



Case Narrative

Analysis: Hydrogen Cyanide
Preparation SOP: NMAM 6010 MOD
Analysis SOP: NMAM 6010 MOD

Client: Atmospheric Analysis & Consulting, Inc.
Matrix: Soda Lime Tubes
ALS Work Order ID(s): 1311467

General Set Information: Five samples from this work order were analysed for hydrogen cyanide collected on soda lime.

Method Summary: The front and back sections from each soda lime tube are emptied into separate dram vials. The soda lime is desorbed in 20 mL of 0.25N NaOH for at least one hour with occasional agitation. Cyanide is reacted with Chloramine-T and a pyridine-barbituric acid solution in a phosphate buffer. The resulting species is quantitated by automated colorimetry on a WestCo SmartChem (Instrument ID: WET01).

Sample Preparation: All samples were prepared in accordance with published procedures.

Hold Times: The hold times were met for both preparation and analysis.

Instrument Calibration Data: Instrument calibration was performed in accordance with published procedures. Calibration results are within control limits.

Initial and Continuing Calibration Data: Initial and continuing calibration verifications were performed in accordance with published procedures. All calibration verifications were within control limits. All calibration blank concentrations were less than the reporting limit.

Dilutions: None were required.

Method QC Data: The method blank concentration was less than the reporting limit. The LCS and LCSD results were within method control limits. The relative percent difference (RPD) between the LCS and LCSD was within control limits.

NC/CAR: None were required.

Flagging Codes: Refer to laboratory report.



Sample Calculation: The analysis instrument produces results in $\mu\text{g/L}$. Instrument results are multiplied by a conversion factor and final results calculated by the equation below. Results are reported to two significant figures on the sample report and three significant figures on the QC report.

Conversion: $(MW, \text{HCN}) 27.026 / (MW, \text{CN}) 26.018 = 1.039$

HCN: $\mu\text{g CN/L} \times 0.020 \text{ L/sample} \times 1.039 \text{ HCN} = 0.02078$ [conversion factor (CF) = 0.02078]

Example: $1311467002\text{B} = (1.298\mu\text{g/L}) \times (0.02078) = 0.0270\mu\text{g HCN/sample}$.

Miscellaneous Comments: The reporting limit was raised due to instrument instability while analysing the LMB.

Samples were analysed with work orders 1311391, and 1311474.

Mary N. Karanu

April 30th, 2013



ANALYTICAL REPORT

Report Date: April 30, 2013

Eric Grosjean
Atmospheric Analysis & Consulting, Inc.
1534 Eastman Avenue
Suite A
Ventura, CA 93003

Phone: (805) 650-1642
Fax: (805) 650-1644
E-mail: egrosjean@aaclab.com

Workorder: **34-1311467**
Client Project ID: 130456/Landfil 042313
Purchase Order: 130456
Project Manager: Paul Pope

Analytical Results

Sample ID: 130456-62453	Media: SKC 226-28, Soda Lime-200/600	Collected: 04/16/2013		
Lab ID: 1311467001	Sampling Location: Landfill	Received: 04/23/2013		
Method: NIOSH 6010	Sampling Parameter: Air Volume 84.2 L	Analyzed: 04/30/2013		
Analyte	ug/sample	ug/m ³	ppb	RL (ug/sample)
Hydrogen Cyanide	<0.48	<5.7	<5.2	0.48

Sample ID: 130456-62462	Media: SKC 226-28, Soda Lime-200/600	Collected: 04/16/2013		
Lab ID: 1311467002	Sampling Location: Landfill	Received: 04/23/2013		
Method: NIOSH 6010	Sampling Parameter: Air Volume 0.95 L	Analyzed: 04/30/2013		
Analyte	ug/sample	ug/m ³	ppb	RL (ug/sample)
Hydrogen Cyanide	<0.48	<510	<460	0.48

Sample ID: 130456-62471	Media: SKC 226-28, Soda Lime-200/600	Collected: 04/16/2013		
Lab ID: 1311467003	Sampling Location: Landfill	Received: 04/23/2013		
Method: NIOSH 6010	Sampling Parameter: Air Volume 0.879 L	Analyzed: 04/30/2013		
Analyte	ug/sample	ug/m ³	ppb	RL (ug/sample)
Hydrogen Cyanide	<0.48	<550	<490	0.48

Sample ID: 130456-62480	Media: SKC 226-28, Soda Lime-200/600	Collected: 04/16/2013		
Lab ID: 1311467004	Sampling Location: Landfill	Received: 04/23/2013		
Method: NIOSH 6010	Sampling Parameter: Air Volume 0.972 L	Analyzed: 04/30/2013		
Analyte	ug/sample	ug/m ³	ppb	RL (ug/sample)
Hydrogen Cyanide	<0.48	<490	<450	0.48

