Alliance TECHNICAL GROUP

284 Sheffield Street, Mountainside NJ 07092
Tel. 908-789-8900 Fax: 908-789-8922

DATA REPORTING QUALIFIERS- INORGANIC

For reporting results, the following " Results Qualifiers" are used:

J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL).
U	Indicates the analyte was analyzed for, but not detected.
ND	Indicates the analyte was analyzed for, but not detected
E	Indicates the reported value is estimated because of the presence of interference
M	Indicates Duplicate injection precision not met.
N	Indicates the spiked sample recovery is not within control limits.
S	Indicates the reported value was determined by the Method of Standard Addition (MSA).
*	Indicates that the duplicate analysis is not within control limits.
+	Indicates the correlation coefficient for the MSA is less than 0.995.
D	Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
M	Method qualifiers **"P"** for ICP instrument **"PM"** for ICP when Microwave Digestion is used **"CV"** for Manual Cold Vapor AA **"AV"** for automated Cold Vapor AA **"CA"** for MIDI-Distillation Spectrophotometric **"AS"** for Semi –Automated Spectrophotometric **"C"** for Manual Spectrophotometric **"T"** for Titrimetric **"NR"** for analyte not required to be analyzed
OR	Indicates the analyte's concentration exceeds the calibrated range of the instrument for that specific analysis.
Q	Indicates the LCS did not meet the control limits requirements
H	Sample Analysis Out Of Hold Time

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LAB CHRONICLE

OrderID:	P4921	**OrderDate:**	11/19/2024 12:44:00 PM
Client:	AECOM	**Project:**	Meeker Ave Plumes Superfund Site RI FS
Contact:	Amit Haryani	**Location:**	L61

LabID	ClientID	Matrix	Test	Method	Sample Date	Prep Date	Anal Date	Received
P4921-01	**WC-11-A-202411**	**WATER**			**11/19/24 07:00**			**11/19/24**
			Cyanide	9012B		11/21/24	11/21/24 13:32	
			Flash Point	1010B			11/20/24 13:30	
			pH	9040C			11/20/24 08:30	
			Reactive Cyanide	9012B		11/20/24	11/21/24 11:15	
			Reactive Sulfide	9034		11/21/24	11/21/24 15:48	

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SAMPLE DATA

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Report of Analysis

Client:	AECOM	Date Collected:	11/19/24 07:00
Project:	Meeker Ave Plumes Superfund Site RI FS	Date Received:	11/19/24
Client Sample ID:	WC-11-A-202411	SDG No.:	P4921
Lab Sample ID:	P4921-01	Matrix:	WATER
		% Solid:	0

Parameter	Conc.	Qua.	DF	MDL	LOQ / CRQL	Units	Prep Date	Date Ana.	Ana Met.
Cyanide	0.019		1	0.00099	0.0050	mg/L	11/21/24 08:30	11/21/24 13:32	9012B
Flash Point	>212		1	0	0	o F		11/20/24 13:30	1010B
pH	7.02	H	1	0	0	pH		11/20/24 08:30	9040C
Reactive Cyanide	0.00099	U	1	0.00099	0.0050	mg/L	11/20/24 15:00	11/21/24 11:15	9012B
Reactive Sulfide	0.43	U	1	0.43	1.00	mg/L	11/21/24 10:30	11/21/24 15:48	9034

Comments: Other method reference for flash point : Pensky-Martens Closed Cup Flash Point ASTM D 93 - IP 34, pH result reported at temperature

U = Not Detected
LOQ = Limit of Quantitation
MDL = Method Detection Limit
LOD = Limit of Detection
D = Dilution
Q = indicates LCS control criteria did not meet requirements
H = Sample Analysis Out Of Hold Time
J = Estimated Value
B = Analyte Found in Associated Method Blank
* = indicates the duplicate analysis is not within control limits.
E = Indicates the reported value is estimated because of the presence of interference.
OR = Over Range
N =Spiked sample recovery not within control limits

QC RESULT SUMMARY

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Initial and Continuing Calibration Verification

Client: AECOM **SDG No.:** P4921

Project: Meeker Ave Plumes Superfund Site RI FS **RunNo.:** LB133526

Analyte		Units	Result	True Value	% Recovery	Acceptance Window (%R)	Analysis Date
Sample ID:	**ICV**						
pH		pH	7.00	7	100	90-110	11/20/2024
Sample ID:	**CCV1**						
pH		pH	2.02	2.00	101	90-110	11/20/2024
Sample ID:	**CCV2**						
pH		pH	12.02	12.00	100	90-110	11/20/2024

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Initial and Continuing Calibration Verification

Client:	AECOM	**SDG No.:**	P4921
Project:	Meeker Ave Plumes Superfund Site RI FS	**RunNo.:**	LB133527

Analyte	Units	Result	True Value	% Recovery	Acceptance Window (%R)	Analysis Date
Sample ID: ICV						
Flash Point	o F	82.4	81	102	78-84	11/20/2024

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Initial and Continuing Calibration Verification

Client:	AECOM	**SDG No.:**	P4921
Project:	Meeker Ave Plumes Superfund Site RI FS	**RunNo.:**	LB133548

Analyte	Units	Result	True Value	% Recovery	Acceptance Window (%R)	Analysis Date
Sample ID: ICV1						
Reactive Cyanide	mg/L	0.096	0.099	97	85-115	11/21/2024
Sample ID: CCV1						
Reactive Cyanide	mg/L	0.25	0.25	100	90-110	11/21/2024
Sample ID: CCV2						
Reactive Cyanide	mg/L	0.24	0.25	96	90-110	11/21/2024
Sample ID: CCV3						
Reactive Cyanide	mg/L	0.26	0.25	104	90-110	11/21/2024

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Initial and Continuing Calibration Verification

Client:	AECOM	**SDG No.:**	P4921
Project:	Meeker Ave Plumes Superfund Site RI FS	**RunNo.:**	LB133553

Analyte		Units	Result	True Value	% Recovery	Acceptance Window (%R)	Analysis Date
Sample ID:	**ICV1**						
Cyanide		mg/L	0.096	0.099	97	90-110	11/21/2024
Sample ID:	**CCV1**						
Cyanide		mg/L	0.25	0.25	100	90-110	11/21/2024
Sample ID:	**CCV2**						
Cyanide		mg/L	0.25	0.25	100	90-110	11/21/2024

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Initial and Continuing Calibration Blank Summary

Client: AECOM **SDG No.:** P4921

Project: Meeker Ave Plumes Superfund Site RI FS **RunNo.:** LB133548

Analyte	Units	Result	Acceptance Limits	Conc Qual	MDL	RDL	Analysis Date
Sample ID: ICB1							
Reactive Cyanide	mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024
Sample ID: CCB1							
Reactive Cyanide	mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024
Sample ID: CCB2							
Reactive Cyanide	mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024
Sample ID: CCB3							
Reactive Cyanide	mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024

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Initial and Continuing Calibration Blank Summary

Client: AECOM **SDG No.:** P4921

Project: Meeker Ave Plumes Superfund Site RI FS **RunNo.:** LB133553

Analyte		Units	Result	Acceptance Limits	Conc Qual	MDL	RDL	Analysis Date
Sample ID:	ICB1							
Cyanide		mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024
Sample ID:	CCB1							
Cyanide		mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024
Sample ID:	CCB2							
Cyanide		mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024

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Preparation Blank Summary

Client: AECOM **SDG No.:** P4921

Project: Meeker Ave Plumes Superfund Site RI FS

Analyte	Units	Result	Acceptance Limits	Conc Qual	MDL	RDL	Analysis Date
Sample ID: PB165128BL							
Reactive Sulfide	mg/L	< 0.5000	0.5000	U	0.43	1	11/21/2024
Sample ID: PB165148BL							
Reactive Cyanide	mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024
Sample ID: PB165170BL							
Cyanide	mg/L	< 0.0025	0.0025	U	0.00099	0.005	11/21/2024

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Matrix Spike Summary

Client: AECOM
SDG No.: P4921
Project: Meeker Ave Plumes Superfund Site RI FS
Sample ID: P4921-01
Client ID: WC-11-A-202411MS
Percent Solids for Spike Sample: 0

Analyte	Units	Acceptance Limit %R	Spiked Result	Conc. Qualifier	Sample Result	Conc. Qualifier	Spike Added	Dilution Factor	% Rec	Qual	Analysis Date
Cyanide	mg/L	75-125	0.053		0.019		0.04	1	85		11/21/2024

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Matrix Spike Summary

Client: AECOM
SDG No.: P4921
Project: Meeker Ave Plumes Superfund Site RI FS
Sample ID: P4921-01
Client ID: WC-11-A-202411MSD
Percent Solids for Spike Sample: 0

Analyte	Units	Acceptance Limit %R	Spiked Result	Conc. Qualifier	Sample Result	Conc. Qualifier	Spike Added	Dilution Factor	% Rec	Qual	Analysis Date
Cyanide	mg/L	75-125	0.055		0.019		0.04	1	90		11/21/2024

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Duplicate Sample Summary

Client: AECOM
SDG No.: P4921
Project: Meeker Ave Plumes Superfund Site RI FS
Sample ID: P4921-01
Client ID: WC-11-A-202411DUP
Percent Solids for Spike Sample: 0

Analyte	Units	Acceptance Limit	Sample Result	Conc. Qualifier	Duplicate Result	Conc. Qualifier	Dilution Factor	RPD/ AD	Qual	Analysis Date
pH	pH	+/-20	7.02		7.03		1	0.14		11/20/2024
Reactive Cyanide	mg/L	+/-20	0.00099	U	0.00099	U	1	0		11/21/2024
Cyanide	mg/L	+/-20	0.019		0.019		1	0		11/21/2024
Reactive Sulfide	mg/L	+/-20	0.43	U	0.43	U	1	0		11/21/2024

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Duplicate Sample Summary

Client: AECOM
Project: Meeker Ave Plumes Superfund Site RI FS
Client ID: WC-11-A-202411MSD
SDG No.: P4921
Sample ID: P4921-01
Percent Solids for Spike Sample: 0

Analyte	Units	Acceptance Limit	Sample Result	Conc. Qualifier	Duplicate Result	Conc. Qualifier	Dilution Factor	RPD/ AD	Qual	Analysis Date
Cyanide	mg/L	+/-20	0.053		0.055		1	4		11/21/2024

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Duplicate Sample Summary

Client: AECOM
Project: Meeker Ave Plumes Superfund Site RI FS
Client ID: 111424-CDUP
SDG No.: P4921
Sample ID: P4927-01
Percent Solids for Spike Sample: 0

Analyte	Units	Acceptance Limit	Sample Result	Conc. Qualifier	Duplicate Result	Conc. Qualifier	Dilution Factor	RPD/ AD	Qual	Analysis Date
Flash Point	o F	+/-2	>212.0		>212.0		1	0		11/20/2024

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Laboratory Control Sample Summary

Client:	AECOM	**SDG No.:**	P4921
Project:	Meeker Ave Plumes Superfund Site RI FS	**Run No.:**	LB133553

Analyte	Units	True Value	Result	Conc. Qualifier	% Recovery	Dilution Factor	Acceptance Limit %R	Analysis Date
Sample ID **PB165170BS**								
Cyanide	mg/L	0.1	0.095		95	1	85-115	11/21/2024

RAW DATA

Reviewed By:Iwona
On:11/20/2024 9:42:04 AM
Inst Id :WC PH METER-1

Analytical Summary Report

Analysis Method: 9040C
Parameter: pH
Run Number: LB133526

Analyst By : jignesh
Supervisor Review By : Iwona
Slope : 98.6
pH Meter ID : WC PH METER-1

Calibration Standards	Chemtech Log#
PH 4 BUFFER SOLUTION	W3107
BUFFER PH 7.00 GREEN 1PINT PK6	W3093
PH 10.01 BUFFER,COLOR CD 475ML	W3094
buffer solution pH 7 yellow	W3071
Buffer Solution, PH2 (500ml)	W3005
Buffer Solution, PH12 (500ml)	W3072

True Value of ICV = 7.00 Control Limits[+/- 0.1].

True Value of CCV1 = 2.00 Control Limits[+/- 0.1].

True Value of CCV2 = 12.00 Control Limits[+/- 0.1].

