

Table 7-1 (continued)
Sample Preservation and Holding Times^a

DETERMINATION	MATRIX ^b	CONTAINER ^c	PRESERVATION	MAXIMUM HOLDING TIME
Semivolatile Organics	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C, Store in Dark ^g TCLP extract: Cool, 4°C, Store in Dark ^g	14 days until TCLP ext'n; 7 days until extraction; 40 days after extraction
Organochlorine Pesticides	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C TCLP extract: Cool, 4°C	14 days until TCLP ext'n; 7 days until extraction; 40 days after extraction
Chlorinated Herbicides	HW	G, Teflon-Lined Cap	Sample: Cool, 4°C TCLP extract: Cool, 4°C	14 days until TCLP ext'n; 7 days until extraction; 40 days after extraction
Contract Laboratory Program (CLP)				
Cyanide, Total and Amenable to Chlorination	W	P,G	Cool, 4°C, NaOH to pH 12, plus 0.6 g Ascorbic Acid	12 days ^h
	S	P,G	Cool, 4°C	12 days ^h
Mercury	W	P,G	HNO ₃ to pH<2	26 days ^h
	S	P,G	Cool, 4°C	26 days ^h
Metals, except Mercury	W	P,G	HNO ₃ to pH<2	180 days ^h
	S	P,G	Cool, 4°C	180 days ^h
Volatile Organics	W,S	G, Teflon-Lined Cap	W-Cool, 4°C, Minimize Headspace Soil – see SOP	10 days ^h
Semivolatile Organics	W,S	G, Teflon-Lined Cap	Cool, 4°C, Store in Dark ^g	5 days until extraction, ^{h,i} 40 days after extraction
Organochlorine Pesticides and PCBs	W,S	G, Teflon-Lined Cap	Cool, 4°C	5 days until extraction, ^{h,i} 40 days after extraction

- a See Section 18.0 for sources of holding time information.
b W = Water; S = Soil or Sediment; HW = Hazardous Waste; A = Air
c P = Polyethylene; G = Glass
d For chlorinated water samples
e The recommended maximum holding time is variable, and is dependent upon the geographical proximity of sample source to the laboratory.
f Fourteen days until extraction for soil, sediment, and sludge samples.
g If the water sample contains residual chlorine, 10% sodium thiosulfate is used to dechlorinate.
h Number of days following sample receipt at the laboratory.
i Ten days until extraction for soil, sediment, and sludge samples.

Figure 7-1
Sample Container Label and Custody Seal

CLIENT:	JOB#:	006
LOCATION:		
DATE SAMPLED:		
ANALYSIS:		
PRESERVATIVE:		
COMMENTS:		

Custody Seal	
Date _____	Project _____
Signature _____	Container# _____ of _____

8.0 SAMPLE CUSTODY

Standard Operating Procedures have been established for the receiving of samples into the laboratory. These procedures ensure that samples are received and properly logged into the laboratory, and that all associated documentation, including chain of custody forms, is complete and consistent with the samples received.

Sample Acceptance Policy:

Samples delivered to the CAS Sample Management Office (SMO) and are received by a Sample Custodian. The Chain of Custody (COC) is reviewed for completeness and accuracy and a Cooler Receipt and Preservation Form (CRPF) (Figure 8-1) is used to document the condition of the cooler and its contents as received by the sample custodian. Verification of sample integrity by the Sample Custodian includes the following activities:

- Assessment of custody seal presence/absence, location and signature.
- Temperature of sample containers upon receipt.
- Chain of custody documents present and properly completed.

Entries should be made in blue or black ink and at a minimum, shall include sample identification, description, date, time, and location of sample collection, the name and signature(s) of the sample collector and intermediate sample custodian(s), date and time of each sample transfer, and signature of the CAS Sample Custodian upon receipt. For an example COC, see Figure 7-2.

- Sample containers checked for integrity (broken, leaking, etc...)
- Sample is clearly marked with the sample ID, date and time of collection.
- Appropriate containers (size, type) are received for the requested analyses.
- Sample container labels and/or tags agree with chain of custody entries (Identification, required analyses, etc...)
- Assessment of proper sample preservation (If inadequate, corrective action is employed).
- VOC containers are inspected for the presence/absence of bubbles. (No assessment of proper preservation is performed for VOC containers by SMO personnel).

Any anomalies or discrepancies observed during the initial assessment are recorded on the CRPF and/or chain of custody documents. All potential problems with a sample shipment are addressed by contacting the client and discussing the pertinent issues. When the Project Manager and client have reached a satisfactory resolution, the log-in process may commence. The laboratory has formally accepted the samples. If resolution cannot be reached with the

client or the samples do not comply with the requirements of the CRPF, these samples may be rejected by the laboratory.

Sample Log-in;

During the log-in process, each sample is given a unique laboratory code and an analytical request form is generated. The laboratory code consists of an order number and submission number. Each sample is given an order number by the LIMS system based upon the order of log-in. A submission number is assigned to a particular job in the same manner. The submission number is coded with the lab location and year as follows:

e.g. Submission No. R20001784 = R - Rochester
20 - Year 2000
001784 - Job Number (sequential number of jobs logged)

The analytical request contains client information, sample descriptions, sample matrix information, required analyses, sample collection dates, analysis due dates and other pertinent information. This analytical request is reviewed by the appropriate Project Manager for accuracy, completeness, consistency of requested analyses and for client project objectives and COC.

Each container received by the lab receives a unique barcode which is scanned by those handling the sample for storage, analysis, or disposal. The sample tracking information from the scan is put in a database which can create a complete Internal Chain of Custody for each sample container. This information is reported in package reports only.

All samples, except those designated for metals analyses, are kept in a refrigerated condition until they undergo analysis. CAS stores samples in one of three walk-in refrigerators. These refrigerators are segregated by method of analysis. The temperature of each storage facility used at CAS is monitored daily and the data recorded in a logbook.

Disposal:

Upon completion of all analyses, most aqueous and soil samples and sample extracts are retained at 0-6°C refrigerators for 30 days (unless other arrangements have been made in advance). Upon expiration of these time limits, the samples are either returned to the client or disposed of according to approved disposal practices. All samples are characterized according to hazardous/non-hazardous waste criteria and are segregated accordingly. All hazardous waste samples are disposed of according to formal procedures outlined in the Sample Disposal SOP (SMO-SPLDIS). It should be noted that all waste produced at the laboratory, including the laboratory's own various hazardous waste streams, is treated in accordance with all applicable local and Federal laws. The bar coding system used to track samples through the lab, including disposal, produces cradle to grave sample history for each sample aliquot.

Figure 8-1

Cooler Receipt And Preservation Check Form

Project/Client _____ Submission Number _____

Cooler received on _____ by: _____ COURIER: CAS UPS FEDEX CD&L CLIENT

1. Were custody seals on outside of cooler? YES NO
2. Were custody papers properly filled out (ink, signed, etc.)? YES NO
3. Did all bottles arrive in good condition (unbroken)? YES NO
4. Did any VOA vials have significant air bubbles? YES NO N/A
5. Were Ice or Ice packs present? YES NO
6. Where did the bottles originate? CAS/ROC, CLIENT
7. Temperature of cooler(s) upon receipt: _____

Is the temperature within 0° - 6° C?: Yes Yes Yes Yes Yes

If No, Explain Below No No No No No

Date/Time Temperatures Taken: _____

Thermometer ID: 161 or IR GUN Reading From: Temp Blank or Sample Bottle

If out of Temperature, Client Approval to Run Samples _____

Cooler Breakdown: Date : _____ by: _____

1. Were all bottle labels complete (i.e. analysis, preservation, etc.)? YES NO
2. Did all bottle labels and tags agree with custody papers? YES NO
3. Were correct containers used for the tests indicated? YES NO
4. Air Samples: Cassettes / Tubes Intact Canisters Pressurized Tedlar® Bags Inflated N/A

Explain any discrepancies: _____

		YES	NO	Sample I.D.	Reagent	Vol. Added
pH	Reagent					
12	NaOH					
2	HNO ₃					
2	H ₂ SO ₄					
Residual Chlorine (+/-)	for TCN & Phenol					
5-9**	P/PCBs (608 only)					

YES = All samples OK NO = Samples were preserved at lab as listed PC OK to adjust pH

**If pH adjustment is required, use NaOH and/or H₂SO₄

VOC Vial pH Verification (Tested after Analysis) Following Samples Exhibited pH > 2			

Other Comments:

9.0 QUALITY CONTROL OBJECTIVES (PRECISION, ACCURACY, SENSITIVITY, AND COMPLETENESS)

A primary focus of Columbia Analytical Services Quality Assurance (QA) Program is to ensure the accuracy, precision and comparability of all analytical results. CAS has established Quality Control (QC) objectives for precision and accuracy that are used to determine the acceptability of the data that is generated in its laboratories. These QC limits are either specified in the methodology or are statistically derived and are based on the laboratory's actual historical data obtained from control-charting the various QC measurements for each analytical method. The Quality Control objectives are defined below and the acceptable numeric values are shown in the table in Appendix C. The actual types of QC samples required for analysis is discussed in the specific analytical SOP.

9.1 Accuracy

Accuracy is a measure of the closeness of an individual measurement (or an average of multiple measurements) to the true or expected value. Accuracy is determined by calculating the mean value of results from ongoing analyses of standard reference materials, standard solutions and laboratory-fortified blanks. In addition, laboratory-fortified (i.e. matrix-spiked) samples are also measured; this indicates the accuracy or bias in the actual sample matrix. Accuracy is expressed as percent recovery (% REC) of the measured value, relative to the true or expected value. The acceptance limits for accuracy (shown in the table in Appendix C) originate from two different sources: Where acceptance limits are defined and stated in the individual methods, CAS has adopted the limits without modification. If no acceptance limits are given in a method, CAS adopts the limits derived from control charts that are generated for each appropriate method. These control charts are updated once a year for the appropriate Surrogate, Laboratory Control Sample, and Matrix Spike compounds.

$$\text{Accuracy (\%REC)} = \frac{A - B}{C} \times 100$$

Where A = Analyte total concentration from spiked sample
B = Analyte concentration from unspiked sample
C = Concentration of spike added

9.2 Precision

Precision is the ability of an analytical method or instrument to reproduce its own measurement. It is a measure of the variability, or random error, in sampling, sample handling and in laboratory analysis.

