Ithaca Falls Overlook
Ithaca, New York

New York State
Department of Environmental Conservation
Environmental Restoration Project

U.S. EPA Brownfield Cleanup Grant

Quality Assurance Project Plan

Prepared For:

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 7
1679 Route 11
Kirkwood, New York 13795

United States Environmental Protection Agency
EPA Region II
290 Broadway, 18th Floor
ERRD/PSB
New York, New York 10007-1866

Prepared By:

Barton & Loguidice, D.P.C.
11 Centre Park, Suite 203
Rochester, New York 14614
Telephone: (585) 325-7190

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Section 1 – Title and Approval Page

Title:	Falls Overlook Quality Assurance Project Plan (QAPP)
Project Name/Property Name:	Environmental Restoration Project/Ithaca Falls Overlook
Property/Site Location:	125 Lake Street, City of Ithaca
Revision Number:	1
Revision Date:	June 2, 2014
Brownfields Cooperative Agreement Number:	ERP #E755018
Brownfields Recipient:	City of Ithaca Urban Renewal Agency
Preparer's Name and Organizational Affiliation:	Barton & Loguidice, D.P.C 11 Centre Park, Suite 203 (585) 325-7190 dhanny@bartonandloguidice.com
Preparation Date:	June 2, 2014

Signatures		
Brownfields Recipient Program Manager:		
	Nels Bohn City of Ithaca Urban Renewal Agency	Date
Environmental Consultant Quality Assurance Officer (QAO):		
	David R. Hanny, CPESC, CPSWQ, LEED AP Barton & Loguidice, D.P.C	Date
EPA Region 2 Brownfields Project Officer:		
	Benny Hom USEPA	Date
EPA Region 2 QA Officer:		
	Adly Michael USEPA	Date

Section 2 – Project Organizational Chart

Personnel involved in project implementation are below and shown as an organization chart on the following page.

Table 1: Project Implementation Personnel

Name	Title	Telephone Number	Organizational Affiliation	Responsibilities[1]
Scott D. Nostrand, P.E.	Sr. Vice President	(315) 457-5200	Barton & Loguidice, D.P.C.	Officer in Charge and Engineer of Record
David R. Hanny, CPESC, CPSWQ, LEED AP	Environmental Consultant Project Manager	(585) 325-7190	Barton & Loguidice, D.P.C.	Project Manager and Quality Assurance Officer
Darik M. Jordan	Sampling Assistance; Field Oversight	(585) 325-7190	Barton & Loguidice, D.P.C.	Collection of soil and groundwater quality samples.
Nels Bohn	USEPA Brownfields Recipient Program Manager	(315) 245-0560	Ithaca Urban Renewal Agency	Liaison with Environmental Consultant and EPA Finance Office
Gary Priscott	NYSDEC DER Project Manager	(607) 775-2545, Ext. 116	NYS Department of Environmental Conservation	Review, approval, and oversight of Brownfield documentation and processes
Benny Hom	USEPA Brownfield Project Manager	(212) 637-3964	EPA Region 2	EPA Project Officer
Adly Michael	USEPA Brownfield Quality Assurance Officer	(732) 906-6161	EPA Region 2	EPA QA Officer
Christopher Wolski	Environmental Laboratory Contact	(908) 728-3149	Chemtech	Laboratory analysis of soil and groundwater samples
Linda Yates	Third Party Data Validator[2]	(315) 655-2733	SGD Environmental	Data validation of laboratory reports issued by Chemtech

The NYSDEC and USEPA Project Managers will be responsible for approving the Quality Assurance Project Plan (QAPP). Barton & Loguidice, D.P.C. will collect all clearance samples in accordance with NYSDEC/USEPA approvals and will be responsible for oversight of remedial tasks including excavation, transport and disposal, and site restoration.

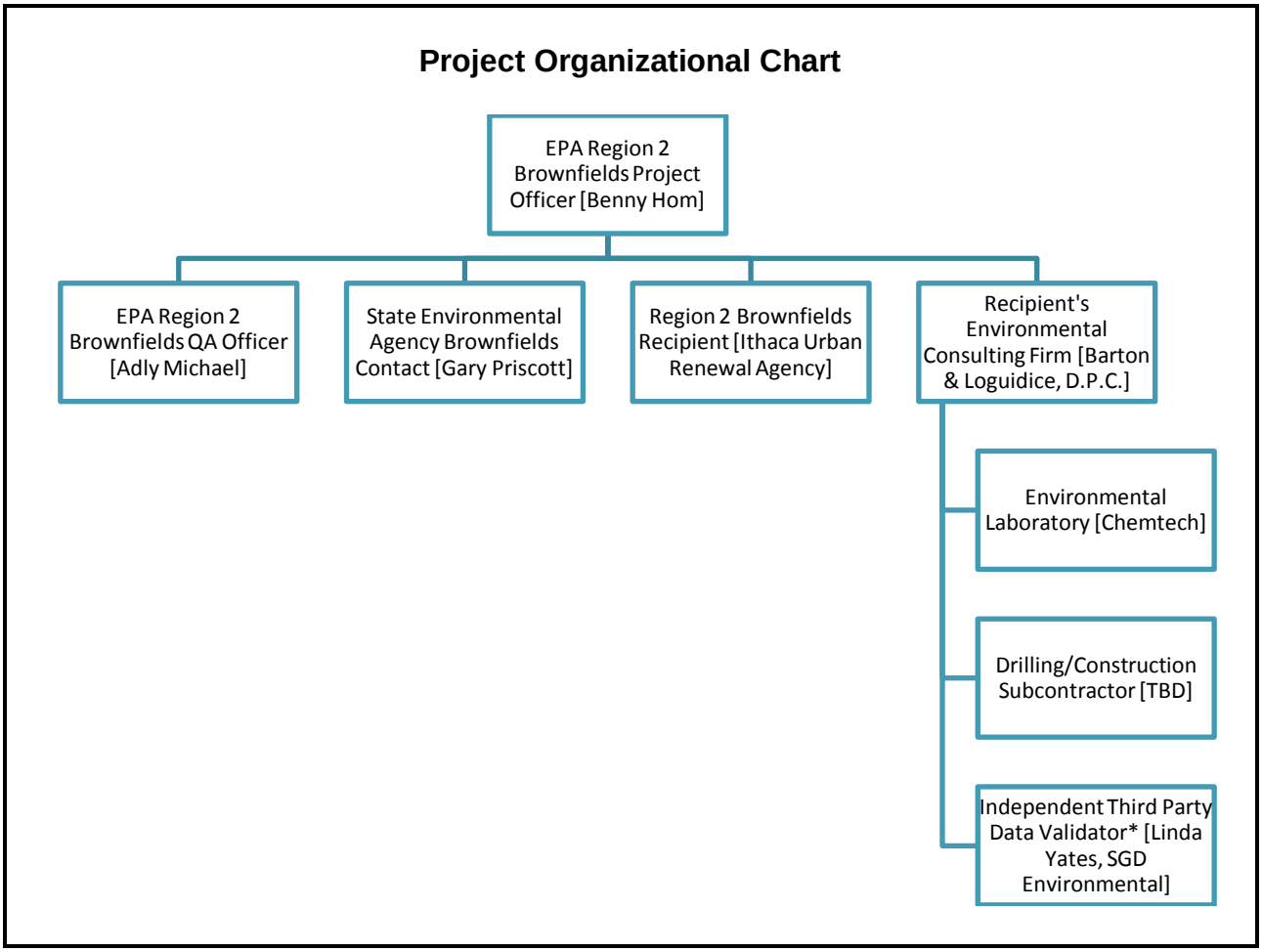
This QAPP shall govern the operation of the project at all times. Each responsible party listed in above shall adhere to the procedural requirements of the QAPP and ensure that subordinate personnel do likewise.

This QAPP shall be reviewed at least annually to ensure that the project will achieve all intended purposes. All the responsible persons listed above shall participate in the review of the QAPP. The Project Manager is responsible for determining that data are of adequate quality to support this project. The project will be modified as directed by

the Project Manager. The Project Manager shall be responsible for the implementation of changes to the project and shall document the effective date of all changes made.

It is expected that from time to time ongoing and perhaps unexpected changes will need to be made to the project. The Project Manager shall authorize all changes or deviations in the operation of the project. Any significant changes will be noted in the next report to EPA, and shall be considered an amendment to the QAPP. All verification and validation methods will be noted in the analysis provided in the final project report.

The following figure depicts the project organizational chart:



Section 3 – Problem Definition/Project Description

Problem Definition

Former industrial uses at the Site have resulted in concentrations of lead above residential NYSDEC Soil Cleanup Objectives (SCOs). Based on site investigation findings, soils with lead concentrations above SCOs within the Site have been identified and will be removed as the selected remedial alternative. Sampling of surface soils will occur along the periphery of the soil removal areas as confirmation that lead concentrations are below SCOs and horizontal limits of contamination have been reached.

Project Description - Site Location, History and Description

The site is located at 125 Lake Street in the City of Ithaca, Tompkins County, New York (see Figure 1). The site is currently owned by the City of Ithaca. The site is situated on a parcel approximately 0.95 acres in size. The site was historically a portion of a larger property used for production of firearms by the former Ithaca Gun Company from 1885 until 1986. The former factory was located east of the ERP site on the adjacent property, which is being progressed as a NYSDEC Voluntary Cleanup Program (VCP) project by a developer.

The City of Ithaca received funding from New York State to pursue an investigation of contamination at the site under the Brownfields Environmental Restoration Project (ERP) Program regulated by the New York State Department of Environmental Conservation (NYSDEC). A Site Investigation was completed as part of the (ERP) to supplement prior studies and remedial efforts conducted on the site and adjacent property.

The “site” pertinent to the EPA Brownfield Cleanup Grant consists of the island and former raceway areas of the site (see Figure 2). The site has elevated levels of lead and other metals in surface and subsurface soils well above NYSDEC’s 400 ppm soil cleanup objective. Although the site is fenced with appropriate warning signs regarding the dangers of lead exposure, the site is frequently trespassed upon to gain access to the recreational opportunities of Fall Creek and to observe the adjacent dramatic 120-foot Ithaca Falls. It is the City’s desire to restore the site to safe levels to afford the public the opportunity to view Ithaca Falls and to support redevelopment of the adjacent property for residential housing.

Site characterization activities conducted as part of the NYSDEC ERP determined the extent of surface and subsurface soil contamination remaining. These activities also defined the future remedial efforts that would be necessary for the property to receive final indemnification by New York State upon completion of the remediation.

The Site Investigation included a determination of the horizontal limits and (vertical limits were not completed due to the shallow depth to bedrock in all areas) of soil contamination in the island and former raceway areas, an evaluation of contaminant

fate and transport, and identification of remedial alternatives for site cleanup (Remedial Alternatives Report). The Site Investigation was conducted in accordance with NYSDEC DER-10 Technical Guidance for Site Investigation and Remediation, May 2010 (DER-10); 6 NYCRR Part 375; and 6 NYCRR Part 703. Site activities were conducted in accordance with the approved Site Investigation Work Plan, which also contained a Sampling and Analysis Plan, Health and Safety Plan, and Citizen Participation Plan.

It is anticipated that the selected remedial alternative for the Site will be removal of all soils present above bedrock within the pre-determined soil removal areas identified within the island and the former raceway areas of the site. Once soils are removed there will be no backfilling activities completed as part of this cleanup effort and the Site will be left with exposed bedrock. Soils will be disposed of off-site at a permitted solid waste landfill. The selected contractor will be responsible for sampling soils for waste characterization purposes in compliance with 40 CFR chapter I, sec. 261.24 and the selected disposal facility. Considering the remedial objective, the amount of environmental sampling post-project is anticipated to be limited. Because soils will be removed to bedrock further soil sampling confirming vertical extent of contamination was reached is not warranted within the soil removal areas. Surface soil sampling to determine the horizontal extent of remaining lead contamination is projected along the project periphery upon completion of the soil removal activities. Included on Figure 3 is the anticipated surface soil sampling locations to occur after soil removal activities. Due to the steep nature of the Site it is anticipated that actual sample locations may differ depending on conditions encountered in the field, however, the anticipated number of surface sample locations will not change.

Project Decision Statement

A community accessway to the Island allowing a scenic view of the High Falls is proposed for the Site. Soils within the Site are to be removed to bedrock. Surface soil samples will be collected along the periphery of the Site after remediation activities to determine that concentrations of lead are below SCOs. If the surface soil sample results conclude that lead concentrations are above SCOs then further soil removal may be necessary.

Project Quality Objectives

The objective of the project is to remediate the site to meet the residential NYSDEC SCOs. Soils are anticipated to be removed to bedrock. Surface samples will be collected as indicated in Figure 3 around the periphery of the Site to determine the horizontal extent of lead contamination within remaining surface soils present immediately adjacent to the identified soil removal areas. The purpose of this monitoring is to determine (and provide further confirmation) that the horizontal extent of lead contamination was successfully reached and no further remediation is warranted. A total of 10 sample locations are proposed. The soil samples will be collected by Barton & Loguidice, D.P.C. and submitted to Chemtech Laboratories for analysis.

To determine whether the soil contain contamination at levels of concern, data collected will be compared to the following SCGs:

- *Soil:* NYSDEC's Soil Cleanup Objectives 6 NYCRR Subpart 375. The specific SCOs that the results will be compared to are the "Restricted Residential" SCO's.

Section 4 – Project Timeline

Project Summary and Work Schedule

This project's major tasks and timeline are outlined in the table below:

Activities	Organization	Dates (MM/DD/YY)		Deliverable
		Anticipated Date(s) of Initiation	Anticipated Date of Completion	
Preparation of QAPP	Barton & Loguidice, D.P.C	March, 2014	May, 2014	QAPP
Preparation of ABCA	Barton & Loguidice, D.P.C	March, 2014	May, 2014	ABCA
Review of QAPP	NYSDEC/USEPA	April, 2014	June, 2014	Approved QAPP by NYSDEC/USEPA
Review of ABCA	NYSDEC/USEPA	May, 2014	June, 2014	Approved ABCA by NYSDEC/USEPA
EPA Cleanup Decision Memo	USEPA	May, 2014	June, 2014	EPA Cleanup Decision Memo
Preparation of Health and Safety Plan	Barton & Loguidice, D.P.C	Completed	Completed	HASP
Preparation and Bid Documents	Barton & Loguidice, D.P.C	April, 2014	June, 2014	Bid Documents
Site Remediation	Contractor to be procured	July, 2014	October, 2014	N/A
Collection of Field Samples	Barton & Loguidice, D.P.C	July, 2014	October, 2014	N/A
Laboratory Package Received	Barton & Loguidice, D.P.C	N/A	November, 2014	Unvalidated data package
Validation of Laboratory Results	EnviroAnalytics	November, 2014	December, 2014	Validated data Packages
Data Evaluation/ Preparation of Final Report	Barton & Loguidice, D.P.C	January, 2015	February, 2015	Final Report

Resource and Time Constraints

The EPA Cooperative Agreement budget time period ends August 31, 2016. It is anticipated that substantial construction completion will be prior to December 31, 2014.

Section 5 – Sampling and Analytical Requirements

Sampling Methods and Locations

A total of 10 surface soils samples will be collected along the project soil removal periphery. Samples will be collected from a depth of 0-2 inches below ground surface. The samples will be collected as grab samples and analyzed for EPA method 6010B TAL metals. It is anticipated that samples will be collected as described in the following table:

Matrix	Sampling Location	Depth (inches)	Analytical Group	Number of Samples	Sampling SOP Reference	Rationale for Sampling Location
Soil	Western border of Island removal area	0-2	Total Metals	4	See Below	Determine lead concentrations are below SCO
Soil	Eastern border of Island removal area	0-2	Total Metals	2	See Below	Determine lead concentrations are below SCO
Soil	Western border of Former Raceway removal area	0-2	Total Metals	2	See Below	Determine lead concentrations are below SCO
Soil	Eastern border of Former Raceway removal area	0-2	Total Metals	2	See Below	Determine lead concentrations are below SCO
Soil	Duplicate	0-2	Total Metals	1	See Below	Laboratory QC
Soil	MS/MSD	0-2	Total Metals	1	See Below	Laboratory QC

Sampling media will be identified by a letter code as follows: SS – X (surface soil). A two-digit number, beginning with 01 and increasing sequentially, will also identify each sample location.

- 4 samples – Western border of Island removal area (SS-01, SS-02, SS-03 & SS 04)
- 2 samples – Eastern border of Island removal area (SS-05 - SS-06)
- 2 samples – Western border of Former Raceway removal area (SS-07 & SS-08)
- 2 samples – Eastern border of Former Raceway removal area (SS-09 & SS-10)

Analytical Methods and Requirements

The contract laboratory providing all analytical services is Chemtech Laboratories. This project will follow recognized analytical methods. The proposed analytical methods for surface soils include:

Analytical Methods and Requirements						
Matrix	**Analytical Group**	**Concentration Level**	**Bottle**	**Preservative**	**Analytical Method[1]**	**Holding Time[2]**
Soil	Total Metals	Low	8 oz. Glass w/Teflon®-lined cap	None	6010B	6 months

1 - USEPA SW-846 Methods
2 - All holding times from Validated Time of Sample Receipt (VTSR)

Reference Limits and Evaluation

Matrix	**Soils**				
Analytical Group	**Metals - Inductively Coupled Plasma**				
Concentration Level	**Low**				
Analytical Method	**SW 846-6010B/C**				
Analyte	**CAS Number**	**Name of State/Territory/Tribal: Regulatory Standards/Criteria**	**Analytical Method/Method Detection Limit**	**Achievable Laboratory Method Detection Limit/ Reporting Limit**	
Aluminum	7429-90-5	NY375 Residential Restricted SCO: N/A	0.84	2.5	5
Antimony	7440-36-0	NY375 Residential Restricted SCO: N/A	0.56	1.25	2.5
Arsenic	7440-38-2	NY375 Residential Restricted SCO: 16 mg/kg	0.33	0.5	1
Barium	7440-39-3	NY375 Residential Restricted SCO: 400 mg/kg	0.4	2.5	5
Beryllium	7440-41-7	NY375 Residential Restricted SCO: 72 mg/kg	0.06	0.15	0.3
Cadmium	7440-43-9	NY375 Residential Restricted SCO: 4.3 mg/kg	0.06	0.15	0.3
Calcium	7440-70-2	NY375 Residential Restricted SCO: N/A	1.07	50	100
Chromium	7440-47-3	NY375 Residential Restricted SCO: N/A	0.13	0.25	0.5
Cobalt	7440-48-4	NY375 Residential Restricted SCO: N/A	0.57	0.75	1.5
Copper	7440-50-8	NY375 Residential Restricted SCO: 270 mg/kg	0.32	0.5	1
Iron	7439-89-6	NY375 Residential Restricted SCO: N/A	1.33	0.25	5
Lead	7439-92-1	NY375 Residential Restricted SCO: 400 mg/kg	0.12	0.3	0.6
Magnesium	7439-95-4	NY375 Residential Restricted SCO: NA	4.58	50	100
Manganese	7439-96-5	NY375 Residential Restricted SCO: 2000 mg/kg	0.19	0.5	1
Mercury	7439-97-6	NY375 Residential Restricted SCO: 0.81 mg/kg	0.002	0.005	0.01
Nickel	7440-02-0	NY375 Residential Restricted SCO: 310 mg/kg	0.46	1	2
Potassium	7440-09-7	NY375 Residential Restricted SCO: N/A	3.5	50	100
Selenium	7782-49-2	NY375 Residential Restricted SCO: 180 mg/kg	0.41	0.5	1
Silver	7440-22-4	NY375 Residential Restricted SCO: 180 mg/kg	0.15	0.25	0.5
Sodium	7440-23-5	NY375 Residential Restricted SCO: N/A	2.52	50	100
Thallium	7440-28-0	NY375 Residential Restricted SCO: N/A	0.27	1	2
Vanadium	7440-62-2	NY375 Residential Restricted SCO: N/A	0.59	1	2
Zinc	7440-66-6	NY375 Residential Restricted SCO: 1000 mg/kg	0.7	1	2

Analytical Laboratory Sensitivity and Project Criteria

Matrix		**Soil**		
Analytical Group		**Metals - Inductively Coupled Plasma**		
Concentration Level		**Low**		
Analytical Method/SOP	**Data Quality Indicators**	**Performance Criteria (Related to Analytical Method)**	**QC Sample (such as Duplicate, Matrix Spike, Surrogates, etc.) Used to Assess Performance Criteria**	**QC Sample Assesses Error for Sampling (S), Analytical (A), or Both (S&A)**
SW3010B/C SOP - M6010B/C - Trace Elements-20	Completeness	N/A	N/A	S&A
	Sampling Precision	N/A	N/A	S
	Sensitivity	DL ≥ 0.5 X RL	N/A	S
	Calibration Accuracy	cc ≥ 0.995	Initial Calibration	A
		%D ±10%	Second-Source Standard	A
		%D ±10%	Calibration Verification	A

Secondary Data Criteria and Limitations

No secondary data is anticipated to be utilized as part of this remedial effort. The site has undergone several previous site investigation studies that have all resulted in a conclusion that elevated lead concentrations are present at the site above SCOs.

Section 6 – Project Specific Method and Standard Operating Procedures (SOPs) Reference

The Chemtech Quality Assurance Manual has been included as Appendix B of this QAPP. The analytical method utilized will be EPA Method M6010B/C - Trace Elements-20.

Quality objectives will be conducted in accordance with the NYSDEC's DER-10/Technical Guidance for Site Investigation and Remediation. All analyses will be conducted by an analytical laboratory that is NYSDOH ELAP certified for ASP/CLP categories. The Project will require full ASP/CLP laboratory reporting and will also be subject to independent third-party data validation or an internal Data Usability Summary Report (DUSR). The project performance measures for surface soils samples and soils that maybe required to be left on-site will include:

- Soil sampling to meet the NYSDEC Part 375 SCO's for Restricted Residential Use 8.

The following procedures will be performed during collection of surface soil samples:

1. Samples for metals analysis will be transferred directly, and as soon as possible, into appropriately sized soil sample containers. The following procedure for the homogenization of soil samples that will be submitted for the analysis metals:
    - Remove rocks, twigs, leaves and other debris from sampling device (if they are not considered part of the samples);
    - Place sample in a stainless steel bowl and thoroughly mix using a stainless steel spoon;
    - Scrape the sample from the sides, corners and bottom of bowl, roll to the middle of bowl and mix;
    - The sample should then be quartered and each quarter mixed separately; then rolled to the center of the bowl and then the entire sample mixed again.
2. Sample jars will be labeled with the following information: project name, project number, location identification, sample depth interval, and date. This information will also be recorded in the bound field log book.

To monitor the integrity of field sampling and laboratory procedures, the following quality assurance/quality control (QA/QC) procedures will be adhered to for this effort.

Duplicate samples will be collected at a frequency of one for every twenty samples from each matrix. If less than twenty samples are collected from any matrix, then at least one duplicate will be collected from that matrix. Duplicate samples are analyzed to check the sample collection and handling process relative to the uniformity of the samples.

Matrix spike/matrix spike duplicate (MS/MSD) samples will be collected at a frequency of one for every twenty samples for each sample matrix. If less than twenty samples are collected from any matrix, then at least one MS/MSD will be collected from that matrix. The purpose of these samples is to evaluate the effect of the sample matrix on the analytical results.

Specific sample containers are required for each of the media types to be sampled, as well as the proposed analyses to be performed. Samples should be received by the laboratory within 24 hours of sample collection. In addition, there are specific holding time requirements for the type of analyses requested for each sample.

Section 7 – Field Equipment Calibration/Corrective Action

No field equipment will be utilized as part of the soil sampling that will require calibration, maintenance, testing or inspection. Samples will be collected with dedicated equipment per each sample collected.

Section 8 – Analytical Laboratory Equipment Calibration/Corrective Action

Analytical Laboratory Instrument and Equipment Maintenance, Testing, and Inspection								
Instrument/ Equipment	**Maintenance Activity**	**Testing Activity**	**Inspection Activity**	**Frequency**	**Acceptance Criteria**	**Corrective Action**	**Responsible Person**	**SOP Reference**
ICP	Tubing Nebulizer Torch	Preventive Maintenance	Check Tubing Check Nebulizer Check Torch	Daily Monthly Annual	Calibration Passes Criteria	Replace Tubing Clean Nebulizer Replace Torch	Analyst/ Supervisor	P255-Maintenance-03
CV	Tubing Lamp, optic cell Mercury lamp	Preventive Maintenance	Check Tubing Check Lamp And Optic Cell Check Mercury Lamp	Daily Monthly Annual	Calibration Passes Criteria	Replace Tubing Clean Lamp And Optic Cell Replace Mercury Lamp	Analyst/ Supervisor	P255-Maintenance-03

Analytical Laboratory Instrument Calibration						
Instrument/ Method	**Calibration Procedure**	**Frequency of Calibration**	**Acceptance Criteria**	**CORRECTIVE ACTION**	**Person Responsible for CORRECTIVE ACTION [2]**	**SOP Reference[1]**
ICP (Metals)	Initial calibration	Before sample analysis, every 24 hours, whenever modifications are made to the system, or when continuing calibration verification fails	If more than one standard is used, correlation coefficient must be > 0.995	Correct problem and repeat initial calibration	Lab analyst	M6010B/C-Trace Elements-20
	Second-source calibration verification	Immediately following each initial calibration	All analytes within ±10% of expected value	Correct problem and repeat initial calibration	Lab analyst	
	Calibration Blank	After every 10 samples and at the end of the sequence	No analytes detected at or above ½ reporting limit	Correct problem, then reanalyze previous 10 samples	Lab analyst	
	Continuing calibration verification	After every 10 samples and at the end of the sequence	All analytes within ±10% of expected value	Recalibrate and reanalyze all samples since the last acceptable continuing calibration verification	Lab analyst	
CVAA (Mercury)	Initial calibration	Before sample analysis, every 24 hours, whenever modifications are made to the system, or when continuing calibration verification fails	Correlation coefficient must be > 0.995	Correct problem and repeat initial calibration	Lab analyst	M7470A-Mercury-14 M7471A-B-Mercury-13
	Second-source calibration verification	Immediately following each initial calibration	All analytes within ±10% of expected value	Correct problem and repeat initial calibration	Lab analyst	
	Calibration Blank	Before any sequence, after every 10 samples and at the end of the sequence	No analytes detected at or above ½ reporting limit	Correct problem, then reanalyze previous 10 samples	Lab analyst	
	Continuing calibration verification	After every 10 samples and at the end of the sequence	All analytes within ±20% of expected value	Recalibrate and reanalyze all samples since last acceptable continuing calibration verification	Lab analyst	
	CCAL	12-hours (beginning & ending)	Beginning => ± 20% native; ± 30% labeled Ending => ± 25% native; ± 30% labeled	Reanalyze standards. If still unacceptable, recalibrate and reanalyze samples from last acceptable CCAL	HRMS Analyst	

Section 9 – Sample Handling and Custody Requirements

Sampling Handling Systems

The following list includes a summary of sample handling system:

Sample Collection, Packaging and Shipment

- Sample Collection – Barton & Loguidice, D.P.C./Darik M. Jordan
- Sample Packaging – Barton & Loguidice, D.P.C./Darik M. Jordan
- Coordination of Shipment – Barton & Loguidice, D.P.C./Darik M. Jordan
- Type of Shipment – UPS

Sample Receipt and Analysis

- Sample Receipt – Chemtech – Chris Wolski
- Sample Custody and Storage – Chemtech – Chris Wolski
- Sample Preparation – Chemtech – Bhupendra Patel
- Sample Determinative Analysis – Chemtech – Sarabjit Jaswal

Sample Archiving

- Field Sample Storage – Samples will be shipped within 24 hours and arrive at Chemtech within 24 hours of sample shipment.
- Sample Extract/Digestate Storage – 60 days

Sample Disposal

- Number of Days from Analysis – 30 days

Sample Custody Requirements

Chain-of-custody records for all samples will be maintained. A sample will be considered to be "in custody" of any individual if said sample is either in direct view of or otherwise directly controlled by that individual. Storage of samples during custody will be accomplished according to established preservation techniques, in appropriately sealed and numbered containers. Chain-of-custody will be accomplished when the samples are directly transferred from one individual to the next, with the first individual witnessing the signature of the recipient on the chain-of-custody record.

The chain-of-custody records will contain the following information:

- Respective sample numbers of the laboratory and Qualified Environmental Professional, if available.
- Signature of the collector.

- Date and time of collection.
- Sample type (e.g., groundwater, sediment).
- Identification of well or sampling point.
- Number of containers.
- Parameter requested for analysis.
- Signature of person(s) involved in the chain of possession.
- Description of sample bottles and their condition.
- Problems associated with sample collection (i.e., breakage, preservatives missing), if any.

Section 10 – Field and Analytical Quality Control Summary

The purpose of the QA/QC program is to establish and maintain laboratory practices that will ensure the scientific reliability and comparability of the data generated in support of the project.

Quality assurance (QA) is the system for ensuring that all information, data, and resulting decisions compiled under an investigation are technically sound, statistically valid, and properly documented. Quality control (QC) is the mechanism through which quality assurance achieves its goals. Quality control programs define the frequency and methods of checks, audits, and reviews necessary to identify problems and dictate corrective action, thus high quality data.

The laboratory QA/QC program will outline the purpose, policies, organizations and operations established to support the chemical analyses.