Seq	LabID	DF	Matrix	Weight (gm)	Volume (ml)	Temperature (°C)	Result (pH)	Anal Date	Anal Time
1	CAL1	1	Water	NA	NA	20.3	4.01	11/20/2024	08:10
2	CAL2	1	Water	NA	NA	20.1	7.00	11/20/2024	08:11
3	CAL3	1	Water	NA	NA	20.2	10.02	11/20/2024	08:12
4	ICV	1	Water	NA	NA	20.3	7.00	11/20/2024	08:15
5	CCV1	1	Water	NA	NA	20.3	2.02	11/20/2024	08:20
6	P4921-01	1	Water	NA	NA	20.7	7.02	11/20/2024	08:30
7	P4921-01DUP	1	Water	NA	NA	20.8	7.03	11/20/2024	08:31
8	P4927-01	1	Water	NA	NA	21.6	5.55	11/20/2024	08:35
9	CCV2	1	Water	NA	NA	20.3	12.02	11/20/2024	08:40

LB133526

WORKLIST(Hardcopy Internal Chain)

WorkList Name : PH P4921 WATER **WorkList ID :** 185590 **Department :** Wet-Chemistry **Date :** 11-20-2024 07:52:31

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
P4921-01 I	WC-11-A-202411	Water	pH	Cool 4 deg C	AECO02	L61	11/19/2024	9040C
P4927-01 A	111424-C	Water	pH	Cool 4 deg C	PSEG03	L61	11/19/2024	9040C

Date/Time 11.20.24 08:00

Raw Sample Received by: [signature]

Raw Sample Relinquished by: [signature]

Date/Time 11.20.24 11:00

Raw Sample Received by: [signature]

Raw Sample Relinquished by: [signature]

Analytical Summary Report

Analysis Method: 1010B
Reviewed By: rubina
Parameter: Flash Point
Supervisor Review By: Iwona
Run Number: LB133527
Ambient Barometric Pressure(mmHg): 760.00
Thermometer ID: Flash Point
Barometric Scale ID: 0511064

Reagent/Standard	Lot/Log #
p-xylene (ICV)	W3088

Seq	LabID	True Value °F	DL	Initial Sample °C	Celsius °C	Result °F	Final Result °F	Anal Date	Anal Time
1	ICV	81	1	9	28.00	82.4	82.4	11/20/2024	13:00
2	P4921-01		1	11	100.00	>212.0	>212.0	11/20/2024	13:30
3	P4927-01		1	13	100.00	>212.0	>212.0	11/20/2024	14:00
4	P4927-01DUP		1	13	100.00	>212.0	>212.0	11/20/2024	14:30

Result = (Celsius * 1.8) + 32

Final Result = Result + (760 - Ambient Barometric Pressure) * 0.06

WORKLIST(Hardcopy Internal Chain)

LB133527.

WorkList Name : FP 11-19 **WorkList ID :** 185585 **Department :** Wet-Chemistry **Date :** 11-19-2024 16:50:32

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
P4921-01	WC-11-A-202411	Water	Flash Point	Cool 4 deg C	AECO02	L61	11/19/2024	1010B
P4927-01	111424-C	Water	Flash Point	Cool 4 deg C	PSEG03	L61	11/19/2024	1010B

Date/Time 11/20/2024 12.50

Raw Sample Received by: RM (WC)

Raw Sample Relinquished by: M Cool C 1

Date/Time 11/20/2024 15:05

Raw Sample Received by: M Cool C

Raw Sample Relinquished by: RM (WC)

LB13

Test results | Aquakem 7.2AQ1 | Page: 1

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11/21/2024 11:26 | Reviewed by : NF | Instrument ID : Konelab

Test: Total CN

Sample Id	Result	Dil. 1 +	Response	Errors
ICV1	94.710	0.0	0.070	
ICV1	95.713	0.0	0.071	
ICB1	-0.296	0.0	0.002	
ICB1	-0.201	0.0	0.002	
CCV1	246.553	0.0	0.179	
CCV1	247.229	0.0	0.179	
CCB1	-0.261	0.0	0.002	
CCB1	-0.262	0.0	0.002	
PB165147BL	-0.430	0.0	0.002	
P4910-04	-0.427	0.0	0.002	
P4910-04DUP	-0.440	0.0	0.002	
P4910-08	-0.213	0.0	0.002	
P4916-04	-0.205	0.0	0.002	
P4916-08	-0.092	0.0	0.002	
P4916-12	-0.164	0.0	0.002	
P4923-02	-0.063	0.0	0.002	
P4923-03	-0.115	0.0	0.002	
P4923-04	-0.269	0.0	0.002	
CCV2	244.202	0.0	0.177	
CCB2	-0.145	0.0	0.002	
P4923-05	-0.499	0.0	0.002	
P4924-04	-0.266	0.0	0.002	
P4925-04	-0.411	0.0	0.002	
P4925-08	-0.433	0.0	0.002	
P4929-02	-0.174	0.0	0.002	
P4938-04	-0.187	0.0	0.002	
P4938-08	-0.075	0.0	0.002	
PB165148BL	-0.164	0.0	0.002	
P4921-01	-0.118	0.0	0.002	
P4921-01DUP	0.051	0.0	0.002	
CCV3	262.892	0.0	0.191	
CCB3	0.347	0.0	0.002	

N	32
Mean	37.056
SD	85.1659
CV%	229.83

Aquakem v. 7.2AQ1
Results from time period:
Thu Nov 21 09:08:52 2024
Thu Nov 21 11:19:18 2024

Sample Id	Sam/Ctr/cA	Test short r	Test type	Result	Result unit	Result date and time	Stat
0.0PPBCN	A	Total CN	P	-0.3619	µg/l	11/21/2024 9:46:56	
5.0PPBCN	A	Total CN	P	5.0542	µg/l	11/21/2024 9:46:57	
10PPBCN	A	Total CN	P	10.0361	µg/l	11/21/2024 9:46:58	
50PPBCN	A	Total CN	P	48.1869	µg/l	11/21/2024 9:46:59	
100PPBCN	A	Total CN	P	99.3081	µg/l	11/21/2024 9:47:00	
250PPBCN	A	Total CN	P	254.9164	µg/l	11/21/2024 9:47:01	
500PPBCN	A	Total CN	P	497.8602	µg/l	11/21/2024 9:47:02	
ICV1	S	Total CN	P	94.7097	µg/l	11/21/2024 11:00:17	
ICV1	S	Total CN	P	95.713	µg/l	11/21/2024 11:00:18	
ICB1	S	Total CN	P	-0.2956	µg/l	11/21/2024 11:00:19	
ICB1	S	Total CN	P	-0.2008	µg/l	11/21/2024 11:00:20	
CCV1	S	Total CN	P	246.553	µg/l	11/21/2024 11:00:21	
CCV1	S	Total CN	P	247.2294	µg/l	11/21/2024 11:00:22	
CCB1	S	Total CN	P	-0.2606	µg/l	11/21/2024 11:00:23	
CCB1	S	Total CN	P	-0.2619	µg/l	11/21/2024 11:00:24	
PB165147BL	S	Total CN	P	-0.43	µg/l	11/21/2024 11:00:25	
P4910-04	S	Total CN	P	-0.4269	µg/l	11/21/2024 11:00:26	
P4910-04DUP	S	Total CN	P	-0.44	µg/l	11/21/2024 11:00:27	
P4910-08	S	Total CN	P	-0.2125	µg/l	11/21/2024 11:07:50	
P4916-04	S	Total CN	P	-0.205	µg/l	11/21/2024 11:07:51	
P4916-08	S	Total CN	P	-0.0919	µg/l	11/21/2024 11:07:52	
P4916-12	S	Total CN	P	-0.164	µg/l	11/21/2024 11:07:53	
P4923-02	S	Total CN	P	-0.0633	µg/l	11/21/2024 11:07:54	
P4923-03	S	Total CN	P	-0.1151	µg/l	11/21/2024 11:07:55	
P4923-04	S	Total CN	P	-0.2693	µg/l	11/21/2024 11:07:56	
CCV2	S	Total CN	P	244.2016	µg/l	11/21/2024 11:07:59	
CCB2	S	Total CN	P	-0.145	µg/l	11/21/2024 11:08:00	
P4923-05	S	Total CN	P	-0.499	µg/l	11/21/2024 11:15:25	
P4924-04	S	Total CN	P	-0.2657	µg/l	11/21/2024 11:15:26	
P4925-04	S	Total CN	P	-0.4106	µg/l	11/21/2024 11:15:27	
P4925-08	S	Total CN	P	-0.4335	µg/l	11/21/2024 11:15:28	
P4929-02	S	Total CN	P	-0.174	µg/l	11/21/2024 11:15:29	
P4938-04	S	Total CN	P	-0.1871	µg/l	11/21/2024 11:15:30	
P4938-08	S	Total CN	P	-0.0746	µg/l	11/21/2024 11:15:31	
PB165148BL	S	Total CN	P	-0.1639	µg/l	11/21/2024 11:15:32	
P4921-01	S	Total CN	P	-0.1177	µg/l	11/21/2024 11:15:33	
P4921-01DUP	S	Total CN	P	0.0509	µg/l	11/21/2024 11:15:34	
CCV3	S	Total CN	P	262.8923	µg/l	11/21/2024 11:19:17	
CCB3	S	Total CN	P	0.3474	µg/l	11/21/2024 11:19:18	

Calibration results Aquakem 7.2AQ1 Page: 1

CHEMTECH CONSULTING GROUP INC
284 Sheffield Street, Mountainside, NJ 07092

Reviewed by : NF Instrument ID : Konelab

11/21/2024 9:47

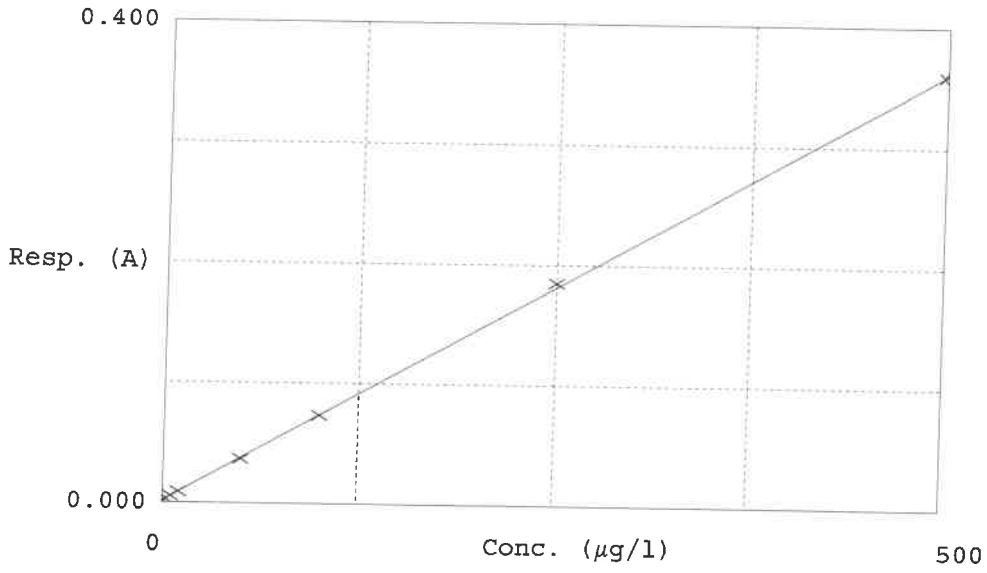
Test Total CN

Accepted 11/21/2024 9:47

Factor 1393
Bias 0.002

Coeff. of det. 0.999841

Errors Meas. error



	Calibrator	Response	Calc. con.	Conc.	Errors (Re)
1	0.0PPBCN	0.002	-0.3619	0.0000	
2	5.0PPBCN	0.006	5.0542	5.0000	1.1
3	10PPBCN	0.009	10.0361	10.0000	0.4
4	50PPBCN	0.037	48.1869	50.0000	-3.6
5	100PPBCN	0.073	99.3081	100.0000	-0.7
6	250PPBCN	0.185	254.9164	250.0000	2.0
7	500PPBCN	0.359	497.8602	500.0000	-0.4

NF 11.21.2024

LB

Test results Aquakem 7.2AQ1

CHEMTECH CONSULTING GROUP INC
284 Sheffield Street, Mountainside, NJ 07092

Reviewed by : NF Instrument ID : Konelab

11/21/2024 13:45

Test: Total CN

Sample Id	Result	Dil. 1 +	Response	Errors
ICV1	96.040	0.0	0.071	
ICB1	0.051	0.0	0.002	
CCV1	245.821	0.0	0.178	
CCB1	0.171	0.0	0.002	
PB165170BL	0.411	0.0	0.002	
PB165170BS	94.950	0.0	0.070	
LOWPB165170	10.336	0.0	0.009	
HIGHPB165170	481.733	0.0	0.348	
P4921-01	19.340	0.0	0.016	
P4921-01DUP	19.493	0.0	0.016	
P4921-01MS	53.114	0.0	0.040	
P4921-01MSD	54.736	0.0	0.041	
CCV2	245.156	0.0	0.178	
CCB2	-0.067	0.0	0.002	

103% 96% (90 - 110) NF
11.21.2024

N	14
Mean	94.377
SD	139.4533
CV%	147.76

Aquakem v. 7.2AQ1
Results from time period:
Thu Nov 21 13:25:21 2024
Thu Nov 21 13:45:19 2024

Sample Id	Sam/Ctr/cA	Test short r	Test type	Result	Result unit	Result date and time	Stat
0.0PPBCN	A	Total CN	P	-0.3619	µg/l	11/21/2024 9:46:56	
5.0PPBCN	A	Total CN	P	5.0542	µg/l	11/21/2024 9:46:57	
10PPBCN	A	Total CN	P	10.0361	µg/l	11/21/2024 9:46:58	
50PPBCN	A	Total CN	P	48.1869	µg/l	11/21/2024 9:46:59	
100PPBCN	A	Total CN	P	99.3081	µg/l	11/21/2024 9:47:00	
250PPBCN	A	Total CN	P	254.9164	µg/l	11/21/2024 9:47:01	
500PPBCN	A	Total CN	P	497.8602	µg/l	11/21/2024 9:47:02	
ICV1	S	Total CN	P	96.0397	µg/l	11/21/2024 13:25:22	
ICB1	S	Total CN	P	0.0506	µg/l	11/21/2024 13:25:23	
CCV1	S	Total CN	P	245.8207	µg/l	11/21/2024 13:25:26	
CCB1	S	Total CN	P	0.1707	µg/l	11/21/2024 13:25:27	
PB165170BL	S	Total CN	P	0.4114	µg/l	11/21/2024 13:25:30	
PB165170BS	S	Total CN	P	94.9496	µg/l	11/21/2024 13:32:53	
LOWPB165170	S	Total CN	P	10.3356	µg/l	11/21/2024 13:32:55	
HIGHPB165170	S	Total CN	P	481.7331	µg/l	11/21/2024 13:32:56	
P4921-01	S	Total CN	P	19.3403	µg/l	11/21/2024 13:32:57	
P4921-01DUP	S	Total CN	P	19.4929	µg/l	11/21/2024 13:32:58	
P4921-01MS	S	Total CN	P	53.1135	µg/l	11/21/2024 13:33:01	
P4921-01MSD	S	Total CN	P	54.7363	µg/l	11/21/2024 13:33:02	
CCV2	S	Total CN	P	245.1559	µg/l	11/21/2024 13:33:03	
CCB2	S	Total CN	P	-0.0669	µg/l	11/21/2024 13:40:28	