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 | PHONE +1 801 266 7700 | FAX +1 801 268 9992
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Environmental

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: **34-1311467**
 Client Project ID: 130456/Landfil 042313
 Purchase Order: 130456
 Project Manager: Paul Pope

Analytical Results

Sample ID: 130456-62491	Media: SKC 226-28, Soda Lime-200/600	Collected: 04/16/2013		
Lab ID: 1311467005	Sampling Location: Landfill	Received: 04/23/2013		
Method: NIOSH 6010	Sampling Parameter: Air Volume Not Applicable	Analyzed: 04/30/2013		
Analyte	ug/sample	ug/m ³	ppb	RL (ug/sample)
Hydrogen Cyanide	<0.48	NA	NA	0.48

Report Authorization

Method	Analyst	Peer Review
NIOSH 6010	Mary N. Karanu	Elijah Gregory

Laboratory Contact Information

ALS Environmental
 960 W Levoy Drive
 Salt Lake City, Utah 84123

Phone: (801) 266-7700
 Email: als@alst.com
 Web: www.alst.com

General Lab Comments

The results provided in this report relate only to the items tested.
 Samples were received in acceptable condition unless otherwise noted.
 Samples have not been blank corrected unless otherwise noted.
 This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	AClass (DoD ELAP)	ADE-1420	http://www.aiclasscorp.com
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwl/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Florida (TNI)	E871067	http://www.dep.state.fl.us/labs/bars/sas/qa/
Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html	
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint ,Air	AClass (ISO 17025, CPSC)	ADE-1420	http://www.aiclasscorp.com
	AIHA (ISO 17025, AIHA ELLAP and NLLAP)	101574	http://www.aihaaccreditedlabs.org
Dietary Supplements	AClass (ISO 17025)	ADE-1420	http://www.aiclasscorp.com



ANALYTICAL REPORT

Workorder: **34-1311467**
Client Project ID: 130456/Landfil 042313
Purchase Order: 130456
Project Manager: Paul Pope

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

** No result could be reported, see sample comments for details.

< This testing result is less than the numerical value.

() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.



Quality Control Sample Batch Report

Analysis Information

Workorder: 1311467

Limits: Historical/Performance

Basis: ALS Laboratory Group

Preparation: NA

Batch: NA

Prepared By: NA

Analysis: NIOSH 6010

Batch: IWC/1855 (HBN: 106028)

Analyzed By: Mary N. Karanu

Blank

LMB: 331666

Analyzed: 04/30/2013 13:17

Units: ug/sample

Analyte	Result	MDL	RL
Cyanide	ND	NA	0.480

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 331667

Analyzed: 04/30/2013 13:17

Dilution: 1

Units: ug/sample

LCSD: 331668

Analyzed: 04/30/2013 13:18

Dilution: 1

Units: ug/sample

Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Cyanide	1.47	2.00	73.5	56.2 128.2	1.71	85.3	14.9	0.0 20.0



Quality Control Sample Batch Report

Analysis Information

Workorder: 1311467

Limits: Historical/Performance

Basis: ALS Laboratory Group

Preparation: NA

Batch: NA

Prepared By: NA

Analysis: NIOSH 6010

Batch: IWC/1855 (HBN: 106028)

Analyzed By: Mary N. Karanu

QC Data Approved and Reviewed by

Mary N. Karanu

Analyst

Elijah Gregory

Peer Review

4/30/2013

Date

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- - Sample and Matrix Duplicate less than 5 times the reporting limit

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
QC results are not adjusted for moisture correction, where applicable

11028/1

130456

AAC Project No.

ATMOSPHERIC ANALYSIS & CONSULTING, INC.

1524 E. ... an Avenue, Suite A

California 93003

642 Fax (805) 650-1644

E-mail: info@aacclab.com

Subcontractor Lab:

ALS-Salt Lake City UT

Paul E Pope

1 800-356-9135

960 West LeVoy Drive, Salt Lake City, UT 84123

Ship:

ONTRAC STD OVN

AAC Account

1311467

CHAIN OF CUSTODY / ANALYSIS REQUEST FORM

Client Name AAC, Inc.		Project Name Landfill		Analysis Requested		Send Report:	
Project Mgr (Print Name) Eric Grosjean		Project Number 130456		Hold for Backup		Attn: Eric Grosjean	
Sampler's Name (Print Name)		Sampler's Signature		NIOH 6010 HCN		Phone #: 805-650-1642	
AAC Sample No.		Client Sample ID/Description		Type/No. of containers		Fax #: 805-650-1644	
130456-62453 ⁸	Tube	BZ-1	Tube	1	X	Send Invoice to:	
130456-62462 ⁸	Tube	F-1	Tube	1	X	Attn: Eric Grosjean	
130456-62471 ⁸	Tube	F-2	Tube	1	X	egrosjean@aacclab.com	
130456-62480 ⁸	Tube	F-3	Tube	1	X	P.O. # NA	
130456-62491 ⁸	Tube	Trip Blank	Tube	1	X	Turn Around Time	
						24-Hr 48-Hr	
						5 day Normal X	
						Other (Specify)	
						Special Intructions / remarks:	
						Please provide Level IV Data Package	
						Please report in ppbv and ug/m ³ and email Excel spreadsheet	
Relinquished by (Signature)	Eric Grosjean	Date/Time	4/18/13 13:20	Received by (Signature)	W. ...	Print Name	0880
Relinquished by (Signature)	Eric Grosjean	Date/Time	4/18/13 13:20	Received by (Signature)	W. ...	Print Name	0880

Log of Air Samples Collected on April 16, 2013

Sample ID	Sample Name	Parameter	Description	Volume (liters)
130456-62453	BZ-1	Hydrogen Cyanide	On-site Ambient	84.2
130456-62462	F-1	Hydrogen Cyanide	Landfill Gas	0.950
130456-62471	F-2	Hydrogen Cyanide	Landfill Gas	0.879
130456-62480	F-3	Hydrogen Cyanide	Landfill Gas	0.972
130456-62449	BZ-1	Carboxylic Acids	On-site Ambient	114
130456-62458	F-1	Carboxylic Acids	Landfill Gas	1.04
130456-62467	F-2	Carboxylic Acids	Landfill Gas	0.958
130456-62476	F-3	Carboxylic Acids	Landfill Gas	1.05
130456-62455	BZ-1	Mercury	On-site Ambient	127
130456-62464	F-1	Mercury	Landfill Gas	1.01
130456-62473	F-2	Mercury	Landfill Gas	0.930
130456-62482	F-3	Mercury	Landfill Gas	0.990



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation



Batch Worklist

HBN: 106028

Instrument: WP
Status: WP

Created: 4/30/2013 08:34
Analyst: M. Karanu

Batch: IWC/1855
Rule: NIOSH 6010, Air



Workorder: 1311391 lot 7542 SKC 226-28 ex Apr/2017
Workorder: 1311467 lot 8128 SKC 226-28 ex Dec/2017
Workorder: 1311474 lot 0956 SKC 226-28 ex Nov/2010

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Mx	Type	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	331666	LMB for HBN 106028 [IWC/1855]			1	LMB		N6010...IQ	6135	4/30/2013	4/30/2013	
2	331667	LCS for HBN 106028 [IWC/1855]			1	LCS		N6010...IQ	6135	4/30/2013	4/30/2013	
3	331668	LCSD for HBN 106028 [IWC/1855]			1	LCSD		N6010...IQ	6135	4/30/2013	4/30/2013	
4	1311391001	PA1			1	SAMPLE	1311391001-A	N6010...1	5975	4/30/2013	4/30/2013	
5	1311391002	CM2			1	SAMPLE	1311391002-A	N6010...1	5975	4/30/2013	4/30/2013	
6	1311391003	AM3			1	SAMPLE	1311391003-A	N6010...1	5975	4/30/2013	4/30/2013	
7	1311467001	130456-62453			1	SAMPLE	1311467001-A	N6010...1	5975	4/30/2013	4/30/2013	
8	1311467002	130456-62462			1	SAMPLE	1311467002-A	N6010...1	5975	4/30/2013	4/30/2013	
9	1311467003	130456-62471			1	SAMPLE	1311467003-A	N6010...1	5975	4/30/2013	4/30/2013	
10	1311467004	130456-62480			1	SAMPLE	1311467004-A	N6010...1	5975	4/30/2013	4/30/2013	
11	1311467005	130456-62491			1	FLDBK	1311467005-A	N6010...1	5975	4/30/2013	4/30/2013	
12	1311474002	A-3 HCN			1	SAMPLE	1311474002-A	N6010...1	5975	4/30/2013	4/30/2013	
13	1311474007	BFML-3 HCN			1	SAMPLE	1311474007-A	N6010...1	5975	4/30/2013	4/30/2013	
14	1311474011	CMFL-3 HCN			1	SAMPLE	1311474011-A	N6010...1	5975	4/30/2013	4/30/2013	
15	1311474014	DMFL-3 HCN			1	SAMPLE	1311474014-A	N6010...1	5975	4/30/2013	4/30/2013	
16	1311474020	FB-8 HCN			1	FLDBK	1311474020-A	N6010...1	5975	4/30/2013	4/30/2013	