Precision is measured through the use of replicate sample analyses within the same batch and is expressed as the relative percent difference (RPD) between the replicate measurements.

$$RPD = \frac{D1 - D2}{(D1 + D2)/2} \times 100$$

Where D1 = Original Result
D2 = Duplicate Result

9.3 Practical Quantitation Limits

The PQLs used at CAS are the routinely reported lower limits of quantitation which take into account day-to-day fluctuations in instrument sensitivity as well as other factors. These PQLs are the levels to which CAS routinely reports results in order to minimize false positive or false negative results. The PQL is normally two to ten times the method detection limit (MDL), which is determined by a procedure outlined in 40 CFR 136, Appendix B. MDLs for analytical methods routinely performed at CAS are determined annually.

9.4 Completeness

Completeness is a measure of the amount of valid data that is obtained, compared to the amount that is expected. It is expected that all analyses conducted in accordance with the approved analytical methods and standard laboratory operating procedures will meet QC acceptance criteria for 95% if the samples tested, however, the CAS objective for completeness is 100%.

$$\text{Completeness (\%)} = \frac{\text{valid data obtained}}{\text{total data planned}} \times 100$$

9.5 Representativeness

Representativeness is the degree to which a samples aliquot that is analyzed gives results identical to analysis of the whole. CAS has sample handling protocols to ensure that the sample given to the laboratory for analysis is thoroughly homogenized before the aliquot for analysis is removed. Further, analytical SOPs specify appropriate sample sizes to further ensure the sample aliquot that is analyzed is representative of the whole.

9.6 Comparability

Comparability expresses the confidence with which one data set can be compared to another. To ensure comparability, SOPs are used for the preservation, handling, and analysis of all samples. Data is reported in units specified by the customer.

10.0 QUALITY CONTROL PROCEDURES

The specific types, frequencies, and processes for quality control sample analysis are described in detail in method-specific standard operating procedures. These sample types and frequencies have been adopted for each method and a definition of each type of QC sample is provided below. In addition, a number of other quality control processes which may impact analytical results are also described below.

10.1 Modified Procedures

CAS strives to perform published methods as described in the referenced documents. If there is a material deviation from the published method, the method is cited as a "Modified" method in the analytical report. Standard operating procedures are available to analysts and are also available to our clients for review. If the modification is such that the method becomes "Performance Based," client approval is obtained for the use of the method prior to the performance of the analysis.

10.2 Procedures for Accepting New Work

Due to the increase in analytes used in the industry and found in the environment, analytes are requested to be analyzed using existing methodologies and/or new methodologies. These requests must be reviewed prior to accepting new work and creating new methodologies. These requests typically include:

1. The addition of analytes to an existing scan.
2. Complete start-up of an established method.
3. Analyte(s) requested with no established method.
4. Specific Confidentiality requests

The addition of analytes to an existing scan.

The analytical method is reviewed to determine if its use is appropriate for the new analyte. The standards are purchased from a commercial vendor and prepared. If the analyte is available from more than one source, a second source may be purchased to verify the calibration standard. A reference is spiked with a mid-level concentration of the appropriate standard and analyzed to determine retention time, resolution, etc. Temperature programs and instrument conditions may be modified to optimize resolution for the analyte. If the analyte may be resolved and detected by the method, an MDL study is performed to determine a detection limit suitable for the analyte. An in-house SOP may be written or modified to include the analyte.

Complete start-up of an established method

The method is obtained and reviewed by the analyst, technical manager, and/or supervisor to determine if the instrumentation and reagents needed by the method are

available. If the required instrumentation is available, then reagents, standards, equipment, and supplies are gathered and purchased. If the analyte(s) are available from more than one source, a second source may be purchased to verify the calibration source. A qualified analyst performs the method, elution times are determined, temperature programs are optimized, and batch QC is performed to monitor accuracy and precision. An MDL study is performed per instrument to determine detection limit(s) and each analyst performing the method must complete an Initial Demonstration of Capability (IDOC) study. An SOP is written by a qualified analyst and QAPM.

Analyte(s) requested with no established method.

The analyte to be analyzed is researched and reviewed by the technical manager for chemical nature, formula, and other related information. The Merck Index and CRC Handbook are reviewed for boiling point, vapor pressure to determine the type of compound. After determining the type of compound, it is assumed that it can be analyzed by an existing method. If not, perhaps a modification of a method or the creation of a method could be tried. The different approaches to testing the analyte may be tried, comparing the efficiency of the various approaches. The method, which allows for the acceptable precision and accuracy, shall be used. Follow procedures outlined above. Precision and accuracy should be documented using the MDL and DOC studies where applicable.

Specific confidentiality requests

Investigate the confidentiality requests of the client. The client may have specific requests regarding the release of the report/data, the retention of the samples and the data, and the disposal of the samples.

Method Performance

Reporting limits are based upon an MDL study performed according to ADM-MDL. At Columbia Analytical Services, the MDL is equal to the limit of detection (LOD) which is used to determine the limit of quantitation (LOQ). See SOP, ADM-MDL.

10.3 Analytical Batch

The basic unit for analytical quality control is the analytical batch. An analytical batch is that all the samples in a batch, both field samples and quality control samples, are to be handled and processed in exactly the same way, and all of the data from each analysis is to be manipulated in exactly the same manner.

The minimum requirements of an analytical batch are:

1. The number of field samples in a batch is not to exceed 20.
2. All field samples in a batch are of the same matrix.
3. The QC samples to be processed with the field samples include:
 - Method Blank - to determine possible laboratory contamination.
 - Laboratory Control Sample - to assess method performance.

- Matrix Spike (field sample) - to assess possible matrix problems.
 - Duplicate Matrix Spike or Duplicate (field) Sample - to assess batch precision and possible matrix problems.
4. A single lot of reagents is used to process the batch of samples.
 5. Refer to SOP, *Analytical Batches and Sequences* (ADM-BCHSQ), for additional batching requirements. Specific project, program or method requirements may create exceptions. The more stringent QC requirements shall be followed in most all cases.

10.4 Method Blank

The method blank is either analyte-free water or analyte-free soil (when available), subjected to the entire analytical process. When analyte-free soil is not available, anhydrous sodium sulfate, organic-free sand, or an acceptable substitute may be used instead. The method blank is analyzed to demonstrate that the analytical system itself is not contaminated with the analyte(s) being measured. The method blank results should be below the reporting limit for the analyte(s) being tested. A method blank is included with the analysis of every analytical batch, every 20 samples, or as stated in the method, whichever is more frequent.

For Industrial Hygiene samples, blanks shall be analyzed with each batch of samples to detect and measure possible contamination of sampling media and reagents used for analysis. Blanks should be supplied by the client as a representative sampling media of the same lot or batch as the field samples.

10.5 Calibration Blanks

Calibration blanks are prepared along with calibration standards. Calibration blanks are free of the analyte of interest, and provide the zero point of the calibration curve.

10.6 Continuing Calibration Blanks

Continuing calibration blanks (CCBs) are solutions of either analyte-free water or solvent that are analyzed in order to verify the zero point of the analytical system. The frequency of CCB analysis is either once every ten samples or as indicated in the method, whichever is greater.

10.7 Calibration Standards

Calibration standards are solutions of known concentration prepared from primary standard solutions which are, in turn, prepared from stock standard materials. Calibration standards are used to calibrate the instrument response with respect to analyte concentration. Standards are analyzed in accordance with the requirements stated in the particular method being used.

10.8 Initial (or Independent) Calibration Verification Standards

Initial (or independent) calibration verification standards (ICVs) are standards that are analyzed *after* calibration but *prior to* sample analysis, in order to verify the calibration of the analytical system. They are prepared from materials obtained from a source independent of that used for preparing the calibration standards. ICVs are also analyzed in accordance with method-specific requirements.

10.9 Continuing Calibration Verification Standards

Continuing calibration verification standards (CCVs) are midrange standards that are analyzed in order to verify that the calibration of the analytical system is still acceptable. The frequency of CCV analysis is either once every ten samples, or as indicated in the method, whichever is greater.

10.10 Internal Standards

Internal standards consist of known amounts of specific compounds that are added to each sample following sample preparation or extraction. Internal standards are generally used for GC/MS and ICP-MS procedures to correct sample results that have been affected by changes in instrument conditions or changes caused by certain matrix effects. The integrated area of the internal standard compared to the continuing calibration check standard should vary by no more than the limits specified in each method.

10.11 Surrogates

Surrogates are organic compounds which are similar in chemical composition and chromatographic behavior to the analytes of interest, but which are not normally found in environmental samples. Depending on the analytical method, one or more of these compounds is added to method blanks, calibration and check standards, and samples (including duplicates, matrix spike samples, duplicate matrix spike samples and laboratory control samples) prior to extraction and analysis in order to monitor the method performance on each sample. The percent recovery is calculated for each surrogate, and the recovery is a measurement of the overall method performance. The acceptance criteria for these various analytes are listed in Appendix C, along with other data quality capabilities.

10.12 Matrix Spikes

Matrix spiked samples are aliquots of samples to which a known amount of the target analyte (or analytes) has been added. The samples are then prepared and analyzed in the same analytical batch, and in exactly the same manner as are routine samples. The spike recovery measures the effects of interferences caused by the sample matrix and reflects the accuracy of the method for the particular matrix in question. Spike recoveries are calculated as discussed in Section 9.1.

For the appropriate methods, matrix spiked samples are prepared and analyzed at a minimum frequency of one spiked sample (and one duplicate spiked sample, if appropriate) per twenty samples. Control limits are summarized in Appendix C.

Matrix spikes are not applicable with industrial hygiene sampling media for air analysis.

Note: A sample identified as a field blank, equipment blank, or trip blank is not to be matrix spiked.

10.13 Laboratory Duplicates and Duplicate Matrix Spikes

Duplicates are additional replicates of samples that are subjected to the same preparation and analytical scheme as the original sample. Depending on the method of analysis, either a duplicate analysis (and/or a matrix spiked sample) or a matrix spiked sample and matrix spike duplicate sample (MS/MSD) are analyzed. The relative percent difference between duplicate analyses or between an MS and MSD is a measure of the precision for a given method and analytical batch. The relative percent difference (RPD) for these analyses is calculated as discussed in Section 9.2.

Depending on the method of analysis, either duplicate and/or matrix spike duplicate analyses are performed at a minimum frequency of one set per 20 samples. Control limits are summarized in Appendix C.

Duplicate analysis is not applicable with industrial hygiene sampling media for air analysis.