Calibration results Aquakem 7.2AQ1

CHEMTECH CONSULTING GROUP INC
284 Sheffield Street, Mountainside, NJ 07092

Reviewed by : NF

11/21/2024 9:47 Instrument ID : Konelab

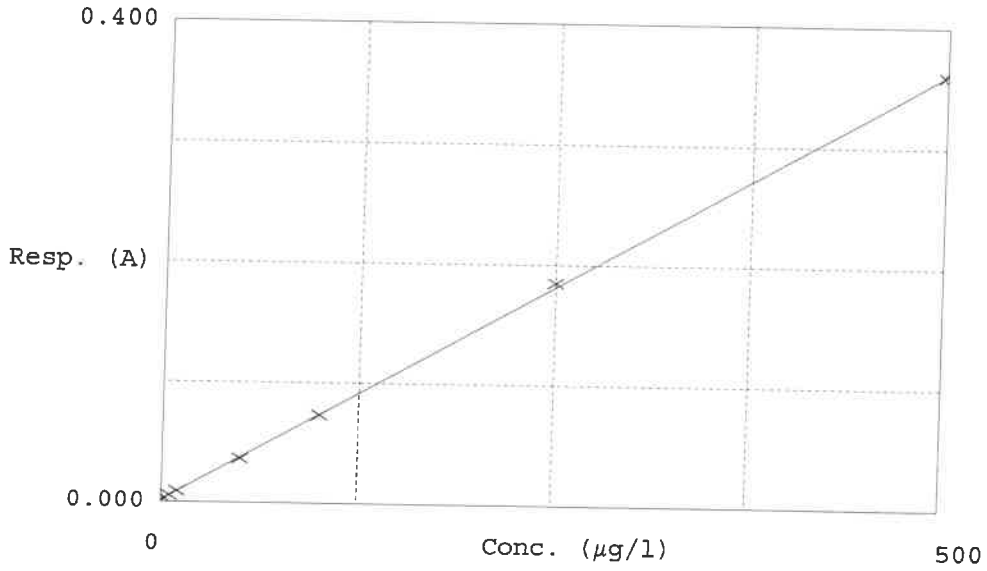
Test Total CN

Accepted 11/21/2024 9:47

Factor 1393
Bias 0.002

Coeff. of det. 0.999841

Errors Meas. error



	Calibrator	Response	Calc. con.	Conc.	Errors (Re)
1	0.0PPBCN	0.002	-0.3619	0.0000	
2	5.0PPBCN	0.006	5.0542	5.0000	1.1
3	10PPBCN	0.009	10.0361	10.0000	0.4
4	50PPBCN	0.037	48.1869	50.0000	-3.6
5	100PPBCN	0.073	99.3081	100.0000	-0.7
6	250PPBCN	0.185	254.9164	250.0000	2.0
7	500PPBCN	0.359	497.8602	500.0000	-0.4

NF 11.21.2024

CHEMTECH

Analytical Summary Report

Analysis Method: 9034
Parameter: Reactive Sulfide
Run Number: LB133562

ANALYST: rubina
SUPERVISOR REVIEW BY: Iwona
Constant: 16000
Normality1: 0.025
Normality2: 0.025

Reagent/Standard	Lot/Log #
SODIUM THIOSULFATE,0.025N,4LITRE	W3105
IODINE SOLUTION .025N 1L	W3114
Starch Solution, 4L	W3149

Seq	Lab ID	True Value (mg/l)	DF	Initial Volume (mL)	Final Volume (ml)	T1 (ml)	T2 Initial	T2 Final	T2 Diff. (ml)	T1 - T2 Diff (mL)	Value Corrected With Blank	Result (ppm)	Anal Date	Anal Time
1	PB165128BL		1	50	50	2.00	0.00	1.94	1.94	0.06	0.00	0.00	11/21/2024	15:45
2	P4921-01		1	50	50	2.00	0.00	1.92	1.92	0.08	0.02	0.16	11/21/2024	15:48
3	P4921-01DUP		1	50	50	2.00	0.00	1.92	1.92	0.08	0.02	0.16	11/21/2024	15:50

T1 = Titrant1

T2 = Titrant2

T2 Diff = T2 Final - T2 Initial

Value Corrected With Blank = ((T1 - T2 Diff) - Blank Correction(BL))

Result = ((T1 * Normality1) - ((T1 - Value Corrected With Blank) * Normality2)) * Constant / Initial Volume

Alliance TECHNICAL GROUP

Water Reactive Sulfide Preparation Sheet

PB165128

SOP ID : M9030B-Sulfide-12

SDG No : N/A

Matrix : WATER

Pippete ID : WC

Balance ID : N/A

Hood ID : HOOD#1

Block ID : MC-1,MC-2

Weigh By : N/A

Start Digest Date: 11/21/2024 **Time :** 10:30 **Temp :** N/A

End Digest Date: 11/21/2024 **Time :** 12:00 **Temp :** N/A

Digestion tube ID : M5595

Filter paper ID : N/A

pH Meter ID : N/A

Block Thermometer ID : N/A

Prep Technician Signature: RM

Supervisor Signature: IZ

Standared Name	MLS USED	STD REF. # FROM LOG
PBW	50.0ML	W3112
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE USED	Lot Number
0.5M ZINC ACETATE	5.0ML	WP108780
FORMALDEHYDE	2.0ML	W2725
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Extraction Conformance/Non-Conformance Comments:

11/21/2024 RM

N/A

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
	Preparation Group	Analysis Group

Alliance TECHNICAL GROUP

Water Reactive Sulfide Preparation Sheet

PB165128

Lab Sample ID	Client Sample ID	Initial Vol (ml)	Final Vol (ml)	pH	Sulfide	Oxidizing	Nitrate/ Nitrite	Comment	Prep Pos
P4921-01	WC-11-A-202411	50	50	N/A	N/A	N/A	N/A	N/A	N/A
P4921-01DUP	WC-11-A-202411DUP	50	50	N/A	N/A	N/A	N/A	N/A	N/A
PB165128BL	PBW128	50	50	N/A	N/A	N/A	N/A	N/A	N/A

WORKLIST(Hardcopy Internal Chain)

WorkList Name : rsul-w 11-21 **WorkList ID :** 185633 **Department :** Distillation **Date :** 11-21-2024 08:40:20

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
P4921-01	WC-11-A-202411	Water	Reactive Sulfide	Cool 4 deg C	AECO02	L61	11/19/2024	9034

Date/Time 11/21/2024 09:25
Raw Sample Received by: RM CWG
Raw Sample Relinquished by: CWG

Date/Time 11/21/2024 11:40
Raw Sample Received by:
Raw Sample Relinquished by: RM CWG

Alliance TECHNICAL GROUP

Water Reactive Cyanide Preparation Sheet

PB165148

SOP ID : M9012B-Total, Amenable and Reactive Cyanide-20

SDG No : N/A

Start Digest Date: 11/20/2024 **Time :** 15:00 **Temp :** N/A

Matrix : WATER

End Digest Date: 11/20/2024 **Time :** 16:30 **Temp :** N/A

Pippete ID : N/A

Balance ID : N/A

Hood ID : HOOD#1

Digestion tube ID : M5595

Block Thermometer ID : N/A

Block ID : MC-1,MC-2

Filter paper ID : N/A

Prep Technician Signature: NF

Weigh By : N/A

pH Meter ID : N/A

Supervisor Signature: 12

Standared Name	MLS USED	STD REF. # FROM LOG
PBW	50.0ML	W3112
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE USED	Lot Number
0.25N NaOH	50.0ML	WP108640
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

LAB SAMPLE ID	CLIENT SAMPLE ID		Comment

Extraction Conformance/Non-Conformance Comments:

N/A

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
11.20.2024, 16:45	NF(WC)	NF (WC)
	Preparation Group	Analysis Group

Alliance TECHNICAL GROUP

Water Reactive Cyanide Preparation Sheet

PB165148

Lab Sample ID	Client Sample ID	Initial Vol (ml)	Final Vol (ml)	pH	Sulfide	Oxidizing	Nitrate/ Nitrite	Comment	Prep Pos
P4921-01	WC-11-A-202411	50	50	N/A	N/A	N/A	N/A	N/A	N/A
P4921-01DUP	WC-11-A-202411DUP	50	50	N/A	N/A	N/A	N/A	N/A	N/A
PB165148BL	PBW148	50	50	N/A	N/A	N/A	N/A	N/A	N/A

WORKLIST(Hardcopy Internal Chain)

WorkList Name : RCN W-11202024 **WorkList ID :** 185619 **Department :** Distillation **Date :** 11-20-2024 13:57:38

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
P4921-01	WC-11-A-202411	Water	Reactive Cyanide	Cool 4 deg C	AECO02	L61	11/19/2024	9012B

Date/Time 11·20·2024,

Raw Sample Received by: NF(WC)

Raw Sample Relinquished by: [signature]

Date/Time 11·20·2024, 16:00

Raw Sample Received by: [signature]

Raw Sample Relinquished by: NF(WC)

Alliance TECHNICAL GROUP

Water Cyanide Preparation Sheet

PB165170

SOP ID : M9012B-Total, Amenable and Reactive Cyanide-20

SDG No : N/A

Matrix : WATER

Pippete ID : WC

Balance ID : N/A

Hood ID : HOOD#1

Block ID : MC-1, MC-2

Weigh By : N/A

Start Digest Date: 11/21/2024 **Time :** 08:30 **Temp :** 124 °C

End Digest Date: 11/21/2024 **Time :** 10:00 **Temp :** 126 °C

Digestion tube ID : M5595

Filter paper ID : N/A

pH Meter ID : N/A

Block Thermometer ID : WC CYANIDE

Prep Technician Signature: JB

Supervisor Signature: JR

Standared Name	MLS USED	STD REF. # FROM LOG
LCSW	1ML	WP109549
MS/MSD SPIKE SOL.	0.40ML	WP110035
PBW	50ML	W3112
N/A	N/A	N/A
N/A	N/A	N/A

Chemical Used	ML/SAMPLE USED	Lot Number
0.25N NaOH	50ML	WP108640
50% v/v H2SO4	5ML	WP110391
51% w/v MgCL2	2ML	WP110390
pH Paper 0-14	N/A	W3121
Nitrate/Nitrite Strip	N/A	W3101
Lead Acetate strip	N/A	W3134
KI-starch paper	N/A	W2965
N/A	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

LAB SAMPLE ID	CLIENT SAMPLE ID	Wt(g)/Vol(ml)	Comment
S0	S0	N/A	N/A
S5.0	S5.0	N/A	N/A
S10.0	S10.0	N/A	N/A
S100.0	S100.0	N/A	N/A
S250.0	S250.0	N/A	N/A
S500.0	S500.0	N/A	N/A
ICV	ICV	0.5ML	W3011
ICB	ICB	N/A	N/A
CCV	CCV	N/A	N/A
CCB	CCB	N/A	N/A
Midrange	Midrange	N/A	N/A
HIGHSTD	HIGHSTD	5.0ML	WP110035
LOWSTD	LOWSTD	0.1ML	WP110035

Extraction Conformance/Non-Conformance Comments:

N/A

Date / Time	Prepped Sample Relinquished By/Location	Received By/Location
11.21.2024, 10:15	JB (WC	NF(WC)
	Preparation Group	Analysis Group

Alliance TECHNICAL GROUP

Water Cyanide Preparation Sheet

PB165170

Lab Sample ID	Client Sample ID	Initial Vol (ml)	Final Vol (ml)	pH	Sulfide	Oxidizing	Nitrate/ Nitrite	Comment	Prep Pos
P4921-01	WC-11-A-202411	50	50	>12	Negative	Negative	Negative	N/A	N/A
P4921-01DUP	WC-11-A-202411DUP	50	50	>12	Negative	Negative	Negative	N/A	N/A
P4921-01MS	WC-11-A-202411MS	50	50	>12	Negative	Negative	Negative	N/A	N/A
P4921-01MSD	WC-11-A-202411MSD	50	50	>12	Negative	Negative	Negative	N/A	N/A
PB165170BL	PBW170	50	50	>12	Negative	Negative	Negative	N/A	N/A
PB165170BS	LCS170	50	50	>12	Negative	Negative	Negative	N/A	N/A

WORKLIST(Hardcopy Internal Chain)

WorkList Name : cn p4921 **WorkList ID :** 185621 **Department :** Distillation **Date :** 11-21-2024 07:49:17