Matrix	Soil
Analytical Group	**Metals - Inductively Coupled Plasma**
Concentration Level	Low
Sampling SOP(s)	See Section 6
Analytical Method/SOP Reference	EPA 6010B/C - Trace Elements -20
Sampler's Name	B&L Field Representative
Field Sampling Organization	Barton & Loguidice, D.P.C.
Analytical Organization	Chemtech
No. of Sample Locations	10 (plus MS/MSD and Duplicate)

Matrix	**Water/Soil**					
Analytical Group	**METALS**					
Analytical Method/ SOP Reference	**SW6010B, 7470A, 7471A /** SOP-M6010B/C-Trace Elements-20, , M7470A-Mercury-14, M7471A-Mercury-13					
QC Sample*	**Frequency/Number**	**Method/SOP QC Acceptance Limits**	**Corrective Action**	**Person(s) Responsible for Corrective Action**	**Data Quality Indicator (DQI)**	**Measurement Performance Criteria**
Method Blank	One per prep batch of 20 or fewer samples of similar matrix; or one per day, whichever comes first	No target compounds should be $\geq$ RL.	Investigate source of contamination. Rerun method blank prior to analysis of samples if possible. Redigest associated samples.	Analyst/ Supervisor	Bias/ Contamination	Same as QC Acceptance Limits
LCS	One per prep batch of 20 or fewer samples of similar matrix	See Section 5 – Analytical Laboratory Sensitivity and Project Criteria (page 11)	Redigest and reanalyze.	Analyst/ Supervisor	Accuracy/Bias	Same as QC Acceptance Limits
MS/MSD	One per prep batch of 20 or fewer samples of similar matrix	See Section 5 – Analytical Laboratory Sensitivity and Project Criteria (page 11) (if sample result is < 4x spike value)	Flag results for affected analytes for all associated samples with "N."	Analyst/ Supervisor	Accuracy/Bias	Same as QC Acceptance Limits
Blind Duplicate	One per prep batch of 20 or fewer samples of similar matrix	RPD < 20%	Results to be interpreted by B&L to determine if re-sampling is required.	B&L/ QA Officer	Precision	Same as QC Acceptance Limits
Serial Dilution	One per prep batch of 20 or fewer samples of similar matrix	1:5 dilution must agree within $\pm$10% of the original sample result if result is > 10x RL	Perform post-spike addition.	Analyst/ Supervisor	Accuracy/Bias	Same as QC Acceptance Limits
Post Spike	One per prep batch of 20 or fewer samples of similar matrix	Recovery within 85 – 115%	Flag results for affected analytes for all associated samples with "N"	Analyst/ Supervisor	Accuracy/Bias	Same as QC Acceptance Limits
Results between DL and LOQ.	NA	Apply "J" qualifier to results between DL and LOQ.	NA	Analyst/ Supervisor	Accuracy	Apply "J" qualifier to results between DL and LOQ.

***** Equipment Blanks are not included. Historical equipment blank results demonstrate concentrations of metals to be nominal and unable to change reported concentrations present within soil at the site to a reportable degree.

Section 11 – Data Management and Documentation/Project Reports

Data Management

The Project Manager shall retain copies of all management reports, memoranda, and all correspondence between the NYSDEC and all project personnel. Other records and documents that will be produced in conjunction with this project include:

- Inspection checklists and reports
- Self-certification forms
- Return-to-compliance forms
- Non-applicability forms
- Enforcement documentation
- Facility outreach materials, including workbook, fact sheets, brochures, etc.
- Amended QAPP
- Readiness reviews (see below)
- Data handling reports
- Quarterly and annual progress reports to EPA
- Project final report (to include discussion of QA issues encountered, and how they were resolved)

The sampler's field records will contain sufficient information such that someone else can reconstruct the sampling situation without reliance on the sampler's memory. Entries in the field records will include, at a minimum, the following:

- Site name and location
- Project number
- Name and affiliation of Project Manager and sampler involved
- Sampling point name and description
- Type of sample container(s) used
- Preservative(s) used
- Date and time of sample collection
- Sample identification number(s)
- Laboratory's sample identification number(s)
- References such as maps or photographs of the sampling site, if available
- Field observations
- Pertinent weather factors such as temperature, wind direction and precipitation

A copy of all project documents and records will be kept on file at Barton & Loguidice, D.P.C. for a minimum of seven years.

Project Reports

The format for all data reporting packages will be consistent with the requirements and procedures used for data validation and data assessment described in this QAPP. The NYSDEC has implemented an Environmental Information Management System (EIMS). The EIMS uses the database software application EQuIS™ (EQuIS) from EarthSoft® Inc. (EarthSoft). Data will be submitted to the NYSDEC in accordance with their EIMS.

Three kinds of reports will be prepared: readiness reviews, regular quarterly and annual progress reports, and project final report. Progress reports will note the status of project activities and identify whether any QA problems were encountered (and, if so, how they were handled). Project final report will analyze and interpret data, present observations, draw conclusions, identify data gaps, and describe any limitations in the way the data should be used.

Project QA Status Reports			
Type of Report	**Frequency**	**Preparer**	**Recipients**
Amended QAPP	Once, before primary data collection begins	Barton & Loguidice, D.P.C.	All recipients of original QAPP
Progress Report	Quarterly		U.S. EPA Region 2 Project Officer Benny Hom
Progress Report	Annually		U.S. EPA Region 2 Project Officer Benny Hom, NYSDEC Region 7, City of Ithaca
Final Project Report	Once		

Section 12 – Data Review

Project Data Verification Process (Step I)

Verification Input	Description	Internal/ External[2]	Responsible for Verification (Name, Organization)
Site/Field Logbooks	Field notes will be prepared daily by the Environmental Consultant Project Manager and will be complete, appropriate, legible and pertinent. Upon completion of field work, logbooks will be placed in the project files.	I	Barton & Loguidice, D.P.C.
Chains of custody	COC forms will be reviewed against the samples packed in the specific cooler prior to shipment. The reviewer will initial the form. An original COC will be sent with the samples to the laboratory, while copies are retained for (1) the Sampling Trip Report and (2) the project files.	I	Barton & Loguidice, D.P.C.
Laboratory analytical data package	Data packages will be reviewed/verified internally by the laboratory performing the work for completeness and technical accuracy prior to submittal.	I	Chris Wolski/ Chemtech
Laboratory analytical data package	Complete data packages will be reviewed as to content and sample information upon receipt by the Environmental Consultant Project Manager and the Third Party Data Validation Personnel.	I/E	Barton & Loguidice, D.P.C. Yates/ SGD Environmental[2]
Final Sample Report	The project data results will be compiled in a sample report for the project. Entries will be reviewed/verified against hardcopy information.	I	Barton & Loguidice, D.P.C.

[1]Step I – Completeness Check

[2]Internal or External is in relation to the data generator.

Project Validation Process (Step IIa and Step IIb)

Step IIa/IIb[1]	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	SOPs	Ensure that the sampling methods/procedures outlined in QAPP were followed, and that any deviations were noted/approved.	Barton & Loguidice, D.P.C.
IIb	SOPs	Determine potential impacts from noted/approved deviations, in regard to PQOs.	Barton & Loguidice, D.P.C.
IIa	Chains of custody	Examine COC forms against QAPP and laboratory contract requirements (e.g., analytical methods, sample identification, etc.).	Yates/SGD Environmental
IIa	Laboratory data package	Examine packages against QAPP and laboratory contract requirements, and against COC forms (e.g., holding times, sample handling, analytical methods, sample identification, data qualifiers, QC samples, etc.).	Yates/SGD Environmental
IIb	Laboratory data package	Determine potential impacts from noted/approved deviations, in regard to PQOs. Examples include PQLs and QC sample limits (precision/accuracy).	Barton & Loguidice, D.P.C. Yates/SGD Environmental
IIb	Field duplicates	Compare results of field duplicate (or replicate) analyses with RPD criteria	Barton & Loguidice, D.P.C. Yates/SGD Environmental

[1]Step IIa – Compliance with Methods, Procedures, and Contracts

[1]Step IIb – Comparison with Performance Criteria in QAPP

Project Matrix and Analytical Validation (Step IIA and Step IIB) Summary

Step IIa/IIb[1]	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (Title and Organizational Affiliation)
IIa / IIb	Soil	TCL Metals	Unknown	QAPP and USEPA Region 2 Data Validation SOP No HW-2a Rev15 - Inorganic Analysis (ICP CLP DV SOP)	Yates/SGD Environmental

[1]Step IIa – Compliance with Methods, Procedures, and Contracts

[1]Step IIb – Comparison with Performance Criteria in QAPP

Usability Assessment (Step III)

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used:

Evaluate whether detectable amounts of contaminant(s) are present. If no detectable amounts are indicated and data are acceptable for the verification and validation, then the data is usable.
If verification and validation are not acceptable then B&L Project Manager to take corrective action (determine cause, data impact, evaluate the impact and document the rationale for resampling).

Describe the evaluative procedures used to assess overall measurement error associated with the project:

Evaluate whether the quality control data is within the performance criteria (precision, accuracy, etc) through validation process IIb (Validation Activities).

Identify the personnel responsible for performing the usability assessment:

Project Management Team –Consisting of the B&L Project Manager; Data Validator Personnel (preparing Usability Report); City of Ithaca.

Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies:

The Usability Report will describe the rationale for the data and the presentation of data limitations. For example, if the performance criteria are not usable to address the regulatory requirements or support the project-decision for the City of Ithaca, then the B&L Project Manager should address how this problem will be resolved and discuss the alternative approach. Data proven to be usable will be tabulated and compared to SCOswithin final project report.

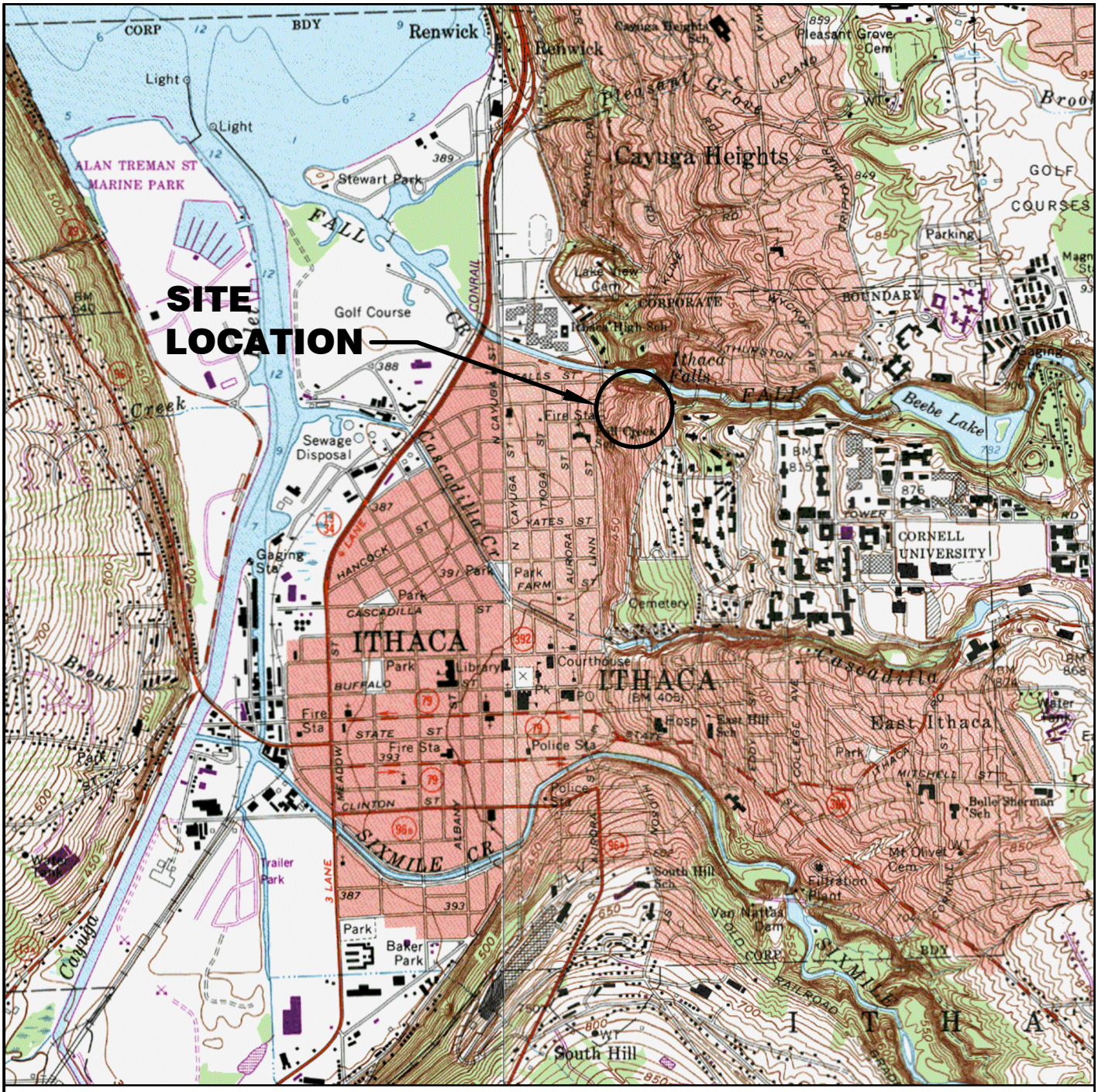
[1]Step III – Usability Assessment

Data Elements for Data Review Process				
Item	**Step I – Data Verification**	**Step IIa – Data Validation Compliance**	**Step IIb – Data Validation Comparison**	**Step III -Data Usability**
Planning Documents				
Evidence of approval of QAPP	X			Use outputs from previous steps
Identification of personnel	X			
Laboratory name	X			
Methods (sampling & analytical)	X	X	X	
Performance requirements (including QC criteria)	X	X		
Project quality objectives	X		X	
Reporting forms	X	X		
Sampling plans – locations, maps grids, sample ID numbers	X	X		
Site identification	X			
SOPs (sampling & analytical)	X	X		
Staff training & certification	X			
List of project-specific analytes	X	X		
Analytical Data Package				
Case narrative	X	X	X	Use outputs from previous steps
Internal lab chain of custody	X	X		
Sample condition upon receipt, & storage records	X	X		
Sample chronology (time of receipt, extraction/digestion, analysis)	X	X		
Identification of QC samples (sampling /lab)	X	X		
Associated PE sample results	X	X	X	
Communication Logs	X	X		
Copies of lab notebook, records, prep sheets	X	X		
Corrective action reports	X	X		
Definition of laboratory qualifiers	X	X	X	
Documentation of corrective action results	X	X	X	
Documentation of individual QC results (e.g., spike, duplicate, LCS)	X	X	X	
Documentation of laboratory method deviations	X	X	X	
Electronic data deliverables	X	X		
Instrument calibration reports	X	X	X	
Laboratory name	X	X		
Laboratory sample identification no.	X	X		
QC sample raw data	X	X	X	
QC summary report	X	X	X	

Data Elements for Data Review Process				
Item	**Step I – Data Verification**	**Step IIa – Data Validation Compliance**	**Step IIb – Data Validation Comparison**	**Step III -Data Usability**
Data Elements for Data Review Process				
Raw data	X	X	X	Use outputs from previous steps
Reporting forms, completed with actual results	X	X	X	
Signatures for laboratory sign-off (e.g., laboratory QA manager)	X	X		
Standards traceability records (to trace standard source form NIST, for example)	X	X	X	
Sampling Documents				
Chain of custody	X	X		Use outputs from previous steps
Communication logs	X	X		
Corrective action reports	X	X	X	
Documentation of corrective action results	X	X	X	
Documentation of deviation from methods	X	X	X	
Documentation of internal QA review	X	X	X	
Electronic data deliverables	X	X		
Identification of QC samples	X	X	X	
Meteorological data from field (e.g., wind, temperature)	X	X	X	
Sampling instrument decontamination records	X	X		
Sampling instrument calibration logs	X	X		
Sampling location and plan	X	X	X	
Sampling notes & drilling logs	X	X	X	
Sampling report (from field team leader to project manager describing sampling activities)	X	X	X	
External Reports				
External audit report	X	X	X	Use outputs from previous steps
External PT sample results	X	X		
Laboratory assessment	X	X		
Laboratory QA plan	X	X		
MDL study information	X	X	X	
NELAP accreditation	X	X		

Figure 1

Site Location Map



SOURCE: ITHACA EAST & ITHACA WEST, NEW YORK U.S.G.S. QUADRANGLE MAPS, DATE 1979.

QUADRANGLE LOCATION

2000' 0 2000'

1"=2000'

N

Barton & Loguidice, D.P.C.

ITHACA URBAN RENEWAL AGENCY

ITHACA FALLS OVERLOOK BROWNFIELD CLEANUP PROJECT QUALITY ASSURANCE PROJECT PLAN

SITE LOCATION PLAN

CITY OF ITHACA TOMPKINS COUNTY, NEW YORK

Date	Scale
MAY, 2014	1" = 2000'

Figure Number 1

Project Number 1307.002.002

Plotted: May 30, 2014 - 2:45PM SYR By: lmw
I:\Shared\1300\1307002\1307002_ERP_FIG1.dwg

Figure 2

Site Plan

LEGEND

UNIT 1

UNIT 2

ERP SITE LIMITS
(ALL LOCATIONS OUTSIDE OF PARCEL A ARE CONSIDERED "OFF-SITE")

N

NAD 83

TAX MAP # 11-3-2.1
CITY OF ITHACA (R.O.)
818/150

TAX MAP # 11-3-1.1
CITY OF ITHACA (R.O.)
851/7

NO. 230 WILLARD WAY
TAX MAP PARCEL 11-3-2.2
SIGMA NU LODGE (R.O.)
188/134

NO. 210 WILLARD WAY LOOP
TAX MAP PARCEL 11-3-11
BLOOM & GREENFIELD (R.O.)
2510/10119

TAX MAP # 12-7-2
CITY OF ITHACA (R.O.)
870/41

"FALL CREEK" GORGE

APPROX. TOP OF BANK

OLD CHAIN LINK FENCE

OLD RACEWAY

PARCEL A
"THE ISLAND"

SHED

CONCRETE PAD

PARCEL B

CHAIN LINK FENCE

ASPHALT DRIVE

CONCRETE PAD

BRIDGE

FORMER SHOP

RETAINING WALL

LOADING DOCK

CONCRETE WALL

~UNIT 2~

FORMER MAIN PLANT

LOADING DOCK

~UNIT 1~

SHED

1 STORY BUILDING

SILO

FORMER BOILER BUILDING

CONCRETE WALL

STREET LINE

ASPHALT PARKING

ASPHALT PARKING

"BOILER BUILDING SUBPARCEL"
THIS PARCEL IS TO BE ATTACHED TO PAR. B
AREA = 0.014 ACRES
(INCLUDES SMOKESTACK AREA)

SMOKE STACK

"SMOKESTACK PARCEL"

40' 0 40'
1"=40'

NOTE:
BASEMAP TAKEN FROM A SURVEY MAP SHOWING LANDS OF FALL CREEK REDEVELOPMENT, LLC. PERFORMED BY T.G. MILLER P.C. ON 6/27/2008.

Plotted: May 30, 2014 - 2:44PM SYR By: lmw
I:\Shared\1300\1307002\1307002_ERP_FIG2.dwg

ITHACA URBAN RENEWAL AGENCY
ITHACA FALLS OVERLOOK
BROWNFIELD CLEANUP PROJECT QUALITY ASSURANCE PROJECT PLAN

SITE PLAN

TOMPKINS COUNTY, NEW YORK
CITY OF ITHACA

Barton & Loguidice, D.P.C.

Date
MAY, 2014

Scale
1" = 40'

Figure Number
2

Project Number
1307.002.002

Figure 3

Anticipated Project Soil Sample Locations

N

TRUE OR CALLED NORTH

"FALL CREEK" GORGE

UPPER ISLAND

SHED

EASTERN RACEWAY

CONCRETE PAD

ISLAND AREA

TOP OF BANK (APPROX.)

ISLAND BENEATH SLABS

CONCRETE PAD

ISLAND

FORMER RACEWAY AREA (SOIL TO BE REMOVED)

CONCRETE PAD

WESTERN RACEWAY

PLUNGE POOL

FORMER WALKWAY

OFF-SITE WESTERN ISLAND SLOPE

WESTERN ACCESSWAY

SILO

LEGEND

- PROPERTY LINE
- FENCE LINE
- EXISTING STRUCTURE
- AREAS ESTIMATED ABOVE 400 PPM
- GORGE WALLS WITH LIMITED OVERBURDEN SOIL
- SURFACE SOIL (0-2") LOCATIONS TO BE COLLECTED TO DETERMINE REMAINING METAL CONCENTRATIONS. SAMPLES ARE TO BE SAMPLED FOR EPA METHOD 6010B TAL METALS.

NO FURTHER SOIL SAMPLING IS EXPECTED TO OCCUR WITHIN PROJECT BOUNDARIES AS SOIL WILL BE REMOVED TO BEDROCK.

NOTE:
BASEMAP TAKEN FROM A SURVEY MAP SHOWING LANDS OF FALL CREEK REDEVELOPMENT, LLC. PERFORMED BY T.G. MILLER P.C. ON 6/27/2008.

COMPLETED CONSTRUCTION

Significant Construction Changes Are Shown

By _____ Date _____

Ck'd _____ Date _____

REVISIONS

ITHACA URBAN RENEWAL AGENCY
ITHACA FALLS OVERLOOK
BROWNFIELD CLEANUP PROJECT QUALITY ASSURANCE PROJECT PLAN

ANTICIPATED PROJECT SOIL SAMPLE LOCATIONS

TOMPKINS COUNTY, NEW YORK

CITY OF ITHACA

Barton & Loguidice, D.P.C.

Date
MAY, 2014

Scale
1" = 20'

Sheet Number
3

File Number
1307.002.002

Checked by _____ Drawn by JGS Designed by LRH In charge of SDN

Plotted: May 30, 2014 - 2:40PM By: lmw
I:\Shared\1307002\1307.002_FIGURE 4_ Sample Location.dwg

Appendix A

Resumes for Key Project Personnel

Scott D. Nostrand, P.E.

Senior Vice President

Years of Experience

26

Education

B.S. Agricultural Engineering - Cornell University, 1984

M.S. Animal Science - Cornell University, 1989

Professional Registrations

Professional Engineer - New York, 1998

State of New York, Department of Labor, Current Asbestos Handling Certificate - Project Designer

Hazardous Waste Operations Health & Safety (HAZWOPER)

Professional Affiliations

Air and Waste Management Association

Solid Waste Associations of North America (SWANA)

Summary

Mr. Nostrand manages B&L's environmental engineering and consulting group and oversees all the firm's environmental activities including hazard mitigation planning, environmental permitting and compliance, stormwater, site remediation, fuel systems design, industrial environmental compliance, air permitting and modeling, asbestos abatement, industrial wastewater pretreatment systems, and biosolids management.

Hazard Mitigation Planning

Mr. Nostrand has overseen several successful FEMA/SEMO funding application and subsequent hazard mitigation plans and plan updates. Generally the plans include pro-active planning with various municipality personnel, community stakeholders, utilities and SEMO to identify hazards, risk assessment and mitigation strategies. He oversees all assessments of natural hazards, including earthquakes, landslides, flooding, and severe weather events.

Greenhouse Gas

Mr. Nostrand has overseen the preparation of greenhouse gas (GHG) monitoring plans and screening analyses for numerous clients to satisfy the requirements for the U.S. Environmental Protection Agency (EPA) Mandatory Greenhouse Gas Reporting Rule (40 CFR Part 98). The process involves evaluating each site to identify specific GHG emission sources requiring monitoring, calculating modeled and actual GHG emissions from various stationary combustion sources and fugitive methane emissions from MSW landfill sources, and preparing comprehensive site specific monitoring plans which included data collection, management, and QA/QC procedures related to the monitoring of GHG emission sources.

Environmental and Permitting

Mr. Nostrand oversees all activities regarding environmental and permitting issues such as wetland permitting, wetland assessment and delineation, wetland mitigation and design, threatened and endangered species surveys, biota inventories, habitat assessments and restorations, stream assessment and natural stream channel design, natural resource inventories, aquatic habitat improvements, fish and wildlife impact analysis, water quality analysis and sampling, electro-fishing, macro/micro invertebrate sampling, SEQR and NEPA compliance assistance, and wildlife management and monitoring plans.

Stormwater and Drainage Design

Mr. Nostrand's stormwater team has become one of the leading providers of services to municipalities for the MS4 program within Central New York and Finger Lakes regions. These services have included MS4 program consulting, planning and design, stormwater drainage control structure design, stormwater modeling, watershed planning and analysis, wetland delineation and mitigation and stream restoration design.

Environmental Compliance
Mr. Nostrand also manages B&L's program for environmental compliance reporting. This area has included the preparation of EPA Spill Prevention Control & Countermeasure Plans, Chemical Bulk Storage Spill Prevention Reports, Hazardous Waste Reduction Plans, and Environmental Compliance Audits.

Petroleum and Chemical Bulk Storage
Mr. Nostrand oversees the design and management of petroleum and chemical bulk storage tank and design of replacement systems to meet regulatory mandates has required design of replacement systems. Recent designs have included fleet fueling systems for petroleum products with capacities from 500 to 12,000 gallons. These systems incorporated fuel management systems, fuel leak detection and meet all NFPA codes. Other designs include bulk storage containment, chemical bulk storage tanks, and loading area containment systems

Due Diligence
Mr. Nostrand has prepared more than 300 Phase I Environmental Site Assessment reports for commercial and industrial clients in the Northeast. Environmental concerns identified during these assessments included leaking underground storage tanks, deteriorated asbestos materials, polychlorinated biphenyls, air, soil, wastewater pollution, permit compliance, and other environmental concerns.

Remediation Projects
Mr. Nostrand has been responsible for the management of numerous investigations of petroleum, solvent, PCB and hazardous substance spills at industrial and municipal sites under various regulatory programs such as NYSDEC's Oil Spills Program, Inactive Hazardous Waste Site Program, Voluntary Cleanup Program, and Environmental Restoration Program (municipal brownfields). These projects have included site characterization, remedial investigation, feasibility analysis, remedial design and construction administration. Remedial design projects have involved in-situ bioremediation, groundwater extraction and treatment, soil vapor extraction, source removal, and monitored natural attenuation. Projects have included remediation investigations at hazardous waste landfills, industrial facilities, abandoned industrial and commercial properties, and petroleum bulk storage and retail service stations.

Asbestos Management
Mr. Nostrand is a certified Asbestos Project Designer, and oversees B&L's Industrial Hygiene group, which provides a broad array of Asbestos Management, Indoor Air Quality, and Environmental Health and Safety services. These services include preparation of pre-demolition surveys, asbestos abatement design, noise assessment, safety training, air quality analysis, and construction inspection for projects company wide.

For all of the project areas identified above, Mr. Nostrand has been involved with contract administration, construction management, and preparation of private and municipal bidding documents.

David R. Hanny, CPESC, CPSWQ, LEED AP

Senior Managing Environmental Scientist

Years of Experience

15

Education

B.S. Environmental Science - SUNY College of Environmental Science and Forestry, Syracuse, New York, 1998

Professional Registrations

Certified Professional in Erosion and Sediment Control (CPESC)

Certified Professional in Stormwater Quality (CPSWQ)

Asbestos Inspector Certificate

Hazardous Waste Operations Health & Safety (Initial 40-hour Course, and Current Annual 8-Hour Refresher Course)

Professional Accreditations

Leadership in Energy and Environmental Design (LEED) Accredited Professional

Professional Affiliations

Soil and Water Conservation Society

National Groundwater Association

NYS Floodplain & Stormwater Managers Association

Summary

Mr. Hanny's principle responsibilities are in the fields of stormwater management, environmental compliance, remediation, and site investigations. He has performed both office and field-based work relating to stormwater management design, environmental compliance monitoring, Phase I Site Assessments, environmental site investigations, remedial design, and asbestos abatement projects.

Mr. Hanny has provided assistance to 15 municipalities in the Central New York and Capital Region with the development of their required Stormwater Management Program in association with the Municipal Separate Storm Sewer Systems (MS4s) SPDES regulations.

Mr. Hanny has also been responsible for project management on numerous petroleum spill sites remediated under the NYSDEC Voluntary Cleanup Agreement and Brownfield Programs. He has been the designated project manager for five NYSDEC Environmental Restoration Projects.

Relevant Project Experience

Remedial Oversight, Des. & Implementation, Utica
Mr. Hanny was the Project Manager responsible for the site investigation, project reporting, remedial design and client relations, and regulatory interaction. This Brownfield Cleanup Program project is focused on investigation and remediation of petroleum and chlorinated solvent impacts to subsurface soil and groundwater. B&L prepared a Remedial Investigation Work Plan, Remedial Investigation Report, Alternatives Analysis Report and Remedial Action Work Plan for the selected remedy.

NYSDEC VCP, Haz. Waste Site RI/FS-Private Ind. Client, Solvay, NY
Mr. Hanny was the Project Manager for this Phase II Investigation project to address soil and groundwater contamination from an industrial site. In addition to a soil and groundwater investigation, the soil vapor investigation was expanded to include an assessment of sub-slab vapor at the site. The site investigation revealed two distinct groundwater plumes at the site (petroleum and chlorinated solvent) that were low in concentration and limited in breadth. B&L is working with the NYSDEC to prepare a proposed remedial action plan that will require annual monitoring of the plume to confirm the natural attenuation of the solvent area and installation of a sub-slab vapor depressurization system.