Note: A sample identified as a field blank, equipment blank, or trip blank is not to be duplicated.

10.14 Laboratory Control Samples

The laboratory control sample (LCS) is an aliquot of analyte-free water or analyte-free soil (or anhydrous sodium sulfate or equivalent) to which known amounts of the method analyte(s) is(are) added. A standard reference material (SRM) of known matrix type, containing certified amounts of target analytes, may also be used as an LCS. The LCS sample is prepared and analyzed in the same analytical batch, and in exactly the same manner, as the other routine samples. Stock solutions used for LCSs are purchased or prepared independently of calibration standards. The percent recovery (% REC.) of the target analytes in the LCS assists in determining whether the methodology is in control and whether the laboratory is capable of making accurate and precise measurements at the required reporting limit. Comparison of batch-to-batch LCS analyses enables the laboratory to evaluate batch-to-batch precision and accuracy. An LCS is prepared and analyzed at a minimum frequency of one LCS per 20 samples, with every analytical batch or as stated in the method, whichever is more frequent. Acceptance criteria for LCS analyses are summarized in Appendix C.

For industrial hygiene samples (air) LCSs shall be performed in duplicate to assess accuracy and precision for each batch, not to exceed 10 samples. Acceptance criterion of 80 – 120% shall be used until enough data points are available to statistically generate a lab QC limit.

10.15 Interference Check Samples

An interference check sample (ICS) is a solution containing both interfering and analyte elements of known concentration that can be analyzed to verify background and interelement correction factors in metals analyses. The ICS is prepared to contain known concentrations of interfering elements that will provide an adequate test of the correction factors. The ICS is spiked with the elements of interest at concentrations of approximately ten times the instrument detection limits. The ICS is analyzed at the beginning and end of an analytical run or every eight hours, whichever is more frequent, and the results must be within $\pm 20\%$ of the true values.

10.16 Post Digestion Spikes

Post digestion spikes are samples prepared for metals analyses that have an analyte spike added to determine if matrix effects may be a factor in the results. The spike addition should produce a method-specified minimum concentration above the instrument detection limit. A post digestion spike is analyzed with each batch of samples and recovery criteria are specified for each method.

10.17 Source and Preparation of Standard Reference Materials

CAS relies on a primary vendor for the majority of its analytical supplies. In addition, consumable primary stock standards are obtained from certified commercial sources or from sources referenced in a specific method, as discussed in section 4.2.2 of this document. All reference materials that are received at CAS are recorded by the technical staff in the appropriate notebook(s) and are stored under conditions that provide maximum protection against deterioration and contamination. The notebook entry includes such information as an assigned logbook identification code, the source of the material (i.e. vendor identification), solvent (if applicable) and concentration of analyte(s), reference to the certificate of analysis and an assigned expiration date. In addition, the date that the standard is received in the laboratory is marked on the container.

Stock solutions and/or calibration standard solutions are prepared fresh as often as necessary according to their stability. After preparation, all standard solutions are properly labeled as to name, concentration, date, preparer, and expiration date; these entries are also recorded in the appropriate notebook. See SOP, *Making Entries onto Benchsheets and Logbooks* (ADM-DATANTRY). To ensure traceability, all standards are labeled with an in-house code that can be traced back to the original stock standard received by the vendor and thus, the certificate of analysis. Prior to introduction into the analytical system/process, some reference materials are verified for accuracy with a second, independent source of the material. In addition, the independent source of reference material is also used to check the calibration standards for signs of deterioration. All standards, reagents and reference materials shall be stored per analytical SOP requirements to ensure their integrity. Safe

handling and transportation of these materials are discussed in the respective analytical SOP and/or Laboratory Safety Manual.

10.18 Control Charting

The generation of control charts is performed annually at CAS. MS, LCS, and Surrogate recoveries are monitored and charted for key parameters to determine new control limits using the data generated in the previous year. After review of the data by the Quality Assurance Program Manager, the new acceptance criteria may replace the previous criteria and method conformity is assessed using the new values. See SOP for *Determination of Statistical Control Limits* (ADM-CRTL-LIM). Old charts are archived for a period of 10 years.

10.19 Proficiency Testing Participation

Each discipline and test method for most analytes are monitored using A2LA or NELAP approved vendors for Proficiency Testing on a semi-annual basis. Results of the proficiency samples are reviewed by the Laboratory Director, the QAPM, the Corporate QA Director and the laboratory staff. Any problems surfacing during the review are investigated, and corrective action is taken regarding any and all deficiencies. Interlaboratory Proficiencies are performed annually to determine continued lab performance throughout the network of CAS laboratories. Such studies are organized by Corporate QA. Proficiency test results are also used to show continued acceptable performance per analyst.

10.20 Glassware Washing

Glassware washing and maintenance play an crucial role in the daily operation of a laboratory. The glassware used at CAS undergoes a rigorous cleansing procedure prior to every usage. Departmental specific glassware washing SOP's (GEN-GC, MET-GC and EXT-GC) have been generated that outline the various procedures used at CAS; each is specific to the end-use of the equipment as well as to the overall analytical requirements of the project.

11.0 CALIBRATION PROCEDURES AND FREQUENCY

All equipment and instruments used at CAS are operated, maintained and calibrated according to the manufacturer's guidelines and recommendations, as well as to criteria set forth in the applicable analytical methodology. Operation and calibration are performed by personnel who have been properly trained in these procedures. Documentation of calibration information is maintained in appropriate reference files. The frequency of calibration and concentration of calibration standards are determined by the manufacturers guidelines, the analytical method, or the requirements of special contracts. See specific analytical SOP's for frequency and criteria. Generally, purchased standards have a shelf life of 12-36 months and prepared standards have a shelf life of 1-12 months. Recalibration is required at anytime that the instrument is not operating correctly or functioning at the proper sensitivity. Brief descriptions of the calibration procedures for our major laboratory equipment and instruments are described below.

11.1 Temperature Control Devices

Temperatures are monitored and recorded for all of our temperature-regulating devices including ovens, incubators and refrigerators. Bound record books are kept which contain recorded temperatures, identification and location of equipment, and the initials of the technician who performed the checks. All thermometers have been identified and the calibration of these thermometers is checked annually against a National Institute of Standards and Technology (NIST) certified thermometer. Calibration records are maintained by the QA PM. (See SOP SMO-DALYCK).

11.2 Analytical Balances

Analytical balances are serviced on an annual basis by a professional metrology organization. New certificates of calibration for each balance are issued to the laboratory on an annual basis. The calibration of each analytical balance is checked prior to use with Class-1 verified weights, which assess the accuracy of the balance at the working range. Bound record books are kept which contain the recorded measurements, identification and location of equipment, and the initials of the technician who performed the checks. (See SOP SMO-DALYCK).

11.3 Inductively Coupled Plasma (ICP) and ICP-Mass Spectrometry (ICP-MS)

Each emission line on the ICP is calibrated daily against a blank and three standards. Analyses of calibration standards, initial and continuing calibration verification standards, and inter-element interference check samples are carried out as specified in the applicable method being utilized (see Section 18.0 for references).

11.4 Atomic Absorption Spectrophotometers (AAS)

These instruments are calibrated daily using a minimum of four standards and a blank. Calibration is validated using reference standards, and is verified at a minimum frequency of once every ten samples.

11.5 GC/MS Systems

All GC/MS instruments are calibrated at five different concentration levels for the analytes of interest, using procedures outlined in Standard Operating Procedures (SOPs) and/or appropriate USEPA method citations. All SRMs used for this function are "EPA-Certified." Compounds selected as system performance check compounds (SPCCs) must show a method-specified response factor in order for the calibration to be considered valid. Calibration check compounds (CCCs) must also meet method specifications for percent difference from the multipoint calibration. Method-specific instrument tuning is regularly checked using bromofluorobenzene (BFB) for volatile organic chemical (VOC) analysis, or decafluorotriphenylphosphine (DFTPP) for semi-volatile analysis. Mass spectral peaks for the tuning compounds must conform both in mass numbers and in relative intensity criteria before analyses can proceed.

11.6 Gas Chromatographs

Calibration and standardization follow SOP guidelines and/or appropriate USEPA method citations. Initial calibration standards are prepared at three to five concentration levels for each analyte of interest. The lowest standard is near the method reporting limit; additional standards define the working range of the GC detector. Results are used to establish response factors and retention-time windows for each analyte. Calibration is verified at a minimum frequency of once every ten samples.

11.7 Infrared Analyzer

The instrument is calibrated using a blank and four standards. The calibration is validated at the beginning of each analysis, and continuing calibration is verified at a minimum frequency of once every ten samples.

11.8 UV-Visible Spectrophotometer (manual colorimetric analyses)

Routine calibrations for colorimetric and turbidimetric analyses involve generating a 5-point calibration curve including a blank. Correlation coefficients must meet method or SOP specifications before analysis can proceed. Independent calibration verification standards (ICVs) are analyzed with each batch of samples. Continuing calibration is verified at a minimum frequency of once every ten samples.

11.9 Flow Injection Analyzer (automated colorimetric analysis)

A minimum of five standards and a blank are used to calibrate the instrument daily. Standard CAS acceptance limits are used to evaluate the calibration curve prior to sample analysis. All linear regressions must have a correlation coefficient of 0.995 or better before analysis may proceed.

11.10 Ion Chromatographs

Calibration of the ion chromatograph (IC) involves generating a 5-point calibration curve. A correlation coefficient of 0.995 or better for the curve is required before analysis can proceed. Quality Control (QC) samples that are routinely analyzed include blanks and laboratory control samples. The target analytes typically determined by the IC include nitrate, chloride, fluoride, and sulfate.

11.11 Turbidimeter

Calibration of the turbidimeter requires analysis of formazin and polymer standards measured as NTU. Quality Control samples that are routinely analyzed include blanks, and duplicates.

11.12 Ion-selective electrode

Two standards are used to calibrate the electrodes before analysis. The slope of the curve must be within acceptance limits before analysis can proceed. Quality Control samples that are routinely analyzed include blanks, LCSs and duplicates.

11.13 HPLC

Calibration and standardization follow SOP guidelines and/or appropriate USEPA method citations. Initial calibration standards are prepared with at least five concentration levels for each analyte of interest. The lowest standard is near the method reporting limit; additional standards define the working range of the detector. Results are used to establish response factors and retention-time windows for each analyte. Calibration is verified at a minimum frequency of once every ten samples.