1311103

cc/103

cc/103

cc/103

9:45 - 10:45

Set ID's: 1311391, 1311467, 1311474
Sample ID's: 1311391001-003; 1311467001-005; 1311474002, 007, 011, 014, 020
Matrix: Soda Lime Tubes
Analyst/Date: Mary Karanu 04/30/13
Analyte/Method: HCN /NIOSH 6010Mod
Batch/HBN ID: IWC: 1855 / 106028
Reporting Limit: (HCN) 0.48µg/sample*

SAMPLE PREPARATION/ANALYSIS: Front (F) and back (B) sections of each tube are added separately to dram vials. 20mL of 0.25N NaOH are added to each and desorbed for a minimum of one hour [0945-1045] with occasional agitation. For particulate cyanide, the glass wool plug at the tube inlet and the glass fiber filter disk are desorbed the same as the soda lime. Then an aliquot of each front section and back section is filtered with a 0.45µm PES membrane filter prior to analysis on a SmartChem Discrete AA (WET01).
In variation to the method; 0.25N NaOH is used instead of water to stabilize the cyanide, and 20mL is used instead of 10mL to allow for complete desorption.

REAGENTS:

0.25 N NaOH	04/02/13 MNK Horizon # 18729
Chloramine-T	04/30/13 EG Notebook # 2082, pg.50
Pyridine	04/29/13 EG Notebook # 2082, pg.50
Phosphate Buffer	04/16/13 EG Notebook # 2082, pg.49

STANDARDS: Working Stock: [17291] 1000 mg/L Check Stock: [18176] 1000 mg/L
Int. Working: [18773, 50000 µg/L] Int. Check: [18774, 50000 µg/L]
Working Stds: prepared per analysis Check Std: prepared per analysis
ICV is 0.200mL of Int. Check Int. [18774] brought to 50mL with 0.25N NaOH = 200µg/L.

INSTRUMENT PARAMETERS: See instrument printout for operating parameters.
Plan #: 20130430002.

CONVERSIONS/CALCULATIONS:

Conversion: $(MW, HCN) 27.026 / (MW, CN) 26.018 = 1.039$
HCN: $\mu\text{g CN/L} \times 0.020 \text{ L/sample} \times 1.039 \text{ HCN} = 0.02078$ [conversion factor (CF) = 0.02078]
QC CN: $\mu\text{g CN/L} \times 0.020 \text{ L/sample} = 0.02$ [conversion factor (CF) = 0.02]

REPORTING LIMIT:

(HCN) RL: $23.0 \mu\text{g/L (low standard)} \times 0.02078 = 0.478 = 0.48 \mu\text{gHCN/sample}$
*Reporting limit was raised from 10µg/L due to above average instrument noise during analysis.

DILUTIONS: None.

COMMENTS: QC's are reported as µg CN/sample; results are not converted to HCN.

(HCN) Media is Soda Lime Tube, SKC Cat.No.226-28, Lot 7542 ex. Apr. /2017.

LCS/LCSD: $0.04 \text{ mL}/20 \text{ mL} \times 0.02 \times 50,000 \mu\text{g/L [18774]} = 2 \mu\text{g CN/sample}$.

Field sample media WO 1311391 Lot 7542 SKC 226-28 exp. Apr/2017; 1311467 Lot 8238 SKC 226-28 exp. Dec/2017; 1311474 Lot 6856 SKC 226-28 exp. Mar/2016.



STANDARD REPORT

Working Standard - CN INT wkg

CN INT wkg		Description - CN INT WKG			
Standard: 18773	Expires: 04/30/2013	Usable: Yes			
Lab Lot: CN INT wkg	Created By: M. Karanu	Amount: 10 mL			
Part ID:	Create Date: 04/30/2013	Validated By:			
MFG: MNK	MFG Lot: In House	Validated Date:			
Pos.	Analyte	Name	Concentration		
1	57-12-5	Cyanide	50000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume Added	Expires
17291	CN stock	CN stock	CN stock	0.5 mL	5/31/2013
18729	0.25N NaOH	0.25N NaOH	0.25N NaOH	9.5 mL	4/25/2015



STANDARD REPORT

Working Standard - CN ENV wkg

CN ENV wkg		Description - CN ENV wkg			
Standard: 18774	Expires: 04/30/2013	Usable: Yes			
Lab Lot: CN ENV wkg	Created By: M. Karanu	Amount: 10 mL			
Part ID:	Create Date: 04/30/2013	Validated By:			
MFG: MNK	MFG Lot: In House	Validated Date:			
Pos.	Analyte	Name	Concentration		
1	57-12-5	Cyanide	50000 ug/L		
Composition					
Standard	Standard ID	Description	Lab Lot ID	Volume Added	Expires
18176	CN stock	CN stock	CN stock	0.5 mL	1/31/2014
18729	0.25N NaOH	0.25N NaOH	0.25N NaOH	9.5 mL	4/25/2015