Brownfield Investigation for Feed Mill and Fueling Station, Village of Adams, Adams, NY
Mr. Hanny was the Project Manager responsible for all aspects of this Phase II ERP Brownfield. B&L performed a site investigation of the G.L. Thomas & Sons Feed Mill and Laramie Tire Property which included: site investigation,

inspection, and mapping; geophysical survey; excavation and removal of underground storage tanks; subsurface investigation of soil and groundwater; groundwater monitoring well investigation; soil vapor investigation; and public health and wildlife evaluation.

Environmental Restoration Project, Laribee Machine Co., Village of Camden, NY
Mr. Hanny was the Project Manager for this ERP Brownfield project which included Phase II site investigation, remedial design and permitting for the project. Remedial measures for the site included the decontamination, removal and salvage of equipment, closure of bulk storage tanks, removal of wastes, removal and disposal of PCB sediments, and demolition of the building.

NYSDEC Environmental Restoration Project, Wayne County Planning Dept.
B&L was retained to conduct a Site Investigation and Remedial Alternatives Analysis of a former automobile dealership as part of NYSDEC's Environmental Restoration Project brownfield program. The project included a characterization of subsurface conditions and an evaluation of potential remedial alternatives. The building was demolished and source materials were removed including drums, underground storage tanks and contaminated soils. Mr. Hanny conducted asbestos related services and assisted with oversight of the field investigation.

Darik M. Jordan

Senior Project Environmental Scientist

Years of Experience

12

Education

B.S. Environmental Health & Safety Management, Rochester Institute of Technology, Rochester, NY, 2000

Professional Registrations

CFR 1910.120–Hazardous Waste Operations Health and Safety- Initial 40 hour course and current annual 8 hour refresher course

Summary

Mr. Jordan's primary responsibilities have been associated with the firm's Environmental and Solid Waste Service groups. Work in those areas has included environmental compliance audits, remediation and site investigation, environmental monitoring, and preparation of landfill groundwater monitoring reports. Mr. Jordan has provided these environmental services for both private industrial and municipal-based clients.

Mr. Jordan's field work experience gained while working at B&L has included collection of various environmental samples including groundwater, soil, surface water, mold, lead-based paint, and landfill gas sampling. The collection of these environmental samples has occurred on various projects including brownfield sites, underground storage tank removals, subsurface site investigations, remedial projects, and municipal solid waste landfills.

Mr. Jordan's office based duties related to the field activities listed above include technical report writing, database management, and evaluation of various analytical data. He has assisted in writing of landfill groundwater reports, tank closure reports, and a variety of other environmental reports and documents. Mr. Jordan is also experienced in reviewing analytical laboratory data and has created complex databases that help assist and demonstrate environmental compliance for various facilities.

Mr. Jordan has experience as an asbestos air sampling technician and has recently become a certified EPA lead-based paint professional. Mr. Jordan has assisted with health and safety oversight for projects concerning PCB's, lead-based paint, chlorine gas, mercury, solvents, caustics, asbestos, hydroflouric acid, and construction safety.

Additional work responsibilities include brownfield environmental remediation projects, petroleum spill remediation projects, UST tank closures, EPA UIC closures, air permitting compliance services and preparation of SPCC and SWPP plans.

Relevant Project Experience

NYSDEC Brownfield Project for Thibado site, Town of Webb, NY
B&L was retained by the Town of Webb to conduct a site investigation and remedial alternatives analysis of a former gasoline station as part of the NYSDEC ERP brownfield program. Mr. Jordan provided field oversight during the site investigation and collected the required environmental samples associated with the underground storage tank removal and site groundwater monitoring.

Onondaga Indian Nation Medical Waste Cleanup, NY
B&L was retained by The Onondaga Indian Nation to assist in cleaning up a former medical waste disposal site. Mr. Jordan conducted field oversight

activities along with various environmental monitoring, including radioactive waste screening. Mr. Jordan worked closely with NYSDEC representatives on-site to ensure environmental compliance throughout the project.

NYSDEC Voluntary Clean-up Program Hazardous Waste Site, Private Client
While expanding operations at an existing industrial laundry enterprise, a private industrial company identified concerns with prior releases of petroleum and dry cleaning fluid on the property. B&L scoped a site investigation of the site to include an assessment for soil vapor migration from the property onto adjacent residential lots. In addition to a soil and groundwater investigation, the soil vapor investigation was expanded to include an assessment of sub-slab vapor at the site. B&L is working with the NYSDEC to prepare a proposed remedial action plan that will require annual monitoring of the plume to confirm the natural attenuation of the solvent area and installation of a sub-slab vapor suppression system.

Environmental Restoration Program Sites, Rome, NY
The City retained the services of B&L in April 2007 to prepare a Site Investigation and Remedial Alternatives Report (SI/RAR) for the five properties located within the City of Rome in accordance with NYSDEC criteria. The five sites, which range in size from 0.31 acres to 2.85 acres, were formerly used as petroleum bulk storage (PBS) facilities (two sites), a textile mill and machine shop, a sawmill manufacturing facility, and gasoline station/automobile repair facilities (two sites). The SI/RAR at each property will consist of: a subsurface investigation to determine the horizontal and vertical extent of soil and/or groundwater contamination at the site (Site Investigation); the implementation of Interim Remedial Measures (IRMs) including the demolition of building structures; and the identification and evaluation of remedial alternatives for potential additional site cleanup measures (Remedial Alternatives Report). In addition, B&L is also administrating a $200,000 U.S. Environmental Protection Agency (USEPA) Brownfield Assessment grant that the City was awarded in September 2004.

Brownfield Investigation for Feed Mill and Fueling Station, Village of Adams
The Village of Adams received funding to pursue an investigation of subsurface contamination under the Environmental Restoration Project at the former G.L. Thomas & Sons Feed Mill and Laramie Tire Property. B&L performed a site investigation of the property which included: site investigation, inspection, and mapping; geophysical survey; excavation and removal of underground storage tanks; subsurface investigation of soil and groundwater; groundwater monitoring well investigation; soil vapor investigation; and public health and wildlife evaluation. In addition, B&L assisted the Village with Project management, reporting and an evaluation of potential Remedial Alternatives for site clean-up. B&L engineers also prepared a Public Relations Fact Sheet to introduce Village of Adams residents to the upcoming Brownfield project.

Schoepfel Chevrolet/SI/RAR, Wayne County, NY

B&L was retained by Wayne County to conduct a Site Investigation and Remedial Alternatives Analysis of a former automobile dealership as part of the NYS Department of Environmental Conservation's (NYSDECs) Environmental Restoration Project (ERP) brownfield program. The project included a characterization of subsurface conditions and an evaluation of potential remedial alternatives. The building was demolished and source materials were removed including drums, underground storage tanks and contaminated soils. B&L conducted asbestos related services and assisted with oversight of the field investigation.

NYSDEC Environmental Restoration Projects – Town of New Bremen, NY
B&L was retained by the Town to conduct a site investigation and remedial alternatives analysis of a former convenience store and gas station located in Croghan, NY as part of the NYSDEC ERP Brownfield program. B&L provided the hydrogeologic investigation including monitoring well installation and sampling, a soil vapor and sub-slab vapor assessment at the site and surrounding residential area, provided a Site Investigation report, and provided field oversight during a pilot test program for the selected in-situ remediation technology.

Diamond International Paper Mill Site - Environmental Restoration Project
The City of Ogdensburg is proceeding with an Environmental Restoration Project of the former Diamond International Paper Mill Site, a vacant 17-acre parcel situated on the eastern bank of the St. Lawrence River. The City has included the site as part of its Waterfront Redevelopment Action Plan, and the site was assessed by the City under an EPA Brownfield Pilot Program. B&L worked with the City to prepare a work plan for investigation of the site to identify the environmental quality of soil and groundwater across the site. Contaminants of concern on this property included petroleum, chlorinated solvents, dioxin, PCBs, and metals. An Interim Remedial Measure (IRM) was performed for the decontamination and demolition of remaining paper mill structures on the site.

CHRISTOPHER WOLSKI. work number 9087283149

EDUCATION: 3.2/4 GPA BS Environmental Science degree with bio minor at Ramapo College of New Jersey class of 2008.

WORK EXPERIENCE:

Chemtech Consulting Group: May 2008 to present

-Project Manager to over 50 accounts nationally and locally.

-sample management staff responsible for labeling,lining up samples, etc

-sales for several clients as well

-assist in collection calls and invoice making.

-projects included but not limited to several ogs projects, con ed projects, portal bridge, and monthly dmr projects.

-train new employees

-coordinate and maintain driver schedule.

Meadowlands Environmental Center: January to May 2006

-develop a lesson plan

-assist with the educational program

MARK C. YATES ***RESUME***
2063 Stanley Rd.
Cazenovia, New York
(315) 655-8556 (315) 560-2560 (cell)
mlyates@twcny.rr.com

TECHNICAL EXPERIENCE:

Over twenty-five years of experience in environmental consulting services including industrial hygiene services, asbestos project monitoring and inspection, quality assurance/quality control and analytical services, environmental evaluation, and environmental assessment. Areas of specialty include:

- Environmental data validation.
- Organic laboratory analysis of pesticides, PCBs, herbicides, and petroleum products.
- Community air monitoring (CAMP).
- Hazardous waste site safety officer (SSO).
- Industrial hygiene air sampling and reporting.
- Safety awareness training.
- Asbestos project monitoring, inspection surveys, and bulk sampling.
- Environmental assessments (Phase I/II).

REPRESENTATIVE PROJECT EXPERIENCE:

Data Validation:

EA Engineering, Science, and Technology - Completed several data validation projects collectively reviewing over 500 samples for various parameters including volatile organic, semivolatile organic, PCB, metals, TOC, herbicides, and pesticides.

OpTech – Evaluated volatile organic, semivolatile organic, PCB, heavy metals, and soil vapor sample data for several sites for implementation in a Data Usability Summary Report (DUSR).

S&W Redevelopment – Prepared several DUSRs for various Brownfield projects. Validation of volatile organic, semivolatile organic, PCB, metals, various inorganic, and soil vapor sample data was conducted.

Confidential – Performed forensic data reconstruction and evaluated PCB data for attorney in support of litigation.

Gould Groundwater Investigation – Created a DUSR for two rounds of sampling for multiple organic and inorganic laboratory analyses from a remedial investigation.

O'Brien & Gere Engineers – Performed data validation to determine the usefulness of a significant volume of PCB data generated from several hundred samples collected from a former rail yard site.

Colden Corporation – Evaluated PCB data comparing conflicting results from two different laboratories and generated a DUSR.

MARK C. YATES ***RESUME***
2063 Stanley Rd.
Cazenovia, New York
(315) 655-8556 (315) 560-2560 (cell)
mlyates@twcny.rr.com

Industrial Hygiene:

Corning Inc. – Conducted numerous personal and area noise surveys and ambient air monitoring projects to evaluate employee exposures. Ambient air monitoring parameters included lead, mercury, radon, welding fumes, respirable and silica dust, refractory ceramic fibers, and numerous organics. In addition, wipe and paint chip sampling for heavy metals was performed. Projects also included exhaust ventilation measurements. Summary reports were prepared based on the findings.

Bristol Myers Squibb – Provided industrial hygiene support over a period of several months for the Environmental Health and Safety Department including noise dosimetry monitoring, personal and area air sampling, and development of a laser safety program.

New York Power Authority – Conducted personal noise dosimetry on eighteen employees in multiple work areas and during varied tasks to measure noise exposure and identify whether an upgrade in PPE was necessary.

GE Inspection Technologies – Developed Qualitative Exposure Assessments (QEAs) for employees performing various tasks.

National Grid – Performed a mercury survey following a potential spill.

Saunders Concrete Products – Conducted personal air monitoring for respirable dust and silica on employees cleaning out cement mixer drums.

Anheuser Busch – Performed personal and area air monitoring for disinfection byproducts.

Hydroelectric facility – Sampled paint for heavy metals and PCBs and conducted air sampling during removal of paint by sandblasting.

Xylem Inc. – Worked closely with the Environmental, Health and Safety manager to develop a sampling plan to identify areas of potential employee exposure. Conducted personal and area noise dosimetry and air sampling for a variety of chemicals.

Safety Awareness Training:

New York Power Authority – Conducted safety awareness training to NYPA employees at two different facilities. Topics included hazard communication, asbestos awareness, bloodborne pathogens, respirator training, lead awareness, emergency evacuation, sun safety, and fire extinguisher use.

MARK C. YATES ***RESUME***
2063 Stanley Rd.
Cazenovia, New York
(315) 655-8556 (315) 560-2560 (cell)
mlyates@twcny.rr.com

Safety:

Land Remediation, Inc. – Served as site safety officer (SSO) during hazardous waste site remediation. Responsible for implementing all aspects of the HASP, including daily safety tool box talks, site control, PPE, confined space entry, excavation safety, lock out-tag out and work zone monitoring.

Land Remediation, Inc. – SSO for 22 weeks during in-situ soil stabilization of coal tar impacted soils. Duties included work zone monitoring using MultiRae four gas meter and TSO Side-Pac, safety audits, implementing the HASP and preparing and presenting weekly health and safety reports.

Asbestos Project Monitoring/Surveys:

Corning Inc, - Project monitoring and air sampling services for the removal of ductwork gaskets and pipe insulation.

Central Square School District - Provided project monitoring and air sampling services for three schools for the removal of floor tile and mastic prior to renovation.

SUNY ESF - Project monitoring and air sampling services for the removal of spray-on insulation and pipe fittings and elbows.

Lockheed Martin - Project monitoring and air sampling services for the removal of floor tile and mastic.

National Grid - Provided project monitoring services for the removal of exterior window caulk and roof flashing prior to building demolition.

Heuber-Breuer – Asbestos survey and bulk sampling prior to demolition of 20+ buildings at a pharmaceutical plant.

New York Power Authority – Numerous project monitoring and bulk sampling projects were conducted.

Community Air Monitoring Program (CAMP):

LeChase Construction Services – Monitored ambient air at the site perimeter for dust and volatile organic compounds at the Syracuse University Center of Excellence.

Land Remediation, Inc. – Community air monitoring using MiniRae PID, TSI Dust-trak, and Davis meteorological station during remediation at a National Grid MGP waste site.

Land Remediation, Inc. – Daily CAMP monitoring for 22 weeks during in-situ soil stabilization of coal tar impacted soils. Duties also included weekly erosion control inspections and reports as well as daily inclinometer well testing during excavation.

MARK C. YATES ***RESUME***
2063 Stanley Rd.
Cazenovia, New York
(315) 655-8556 (315) 560-2560 (cell)
mlyates@twcny.rr.com

Environmental Assessments:

Cottonwood Development, LLC – Assisted with a Phase I Environmental Site Assessment (ESA) for an approximate 16-acre parcel comprised of three buildings used for light manufacturing, warehousing, distribution, and commercial activities. The project was requested in connection with the potential purchase of the subject property.

Heavy equipment sales and rental company - Assisted with a Phase I assessment that involved the evaluation of current and past activities of a site including numerous buildings. Concerns related to past disposal practices and petroleum storage were addressed by this ESA and, as a result, a limited Phase II was conducted to assess whether historic use of the property impacted the site.

Quick Change – Researched historical documents and maps and helped prepare a Phase I ESA for an approximate two-acre parcel where an automobile repair business operated from a five-bay garage.

Major Medical Institutions (Syracuse, NY) – Performed site visits and research at two large medical facilities to identify potential recognized environmental conditions at the subject properties that were being considered for purchase. Historic activities conducted at the sites, such as petroleum usage and storage including many USTs and ASTs, waste disposal activities, medical waste incineration, PCB and mercury usage, resulted in recognized environmental conditions. As a result of the findings, a Phase II was recommended.

Real estate developer (Syracuse, NY) – Performed a site visit and research at a large parking lot site in an urban setting in connection with the potential purchase of the subject property. Past uses of the site as railroad spur and at neighboring properties, such as chemical manufacturing, automobile repair and gasoline storage resulted in recognized environmental conditions.

Environmental Laboratory Experience:

O'Brien & Gere Laboratories and Life Science Laboratories - Developed a strong background in all phases of environmental organic chemistry over 20 years with a particular expertise in gas chromatographic analysis of environmental matrices utilizing EPA methods. Responsibilities included preparing reports for clients, gas chromatograph operation and maintenance, methods development and quality control. Proficient with Agilent 5890 and 6890 gas chromatographs with electron capture and flame ionization detectors including maintenance and repair.

Consistently demonstrated proficiency in extraction and analysis utilizing the following EPA methods: pesticides by CLP, 8081A and 608, herbicides by 8151A, petroleum hydrocarbons by 8015 and 8100, PCBs by CLP, 8082 and 608 including congener specific analysis, EDB and DBCP by 8011, explosives by 8330 (HPLC), and PAHs by 8310 (HPLC).

Setup of off-site laboratories for rapid analysis of PCBs at GE plants in Pittsfield, MA and Parkersburg, WV. Duties included procuring supplies, interviewing and training employees, and instrument setup.

Appendix B

Chemtech Quality Assurance Manual

QUALITY ASSURANCE MANUAL

CHEMTECH

284 Sheffield Street
Mountainside, NJ 07092
Tel: (908) 789-8900

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Date Effective: June 10, 2013

Approved By:

Divya Mehta — Date: 06/07/13
Technical Director

Himanshu Prajapati — Date: 06/07/2013
QA/QC Director

INTRODUCTION

The Chemtech Quality Program, outlined in this document, has been prepared to meet the requirements of ISO/IEC DIS 17025 and National Environmental Laboratory Accreditation Program (NELAP). The program establishes all Quality Assurance (QA) policies and Quality Control (QC) procedures to follow in order to ensure and document the quality of the analytical data produced by the Laboratory. The Quality Program is reviewed periodically and revisions are implemented as required.

Chemtech Standard Operating Procedures (SOPs) provide explicit instructions on the implementation of each element of the plan and assure that compliance with the requirements of the plan is achieved. All employees are required to adhere to the requirements of the SOP's in performing their specific job functions. SOP's are reviewed periodically and revisions are implemented as required when change occurs.

The goal of the Quality Program is to consistently produce accurate, defensible analytical data through the implementation of sound and useful Quality Assurance/Quality Control management practices. The plan will ensure that Chemtech, its employees and client expectations are achieved.

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1. QUALITY POLICY

1.1 CHEMTECH MISSION

Chemtech will be recognized as a dynamic, professional organization, which provides high quality analytical services to the environmental market.

It will consistently meet client expectations while providing a challenging work environment for its employees and acceptable profit margins for its shareholders.

1.2 POLICY STATEMENT

Chemtech is committed to the production of analytical data meeting specific defined quality standards and to continue improvements in all areas of our operation. As a result of having a focus on environmental analyses, an emphasis is placed on timelines of work, meeting data quality objectives, and the legal defensibility of the data. Each operation maintains a local perspective in its scope of services and client relations and maintains a national perspective in terms of quality. Chemtech has policies and procedures to avoid involvement in any activities that would diminish confidence in its competence, impartiality, judgment or operational integrity. Under the guidance of this quality assurance manual, a level of quality, which is acceptable on a national and international scale, is upheld in all Chemtech laboratory operations. Chemtech management is committed to be compliant with NELAC TNI Standard (EL-V1-2011) and NELAP policies. Chemtech will comply with the requirements in Department of Defense Quality Systems Manual for Environmental laboratories, Version 4.2 for all DOD work.

Our corporate goal for all segments of Chemtech operations is to have uniform products and service quality standards, while encouraging local variation to meet state regulations and customer specifics needs. The process of achieving this goal entails continuous evaluation and action. Chemtech management requires documentation of existing practices and improvement action plans at every stage in the analytical measurement process. Documentation is fundamental to the demonstration and management of quality practices in environmental analytical laboratories.

Chemtech management is committed to continually improve the quality system. The importance of meeting customer requirements, operating in accordance with statutory and regulatory requirements, and operating in accordance with Chemtech's documented ethics policy is communicated to all personnel and stressed at all levels of work.

A spirit of innovation is an essential element to the success of Chemtech in solving the complicated analytical problems encountered with environmental samples. This spirit, combined with the discipline and attention to detail required to provide the level of service expected by our customers, is what makes Chemtech stands out among others in this field. This same spirit is what drives continuous quality improvement and is the keystone to the Chemtech quality program.

1.3 ANNUAL REVIEWS AND PLANNING

As part of our 2011 TNI Standard Certification requirement, the QA/QC Director produces an annual report to the Management to discuss deficiencies, corrective actions and planning for the upcoming year. All corrective actions in the laboratory are documented and updated in the Corrective Action Report Database. These Corrective Action Reports are also graphed. The QA/QC Director submits this report to the Management at the beginning of the year and the management performs annual review and planning based on this report. The issues discussed in the report are New Certifications, New Instrumentation, Performance Evaluation, Assessment, Quality Assurance Programs and Goals for the next year.

2. ORGANIZATION AND MANAGEMENT

2.1 ORGANIZATIONAL ENTITY

Chemtech, located in Mountainside, New Jersey, is a privately held independent analytical laboratory established in 1967. Chemtech is incorporated in the State of New York and registered to do business in the State of New Jersey. Our Directors, many of who are also major shareholders are acutely aware of the dynamics of our industry, the changing technology, and need for capital investment. Capital for investment in technology and expansion is mainly derived from operating profits and our shareholders. We have been successful in acquiring the necessary equipment, software and automation necessary to be a leader in the analytical community.

2.2 MANAGEMENT RESPONSIBILITIES

Objective: The laboratory has an established chain of command as detailed in the Organizational Chart. The responsibilities of the management staff are linked to the President of Chemtech who establishes the strategy and direction for all company activities.

President: Primarily responsible for all operations and business activities. Develops and implements strategies, initiatives and direction for the company. Delegates authority to Laboratory Directors, all Managers, and Quality Assurance/Quality Control Director to conduct day-to-day operations and execute quality assurance duties.

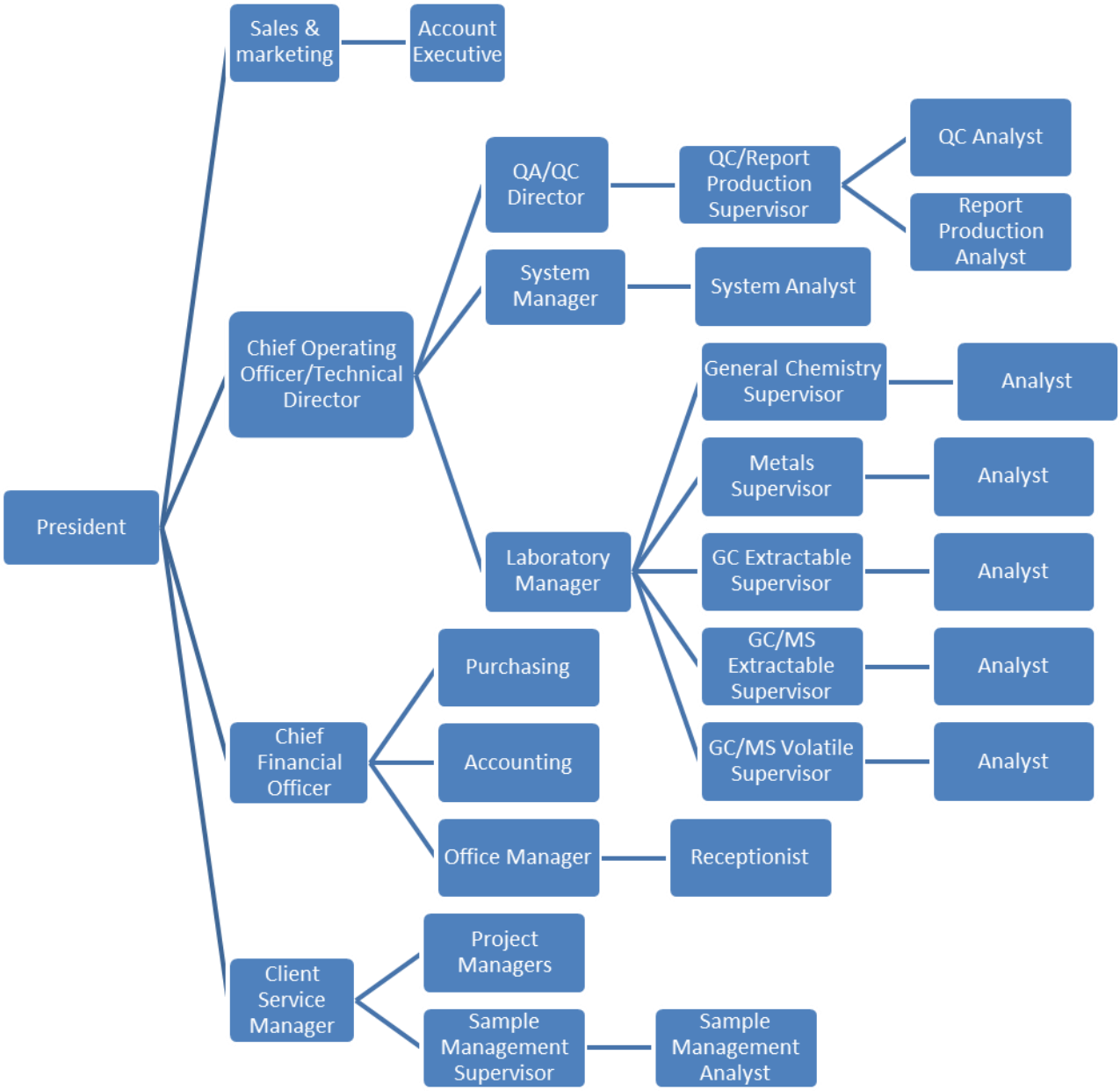
Chief Operating Officer/Technical Director: Facilitates uniformity and focus in all aspects of the company's technical affairs; including, Quality Assurance, Information Systems, and Organic and Inorganic technical direction. Strives to align the strategies, initiative and direction of technical affairs with the strategic direction of the company. Reports to the President.

Quality Assurance/Quality Control (QA/QC) Director: Implements, supervises, and facilitates responsibility for all QA activities established by the Quality Program. Reports to the Chief Operating Officer/Technical Director.

Laboratory Manager: Plans, directs, and controls the day-to-day company's operational performance expectations. Reports to the Chief Operating Officer/Technical Director.

Department Manager: Supervises, plans, directs, and controls the day-to-day responsibility of a specific laboratory department. Report to Laboratory Manager.

Department Supervisors: Supervise day-to-day responsibility of a specific laboratory department. Report to Department Manager.


President
Sales & marketing
Account Executive
Chief Operating Officer/Technical Director
QA/QC Director
QC/Report Production Supervisor
QC Analyst
Report Production Analyst
System Manager
System Analyst
Laboratory Manager
General Chemistry Supervisor
Analyst
Metals Supervisor
Analyst
GC Extractable Supervisor
Analyst
GC/MS Extractable Supervisor
Analyst
GC/MS Volatile Supervisor
Analyst
Chief Financial Officer
Purchasing
Accounting
Office Manager
Receptionist
Client Service Manager
Project Managers
Sample Management Supervisor
Sample Management Analyst

3. RELATIONSHIP BETWEEN MANAGEMENT, TECHNICAL OPERATIONS, SUPPORT SERVICES, AND QUALITY SYSTEM

Objective: The members of the management team have defined responsibility for the Quality Program. The development and implementation of the Quality Program is the responsibility of Quality Assurance/Quality Control Director. The implementation and operation of the Program is the responsibility of the operations management.

President: Responsible for all quality activities including the overall responsibility of implementing the Program. Authorizes the QA/QC Director to design, implement, and coordinate the Program.

Chief Operating Officer/Technical Director: Responsible for executing and coordinating the Program in all laboratory departments. Responsible to certify and document that personnel have the appropriate education and/or technical background to perform the tests for which the laboratory is accredited to perform. Responsible for the development and implementation of corrective actions, including the authority to delegate Quality Program implementation responsibilities. Is the primary alternate in the absence of the QA/QC Director or Laboratory Manager.

Quality Assurance/Quality Control Director: Responsible for the establishment, execution, support, training, monitoring of the Quality Program & document control. Identifies all product, process, or operational defects through statistical monitoring and audits including implementation of corrective action. Audits corrective actions for compliance with the Program. Is the primary alternate in the absence of the Technical Director for QA/QC related issues.

Laboratory Manager: Responsible for coordinating and monitoring the requirements of the Quality Program in the laboratory. Assures that subordinates follow the requirements of the Quality Program. Implement corrective actions as necessary to address quality deficiencies. Is the primary alternate in the absence of Technical Director for technical issues, and the primary alternate in the absence of Department Managers or Department Supervisors.

Department Managers: Responsible for implementing the requirements of the Quality Program in their departments. To assure all subordinates and analysts follow the requirements of the Quality Program. Implement corrective actions as necessary to address quality deficiencies.

Department Supervisors: Responsible for implementing the requirements of the Quality Program within their department. To assure all analysts follow the requirements of Quality Program. Implement corrective actions as necessary to address quality deficiencies.

Analysts: Responsible for applying the requirements of the Quality Program to the analyses they perform. To evaluate QC data and initiate corrective action for quality control deficiencies within their control. Implement corrective actions as directed by superiors.

Support Services: Sample Management, MIS, Client Services and the Account Executives are responsible for applying the applicable requirements of the Quality Program to their specific tasks.

4. JOB DESCRIPTION OF KEY PERSONNEL

Objective: Job descriptions of key positions are defined to communicate a clear understanding of the duties and responsibilities including reporting relationships.

President: Responsible for all business activities including the strategic direction, mission and expectations of the company. Builds a strong, cohesive management team that is constantly focused on improving the operating, technical and financial performance of the company.

