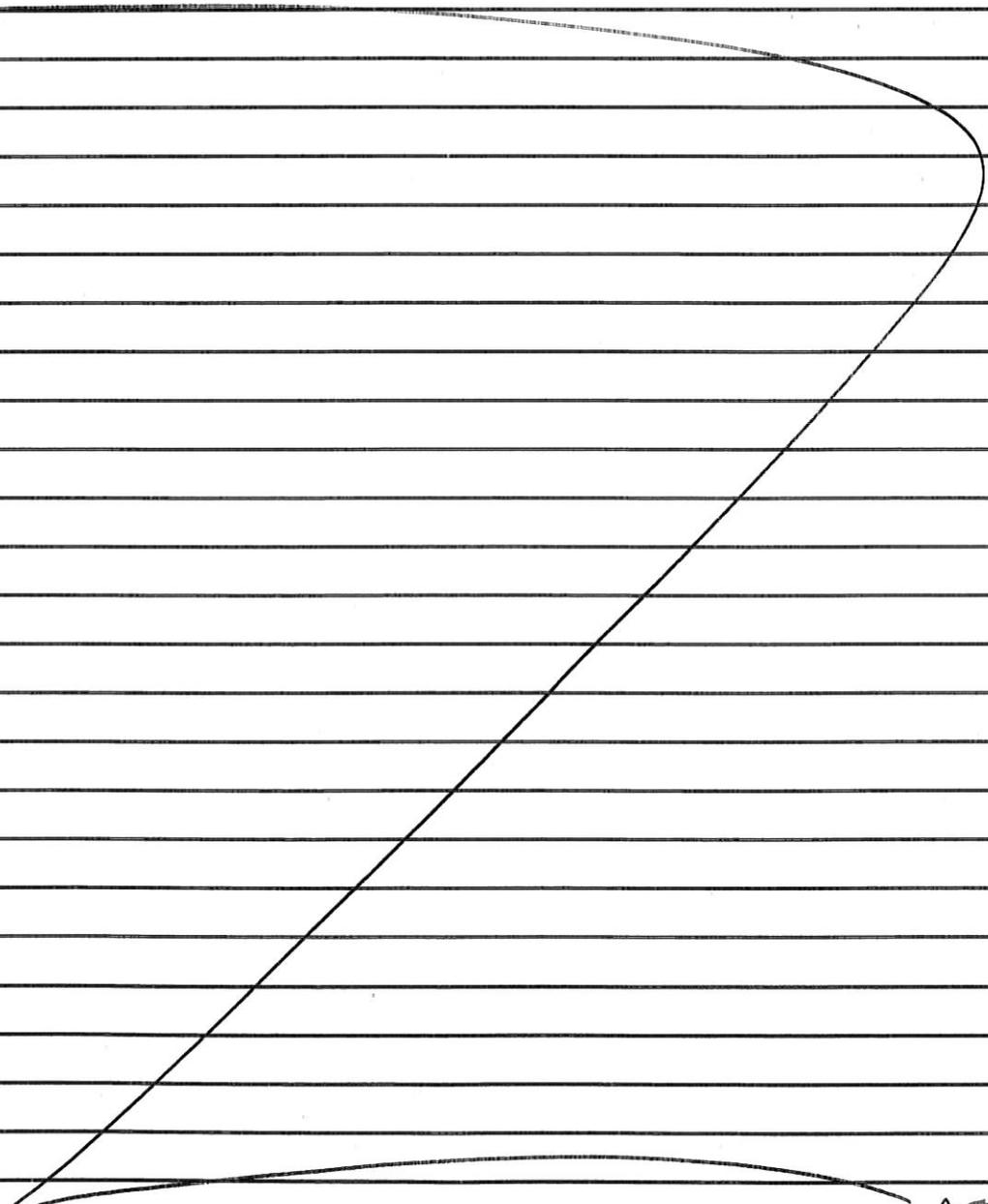
**Spectrophotometer Standard Preparation Log**

**@Air Toxics Ltd. Log Book #: 1858**

Standard ID: 1858-47  
Project: Ferric Chloride Solution Rad170  
Analyst: M. Skidmore  
Preparation Date: 9/23/09  
Expiration Date: ~~3/23/09~~ <sup>9/25/09</sup> 9/23/09

Solvent: D.I. H<sub>2</sub>O  
Solvent Lot #: N/A

Procedure/Comments: Dissolve 25g of ferric chloride hexahydrate (located in ER2C lot: 73297 MJ) in 10.0 mL of D.I. H<sub>2</sub>O.