Sample	Customer Sample	Matrix	Test	Preservative	Customer	Raw Sample Storage Location	Collect Date	Method
P4921-01 C	WC-11-A-202411	Water	Cyanide	Cool 4 deg C	AECO02	L61	11/19/2024	9012B

Date/Time 11.21.2024, 08:00
Raw Sample Received by: [illegible]
Raw Sample Relinquished by: JD (SM)

Date/Time 11.21.2024, 10:00
Raw Sample Received by: JD (SM)
Raw Sample Relinquished by: [illegible]

284 Sheffield Street, Mountainside, New Jersey 07092, Phone : 908 789 8900,
Fax : 908 789 8922

Instrument ID: WC PH METER-1

Daily Analysis Runlog For Sequence/QCBatch ID # LB133526

Review By	jignesh	Review On	11/20/2024 8:36:08 AM
Supervise By	Iwona	Supervise On	11/20/2024 9:42:04 AM
SubDirectory	LB133526	Test	pH

STD. NAME	STD REF.#
ICAL Standard	N/A
ICV Standard	N/A
CCV Standard	N/A
ICSA Standard	N/A
CRI Standard	N/A
LCS Standard	N/A
Chk Standard	W3107,W3093,W3094,W3071,W3005,W3072

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	CAL1	CAL1	CAL	11/20/24 08:10		jignesh	OK
2	CAL2	CAL2	CAL	11/20/24 08:11		jignesh	OK
3	CAL3	CAL3	CAL	11/20/24 08:12		jignesh	OK
4	ICV	ICV	ICV	11/20/24 08:15		jignesh	OK
5	CCV1	CCV1	CCV	11/20/24 08:20		jignesh	OK
6	P4921-01	WC-11-A-202411	SAM	11/20/24 08:30		jignesh	OK
7	P4921-01DUP	WC-11-A-202411DUP	DUP	11/20/24 08:31		jignesh	OK
8	P4927-01	111424-C	SAM	11/20/24 08:35		jignesh	OK
9	CCV2	CCV2	CCV	11/20/24 08:40		jignesh	OK

284 Sheffield Street, Mountainside, New Jersey 07092, Phone : 908 789 8900,
Fax : 908 789 8922

Instrument ID: IGN-1

Daily Analysis Runlog For Sequence/QCBatch ID # LB133527

Review By	rubina	Review On	11/20/2024 3:58:07 PM
Supervise By	Iwona	Supervise On	11/20/2024 3:58:14 PM
SubDirectory	LB133527	Test	Flash Point

STD. NAME	STD REF.#
ICAL Standard	N/A
ICV Standard	N/A
CCV Standard	N/A
ICSA Standard	N/A
CRI Standard	N/A
LCS Standard	N/A
Chk Standard	W3088

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	ICV	ICV	ICV	11/20/24 13:00		rubina	OK
2	P4921-01	WC-11-A-202411	SAM	11/20/24 13:30		rubina	OK
3	P4927-01	111424-C	SAM	11/20/24 14:00		rubina	OK
4	P4927-01DUP	111424-CDUP	DUP	11/20/24 14:30		rubina	OK

284 Sheffield Street, Mountainside, New Jersey 07092, Phone : 908 789 8900,
Fax : 908 789 8922

Instrument ID: KONELAB

Daily Analysis Runlog For Sequence/QCBatch ID # LB133548

Review By	Niha	Review On	11/22/2024 9:12:18 AM
Supervise By	Iwona	Supervise On	11/22/2024 11:46:08 AM
SubDirectory	LB133548	Test	Reactive Cyanide

STD. NAME	STD REF.#
ICAL Standard	WP110809,WP110810,WP110811,WP110812,WP110813,WP110814,WP110815
ICV Standard	WP110817
CCV Standard	WP110810
ICSA Standard	N/A
CRI Standard	N/A
LCS Standard	N/A
Chk Standard	WP109068,WP110103,WP110816

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	0.0PPBCN	0.0PPBCN	CAL1	11/21/24 09:46		Niha	OK
2	5.0PPBCN	5.0PPBCN	CAL2	11/21/24 09:46		Niha	OK
3	10PPBCN	10PPBCN	CAL3	11/21/24 09:46		Niha	OK
4	50PPBCN	50PPBCN	CAL4	11/21/24 09:46		Niha	OK
5	100PPBCN	100PPBCN	CAL5	11/21/24 09:47		Niha	OK
6	250PPBCN	250PPBCN	CAL6	11/21/24 09:47		Niha	OK
7	500PPBCN	500PPBCN	CAL7	11/21/24 09:47		Niha	OK
8	ICV1	ICV1	ICV	11/21/24 11:00		Niha	OK
9	ICB1	ICB1	ICB	11/21/24 11:00		Niha	OK
10	CCV1	CCV1	CCV	11/21/24 11:00		Niha	OK
11	CCB1	CCB1	CCB	11/21/24 11:00		Niha	OK
12	PB165147BL	PB165147BL	MB	11/21/24 11:00		Niha	OK
13	P4910-04	MH-COTTAGE	SAM	11/21/24 11:00		Niha	OK
14	P4910-04DUP	MH-COTTAGEDUP	DUP	11/21/24 11:00		Niha	OK
15	P4910-08	MH-759	SAM	11/21/24 11:07		Niha	OK
16	P4916-04	TP-1-WC	SAM	11/21/24 11:07		Niha	OK
17	P4916-08	TP-2-WC	SAM	11/21/24 11:07		Niha	OK
18	P4916-12	TP-3-WC	SAM	11/21/24 11:07		Niha	OK

284 Sheffield Street, Mountainside, New Jersey 07092, Phone : 908 789 8900,
Fax : 908 789 8922

Instrument ID: KONELAB

Daily Analysis Runlog For Sequence/QCBatch ID # LB133548

Review By	Niha	Review On	11/22/2024 9:12:18 AM
Supervise By	Iwona	Supervise On	11/22/2024 11:46:08 AM
SubDirectory	LB133548	Test	Reactive Cyanide

STD. NAME	STD REF.#
ICAL Standard	WP110809,WP110810,WP110811,WP110812,WP110813,WP110814,WP110815
ICV Standard	WP110817
CCV Standard	WP110810
ICSA Standard	N/A
CRI Standard	N/A
LCS Standard	N/A
Chk Standard	WP109068,WP110103,WP110816

19	P4923-02	COMP-1	SAM	11/21/24 11:07		Niha	OK
20	P4923-03	COMP-2	SAM	11/21/24 11:07		Niha	OK
21	P4923-04	COMP-3	SAM	11/21/24 11:07		Niha	OK
22	CCV2	CCV2	CCV	11/21/24 11:07		Niha	OK
23	CCB2	CCB2	CCB	11/21/24 11:08		Niha	OK
24	P4923-05	COMP-4	SAM	11/21/24 11:15		Niha	OK
25	P4924-04	MH-4	SAM	11/21/24 11:15		Niha	OK
26	P4925-04	MH-741	SAM	11/21/24 11:15		Niha	OK
27	P4925-08	MH-741	SAM	11/21/24 11:15		Niha	OK
28	P4929-02	ARS520	SAM	11/21/24 11:15		Niha	OK
29	P4938-04	MH-732	SAM	11/21/24 11:15		Niha	OK
30	P4938-08	MH-734	SAM	11/21/24 11:15		Niha	OK
31	PB165148BL	PB165148BL	MB	11/21/24 11:15		Niha	OK
32	P4921-01	WC-11-A-202411	SAM	11/21/24 11:15		Niha	OK
33	P4921-01DUP	WC-11-A-202411DUP	DUP	11/21/24 11:15		Niha	OK
34	CCV3	CCV3	CCV	11/21/24 11:19		Niha	OK
35	CCB3	CCB3	CCB	11/21/24 11:19		Niha	OK

284 Sheffield Street, Mountainside, New Jersey 07092, Phone : 908 789 8900,
Fax : 908 789 8922

Instrument ID: KONELAB

Daily Analysis Runlog For Sequence/QCBatch ID # LB133553

Review By	Niha	Review On	11/22/2024 9:59:51 AM
Supervise By	Iwona	Supervise On	11/22/2024 11:46:15 AM
SubDirectory	LB133553	Test	Cyanide

STD. NAME	STD REF.#
ICAL Standard	WP110809,WP110810,WP110811,WP110812,WP110813,WP110814,WP110815
ICV Standard	W3011
CCV Standard	WP110810
ICSA Standard	N/A
CRI Standard	N/A
LCS Standard	WP109549
Chk Standard	WP109068,WP110103,WP110816

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	0.0PPBCN	0.0PPBCN	CAL1	11/21/24 09:46		Niha	OK
2	5.0PPBCN	5.0PPBCN	CAL2	11/21/24 09:46		Niha	OK
3	10PPBCN	10PPBCN	CAL3	11/21/24 09:46		Niha	OK
4	50PPBCN	50PPBCN	CAL4	11/21/24 09:46		Niha	OK
5	100PPBCN	100PPBCN	CAL5	11/21/24 09:47		Niha	OK
6	250PPBCN	250PPBCN	CAL6	11/21/24 09:47		Niha	OK
7	500PPBCN	500PPBCN	CAL7	11/21/24 09:47		Niha	OK
8	ICV1	ICV1	ICV	11/21/24 13:25		Niha	OK
9	ICB1	ICB1	ICB	11/21/24 13:25		Niha	OK
10	CCV1	CCV1	CCV	11/21/24 13:25		Niha	OK
11	CCB1	CCB1	CCB	11/21/24 13:25		Niha	OK
12	PB165170BL	PB165170BL	MB	11/21/24 13:25		Niha	OK
13	PB165170BS	PB165170BS	LCS	11/21/24 13:32		Niha	OK
14	LOWPB165170	LOWPB165170	SAM	11/21/24 13:32		Niha	OK
15	HIGHPB165170	HIGHPB165170	SAM	11/21/24 13:32		Niha	OK
16	P4921-01	WC-11-A-202411	SAM	11/21/24 13:32		Niha	OK
17	P4921-01DUP	WC-11-A-202411DUP	DUP	11/21/24 13:32		Niha	OK
18	P4921-01MS	WC-11-A-202411MS	MS	11/21/24 13:33		Niha	OK

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Instrument ID: KONELAB

Daily Analysis Runlog For Sequence/QCBatch ID # LB133553

Review By	Niha	Review On	11/22/2024 9:59:51 AM
Supervise By	Iwona	Supervise On	11/22/2024 11:46:15 AM
SubDirectory	LB133553	Test	Cyanide

STD. NAME	STD REF.#
ICAL Standard	WP110809,WP110810,WP110811,WP110812,WP110813,WP110814,WP110815
ICV Standard	W3011
CCV Standard	WP110810
ICSA Standard	N/A
CRI Standard	N/A
LCS Standard	WP109549
Chk Standard	WP109068,WP110103,WP110816

19	P4921-01MSD	WC-11-A-202411MSD	MSD	11/21/24 13:33		Niha	OK
20	CCV2	CCV2	CCV	11/21/24 13:33		Niha	OK
21	CCB2	CCB2	CCB	11/21/24 13:40		Niha	OK

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Instrument ID: TITRAMETRIC

Daily Analysis Runlog For Sequence/QCBatch ID # LB133562

Review By	rubina	Review On	11/21/2024 5:39:33 PM
Supervise By	Iwona	Supervise On	11/22/2024 9:41:50 AM
SubDirectory	LB133562	Test	Reactive Sulfide

STD. NAME	STD REF.#
ICAL Standard	N/A
ICV Standard	N/A
CCV Standard	N/A
ICSA Standard	N/A
CRI Standard	N/A
LCS Standard	N/A
Chk Standard	W3105,W3114,W3149

Sr#	SampleId	ClientID	QcType	Date	Comment	Operator	Status
1	PB165128BL	PB165128BL	MB	11/21/24 15:45		rubina	OK
2	P4921-01	WC-11-A-202411	SAM	11/21/24 15:48		rubina	OK
3	P4921-01DUP	WC-11-A-202411DUP	DUP	11/21/24 15:50		rubina	OK

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Prep Standard - Chemical Standard Summary

Order ID : P4921

Test : Cyanide,Flash Point,pH,Reactive Cyanide,Reactive Sulfide

Prepbatch ID : PB165128,PB165148,PB165170,

Sequence ID/Qc Batch ID: LB133526,LB133527,LB133548,LB133553,LB133562,

Standard ID :
WP108640,WP108780,WP109068,WP109549,WP110035,WP110103,WP110390,WP110391,WP110808,WP110809,WP110810,WP110811,WP110812,WP110813,WP110814,WP110815,WP110816,WP110817,

Chemical ID :
E3657,M5673,M5929,W2668,W2725,W2882,W2926,W3001,W3005,W3011,W3019,W3071,W3072,W3088,W3093,W3094,W3101,W3105,W3107,W3112,W3114,W3121,W3138,W3139,W3142,W3149,

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
11	Sodium hydroxide absorbing solution 0.25 N	WP108640	07/05/2024	01/05/2025	Rubina Mughal	WETCHEM_SCALE_4 (WCSC-4)	None	Iwona Zarych 07/08/2024

FROM 21.00000L of W3112 + 210.00000gram of E3657 = Final Quantity: 21.000 L

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
160	0.5M ZINC ACETATE	WP108780	07/22/2024	12/08/2024	Rubina Mughal	WETCHEM_SCALE_5 (WCSC-5)	WETCHEM_PIPETTE_3 (WC)	Iwona Zarych 07/23/2024

FROM 0.88900L of W3112 + 1.00000ml of M5929 + 110.00000gram of W2926 = Final Quantity: 1000.000 ml