Chief Operating Officer/Technical Director: Coordinates the operational activities and the technical direction of the laboratory. Responsible to certify and document that personnel have the appropriate education and/or technical background to perform the tests for which the laboratory is accredited to perform. Develops the strategy to evaluate new methods, technology and objectives. Provides assistance and leadership to management teams to implement new innovated technologies. Reports to the President.

Quality Assurance/Quality Control Director: Establishes and audits the company quality program. Provides technical assistance to ensure that the procedure and data quality is technically sound, legally defensible and consistently meets the objectives of the QA Manual. Reports to the Technical Director.

System Manager: Provides the operational support for all information systems. Develops and implements MIS software to meet the strategic and technical goal of the company. Reports to the Technical Director.

Client Service Manager: Responsible for the planning, directing and control of the Sample Management Department and the Project Management staff. Supervises the sample log in operation and coordinates the project management activities. Communicates client expectations to the laboratory regarding analytical and reporting requirements. Reports to the President.

Laboratory Manager: Provides the technical, operational and administrative leadership through planning, allocation and management of personnel and equipment resources. Maintains a clearly qualified model of laboratory capacity. Uses this model as a basis for controlling the flow of work into and through the laboratory. Reports to the Technical Director.

Department Manager: Directs, plans and controls the operations of the department. Supervises daily production to ensure compliance with the requirements of the Quality Program and client expectations. Reports to the Laboratory Manager.

Department Supervisor: Provides supervision and directions for the group. Implements the daily analysis schedule. Ensures that the group and the analytical data are in compliance with the Quality Program. Reports to the Department Manager.

5. APPROVED SIGNATORIES

Objective: For traceability of data and related documents procedures are required which detail the authorization of signature approvals of data and information within Chemtech. A log of signatures and initials of all the analytical staff is maintained in the QA/QC office for cross-reference check.

5.1 SIGNATURE AUTHORITY

President: Authorizes contracts and binding agreements.

Chief Operating Officer/Technical Director: Approves the QA policy and SOP's and approves final reports in the absence of QC supervisor and QA/QC Director.

Quality Assurance/Quality Control Director: Approves SOP's, and the QA Plan. Approves final reports in the absence of QC supervisor.

5.2 SIGNATURE REQUIREMENT: All laboratory activities, commencing with sample receipt through the release of data, are approved by appropriate personnel by initialing or signing and dating the documents. A document signed or initialed by an employee, is within their limits of authority. All raw data are initialed and dated by the analyst conducting the analysis. All signatures and initials can be cross-referenced to the signatures and initial log.

5.3 SIGNATURE AND INITIAL LOG: The QA/QC office keeps a logbook of all signatures and initials of all technical personnel. New technical employee's signatures and initials are added to the logbook on the first day of their employment. Ex-employee signatures are kept on file but annotated with the last day of employment.

6. PERSONNEL TRAINING

Objective: To ensure that all analysts are properly trained, acquire an adequate amount of experience prior to performing independent analyses and maintain technical competence. These factors are an essential part of the laboratory QA Program. Chemtech uses personnel who are employed by, or are under contract to Chemtech. Where contracted and additional technical key support personnel are used, Chemtech ensures that such personnel are supervised and competent and that they work in accordance with Chemtech's quality system.

6.1 EMPLOYEE ORIENTATION AND TRAINING: All new employees go through a training period which includes introducing new personnel to Chemtech company policies, QA/QC practices, safety and health, and ethics training in addition to training related to their job functions. The training period extends approximately 1 to 6 months, depending upon the level of experience of the individual.

6.2 PERSONNEL QUALIFICATIONS AND TRAINING: All technical employees at Chemtech fulfill the educational, work experience, and training requirements for their positions as outlined in their job description. As workload permits, Chemtech encourages cross training of personnel as appropriate.

All employees must undergo laboratory health and safety training and ethics training and must read laboratory QA Manual. A signed and dated statement from each technical employee that they have read, understood, and is using the latest version of the laboratory QA manual and SOP's is maintained in their training file.

A signed and dated statement from each employee that they have read, acknowledged and understood their personal ethical and legal responsibilities is kept in their training record.

The analysts are also required to take any QA/QC training (Introduction to Quality Assurance and specialized QC courses) provided by the QA/QC Director.

6.3 TECHNICAL SKILLS: Analysts are initially qualified by education with a minimum of a BS degree in Chemistry, Physical and/or Biological sciences, wherever required. Every new analyst is trained, regardless of education and outside experience, in the individual analytical procedures by a senior analyst. All Chemtech analyst capabilities are determined initially with Initial Demonstration of Capability studies.

When new equipment is purchased, appropriate Chemtech personnel are trained locally by the manufacturer, vendor or at the manufacturer's training course.
Any significant change to an analytical system requires that the analyst perform an initial demonstration of precision and accuracy, and recalibration of the instrument. For example, replacing a column in a gas chromatograph, cleaning the mass spectrometer ion source, etc.

6.4 **TRAINING RECORDS:** Training records for technical employees are kept in the QA office. The Technical Director certifies and document's that all technical employees have the appropriate education and/or technical background to perform the tests for which the laboratory is accredited to perform. It is the responsibility of each employee to assure that records of completed training are provided to the QA/QC Director to update his/her personnel file.
In addition to the ethics and QA manual statements, the employee record file contains: read receipts of SOP's, a Demonstration of Capability for each accredited method that he/she performs; documentation of any training courses, seminars, and/or workshops; and documentation of continued proficiency to perform each test.
Continued analyst proficiency can be achieved by one of the following: acceptable performance of blind samples for each accredited method that he/she performs; through the analysis of Laboratory Control Samples - at least four consecutive Laboratory Control Samples with acceptable levels of precision and accuracy.

6.5 **Training requirements for key positions:** Training requirements are assigned depending on the position and department the employee is in.

QA/QC Director: The QAQC Director must have ample knowledge of the laboratory procedures, have at least 5 years of laboratory experience preferably in Organics and have at least 2 years of data review procedures training.

Department Manager- A department manager must have at least 3 years of experience in the area of Supervision. Must have proper training in methodology and the skill to organize, schedule and train personnel for a successful operation of their department.

Department Supervisor: A department supervisor must have at least 2 years of experience in the area they are to supervise. Be able to write SOPs

7. ETHICS POLICY

Chemtech provides comprehensive analytical testing services for the qualitative and quantitative assessment of environmental contaminants. Our services are used to meet various regulatory permitting and reporting requirements, determine compliance for both State and Federal environmental regulations to assess potential present and future environmental liability or health risks.

Our policy is to conduct our business with honesty and integrity; to produce accurate and usable data, and provide our employees with guidelines leading to an understanding of the ethical and quality standard required by Chemtech.

7.1 CODE OF ETHICS: Chemtech is managed in accordance with the following principals:

To produce analytical test results that are accurate and meet the requirements of our Quality program.

To operate our laboratory in a manner that protects the environment, as well as the health and safety of all our employees.

To provide employees with guidelines leading to an understanding of the ethical and quality standards required by Chemtech.

To report analytical data without any considerations or self-interests.

To provide analytical services in a confidential, truthful, and candid manner.

To abide by all Federal, State, and Local regulations that affects our business.

To have processes to ensure that its management and personnel are free from any undue internal and external commercial, financial and other pressures and influences that may adversely affect the quality of their work.

7.2 EMPLOYEE ETHICS TRAINING: Each employee receives ethics training during employee orientation and must sign an Employee Ethics Statement. During the orientation, an employee is made aware of the ethical and legal responsibilities including potential punishments and penalties for improper, unethical or illegal actions. The Employee Ethics Training program is updated annually (or more frequently if required). Ethics Training Seminars are presented annually, and all employees are required to attend. Personnel files are updated to include the date the employee attended the annual Ethics Training Seminar.

8. FACILITIES AND RESOURCES FOR NEW ANALYTICAL PROJECTS AND IMPLEMENTING CLIENT REQUIREMENTS

Objective: To ensure that appropriate facilities and resources are available to meet the demand for new analytical projects and process to implement client requirements.

8.1 REVIEW OF NEW ANALYTICAL PROJECTS: A Project Chronicle (PC) is prepared by the Account Executive prior to a quotation preparation and/or an award, and presented to the Technical Director and his staff for review and comments. The PC outlines all the client requirements and includes copies (if available) of the clients Quality Assurance Project Plan (QAPP), Statement of Work (SOW) and contractual provisions. The PC and associated information are scanned and stored on the network for future reference.

A "Kick Off Meeting" chaired by the Technical Director is scheduled to discuss the PC and its associated information. Project Management, the QA/QC Director, Laboratory Manager, including appropriate Department Managers/Supervisors, Sample Management and MIS staff are present to familiarize themselves with the requirements, and are asked to participate in the planning and implementation of the project.

8.2 RESOURCE AVAILABILITY: Chemtech maintains a 30,000 square foot laboratory designed for maximum efficiency and safety. There is a redundancy of equipment to ensure ample equipment resources. The laboratory is adequately staffed by a highly skilled group of chemists with diversified experience in environmental analysis; and managed by a knowledgeable team of professionals who are committed to quality and client satisfaction.

The laboratory management maintains a clearly defined model of laboratory capacity based upon historical data. This model is the basis for controlling resources, management of personnel and equipment, including the flow of work into and through the laboratory.

8.3 NEW WORK COORDINATION: Project Management coordinates the project logistics with the client and Sample Management in addition to overseeing the analytical progress through the laboratory. Sample Management initiates the Log-In process, which includes requirements, detailed in the PC and Quotation.

Prior to release of data to the client, the Department Managers, Supervisors, and the QC/Report Production staff review the data for completeness, accuracy, and conformance with applicable regulatory and clients requirements.

9. CLIENT CONFIDENTIALITY

Objective: To design and implement policies and procedures to protect the confidentiality and proprietary rights of our clients.

9.1 CLIENT CONFIDENTIALITY:

Information related to a Client and or a Project are entered and stored in Chemtech's LIMS SQL Server. Employees with the appropriate level of authority enter the information. Security levels within Chemtech's system define an individual's access to information levels. Information on the Server is backed up at defined intervals, and the backup information is stored offsite. Refer to P229-Computer Backup and Security SOP and P232-Data Storage SOP.

Analytical data is prepared in a report format, as required by the client. The report is copied and scanned electronically. A paginated copy of the report or the original copy is distributed as directed by the client while the scanned copy and related information is kept on site in the Document Storage Area on our LIMS Server. The employee's security authorization levels limit access to the Document Storage Area or the LIMS Server. The files are archived for a period of five years.

Electronic data stored in Chemtech's database is protected by a variety of systems including, Virtual Private Networks (VPS), firewalls, log in user names and passwords. A Gateway system is also employed to restrict access to specific users based upon their authorization level.

Reports or client information requested by a third party must be accompanied by written authorization from our Client. Client information is released when directed by a subpoena from a court with valid jurisdiction. The Client is promptly notified of the subpoena requesting their information.

10. CLIENT COMPLAINTS AND RESOLUTIONS

Objective: To establish a system to address and resolve client complaints regarding any laboratory activity. The process for dealing with complaints must include a procedure, documentation, corrective action, and monitoring of the implemented corrective action. Chemtech will co-operate with the client or their representatives to clarify the client's request and to monitor the laboratory's performance in relation to the work performed, provided that Chemtech ensures confidentiality to other clients.

10.1 PROCEDURE: When a client calls or e-mails an inquiry regarding a project or a report to the Project Manager (PM), the PM receiving the call (or e-mail) summarizes the client issue or requests the client to mail/fax any questions. Once a formal request is received, the PM communicates to the QA/QC Director, who prepares a Corrective Action (CA) report form, which includes the client name, laboratory project numbers(s), and summary of issues. The CA report form is assigned a three digit tracking number, by the QA/QC Director. The CA report form is submitted to the Technical Director, who assigns the CA report form to the affected department supervisor to review, comment and correct the issue within 24 hours. All technical and data reporting inquiries are submitted to the QA/QC Director for review. Once the response comes back from the laboratory, the QC Supervisor and QA/QC Director reviews it, and if satisfactory, the CA report form is filed in the QA/QC office. The client is sent the corrected information.

10.2 DOCUMENTATION: Client's complaints are documented using CA report form, which originates from the QA/QC Director's office. The original communication (phone log, e-mail, or fax) is kept in the PM office while closed CA report form is filed in the QC office. The CA report contains the date and name of the person receiving the complaint, a description of the complaint, source of the complaint, the resolution, and any written material accompanying the complaint. The CA database is updated by QA/QC office to which only QA/QC Director has access. A database is maintained where client inquiries are logged-in including date, client name, project number, department in question, and a summary of the inquiry and CA taken.

10.3 CORRECTIVE ACTION: The CA report is entered in a database to monitor systematic defects. The appropriate department supervisor must deal with the complaint by responding to the inquiry. The response must address the issue(s) and provide an explanation and resolution. The response may involve reprocessing of data and issuing a revised data report. The QA/QC Director reviews the CA for a persistent defect in case the

respective SOP needs modifications. Refer to P210-Corrective Action Report SOP.

10.4 QA/QC AUDITING: The CA is entered in a database to monitor systematic defects. The QA/QC Director investigates complaints and promptly audits all areas of activity to assure that the CA implemented has resolved the defect. If the defect persists, the QA/QC Director, and Department Manager and Supervisor develop and implement an effective process. When the defect is resolved, monitoring is incorporated as a part of the annual system audit. For detailed information on client inquiries refer to the SOP for handling client inquiries.

11. SAMPLE MANAGEMENT PROCESS

Objective: To establish a system to process client requests for analytical services and samples upon arrival at the laboratory. Refer to P204-Chain of Custody SOP and P250-Log in SOP for detailed information for sample receipt, containers and all other related information.

11.1 CONTAINER ORDER REQUEST: Project Managers prepare a Container Order Request from the information detailed on the Project Chronicle (PC) and provide a copy to Sample Management in order to initiate a sampling event.

11.2 SAMPLE CONTAINER PREPARATION AND SHIPMENT: All bottle orders prepared from the Container Order Requests are prepared with bottles that are certified pre-cleaned by the manufacturer according to US EPA specifications. Reagent grade preservatives are added to the bottles at the laboratory. All preservative solutions are checked to assure that they are free of contamination. Chemtech utilizes laboratory reagent water for trip and field blanks.

Bottle orders are prepared by sample management department. The bottles are then relinquished from Sample Management to the appropriate courier. When the bottles arrive at the client destination, the courier will then relinquish custody of the bottles to the client or the client designee.

Samples arrive at the laboratory via Chemtech couriers, common carrier, or client delivery. All shipments and deliveries of samples are received through the shipping & receiving door located in the rear of the facility. All deliveries enter in the same location and go directly to the sample room. The SOP's for Chain of Custody (CoC) P204 Chain of Custody SOP and Sample Acceptance and Receipt P250-Log-in Procedure SOP are followed.

Sample Management personnel sign for all shipments received and notify the Sample Custodian immediately. The samples are then relinquished to the Sample Custodian.

A sample or sample container is considered to be in custody if: it is in the persons' actual possession; it is in the person's view after being in their physical possession; it was in their possession and then locked in a refrigerator or sealed in a cooler; it is in a designated secure area.

11.3 SAMPLE ACCEPTANCE

Upon receipt of sample coolers at the laboratory, coolers are examined for damaged or broken custody seals. Records of the condition of the custody seals and coolers are recorded on the Project Track Ticket Detail. If seals and coolers are intact, the sample acceptance procedure is continued. If they are not intact, the appropriate Laboratory Project Manager (PM) is notified. The PM will seek guidance from the client whether to proceed with the analysis of the samples or discard or send back the samples. The PM will communicate information given by the Client to Sample Management via Project Track Ticket Detail.

11.4 SAMPLE RECEIPT

Once the samples have been accepted, the sample receipt process begins. Sample Management will issue the Project ID, which will be documented on the CoC and on the respective cooler. Sample Management will then give a yellow copy of the CoC to the Project Manager. The Project Manager will generate Login-Guidance based on the CoC review. The Sample Custodian will line up the samples according to the CoC and begin comparing the information documented on the CoC to the samples received. Any deviation noted from the CoC or non-conformance is recorded on the Project Track Ticket Detail and communicated to the appropriate Laboratory Project Manager.

11.5 SAMPLE CUSTODIAN RESPONSIBILITIES

The Sample Custodian must take a cooler temperature soon after sample receipt and record it on the Laboratory Chronicle and the Field CoC. This will verify that the samples were transported and received at the required temperature.

The Sample Custodian must ensure that samples are received in good condition and ensure that samples listed on the CoC are all present. The Sample Custodian must compare the sample identification on the CoC to the labels on the bottles, and make sure that the information on the CoC exactly matches the bottle labels. Verification that enough volume has been received for the sample tests requested and absence of headspace for volatile analysis must be noted.

The Sample Custodian must ensure that all samples are properly preserved. Appropriate preservation of samples is determined by checking the pH of the samples. Sample Management Staff are issued a reference table that lists the tests methods utilized and their appropriate preservation techniques. The pH of the samples is checked, and any discrepancies are recorded on the Laboratory Chronicle and communicated to the client.

The Sample Custodian must sign the CoC and other documentation received with the samples. Documentation of custody is initiated when the field sampler is collecting the samples. Custody documentation includes all information that provides a clear record of the sample identification, time of collection, and collection chronology. This record is kept on Chemtech or Client CoC Forms.

The Sample Custodian must place the samples in storage or relinquish to the appropriate laboratory analyst after labeling the samples with the unique laboratory number, as will be automatically assigned by the software when samples are logged in the LIMS. Refer to P250-Log-in Procedure SOP.

11.6 SAMPLE MANAGEMENT STAFF RESPONSIBILITIES

Sample Management staff must review the Field CoC submitted by the Sample Custodian once login is created based on Login Guidance from the PM. Sample Management staff must compare the Login Guidance to the Field CoC and ensure that all information on the Login Guidance follows the CoC. If not, contact the appropriate PM for further guidance. The PM should resolve all discrepancies between the Login Guidance and the CoC prior to signing off the project. Once the discrepancies are resolved the PM will issue a Record of Communication to document the client's instructions.

Upon receipt of the yellow copy of the CoC, the Project Manager will create a Login Guidance. Sample Management will proceed to login the samples based on the Login Guidance. Create a folder with the original Field CoC, the sample and delivery tickets, any third party delivery documentation, and the login report.

If samples are received for short hold-time analysis (hold times less than 72 hours) after 5:30pm, then samples are relinquished to the laboratory without login. Samples relinquished by the sample management personnel and received by the analytical department analyst are documented on a copy of the CoC.

11.7 SUBCONTRACTED ANALYSIS

Projects sometimes contain analyses that Chemtech does not perform. In order to give a high level of service to our clients, Chemtech will subcontract these analyses to other laboratories. All subcontracted laboratories must meet vigorous standards set forth by QA/QC Department as well as standards established for the environmental laboratory industry. A documented procedure is followed to qualify laboratories for subcontracting and a list in maintained in our QA/QC

Department. Procedures have also been established to assure that CoC is maintained and the subcontract laboratory achieves all client objectives.

Note: For DoD work: Subcontracting laboratories must have an established and documented laboratory quality system that complies with DoD QSM requirements, must be approved by the specific DoD component, must be able to generate acceptable results from PT sample analysis, must receive project-specific approval from DoD client before any samples are analyzed, and must identify those samples requiring special reports (e.g. MCL exceedance).

A subcontracted laboratory must provide our QA/QC Department the following information in order to be used as a subcontractor: a valid state certification for the required tests, Quality Assurance Plan, PT Studies for the required tests, and copies of the SOP's for the required tests.

The subcontracting procedure is a documented procedure that is initiated by an Account Executive. The Account Executive is responsible for ensuring that the subcontracted laboratory meets all client specifications. When a client issues a Scope of Work, the Account Executive thoroughly reviews the document. If subcontracting is required, the Account Executive will consult the established subcontracting list that is issued by the QA/QC Department. If a particular analysis is not conducted by one of these approved laboratories, the Account Executive must then request that QA/QC Director locates and approves a laboratory for the requested analysis.

Once a subcontract laboratory is found, the Account Executive must contact the laboratory to communicate the client's requirements and request a quotation from the laboratory. The Account Executive then creates a Project Chronicle that documents the client requirements, the subcontract laboratory to be used, and attaches a quote to this document. The Project Chronicle is an electronic document available to all appropriate personnel. This procedure is followed prior to the receipt of samples from the client.

When the client calls to order the bottles for the project, the PM initiates a Container Order Request from the information documented on the Project Chronicle. The Container Order Request includes the information for the subcontract laboratory as well as any special bottle instructions for the subcontracted tests, and is given to Sample Management. Sample Management then creates the bottle order and sends it to the client.

Upon receipt of the samples, the Sample Custodian will give a copy of the CoC to the Client Service Manager. The Client Service Manager will then create a subcontract chain of custody and procure a Purchase Order from Accounting. This documentation is given to Sample Management to send to the subcontract laboratory along with the samples. A copy of this documentation is retained and placed in the login folder and double-checked by the appropriate Project Manager.

All subcontracted samples are logged into the LIMS System to allow for sample tracking and data reporting. A PM will track the samples to ensure that client deadlines and specifications are met. Once the data packages arrive from the subcontract laboratory, the PM will check the report for completeness. If the data package is deficient, the PM will immediately notify the subcontract laboratory to remediate the deficiencies. The report is then passed to the QA/QC Department. All data that is subcontracted is clearly designated.

11.8 SAMPLE STORAGE

Chemtech maintains a 40-foot walk-in refrigerator that contains a multitude of shelves. Sample Management staff maintains the storage chart manually that indicates the locations in the refrigerator that are either used or empty. While assigning sample storage location, sample custodian looks for available shelves by checking the sample storage chart, and then crosses off that shelf location on the chart to indicate that the shelf is now occupied. All samples, with the exception of volatiles, are kept in this refrigerator. The refrigerator temperature is monitored constantly and recorded once a day. The refrigerator temperature is also monitored using a data logger over the weekend. All shelves in the walk-in refrigerator are identified with a code. The Sample Custodian assigns samples to a refrigerator shelve and gives the shelve location to Sample Management to login with the sample information. This documented procedure allows the samples to be found very easily.

The volatile refrigerators are located in the Volatile Department and kept secure. All Volatile refrigerators are also monitored for temperature. The temperature is recorded every day on a log page. Samples for Volatile Organic analysis are stored separately from other samples. Samples suspected of containing high levels of Volatile Organic Compounds are further isolated from other Volatile Organic samples.

Back-up refrigerators are available should any mechanical problem present itself. All samples are securely moved to the backup refrigerators if necessary.

Only the Sample Custodians are permitted access to sample storage. Analysts create a sample request electronically and send the request to the Sample Custodians. Once received, the Sample Custodians fill out the appropriate paperwork and issue the samples to the Analysts.

Periodically throughout the day, the Sample Custodians will pick up samples from the laboratory and sign them back into storage. Analysts will submit a signed work list to the Sample Custodian along with the samples when they finished with the samples. All samples must be back in refrigeration at the end of a shift and the chain of custody is required to be kept at all times.

12. ANALYTICAL CAPABILITIES

Analytical Fraction	Soil/Solid Matrix Methods	Aqueous Matrix Methods
Volatile Organics by GC/MS	SW 5030B/5030C/8260B SW 5035/8260B SOM01.2	SW 5030B/5030C/SW 8260B SW5035/SW 8260B OLC02.1 OLC03.1 EPA 524.2 EPA 624 SOM01.2
Volatile Organics by GC	SW 8015B/8015D	SW 8015B/8015D
Semi volatiles by GC/MS	SW 3510C/SW 8270C SW 3520C/SW 8270C SW 3540C/SW 8270C/8270D SW 3545/SW 8270C SW 3580A/SW 8270C/8270D SW 3550C/8270D SOM01.2 CWA by 8270-Modified White Phosphorus by Chemtech SOP	EPA 625 SW 3510C/SW 8270C/8270D SW 3520C/SW 8270C/8270D SW 3540C/SW 8270C SW 3545/SW 8270C SW 3580A/SW 8270C/8270D OLC02.1 OLC03.1 SOM01.2 CWA by 8270-Modified White Phosphorus by Chemtech SOP
Chemical Warfare Agent Degredation Products	Chemtech SOP	Chemtech SOP
White Phosphorus	Chemtech SOP	Chemtech SOP
Semi volatiles by GC	SW 8015B/8015D	SW 8015B/8015D
Explosives by HPLC	SW 8330A/8330B	SW 8330A/8330B
Pesticides &/ or PCBs	SW 3510C/SW 8081A&/or 8082 SW 3520C/SW 8081A&/or 8082 SW 3540C/SW 8081A/8081B&/or 8082/8082A SW 3545/SW 8081A&/or 8082 SW 3580A/SW 8081A/8081B&/or 8082/8082A SW 3550C/8081B &/or 8082A SOM01.2	SW 3510C/SW 8081A/8081B&/or 8082/8082A SW 3520C/SW 8081A/8081B&/or 8082/8082A SW 3540C/SW 8081A&/or 8082 SW 3545/SW 8081A&/or 8082 SW 3580A/SW 8081A/8081B&/or 8082/8082A EPA 608 SOM01.2
Chlorinated Herbicides	SW 8151A	SW 8151A
Volatile Organics by GC/MS	Air Matrix Method: TO-15	

Analytical Fraction	Soil/Solid Matrix Methods	Aqueous Matrix Methods
Metals	SW 6010B/6010C SW 6020/6020A SW 7471A/7471B SW 3050B ILM05.4 ISM01.2	EPA 200.7 EPA 245.1 SW 6010B/6010C SW 6020/6020A SW 7470A SW 3005A SW 3010A ILM05.4 ISM01.2
Wet Chemistry		
Acidity	------	ASTM D1067-92
Alkalinity	------	SM 2320 B
Alkalinity, Bicarbonate	------	SM 2320 B
Ammonia	------	SM 4500-NH3 H SM 4500 NH3 B, D
Anions: Bromate Bromide Chloride Fluoride Nitrate Nitrite Orthophosphate Sulfate	SW 9056/9056A	EPA 300.0
Biochemical Oxygen Demand (BOD5)	------	SM 5210B
Bromide	------	EPA 300.0
Carbon Dioxide	------	SM4500 CO2 C
Carbonaceous BOD (cBOD)	------	SM 5210B
Cation-Exchange Capacity	SW 9080 SW 9081	------
Chemical Oxygen Demand (COD)	------	SM 5220D
Chloride	SW 9056/9056A	EPA 300.0 SM 4500-Cl C
Color	------	SM 2120B
Conductivity	SW 9050A	EPA 120.1 SM 2510 B
Corrosivity	SW 9045C/9045D	SW 9040B/9040C/9040D
Corrosivity Toward Steel	SW 1110	SW 1110
Cyanide	SW 9010C SW 9012B SW 9014	SM 4500-CN C&E SW 9010C SW 9012B SW 9014

Analytical Fraction	Soil/Solid Matrix Methods	Aqueous Matrix Methods
Cyanide-Amenable	SW 9010C	SM 4500-CN C,G
Dissolved Oxygen	-----	SM 4500-O G SM 4500-O C
Extractions	SW 3610/3610B SW 3620C SW 3630/3630C SW 3640A SW 3660/3660B SW 3665	SW 3610/3610B SW 3620C SW 3630/3630C SW 3640A SW3660/3660B SW 3665
Ferrous Iron	------	SM 3500 B SM 3500FE-D
Flashpoint	SW 1030	SW 1010A
Foaming Agents	-----	SM 5540 C
Fluoride	SW 9056/9056A	EPA 300.0
Hardness, Calcium	------	EPA 200.7
Hardness, Total	------	EPA 200.7 SM 2340C
Hexavalent Chromium	SW 3060A/SW 7196A	SM 3500-Cr D
Ignitability	SW 1030	SW 1010A
Methylene Blue Active Substances (MBAS) Surfactants	------	SM 5540 C
Nitrate	SW 9056/9056A	EPA 300.0 EPA 353.2
Nitrate/Nitrite	------	EPA 300.0 EPA 353.2
Nitrite	SW 9056/9056A	EPA 300.0 SM 4500 NO2 B
Nitrocellulose	Chemtech SOP	Chemtech SOP
Odor	------	SM 2150 B
Oil & Grease	SW 9071B	EPA 1664A
Orthophosphate	SW 9056/9056A	EPA 300.0 SM 4500-P,E
Paint Filter Test	------	SW 9095
pH	SW 9040B SW 9045C/9045D	SM 18 4500-H B SW 9040B/9040C SW 9041A

Analytical Fraction	Soil/Solid Matrix Methods	Aqueous Matrix Methods
Phenolics	SW 9065	EPA 420.1
Phosphorus, Ortho	SW 9056/9056A	EPA 300.0 EPA 365.3 SM 4500 P-E
Phosphorus, Total	EPA 365.3	------
Residual Chlorine	-----	SM 4500-Cl G
Settleable Solids	------	SM 2540 F
Silica	SW 6010B	EPA 200.7 SM 4500-SiO2 C
SPLP Extraction	SW 1312	SW 1312
Sulfate	SW9038 SW9056/9056A	EPA 300.0 SM 4500SO4 E
Sulfide	SW 9030B SW 9031 SW 9034	SW 9030B SW 9031 SW 9034 SM 4500 S F
Sulfide, Acid Soluble & Insoluble	SW 9030B	SW 9030B SW 9031
TCLP Leaching Procedure	SW 1311	SW 1311
Temperature	SW 2550B	SM 2550B
Total Dissolved Solids (TDS)	------	SM 2540 C
Total Kjeldahl Nitrogen (TKN)	------	SM 4500-N Org B or C SM 4500-N Org C, D
Total Organic Carbon (TOC)	SW 9060 Lloyd Kahn	SW 9060 SM 5310 B
Total Solids (TS)	------	SM 2540 B
Total Suspended Solids (TSS)	------	SM 2540 D
Total Volatile Solids (TVS)	------	EPA 160.4
Turbidity	------	EPA 180.1 SM 2130 B
Volatile Suspended Solids (VSS)	------	EPA 160.4