STANDARD REPORT

Constituent

Stock Standard - CN stock

<i>CN stock</i>		<i>Description - CN stock</i>	
Standard: 18176	Expires: 1/31/2014	Usable: Yes	
Lab Lot: CN stock	Created By: E. Gregory	Amount: 120 mL	
Part ID:	Create Date: 3/7/2013	Validated By:	
MFG: ULTRA Scientific	MFG Lot: P01284	Validated Date:	
Pos.	Analyte	Name	Concentration
1	57-12-5	Cyanide	1000 ug/mL



STANDARD REPORT

Constituent

Stock Standard - CN stock

CN stock		Description - CN stock	
Standard: 17291	Expires: 5/31/2013	Usable: Yes	
Lab Lot: CN stock	Created By: E. Gregory	Amount: 120 mL	
Part ID:	Create Date: 12/14/2012	Validated By:	
MFG: Ricca	MFG Lot: 1211497	Validated Date:	
Pos.	Analyte	Name	Concentration
1	57-12-5	Cyanide	1000 ug/mL



STANDARD REPORT

Constituent

Solvent Standard - 0.25N NaOH

<i>0.25N NaOH</i>		Description - 20g pellets diluted to 2L with DDI	
Standard: 18729	Expires: 4/25/2015	Usable: Yes	
Lab Lot: 0.25N NaOH	Created By: E. Gregory	Amount: 2 L	
Part ID:	Create Date: 4/25/2013	Validated By:	
MFG: EMD	MFG Lot: B0510904036	Validated Date:	
Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

From Page No. _____		Chemical	Manufacturer / Lot #	Pipettor/Balance	Analyst/Date
NH ₃	1:1 NaOCl	- SAME -	Baker / 0000023399	WC#4 (10mL) / 20 mL	EJ 04/23/13
CN	Chloramine-T	- SAME -	TCI America / QYNVA	102838 (0.25g) / 25 mL	EJ 04/24/13
TKN	Sulficylate Oxid	Sodium Sulficylate	Mall. / 12094A05005	102838 (7.5g) / 25 mL	ME 04/24/13
TKN	6% NaOcl	NaOcl	Baker / 0000023399	WF-4 (1.5mL) / 25 mL	ME 04/24/13
↓	4% Sulfuric acid	conc. H ₂ SO ₄	TMD / 50280	WC-4 (4mL) / 100 mL	ME 04/25/13
CN	Chloramine-T	- SAME -	TCI America / QYNVA	102838 (0.25g) / 25 mL	EJ 04/25/13
amenable	5% Calcium Hypochlorite	- SAME -	Baker / L34659	102838 (2.5g) / 50 mL	EJ 04/26/13
CN	Chloramine-T	- SAME -	TCI America / QYNVA	102838 (0.25g) / 25 mL	EJ 04/26/13
CN	Color solution	Barbituric Acid	Aldrich / 07021HU	102838 (7.5g) / 500 mL	EJ 04/29/13
↓	↓	Pyridine	EM Science / 36282	grad. cylinder (37.5 mL) / 500 mL	exp. 10/29/13
↓	↓	HCl, conc.	EMD / 52250	WC#4 (7.5 mL) / 100 mL	
CN	Chloramine-T	- SAME -	TCI America / QYNVA	102838 (0.25g) / 25 mL	EJ 04/29/13
CN	Chloramine-T	- SAME -	TCI America / QYNVA	102838 (0.25g) / 25 mL	EJ 04/30/13