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
607	PYRIDINE-BARBITURIC ACID	WP109068	08/06/2024	12/08/2024	Niha Farheen Shaik	WETCHEM_SCALE_5 (WCSC-5)	None	Iwona Zarych 08/07/2024

FROM 145.00000ml of W3112 + 15.00000gram of W2882 + 15.00000ml of M5929 + 75.00000ml of W3019 = Final Quantity: 250.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3371	Cyanide LCS Spike Solution, 5PPM	WP109549	09/06/2024	01/05/2025	Niha Farheen Shaik	None	WETCHEM_PIPETTE_3 (WC)	Iwona Zarych 09/06/2024

FROM 1.00000ml of W3138 + 199.00000ml of WP108640 = Final Quantity: 200.000 ml

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3850	Cyanide MS-MSD spiking solution, 5PPM	WP110035	10/03/2024	11/30/2024	Rubina Mughal	None	WETCHEM_PIPETTE_3 (WC)	Iwona Zarych 10/04/2024

FROM 1.00000ml of W3142 + 199.00000ml of WP108640 = Final Quantity: 200.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
539	CN BUFFER	WP110103	10/08/2024	04/08/2025	Rubina Mughal	WETCHEM_SCALE_5 (WCSC-5)	None	Iwona Zarych 10/08/2024

FROM 138.00000gram of W2668 + 862.00000ml of W3112 = Final Quantity: 1000.000 ml

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3214	Magnesium Chloride For Cyanide 2.5M(51%W/V)	WP110390	10/24/2024	04/24/2025	Niha Farheen Shaik	WETCHEM_SCALE_5 (WCSC-5)	None	Iwona Zarych 10/24/2024

FROM 500.00000ml of W3112 + 510.00000gram of W3001 = Final Quantity: 1000.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1714	Sulfuric Acid, 50% (v/v)	WP110391	10/24/2024	04/24/2025	Niha Farheen Shaik	None	None	Iwona Zarych 10/24/2024

FROM 1000.00000ml of M5673 + 1000.00000ml of W3112 = Final Quantity: 2000.000 ml

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3456	Cyanide Intermediate Working Std, 5PPM	WP110808	11/21/2024	11/22/2024	Niha Farheen Shaik	None	WETCHEM_PIPETTE_3 (WC)	Iwona Zarych 11/22/2024

FROM 0.25000ml of W3142 + 49.75000ml of WP108640 = Final Quantity: 50.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
4	Calibation standard 500 ppb	WP110809	11/21/2024	11/22/2024	Niha Farheen Shaik	None	None	Iwona Zarych 11/22/2024

FROM 45.00000ml of WP108640 + 5.00000ml of WP110808 = Final Quantity: 50.000 ml

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
3761	Calibration-CCV CN Standard 250 ppb	WP110810	11/21/2024	11/22/2024	Niha Farheen Shaik	None	None	Iwona Zarych 11/22/2024

FROM 2.50000ml of WP110808 + 47.50000ml of WP108640 = Final Quantity: 50.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
6	Calibration Standard 100 ppb	WP110811	11/21/2024	11/22/2024	Niha Farheen Shaik	None	None	Iwona Zarych 11/22/2024

FROM 1.00000ml of WP110808 + 49.00000ml of WP108640 = Final Quantity: 50.000 ml

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
7	Calibration Standard 50 ppb	WP110812	11/21/2024	11/22/2024	Niha Farheen Shaik	None	WETCHEM_PIPETTE_4 (SM-DESP#01)	Iwona Zarych 11/22/2024

FROM 0.50000ml of WP110808 + 49.50000ml of WP108640 = Final Quantity: 50.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
8	Calibration Standard 10 ppb	WP110813	11/21/2024	11/22/2024	Niha Farheen Shaik	None	WETCHEM_PIPETTE_3 (WC)	Iwona Zarych 11/22/2024

FROM 1.00000ml of WP110809 + 49.00000ml of WP108640 = Final Quantity: 50.000 ml

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
9	Calibration Standard 5 ppb	WP110814	11/21/2024	11/22/2024	Niha Farheen Shaik	None	WETCHEM_PIPETTE_3 (WC)	Iwona Zarych 11/22/2024

FROM 0.50000ml of WP110809 + 49.50000ml of WP108640 = Final Quantity: 50.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
167	0 ppb CN calibration std	WP110815	11/21/2024	11/22/2024	Niha Farheen Shaik	None	None	Iwona Zarych 11/22/2024

FROM 50.00000ml of WP108640 = Final Quantity: 50.000 ml

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Wet Chemistry STANDARD PREPARATION LOG

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
1582	Chloramine T solution, 0.014M	WP110816	11/21/2024	11/22/2024	Niha Farheen Shaik	WETCHEM_SCALE_5 (WCSC-5)	None	Iwona Zarych 11/22/2024

FROM 0.08000gram of W3139 + 20.00000ml of W3112 = Final Quantity: 20.000 ml

Recipe ID	NAME	NO.	Prep Date	Expiration Date	Prepared By	ScaleID	PipetteID	Supervised By
2168	RCN ICV STD, 100 PPB	WP110817	11/21/2024	11/22/2024	Niha Farheen Shaik	None	None	Iwona Zarych 11/22/2024

FROM 1.00000ml of WP109549 + 49.00000ml of WP108640 = Final Quantity: 50.000 ml

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	PC19510-5 / Sodium Hydroxide Pellets 2.5 Kg, Pk of 4	23B1556310	12/31/2025	12/04/2023 / Rajesh	12/01/2023 / Rajesh	E3657

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9673-33 / Sulfuric Acid, Instra-Analyzed (cs/6c2.5L)	23D2462010	03/20/2028	09/21/2023 / mohan	09/05/2023 / mohan	M5673

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	BA-9530-33 / Hydrochloric Acid, Instra-Analyzed (cs/6x2.5L)	22G2862015	12/08/2024	06/24/2024 / Al-Terek	06/07/2024 / Al-Terek	M5929

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	J3818-5 / SODIUM PHOSPHATE, MONOBAS/HYD, CRYS, ACS, 2.5 KG	0000225799	12/03/2025	04/05/2021 / Alexander	02/10/2020 / apatel	W2668

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	EMD-FX0410-5 / FORMALDEHYDE SOLUTION 450ML	60045	06/22/2025	08/19/2024 / Iwona	06/22/2020 / apatel	W2725

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	EM-BX0035-3 / Barbituric Acid, 100 gms	1.00132.0100	04/30/2025	12/07/2021 /	11/30/2021 / apatel	W2882

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	J4296-1 / ZINC ACETATE,DIHYD,CRYS,ACS,500G	383058	07/05/2027	07/05/2022 / ketankumar	07/05/2022 / ketankumar	W2926

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	01237-10KG / Megnasium Chloride Hexahydrate ACS 10KG	002251-03319	06/06/2027	01/23/2023 / Iwona	06/06/2022 / Iwona	W3001

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL13850-1 / Buffer Solution, PH2 (500ml)	4212E45	12/31/2024	01/31/2023 / Iwona	01/31/2023 / Iwona	W3005

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
EPA	/ ICV-CN	ICV6-400	12/31/2024	01/03/2024 / Iwona	02/20/2020 / Iwona	W3011

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
SIGMA ALDRICH	270970-1L / Pyridine 1L	SHBQ2113	04/03/2028	04/03/2023 / Iwona	04/03/2023 / Iwona	W3019

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL14455-3 / buffer solution pH 7 yellow	4308H30	07/31/2025	01/02/2024 / JIGNESH	12/06/2023 / Iwona	W3071

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL14940-1 / Buffer Solution, PH12 (500ml)	2310P21	04/30/2025	01/02/2024 / JIGNESH	12/07/2023 / Iwona	W3072

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	TCX0014-500ML / p-xylene	Y348K-RX	03/20/2029	09/19/2024 / rubina	03/20/2024 / Iwona	W3088

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	566002 / BUFFER PH 7.00 GREEN 1PINT PK6	44001f99	12/31/2025	04/03/2024 / jignesh	04/02/2024 / jignesh	W3093

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	1601-1 / PH 10.01 BUFFER,COLOR CD 475ML	4310g83	03/31/2025	04/03/2024 / jignesh	04/02/2024 / jignesh	W3094

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	470112-662 / TEST STRIPES, NITRATE/NITRITE, PK50	402403	04/30/2026	05/02/2024 / Iwona	04/10/2024 / Iwona	W3101

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL69870-8 / SODIUM THIOSULFATE,0.025N,4LITRE	4403S13	09/30/2025	04/22/2024 / Iwona	04/22/2024 / Iwona	W3105

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL14055-3 / PH 4 BUFFER SOLUTION	AL14055-3	02/27/2026	09/05/2024 / jignesh	05/13/2024 / jignesh	W3107

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
Seidler Chemical	DIW / DI Water	Daily Lab-Certified	07/03/2029	07/03/2024 / Iwona	07/03/2024 / Iwona	W3112

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL35830-4 / IODINE SOLUTION .025N 1L	2405D89	05/31/2025	07/10/2024 / Iwona	07/10/2024 / Iwona	W3114

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	140444 / TEST PAPERS,PH 0-14,.5 SENSI,100PK	HC446507	07/25/2029	07/25/2024 / Iwona	07/25/2024 / Iwona	W3121

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	LC135457 / Cyanide Standard, 1000 PPM, Second Source	44080060	01/30/2025	09/06/2024 / Iwona	08/28/2024 / Iwona	W3138

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	JTE494-6 / CHLORAMINE-T BAKER 250GM	10239484	09/09/2029	09/09/2024 / Iwona	09/09/2024 / Iwona	W3139

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CHEMICAL RECEIPT LOG BOOK

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	RC2543-4 / CYANIDE STD 1000PPM 4OZ	1405J81	11/30/2024	09/25/2024 / Iwona	09/25/2024 / Iwona	W3142

Supplier	ItemCode / ItemName	Lot #	Expiration Date	Date Opened / Opened By	Received Date / Received By	Chemtech Lot #
PCI Scientific Supply, Inc.	AL70850-8 / Starch Solution, 4L	4408P62	08/31/2026	10/16/2024 / Iwona	10/16/2024 / Iwona	W3149

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W3071
Rec 12/6/23

Certificate of Analysis 12

Buffer, Reference Standard, pH 7.00 ± 0.01 at 25°C (Color Coded Yellow)

Lot Number: 4308H30 **Product Number:** 1551

Manufacture Date: AUG 09, 2023
Expiration Date: JUL 2025

The certified value for this product is confirmed in independent testing by a second qualified chemist.
The NIST traceable pH value is certified to ±0.01 at 25 °C only. All other pH values at their corresponding temperatures are accurate to ± 0.05.

°C	0	5	10	15	20	25	30	35	40	45	50
pH	7.12	7.09	7.06	7.04	7.02	7.00	6.99	6.98	6.98	6.97	6.97

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Sodium Phosphate Dibasic	7558-79-4	ACS
Potassium Dihydrogen Phosphate	7778-77-0	ACS
Preservative	Proprietary	
Yellow Dye	Proprietary	
Sodium Hydroxide	1310-73-2	Reagent

Test	Specification	Result	
Appearance	Yellow liquid	Passed	*Not a certified value.

Test	Certified Value	Uncertainty	NIST SRM#
pH at 25°C (Method: SQCP027, SQCP033)	7.002	0.02	186-I-g, 186-II-g, 191d

Specification	Reference
Commercial Buffer Solutions	ASTM (D 1293 B)
Buffer A	ASTM (D 5464)
Buffer A	ASTM (D 5128)

pH measurements were performed in our Batesville, IN laboratory under ISO/IEC 17025 accreditation (ANAB Certificate L2387.02) and are certified traceable to National Institute of Standards and Technology (NIST) Standard Reference Material as indicated above via an unbroken chain of comparisons. The uncertainty is calculated from the uncertainty of the measurement variation from sample to sample, the uncertainty in the NIST Standard Reference Material, and the uncertainty of the measurement process. The uncertainty is multiplied by k=2, corresponding to 95% coverage in a normal distribution. Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
1551-2.5	10 L Cubitainer®	24 months
1551-5	20 L Cubitainer®	24 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Paul Brandon (08/09/2023)
Production Manager
This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

This product was tested in an ISO 17025 Accredited Laboratory

~~W2918~~ W3001 Rec. 06/06/22 Exp. 06/06/27

Chem-Impex International, Inc.

Tel: (630) 766-2112
E-mail: sales@chemimpex.com
Shipping and Correspondence:
935 Dillon Drive
Wood Dale, IL 60191

Fax: (630) 766-2218
Web site: www.chemimpex.com
Manufacturing site:
825 Dillon Drive
Wood Dale, IL 60191

Certificate of Analysis

Catalogue Number	01237
Product	**Magnesium chloride hexahydrate**
Lot Number	002251-03319
	Magnesium chloride•$6H_2O$
CAS Number	7791-18-6
Molecular Formula	$MgCl_2$•$6H_2O$
Molecular Weight	203.3

Appearance	Colorless crystals, very deliquescent
Heavy Metals	< 5 ppm
Anion	Nitrate : < 0.001% Phosphate : < 5 ppm Sulfate : < 0.002%
Cation	Ammonium : < 0.002% Barium : < 0.005% Calcium : 0.0006% Iron : < 5 ppm Manganese : 1.8 ppm Potassium : 0.0006% Sodium : 0.0008% Strontium : 0.0015%
Insoluble material	0.0025%
Assay by titration	100.29%
Grade	ACS reagent
Storage	Store at RT
Country of Origin	India

Certificate of Analysis

Catalog Number: 01237 **Lot Number: 002251-03319**

Remarks	See material safety data sheet for additional information
	For laboratory use only

The foregoing is a copy of the Certificate of Analysis as provided by our supplier

Bala Kumar
Quality Control Manager

Sigma-Aldrich.