13. MAJOR EQUIPMENT

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
GC/MS SEMI VOA Lab							
GC	BNA-A	Hewlett Packard 5890 Series II	3223A43380	June 1992	July 2001	BNA Lab	used
MSD	BNA-A	Hewlett Packard 5971 Series	2919A00378	June 1992	July 2001	BNA Lab	Used
Auto Sampler	BNA-A	Hewlett Packard 18596B	2718A04705	June 1992	July 2001	BNA Lab	Used
Injector Tower	BNA-A	Hewlett Packard 7673 A	3048A24622	June 1992	July 2001	BNA Lab	Used
Controller	BNA-A	Hewlett Packard 7673 A 18594B	3330A32763	June 1992	July 2001	BNA Lab	Used
Computer	BNA-A	Minta	CN548014089	June 1992	July 2001	BNA Lab	Used
GC	BNA-B	Hewlett Packard 5890	2750A18411	July 1994	July 2001	BNA Lab	Used
MSD	BNA-B	Hewlett Packard 5971 Series	3188A03673	July 1994	July 2001	BNA Lab	Used
Auto Sampler	BNA-B	Hewlett Packard 18596B	3021A21493	July 1994	July 2001	BNA Lab	Used
Injector Tower	BNA-B	Hewlett Packard 7673 A	2704A04914	July 1994	July 2001	BNA Lab	Used
Controller	BNA-B	Hewlett Packard 7673 A 18594B	320A28097	July 1994	July 2001	BNA Lab	Used
Computer	BNA-B	Minta	93001897	July 1994	July 2001	BNA Lab	Used
GC	BNA-E	Hewlett Packard 6890 Series	4500030441	Dec 2002	Jan 2003	BNA Lab	New
MSD	BNA-E	Hewlett Packard 5973	4591422501	Dec 2002	Jan 2003	BNA Lab	New
Auto Sampler	BNA-E	Agilent 7683 Series	4514413296	Dec 2002	Jan 2003	BNA Lab	New
Injector Tower	BNA-E	Agilent 7683 Series	CN13922355	Dec 2002	Jan 2003	BNA Lab	New
Computer	BNA-E	Hewlett Packard Vectra VL 420 DT	4522100267	Dec 2002	Jan 2003	BNA Lab	New
GC	BNA-F	Hewlett Packard 6890 Series	CN10525020	Oct. 2006	Oct. 2006	BNA Lab	New
MSD	BNA-F	Hewlett Packard 5975	4552430204	Oct. 2006	Oct. 2006	BNA Lab	New
Auto Sampler	BNA-F	Agilent 7683 Series	CN52033154	Oct. 2006	Oct. 2006	BNA Lab	New
Injector Tower	BNA-F	Agilent 7683 Series	CN52025140	Oct. 2006	Oct. 2006	BNA Lab	New
Computer	BNA-F	Hewlett Packard Vectra VL 420 DT	------	Oct. 2006	Oct. 2006	BNA Lab	New
GC	BNA-G	Hewlett Packard 6890 Series	US00029768	July 2011	July 2011	BNA Lab	New
MSD	BNA-G	Hewlett Packard 5973	US92522714	July 2011	July 2011	BNA Lab	New
Auto Sampler	BNA-G	18596C	3506A38037	July 2011	July 2011	BNA Lab	New
Injector Tower	BNA-G	HP 6890 Series	3600A45484	July 2011	July 2011	BNA Lab	New
Controller	BNA_G	G1512 A	US72001994	July 2011	July 2011		
Computer	BNA-G	Dell Windows XP	GVC4B71	July 2011	July 2011	BNA Lab	New
Refrigerator	BNA-Ref-1	Roper	ED2933135	May 1999	July 2001	BNA Lab	Used
Refrigerator	BNA-Ref--2	White Westinghouse	------	June 2006	June 2006	BNA Lab	New
Refrigerator	BNA-Ref-3	Frigidaire	WA81100949	1999	Mar. 2008	BNA Lab	Used

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
GC SEMI VOA Lab							
HPLC	HPLC-B	Hewlett Packard Series 1100 DAD	JP73007001/ US72101011/ US72101340	May 1999	July 2001	Pest Lab	Used
Auto sampler	HPLC-B	Hewlett Packard 1313 AS	US72102636	May 1999	July 2001	Pest Lab	Used
Computer	HPLC-B	HP Vectra XA	US73465640	May 1999	July 2001	Pest Lab	Used
HPLC	HPLC-L	Hewlett Packard Series 1100 DAD	US64402121 US72101011 JP73007001	Oct. 2006	Oct. 2006	Pest Lab	Used
Auto sampler	HPLC-L	Hewlett Packard 1313 AS	Us80603781	Oct. 2006	Oct. 2006	Pest Lab	Used
Computer	HPLC-L	HP Vectra XA	------	Oct. 2006	Oct. 2006	Pest Lab	Used
HPLC	HPLC-N	Hewlett Packard Series 1100 DAD	------	------	2013	Pest Lab	Used
Degasser	HPLC-N	G1322A	JP73010099	------	2013	Pest Lab	Used
QuatPump	HPLC-N	G1310A	US72101878	------	2013	Pest Lab	Used
Auto Sampler	HPLC-N	G1313A ALS	DE33224630	------	2013	Pest Lab	Used
Column Compartment	HPLC-N	G1316A	DE11610394	------	2013	Pest Lab	Used
Detector	HPLC-N	G1314A Variable Wavelength UV Detector	JP43825742	------	2013	Pest Lab	Used
ECD	ECD-B	Hewlett Packard 5890 Series II	3115A34809	June 1992	July 2001	Pest Lab	Used
Auto Sampler	ECD-B	Hewlett Packard	3137A26240	June 1992	July 2001	Pest Lab	Used
Inject Tower	ECD-B	Hewlett Packard	3013A22005	June 1992	July 2001	Pest Lab	Used
Controller	ECD-B	Hewlett Packard	3018A21613	June 1992	July 2001	Pest Lab	Used
Computer	ECD-B	Expert Group	CN548014091	June 1992	July 2001	Pest Lab	Used
ECD	ECD-C	Hewlett Packard 5890 Series II	3235A44756	May 1999	July 2001	Pest Lab	Used
Auto Sampler	ECD-C	Hewlett Packard	2718A07968	May 1999	July 2001	Pest Lab	Used
Inject Tower	ECD-C	Hewlett Packard	3231A31724	May 1999	July 2001	Pest Lab	Used
Controller	ECD-C	Hewlett Packard	3113A26547	May 1999	July 2001	Pest Lab	Used
Computer	ECD-C	Expert Group	CN548014091	May 1999	July 2001	Pest Lab	Used
ECD	ECD-D	Agilent Technologies 6890N	CN10521041	June 2005	June 2005	Pest Lab	New
Auto Sampler	ECD-D	Agilent 7683	CN52033127	June 2005	June 2005	Pest Lab	New
Inject Tower	ECD-D	Agilent 7683B	CN51825037	June 2005	June 2005	Pest Lab	New
Computer	ECD-D	Dell	CN-0G1494-70821-359-25-KF	June 2005	June 2005	Pest Lab	New
ECD	ECD-E	Hewlett Packard 5890 Series II	2541A06937	May 1999	July 2001	Pest Lab	Used
Auto Sampler	ECD-E	HP 7673A	3120A26762	May 1999	July 2001	Pest Lab	Used
Inject Tower	ECD-E	HP 7673	2718A08998	May 1999	July 2001	Pest Lab	Used
Controller	ECD-E	HP 7673A	2906A13936	May 1999	July 2001	Pest Lab	Used
FID	FID-E	Agilent Tech 6890N	CN10410002	June 2005	June 2005	Pest Lab	New
Auto Sampler	FID-E	Agilent 7683	CN41128296	June 2005	June 2005	Pest Lab	New
Inject Tower	FID-E	Agilent Tech	CN41235695	June 2005	June 2005	Pest Lab	New
Computer	FID-E	Dell	J2YZZ31	June 2005	June 2005	Pest Lab	New

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
GC SEMI VOA Lab							
GC	ECD_L	HP 6890N	US10217093	------	2004	GC Lab	------
ECD	ECD_L	ECD1	U44268	------	2004	GC Lab	------
ECD	ECD_L	ECD2	U44267	------	2004	GC Lab	------
Injector	ECD_L	HP 7683	CN32631493	------	2004	GC Lab	------
Auto Sampler	ECD_L	----------	CN53536388	------	2004	GC Lab	------
GC	ECD_O	HP 6890N	US10417011	------	2004	GC Lab	------
ECD	ECD_O	ECD1	U6937	------	2004	GC Lab	------
ECD	ECD_O	ECD2	U6936	------	2004	GC Lab	------
Injector	ECD_O	HP 7683	CN41536014	------	2004	GC Lab	------
Auto Sampler	ECD_O	----------	CN41528555	------	2004	GC Lab	------
GC	ECD_P	HP 6890N	US10329046	------	2004	GC Lab	------
ECD	ECD_P	ECD1	U5759	------	2004	GC Lab	------
ECD	ECD_P	ECD2	U5760	------	2004	GC Lab	------
Injector	ECD_P	HP 7683	CN21224536	------	2004	GC Lab	------
Auto Sampler	ECD_P	----------	CN32224158	------	2004	GC Lab	------
FID	FID-1&2	Hewlett Packard	3033A32320	Oct. 2007	Oct. 2007	Pest Lab	Used
Auto Sampler	FID-1&2	ALS2016 Tekmar	92231005	June 2008	July 2008	Pest Lab	Used
Computer	FID-1&2	Ultra	----------	Oct. 2007	Oct. 2007	Pest Lab	Used
Controller	FID-1&2	LCS 2000 Tekmar	93257007	June 2008	June 2008	Pest Lab	Used
FID	FID-3&4	Agilent Tech 6890N	CN10805006	Oct. 2007	Oct. 2007	Pest Lab	New
Auto Sampler	FID-3&4	Agilent Tech	CN80347096	Oct. 2007	Oct. 2007	Pest Lab	New

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
GC SEMI VOA Lab							
Tower 1	FID-3	Agilent Tech	CN80346457	Oct. 2007	Oct. 2007	Pest Lab	New
Tower 2	FID-4	Agilent Tech	CN80346490	Oct. 2007	Oct. 2007	Pest Lab	New
Computer	FID-3&4	Dell	CN-0G3022-42940-3AT-029T	Oct. 2007	Oct. 2007	Pest Lab	New
Refrigerator	GC ext-Ref 2	Kelvinator	LA21203733	May 1999	July 2001	Pest Lab	Used
Refrigerator	GC ext-Ref 3	GE	ST734619	Feb. 2009	Feb. 2009	Pest Lab	New
Refrigerator	GC ext-Ref 1	Revco	T10G340582TG	May 1999	Mar. 2008	Pest Lab	Used
Refrigerator	GC ext-Ref 5	Frigidaire	WA92101209	June 2009	June 2009	Pest Lab	New
Instrument	**Lab ID**	**Manufacturer Description**	**Serial Number**	**Year Purchased**	**Date placed in service at this location**	**Current Location**	**Condition Received (used, new, recondition)**
GC/GC MS VOA Lab							
MSD	MSVOA-D	Hewlett Packard 5971	3234A04258	May 1999	July 2001	VOA Lab	Used
GC	MSVOA-D	Hewlett Packard 5890 Series II	3033A31948	May 1999	July 2001	VOA Lab	Used
Auto Sampler	MSVOA-D	Varian Archon P & T	12963	May 1999	July 2001	VOA Lab	Used
Concentrator	MSVOA-D	Tekmar 3000	94090017	2004	Feb 04	VOA Lab	New
Computer	MSVOA-D	Micron	1318635-0008	May 1999	July 2001	VOA Lab	Used
MSD	MSVOA-E	Hewlett Packard 5972	N/A	May 1999	July 2001	VOA Lab	Used
GC	MSVOA-E	Hewlett Packard 5890	2443A3670	May 1999	July 2001	VOA Lab	Used
Auto Sampler	MSVOA-E	Varian Archon	14109	May 1999	July 2001	VOA Lab	Used
Concentrator	MSVOA-E	OI Analytical 4560	N249460495	2004	Feb 04	VOA Lab	New
Computer	MSVOA-E	----------	----------	May 1999	July 2001	VOA Lab	Used
MSD	MSVOA-F	Hewlett Packard 5971 Series	3118A02237	May 1999	July 2001	VOA Lab	Used

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
GC/GC MS VOA Lab							
GC	MSVOA-F	Hewlett Packard 5890 Series II	3108A34429	May 1999	July 2001	VOA Lab	Used
Concentrator	MSVOA-F	OI 4660 Eclipse	338466642P	July 2001	July 2001	VOA Lab	Recondition
Auto Sampler	MSVOA-F	OI4552	14293	July 2001	July 2001	VOA Lab	Recondition
Computer	MSVOA-F	Dell Dimension 2350	93007037	May 1999	July 2001	VOA Lab	Used
MSD	MSVOA-G	Hewlett Packard 5971A	3435A01877	May 1999	July 2001	VOA Lab	Used
GC	MSVOA-G	Hewlett Packard 5890 Series II	3020A11012	May 1999	July 2001	VOA Lab	Used
Concentrator	MSVOA-G	OI Eclipse 4660	338466643P	2003	March 2003	VOA Lab	Used
Auto Sampler	MSVOA-G	OI Analytical 4552	13854	May 1999	July 2001	VOA Lab	Used
Computer	MSVOA-G	Dell	DLCY9	May 1999	July 2001	VOA Lab	Used
MSD	MSVOA-H	Hewlett Packard 5971 Series	3188A03008	May 1999	July 2001	VOA Lab	Used
GC	MSVOA-H	Hewlett Packard 5890	2750A17849	May 1999	July 2001	VOA Lab	Used
Concentrator	MSVOA-H	OI Eclipse 4660	A401466023P	2004	Feb 2004	VOA Lab	Used
Auto Sampler	MSVOA-H	EST Archon	12971	May 1999	July 2001	VOA Lab	Used
Computer	MSVOA-H	MINTA ACER 32X	83007353	May 1999	July 2001	VOA Lab	Used
MSD	MSVOA-I	Hewlett Packard 5972 Series	3188A03673	June 1992	July 2001	VOA Lab	Used
GC	MSVOA-I	Hewlett Packard 5890 Series II	3235A45496	June 1992	July 2001	VOA Lab	Used
Concentrator	MSVOA-I	OI 4660 Eclipse	338466643P	2003	March 2003	VOA Lab	New
Auto Sampler	MSVOA-I	OI Archon 5100A	12225	2003	March 2003	VOA Lab	Used
Computer	MSVOA-I	Dell	A4054664199	June 1992	July 2001	VOA Lab	Used
MSD	MSVOA-K	Hewlett Packard 5971A Series	3188A03008	December 2002	Jan 2003	VOA Lab	New
GC	MSVOA-K	Hewlett Packard 5890 Series II	3235A45495	December 2002	Jan 2003	VOA Lab	New

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
GC/GC MS VOA Lab							
P&T 2	MSVOA-K	OI Analytical 4560	N249460496	December 2002	Jan 2003	VOA Lab	New
Auto Sampler	MSVOA-K	OI Analytical 4552	13843	December 2002	Jan 2003	VOA Lab	New
Computer	MSVOA-K	EXPERT Group	_____	December 2002	Jan 2003	VOA Lab	New
MSD	MSVOA-L	Agilent 5975	US52430266	2004	March 2004	VOA Lab	New
GC	MSVOA-L	Agilent 6890N	CN10524059	2004	March 2004	VOA Lab	New
Concentrator	MSVOA-L	Entech 7100A	1224	2004	March 2004	VOA Lab	New
Auto Sampler	MSVOA-L	Entech 7016CA	----------	2004	March 2004	VOA Lab	New
Computer	MSVOA-L	Dell XP	----------	2004	March 2004	VOA Lab	New
MSD	MSVOA-M	Agilent 5971	3118A02663	2004	March 2004	VOA Lab	New
GC	MSVOA-M	Agilent 5890	2429A02327	2004	March 2004	VOA Lab	New
Concentrator	MSVOA-M	Entech 7100A	1129	2004	March 2004	VOA Lab	New
Auto Sampler	MSVOA-M	Entech 7500/7016CA	----------	2004	March 2004	VOA Lab	New
Computer	MSVOA-M	Dell XP	----------	2004	March 2004	VOA Lab	New
GC	MSVOA_R	HP 6890N	CN10414059	------	2004	VOA Lab	------
MS	MSVOA_R	HP 5973	US40620571	------	2004	VOA Lab	------
Auto Sampler	MSVOA_R	OI4552	13576	------	2004	VOA Lab	------
Concentrator	MSVOA_R	Tekmar 3100 P&T	95195004	------	2004	VOA Lab	------
GC	MSVOA_T	HP 6890N	US10244019	------	2004	VOA Lab	------
MS	MSVOA_T	HP 5973	US21864274	------	2004	VOA Lab	------
Auto Sampler	MSVOA_T	OI 4552	13694	------	2004	VOA Lab	------
Concentrator	MSVOA_T	OI 4660	A405466417P	------	2004	VOA Lab	------
GC	MSVOA_N	HP 7890	CN12061053	May 2012	May 2012	VOA Lab	------
MS	MSVOA_N	HP 5975C	US11483919	May 2012	May 2012	VOA Lab	------

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
GC/GC MS VOA Lab							
Auto Sampler	MSVOA_N	Tekmar	US12017004	May 2012	May 2012	VOA Lab	------
Computer	MSVOA_N	HP Compaq	------	May 2012	May 2012	VOA Lab	------
GC	FID_13	HP 5890	3235A44734	------	2004	VOA Lab	------
FID	FID_13	FID	----------	------	2004	VOA Lab	------
Auto Sampler	FID_13	Varian Archon	----------	------	2004	VOA Lab	------
Concentrator	FID_13	Tekmar 3000 P&T	95192004	------	2004	VOA Lab	------
Refrigerator	VOA-Ref-1	Frigidaire	WB50332890	June 2005	June 2005	VOA Lab	New
Refrigerator	VOA-Ref-2	Frigidaire	WB50332901	June 2005	June 2005	VOA Lab	New
Refrigerator	VOA-Ref-3	Sanyo	911246533	May 1999	July 2001	VOA Lab	Used
Refrigerator	VOA-Ref-4	Glenco	JJ-371503	May 1999	July 2001	VOA Lab	Used
Refrigerator	VOA-Ref-5	Beverage Air KR48-IAS	7054308	May 1999	July 2001	VOA Lab	Used
Refrigerator	VOA-Ref-6	True Refrigerator T-72	682166	May 1999	July 2001	VOA Lab	Used
Oven	VOA-Oven 1	Fisher Scientific 230F	2876	May 1999	July 2001	VOA Lab	Used
Scale	VOA SC-1	Mettler PE 300	E28222	May 1999	July 2001	VOA Lab	Used
Instrument	**Lab ID**	**Manufacturer Description**	**Serial Number**	**Year Purchased**	**Date placed in service at this location**	**Current Location**	**Condition Received (used, new, recondition)**
Metals Lab							
ICAP	P-4	Thermo Scientific ICAP series 6000	20070701	Mar. 2007	Mar. 2007	Metals Lab	New
Autosampler	P-4	Thermo Scientific CETAC ASX-520	020766A520	Mar. 2007	Mar. 2007	Metals Lab	New
Circulator	P-4	Thermo Scientific Neslab Merlin M33	110134043	Mar. 2007	Mar. 2007	Metals Lab	New
Computer	P-4	Dell	----------	Mar. 2007	Mar. 2007	Metals Lab	New
ICAP	P-5	Thermo Scientific ICAP series 6000	20081906	June 2008	June 2008	Metals Lab	New
Autosampler	P-5	Thermo Scientific CETAC ASX-520	120761A500	June 2008	June 2008	Metals Lab	New
Circulator	P-5	Thermo Scientific Neslab Thermoflex 900	110279034	June 2008	June 2008	Metals Lab	New
Computer	P-5	Dell	----------	June 2008	June 2008	Metals Lab	New
ICP MS	P-6	Thermo Elemental	X0315	Dec 2003	Feb 2004	Metals Lab	New
Auto Sampler	P-6	ASX-510 Autosampler	120308ASX	Dec 2003	Feb 2004	Metals Lab	New
Circulator	P-6	Thermo Neslab (Water Circulator)	109223014	Dec 2003	Feb 2004	Metals Lab	New
Computer	P-6	IBM	KLAT783	Nov 2013	Nov 2013	Metals Lab	New

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
Metals Lab							
ICP-MS	P9	Thermo Elemental X-Series	X0206	----------	2004	Metals Lab	----------
Mercury Analyzer	CV-1	Leeman Labs HYDRA II AA Automated Mercury Analyzer	64244	June 2011	Dec 2011	Metals Lab	New
Computer	CV-1	Dell	----------	June 2011	Dec 2011	Metals Lab	New
Mercury Analyzer	CV-2	Leeman Labs Hydra AA Automated Mercury Analyzer	62598	June 2002	June 2002	Metals Lab	New
Computer	CV-2	Dell	CJ85K11	June 2002	June 2002	Metals Lab	New
Auto Block II	Met	Environmental Express	1783	Feb. 2007	Feb. 2007	Metals Digestion Lab	New
Oven	M Oven-1	Lab-Line Model 3512	0700-0078	May 1999	July 2001	Metals Digestion Lab	Used
Scale	M SC-1	Adventurer Pro	8027100143	June 2006	June 2006	Metals Digestion Lab	New
Scale	M SC-2	Mettler PJ 400	G62435	May 1999	July 2001	Metals Digestion Lab	Used
Scale	M SC-3	Mettler PE360	47890	May 1999	July 2001	Metals Digestion Lab	Used
Microwave Digestor	M D-1	Mars	MD8656	June 2006	June 2006	Metals Digestion Lab	New
TCLP Rotator	MDT#1	Associated Design – 4 space	0469YQGS0089	------	2004	Metals Digsetion Lab	------
TCLP Rotator	MDT#2	Associated Design –12 space	685TT2446	------	2004	Metals Digsetion Lab	------

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
General Chemistry Lab							
Ion Chromatograph	IC-1	Metrohm 761 Compact Ion Chromatograph	17610020/09119	June 2002	June 2002	General Chemistry Lab	New
Sample Processor	IC-1	Metrohm 766	62041430	June 2002	June 2002	General Chemistry Lab	New
Computer	IC-1	Micron	13186350008	June 2002	June 2002	General Chemistry Lab	New
Ion Chromatograph	IC-2	Metrohm 838Compact Ion Chromatograph	-----	June 2005	June 2005	General Chemistry Lab	New
Sample Processor	IC-2	IC838 Advanced Sample Processor	1830002400412 9	June 2005	June 2005	General Chemistry Lab	New
Interface	IC-2	Interface 830	1830002004179	June 2005	June 2005	General Chemistry Lab	New
Detector	IC-2	Detector 819	1819001003166	June 2005	June 2005	General Chemistry Lab	New
Ion Chromatograph	IC_5	Dionex DX-500	----------	------	2004	IC Lab	------
Chromatography Enclosure	IC_5	LC20	98070157	------	2004	IC Lab	------
Detector	IC_5	CD20 Conductivity	98070855	------	2004	IC Lab	------
Pump	IC_5	GP50 Gradient	98070962	------	2004	IC Lab	------
Auto Sampler	IC_5	AS40	05060058	------	2004	IC Lab	------
Ion Chromatograph	IC_6	Dionex DX-600	----------	------	2004	IC Lab	------
Chromatography Enclosure	IC_6	LC20	02080142	------	2004	IC Lab	------
Detector	IC_6	CD25 Conductivity	3020237	------	2004	IC Lab	------
Pump	IC_6	GS50 Gradient	02060282	------	2004	IC Lab	------
Auto Sampler	IC_6	AS40	04020590	------	2004	IC Lab	------
Eluent Generator	IC_6	EG50	05120361	------	2004	IC Lab	------

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
General Chemistry Lab							
Pump	IC-2	Metrohm Pump 818	1818011004182	June 2005	June 2005	General Chemistry Lab	New
Separation Center	IC-2	Metrohm 820	1820023004135	June 2005	June 2005	General Chemistry Lab	New
Liquid Handling Unit	IC-2	Metrohm 833	183001004142	June 2005	June 2005	General Chemistry Lab	New
Incubator	Incubator-3	Forma-Scientific Model 3918 Incubator	60147-89	May 1999	July 2001	General Chemistry Lab	Used
Scale	WC SC-1	Mettler PJ 400	J39330	May 1999	July 2001	General Chemistry Lab	Used
Scale	WC SC-2	Mettler AE200	J39333	May 1999	July 2001	General Chemistry Lab	Used
Scale	TE214S	Sartorius TE2145	22250964	------	2006	General Chemistry Lab	------
Analytical Balance	MDB#8	Mettler AE100	H15909	------	2004	General Chemistry Lab	------
Analytical Balance	MDB#9	Mettler AE200	J39330	------	2004	General Chemistry Lab	------
COD Digestion Block	COD Block # 2	COD Reactor HACH	4069	May 1999	July 2001	General Chemistry Lab	Used
COD Digestion Block	COD Block # 1	HACH Hot Plate 16500-10	880711134	May 1999	July 2001	General Chemistry Lab	Used
COD Digestion Block	COD Block # 3	COD Reactor HACH	971100016836	------	2004	General Chemistry Lab	------
Stirrer	WC S-1	PMC	------	June 2006	June 2006	General Chemistry Lab	New
Stirrer	WC S-2	Torrey Pine Scientific	101	May 1999	July 2001	General Chemistry Lab	Used
Stirrer	WC S-3	Torrey Pine Scientific	-----	June 2000	June 2000	General Chemistry Lab	New
Tumbler	T-1	Env. Express	------	June 1997	July 2001	General Chemistry Lab	New
Tumbler	T-2	Env. Express	------	June 1997	July 2001	General Chemistry Lab	New

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
General Chemistry Lab							
Zero Headspace Extractor	ZHE-1	ZHE	3745-ZHE	June 1997	July 2001	General Chemistry Lab	New
Zero Headspace Extractor	ZHE-2	ZHE	3740-12-BRE	May 1999	July 2001	General Chemistry Lab	Used
pH Meter	WC pH meter-1	Thermo Orion 350	014070	July 2004	July 2004	General Chemistry Lab	New
pH Probe	WC pH Probe-1	Thermo Orion 9106 BNWP	OU1-1337	August 2010	August 2010	General Chemistry Lab	New
Konelab	Konelab	Konelab	P4719011	Dec 2002	Jan 2003	General Chemistry Lab	new
Computer	Konelab	Dell	2000-256036	Dec 2002	Jan 2003	General Chemistry Lab	new
Refrigerator	WC-Ref-1	Frigidaire	LA23205322	May 1999	July 2001	General Chemistry Lab	used
Refrigerator	WC-Ref-2	Frigidaire	BA42511879	May 1999	July 2001	General Chemistry Lab	used
Cabiner Dessicator	1WCD	Boekel	----------	------	2004	General Chemistry Lab	------
Cabiner Dessicator	2WCD	Boekel	----------	------	2004	General Chemistry Lab	------
Oven	WC-Oven 1	VWR 1305U	1203788	Dec 1997	July 2001	General Chemistry Lab	Used
Oven	WC- Oven 3	VWR 1305U	01202393	May 1999	July 2001	General Chemistry Lab	Used
Spectrophotometer	COD-1	Hach DR/2010 Spectrophotometer	971100006417	May 1999	July 2001	General Chemistry Lab	used
Turbidimeter	WC-Turbidimeter-1	HACH 2100N	09090C025745	------	2004	General Chemistry Lab	------
Conductance Meter	Conductance Meter	YSI Model 35 Conductance Meter	K8002530	May 1999	July 2001	General Chemistry Lab	used
Muffle Furnace	Muffle Furnace	Paragon Q11	418333	May 1999	July 2001	General Chemistry Lab	used
Midi Cyanide	MC-1	Andrews Glass (Cyanide Distillation)	ABX0409	May 1999	July 2001	General Chemistry Lab	used