Witnessed & Understood by me, _____

Date _____

Invented by _____

Date _____

Recorded by _____

To Page No. _____

From Page No.	Analyte	Reagent	Chemical	Manufacturer/Lot #	Pipettor/Balance	Analyst/Date
	TKN	Stock Buffer	sodium phosphate dibasic, anhydrous	Mallinckrodt/7917KJRA	102838(3.55g)/50ml	EJ 04/04/13
	TKN	Salicylate Color	sodium hydroxide	EMD/80510904036	102838(1.0g)/DDI H ₂ O	exp. 04/04/14
	TKN	4% Sulfuric Acid	Sodium salicylate	Mall./12094 A05605	102838(7.5g) / 25ml DDI H ₂ O + 0.15ml rinse	EJ 04/04/13 04/11/13
	TKN/TP	Digestion Soln.	-SAME-	EMD/50280	WC#4 (4ml) / 100ml DDI H ₂ O	EJ 04/08/13 exp. 05/08/13
			H ₂ SO ₄ , conc.	EMD/50280	grad. cyl. (100ml) + WC#4 (+1.25ml)	EJ 04/05/13
			mercuric oxide, red	Fisher/975522	102838 (1.0g) / 500	exp. 04/05/14
			potassium sulfate	Amresco/1042C266	102838 (66.5g) / DDI H ₂ O	exp. 04/05/13
	TKN	6% NaOCl	NaOCl	Baker/0000023399	WC#4 (1.5ml) / 25ml DDI H ₂ O	EJ 04/05/13 make daily
	Cr ⁶⁺	Extraction/Digestion Solution	NaOH pellets	EMD/80310906036	102838 (4g) / 200ml	EJ 04/08/13
			Na ₂ CO ₃	Aldrich/02108AR	102838 (6g) / DDI H ₂ O	exp. 07/08/13
	NH ₃	Dechlorinating Agent	Sodium Thiosulfate	Baker/L06467	102838 (0.175g) / 50ml DDI H ₂ O	EJ 04/08/13 exp. 04/08/14
	NH ₃	6% NaOCl	NaOCl	Baker/0000023399	WC#4 (1.5ml) / 25ml DDI H ₂ O	EJ 04/08/13 make daily
	NH ₃	1:1 NaOCl	-SAME-	Baker/0000023399	WC#4 (10ml) / 20ml DDI H ₂ O	EJ 04/08/13 make daily
	amenable CN	5% Calcium Hypochlorite	-SAME-	Baker/L34659	102838 (2.5g) / 50ml DDI H ₂ O	EJ 04/09/13 exp. 04/16/13
	CN	Releasing Soln.	MgCl ₂ • 6H ₂ O	CALBIOLHEM/D00127194	102838 (32.2g) / 110.8g	EJ 04/09/13
			H ₂ SO ₄ , conc.	EMD/50280	102838 (139g) / DDI H ₂ O	exp. 04/09/14
	As ³⁺	25% NaOH	NaOH pellets	EMD/80510904036	102838 (200g) / 1000ml DDI H ₂ O	MK 04/09/13 ex. 04/09/14
	CN	Chloramine-T	-SAME-	TCl America/QYNVA	102838 (0.25g) / 25ml DDI H ₂ O	EJ 04/09/13 make daily
	TKN	Salicylate Color	Sodium salicylate	Mallinckrodt/12094 A05605	102838 (7.5g) / 25ml DDI H ₂ O + 0.15ml rinse	EJ 04/11/13 exp. 04/18/13
	TKN	4% Sulfuric Acid	-SAME-	EMD/50280	WC#4 (4ml) / 100ml DDI H ₂ O	EJ 04/12/13 exp. 05/12/13
	TKN	6% NaOCl	NaOCl	Baker/0000023399	WC#4 (1.5ml) / 25ml DDI H ₂ O	EJ 04/12/13 make daily
	TOC	20% H ₃ PO ₄	conc. H ₃ PO ₄	EMD/50190	grad. cyl. (40ml) / 200ml DDI H ₂ O	MK 04/15/13 + 2x 1yr
	amenable CN	5% Calcium Hypochlorite	-SAME-	Baker/L34659	102838 (2.5g) / 50ml DDI H ₂ O	EJ 04/16/13 exp. 04/23/13
	CN	Chloramine-T	-SAME-	TCl America/QYNVA	102838 (0.25g) / 25ml DDI H ₂ O	EJ 04/16/13 make daily
	CN	Phosphate Buffer	NaH ₂ PO ₄ • H ₂ O	EMD/A901649	102838 (69g) / 500ml DDI H ₂ O + 25ml rinse	EJ 04/16/13 exp. 1 year
	SiO ₂	Ascorbic Acid	-same-	Mall. 8829135602	102838 (0.86g) / 50ml	MK 04/18/13 make daily
		oxalic acid	15% SDS	[EJ 08/31/12, 2082/39]	PL-214 (0.25ml) / DDI H ₂ O	MK 04/18/13 make daily
		Ammonium metaborate tetrahydrate	-same-	Baker/K07331	102838 (2.5g) / 50ml DDI H ₂ O	MK 04/18/13 make daily
			1:1 H ₂ SO ₄	EMD/47290033	102838 (0.5g) / 5ml	MK 04/18/13 make daily
			15% SDS	[MK 04/25/12, 2082/31]	PL-214 (0.25ml) / H ₂ O	MK 04/18/13 make daily
	MBAS	Wash Solution	6N H ₂ SO ₄	[EJ 03/25/13, 2082/48]	grad. cyl. (20.5ml) / 500ml	EJ 04/19/13
			NaH ₂ PO ₄ • H ₂ O	EMD/A909649	102838 (25g) / DDI H ₂ O	exp. 04/19/14
	Alk Dust	0.02N NaOH	0.1N NaOH	[EJ 03/26/13, 2082/48]	grad. cyl. (50ml) / DDI H ₂ O	MK 04/19/13 exp. 03/26/14
	CN	Chloramine-T	-SAME-	TCl America/QYNVA	102838 (0.25g) / 25ml DDI H ₂ O	EJ 04/23/13 make daily