MJS  
9/23/09

# Spectrophotometer Standard Preparation Log

@Air Toxics Ltd. Log Book #: 1858

Standard ID: 1858-64  
Project: Rad 170 Amine Solution  
Analyst: M. Skidmore  
Preparation Date: 9/30/09  
Expiration Date: 10/30/09

Solvent: H<sub>2</sub>SO<sub>4</sub> / H<sub>2</sub>O  
Solvent Lot #: N/A

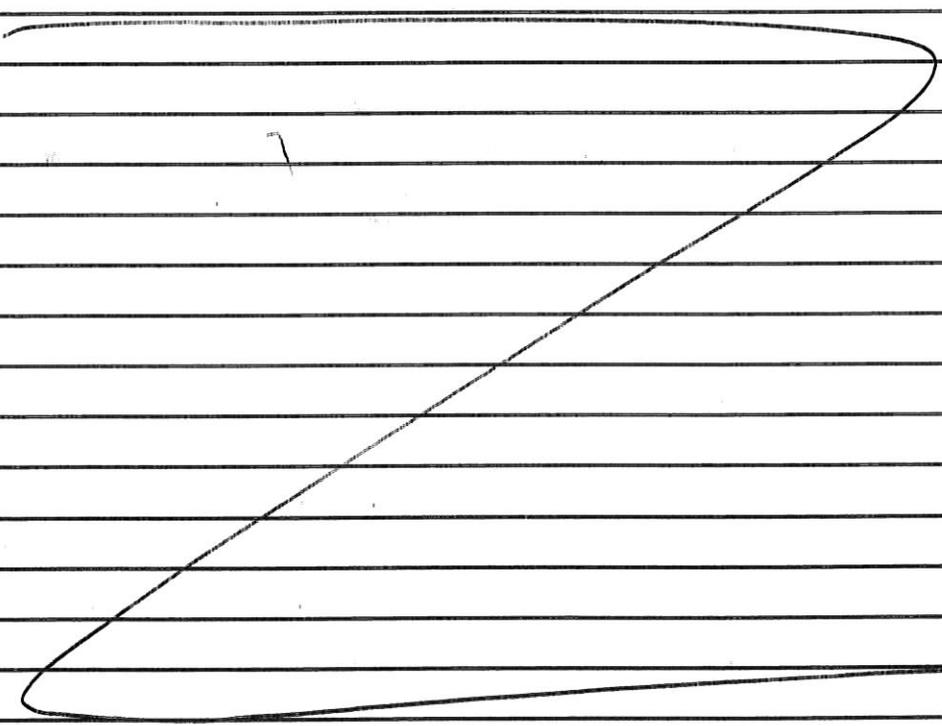
Procedure/Comments: \_\_\_\_\_

## Sulfuric acid solution:

Slowly add 6.25 mL of concentrated sulfuric acid to 2.5 mL of DI H<sub>2</sub>O, and let the solution cool. (sulfuric acid lot: 06011DA)

## Amine solutions

Dissolve 1.6875 g of N,N-dimethyl-p-phenylenediammonium oxalate (located ERIA, lot: 63797PJ) in the above mentioned sulfuric acid solution. Dilute this solution to 250 mL with sulfuric acid - water 1:1 v/v, (this is roughly 120 mL H<sub>2</sub>O + 120 mL H<sub>2</sub>SO<sub>4</sub>)



MJS  
9/30/09

# Spectrophotometer Standard Preparation Log

@Air Toxics Ltd. Log Book #: 1858

Standard ID: 1858-70  
Project: Calibration Solution Rad 170  
Analyst: M. Skidmore  
Preparation Date: 10/1/09  
Expiration Date: 10/1/09