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
General Chemistry Lab							
Midi Cyanide	MC-2	Andrews Glass (Cyanide Distillation)	-------	2002	2002	General Chemistry Lab	New
TOC Analyzer	TOC	Tekmar Appolo 9000	US03227003	Aug 2003	Aug 2003	General Chemistry Lab	new
TOC Boat Sampler	TOC	Boat Sampler 183	US03227003	Aug 2003	Aug 2003	General Chemistry Lab	new
Auto-Titrator	Titrator	Titroline Alpha	441912	March 2004	March 2004	General Chemistry Lab	new
Auto-Titrator Sampler	Titrator	TW Alpha 16 Sample Changer	00472248	March 2004	March 2004	General Chemistry Lab	new
Digestor	Digestor	Westco Easy Digest 40/20	1102	March 2003	March 2003	General Chemistry Lab	new
Ignitability instrument	IGN-1	Koehler closed cup (Penske substitute)	R61091858	March 2004	April 2004	General Chemistry Lab	new
Dissolved Oxygen meter	DO Meter	YSI 5000 Dissolved Oxygen Meter	98C0951AB	May 1999	July 2001	General Chemistry Lab	Used
Dissolved Oxygen meter	MDWC#H	YSI Model 5000	5905/5010	------	2004	General Chemistry Lab	------
Dissolved Oxygen meter	MDWC#H -1	DO Probe, YSI Model 07A	5750, 07D100216	------	2004	General Chemistry Lab	------
Grain Size Seive Shaker	MDGEO-1	RO-TAP RX-29	21049	------	2004	General Chemistry Lab	------
Autoclave	MDA1	All American Pressure Steam Sterilizer 25X	0011555	------	2004	General Chemistry Lab	------
Puck-Mill Grinder	MDMI#1	Labtechnics LM1-P	9202634	------	2008	Sample Management	------
Hot Plate	EX HP-1	Corning PC-35	----------	May 1999	July 2001	General Chemistry Lab	Used
Instrument	**Lab ID**	**Manufacturer Description**	**Serial Number**	**Year Purchased**	**Date placed in service at this location**	**Current Location**	**Condition Received (used, new, recondition)**
Sample Management							
Refrigerator	SM Ref-2	White Westinghouse (Ice Packs)	BA93101799	May 1999	July 2001	Sample Management	used

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
Sample Management							
Walk in Refrigerator	SM-Walk in-1	Bally (10' X 38')	----------	May 1999	July 2001	Sample Management	used
Temperature Gun	Temperature Gun	Mannix Model # IRT4	----------	2005	2005	Sample Management	New
Instrument	**Lab ID**	**Manufacturer Description**	**Serial Number**	**Year Purchased**	**Date placed in service at this location**	**Current Location**	**Condition Received (used, new, recondition)**
Extractions Lab							
N-EVAP	N-EVAP	Organomation Nitrogen Evaporation System	----------	May 1999	July 2001	Extractions Lab	used
Water Bath	EX-WB-1	Boekel	----------	May 1999	July 2001	Extractions Lab	used
Water Bath	EX-WB-2	Boekel	----------	May 1999	July 2001	Extractions Lab	used
Water Bath	EX-WB-3	Boekel	----------	May 1999	July 2001	Extractions Lab	used
Water Bath	EX-WB-4	Boekel	----------	May 1999	July 2001	Extractions Lab	used
Water Bath	EXT Water Bath#2	Boekel	----------	July 2012	July 2012	Extractions Lab	------
Water Bath	EXT Water Bath#3	Boekel	----------	July 2012	July 2012	Extractions Lab	------
GPC	GPC-1	Accuprep JZ Scientific	03B-1060-3.0	2003	March 2003	Extractions Lab	used
S-Evaporator	Evaporator-1	Organomation Analytical Evaporator	10688	May 1999	July 2001	Extractions lab	used
Oven	EX Oven-2	Fisher 117G	----------	May 1999	July 2001	Extractions Lab	Used
ASE	ASE-1	Dionex Accelerated Extraction	03010456	March 2003	October 2003	Extractions Lab	new
ASE	ASE-2	Dionex Accelerated Extraction	03060034	March 2003	October 2003	Extractions Lab	new
ASE	ASE-3	Dionex Accelerated Extraction	03060032	March 2003	October 2003	Extractions Lab	new
Ultrasonic Bath	Sonicator Bath	Bransonic Ultrasonic Cleaner 8510	RPA020497187 E	March 2004	March 2004	Extractions Lab	new
Turbovap II	Turbovap	Zymark	TV9751N7885	**1997**	**July 2001**	Extractions Lab	**New**
Refrigerator	EX Ref-1	Gibson	LA23601205	May 1999	July 2001	Extractions Lab	used
Refrigerator	EX Ref-2	Welbilt	----------	May 1999	July 2001	Extractions Lab	Used

Instrument	Lab ID	Manufacturer Description	Serial Number	Year Purchased	Date placed in service at this location	Current Location	Condition Received (used, new, recondition)
Extraction Lab							
Touch Vortexer	Vortex	Glas-Col	263248	May 1999	July 2001	Extractions Lab	Used
Centrifuge	Centrifuge	Damon/IEC Division	AE0921	**1984**	**July 2001**	Extractions Lab	**New**
Scale	EX-SC-1	Mettler PM 4600	975690	May 1999	July 2001	Extractions Lab	used
Scale	EX SC-2	Ohaus GA110	1348	2000	July 2001	Extractions Lab	Used
Scale	EX SC-3	Sartorius A 200S	36100008	2000	July 2001	Extractions Lab	Used
Soxtherm	SOX-1	Soxtherm	4032298	Feb 2004	March 2004	Extractions Lab	New
Soxtherm	SOX-2	Soxtherm	4040032	Feb 2004	March 2004	Extractions Lab	New
Soxtherm	SOX-3	Soxtherm	4031744	Feb 2004	March 2004	Extractions Lab	New
Soxtherm	SOX-4	Soxtherm	4031743	Feb 2004	March 2004	Extractions Lab	New
SPE DEX Extractor	SPE-1	Horizon 4790 series	04-0509	2004	2004	Extractions Lab	New
SPE DEX Extractor	SPE-2	Horizon 4790 series	04-0510	2004	2004	Extractions Lab	New
SPE DEX Extractor	SPE-3	Horizon 4790 series	04-0507	2004	2004	Extractions Lab	New
SPE DEX Extractor	SPE-4	Horizon 4790 series	04-0508	2004	2004	Extractions Lab	New
ROT-X-TRACT-LC	LL-Extractor	Organomation Liquid-Liquid extractor	----------	Nov 2005	Nov 2005	Extractions Lab	New
SPE DEX Controller	SPE Controller	Horizon	04-0433	**2004**	**2004**	Extractions Lab	**New**

14. DOCUMENT CONTROL

Objective: To establish a system in order to have all information related to the production of analytical data controlled, protected, and stored to ensure its integrity and traceability. The system must ensure that only most recent version of required documentation is used by the appropriate personnel in the laboratory. Insure that invalid or obsolete documents are promptly removed from all points of issue or use, or otherwise assured against unintended use. All internal regulatory documents including the QA manual, SOP's, software, and equipment user's manuals are subject to document control. Obsolete documents retained for either legal or knowledge preservation purposes will be marked with the date that the document became obsolete.

Quality Assurance Manual: The QA Manual outlines how Chemtech plans, implements, and assesses the effectiveness of QA/QC control actions in the functioning of its analytical services.

Standard Operating Procedures (SOP's): An SOP is a written document, which details the method of an operation, analysis or action whose techniques and procedures are thoroughly prescribed, and which is accepted as the method for performing certain routine or repetitive task. SOP's are an integral part of consistent quality laboratory work.

14.1 DOCUMENT OVERSIGHT: The QA/QC Director is responsible for the document control system and maintains a current list of controlled documents, their location, and revision number. The QA/QC Director and Technical Director approve all newly released operating procedures and any revision to controlled documents.

14.2 DISTRIBUTION OF CONTROLLED DOCUMENTS: Controlled documents are signed by QA/QC Director and Technical Director. Copies of documents not signed or assigned a control number are considered uncontrolled documents. All departments supervisor receive a copy of the updated document control of the QA Manual, SOP's, and any other related documents. With the document, the supervisor receives a distribution document log that is signed and returned to the QA Office to be filed in a binder. This distribution log has the name of the document the printed name of the person receiving it, the signature and date of distribution.

A copy of current applicable SOP (analytical, administrative, and or procedural) and QA Manual is kept in each department. The original document of each outdated SOP or QA manual is retained in the QA/QC office.

14.3 **DOCUMENT REVISIONS:** All laboratory documents under document control are reviewed at least annually and revised as appropriate. Document revisions may be requested due to a change in procedure; an added procedure; internal review of the laboratory procedures, personnel, facility, equipment, policy and/or procedures; implementation of new contracts/regulations.

For work performed under the USEPA SOW for Organic analysis Multi-Media, Multi-Concentration SOM01.X and SOW for Inorganic Superfund Methods Multi-Media Multi-Concentration Methods ISM01.X, the QAP must be revised when the following circumstances occur:

- USEPA modifies the technical requirements of the SOW or contract.
- USEPA notifies Chemtech of deficiencies in the QAP.
- USEPA notifies Chemtech of deficiencies resulting from USEPA's review of the laboratory performance.
- Chemtech's organization, personnel, facility, equipment, policy or procedures change.
- Chemtech identifies deficiencies resulting from the internal review of the organization, personnel, facility, equipment, policy or procedure changes.

The QAP will be revised within 14 days of when the circumstances listed above result in a discrepancy. The changes are highlighted and a copy is sent to USEPA Regional CLP PO and QATS.

A request to change a document is initiated on a "Corrective Action Report". The Technical Director and QA/QC Director review the requested change. The QA/QC Director is responsible for updating the appropriate document once a change has been approved.

Whenever corrections are required to a controlled document pending the re-issue of the document, a corrective action report will be generated. The corrected data will be entered manually by hand on the hard copy of the document, with initial and date, and the reason for the change. The changes will be approved by all persons originally approving the document. The corrected copy will be replaced in hard copy or electronic copy, as applicable. A revised document will be re-issued as soon as practicable. Altered or new text in the SOP or QAM will be highlighted.

Any changes in electronically stored data are identified by storing the file as a revised version, keeping the original file intact, and tracing the changes to the data to the user login ID.

These changes will be communicated to the affected personnel by replacing all copies with the revised version. Read receipts and/or training documents will be signed by the affected personnel, documenting that the affected changes are read and understood, and followed as soon as the changes are approved. The read receipts/training documents are maintained in the employee training file.

14.4 STANDARD OPERATING PROCEDURES (SOP's): Three (3) types of SOP's are used at Chemtech.

14.4.1 **Analytical SOP**: Provides stepwise instructions to an analyst on how to perform a particular analysis.

14.4.2 **Administrative SOP**: Details the process of documentation of all administrative activities.

14.4.3 **Procedural SOP**: Provides instructions and information for support activities in the laboratory.

Each SOP developed is assigned a unique document control number. SOP's are reviewed annually and updated if necessary. SOP's can be edited more frequently if systematic errors dictate a need for process change or the originating regulatory agency promulgates a new revision of the method.

SOP's are maintained in electronic read only format on Chemtech LIMS network server. All original hard copies are kept in the QA/QC office in official SOP file. A list of available SOPs is enclosed as Section 27.

14.5 LOGBOOK CONTROL: Laboratory logbooks maintained at Chemtech are preprinted, numbered and include a title which identifies the purpose of the logbook. Each logbook indicates the instrument name, manufacturer, model number and a Chemtech identification number. All quality control activities are recorded in the logbooks. Refer to P243-Manual Integration Policy and Electronic Logbook SOP, P254-Purchases and Supplies SOP and P255-Maintenance SOP.

All logbook entries must be completed and reviewed. For any corrections made to the logbook entries, Refer to P226-Corrections SOP.

Active logbooks are maintained in the laboratory and retired logbooks are maintained in the QA/QC office or archived on the server. Refer to P232-Data Storage SOP. Laboratory staff may keep two recent sequentially dated logbooks of the same type in order to simplify review of recently conducted analysis.

14.6 **ANALYTICAL DOCUMENT MAINTENANCE AND STORAGE:** Analytical data logbooks and clients reports are retained for five years unless specified otherwise. After five years, the analytical data and reports are systematically destroyed. The data is retained for ten years for clients from Massachusetts.

Projects completed in the current year are maintained in the Report Production area. All other analytical data, reports, and logbooks are kept in the Document Storage Area. The electronically scanned data are archived on LIMS Server. Levels of authorization limit access to Document Storage Area and the LIMS Server. Refer to P229-Computer Backup and Security SOP, P231-Data Archive SOP and P232-Data Storage SOP.

In the event of an ownership change all appropriate regulatory agencies will be notified. As a condition of the ownership change the buyer will be requested to maintain all records and reports prior to the time of legal transfer.

In the event of a bankruptcy all appropriate regulatory agencies and clients will be notified. They will be given the opportunity to retrieve their records and reports within 30 days of notification. The records and reports will be destroyed after the 30 days notification period has expired.

14.7 **PERSONNEL RECORDS:** The QA/QC office maintains personnel folders for all analytical staff members. These folders document that analysts have received instructions for their job related activities including read receipts for SOP's and the QA Manual. Personnel records also include health and safety training received and a signed ethics agreement, in addition to technical training records, demonstration of capability, and precision and accuracy for the tests.

14.8 **INTERNAL AUDITS:** The QA/QC Director conducts annual internal audits of the laboratory activities to verify that the laboratory operations continue to comply with the requirements of the quality system, the latest version of the NELAC standard, DOD QSM, and all applicable state and federal program requirements. The internal audit program addresses all elements of the quality system, including the environmental testing activities. Internal Audits are planned activity.

When audit findings cast a doubt on the effectiveness of the operations or on the correctness or validity of the laboratory's environmental test results, corrective actions are taken. Clients are notified in writing if investigations show that the laboratory results may have been affected.

The project manager notifies the clients promptly, in writing, within 48 hours, of any event such as identification of defective measuring or test equipment that casts doubt on the validity of results given in any test report or amendment to a report.

The area of activity audited, the audit findings and corrective actions that arise from them are recorded. The management ensures that these actions are discharged within the agreed time frame, per P210-Corrective-Preventive Action SOP.
Follow-up audit activities verify and record the implementation and effectiveness of the corrective action taken.

A review is conducted with respect to any evidence of inappropriate actions or vulnerabilities related to data integrity. Discovery of potential issues is handled in a confidential manner until such time as a follow up of evaluation, full investigation, or other appropriate actions have been completed and issues clarified. All investigations that result in finding of inappropriate activity are documented and include any disciplinary actions involved, corrective actions taken, and all appropriate notifications of client. All documentation of these investigation and actions taken are maintained for at least five years.

14.9 **MANAGEMENT REVIEWS:** The executive management conducts a review of the laboratory's quality system and environmental testing activities annually to ensure their continuing suitability and effectiveness, and to introduce necessary changes or improvements. The review takes account of:

- The suitability of policies and procedures
- Reports from managerial and supervisory personnel
- The outcome of recent internal audits
- Corrective and preventive actions
- Assessments by external bodies
- The results of inter-laboratory comparisons or proficiency tests
- Changes in the volume and type of work
- Client feedback
- Complaints and other relevant factors, such as quality control activities, resources and staff training.

Findings from the management reviews and the actions that arise from them are recorded. The management ensures that those actions are carried out within an appropriate and agreed timescale, per P210-Corrective-

Preventive Action SOP. The records of review findings and actions are maintained.

15. TRACEABILITY OF MEASUREMENTS

Objective: To establish procedures for achieving traceability of measurements between a measured value and a national reference standard.

15.1 METRIC MEASUREMENTS – THERMOMETER AND BALANCE CALIBRATION: Verification and/or validation of balances and thermometers are performed with National Institute of Standards and Technology (NIST) traceable standards. All new thermometers used in the laboratory are calibrated prior to their use and all thermometers are calibrated annually. A tag attached to the calibrated thermometer documents the date it was calibrated and any correction factor if necessary. The calibration readings are recorded in a logbook. Test equipment used in the laboratory requiring temperature control is assigned a separate calibrated thermometer. The temperature is recorded daily in a temperature log for all required equipment. Refer to SOP ID P208 - Thermometer Calibration SOP.

Class S Calibration weights are used to calibrate all the balances used in the laboratory. Calibration checks are performed on a daily basis and recorded in a logbook. Refer to P209-Scale Calibration SOP. An annual balance calibration is conducted by a certified agency or organization. Calibration certificates include the location of the equipment, model, serial number, manufacturer and sensitivity information. This information is maintained in the QA/QC office.

15.2 CHEMICAL STANDARDS: All reference and working standards used for calibration must be NIST traceable and have a traceability certificate. Vendors provide a traceability certificate for all chemical standards, which include a lot number and expiration date. Working standards are prepared from the vendor traceable standards and are documented in the "Standard Preparation Logbook" and include the vendor lot number, dates of preparation, and preparer's initials and date. Refer to individual method SOPs for Standard Preparation information. Reagents are checked for contamination by analyzing the Method Blank. . Refer to P220-Traceability SOP. Analytical standards are verified and documented. Refer to P202-Reagent Check SOP. The certificates of traceability are affixed to the logbook to keep a permanent record. The vials, in which working standards are kept, are labeled with the lot number, preparation date, and expiration date. All reagents that do not have an expiration date from the manufacturer will be labeled as expiring 10 years from the date the reagent container was opened. All expired standards must be stored separately from the working standards.

16. CALIBRATION AND VERIFICATION OF TEST PROCEDURES

Objective: To ensure that instrumentation is performing to predetermined operational standard prior to the analysis of any samples and that the data are of known quality and appropriate for a given regulatory agency requirements must be established by the laboratory.

16.1 ORGANIC TEST PROCEDURES

Tuning Criteria for GC/MS Instruments: Each GC/MS system must pass the performance criteria for 4-Bromofluorobenzene (BFB) or Decafluorotriphenylphosphine (DFTPP) before any samples, standards or blanks can be analyzed. The tuning standard must meet the criteria specified in each analytical SOP. The chromatogram should not contain any baseline drift and the peaks should be symmetrical. Each GC/MS system must be tuned every 12 hours for SW846 methods, OLM04.2 and SOM01.1 analyses and 24 hours for 600 series methods.

Initial Calibration: Second source standards are obtained from a different manufacturer than the original standards, unless one is not available and are used to verify the initial calibration. An initial calibration is run on all instruments. Initial calibration is rerun when continuing calibration criteria cannot be met. The criterion for an initial calibration curve consists of a minimum of five points for SW846 Methods, OLM04.2 and SOM01.1 analyses and a minimum of three points for 600 series methods. The lowest standard analyzed must be equal to or less than the reporting limit, however, the five points are specified in the analytical SOP for CLP work. The response factor (RF) must be calculated for all compounds. The Relative Standard Deviation (RSD) is used to determine linearity. See individual SOPs for limits, criteria and allowances. The system performance check compounds (SPCC) are checked for SW 846 methods for a minimum average response factor. These compounds must meet the minimum response factors specified in each analytical SOP. If the minimum average response factor for any SPCC does not meet the criteria then corrective action is required and the GC/MS system recalibrated. The initial calibration verification must be successfully completed prior to running any samples.

If more stringent standards or requirements are included in a mandated test method or by regulation, Chemtech will demonstrate that such requirements are met. If it is not apparent which standard is more stringent, then the requirements of the regulation or mandated test method are to be followed.

Continuing Calibration Verification (CCV): The initial calibration curve for each compound of interest is checked and verified once every 12 hours for SW846 methods, OLMO4.2 and SOM01.1 analyses, and once every 24 hours for 600 series methods. This is accomplished by analyzing a midpoint calibration standard and verifying all continuing calibration criteria for a given method are met. Sample, blank, and QC standards cannot be analyzed unless a CCV meets method criteria. For further details refer to the individual SOP's.

Formulas:

$$RF = \frac{\text{Area of compound x Concentration of ISTD}}{\text{Area of ISTD x Concentration of compound}}$$

$$\%\ RSD = \frac{SD}{RF} \times 100$$

where **SD** is the standard deviation for all compounds and **RF** is the average response factor

When the %RSD exceeds criteria for any analyte, a linear regression of the instrument response versus the concentration of the standards is performed for 600 series and SW846 methods. The regression will produce the slope and intercept terms for a linear equation in the form

$$y = ax + b,$$

where:

y = instrument response (peak area or height)
a = slope of the line(also called the coefficient of x)
x = concentration of the calibration standard
b = intercept

- The use of linear regression may not be used as a rationale for reporting results below the calibration range demonstrated by the analysis of the standards.
- The regression calculation will generate a correlation coefficient(r).

In order to be used for quantitative purposes, the correlation coefficient must be greater or equal to 0.99

16.2 INORGANIC TEST PROCEDURES

Balance Calibration: All balances are calibrated each day with 3 class "S" weights covering the expected range of analysis and recorded in the balance calibration logbook. Refer to P209-Scale Calibration SOP. The non-reference weights are calibrated annually using reference weights and the results are recorded. The accuracy of the reference weights is certified

every five years. An outside contractor certifies each balance for accuracy once a year. A calibration sticker is placed on the balance and all associated information is maintained in the QA/QC department.

Titrant Standardization: All titrants used in the laboratory are standardized when opened to verify the titrant's normality in duplicate. These values are recorded in the appropriate analytical logbook. Each titrant must be within 90-110% of the known value. If not, the titrant is restandardized.

Instrument Calibration: An initial calibration is run on all instruments. Refer to individual method SOPs for method-specific calibration requirements.

Mercury analyzer must be calibrated using blank and 5 standards in graduated amounts that define the linear range of analysis. The correlation coefficient for the curve must be > 0.995.

Spectrophotometric analyses are calibrated by using a blank and minimum 5 standards. The correlation coefficient must be > 0.995, or as defined in the analytical SOP

If any calibration curve has a correlation coefficient < 0.995, corrective action is taken and a new calibration curve is analyzed. Samples, blanks, and standards are not analyzed until the curve passes the criteria. For all calibrations the lowest standard analyzed must be equal to or less than the reporting limit.

Formula: $y = ax \pm b$,

where:
y = instrument response (peak area or height)
a = slope of the line(also called the coefficient of x)
x = concentration of the calibration standard
b = intercept

Initial Calibration Verification (ICV): Second source standards are obtained from a different manufacturer than the original standards, whenever possible, or a different lot number from the same manufacturer is obtained, unless one is not available, and are used to verify the initial calibration. The ICV must be performed immediately after calibration of each analysis, as applicable. This is accomplished by analyzing a midpoint calibration standard. The ICV must have a percent recovery as specified in the individual method SOP. If the criterion is not met, corrective action must be taken. If the source of the problem can be determined after

corrective action has been taken, a new calibration MUST be generated. Samples, blank, and QC standards cannot be analyzed unless the ICV meets method criteria. The initial calibration shall be verified and documented for every analyte at each wavelength used for analysis.

Continuing Calibration Verification (CCV): CCV analysis is performed at a frequency specified in each method SOP. The CCV must be analyzed at the beginning of the run and after the last analytical sample, or as applicable per method SOP. The CCV concentration is at or near the midpoint of the calibration curve and is analyzed at every wavelength used for the analysis of each analyte. The CCV results must fall within the control limits specified in each analytical SOP.

Thermometer Calibration: Every liquid–in-glass thermometer used in the laboratory is certified annually, electronic and other non-liquid-in-glass thermometers are verified quarterly, against a NIST certified thermometer, which is traceable to the manufacturer. The certified reference thermometer has calibration verified annually. All data is recorded in a controlled logbook.

pH meter Calibration: Each pH meter is calibrated daily at pH of 4 and 7 and then checked with a pH 10 buffer solution. The calibration is recorded in the pH logbook along with the date and time of calibration. The calibration is checked every 3 hours during use and any adjustments are made. The pH meter slope is recorded monthly after calibration. Corrective action is taken if the slope falls outside the 95 to 105% range.

Spectrophotometer Wavelength Check: A wavelength check of each spectrophotometer is performed annually against Platinum/Cobalt standards and recorded in the maintenance logbook. If the wavelength does not meet the manufacturer's specified conditions, service is performed on the instruments.

Autoclave test strip: A temperature sensitive tape is used to verify the content of each autoclave run is processed.

Linear range Verification & Calibration for ICP - Metals: Linear range verification is performed for all ICP instruments. A series of calibration standards are analyzed over a broad range of concentration and data from these analyses are used to determine the valid analytical range for the instrument. ICP instrument calibration is routinely performed using a single standard at a concentration within the linear range and a blank.

17. CALIBRATION, VERIFICATION, AND MAINTENANCE OF EQUIPMENT

Objective: To establish a system to ensure accurate calibration and maintenance of all laboratory equipment. All instrument maintenance activities must be recorded in the instrument logbooks. Instrument should be labeled as a dedicated piece of equipment when an instrument is used for a unique activity.

17.1 INSTRUMENT CALIBRATION: Instruments are calibrated according to the requirements set forth by the manufacturer or as dictated by the respective SOP's for the test method for which the instruments are used. The frequency and type of maintenance and calibration activity performed must be documented in the instrument logbook. If an instrument is out of working order, out of calibration or in need of repair, a tag is affixed to the instrument directing the analysts to use another instrument.

Support instruments are calibrated and verified using NIST traceable reference standards over the range of use. Balances, ovens, incubators, water baths, freezers, and refrigerators are checked daily if in use and readings are recorded in their respective logbooks.

Refer to analytical method SOPs for method-specific calibration requirements. Also Refer to P244-Calibration policy SOP.

17.2 INSTRUMENT MAINTENANCE: Some instruments are purchased with a service contract. If a service contract is purchased, it is recorded in the logbook along with a contact phone number. Refer to P227-Services and Daily Maintenance SOP and P255-Maintenance SOP. Calibration is necessary after instrument repair and prior to using any new instrument. Instrument servicing includes routine cleaning and the repair and/or replacement of any faulty parts. For further information refer to the instrument manual or the SOP for the test method the equipment is used.

17.3 CALIBRATION/MAINTENANCE LOG: Each instrument has an associated maintenance and calibration logbook. The interval maintenance/ calibrations are guided by the manufacturer's instructions or as often as needed based on individual instrument performance. It may be modified by user's experience and frequency of use. The instrument is identified on the first page of the logbook. The logbook must document the calibration and maintenance of the instrument.

18. VERIFICATION PRACTICES

Objective: To establish a process for the verification practices in effect to assure adherence to the Quality Assurance Plan. A system for proficiency testing, use of reference materials, and internal QC schemes must be in place in order to ensure compliance.

18.1 PROFICIENCY TESTING (PT) PROGRAMS:

External PT Samples: Chemtech participates in NYSDOH Potable, Non Potable and Solid/Hazardous Categories and USEPA CLP. The results are used to evaluate the ability of the laboratory to produce accurate data. PT reports and raw data are retained in the laboratory for a minimum of five years. These records include results and supporting documentation of analyses of test samples and all related Quality Control analysis. The laboratory participates in the PT from other providers as well, e.g., client specific PT samples and Environmental Resources Association (ERA).

All PT samples are handled (i.e. managed, analyzed and reported) in the same manner as real environmental samples utilizing the same staff, methods as used for routine analysis of that analyte, procedures, equipment, facilities, and frequency of analysis. When analyzing a PT sample, the same calibration, laboratory quality control and acceptance criteria, sequence of analytical steps, number of replicates and other procedures are used as when analyzing routine samples.

Chemtech does not send any PT sample, or a portion of a PT sample, to another laboratory for any analysis for which it seeks accreditation, or is accredited. Chemtech does not knowingly receive any PT sample or a portion of a PT sample from another laboratory for any analysis for which the sending laboratory seeks accreditation, or is accredited. Chemtech management or staff does not communicate with any individual at another laboratory (including intra-company communication) concerning the PT sample. Chemtech management or staff does not attempt to obtain the assigned value of any PT sample from their PT provider.

Internal PT Samples: The QA/QC Director is responsible for administering an in-house blind check sample program, at QA/QC Director's discretion. Quality control samples are obtained from the EPA and from a private supplier. The known samples are blindly introduced into the system as a typical sample and analyzed as such. The results are reported to the QA/QC Director and evaluated.

This process allows for close monitoring of the accuracy of laboratory analyses on blind samples. If a problem is discovered, the QA/QC Director brings it to the attention of the Company President and Laboratory and Department Manager. With the assistance of the Technical Director, the cause of the problem is determined and appropriate corrective action is taken. Another blind sample is sent through the laboratory to confirm the problem has been resolved.

18.2 **USE OF REFERENCE MATERIAL AND SUPPLIES:** The laboratory purchases external reference samples from known vendors. All reference samples are certified and the laboratory maintains the manufacturer's Certificate of Analysis on file. Pre-certified and pre-cleaned supplies are purchased for DoD Work. Each lot of supplies is analyzed to ensure that no target analytes are present at concentrations above ½ Reporting Limit for DoD Work.

18.3 **INTERNAL QUALITY CONTROL PROCEDURES:** The data acquired from QC procedures are used to judge the analytical quality of the data, to determine the need for a corrective action, and to interpret results after the implementation of corrective actions. Each test method SOP details the QC procedures to be followed.

Method Blank: A method blank is an aliquot of reagent water for aqueous samples and an aliquot of a solid matrix, whenever possible, carried through the entire sample preparation and analytical procedure. A method blank must not contain any target analyte(s) at concentrations that exceed method requirements. If it does, the source of contamination must be removed or minimized before proceeding with sample analysis.

Note: For DoD Work: A method blank must not contain any analyte at ≥1/2 Reporting Limit and for common laboratory contaminants, no analyte must be present at ≥ Reporting Limit. If method blank contamination does not meet criteria, reprocess the associated samples in a subsequent preparation batch, except when sample analysis results in non-detect. If no sample volume remains for reprocessing, then results will be reported with appropriate data qualifiers.

Laboratory Control Samples (LCS): A LCS is an aliquot of reagent water for aqueous samples and aliquot of a solid matrix, whenever possible, spiked with the target analyte list analyzed with each batch of samples to demonstrate the method accuracy within acceptance QC limits. The results are used to determine batch acceptance. Each method SOP includes detailed QC procedures and QC limits.

Sample Duplicates: Sample duplicates are performed to measure analytical precision. One duplicate sample must be analyzed from each group of samples of similar matrix type for each batch of 20 samples. If a duplicate result falls outside QC limits the original sample and the duplicate sample data are regarded as unreliable and may necessitate corrective action.