Witnessed & Understood by me, Mary Kwanam Date 04/24/13

Invented by N/A Date 04/23/13

Recorded by Elijah Lung

To Page No. X



ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

ALS Environmental

Instrument ID: WET01

Mary Kavany 04/30/13
 W.O. 1311391, 1311407, 1311474

Method : CYN -Unit [µg/L] - CYANIDE

HPN 106028
 No dilutions required.
 R.L. = 0.48 µg/sample
 Conv. factor 0.02078 (Samples)
 0.02 (QCs)

Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Analysis Time
DIL-1	RBL	0.000	-0.0006	0.00	1:02:59 PM
DIL-1	RBL	0.000	0.0026	0.00	1:03:17 PM
DIL-1	RBL	0.000	0.0025	0.00	1:05:59 PM
DIL-1	Std-1	0.000	0.0014	0.00	1:06:17 PM
SR5-1	Std-2	10.000	0.0124	0.00	1:08:59 PM
SR5-2	Std-3	50.000	0.0568	0.00	1:09:17 PM
SR5-3	Std-4	100.000	0.1082	0.00	1:10:12 PM
SR5-4	Std-5	200.000	0.2118	0.00	1:10:30 PM
SR5-5	Std-6	300.000	0.3139	0.00	1:13:11 PM
SR5-6	Std-7	400.000	0.4116	0.00	1:13:29 PM
1	ICV	216.211	0.2260	0.00	1:14:24 PM
2	ICB	-0.065	0.0038	0.00	1:14:41 PM
3	LMB	-19.589	-0.0163	0.00	1:17:23 PM
4	LCS	73.500	0.0794	0.00	1:17:41 PM
5	LCSD	85.308	0.0915	0.00	1:18:35 PM
6	1311391001F	-14.419	-0.0109	0.00	1:18:54 PM
7	001B	1.493	0.0054	0.00	1:21:36 PM
8	002F	-21.047	-0.0178	0.00	1:21:53 PM
9	002B	-16.423	-0.0130	0.00	1:22:48 PM
10	003F	-18.871	-0.0155	0.00	1:23:05 PM
11	003B	-0.260	0.0036	0.00	1:25:48 PM
12	CCV	206.965	0.2165	0.00	1:26:05 PM
13	CCB	-1.720	0.0021	0.00	1:27:00 PM
14	1311467001F	-21.493	-0.0182	0.00	1:27:17 PM
15	1311467001B	-0.162	0.0037	0.00	1:30:00 PM
16	1311467002F	-11.646	-0.0081	0.00	1:30:18 PM
17	1311467002B	1.298	0.0052	0.00	1:31:12 PM
18	1311467003F	-9.982	-0.0064	0.00	1:31:30 PM
19	1311467003B	1.785	0.0057	0.00	1:34:12 PM
20	1311467004F	-17.827	-0.0144	0.00	1:34:30 PM
21	1311467004B	-0.162	0.0037	0.00	1:35:24 PM
22	1311467005F	-1.800	0.0020	0.00	1:35:42 PM

X0.02 = -0.29178 µg/sample
 X0.02 = 1.47 µg/sample
 X0.02 = 1.70616 µg/sample

Report Date :04/30/2013

Run Date :4/30/2013

Operator : GREGORY

Plan # :20130430002

Plan Description : 6010cyn-106028

ALS Environmental

Method : CYN -Unit [µg/L] - CYANIDE

Smp#[Dil Fact]	Sample ID	Conc	OD	%Recovery/RPD	Analysis Time
23	1311467005B	1.201	0.0051	0.00	1:38:24 PM
24	CCV2	204.629	0.2141	0.00	1:38:42 PM
25	CCB2	-0.746	0.0031	0.00	1:39:36 PM
26	1311474002F	-22.218	-0.0190	0.00	1:39:53 PM
27	1311474002B	-20.670	-0.0174	0.00	1:42:36 PM
28	1311474007F	-20.191	-0.0169	0.00	1:42:53 PM
29	1300474007B	-16.648	-0.0132	0.00	1:43:47 PM
30	011F	-20.002	-0.0167	0.00	1:44:05 PM
31	011B	0.130	0.0040	0.00	1:46:47 PM
32	014F	-20.378	-0.0171	0.00	1:47:05 PM
33	014B	-1.330	0.0025	0.00	1:47:59 PM
34	020F	-2.109	0.0017	0.00	1:48:18 PM
35	020B	-1.330	0.0025	0.00	1:51:00 PM
36	CCV3	208.035	0.2176	0.00	1:51:17 PM
37	CCB3	-0.552	0.0033	0.00	1:52:11 PM