Solvent: D.I. H<sub>2</sub>O  
Solvent Lot #: N/A

Procedure/Comments: \_\_\_\_\_

\_\_\_\_\_ Solution A: 2 mL of Code Rad 171 (1476-984, exp 8/6/10) (located in ER1B) with \_\_\_\_\_  
\_\_\_\_\_ 98 mL of D.I. H<sub>2</sub>O = 1.145 µg/mL \_\_\_\_\_

\_\_\_\_\_ Solution B: 2.5 mL of Solution A with 2.5 mL of D.I. H<sub>2</sub>O = 0.572 µg/mL \_\_\_\_\_

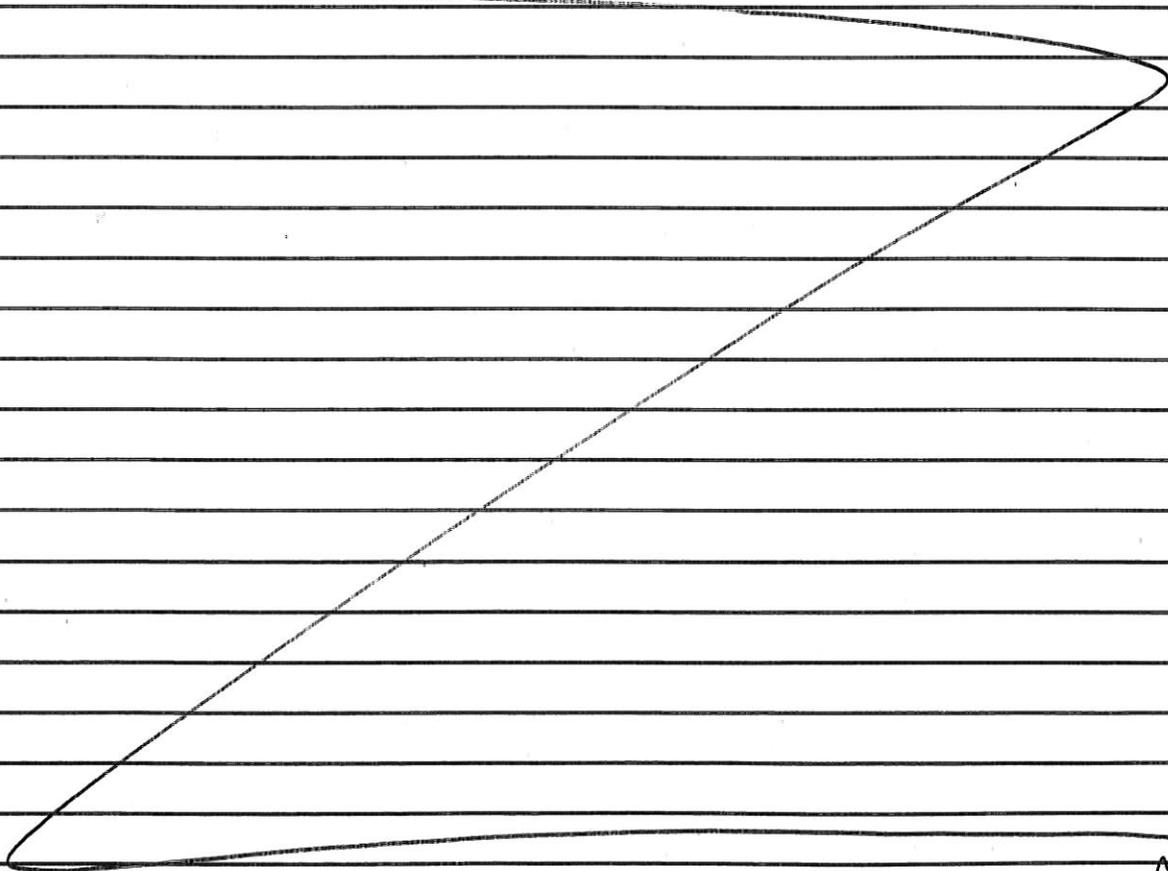
\_\_\_\_\_ Solution C: 1.25 mL of Solution A with 3.75 mL of D.I. H<sub>2</sub>O = 0.286 µg/mL \_\_\_\_\_