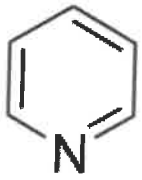
W3019
Rec 4/3/23

3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Pyridine - anhydrous, 99.8%

Product Number:	**270970**
Batch Number:	**SHBQ2113**
Brand:	SIAL
CAS Number:	110-86-1
MDL Number:	MFCD00011732
Formula:	C5H5N
Formula Weight:	79.10 g/mol
Quality Release Date:	15 DEC 2022



Test	Specification	Result
Appearance (Color)	Colorless	Colorless
Appearance (Form)	Liquid	Liquid
Infrared Spectrum	Conforms to Structure	Conforms
Purity (GC)	≥ 99.75 %	99.99 %
Water (by Karl Fischer)	≤ 0.003 %	0.002 %
Residue on Evaporation	≤ 0.0005 %	< 0.0001 %

Larry Coers, Director
Quality Control
Sheboygan Falls, WI US

RICCA CHEMICAL COMPANY®

1841 Broad Street
Pocomoke City, MD 21851
http://www.riccachemical.com
1-888-GO-RICCA
customerservice@riccachemical.com

W3072
rec. 12/01/23
12

Certificate of Analysis

Buffer, Reference Standard, pH 12.00 ± 0.01 at 25°C

Lot Number: 2310P21 **Product Number:** 1615

Manufacture Date: OCT 24, 2023
Expiration Date: APR 2025

The certified value for this product is confirmed in independent testing by a second qualified chemist.

°C	15	20	25	30	35	40
pH	12.35	12.17	11.99	11.78	11.62	11.46

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Potassium Chloride	7447-40-7	ACS
Sodium Hydroxide	1310-73-2	Reagent

Test	Specification	Result	
Appearance	Colorless liquid	Passed	*Not a certified value.

Test	Certified Value	Uncertainty	NIST SRM#
pH at 25°C (Method: SQCP027, SQCP033)	12.005	0.02	186-I-g, 186-II-g, 191d

pH measurements were performed in our Pocomoke City, MD laboratory under ISO/IEC 17025 accreditation (ANAB Certificate L2387.01) and are certified traceable to National Institute of Standards and Technology (NIST) Standard Reference Material as indicated above via an unbroken chain of comparisons. The uncertainty is calculated from the uncertainty of the measurement variation from sample to sample, the uncertainty in the NIST Standard Reference Material, and the uncertainty of the measurement process. The uncertainty is multiplied by k=2, corresponding to 95% coverage in a normal distribution. Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
1615-1	4 L natural poly	18 months
1615-16	500 mL clear PET-G	18 months
1615-32	1 L natural poly	18 months
1615-5	20 L Cubitainer®	18 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Sharon Travers (10/24/2023)
Operations Manager
This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

This product was tested in an ISO 17025 Accredited Laboratory

W2723, W2724, W2725, W2726 Received on 6/22/20 by AP

Certificate of Analysis

Date of Release:	2/26/2020
Name:	Formaldehyde Solution GR ACS Meets ACS Specifications
Item No:	FX0410 all size codes
Lot / Batch No:	60045
Country of Origin:	USA

Characteristic	Requirement		Results	Units
	Min.	Max.		
Assay	36.5	38.0	36.71	%
Chloride (Cl)		5	<5	ppm
Color (APHA)		10	<10	
Form			Passes test	
Heavy metals (as Pb)		5	<5	ppm
Iron (Fe)		5	0.6	ppm
Residue after ignition		0.005	<0.0050	%
Sulfate (SO4)		0.002	<0.0020	%
Titrable acid		0.006	<0.0060	meq/g

Heather Sinn,
_____
Quality Control Manager
This document has been produced electronically and is valid without a signature.

EMD Millipore Corporation, an affiliate of Merck KGaA, Darmstadt, Germany
290 Concord Road
Billerica, MA 01821
U.S.A

VWR®

Certificate of Analysis

Sodium Hydroxide (Pellets)

Material: 0583
Grade: ACS GRADE
Batch Number: 23B1556310

Chemical Formula: NaOH
Molecular Weight: 40
CAS #: 1310-73-2
Appearance:

Pellets

Manufacture Date: 12/14/2022
Expiration Date: 12/31/2025

Storage: Room Temperature

TEST	SPECIFICATION	ANALYSIS	DISPOSITION
Calcium	<= 0.005 %	<0.005 %	PASS
Chloride	<= 0.005 %	0.002 %	PASS
Heavy Metals	<= 0.002 %	<0.002 %	PASS
Iron	<= 0.001 %	<0.001 %	PASS
Magnesium	<= 0.002 %	<0.002 %	PASS
Mercury	<= 0.1 ppm	<0.1 ppm	PASS
Nickel	<= 0.001 %	<0.001 %	PASS
Nitrogen Compounds	<= 0.001 %	<0.001 %	PASS
Phosphate	<= 0.001 %	<0.001 %	PASS
Potassium	<= 0.02 %	<0.02 %	PASS
Purity	>= 97.0 %	99.2 %	PASS
Sodium Carbonate	<= 1.0 %	0.5 %	PASS
Sulfate	<= 0.003 %	<0.003 %	PASS

Internal ID #: 710

Signature

We certify that this batch conforms to the specifications listed.

This document has been electronically produced and is valid without a signature.

Leona Edwardson, Quality Control Sr. Manager - Solon
VWR Chemicals, LLC.
28600 Fountain Parkway, Solon OH 44139 USA

Additional Information

Analysis may have been rounded to significant digits in specification limits.

Product meets analytical specifications of the grades listed.

E 3657	E 3659
E 3654	E 3660

W3011
W3012
W3013
W3014
W3015

For ICP-MS use: dilute the ICV1 concentrate 50-fold with 1% (v/v) nitric acid; pipet 2 mL of the concentrate into a 100 mL volumetric flask and dilute to volume with 1% (v/v) nitric acid.

ICV5-0415 For the cold vapor analysis of mercury by AA: dilute the ICV5 concentrate 100-fold with 2% (v/v) nitric acid; pipet 1 mL of the concentrate into a 100 mL volumetric flask and dilute to volume with 2% (v/v) nitric acid. The ICV5 concentrate is prepared in 0.05% (w/v) $K_2Cr_2O_7$ and 5% (v/v) nitric acid.

ICV6-0400 For the analysis of cyanide: dilute the ICV6 concentrate 100-fold with Type II water; pipet 1 mL of the concentrate into a 100 mL volumetric flask and dilute to volume with Type II water. Distill this solution along with the samples before analysis. The cyanide concentrate is prepared from $K_3Fe(CN)_6$, Type II water, and 0.1 % sodium hydroxide, and will decompose rapidly if exposed to light.

NOTE: USE TYPE II WATER AND HIGH-PURITY ACIDS FOR ALL DILUTIONS.

(D) *CERTIFIED CONCENTRATIONS OF QATS ICV1, ICV5, AND ICV6 SOLUTIONS*

ICV1-1014		
Element	**Concentration (µg/L) (after 10-fold dilution)**	**Concentration (µg/L) (after 50-fold dilution)**
Al	2520	504
Sb	1010	202
As	997	199
Ba	518	104
Be	514	103
Cd	514	103
Ca	10000	2000
Cr	517	103
Co	521	104
Cu	505	101
Fe	10100	2020
Pb	1030	206
Mg	5990	1198
Mn	524	105
Ni	525	105
K	9940	1988
Se	1030	206
Ag	252	50
Na	10100	2020
Tl	1040	208
V	504	101
Zn	1010	202

ICV5-0415		ICV6-0400	
Element	**Concentration (µg/L) (after 100-fold dilution)**	**Analyte**	**Concentration (µg/L) (after 100-fold dilution)**
Hg	4.0	**CN^-**	99

Sulfuric Acid
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis
Low Selenium

9673- 33

avantor™ | J.T.Baker®

Material No.: 9673-33
Batch No.: 23D2462010
Manufactured Date: 2023-03-22
Retest Date: 2028-03-20
Revision No.: 0

Certificate of Analysis

Test	Specification	Result
ACS – Assay (H_2SO_4)	95.0 – 98.0 %	96.1 %
Appearance	Passes Test	Passes Test
ACS – Color (APHA)	≤ 10	5
ACS – Residue after Ignition	≤ 3 ppm	< 1 ppm
ACS – Substances Reducing Permanganate (as SO2)	≤ 2 ppm	< 2 ppm
Ammonium (NH_4)	≤ 1 ppm	1 ppm
Chloride (Cl)	≤ 0.1 ppm	< 0.1 ppm
Nitrate (NO_3)	≤ 0.2 ppm	< 0.1 ppm
Phosphate (PO_4)	≤ 0.5 ppm	< 0.1 ppm
Trace Impurities – Aluminum (Al)	≤ 30.0 ppb	< 5.0 ppb
Arsenic and Antimony (as As)	≤ 4.0 ppb	< 2.0 ppb
Trace Impurities – Boron (B)	≤ 10.0 ppb	8.5 ppb
Trace Impurities – Cadmium (Cd)	≤ 2.0 ppb	< 0.3 ppb
Trace Impurities – Chromium (Cr)	≤ 6.0 ppb	< 0.4 ppb
Trace Impurities – Cobalt (Co)	≤ 0.5 ppb	< 0.3 ppb
Trace Impurities – Copper (Cu)	≤ 1.0 ppb	< 0.1 ppb
Trace Impurities – Gold (Au)	≤ 10.0 ppb	0.5 ppb
Heavy Metals (as Pb)	≤ 500.0 ppb	< 100.0 ppb
Trace Impurities – Iron (Fe)	≤ 50.0 ppb	1.3 ppb
Trace Impurities – Lead (Pb)	≤ 0.5 ppb	< 0.5 ppb
Trace Impurities – Magnesium (Mg)	≤ 7.0 ppb	0.8 ppb
Trace Impurities – Manganese (Mn)	≤ 1.0 ppb	< 0.4 ppb
Trace Impurities – Mercury (Hg)	≤ 0.5 ppb	< 0.1 ppb
Trace Impurities – Nickel (Ni)	≤ 2.0 ppb	0.3 ppb
Trace Impurities – Potassium (K)	≤ 500.0 ppb	< 2.0 ppb
Trace Impurities – Selenium (Se)	≤ 50.0 ppb	< 0.1 ppb
Trace Impurities – Silicon (Si)	≤ 100.0 ppb	31.5 ppb
Trace Impurities – Silver (Ag)	≤ 1.0 ppb	< 0.3 ppb

>>> Continued on page 2 >>>

Sulfuric Acid
BAKER INSTRA-ANALYZED® Reagent
For Trace Metal Analysis
Low Selenium

avantor™ | J.T.Baker®

Material No.: 9673-33
Batch No.: 23D2462010

Test	Specification	Result
Trace Impurities - Sodium (Na)	≤ 500.0 ppb	5.4 ppb
Trace Impurities - Strontium (Sr)	≤ 5.0 ppb	< 0.2 ppb
Trace Impurities - Tin (Sn)	≤ 5.0 ppb	< 0.8 ppb
Trace Impurities - Zinc (Zn)	≤ 5.0 ppb	0.4 ppb

For Laboratory,Research,or Manufacturing Use

Country of Origin: USA
Packaging Site: Phillipsburg Mfg Ctr & DC

James T Ethier

Jamie Ethier
Vice President Global Quality

Certificate of Analysis

1.00132.0000 Barbituric acid for analysis EMSURE®
Batch N020065932

	Spec. Values		Batch Values	
Assay (acidimetric)	≥ 99	%	99.6	%
Identity (IR-spectrum)	passes test		passes test	
Chloride (Cl)	≤ 40	ppm	≤ 40	ppm
Heavy metals (as Pb)	≤ 50	ppm	≤ 50	ppm
Fe (Iron)	≤ 10	ppm	≤ 10	ppm
Sulfated ash	≤ 0.1	%	≤ 0.1	%
Loss on Drying (105 °C)	≤ 0.1	%	≤ 0.1	%
Suitability as reagent (for cyanide determination)	passes test		passes test	

Date of release (DD.MM.YYYY) 17.04.2020
Minimum shelf life (DD.MM.YYYY) 30.04.2025

Ioannis Chartomatsidis
Responsible laboratory manager quality control

This document has been produced electronically and is valid without a signature.