Matrix Spikes: Matrix spikes are analyzed at a frequency of one per twenty samples to measure analytical precision and accuracy of the specified matrix. If precision and accuracy are out of QC limits, corrective action is required.

Surrogate Spikes: Surrogates are organic compounds that are similar in behavior to the target analytes but are not found in nature. They are added to all blanks, samples, and standards except the tuning standards at a concentration specified in relevant SOP's. All surrogates must meet the recovery limits specified in each SOP. If any surrogate does not meet the limits, the sample must be reanalyzed.

Internal Standard: An internal standard (IS) is a known amount of standard added to a test portion of a sample as a reference for evaluating and controlling the precision and bias of the applied analytical method. Retention time (RT) for an IS is also compared to reference standards to assure that target analytes can be located by their individual relative RT. If the criteria for IS response or RT criteria are not achieved corrective action is required, e.g., recalibration and reanalysis.

Sample Analysis: The analyst is responsible for performing all QC requirements before and after analyzing the sample to make sure that required QC criteria are met. If the sample QC criteria are not met, the analyst must take corrective action to rectify any problems. If the analyst is not able to remediate the issue, then must notify the supervisor who will take necessary corrective action.

Storage Blank, GPC Blank and Blank Spike analysis: Storage and GPC Blank and GPC Blank Spikes are logged weekly every Monday, and monitored by the QA/QC Director. Storage Blanks are analyzed to ensure that cross-contamination has not affected the sample results. GPC Blank and Blank Spike samples are monitored to ensure efficiency of the GPC cleanup process. GPC Blank and Blank Spike may not be performed weekly, if no samples are processed through GPC. However, the GPC Blank and Blank spike must be performed whenever GPC cleanup is performed.

Data Package Review: Data review is performed at different levels to assure that all QC criteria are met. The analyst conducting the analysis performs first data review. The data is then submitted for supervisory review. The final review of the data is conducted in the QC department before the data are released to the client. The QA/QC Director conducts a spot check review of the completed data packages. For further details refer to "Procedures for Audits and Data Review" section of this QA Manual and P201-Data Review SOP.

Monitoring Quality Control Limits: Quality Control data generated from duplicate analysis and matrix spikes/matrix spike duplicates are monitored and plotted on Quality Control Charts. Refer to P211-Control Charts SOP. Chemtech utilizes the Quality Control charts to identify data trends and assure that all tests are within control.

Chemtech records the theoretical or true value, then calculates and plots the mean value. In general, our warning limits are ±2 Standard Deviations from the true value. Corrective action is taken when ±3 Standard Deviations from the mean value are encountered. The Percent Recovery for all quality control samples must be within the limits stated in the method.

In addition to control chart limits, the laboratory uses limits of 75-125% and RPD limits of ±20% for inorganic analysis. For organic analysis %R limits and RPD limits as stated in applicable methods are used.

In control charts application, any points beyond the control limits indicate an out of control situation. When data points are out of statistical control, Chemtech investigates the source of the statistical perturbation. When an out-of-control situation occurs, analyses must be stopped immediately until the problem has been identified and resolved. The control charts are also utilized to identify trends, which can be checked and resolved before the system goes out-of-control.

Annual Quality Audits: An annual quality review of the system is important to ensure that laboratory management can continue to be confident that all measures are being taken to produce the highest quality of data and services. Annual audits, along with day-to-day data review, provide effective means for ensuring that QC activities are being implemented and that each analyst performs in a manner consistent with the quality system. The QA/QC Director conducts the audits, which are scheduled and announced in advance. For further details refer to the "Data Review and Internal Quality Audits" section of this manual.

18.4 **EXTERNAL QUALITY CONTROL PROCEDURES:** Chemtech participates in hardcopy and electronic data audits as required, in addition to on-site evaluations performed by various agencies and clients.

19. LABORATORY MANAGEMENT POLICY FOR PERMITTED DEPARTURES FROM DOCUMENTED POLICIES AND PROCEDURES

Objective: To establish a process for an event which requires departure from the documented policies and procedures.

19.1 **PROCEDURE:** The Technical Director, Laboratory Manager, and QA/QC Director have the responsibility for ensuring that all personnel adhere to the laboratory's policies. A departure from documented policies is allowed if fully documented and approved by the appropriate level of authority. Documentation of the departure includes the reason for the departure, the effected SOP(s), intended results of the departure and the actual results. The client will be informed of any deviation from the contract.

If the departure affects data, the client is notified before conducting the analysis for approval. This departure is also noted in the case narrative of the final report.

If the Client requests a method modification that represents a significant departure from a reference method, the client must acknowledge in writing the authorization of the modification. The acknowledgment can be in the form of a contract modification or signing the quotation acceptance page.

The quotation details the analytical requirements including the test methods for the project, the acceptance page to be signed by the client, states that "the quotation accurately describes the analytical requirements".

20. CORRECTIVE ACTIONS FOR TESTING DISCREPANCIES

Objective: To establish a system for actions taken in response to non-conformance reports issued during performance, data review, or a client complaint. The goal of the corrective action program is to correct and monitor out-of-control events, which effect the integrity of analytical results. All conditions that adversely impact data quality must be identified and corrected.

20.1 OUT-OF-CONTROL EVENTS: Out-of-control situations are identified through analytical data validation procedures. An out-of-control event is a situation, which results in the development of unacceptable results. Once a problem has been identified, the QA/QC Director must contact the department supervisor using the Corrective Action (CA) report form. The supervisor must initiate investigation into cause, and must ensure that corrective action is implemented and is effective. The CA must be documented on the (CA) report form and filed in QA/QC office. Refer to Corrective Action SOP for details of the corrective action report forms.

There are many situations that present an out-of-control situation. Contamination, percent recoveries and duplicate variations that are not within control limits, and failing calibrations are examples of situations considered out-of-control. Whenever a situation of this nature is encountered, Chemtech diligently develops the appropriate corrective action.

20.2 CORRECTIVE ACTION PROCESS: A corrective action is a response to an out-of-control event, which brings back a system to produce acceptable results. Corrective actions taken to control an event can be: stop analytical work immediately; identify the symptom of the out-of-control event; identify the cause of the out-of-control event; implement a corrective action; confirm that a return to control has been achieved by analyzing reference samples; document entire process by completing a CA Report Form; complete and return the CA Report Form to the QA/QC office.

20.3 DEPARTURES FROM DOCUMENTED POLICIES AND PROCEDURES: Method SOP's provide QC acceptance criteria and specific protocols for corrective actions. When testing discrepancies are detected such as out-of-control QC, the analyst must follow the corrective action protocol as described in the applicable method SOP.

Technical Director and QA/QC Director first approve any corrective action taken that is not mentioned in the SOP. This action is recorded in the CA Report Form and is documented in the electronic database of

corrective actions. If necessary, the method SOP is than revised to incorporate the corrective action to make it a part of SOP for future uses.

20.4 **CORRECTIVE ACTION MONITORING:** Laboratory Manager, Department Managers and QA/QC Director routinely monitor corrective actions implemented in the laboratory for effectiveness and to ensure that the deficiency has been completely removed from the system. If the deficiency still exists after a given period of time, the corrective action is reevaluated and modified.

21. REPORTING ANALYTICAL RESULTS

Objective: To ensure that the reported results are accurate, clear, objective, and unambiguous. The contents of the final report must include all necessary information and must be clear and understandable for the end-user.

21.1 REQUIRED DOCUMENTATION: All documentation used to approve and defend reported data must be collected and should be available and referenced so it can be found at any time it may be needed. Chemtech reports meet all applicable regulatory and client requirements. Electronic reports can be customized to meet the client specific requirements.

Documentation for Sample Identification: Includes at minimum sample identification, chain-of-custody, Field QC, if any and any other related documents.

Documentation of the Analytical Performance: Analytical method used and method detection limit (MDL), reporting limit (RL), limit of detection (LOD), or limit of quantitation (LOQ), as required; Instrumentation (manufacturer, model, performance checks); Calibration data (initial and continuing); Detailed analytical work (raw data, run logs, standard and reagent preparation, calculations)

QA/QC Documentation and Data: Analysis of blanks; Source of QC check standards; Preparation of spike stock solution.

Checks and Validation of Analytical Data: QC review Checklists; Corrective actions (when applicable); Date and signature of approval of the reportable data of each parameter tested; Date and signature for approval of the final report.

21.2 SIGNIFICANT FIGURES IN ANALYTICAL REPORTS: Numerical data are often obtained with more digits than are justified by their accuracy and precision, therefore must be reported by the accuracy of the analytical method.

The number of significant figures refers to the number of digits reported for the value of a measured or calculated quantity indicating the accuracy and precision of the value. Nonzero integers always count as significant figures. Leading zeros are zeros that precede all the zero digits and do not count as significant figures. The zeros simply indicate the position of the decimal point.

Captive zeros are zeros between nonzero digits, and always count as significant figures. Trailing zeros are zeros at the right end of the number and are significant only if the number contains a decimal point. At Chemtech the results are reported to two significant figures.

When rounding a number carry at least one digit beyond the last significant digit throughout all calculations. Round the final result by changing all digits beyond the last significant digit to zeros; drop these zeros if they are to the right of the decimal point. Refer to P225-Rounding Rules SOP.

21.3 UNITS USED TO EXPRESS ANALYTICAL RESULTS: Units used to express analytical results depend on the analytical method used, the concentration of the analytes, and the matrices of the sample analyzed.

The most common unit used to express results is milligrams per liter (mg/L), which is equal to parts per million (ppm) or milligrams per kilogram (mg/Kg). Other units used are microgram per liter (µg/L), which is equal to parts per billion (ppb) or micrograms per kilogram (µg/Kg).

21.4 REPORT CONTENTS: The final report includes the following information:

Client Information: name and address of the client

Project Information: Client project name and location (if specified by the client)

Chemtech Reference Information: Chemtech project number

Evidence Receipt: Description and identification of samples, chain-of-custody

Case narrative (if applicable): Description and/or identification of analysis performed with a description of deviations from the SOP if required

Summary and Results: Analytical results supported by raw data, chromatograms, initial calibration and continuous calibration, etc.

Report is sequentially numbered and all raw data and chromatograms are initialed and dated by the analyst. The final report is signed and dated by the QC supervisor. Refer to P201-Data Review SOP.

21.5 DATA COLLECTION , REDUCTION, REPORTING AND VALIDATION PROCEDURE

Data collection:
All data is collected from the instrumentation electronically. This data is then transferred electronically to a data processing computer were the data is revised and verified for method adherence and compliance.

For some analysis the data cannot be transferred electronically. The data is then entered manually to the reporting software and verified by a peer review.

Data reduction:
Analyst then processes the data and saves all instrument data collected in a designated folder in Mars (data storage server). The data is then brought electronically into the data reporting system where the data is reviewed against the method requirements and QC limits.

Data reporting:
Once the data is approved, the forms are printed. The data package is arranged with the necessary forms, depending on the method and client specifications. Once the data package is complete, the package is then brought to the Reporting Department for review and validation.

Data validation:
The first review is done in the lab by the analyst performing the analysis with the help of the reporting software (EISC), which contains all the method requirements.

Supervisor for the department performs a secondary review.

The last review is done at the reporting department were data reviewers go through the data package in detail and verify compliance with the method and client requirements.

22. DATA REVIEW AND INTERNAL QUALITY AUDITS

Objective: To design a process to assess compliance of laboratory activities with the operational requirements of the QA manual and to evaluate the performance of all analytical departments. The validation of data must be accomplished by a data review procedure.

22.1 DATA REVIEW: At Chemtech there are several stages for the data review/validation process. The analyst performing the analysis conducts the first data review. The supervisor reviews the data after the analyst review. The QC/Report Production performs the final review.

Analyst Review: The analyst is responsible for ensuring that all work performed meets the specifications and criteria outlined in the Statement of Work. They are to double-check all aspects of their analyses, including instrumental conditions, QA/ QC limits, calculations, and compound identification. When manual integration's are performed, the raw data records shall include a complete audit trail for those manipulations. Raw data output showing the results of the manual integration's, a notation of the rationale for the manual integration, including the date and initials/signature of the person performing the manual operation must be included in the raw data file.

Supervisor Review: Supervisor performs a technical data review to ensure that proper analytical sequence was employed, all QA/QC criteria were met, compounds were properly identified and flagged if required, correct standard, dilutions, and calculations were made.

Quality Control/Report Production Review: The completed data is reviewed by the QC/Report Production. Sample information from the sample receiving documentation is compared to in-house laboratory information to ensure consistency. The data are checked for general completeness, compliance, and QA/QC requirements, and random calculations are performed. If a quality control measure is found to be out of control, and the results are to be reported, all samples associated with the failed quality control measure will be reported with the appropriate data qualifier(s).

If a defect is identified in the data package, that can be corrected before the data are released to the client, the data package is returned to the laboratory for corrections. Immediate action is taken by the affected department to rectify the problem and corrected data package is returned to QC/Report Production office for review and final release of the data.

Spot Check Review by QA/QC Director: The QA/QC Director performs spot-check reviews about 10% of the data before they are released to the client. He/she focuses on all elements of data deliverables including sample identification, sample custody documentation, analytical quality control, and client specifications and requirements.

22.2 **INTERNAL QUALITY SYSTEM AUDITS:** Annual internal audits are conducted under the direction of the QA/QC Director. These audits are used to detect and correct any specific problems. The audit involves a thorough laboratory inspection to evaluate the following areas: adherence to all laboratory procedures as specified in applicable New Jersey, Pennsylvania, New York and other state or federal program regulations; verification of methodology; adherence to all method QC requirements; frequency of duplicates, spikes, blanks, and QC sample analyses; maintenance of documentation in adherence with good laboratory practices; and verification that laboratory equipment, supplies, and reagents are properly maintained. The internal audits cover all laboratory and support systems and include the analyst qualifications and training documents.

A comprehensive audit checklist is used for the department to be audited based on the method SOP and includes the cycle of a sample analysis beginning from sample receiving till the disposal of the sample and the release of data to the client. Checklists are revised annually to incorporate corrective actions initiated during the previous year to be followed up and to ensure that the corrective actions are taken and followed in the affected areas. Refer to Internal Audit Report for a copy of the latest checklists. Deficiencies are noted on the checklist and CA reports are issued to the area being audited.

Findings of the audit are documented and copies of the findings are given to the Company President, the Technical Director, the Laboratory Manager, and the Department Supervisor. A copy of the findings is also provided to the analyst. Any problems and their prospective resolutions are discussed among the QA/QC Director, Technical Director, and Department Supervisor. After an agreed upon time period, it is the responsibility of the QA/QC Director to ensure that the required corrective action has been implemented. All audit documents are kept on file by the QA/QC Director in the QA office.

23. ELECTRONIC DATA

Objective: To establish a system to control, verify, validate and document computer software used by LIMS.

23.1 Software: To ensure that the software that is used to collect, analyze, process and/or maintain LIMS Raw Data, SOP's are established, approved and managed for:

Testing and quality assurance methods to ensure that all LIMS software accurately performs its intended functions, including acceptance criteria, tests to be used, personnel responsible for conducting the tests, documentation of test results, and test review and approval.

Change control methods that include instructions for requesting, testing, approving, documenting and implementing changes. When indicated, change control methods shall also include reporting and evaluating problems, as well as implementing corrective actions.

23.2 Documentation: Documentation is established and maintained to demonstrate the validity of all software used in the LIMS and includes:

A description of the software and functional requirements; a listing of all algorithms and formulas; and as they occur, testing and quality assurance, installation and operation/enhancement, and retirement.

23.3 Security: SOP's are established to implement appropriate security procedures to assure the integrity of LIMS data are adequate.

23.4 Electronic Audit: The organics laboratory uses two different software packages to collect the data and two different software packages to produce the report. Both the volatiles and semi-volatiles departments use the combination of Hewlett Packard (HP) Chemstation/Enviroforms and EISC to collect and produce reports. GC volatiles only use TurboChrom software to process and quantitate the data. TurboChrom generates 3 separate files. The raw files contain no quantitation, only the output from the instrument. The .TXT files contain a process file, and the rpt. file contains a detailed report table. The raw file cannot be tampered with or changed. This file is protected by the software to preserve the original output. The PST/PCB data is collected on a different version of Chemstation and the EISC software is used to produce the reports. HP and EISC have set up security for the data itself and there is no way to effect any changes to the raw data. The quantitation is similarly secured by the software in that any data produced has information on it that can be used to determine its origin.

24. GLOSSARY

1. Acceptance Criteria: specified limits placed on characteristics of an item, process, or service defined in requirement documents.

2. Analytical Detection Limit: the smallest amount of an analyte that can be distinguished in a sample by a given measurement procedure throughout a given confidence interval.

3. Analyst: the designated individual who performs the "hands-on" analytical methods and associated techniques and who is the one responsible for applying required laboratory practices and other pertinent quality controls to meet the required level of quality.

4. Audit: a systematic evaluation to determine the conformance to quantitative and qualitative specifications of some operational function or activity.

5. Calibration: to determine, by measurement or comparison with a standard, the correct value of each scale reading on a meter, instrument, or other device. The levels of the applied calibration standard should bracket the range of planned or expected sample measurements.

6. Chain of custody: an unbroken trail of accountability that ensures the physical security of samples and includes the signatures of all who handle the samples.

7. Confidential Business Information: Information that an organization designates as having the potential of providing a competitor with inappropriate insight into its management, operation or products.

8. Confirmation: verification of the identity of a component through the use of an approach with a different scientific principle from the original method. These may include, but are not limited to: second column confirmation; alternate wavelength, derivatization, mass spectral interpretation, alternative detectors or additional cleanup procedures.

9. Corrective Action: the action taken to eliminate the causes of an existing nonconformity, defect or other undesirable situation in order to prevent recurrence.

10. Data Audit: a qualitative and quantitative evaluation of the documentation and procedures associated with environmental measurements to verify that the resulting data are of acceptable quality.

11. Demonstration of Capability: a procedure to establish the ability of the analyst to generate acceptable accuracy.

12. Document Control: the act of ensuring that documents and revisions are proposed, reviewed for accuracy, approved for release by authorized personnel, distributed properly and controlled to ensure use of the correct version at the location where the prescribed activity is performed.

13. Holding Times: the maximum times that samples may be held prior to analysis and still be considered valid or not compromised.

14. Laboratory: a defined facility performing environmental analyses in a controlled and scientific manner.

15. Laboratory Control Sample (lab fortified blank, blank spike, QC check sample): a sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes from a source independent of the calibration standards or a material containing known and verified amounts of analytes. It is generally used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.

16. Manager: the individual designated as being responsible for the overall operation, all personnel, and the physical plant of the environmental laboratory.

17. Method Detection Limit : the minimum concentration of a substance an analyte that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.

18. NELAC standards: the plan of procedures for consistently evaluating and documenting the ability of laboratories performing environmental measurements to meet nationally defined standards established by the National Environmental Laboratory Accreditation Conference or TNI (The NELAC Institute).

19. Nonconformance: An indication or judgement that a product or service has not met the requirements of the relevant specifications, contract or regulation; also the state of failing to meet the requirements.

20. Precision: the degree to which a set of observations or measurements of the same property, obtained under similar conditions, conform to themselves; a data quality indicator.

21. Preservation: refrigeration and/or reagents added at the time of sample collection to maintain the chemical and/or biological integrity of the sample.

22. Proficiency testing: a means of evaluating a laboratory's performance under controlled conditions relative to a given set of criteria through analysis of unknown samples provided by an external source.

23. Quality Assurance: an integrated system of activities involving planning, quality control, quality assessment, reporting and quality improvement to ensure that a product or service meets defined standards of quality with a stated level of confidence.

24. Quality Assurance Plan: a formal document describing the detailed quality control procedures by which the quality requirements defined for the data and decisions pertaining to a specific project are to be achieved.

25. Quality Control Sample: an uncontaminated sample matrix spiked with known amounts of analytes from a source independent from the calibration standards. It is generally used to establish intra-laboratory or analyst specific precision and bias or to assess the performance of all or a portion of the measurement system.

26. Quality System: a structured and documented management system describing the policies objectives, principles, organizational authority, responsibilities, accountability and implementation plan of an organization for ensuring quality in its work processes products and services. The quality system provides the framework for planning, implementing, and assessing work performed by the organization and for carrying out required QA and QC.

27. Raw data: any original factual information from a measurement activity or study recorded in a laboratory notebook, worksheets, records memoranda, notes, or exact copies thereof that are necessary for the reconstruction and evaluation of the report of the activity or study.

28. Record Retention: The systematic collection, indexing and storing of documented information under secure conditions.

29. Reference Method: a method of known and documented accuracy and precision issued by an organization recognized as competent to do so.

30. Reporting Limit: A specific concentration at or above the lower quantitation limit that is reported to the client with confidence. It is often defined on a project-specific basis. If set by the client below the lower quantitation limit, method modification is required or the client will be required to accept the lowest technically valid value that can be provided by the laboratory.

31. Standard Operating Procedures: a written document which details the method of an operation, analysis or action whose techniques and procedures are thoroughly prescribed and which is accepted as the method for performing certain routine or repetitive tasks.

32. Technical Director: individuals who has overall responsibility for the technical operation of the environmental testing laboratory.

33. Traceability: the property of a result of a measurement whereby it can be related to appropriate standards, generally international or national standards, through an unbroken chain of comparisons

25. REFERENCES

1. ISO/IEC DIS 17025: 2005. General requirements for the competence of calibration and testing laboratories.

2. NELAC TNI Standard (EL-V1-2011

3. DOD Quality Systems Manual for Environmental Laboratories Version 4.2

26. RESUMES OF KEY PERSONNEL AND CERTIFICATION LIST

26.1 Certification List – Mountainside NJ

STATE	STATUS	LABORATORY ID	Certification Categories
NJ-NELAP	Certified	20012	DW, WW, SHW, Air
NY-ELAP	Certified	11376	DW, WW, SHW, Air
CONNETICUT	Certified	PH-0649	DW, WW, SHW
FLORIDA	Certified	E87935	DW, WW, SHW
LOUISIANA	Certified	05035	WW, SHW, Air
MARYLAND	Certified	296	DW
MASSACHUSETTS	Certified	M-NJ503	WW
OKLAHOMA	Certified	9705	WW
PENNSYLVANIA	Certified	68-548	DW
RHODE ISLAND	Certified	LAO00259	DW,WW,,SHW, Air
TEXAS	Certified	T10470448-10-1	WW
VIRGINIA	Certified	460220	WW, SHW, Air
USDA	Certified	P330-11-00012	Soil Permit
USEPA	CLP	CHEM	metals, cyanide
DoD ELAP (L-A-B)	Certified	L2219	WW, SHW, Air

26.2 **Key Employee Resume** (additional resumes available upon request)

NAME: ***Divyajit Mehta*** **POSITION: Laboratory Director/Chief Operating Officer**

RESPONSIBILITIES: Responsible for all technical efforts of the Laboratory to meet all terms and conditions of EPA contract as well as all of CHEMTECH's clients. Experienced in the analysis of inorganic soil and water samples according to the requirements of the EPA Superfund, Contract Laboratory Program. Hands on experience in the use of the modern analytical instrumentation and wet chemical techniques. Currently responsible for the overall technical performance of the laboratory. Review the technical and QA/QC requirements during the analysis. Oversees the laboratory operations and compliance with all regulations.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
Gujarat University INDIA	1979	1982	*CHEMICAL* ENGINEERING		*BS, 1982*
NJIT	1984		*CHEMICAL ENGINEERING*		MS INCOMPLETE

Professional Experience

Name & Address of Employer: *CHEMTECH MOUNTAINSIDE, NJ 1/99-Present*	Responsibilities included: Oversee overall technical laboratory performance and compliance with regulations and contracts. Responsible for Corporate Health and Safety program.
Title of Position: CHIEF OF OPERATIONS/LABORATORY DIRECTOR	
Name & Address of Employer: CHEMTECH *ENGLEWOOD, NJ 1/89-1/99*	Responsibilities included: Responsible for the technical efforts of the inorganic department and compliance with EPA contract
Title of Position: *INORGANIC MANAGER*	

Professional Skills

Hands on experience in a variety of instruments such as GC/MS, ICP, GC and various Wet chemistry techniques.
Various training such NELAC training, instrument training and other seminars related with the Analytical procedures and instrumentation.

Computer Skills

Computer literate- MS Office- MS Word, MS Excel, MS Power Point
Use and design of Environmental Data Reduction Software
Enviroquant & Enviroforms, LIMS- Sample Master, EISC data reduction Software.

Other Achievements or Awards

Divyajit has completed various training in the Environmental field. Examples of these are: Inorganic Data validation training, Region II Organic data validation, Sample Master LIMS advance course, ICP training course and others. OSHA 40-hour Training Certified

Title of Position & Dates: *Project Management Director, 1/2008 – 2/2009*	

NAME: Himanshu N. Prajapati **POSITION:** QA/QC Director

Dates: 02/2013 – Present

RESPONSIBILITIES: Enforcement of all QA/QC requirements as per EPA, CLP protocols and all state regulations, Internal Audit of the lab, write and annually update Standard Operating Procedures, Assure that lab QA/QC practices are kept by conducting Internal Audit Annually, Verify all QC Client Contract compliance and Screening, Provide clients with technical support upon request, Development and maintenance of corrective action reports, regulatory and client document review, monitor external assessments, monitor compliance of lab systems with quality system guidelines established by federal and state agencies.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
L.D. College of Engineering Ahmedabad, Gujarat, India	1993	1997	***Chemical Engineering***	***NA***	***B.E. Chemical Engineering***
Stevens Institute of Technology NJ, USA	1999	-	***MS Chemical Engineering***	NA	

Professional Experience

Name & Address of Employer: ***CHEMTECH 284 Sheffield Street Mountainside, NJ 07092***	**Responsibilities Included:** Responsible for review of CLP packages, maintenance and troubleshooting of instruments, training other lab personnel in Semi-Volatile analysis and instrumentation. Prepare and analyze proficiency samples. Schedule work flow for other analysts.
Title of Position: *GC/MS Extractables Supervisor**; 10/02-02/13***	
Name & Address of Employer: ***CHEMTECH 284 Sheffield Street Mountainside, NJ 07092***	**Responsibilities Included:** Assist supervisor with all aspects of data deliverable production, review data based on SW-846, CLP and 40 CFR methodology, depending on project requirement. Verify all QC requirements, contract compliance, screening and method requirements
Title of Position: ***QC Analyst; 9/04-12/04***	
Name & Address of Employer: ***CHEMTECH 284 Sheffield Street Mountainside, NJ 07092***	**Responsibilities Included:** Perform BNA analysis as per EPA 600 series, SW 846 and CLP protocols. Assist supervisor with SOPs updates. Update LIMS system. Troubleshoot instrument.

Title of Position: GC/MS Analyst; 04/00-10/02	

YFor additional information please see attachment.

Professional Skills

Proficient with the analysis of samples for inorganic & organic parameters.

Computer Skills

MS Office- Word and Excel
Data Processing software

Other Achievements or Awards

NAME: Qi Mo **POSITION:** GC/MS Extractables Leader Operator

Dates: Feb 2013 – Present

RESPONSIBILITIES: Analyze samples using SW846, EPA CLP and 600 series methods. Prepare and analyze proficiency samples. Responsible for maintenance and troubleshooting of instruments.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
Brooklyn College		2005	***Arts***		***Master of Arts***

Professional Experience

Name & Address of Employer: ***CHEMTECH 284 Sheffield Street Mountainside, NJ 07092***	**Responsibilities Included:** Assist supervisor with all aspects of data deliverable production, review data based on SW-846, CLP and 40 CFR methodology, depending on project requirement. Verify all QC requirements, contract compliance, screening and method requirements. Update LIMS system. Troubleshoot instrument.
Title of Position: ***GC/MS Analyst; 9/04-Present***	

YFor additional information please see attachment.

Computer Skills

MS Office- Word and Excel
Data Processing software

NAME: Rajesh Parikh **POSITION:** Extraction Supervisor

DATES: March 2011-Present

RESPONSIBILITIES: Supervision of Extractions department, schedule and coordinate workflow for the extractions analysts. Extract samples for BNA, Pesticides, PCBs, Herbicides and TPH based on EPA 600 series, SW 846 and CLP methodologies. Updating LIM system. Review and updating of Extractions SOPs. Troubleshoot instrument. Prep and Analysis of Oil and Grease based on method SW 1664.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
University of Baroda India	1967	1971	***Chemistry***		***BS 1970***

Professional Experience

Name & Address of Employer: ***CHEMTECH*** 284 Sheffield St, Mountainside, NJ 07092 **Title of Position:** ***Extraction Analyst, June 2003-March 2011***	**Responsibilities included:** Extract samples for BNA, Pesticides, PCBs, Herbicides and TPH based on EPA 600 series, SW 846 and CLP methodologies. Assist supervisor with SOPs updates. Update LIMS system. Troubleshoot instrument. Prep and Analysis of Oil and Grease based on method SW 1664.
Name & Address of Employer: ***Godak Mills*** India **Title of Position:** ***Chemist Jan 1977-Nov 2002***	**Responsibilities included:** Testing and analysis of raw materials and Dyes. Analysis of In-process and finished products.
Name & Address of Employer: Calico Mills India **Title of Position:** Chemist Jan 1972-Dec 1976	**Responsibilities included:** Testing and analysis of raw materials and Dyes. Analysis of In-process and finished products.

YFor additional information please see attachment.