\_\_\_\_\_ Solution D: 0.625 mL of Solution A with 4.375 mL of D.I. H<sub>2</sub>O = 0.143 µg/mL \_\_\_\_\_

\_\_\_\_\_ Solution E: 0.375 mL of Solution A with 5.625 mL of D.I. H<sub>2</sub>O = 0.0716 µg/mL \_\_\_\_\_

\_\_\_\_\_ Note: Each solution was measured immediately after it was prepared. Solution A is only \_\_\_\_\_  
\_\_\_\_\_ stable in the flask it was prepared in. \_\_\_\_\_

MJS 10/1/09



MJS 10/5/09



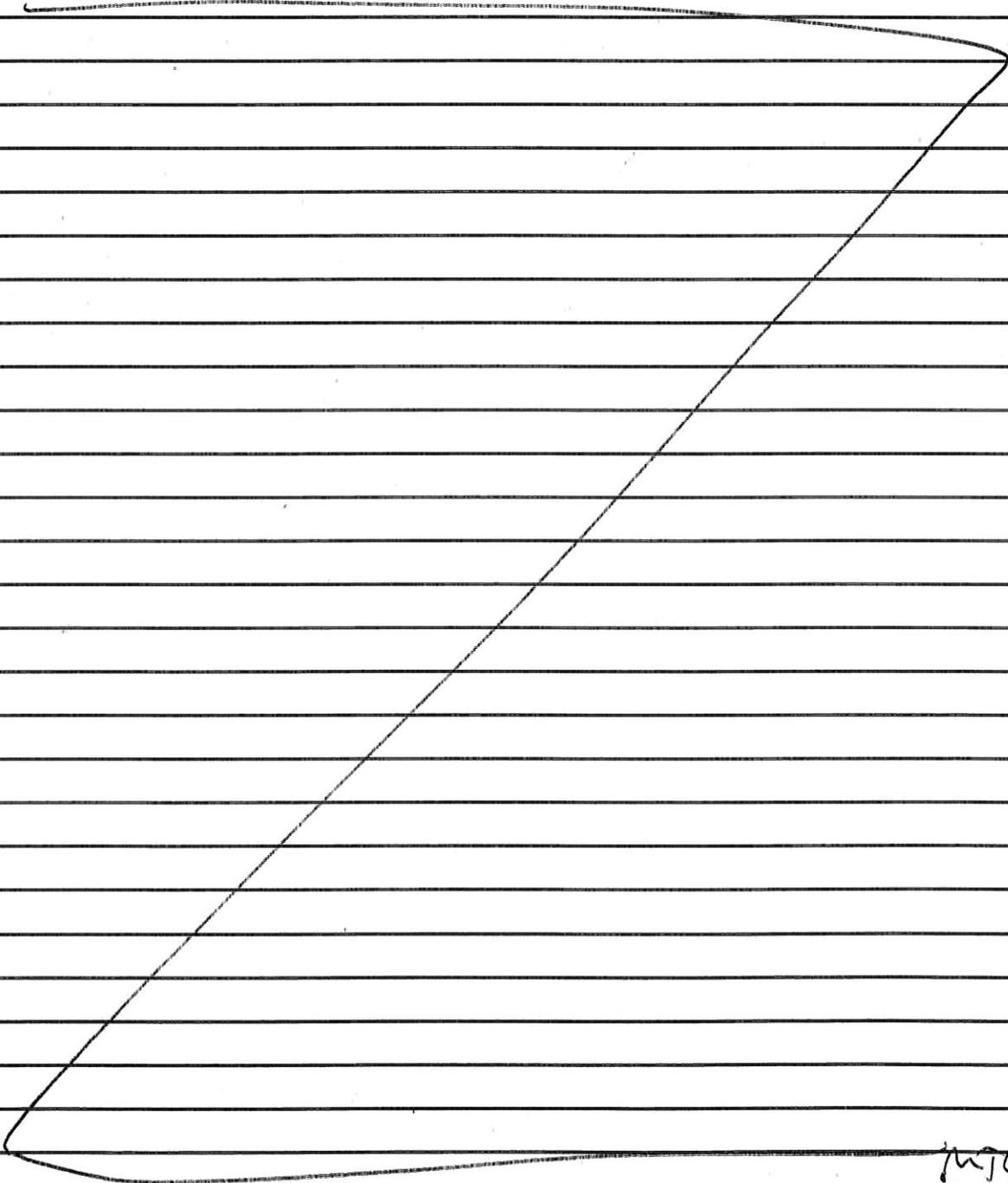
**Spectrophotometer Standard Preparation Log**