11.14 Other Instruments

Calibration for the total organic carbon (TOC) and other instruments is performed following manufacturer's recommendations and applicable SOPs.

12.0 DATA REDUCTION, VALIDATION, AND REPORTING

CAS reports the analytical data produced in its laboratories to the client via the certified analytical report. This report typically includes a transmittal letter, a case narrative, client project information, specific test results, quality control data, chain of custody information, and any other project-specific support documentation. The following procedures describe our data reduction, validation and reporting procedures.

12.1 Laboratory Information Management System (LIMS)

CAS/Rochester currently uses StarLIMS v.6.IIa throughout the laboratory. This data management and retrieval system is the PC based StarLIMS that runs on a Novell Network. The LIMS is used for sample tracking, sample workload projections, sample result storage, reporting, and invoicing. The system allows you to acquire data from instrumentation and can generate ASCII, spreadsheet, database, and/or print files. Periodically, historical data is checked on the LIMS for authenticity and ability to recreate data files. These files are reviewed for data integrity and possible corruption. See Software Quality Assurance Plan.

12.2 Data Reduction and Custody

All data is initially reviewed and processed by analysts using appropriate methods (e.g. chromatographic software, instrument printouts, hand calculation, etc.) The resulting data set is either manually entered (e.g. some general chemistry parameters) into the LIMS system or is electronically transferred into LIMS from the software used to process the original data set (e.g. chromatographic software). A file of all raw data is generated and given to the departmental supervisor or other certified analyst for secondary review. Once the complete data set has been reviewed to be complete and correct by two analysts, the LIMS data is validated against the raw data which allows the data to be available to Project Managers and Report Writers. Upon approval of the data the supervisor relinquishes the raw data file to a Report Writer, who generates a final report from the LIMS system. The resulting final report is then reviewed by the Project Manager for accuracy. Typically, all data is reported in the units and MRLs listed in Appendix C. An estimation of the uncertainty of the measurements is available upon request using the procedures in the CAS SOP ADM-UNCERT. Assessment of the analytical data includes a check on data consistency by looking for comparability of duplicate analyses, comparability of previous data from the same sampling location (if available), adherence to accuracy and precision control limits, and anomalous low or high parameter values. Once the data has been checked for accuracy and acceptability, the final report and raw data is forwarded to the Lab Director or Quality Assurance Project Manager, who further reviews the data package for errors. When the entire data set has been found to be acceptable the report is signed, distributed, and the raw data is filed for approximately one year, then archived.

All hard copy and electronic backups are archived in a secured room for a period of at least 5 years from the date of the final report (as discussed in section 12.6.1). It is not unusual to have various clients require a 10-year retention of records, therefore, the archivist, project manager, and possibly the client are consulted prior to the destruction of the records.

12.3 Confirmation Analysis

12.3.1 Gas Chromatographic Analyses

For gas chromatographic (GC) analyses, most positive results are confirmed by a second column, a second detector, or by GC/MS analysis, unless exempted by one of the following situations:

- The analyte of interest produces a chromatogram containing "pattern" peaks which match appropriate standards. These analytes include polychlorinated biphenyls (PCBs) and hydrocarbon fuels (e.g., gasoline and diesel).
- The sample is analyzed for benzene, toluene, ethylbenzene and xylenes (BTEX), and the sample is found, by a separate analysis, to contain gasoline. In a sample containing no gasoline, the presence of BTEX compounds will be confirmed.
- The sample meets all of the following requirements:
 1. All samples (liquid or solid) come from the same source (e.g., groundwater samples from the same well) for continuous monitoring.
 2. All analytes have been previously analyzed, identified and confirmed by a second column or by GC/MS. The documents indicating previous confirmation must be available for review.
 3. The resulting chromatogram is relatively simple and does not contain complex or overlapping peaks.
 4. The chromatogram is largely unchanged from the one for which confirmation was carried out.

12.3.2 Confirmation Data

Confirmation data will be provided as specified in the method. Identification criteria for GC or GC/MS methods are summarized below:

- GC Methods - The analyte must fall within plus or minus three times the standard deviation (SD) of the retention time of the daily midpoint standard in order to be qualitatively identified. The retention-time windows will be established and documented, as specified in the appropriate Standard Operating Procedure (SOP).
- GC/MS Methods - Two criteria are used to verify identification:
 1. Elution of the analyte in the sample will occur at the same relative retention time (RRT) as that of the analyte in the standard.

2. The mass spectrum of the analyte in the sample must, in the opinion of a qualified analyst or the department manager, correspond to the spectrum of the analyte in the standard or the current GC/MS reference library.

12.4 Data Validation

The integrity of the data generated in the laboratory is primarily assessed by the analyst, supervisor and project manager through the use of a variety of measures that may include reagent blanks, laboratory fortified blanks, duplicates, matrix spikes and QC samples. The numerical criteria for evaluation of these QC samples are listed in Appendix C; these various QC sample analyses are evaluated using the flow diagrams found in Figures 12-1 through 12-9. Other validation measures of the data include a check of the linearity of the calibration curve, an accuracy check of the QC standards and a check of the system sensitivity. Data transcriptions and calculations are also reviewed. Specific calculations used for determining the concentration or value of the measured parameters from the raw data are given in each of the analytical methods or CAS SOPs.

The QA department performs in-depth periodic monitoring of the data integrity program using data validation and electronic data audits (see ADM-1AUD and ADM-E DATA).

12.5 Data Reporting

When an analyst determines that the data has met the data quality objectives (and/or any client-specific data quality objectives) of the method and has qualified any anomalies in a clear, acceptable fashion, the data is validated by the supervisor. Validated data is reported from LIMS by report writers using specialized forms created by LIMS (see SOP, ADM-RG). Prior to release of the report to the client, the project manager must also review the entire body of data for completeness and to ensure that any and all client-specified objectives were successfully achieved. If required, samples exceeding any established state/federal maximum contaminant level or reportable concentration level, must be reported to the client. A case narrative may be written by the project manager to explain any unusual problems with a specific analysis or sample, client-specific objectives, exceedences, etc... The original raw data, along with a copy of the final report, is filed for archiving. CAS maintains control of analytical results by adhering to standard operating procedures and by observing sample custody requirements. All data are calculated and reported in units consistent with project specifications, to enable easy comparison of data from report to report. Typical qualifiers used to flag analytical results are listed in Appendix D.

12.6 Document Control

A document control system ensures that all documents are accounted for when the project is complete. A submission number is assigned to each project for reporting and filing purposes. This number is associated with each order number (sample).

12.6.1 Documentation and Archiving of Routine Analysis Data

The archiving system includes all of the following items for each set of analyses performed:

- Benchsheets describing sample preparation (if appropriate)
- Instrument parameters
- Sample analysis sequence
- Analysis benchsheets and instrument printouts

- Chromatograms and peak integration reports for all samples, standards, blanks, spikes and reruns
- Log book ID number for the appropriate standards
- Copies of report submitted to the client

Individual sets of analyses are indexed by analysis date and/or submission number. Since many analyses are performed with computer-based data systems, the final sample concentrations can be automatically calculated. If additional calculations are needed, they are written on the integration report or securely stapled to the chromatogram, if done on a separate sheet. The archive room is a separate file room in which files shall be maintained for a period of at least five years (from date of report issue). It is not unusual to have various clients require a 10-year retention of records, such as NAVY and NYS Drinking Water Programs, therefore the archivist, project manager, and possibly the client are consulted prior to destruction of the records. The archive room is kept locked and access keys are controlled. All documents must be signed out if needed outside of the archive room and returned in a timely manner. A designated archivist monitors filing, incoming, and outgoing data from the archive.

In the event that the laboratory transfer's ownership or goes out of business, laboratory records shall be maintained for the contracted period and clients shall be notified prior to early destruction / disposal of samples or data.

All related quality documentation such as the quality manual, standard operating procedures, temperature and balance records, maintenance logs, (see Section 4.2 QAM) etc. are controlled and retained by the laboratory for 5-10 years depending upon the program (See ADM-DOC_CTRL).

12.6.2 Reporting Deliverables

In order to meet individual project needs, CAS provides several levels of analytical reports. Basic specifications for each level of deliverable are described in Table 12-1. Turnaround time and package level are negotiable on a project to project basis.

12.6.3 Electronic Data Deliverables (EDD)

CAS/Rochester offers standard Excel format as well as a variety of custom developed EDDs such as ASCII, dBase, and GISKEY. EDDs are available upon request on a project to project basis.