Professional Skills

Computer Skills

Microsoft Office 2000-Excel, Windows

NAME: Jaswal Sarabjit **POSITION: Metals Analysis Supervisor**

Dates: 12/89 to Present

RESPONSIBILITIES: Supervision of Metals departments. Flow of work; analyses of samples within holding times, scheduling of work with the analysts, verify the test results performed by analysts. Technical data review of analyses (ICP data run – Methods 6010, 200.7, CLP, Hg data run – Methods 7470, 7471, 245.1, CLP. Report preparation and handle centralize computer system for analytical reports.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
Punjab University, India	*1976*	*1981*	***Chemistry***	------	***BS; 1981***

Professional Experience

Name & Address of Employer: CHEMTECH 205 Campus Plaza 1, Edison, NJ 08837 **Title of Position & Dates:** ***Laboratory Chemist;*** ***7/88 to 12/89***	**Responsibilities included:** Analyses of General Chemistry and Metals parameters including cyanide, nitrate-nitrite, TKN, TDS, TSS, BOD, COD, TOC, hardness, etc. of wastewater, drinking water, soil, and sludges. Reporting of data as required.
Name & Address of Employer: JCT Mills (Nylon Plant). **Title of Position & Dates:** ***Laboratory Chemist;*** ***1/83 to 11/85***	**Responsibilities included:** Analysis of General Chemistry methods.

Professional Skills

- Experience in EPA methods, NYSDOH, NJDEP, and CLP requirements.
- Hands on experience for running ICP/Hg analyzer, TOC, Lachate, UV spectrophotometer, etc.
- Troubleshooting of above-mentioned instruments.

Computer Skills

MS Office – MS Word, MS Excel, MS PowerPoint

NAME: Ugochukwu Amadioha **POSITION: GC Extractables Supervisor**

DATES : MAY 06 – PRESENT

RESPONSIBILITIES: Supervision of Pesticide/PCB department, co-ordination of workflow in the department, analysis of samples within the specified holding times, scheduling the work with the analysts, and training of the new employees.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
COLLEGE OF NEW JERSEY		*2003*	***Biology***	------	***BS 2003***

Professional Experience

Name & Address of Employer: CHEMTECH Mountainside, NJ 07092 **Title of Position:** ***GC and GC/MS analyst;*** ***10/04-05/06***	**Responsibilities included:** VOC water, soil and gases analysis by method EPA 600 and SW846. Operate Archon autosampler, GC FID. Prepare standards. Follow GLP. Daily calibration of lab scales, refrigerators, autoclaves.
Name & Address of Employer: Roche Molecular systems Branchburg, NJ **Title of Position:** ***PCR Control Scientist;*** ***06/05-02/06***	**Responsibilities included:** Support manufacturing of Qualitative standards and Internal Controls for Polymerase Chain Reaction kits. Operate PCR instruments and Real Time PCR. Review controlled testing and manufacturing documents.
Name & Address of Employer: Medco Health Solution, LLC Parsippany, NJ **Title of Position:** *Customer Services Representative;* *10/03-08/04*	**Responsibilities included:** Educate members about prescription drug benefits managed by Medco Health and on plan attributes as it relates to copay, deductible, Out of Pocket expenses and CAP.

Professional Skills

Lab Techniques in Cell and Molecular Biology and Genetics: PAGE and Agrose Gel Electrophoresis. Protein purification, DNA isolation, Column Affinity Chromatography, PCR and Restrictive Fragment Analysis, Pour Plating, Colony Isolation, and Aseptic techniques.

NAME: Jonghun Jung **POSITION: GC Semivolatile Analyst**

DATES: June 2004- Present

RESPONSIBILITIES: Perform analysis on samples for Pesticide/PCB analyses. Updating LIM system. Review and updating of GC Semi Volatile SOPs. Review and finalize data before Supervisor review

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
University of Seoul Seoul, South Korea	*1993*	*1996*	***Physics***	------	***BS 1996***
New York University, New York NY	*1997*	*1999*	*English language and liberal arts*	------	*Certificate 1999*
New York University, New York, NY	*1999*	*2002*	*Environmental Health Science*	------	*MS 2002*
College of Staten Island (CUNY)	*2002*	*Present*	*Environmental Science*	------	*Expected MS 2005*

Professional Experience

Name & Address of Employer: Chemtech 284 Sheffield Street	**Responsibilities included:** Updating LIM system. Review and updating of Metals data per ILM05.3. Review and finalize data before Supervisor review. Generate reports and assist QC on the final data report.
Title of Position: ***Metals data processing*** ***Feb, 2004- June 2004***	
Name & Address of Employer: College of Staten Island Staten Island, New York	**Responsibilities included:** Laboratory technician in the Engineering sciences and Physics department.
Title of Position: ***Lab Tech*** ***2002-2003***	

Name & Address of Employer: NY University Graduate School of Arts and Science New York, NY	**Responsibilities included:** Teaching assistant in environmental hygiene measurement course. Worked at WTC-ground zero for air sampling and monitoring. Analyzed samples using GC instrument.
Title of Position: *Teaching assistant* *1999-2002*	

Professional Skills

Indoor Air Quality Inspection, Environmental pollutants measurements, Gas Chromatography, microbalance, fluorescence spectroscopy and AA spectrophotometry.

NAME: Mildred V. Reyes **POSITION: QC Supervisor**

DATES: Feb.2006-Present

RESPONSIBILITIES: Supervision of data deliverable production, data review based on SW-846, CLP and 40 CFR methodologies. Verify QC requirements, contract compliance and screening requirements.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
UNIVERSITY OF PUERTO RICO	*1982*	*1987*	***Biology***	------	***BS 1987***

Professional Experience

Name & Address of Employer: CHEMTECH Mountainside, NJ 07092 **Title of Position:** *QA/QC Director* *2002-2006*	**Responsibilities included:** Enforcement of QA/QC requirements, Internal Audit of the lab, Write and update SOP, Verify QC Client Contract Compliance and Screening, Provide clients with technical support.
Name & Address of Employer: CHEMTECH Mountainside, NJ 07092 **Title of Position:** ***QA/QC Supervisor*** ***1999-2002***	**Responsibilities included:** Supervision of all aspects of data deliverable production, data review of GC/MS Volatile and Semi volatile, Pesticides, PCBs, Herbicides, Metals and Wet Chemistry based on SW 846, EPA, CLP and 40 CFR methodologies. Verify all QC requirements, contract compliance, screening and requirements.
Name & Address of Employer: Analab/ICM Division 205 Campus Plaza 1, Edison, NJ 08837 **Title of Position:** ***GC, Supervisor*** ***1995-1999***	**Responsibilities included**: Supervision of four GC analysts; coordination of work flow and schedule; technical review of all data generated for GC Volatile, Pest, PCB Herbicides analysis; instrument trouble shooting and other technical problems.

Name & Address of Employer: Cycle Chem, INC Elizabeth, NJ **Title of Position:** *Production Chemist* *1993-1995*	**Responsibilities included:** Perform daily lab analysis on disposal material based on SW 846 and 40 CFR requirements. Analysis included PCB analysis, Metals and Wet Chemistry; inventory of all incoming samples
Name & Address of Employer: Safety Kleen, Linden, NJ **Title of Position:** ***Laboratory Technician*** ***1990-1993***	**Responsibilities included:** Senior Technician overseen laboratory operations during night shift. Perform daily lab analysis, which included Volatile Organic analysis, PCB analysis, and Wet Chemistry**.**

Other Achievements or Awards

Environmental Laboratories Seminar
Internal Assessment Training

Professional Skills

GC Volatile, Pesticides, PCBs, Herbicides analysis by GC using EPA, SW 846 and 40 CFR methodology.
ASP and CLP deliverable.

Computer Skills

MS Office- MS Excel, MS Word, MS Power Point
Use of Environmental data reduction software

NAME: Snehal Mehta **POSITION**: ***Sample Management Supervisor***

Dates: Jan.01 - Present

RESPONSIBILITIES: Login samples. Prepare bottle orders and receiving samples, sample custodian.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
Gujrat University	1993	1996	***Chemistry***	-----	***BS, 1996***

Professional Experience

Name & Address of Employer: Kroma Dyestuffs Ltd., India	**Responsibilities included:** Analyze soil, water and sludge analysis. Supervision of analysts. Data and technical review.
Title of Position & Dates: ***Analytical Chemist*** ***1994-1997***	

Computer Skills

MS Office – MS Word, MS Excel, MS PowerPoint

NAME: Semsettin (Sam) Yesiljurt **POSITION: GC/MS Analyst (Volatile)**

Dates: 7/2001 – Present

RESPONSIBILITIES: Analyze and QA/QC water and soil samples using SW 846 8000 series and EPA 600 series methods. Preparing data packages to be reported to the client. Keeping track of projects pertaining to the department. Troubleshooting of instruments and other technical problems according to methodology.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
Gazi University ***Ankara, Turkey***	*1976*	*1980*	***Chemical Engineering***	------	***BS, 1980***

Professional Experience

Name & Address of Employer: CHEMTECH Consulting 205 Campus Plaza, Raritan Ctr. Edison NJ **Title of Position & Dates:** ***GC Analyst*** ***7/99 – 7/01***	**Responsibilities included:** Analyze and QA/QC water and soil samples using SW 846 8000 series and EPA 600 series methods for Pest, PCB, Herb. Preparing data packages to be reported to the client. Troubleshooting of instruments and other technical problems according to methodology.
Name & Address of Employer: All Test Environmental Lab **Title of Position & Dates:** ***GC/MS analyst,*** ***2/99 – 7/99***	**Responsibilities included:** Analyze and QA/QC water and soil samples using SW 846 8000 series and EPA 600 series methods.
Name & Address of Employer: Technion **Title of Position & Dates** *GC/MS Analyst 8/96-2/99*	**Responsibilities included:** Analyze and QA/QC water and soil samples using SW 846 8000 series and EPA 600 series methods.
Name & Address of Employer: Technion **Title of Position:** ***GC Analyst 4/93-8/96***	**Responsibilities included:** Analyze and QA/QC water and soil samples using SW 846 8000 series and EPA 600 series methods.

Professional Skills

- Troubleshooting of GC/MS, Tekmar autosampler
- Data package production using Enviroforms and EISC software
- Acquisition and analysis of samples using Enviroquant and RTE software
- ASP Deliverables, CLP Deliverables

Computer Skills

MS Office – MS Word, MS Excel, MS PowerPoint
Use of Environmental Data Reduction Software – Enviroquant & Enviroform, EISC, LIMS

NAME: Mohammad Ahmed **POSITION: Laboratory Manager**

Dates: Nov. 2005 - Present

RESPONSIBILITIES: Responsible for all technical efforts of the Laboratory to meet all terms and conditions of CHEMTECH clients. Hands-on experience in the use of modern analytical instrumentation and wet chemical techniques. Currently responsible for the overall technical performance of the laboratory. Review technical and QA/QC requirements during the analysis. Oversee the laboratory operations and compliance with all regulations.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
University of Punjab	1996	2001	***Science***	-----	***BS, 2001***

Professional Experience

Name & Address of Employer: CHEMTECH Mountainside, NJ **Title of Position & Dates:** ***Laboratory Manager Nov. 2005-Present***	**Responsibilities included:** Oversee all technical laboratory performance and compliance with regulations and contracts.
Name & Address of Employer: Naturex **Title of Position & Dates:** ***Senior Chemist Oct.2005-Nov.2006***	**Responsibilities included:** Responsible for SOP prep. and review, method development, perform analysis using different instruments, calibrate and maintain instruments.
Name & Address of Employer: Garden State Laboratories **Title of Position & Dates:** ***Team Leader May 2001-Oct.2005***	**Responsibilities included:** Supervise organic department, oversee sampling projects, produce monthly reports, supervise PT analysis.
Name & Address of Employer: Accutest laboratories **Title of Position & Dates:** ***Senior Chemist Sept..2002-Oct.2003***	**Responsibilities included:** Responsible for laboratory audits, review data, create SOPs, perform organic and inorganic analysis.

Professional Skills

- Hands on experience in a variety of instruments such as GC/MS, ICP, GC, and various Wet chemistry methods.

Computer Skills

- ***MS Office – MS Word, MS Excel***
- Use of Environmental Data Reduction Software – Enviroquant, EISC, LIMS

NAME: Jacob Tsvik **POSITION: Systems Manager**

DATES: October 2004- Present

RESPONSIBILITIES: Quality Control of all computer systems, including hardware, software, documentation and procedures. Generates and updates the automated deliverables in accordance to client specifications. Installation, training, maintenance and operation of programs as they pertain to providing open architecture systems that promote adaptability, efficiency, reliability and system integration. Develop, design and implement CHEMTECH's LIMS system. Develop US Army. US Navy and US Air Force and commercial client EDDs based on each individual requirement.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
COPE Institute, NY	1995	2002	-----	-----	***2002***
University of Technology, Ukraine	1978	1983	-----	-----	BS, Engineering

Professional Experience

Name & Address of Employer: Bris Avrohom, Hillside, NJ **Title of Position & Dates:** Field Network Technician, 06/2002 – 03/2004	**Responsibilities included:** Support users for Network Client Installation and support, Install and setup Windows 95/98 and Windows NT, 2000, XP workstations and create user accounts, home directories, assign permissions to shares. Install 3com cards, hubs, test connectivity. Provide Level 1, 2 support. Perform system backup. Resolve service interruptions.
Name & Address of Employer: BLS Technology Inc., Brooklyn, NY **Title of Position & Dates:** Consultant, 08/1996 – 03/2002	**Responsibilities included:** Physical inventory, Asset tag placement, Maintain and troubleshoot entire network, Administer domain accounts, Software installation and troubleshooting, Install and support Client 32, Deal with TCP/IP address, Upgrade and repair desktop computers.
Name & Address of Employer: J & R Computer World, NY **Title of Position & Dates:** Computer Technician, 01/1995 – 07/1996	**Responsibilities included:** Upgrade and repair desktop and laptop computers, Install and configure external and internal devices, Heavy phone troubleshooting and support, on-site troubleshooting and user orientation.

Professional Skills

Windows NT, 2000, XP, Linux system, Microsoft Office, PC and PC components, laptops, cables and adapters, NIC, Routers, Hubs, Switches, Cables and connectors, UPS, Printers, Scanners, Modems, ISDN, DSL, Video equipment.

Computer Skills

Microsoft Office Word, Power Point Excel

NAME: ***Amit Patel*** **POSITION**: ***General Chemistry Supervisor***
Dates: Feb. 2005

RESPONSIBILITIES: Analyze and QA/QC water and soil samples using SW 846 8000 series, EPA CLP and EPA 600 series methods. Preparing data packages to be reported to the client. Keeping track of projects pertaining to the department. Troubleshooting of instruments and other technical problems according to methodology.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
Gujarat University	1996	2000	***Chemical Engineering***	-----	***Gujarat University***

Professional Experience

Name & Address of Employer: Chemtech	**Responsibilities included:** Worked as assistant engineer in cement plant using 100% lignite as fuel.
Title of Position & Dates: ***Assistant Engineer, 11/02 – 10/04***	
Name & Address of Employer: Sanghi Industries Ltd.	
Title of Position & Dates: Assistant Engineer, 11/02 – 10/04	

Professional Skills

- Project on Thionile Chloride
- Seminar on Composting – a solid waste management system

Computer Skills

- ***MS Office 2000, C, C++, Basic, Java 2.0, HTML Languages***
- ***Windows, Linux, MD DOS***
- SQL Server 7.0

NAME: ***Kurt Hummler*** **POSITION**: ***Project Manager***

Dates: Feb. 1997 - Present

RESPONSIBILITIES: Responsible for setting up client projects and maintaining direct client contact throughout the project to ensure that all client requirements are fulfilled.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
University of North Carolina			***Political Science***	-----	***BA***

Professional Experience

Name & Address of Employer: CHEMTECH 284 Sheffield Street Mountainside, NJ	**Responsibilities included:** Responsible for communicating with client and laboratory all information pertaining to the project.
Title of Position & Dates: Project Manager, Feb. 1997-Present	
Name & Address of Employer: Lab Resources Inc.	**Responsibilities included:** Responsible for marketing and managing the project.
Title of Position & Dates: Project/Marketing Manager, 08/97 – 01/98	
Name & Address of Employer: Core Labs, Inc.	**Responsibilities included:** Worked as project manager.
Title of Position & Dates: Project Manager, 02/92 – 05/97	

Computer Skills

MS Office – MS Word, MS Excel, MS PowerPoint

NAME: Emanuel Hedvat **POSITION: President**

RESPONSIBILITIES: Primarily responsible for all operations and business activities. Develop and implement strategies and initiatives. Responsible for growth and direction of Chemtech. Responsible for the profitability of the company, the quality of analyses performed and the high level of service provided to clients. Delegate authority to Laboratory Directors, all Managers, and Quality Assurance/Quality Control Director to conduct day-to-day operations and execute quality assurance duties.

Educational Background

College/University	Dates Attended		Major	Minor	Degree & Date
	From	To			
Fairleigh Dickenson University			Chemistry	---	BS
Fairleigh Dickenson University			Chemistry	---	***MS, 1983***

Professional Experience

Name & Address of Employer: Chemtech **Title of Position & Dates:** ***President***	**Responsibilities included:** Oversee overall laboratory performance and compliance. Maintain quality service. Discuss analytical requirements with Disposal facilities and Regulatory Agencies. Develop Sampling and Analysis Plans. Create Site Maps. Generate Electronic Diskette Deliverables for interpretation of analytical results as per Disposal Facility requirements. Perform sampling per regulatory agency requirements.

Professional Skills

Mr Hedvat has over 25 years of experience in the environmental testing industry including on-site laboratories. With extensive experience in corporate management. He has conducted numerous field chromatography studies at various US Navy bases. Developed and implemented numerous analytical techniques in support of remedial investigations studies. His knowledge on environmental testing stems from having served as Laboratory Director, Field Services Director and Project Management Director.

Computer Skills

Microsoft office 2003; excel, word, power point

Other Achievements or Awards

Active Registration and Awards:
American Chemical Society
American Society for Testing & Materials
Water Pollution Control Federation
Society of American Military Engineers

27. Laboratory SOP List

(a list of current SOP revisions and reviewed dates available upon request)

Document Title	Document Control Number
Quality Assurance Manual	A2040129
Chemical Hygiene Plan	A2040232
Conflict of Interest Plan	A2070189
Affirmative Action Program Executive	A2070190
AAP Section 503 and 4212-01	A2070191
Procedural SOPs	
P201-Data Review	A2040102
P202-Reagent Check	A2040103
P203-Laboratory Limits and Demonstration of Capability	A2040104
P204-Chain-of-Custody Procedure	A2040139
P205-Chemical Waste Disposal	A2040106
P207-ASTM Type II Water	A2040108
P208-Thermometer Calibration	A2040109
P209-Scale Calibration	A2040110
P210-Corrective-Preventative Action	A2040111
P211-Control Charts	A2040112
P212-Water Purity	A2040113
P213-Calibration of Auto Pipettes	A2040114
P214-Subcontracting	A2040115
P215-Hood Calibration	A2040116
P216-Calibration and Temperature Setting	A2040117
P217-Glassware Cleaning	A2040118
P218-Chemical Storage	A2040119
P219-Disposal of Chemicals	A2040120
P220-Traceability	A2040121

Document Title	Document Control Number
P222-Standard Operating Procedure Preparation	A2040123
P223-Material Safety Data and Records	A2040126
P224-Bottle Preparation	A2070104
P225-Rules for Rounding	A2040124
P226-Corrections	A2040127
P227-Service and Daily Maintenance	A2040127
P228-Storage and Disposal of PCB Materials	A2040139
P229-Computer Backup and Storage	A2070074
P230-Sample Aliquot	A2070075
P231-Data Archive	A2070076
P232-Data Storage	A2040105
P234-Field Sampling	A2070091
P235-Worklist	A2070098
P236-Fax Procedure	A2070099
P237-Training	A2070105
P238-Field Chlorine Test	A2070130
P241-Air Canister Cleanup	A2070133
P243-Manual Integration Policy and Electronic Logbook	A2070146
P244-Calibration Policy	A2070147
P250-Log-in Procedure	A2040128
P251-Quotation Project Chronicle	A2070151
P252-Ethics Policy	A2070178
P253-Uncertainty Policy	A2070179
P254-Purchasing and Supplies	A2070194
P255-Maintenance	A2070195
P256-Storage Blank	A2070196
P257-Foreign Soils	A2070201

Document Title	Document Control Number
GC VOC SOPs	
M8015B/C-GRO	A2040028
MRSK-175	A2070198
GCMS VOC SOPs	
M524.2-DWVOA	A2040035
M64/SM6210B-MSVOA	A2040037
M8260B/C-SWGCMSVOA	A2040038
MTO15-Air VOC	A2070131
MSOM01.2-GCMS VOA	A2070183
MSOM01.2-GCMS VOA Trace and SIM	A2070184
Extractions SOPs	
M3510C,3580A-Extraction SVOC	A2040001
M3510C,3580A-Extraction DRO	A2040002
M3510C,3580A-Extraction PCB	A2040004
M3510C,3580A-Extraction Pesticide	A2040005
M3610-Alumina Cleanup	A2070036
M3620C-Florisil Cleanup	A2070037
M3630-Silica Gel Cleanup	A2070038
M3640A-GPC Cleanup	A2070039
M3660B-Sulfur Cleanup	A2070040
M3665A-Sulfuric Acid Cleanup	A2070041
M3545A-Pressurized Fluid Extraction	A2070091A
M3520C-Pest/PCB Liquid-Liquid Extraction	A2070100
M3541-ASE Extraction	A2070095
MSOM01.2-Sample Preparation	A2070185
M3535A-HPLC Explosives Preparation	A2070137
M8330/A-Explosives Salting Preparation	A2070138

Document Title	Document Control Number
O.17-CWA Breakdown Product Extraction from Solids	A2070207
O.18-CWA Breakdown Product Extraction from Water	A2070208
O.19-White Phosphorus Extraction from Soil	A2070257
O.20-White Phosphorus Extraction from Water	A2070258
P.1-Biological Tissue Homogenization	A2070282
P.5-Percent Lipid Determination	A2070283
GCMS SVOC SOPs	
M625-BNA	A2040030
M8270C/D-BNA	A2040031
MSOM01.2-SVOC	A2070186
M8330A-Nitroaromatics	A2040007
L.2-Explosives Residues by 8330B	A2070203
M.4-CWA Breakdown Products by GCMS	A2070211
M.5-White Phosphorus Analysis by GCMS	A2070265
GC SVOC SOPs	
M608-WW Pesticide PCB	A2040017
M8015B/C-DRO	A2040018
M8081A/B-Pesticide	A2040020
M8082/A=PCB	A2040021
M8151A-Herbicide	A2040022
Document Title	**Document Control Number**
M8015B-Fingerprint	A2070141
MOLC03.2-Pesticide PCB	A2040023
MSOM01.2-PCB	A2070188
MSOM01.2-Pesticide	A2070187
MNJDEP-EPH	A2070199

MOQA-QAM-025-TPH	A2070182
Metals SOPs	
M3005A-Digestion	A2040143
M3010A-Digestion	A2040011
M3050B-Digestion	A2070023
M7470A-Mercury	A2040095
M7471A/B-Mercury	A2040096
M200.7-Trace Elements	A2070019
M200.7/2340B-Hardness	A2040097
M6010B/C-Trace Elements	A2040091
M6010-SM2340B-Hardness	A2070192
M200.8-Trace Elements	A2070103
M6020/A-Metals ICPMS	A2070102
MILM05.4HGS-Mercury in Soil	A2070158
MILM05.4HGW-Mercury in Water	A2070155
MILM05.4-Metals ICPMS	A2070156
MILM05.4-Trace Metals	A2070153
MISM01.2-Trace Metals	A2070198
MISM01.2-Metals ICPMS	A2070199
MISM01.2-Mercury in Soil	A2070200
MISM01.2-Mercury in Water	A2070201
MISM01.3-Mercury in Soil	A2070285
MISM01.3-Mercury in Water	A2070286

Document Title	**Document Control Number**
MISM01.3-Trace Metals	A2070288
MISM01.3-Metals ICPMS	A2070287
MPM10-Digestion	A2070189
P.3-Biological Tissue Digestion	A2070281
General Chemistry SOPs	
M1010A-Flash Point	A2040041
M1110-Corrosivity	A2040043
M1311-TCLP	A2040044
MSM2540B/160.4&SM2540G-Total Solids and Total Volatile Solids	A2040046
M180.1-Turbidity	A2040048
M300.0-Inorganic Anions	A2040050
M3060A/7196A-Hexavalent Chromium	A2040051
MSM3500-Cr B-Hexavalent Chromium	A2040058
M365.3/SM4500-P E,B5	A2040061
MSM5210B-BOD&CBOD	A2040063
MSM4500-Cl G-Residual Chlorine	A2040065
MSM4500-SO4 E-Sulfate	A2040067
M9010C-Total, Ammenable & Reactive Cyanide	A2040077
M9040C-pH	A2040081
M9045C-pH	A2040082
M9060/A-TOC	A2040083
MAVS	A2040087
MLloyd Kahn TOC	A2040088
M120.1-Conductivity	A2070007
MSM2150B-Odor	A2070021
MSM2320B-Alkalinity	A0010001
MSM2120B-Color	A2070020
M5220C/D-COD	A2070010

Document Title	Document Control Number
MSM4500-H B-pH	A2070045
M5540C-MBAS	A2070048
M9041A-pH	A2070049
M9056/A-Inorganic Anions	A2070050
M9065-Phenolics	A2070051
M9071B-Oil&Grease	A2070053
M9080-Cation Exchange	A2070054
M9081-Cation Exchange	A2070055
M9095A/B-Free Liquids	A2070056
M-Percent Solids	A2070004
M1312-SPLP	A2070068
M1664A-Oil&Grease	A2040047
MSM4500-NH3 B,G/H-Ammonia	A2040057
M9012A/B-Total, Ammenable & Reactive Cyanide	A2070088
M9030B-Sulfide	A2070070
M9050A-Conductivity	A2070090
M1030-Ignitability	A2070064A
M9034/SM4500-S F-Sulfide	A2070069
M420.1-Phenolics	A2070106
M1498-REDOX Potential	A2070089
M9038-Sulfate	A2070134
MILM05.4CN-Cyanide	A2070154
M-Percent Solids (ILM05.4)	A2070157
MASTM D1037-92-Acidity	A2070161
MSM2130B-Turbidity	A2070159
MSM2510B-Conductivity	A2070164
MSM2540C-Total Dissolved Solids	A2070173
MSM2540D-Total Suspended Solids	A2070172

Document Title	Document Control Number
MSM2540F-Settleable Solids	A2070174
MSM2550B-Temperature	A2070160
MSM4500-Cl C, E-Chloride	A2070162
MSM4500-CN C,E-Cyanide	A2070168
MSM4500-CN C,G-Amenable Cyanide	A2070169
MSM4500-O C-Dissolved Oxygen	A2070165
MSM4500-O G-Dissolved Oxygen	A2070166
MSM4500-SO3 B-Sulfite	A2070175
MSM4500-NO2 B-Nitrite	A2070163
MSM4500-NOrg B or C-TKN	A2070176
M9013-Cyanide Distillation	A2070171
M9031-Sulfide	A2070177
MHACH8146-Ferrous Iron	A2070193
MHACH8110-Formaldehyde	A2070190
MSM5310C-TOC	A2070167
M9014-Reactive Cyanide	A2070069A
MSM4500-CO2 C-Carbon Dioxide	A2070199
MSM2520B-Salinity	A2070254
MSM1500-KMnO4-Potassium Permanganate	A2070255
MLOI-Loss on Ignition	A2070280
MISM01.2-Cyanide	A2070202
MISM01.3-Cyanide	A2070289
J.21-Nitrocellulose	A2070213

28. NELAC Certificate and Parameter List

Current certificates and certified scopes available upon request

CHEMTECH

APPENDIX A

CAR TRACKING #: CAR1211-005

CORRECTIVE ACTION/PREVENTIVE ACTION REPORT

Created By : Krupa Dubey

Client: Chemtech Consulting Group | Order ID: | Date Initiated: 12/29/2011

Project ID : NELAC audit finding | Initiated By: Client | Yes | Client notification: Yes

Approved By: Divyajeet Mehta | Department: QA/QC | Due Date : 01/05/2012 | Given To: Krupa Dubey

Description : Revise QAM. Add Section 1.4 under Quality Policy: Client feedback: Chemtech actively seeks client feedback from our customers. Customer satisfaction survey cards are sent out to our clients, and feedback via emails to our project managers or president are encouraged. The feedback is used to improve the management system, the quality of our product, and customer service.

Root Cause Analysis : Customer feedback statement was missing in the QAM. Feedback was sought, but the requirement was not documented.

Analysis submitted By: Krupa Dubey | Review By: Divyajit Mehta

Proposed Corrective Action : The quality assurance manual will be revised upon the next SOP review event.

Proposed Preventive Action : This corrective action report will be attached to the QAM and followed, until the QAM is revised.

Corrective/Preventive Action Proposed By: Krupa Dubey | Supervisor: Divyajit Mehta

QA/QC Director: Krupa Dubey | Technical Director: Divyajit Mehta

Follow-Up completed on: Date: 12/29/2011 | By: Krupa Dubey

Follow Up Review : CAR is attached to QAM. QAM will be revised at the next review.

CAR Completion: Date: 12/29/2011 | By: Krupa Dubey

CLOSE OUT

Was the proposed corrective action implemented? Yes

Was the proposed preventive action implemented? Yes

If No, Why?