@Air Toxics Ltd. Log Book #: 1858

Standard ID: 1858-72  
Project: Ferric Chloride - Amine  
Analyst: M. Skidmore  
Preparation Date: 10/1/09  
Expiration Date: 10/1/09

Solvent: DI H<sub>2</sub>O  
Solvent Lot #: N/A

Procedure/Comments: 6.5 mL of ferric chloride (1858-47)  
with 32.5 mL of amine solution (1858-64).



MJS  
10/1/09

## **Shipping/ Receiving Documents**

**180 Blue Ravine Road, Suite B  
Folsom, CA 95630**

**Phone (916) 985-1000 FAX (916) 985-1020  
Hours 8:00 A.M. to 6:00 P.M. Pacific**

COMPANY: Environmental Health & Engineering, Inc.  
ATTENTION: Mr. Taeko Minegishi  
FAX #: 781-247-4305  
FROM: Sample Receiving  
Workorder #: 0909559B  
# of pages (Including Cover): 4

10/20/2009

Thank you for selecting Air Toxics Ltd. We have received your samples and have found no discrepancies. In order to expedite analysis and reporting, please review the attached information for accuracy. Corrections can be faxed to **Ausha Scott at 916-985-1020.** ATL will proceed with the analysis as specified on the Chain of Custody and Sample Login page.

DATE: 9/24/09

FROM: Environmental Health and Engineering, Inc.  
117 Fourth Avenue  
Needham, MA 02494-2725 **0909559**

TO: AIR TOXICS

Please send invoices to ATTN: Accounts Payable  
Please send reports to ATTN: Data Coordinator

In all correspondence regarding this matter, please refer to EH&E Project # 16512

The cost of this analysis will be covered by EH&E Purchase Order # 16512

For EH & E Data Coordinator - URGENT DATA

SAMPLE ID	SAMPLE TYPE	ANALYTICAL METHOD/NUMBER	Start	OTHER: Time/Date/Vol.	End
6A-103210	AIR/PASSIVE	H <sub>2</sub> S ANALYSIS	9/8/09		9/21/09
7A-103211			↓	⊕	
18A-106675			9/8/09		9/21/09
19A-106676					↓
20A-106677					↓
21A-106678					↓
22A-106679					↓
23A-106680				⊕	
24A-106704			9/8/09		9/21/09
25A-106705					↓
26A-106706					↓
27A-106707					↓
28A-106708					↓
29A-106709				⊕	
30A-106733			9/8/09		9/23/09
31A-106734			↓		↓

**Special Instructions:**

- Standard turn around time
- Fax results 781-247-4305
- RETURN SAMPLES
- Additional report recipient mfragala@ehinc.com
- Rush by \_\_\_\_\_ date/time
- Electronic transfer - datacoordinator@ehinc.com

*Fedex*  
**CUSTODY SEAL INTACT?**  
Y N **(NONE)** TEMP 3.6°C

**Each signatory please return one copy of this form to the above address**

Relinquished by: [Signature] of Environmental Health & Engineering, Inc. Date: 9/24/09  
 Received by: [Signature] of (company name) ATI Date: 9/25/09  
 Relinquished by: \_\_\_\_\_ of (company name) \_\_\_\_\_ Date: \_\_\_\_\_  
 Received by: \_\_\_\_\_ of (company name) \_\_\_\_\_ Date: \_\_\_\_\_  
 Relinquished by: \_\_\_\_\_ of (company name) \_\_\_\_\_ Date: \_\_\_\_\_  
 Received by: \_\_\_\_\_ of (company name) \_\_\_\_\_ Date: \_\_\_\_\_  
 Lab Data  
 Received by: \_\_\_\_\_ of Environmental Health & Engineering, Inc. Date: \_\_\_\_\_