Figure 12-1
Evaluation of Method Calibration

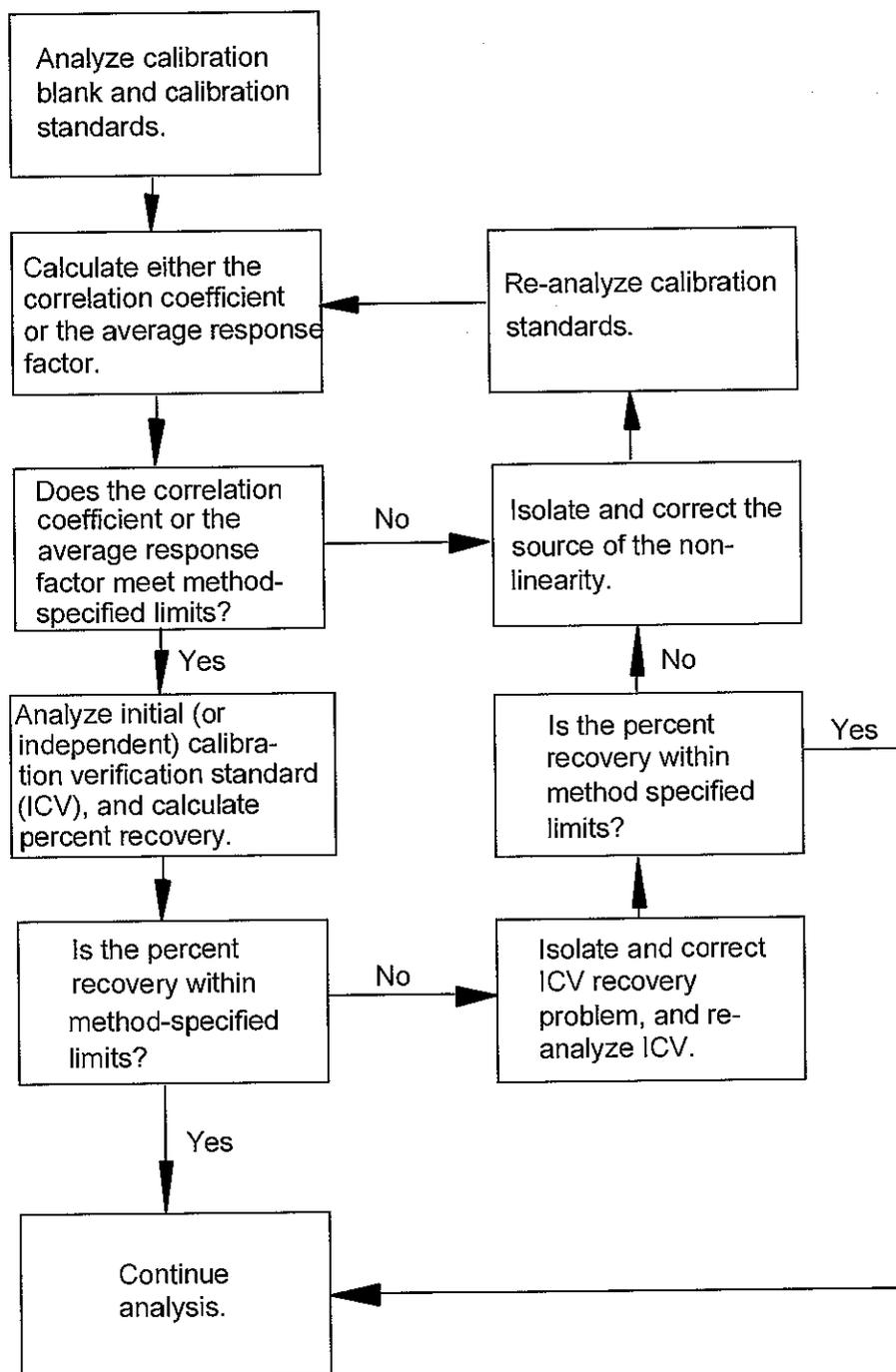


Figure 12-2
Evaluation of Continuing Calibration

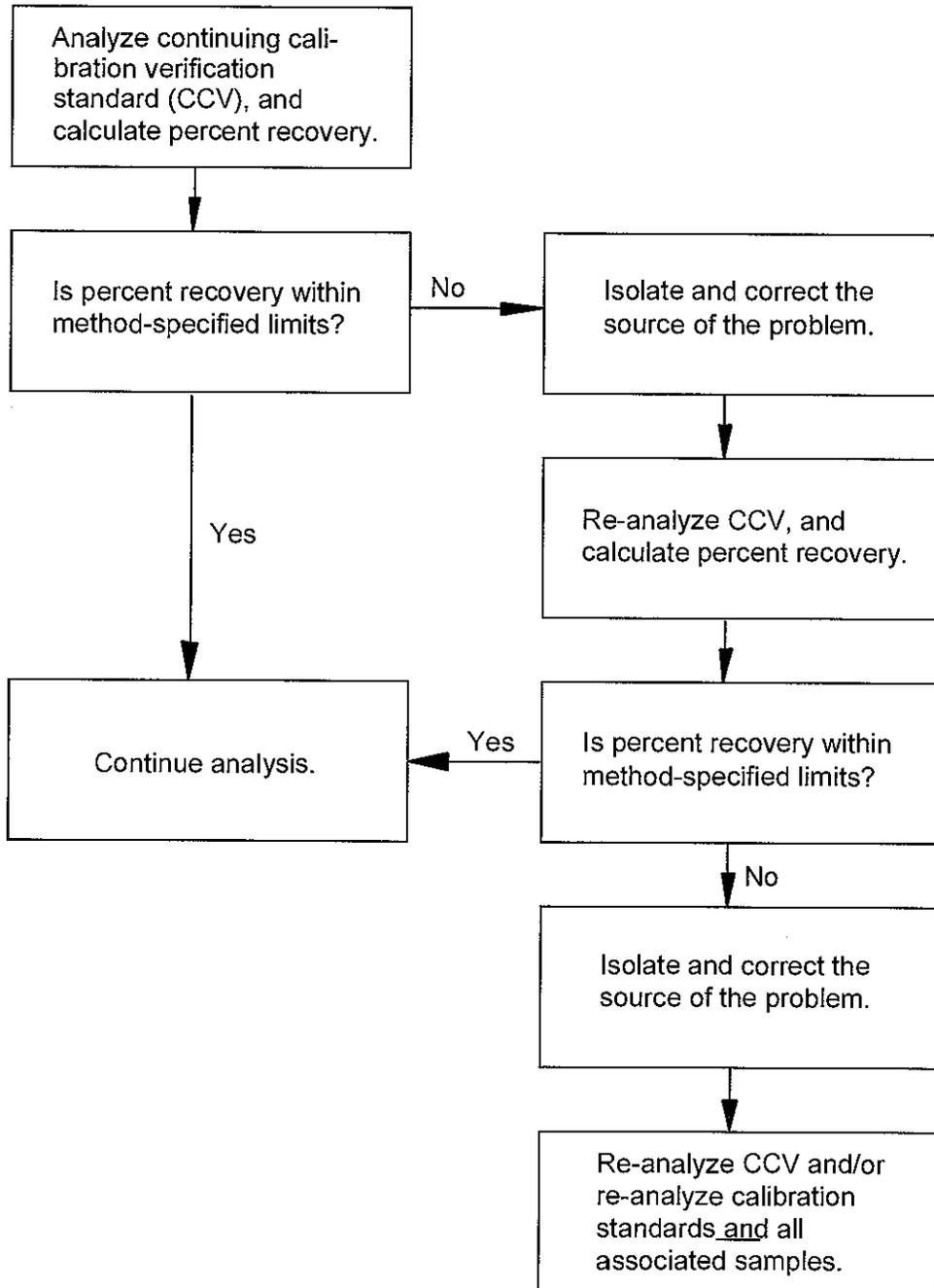


Figure 12-3
Evaluation of Method Blank and Instrument Blank Results

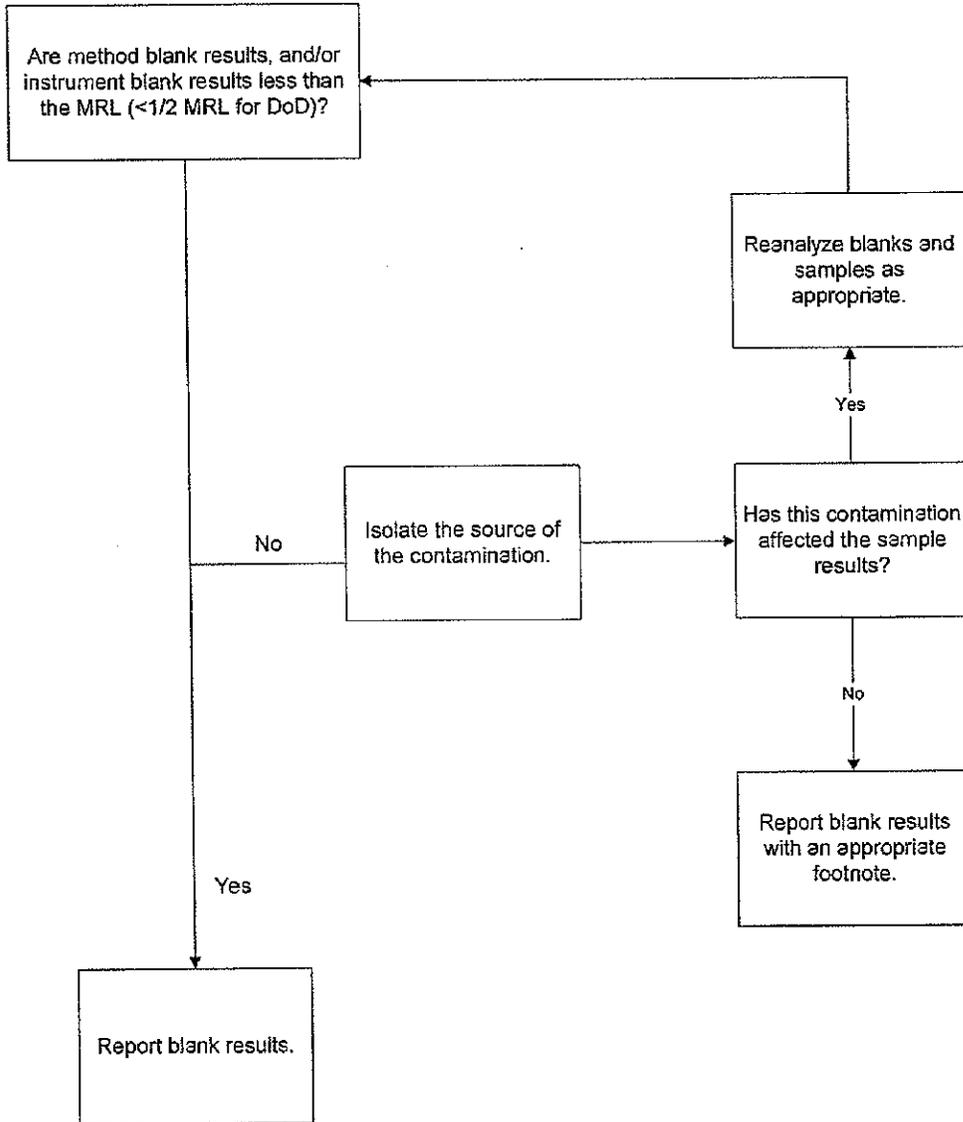


Figure 12-4
Evaluation of Sample Results for Inorganic Analyses

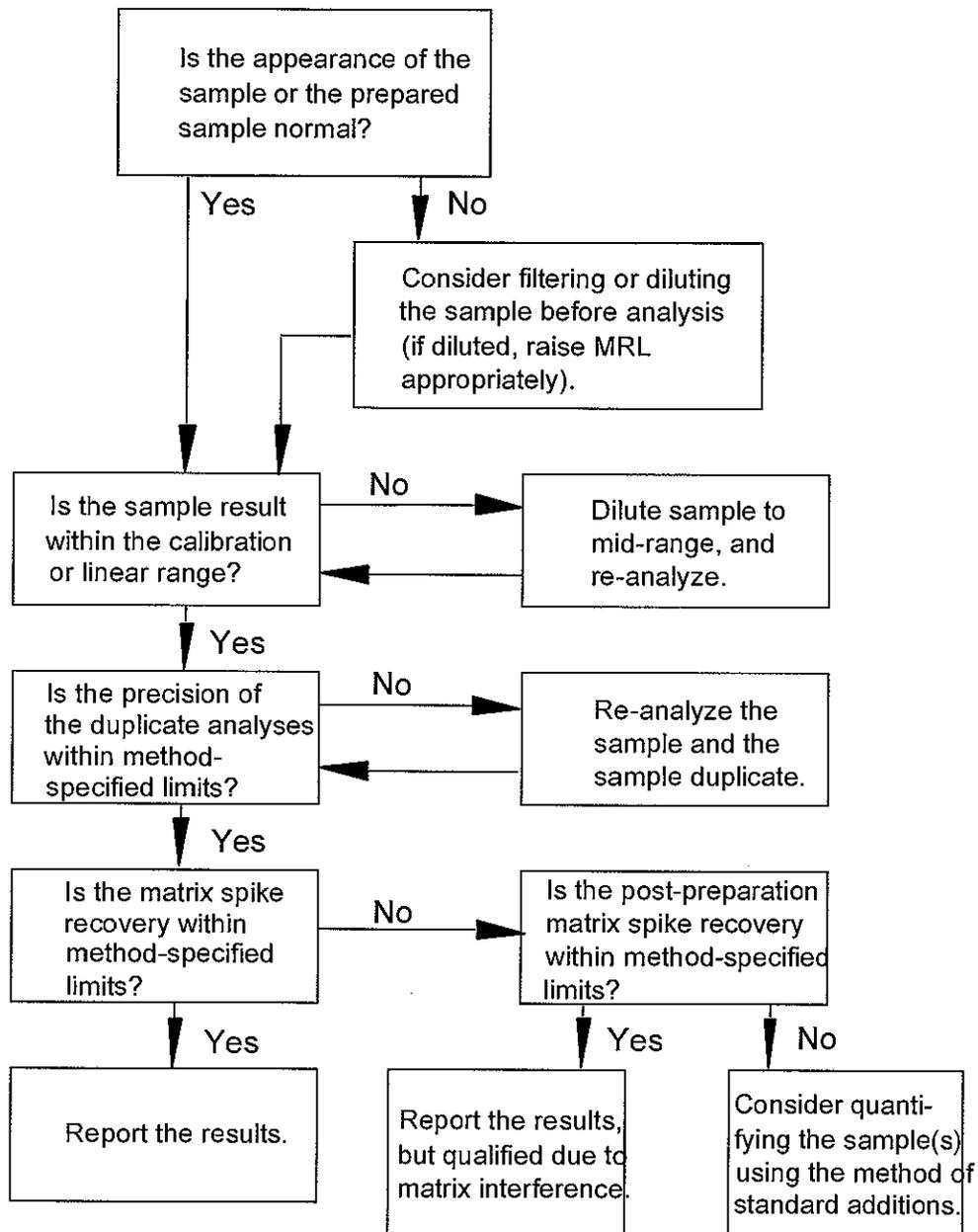


Figure 12-5
Evaluation of Sample Results for Organic Analyses

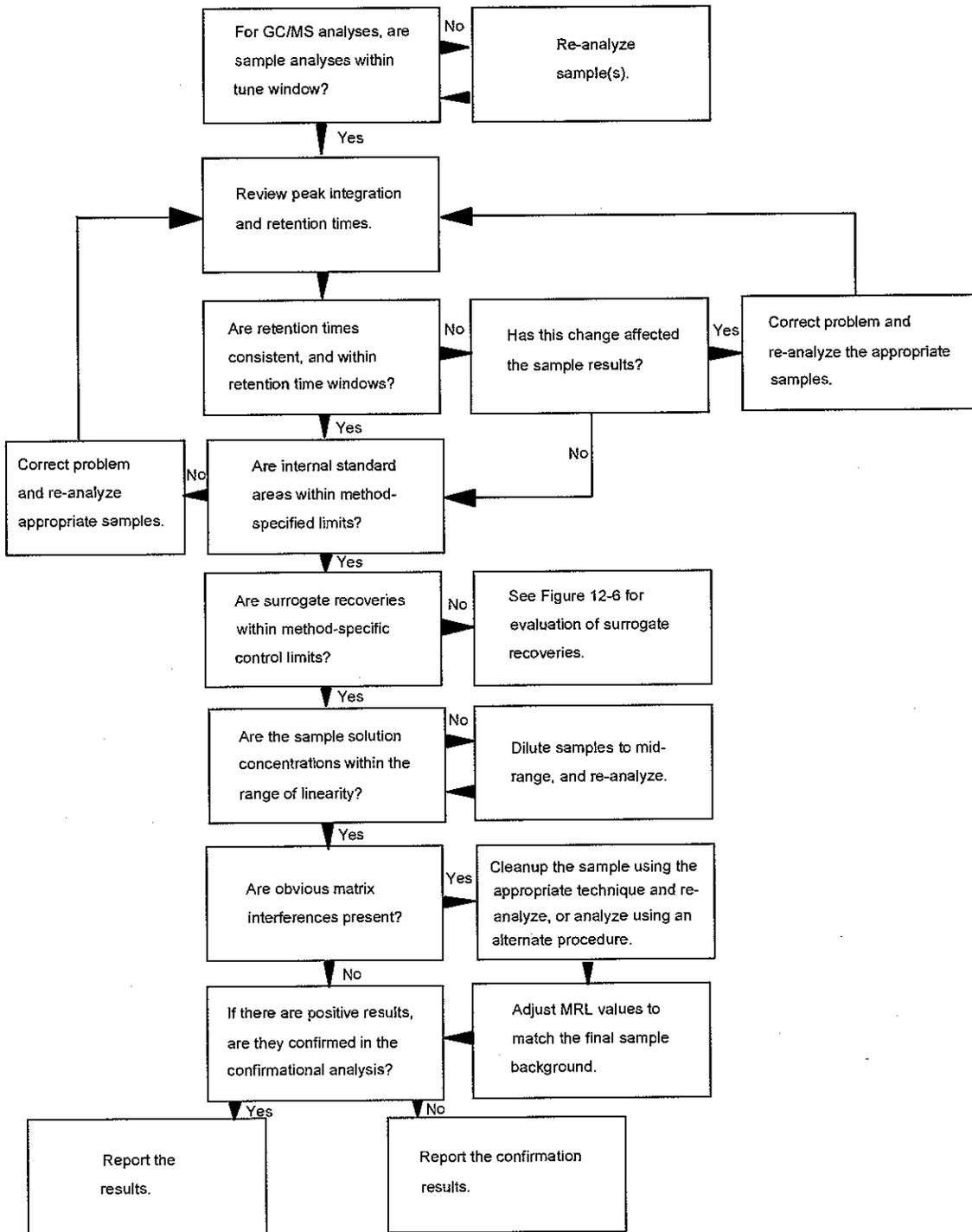


Figure 12-6
Evaluation of Surrogate Compound Recoveries

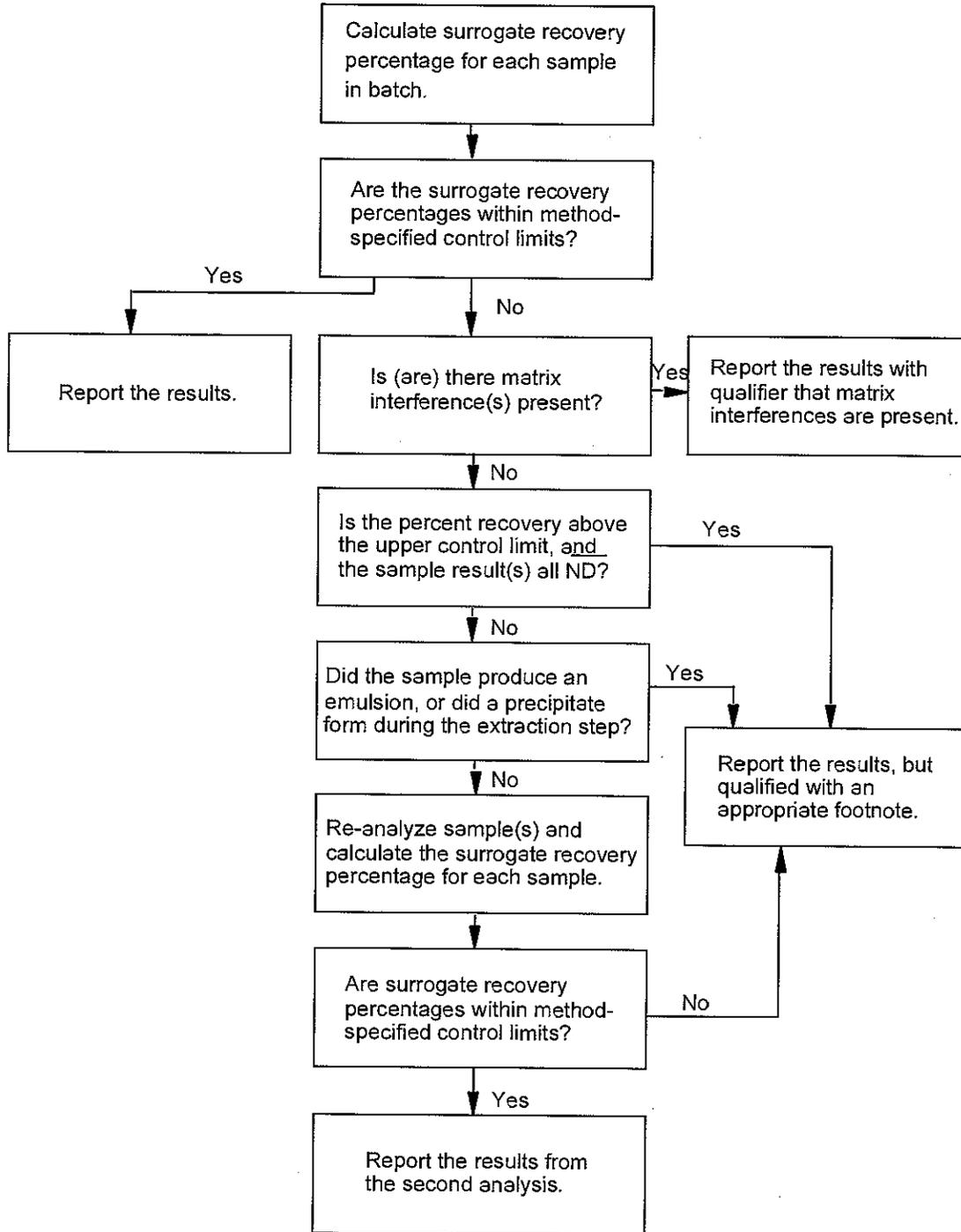


Figure 12-7
Evaluation of Duplicate Sample and/or Duplicate Matrix Spike Results

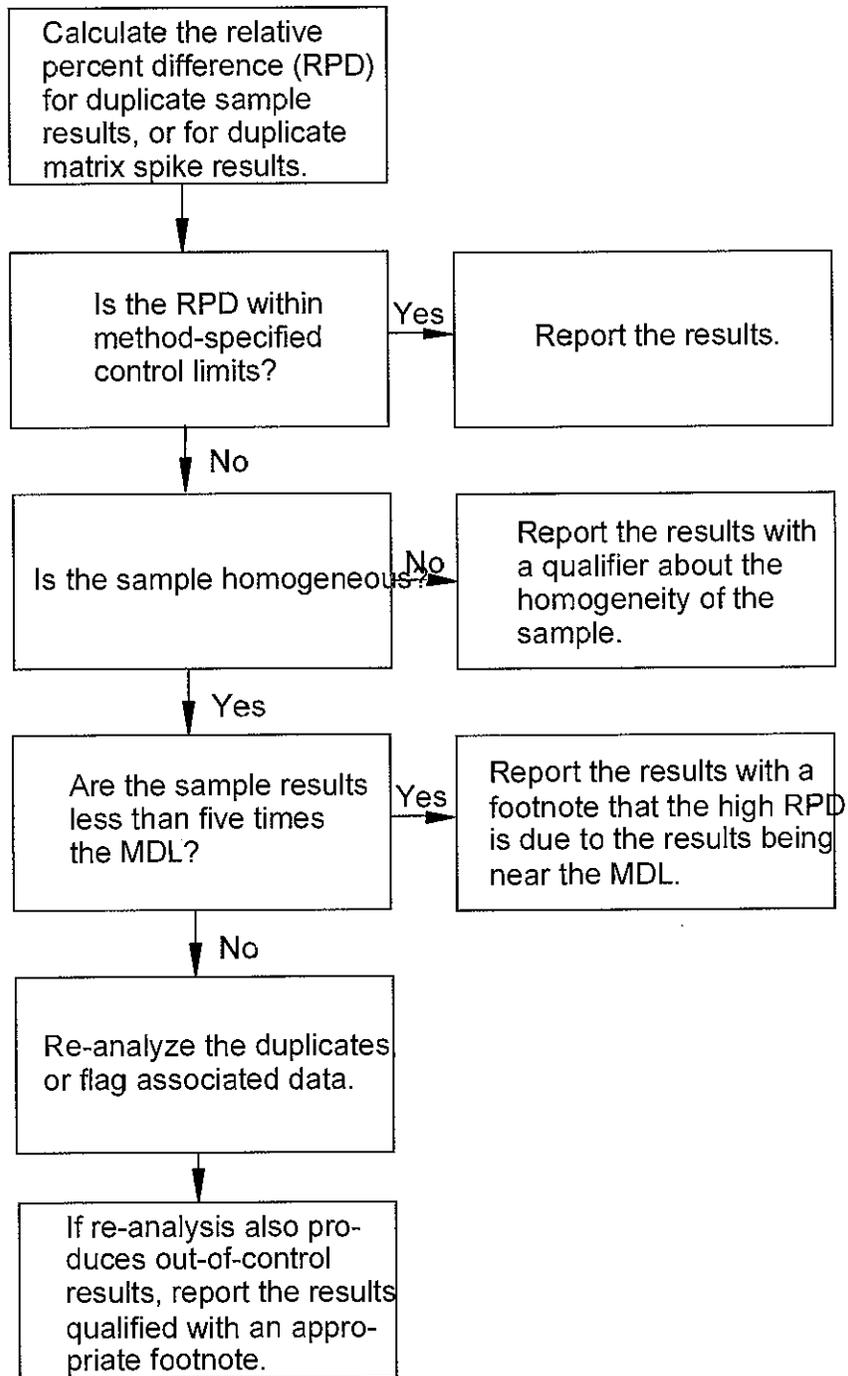


Figure 12-8
Evaluation of Matrix Spike Recoveries

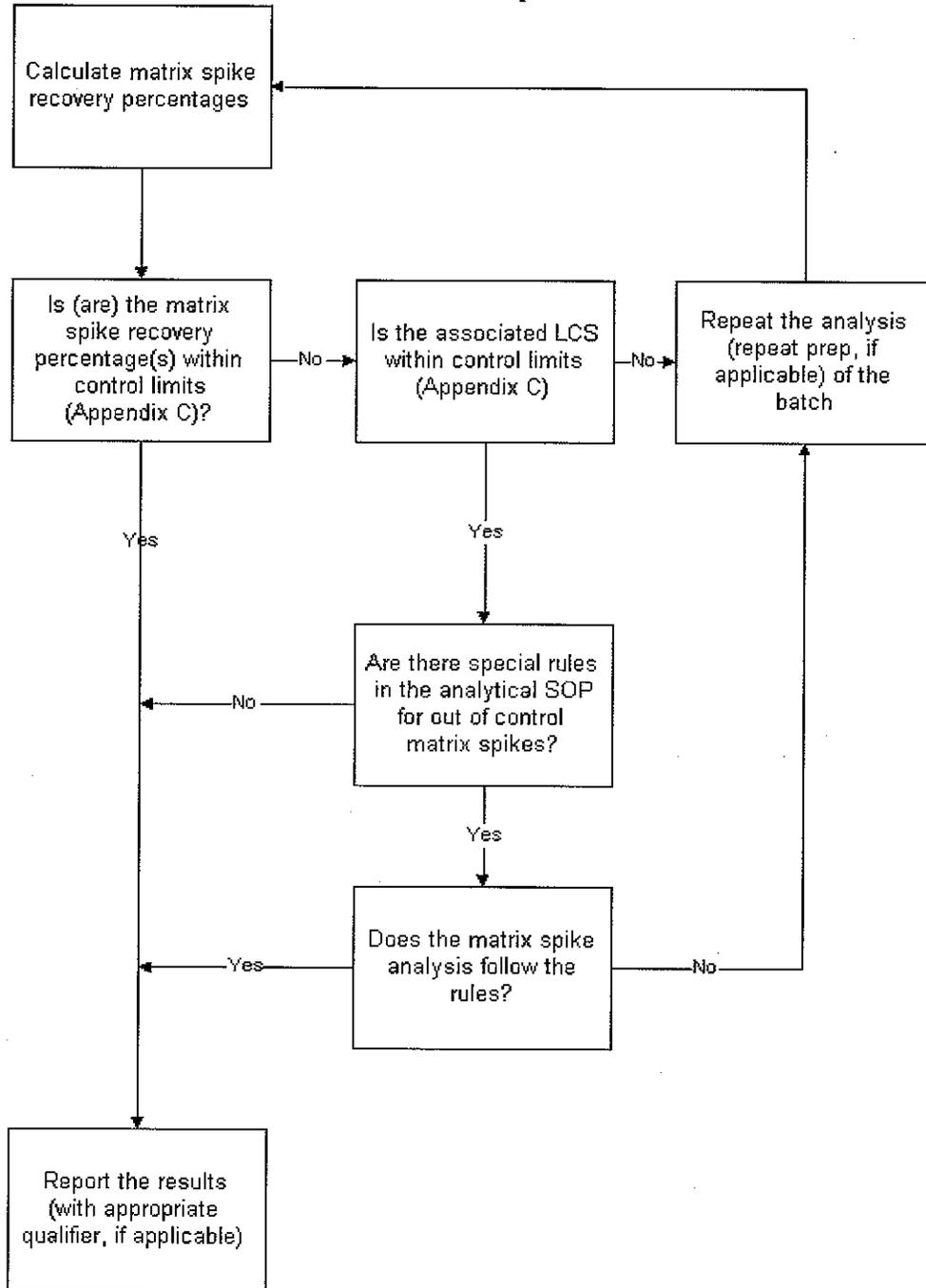


Figure 12-9
Evaluation of Laboratory Control Sample (LCS) Results

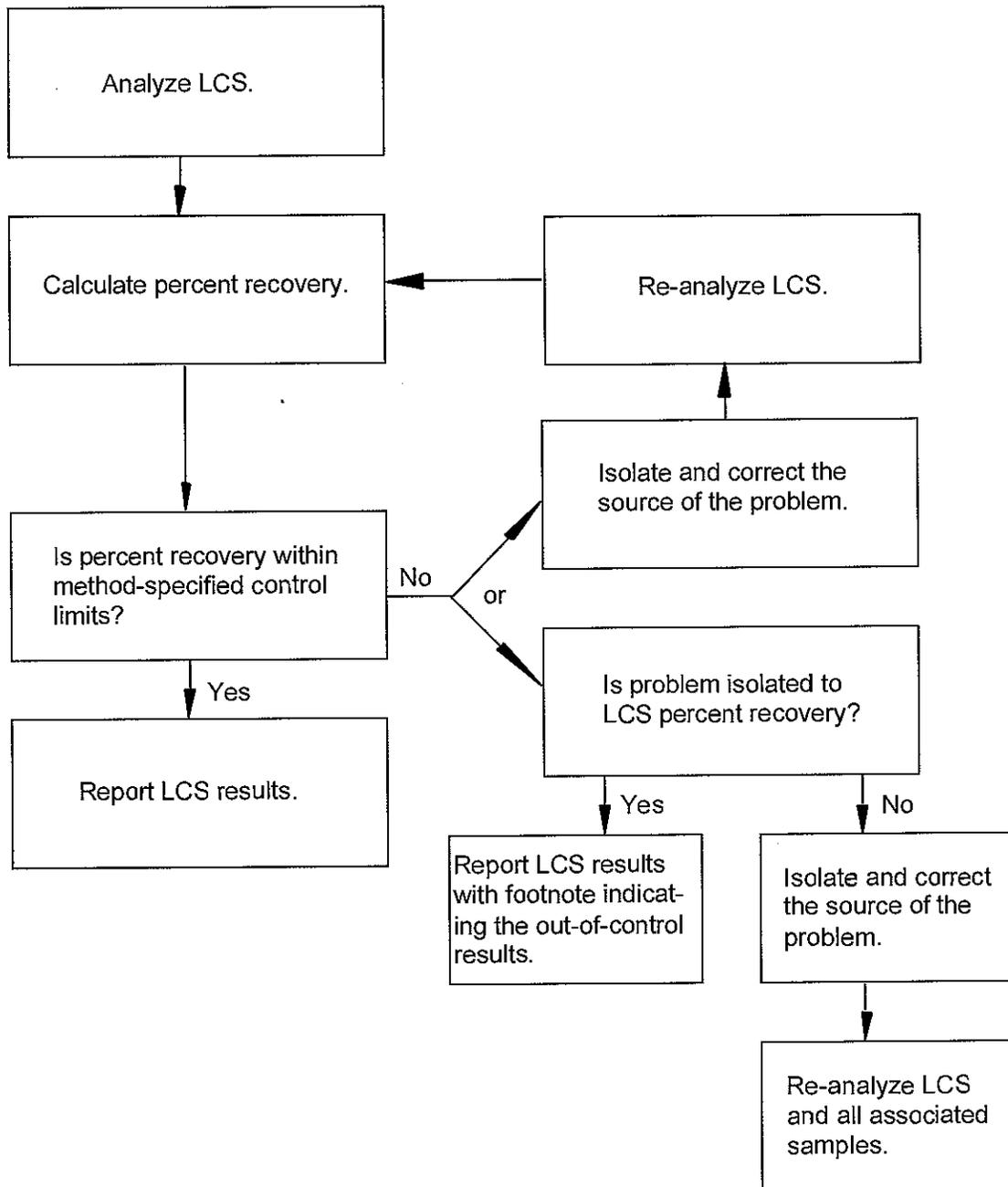


Table 12-1
Laboratory Data Deliverables

Package 1. A Routine Certified Analytical Report Includes the Following

1. Transmittal Letter
2. Sample Analytical Results
3. Method Blank Results
4. Surrogate Recovery Results for appropriate organic methods, including associated EPA or CAS acceptance criteria
5. Chain of Custody Documents

Package 2. In Addition to the Package 1 Deliverables, this Report Includes the Following:

1. Case Narrative

Package 3. In Addition to the Package 2 Deliverables, this Report Includes the Following:

1. Calibration Summaries and Results of initial and continuing calibration verification standards, with calculated recoveries
2. Method Blank Summaries

Package 4. In Addition to the Package 3 Deliverables, this Report Includes the Following:

1. Sample Quantitation Report
2. Standards Preparation Information

Package 5. Full Data Packages

A complete validatable data package, fulfills all deliverable requirements, as specified in the EPA CLP Statement of Work. The data package may include diskette deliverables, upon request.

13.0 AUDITS AND VERIFICATION PRACTICES

Quality Control (QC) audits are an essential part of CAS's QA program. There are two types of audits used at the facility: System Audits are conducted to qualitatively evaluate the operational details of the field and laboratory QA program, while Performance Audits are conducted by analyzing performance evaluation samples in order to quantitatively evaluate the outputs of the various measurement systems.

The system audit examines the presence and appropriateness of laboratory systems. External system audits of CAS are conducted regularly by various regulatory agencies and clients. Appendix F summarizes some of the major programs in which CAS/Rochester participates. Additionally, internal system audits of CAS/Rochester are conducted regularly by the Quality Assurance Program Manager and by the CAS Quality Assurance Director. The internal system audits are scheduled as four to five auditing events:

- Comprehensive lab-wide system audit - annually
- Audits examining compliance with all QA program requirements as applied to selected projects - 2 per year.

The results of each audit are reported to the Laboratory Director and Supervisors for review and comment. Any deficiencies noted by the auditor are summarized in an audit report and corrective action is taken within a specified length of time to correct each deficiency. Should problems impacting data quality be found during an internal audit, any client whose data is adversely impacted will be given written notification if not already provided. (See SOP ADM-IAUD).

Additionally, CAS/Rochester participates in the analysis of performance evaluation (PE) samples. Results of the performance evaluation samples and audits are reviewed by the Laboratory Director, the QA Program Manager, the Corporate QA Director and the laboratory staff. Any problems surfacing during the audit are investigated, and corrective action is taken regarding any and all deficiencies. See SOP ADM-PTS.

14.0 PREVENTIVE MAINTENANCE

Preventive maintenance is a crucial element of Columbia Analytical Services Quality Assurance program. Instruments at CAS (e.g., GC/MS systems, atomic absorption spectrometers, analytical balances, gas and liquid chromatographs, etc...) are maintained under commercial service contracts or by qualified, in-house personnel. All instruments are operated and maintained according to the instrument operating manuals. All routine and special maintenance activities pertaining to the instruments are recorded in instrument maintenance logbooks. The maintenance logbooks used at CAS contain extensive information about the instruments used at the laboratory.

All preventive maintenance requires a reference to acceptable QC to verify instrument has returned to proper operating functions. An initial demonstration of analytical control is required on **every** instrument used at CAS before sample analyses may proceed. If an instrument is modified or repaired, a return to analytical control is **required** before subsequent sample analyses can continue. When an instrument is acquired at the laboratory, the following information is recommended to be noted in a bound maintenance notebook specifically associated with the new equipment:

- Instrument Name, manufacturer, make, model and type
- The equipment's serial number.
- Date the equipment was received.
- Date the equipment was placed into service.
- Condition of equipment when received (new, used, reconditioned, etc...)
- Prior history of damage, malfunction, modification or repair (if known).