Sodium Phosphate, Monobasic, Monohydrate,
Crystal
BAKER ANALYZED® A.C.S. Reagent

(sodium dihydrogen phosphate, monohydrate)

Material No.: 3818-05
Batch No.: 0000225799
Manufactured Date: 2018/12/05
Retest Date: 2025/12/03
Revision No: 1

Certificate of Analysis

Meets ACS Reagent Chemical Requirements,

Test	Specification	Result
Assay ($NaH_2PO_4 \cdot H_2O$)	98.0 - 102.0 %	99.5
pH of 5% Solution at 25°C	4.1 - 4.5	4.3
Insoluble Matter	<= 0.01 %	< 0.01
Chloride (Cl)	<= 5 ppm	< 5
ACS - Sulfate (SO_4)	<= 0.003 %	< 0.003
Calcium (Ca)	<= 0.005 %	<0.005
Potassium (K)	<= 0.01 %	< 0.01
Heavy Metals (as Pb)	<= 0.001 %	< 0.001
Trace Impurities - Iron (Fe)	<= 0.001 %	< 0.001

For Laboratory, Research or Manufacturing Use
Meets Reagent Specifications for testing USP/NF monographs

Country of Origin: IN
Packaging Site: Paris Mfg Ctr & DC

Jamie Ethier
Vice President Global Quality

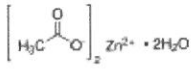
For questions on this Certificate of Analysis please contact Technical Services at 855.282.6867 or +1.610.386.1700
Avantor Performance Materials, LLC
100 Matsonford Rd, Suite 200, Radnor, PA 19087. U.S.A. Phone: 610.386.1700

3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

W2926
open 7/5/22
received
on
7/5/22

Certificate of Analysis

Product Name:
Zinc acetate dihydrate - ACS reagent, ≥98%



Product Number:	**383058**
Batch Number:	**MKCQ9159**
Brand:	SIGALD
CAS Number:	5970-45-6
MDL Number:	MFCD00066961
Formula:	C4H6O4Zn · 2H2O
Formula Weight:	219.51 g/mol
Quality Release Date:	06 JAN 2022

Test	Specification	Result
Appearance (Color)	White	White
Appearance (Form)	Powder or Crystal or Chunk(s)	Powder
Infrared Spectrum	Conforms to Structure	Conforms
Insoluble Matter	≤ 0.005 %	0.003 %
Calcium (Ca)	≤ 0.005 %	0.003 %
Chloride (Cl)	≤ 5 ppm	< 5 ppm
Iron (Fe)	≤ 5 ppm	< 5 ppm
Potassium (K)	≤ 0.01 %	0.00 %
Magnesium (Mg)	≤ 0.005 %	0.003 %
Sodium (Na)	≤ 0.05 %	0.03 %
Lead (Pb)	≤ 0.002 %	< 0.001 %
pH	6.0 - 7.0	6.1
Sulfate (SO4)	≤ 0.005 %	< 0.005 %
Complexometric EDTA	98.0 - 101.0 %	100.3 %
Meets ACS Requirements	Meets Requirements	Meets Requirements

Larry Coers, Director
Quality Control
Milwaukee, WI US

RICCA CHEMICAL COMPANY®

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customerservice@riccachemical.com

W 3005 REC. 1/31/23 12

Certificate of Analysis

Buffer, Reference Standard, pH 2.00 ± 0.01 at 25°C

Lot Number: 4212E45 **Product Number:** 1493

Manufacture Date: DEC 20, 2022
Expiration Date: DEC 2024

The certified value for this product is confirmed in independent testing by a second qualified chemist.
The NIST traceable pH value is certified to ±0.01 at 25 °C only. All other pH values at their corresponding temperatures are accurate to ± 0.05.

°C	10	15	20	25	30	35	40	45	50
pH	1.93	1.98	1.98	2.00	2.01	2.03	2.03	2.04	2.04

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Potassium Chloride	7447-40-7	ACS
Hydrochloric Acid	7647-01-0	ACS

Test	Specification	Result	
Appearance	Colorless liquid	Passed	*Not a certified value.

Test	Certified Value	Uncertainty	NIST SRM#
pH at 25°C (Method: SQCP027, SQCP033)	2.000	0.02	185i, 186-I-g, 186-II-g

pH measurements were performed in our Batesville, IN laboratory under ISO/IEC 17025 accreditation (ANAB Certificate L2387.02) and are certified traceable to National Institute of Standards and Technology (NIST) Standard Reference Material as indicated above via an unbroken chain of comparisons. The uncertainty is calculated from the uncertainty of the measurement variation from sample to sample, the uncertainty in the NIST Standard Reference Material, and the uncertainty of the measurement process. The uncertainty is multiplied by k=2, corresponding to 95% coverage in a normal distribution. Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
1493-1	4 L natural poly	24 months
1493-16	500 mL natural poly	24 months
1493-32	1 L natural poly	24 months
1493-5	20 L Cubitainer®	24 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Paul Brandon (12/20/2022)
Production Manager
This Certificate of Analysis is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

This product was tested in an ISO 17025 Accredited Laboratory

W3084-W3088 Received on 3/20/24 by IZ

Certificate of Analysis

03/20/2024(JST)

TOKYO CHEMICAL INDUSTRY CO.,LTD.
T-PLUS Nihonbashi-Kodemmacho
16-12 Nihonbashi-kodemmacho, Chuo-ku, Tokyo 103-0001, Japan

Chemical Name: ***p*-Xylene**		
Product Number: X0014 CAS RN: 106-42-3	Lot: Y348K	

Tests	Results	Specifications
Appearance	Colorless clear liquid	Colorless to Almost colorless clear liquid
Purity(GC)	99.7 %	min. 99.0 %

TCI Lot numbers are 4-5 characters in length. Characters listed after the first 4-5 characters are control numbers for internal purpose only.
The contents of the specifications are subject to change without advance notice. The specification values displayed here are the most up to date values. There may be cases where the product labels display a different specification, however, the product quality still meets the latest specification.

Customer Service:

TCI AMERICA
Tel: +1-800-423-8616 / +1-503-283-1681
Fax: +1-888-520-1075 / +1-503-283-1987
E-mail: Sales-US@TCIchemicals.com

Takuya Nishioka
Quality Assurance Department Manager

RICCA CHEMICAL COMPANY®

1490 Lammers Pike
Batesville, IN 47006
http://www.riccachemical.com
1-888-GO-RICCA
customerservice@riccachemical.com

W3093 0941 04/03/2024 LG

Certificate of Analysis

Buffer, Reference Standard, pH 7.00 ± 0.01 at 25°C (Color Coded Yellow)

Lot Number: 4401F99 **Product Number:** 1551

Manufacture Date: JAN 08, 2024
Expiration Date: DEC 2025

The certified value for this product is confirmed in independent testing by a second qualified chemist.
The NIST traceable pH value is certified to ±0.01 at 25 °C only. All other pH values at their corresponding temperatures are accurate to ± 0.05.

°C	0	5	10	15	20	25	30	35	40	45	50
pH	7.12	7.09	7.06	7.04	7.02	7.00	6.99	6.98	6.98	6.97	6.97

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Sodium Phosphate Dibasic	7558-79-4	ACS
Potassium Dihydrogen Phosphate	7778-77-0	ACS
Preservative	Proprietary	
Yellow Dye	Proprietary	
Sodium Hydroxide	1310-73-2	

Test	Specification	Result	
Appearance	Yellow liquid	Passed	*Not a certified value.

Test	Certified Value	Uncertainty	NIST SRM#
pH at 25°C (Method: SQCP027, SQCP033)	7.004	0.02	186-I-g, 186-II-g, 191d

Specification	Reference
Commercial Buffer Solutions	ASTM (D 1293 B)
Buffer A	ASTM (D 5464)
Buffer A	ASTM (D 5128)

pH measurements were performed in our Batesville, IN laboratory under ISO/IEC 17025 accreditation (ANAB Certificate L2387.02) and are certified traceable to National Institute of Standards and Technology (NIST) Standard Reference Material as indicated above via an unbroken chain of comparisons. The uncertainty is calculated from the uncertainty of the measurement variation from sample to sample, the uncertainty in the NIST Standard Reference Material, and the uncertainty of the measurement process. The uncertainty is multiplied by k=2, corresponding to 95% coverage in a normal distribution. Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
1551-1	4 L natural poly	24 months
1551-1CT	4 L Cubitainer®	24 months
1551-2.5	10 L Cubitainer®	24 months
1551-5	20 L Cubitainer®	24 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Paul Brandon (01/08/2024)
Production Manager
This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

This product was tested in an ISO 17025 Accredited Laboratory

RICCA CHEMICAL COMPANY®

1490 Lammers Pike
Batesville, IN 47006
http://www.riccachemical.com
1-888-GO-RICCA
customerservice@riccachemical.com

W3094 78 opuc: 04/03/2025

Certificate of Analysis

Buffer, Reference Standard, pH 10.00 ± 0.01 at 25°C (Color Coded Blue)

Lot Number: 4310G83 **Product Number:** 1601

Manufacture Date: OCT 09, 2023
Expiration Date: MAR 2025

The certified value for this product is confirmed in independent testing by a second qualified chemist.
The NIST traceable pH value is certified to ±0.01 at 25 °C only. All other pH values at their corresponding temperatures are accurate to ± 0.05.

°C	0	5	10	15	20	25	30	35	40	50
pH	10.31	10.23	10.17	10.11	10.05	10.00	9.95	9.91	9.87	9.81

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Sodium Carbonate	497-19-8	ACS
Sodium Bicarbonate	144-55-8	ACS
Sodium Hydroxide	1310-73-2	Reagent
Preservative	Proprietary	
Blue Dye	Proprietary	

Test	Specification	Result	
Appearance	Blue liquid	Passed	*Not a certified value.

Test	Certified Value	Uncertainty	NIST SRM#
pH at 25°C (Method: SQCP027, SQCP033)	10.003	0.02	186-I-g, 186-II-g, 191d

Specification	Reference
Commercial Buffer Solutions	ASTM (D 1293 B)
Buffer C	ASTM (D 5464)
Buffer C	ASTM (D 5128)

pH measurements were performed in our Batesville, IN laboratory under ISO/IEC 17025 accreditation (ANAB Certificate L2387.02) and are certified traceable to National Institute of Standards and Technology (NIST) Standard Reference Material as indicated above via an unbroken chain of comparisons. The uncertainty is calculated from the uncertainty of the measurement variation from sample to sample, the uncertainty in the NIST Standard Reference Material, and the uncertainty of the measurement process. The uncertainty is multiplied by k=2, corresponding to 95% coverage in a normal distribution. Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
1601-16	500 mL natural poly	18 months
1601-5	20 L Cubitainer®	18 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Paul Brandon (10/09/2023)
Production Manager
This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

This product was tested in an ISO 17025 Accredited Laboratory

RICCA CHEMICAL COMPANY®

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Batesville, IN 47006
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W3105 Received on 4/22/24 by IZ

Certificate of Analysis

Sodium Thiosulfate, 0.0250 Normal (N/40)

Lot Number: 4403S13 **Product Number:** 7900

Manufacture Date: MAR 29, 2024
Expiration Date: SEP 2025

This product is specially formulated to increase its stability. A preservative is added to prevent bacterial contamination. However, all Sodium Thiosulfate solutions are subject to slow chemical deterioration and should be restandardized periodically.

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Sodium Thiosulfate Pentahydrate	10102-17-7	ACS
Organic Preservative	Proprietary	
Sodium Carbonate	497-19-8	ACS

Test	Specification	Result	NIST SRM#
Appearance	Colorless liquid	Passed	
Assay (vs. Potassium Iodate/Starch)	0.02499-0.02501 N at 20°C	0.02501 N at 20°C	136

Specification	Reference
Standard Sodium Thiosulfate Solution, 0.0250 N	APHA (4500-S2- F)
Standard Sodium Thiosulfate Titrant	APHA (4500-O D)
Standard Sodium Thiosulfate Titrant	APHA (4500-O E)
Standard Sodium Thiosulfate Titrant	APHA (4500-O F)
Standard Sodium Thiosulfate Titrant, 0.025 N	APHA (4500-Cl B)
Standard Sodium Thiosulfate Titrant	APHA (4500-O C)
Standard Sodium Thiosulfate Titrant, 0.025 M	APHA (5530 C)
Standard Sodium Thiosulfate Solution (0.025 N)	EPA (SW-846) (9031)
Standard Sodium Thiosulfate solution (0.025 N)	EPA (SW-846) (9034)

Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
7900-1	4 L natural poly	18 months
7900-16	500 mL natural poly	18 months
7900-1CT	4 L Cubitainer®	18 months
7900-32	1 L natural poly	18 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Paul Brandon (03/29/2024)
Production Manager
This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

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W3107
38

Certificate of Analysis

Buffer, Reference Standard, pH 4.00 ± 0.01 at 25°C (Color Coded Red)

Lot Number: 4403F90 **Product Number:** 1501

Manufacture Date: MAR 09, 2024
Expiration Date: FEB 2026

The certified value for this product is confirmed in independent testing by a second qualified chemist.
The NIST Traceable pH value is certified to ±0.01 at 25 °C only. All other pH values at their corresponding temperatures are accurate to ± 0.05.

°C	0	5	10	15	20	25	30	35	40	45	50
pH	4.00	4.00	4.00	4.00	4.00	4.00	4.01	4.02	4.03	4.04	4.06

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Potassium Acid Phthalate	877-24-7	Buffer
Preservative	Proprietary	Commercial
Red Dye	Proprietary	Purified

Test	Specification	Result	
Appearance	Red liquid	Passed	*Not a certified value.