**SAMPLE RECEIPT SUMMARY**

**WORKORDER 0909559B**

<b>Client</b>	<b>Phone</b>	<b>Date Promised:</b> 10/06/09 11:59 pm
Mr. Taeko Minegishi	800-825-5343	<b>Date Completed:</b> 10/16/09
Environmental Health & Engineering, Inc.	<b>Fax</b>	<b>Date Received:</b> 9/25/09
117 Fourth Avenue	781-247-4305	<b>PO#:</b> 16512
Needham, MA 02494		<b>Project#:</b> 16512
<b>Sales Rep:</b> TL		<b>Total \$:</b> \$ 880.00
		<b>Logged By:</b> MW

<u>Fraction</u>	<u>Sample #</u>	<u>Analysis</u>	<u>Collected</u>	<u>Amount\$</u>
16A	103210	ATL Applications	9/21/2009	\$50.00
17A	103211	ATL Applications	NA	\$50.00
18A	106675	ATL Applications	9/21/2009	\$50.00
19A	106676	ATL Applications	9/21/2009	\$50.00
19AA	106676 Lab Duplicate	ATL Applications	9/21/2009	\$0.00
20A	106677	ATL Applications	9/21/2009	\$50.00
21A	106678	ATL Applications	9/21/2009	\$50.00
22A	106679	ATL Applications	9/21/2009	\$50.00
23A	106680	ATL Applications	NA	\$50.00
24A	106704	ATL Applications	9/21/2009	\$50.00
25A	106705	ATL Applications	9/21/2009	\$50.00
26A	106706	ATL Applications	9/21/2009	\$50.00
27A	106707	ATL Applications	9/21/2009	\$50.00
28A	106708	ATL Applications	9/21/2009	\$50.00
29A	106709	ATL Applications	NA	\$50.00
30A	106733	ATL Applications	9/22/2009	\$50.00
30AA	106733 Lab Duplicate	ATL Applications	9/22/2009	\$0.00
31A	106734	ATL Applications	9/22/2009	\$50.00
32A	Lab Blank	ATL Applications	NA	\$0.00
32B	Lab Blank	ATL Applications	NA	\$0.00

**Note:** Samples received after 3 P.M. PST are considered to be received on the following work day.  
 Atlas Project Name/Profile#: CPSC Indoor Air Monitoring/13297

**BILL TO:** Accounts Payable  
 Environmental Health & Engineering, Inc.  
 117 Fourth Avenue  
 Needham, MA 02494

Analysis Code: Other GC

**TERMS:**

Reporting Method: ATL Application #59 H2S-Radiello 170

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630  
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

**SAMPLE RECEIPT SUMMARY Continued**

<b>Client</b>	<b>Phone</b>	<b>Date Promised:</b> 10/06/09 11:59 pm
Mr. Taeko Minegishi	800-825-5343	<b>Date Completed:</b> 10/16/09
Environmental Health & Engineering, Inc.	<b>Fax</b>	<b>Date Received:</b> 9/25/09
117 Fourth Avenue	781-247-4305	<b>PO#:</b> 16512
Needham, MA 02494		<b>Project#:</b> 16512
<b>Sales Rep:</b> TL		<b>Total \$:</b> \$ 880.00
		<b>Logged By:</b> MW

<u>Fraction</u>	<u>Sample #</u>	<u>Analysis</u>	<u>Collected</u>	<u>Amount\$</u>
33A	CCV	ATL Applications	NA	\$0.00
Misc. Charges eCVP (16) @ \$5.00 each.				\$80.00

**Note:** Samples received after 3 P.M. PST are considered to be received on the following work day.  
Atlas Project Name/Profile#: CPSC Indoor Air Monitoring/13297

**BILL TO:** Accounts Payable  
Environmental Health & Engineering, Inc.  
117 Fourth Avenue  
Needham, MA 02494

Analysis Code: Other GC

**TERMS:**

Reporting Method: ATL Application #59 H2S-Radiello 170

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630  
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

## **Other Records**

Method : ATL Application #59 H2S-Radiello 170

CAS Number	Compound	Rpt. Limit (ug)
7783-06-4	Hydrogen Sulfide	1.2