Preventative maintenance procedures, frequencies, etc... are available for each instrument used at CAS. They may be found in the various SOPs for routine methods performed on an instrument and may also be found in the operating or maintenance manuals provided with the equipment at the time of purchase. Responsibility for ensuring that routine maintenance is performed lies with the section supervisor. Each laboratory section maintains a critical parts inventory. The parts inventories include the items needed to perform the preventative maintenance procedures listed in Appendix E. This inventory or "parts list" also includes the items needed to perform any other routine maintenance and certain in-house non-routine repairs.

When performing maintenance on an instrument (whether preventative or otherwise), additional information about the problem, attempted repairs, etc... is also recorded in the notebook. Typical logbook entries include the following information:

- Details and symptoms of the problem
- Repairs and/or maintenance performed
- Description and/or part number of replaced parts
- Source(s) of the replaced parts
- Analyst's signature and date
- Demonstration of return to analytical control

For most major equipment, back-up equipment is available to avoid downtime. All major analytical equipment is summarized in Appendix A. The section supervisor is responsible to coordinate repair with the manufacturer. The project manager shall assess the effect of the downtime on the samples in-house and notify the appropriate clients of any delays and/or the possibilities of subcontracting.

15.0 CORRECTIVE ACTION AND COMPLAINTS

Failure to meet established analytical controls, such as the quality control objectives outlined in Sections 9.0 and 12.0, prompts corrective action. In general, corrective action may take several forms and may involve a review of the calculations, a check of the instrument maintenance and operation, a review of analytical technique and methodology, and reanalysis of quality control and field samples. If a potential problem develops that cannot be solved directly by the responsible analyst, the supervisor, the department manager, and/or the QAPM may examine and pursue alternative solutions. In addition, the appropriate project manager may be notified in order to ascertain if contact with the client is necessary.

The QAPM initiates corrective action due to a performance audit or a check sample problem; the affected laboratory personnel are promptly informed, as are the laboratory supervisors and managers. In cases where data quality is or may be impacted, the client is notified.

In either case, a Nonconformity and Corrective Action Form is generated to document and notify the appropriate personnel of the nonconformity. Procedures for issuing and filing nonconformities are discussed in SOP, *Nonconformity and Corrective Action* (ADM-NCAR).

In special cases, the Laboratory Director may give permission to the analyst, Supervisor, or Project Manager to deviate from CAS Policy. Typically, a Nonconformity form must be issued to the Director and signed off as being acceptable. Otherwise verbal instructions are given and documented on the raw data as being accepted by the Laboratory Director.