Test	Certified Value	Uncertainty	NIST SRM#
pH at 25°C (Method: SQCP027, SQCP033)	4.000	0.02	185i, 186-I-g, 186-II-g

Specification	Reference
Commercial Buffer Solutions	ASTM (D 1293 B)
Buffer B	ASTM (D 5464)
Buffer B	ASTM (D 5128)

pH measurements were performed in our Batesville, IN laboratory under ISO/IEC 17025 accreditation (ANAB Certificate L2387.02) and are certified traceable to National Institute of Standards and Technology (NIST) Standard Reference Material as indicated above via an unbroken chain of comparisons. The uncertainty is calculated from the uncertainty of the measurement variation from sample to sample, the uncertainty in the NIST Standard Reference Material, and the uncertainty of the measurement process. The uncertainty is multiplied by k=2, corresponding to 95% coverage in a normal distribution. Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
1501-2.5	10 L Cubitainer®	24 months
1501-32	1 L natural poly	24 months
1501-5	20 L Cubitainer®	24 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Paul Brandon (03/09/2024)
Production Manager
This document is designed to comply with ISO Guide 31 "Reference Materials -- Contents of Certificates and Labels."

This product was tested in an ISO 17025 Accredited Laboratory

RICCA CHEMICAL COMPANY®

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Certificate of Analysis

Iodine (Iodine-Iodide), 0.0250 Normal (N/40), 1 mL = 0.4008 mg S^{2-}

Lot Number: 2405D89 **Product Number:** 3975

Manufacture Date: MAY 10, 2024
Expiration Date: MAY 2025

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Potassium Iodide	7681-11-0	ACS
Iodine	7553-56-2	ACS

Test	Specification	Result	NIST SRM#
Appearance	Dark brown liquid	Passed	
Assay (vs. Sodium Thiosulfate/Starch)	0.02498-0.02502 N at 20°C	0.02502 N at 20°C	136

Specification	Reference
Standard Iodine Solution, 0.0250 N	APHA (4500-S2- F)
Iodine Solution (approximately 0.025 N)	EPA (SW-846) (9031)
Standard Iodine Solution, 0.0250 N	EPA (376.1)
Iodine Solution (approximately 0.025 N)	EPA (SW-846) (9034)

Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
3975-1	4 L amber glass	12 months
3975-16	500 mL amber glass	12 months
3975-32	1 L amber glass	12 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Jose Pena (05/10/2024)
Operations Manager

LabChem
Part of TCP Analytical Group
Jackson's Pointe Commerce Park- Building 1000
1010 Jackson's Pointe Court, Zelienople, PA 16063

Certificate of Analysis

Cyanide Standard 1000 ppm (1ml = 1mg CN)

Product Code: **LC13545**

Manufacture Date: August 01, 2024

Lot Number: **44080060**

Expiration Date: January 30, 2025

Test	Specification	Result
Appearance (clarity)	clear solution	clear solution
Appearance (color)	colorless	colorless
Concentration (CN)	0.990 - 1.010mg/mL	1.008mg/mL
Concentration (CN)	990 - 1,010ppm	1,008ppm
Traceable to NIST SRM	Report	999b

Intended Use *- Product is intended for use in manufacturing procedures and laboratory procedures and protocols.*

Storage Information *- Unless noted on the product label, store the product under normal lab conditions in its tightly closed, original container. Do not pipet directly from the container or return unused portions to the container.*

Instructions for Handling and Use - *Please refer to the associated product label and Safety Data Sheet (SDS) for information regarding safety and handling of this product.*

Preparation - *All products are manufactured and tested according to established, documented procedures and methodology. Production documentation records manufacturing data, raw material traceability and testing history on a per lot basis. Balances, thermometers, and glassware are calibrated before first use and on a regular schedule with references traceable to NIST standards.*

The suffix of the product code may differ from what is on your product label. The suffix will designate the size and be associated with a numeric digit(s). Visit LabChem.com for more information

Suffix	1	2	3/3S/36/36S	4/4C	5	6	7	8	9	20	44	200	246	486
Size	500mL or g	1L or 1kg	2.5L/2.5L Coated/6x2.5L/6x2.5L Coated	4L	20L	10L	125mL	25g	100g	20x20mL	4x4L	200L	24x6mL	48x6mL

Michael Monteleone

Michael Monteleone
Chemistry Supervisor - Quality Control

ISO9001:2015 Registration #0306-01

2024080113:32:16bsturges-0-0

ThermoFisher SCIENTIFIC

Certificate of Analysis

W3139 Received on 9/9/24 by IZ

Product No.:	A12044
Product:	Chloramine-T trihydrate, 98%
Lot No.:	10239484

Appearance:	White powder
Melting Point:	166°C(dec)
Assay (Iodometric titration):	100.5%
Identification (FTIR):	Conforms

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Certificate of Analysis

Cyanide Standard, 1000 ppm CN^-

Lot Number: 1405J81 **Product Number:** 2543

Manufacture Date: MAY 20, 2024
Expiration Date: NOV 2024

This standard is prepared using accurate volumetric techniques from material that has been assayed against Silver Nitrate solution certified traceable to NIST Standard Reference Material 999. The certified value reported is the prepared value based upon the method of preparation of the material. The uncertainty in the prepared value is the combined uncertainty based on the stability of the assayed Potassium Cyanide, and the uncertainty in the mass and volume measurements.
Use 0.16% (w/v) (0.04 N) Sodium Hydroxide or 0.225 % (w/v) (0.04 N) Potassium Hydroxide to make dilutions of this standard. Restandardize weekly if extreme accuracy is required.

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Potassium Cyanide	151-50-8	ACS
Sodium Hydroxide	1310-73-2	Reagent

Test	Specification	Result
Appearance	Colorless liquid	Passed
Cyanide (CN^-)	995-1005 ppm	1000 ppm

Specification	Reference
Stock Standard Cyanide Solution	APHA (4500-CN- F)
Stock Cyanide Solution	APHA (4500-CN- E)
Stock Cyanide Solution	APHA (4500-CN- K)
Stock Cyanide Solution	APHA (4500-CN- H)
Cyanide Reference Solution (1000 mg/L)	EPA (SW-846) (7.3.3.2)
Cyanide Calibration Stock Solution (1,000 mg/L CN-)	EPA (SW-846) (9213)
Stock Cyanide Solution	EPA (335.3)
Stock Cyanide Solution	EPA (335.2)
Cyanide Solution Stock	ASTM (D 4282)
Simple Cyanide Solution, Stock (1.0 g/L CN)	ASTM (D 4374)

Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
2543-16	500 mL amber poly	6 months
2543-4	120 mL amber poly	6 months

Recommended Storage: 2°C - 8°C (36°F - 46°F)

Heidi J Green (05/20/2024)
Operations Manager

RICCA CHEMICAL COMPANY®

W3149 Received on 10/16/24 by IZ

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Certificate of Analysis

Starch Indicator, 0.5% (w/v), Mercury Free, for Iodometric Titrations

Lot Number: 4408P62 **Product Number:** 8000

Manufacture Date: AUG 28, 2024
Expiration Date: AUG 2026

This product is Mercury-free.

Name	CAS#	Grade
Water	7732-18-5	ACS/ASTM/USP/EP
Starch, soluble	9005-84-9	ACS
Salicylic Acid	69-72-7	ACS

Test	Specification	Result
Appearance	White translucent liquid	Passed
Suitability for Use	Colorless (Iodine absent) - Blue (Iodine present)	Passed

Specification	Reference
Starch Solution	APHA (4500-S2- F)
Starch Indicator Solution	APHA (4500-Cl B)
Starch Indicator	APHA (4500-SO32- B)
Starch indicator solution	APHA (2350 B)
Starch indicator solution	APHA (2350 E)
Starch Solution	APHA (510 B)
Starch Solution	APHA (5530 C)
Starch Indicator	APHA (4500-Cl C)
Starch Indicator	EPA (345.1)

Volumetric glassware complies with Class A tolerance requirements of ASTM E 288 and NIST Circular 434; it is calibrated before first use and recalibrated regularly in accordance with ASTM E 542 and NIST Procedure NBSIR 74-461. Balances are calibrated regularly with weights certified traceable to the NIST national mass standard. Thermometers and temperature probes are calibrated before first use and recalibrated regularly with a thermometer traceable to NIST standards. All products are prepared according to master documents that assure manufacture according to validated methods. Batch records document raw material traceability and production and testing history for each lot manufactured.

Part Number	Size / Package Type	Shelf Life (Unopened Container)
8000-1	4 L natural poly	24 months
8000-16	500 mL natural poly	24 months
8000-32	1 L natural poly	24 months

Recommended Storage: 15°C - 30°C (59°F - 86°F)

Paul Brandon (08/28/2024)
Production Manager

SHIPPING DOCUMENTS

CHEMTECH
CHAIN OF CUSTODY RECORD

284 Sheffield Street, Mountainside, NJ 07092
(908) 789-8900 • Fax (908) 789-8922
www.chemtech.net

CHEMTECH PROJECT NO. P4921
QUOTE NO.
COC Number 2041714

CLIENT INFORMATION

REPORT TO BE SENT TO:
COMPANY: AECOM
ADDRESS: 605 3rd Ave
CITY New York STATE: NY ZIP: 10158
ATTENTION: Amit Haryani
PHONE: FAX:

CLIENT PROJECT INFORMATION

PROJECT NAME: Meeker Ave Superfund
PROJECT NO.: 60705866 LOCATION: Brooklyn
PROJECT MANAGER: Amit Haryani
e-mail: amit.haryani@aecom.com
PHONE: FAX:

CLIENT BILLING INFORMATION

BILL TO: PO#:
ADDRESS: SAME
CITY STATE: ZIP:
ATTENTION: PHONE:

DATA TURNAROUND INFORMATION

FAX (RUSH) 3 day DAYS*
HARDCOPY (DATA PACKAGE): DAYS*
EDD: DAYS*
*TO BE APPROVED BY CHEMTECH
STANDARD HARDCOPY TURNAROUND TIME IS 10 BUSINESS DAYS

DATA DELIVERABLE INFORMATION

- ☐ Level 1 (Results Only)
- ☐ Level 2 (Results + QC)
- ☐ Level 3 (Results + QC + Raw Data)
- ☐ Level 4 (QC + Full Raw Data)
- ☐ NJ Reduced
- ☐ NYS ASP A
- ☐ NYS ASP B
- ☐ US EPA CLP
- ☐ Other
- ☐ EDD FORMAT

ANALYSIS

1 TCLP VOA
2 TCLP BNA PCB.
3 TCLP Pesticides
4 TCLP Metal and Hem
5 React. Cyanide
6 React. Sulfide
7 pH
8 Flash Point
9 30 int Filter

PRESERVATIVES

COMMENTS

← Specify Preservatives
A-HCl D-NaOH
B-HN03 E-ICE
C-H2SO4 F-OTHER

CHEMTECH SAMPLE ID	PROJECT SAMPLE IDENTIFICATION	SAMPLE MATRIX	SAMPLE TYPE COMP	SAMPLE TYPE GRAB	SAMPLE COLLECTION DATE	SAMPLE COLLECTION TIME	# OF BOTTLES	1	2	3	4	5	6	7	8	9	COMMENTS
1.	WC-11-A-20241111	GW	X		11/19/24	0700	12	✓	✓	✓	✓	✓	✓	✓	✓	✓	
2.																	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

SAMPLE CUSTODY MUST BE DOCUMENTED BELOW EACH TIME SAMPLES CHANGE POSSESSION INCLUDING COURIER DELIVERY

RELINQUISHED BY SAMPLER:	DATE/TIME:	RECEIVED BY:
1.	11/19/24	1. 1230 11-19-24
2.	DATE/TIME:	RECEIVED BY: 2.
3.	DATE/TIME: 1450 11-19-24	RECEIVED BY: 3.

Conditions of bottles or coolers at receipt: ☐ COMPLIANT ☐ NON COMPLIANT ☐ COOLER TEMP 2.4 °C
Comments:

Page ____ of ____

CLIENT: ☐ Hand Delivered ☐ Other
CHEMTECH: ☐ Picked Up ☐ Field Sampling

Shipment Complete ☐ YES ☐ NO

WHITE - CHEMTECH COPY FOR RETURN TO CLIENT YELLOW - CHEMTECH COPY PINK - SAMPLER COPY

CHEMTECH 284 Sheffield Street, Mountainside NJ 07092 (908)-789-8900 Fax : 908 789 8922

Laboratory Certification

Certified By	License No.
CAS EPA CLP Contract	68HERH20D0011
Connecticut	PH-0830
DOD ELAP (ANAB)	L2219
Maine	2024021
Maryland	296
New Hampshire	255424 Rev 1
New Jersey	20012
New York	11376
Pennsylvania	68-00548
Soil Permit	525-24-234-08441
Texas	T104704488

Alliance TECHNICAL GROUP

284 Sheffield Street, Mountainside, New Jersey 07092, Phone : 908 789 8900,
Fax : 908 789 8922

LOGIN REPORT/SAMPLE TRANSFER

Order ID : P4921 AECO02
Client Name : AECOM
Client Contact : Amit Haryani
Invoice Name : AECOM
Invoice Contact : Amit Haryani

Order Date : 11/19/2024 12:44:00 PM
Project Name : Meeker Ave Plumes Superfi
Receive DateTime : 11/19/2024 ~~12:00:00~~ 14:50 AM
Purchase Order :

Project Mgr :
Report Type : Results+QC
EDD Type : Excel NY
Hard Copy Date :
Date Signoff :

LAB ID	CLIENT ID	MATRIX	SAMPLE DATE	SAMPLE TIME	TEST	TEST GROUP	METHOD	FAX DATE	DUE DATES
P4921-01	WC-11-A-202411	Water	11/19/2024	07:00					
					TCLP VOA		8260D		3 Bus. Days

Relinguished By :
Date / Time : 11-19-24 1530

Received By :
Date / Time : 11.19.24 1530

Storage Area : VOA Refridgerator Room