Report Date :04/30/2013

Run Date :4/30/2013

Operator : GREGORY

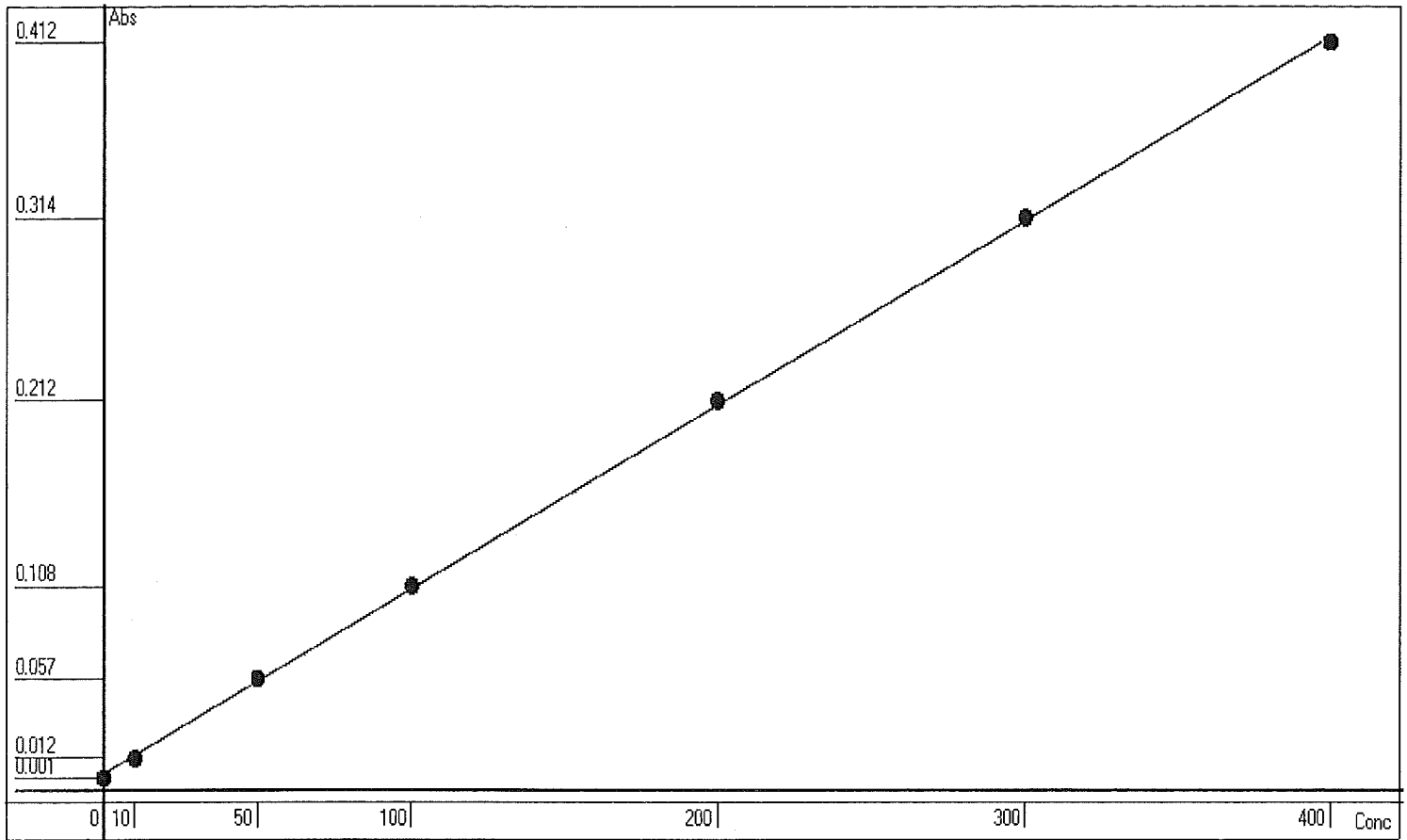
Plan # :20130430002

Plan Description : 6010cyn-106028

Calibrant Report - CYN -

Calib Lot #:N/A Exp Date:1/1/2025 User:Westco Scientific

Plan # : 20130430002 Description : [6010cyn-106028] Unit



Point	OD	Conc	Recalc Conc	% Error
1	0.0014	0	-2.4008	-240.08
2	0.0124	10	8.3059	-16.94
3	0.0568	50	51.5222	3.04
4	0.1082	100	101.5519	1.55
5	0.2118	200	202.3899	1.19
6	0.3139	300	301.7679	0.59
7	0.4116	400	396.8633	-0.78

Conc= +973.34*Abso -3.7635 R²=0.9998

RBL
0.0026
0

Report Date 4/30/2013 Run Date 4/30/2013