In cases where there are complaints from the clients, follow policy procedures outlined in the SOP, *Dealing with Complaints* (ADM-CMPLT).

Corrective actions may also be used to monitor continuous process improvements and tracking of missed proficiency test samples. Laboratory management is responsible for following through with the proficiency testing programs, ensuring that the corrective actions are implemented after testing, and evaluating the effectiveness of the corrective action.

Figure 15-1

Nonconformity and Corrective Action Report

SAMPLES/SYSTEM/JOB/CLIENT AFFECTED _____

N&CA Report No. _____

--

NONCONFORMITY

Analysis/Event: _____	
Instrument/System: _____	Date: _____
Detailed Description of Nonconformity: 	
Originator (name): _____	Date: _____
Supervisor Verification: _____	Date: _____

CORRECTIVE ACTION AND OUTCOME

Detailed Description: (Re-establishment of conformity must be demonstrated and documented. Describe the steps that were taken, or are planned to be taken, to correct the particular Nonconformity and prevent the reoccurrence of the Nonconformity.) 	
Is the data to be flagged in the Analytical Report with an appropriate qualifier?	No Yes
Person Responsible: _____	Date: _____
Supervisor Verification: _____	Date: _____

NOTIFICATION - CUSTOMER/CLIENT - INTERNAL/EXTERNAL

Project Chemist Notified by: _____	Date: _____
Customer Notified? No Yes If Yes, Notifier: _____	Date: _____
Project Chemist/Customer Comments (Retain record, e.g. telephone record, e-mail) _____	

ACCEPTANCE OF CORRECTIVE ACTION

Comments: 	
Corrective Action(s) have been implemented. QA Pgm Mgr: _____	Date: _____

Original: Client File

Photocopies: Supervisor and QA Pgm Mgr

N&CA_RPT.DOC 1/26/2001

16.0 QUALITY ASSURANCE REPORTS

Quality assurance requires an active, ongoing commitment by CAS personnel at all levels of the organization. Information flow and feedback mechanisms are designed so that analysts, supervisors and managers are aware of quality assurance issues in the laboratory.

Analysts performing routine tests in the laboratory are aware of the various method acceptance criteria and in-house control limits that must be met in order to generate acceptable results. Any non-conformities and corrective actions may also be attached to the data prior to review. Supervisors, or designee, review all of the completed analytical batches to ensure that all QC criteria have been examined and any deficiencies noted and corrected if possible.

It is the responsibility of each laboratory unit to provide the Project Manager with a final report of the data, accompanied by signature approval. Footnotes and/or narrative notes must also accompany any data package if problems were encountered that require further explanation to the client. Each data package is submitted to the appropriate project manager, who in turn reviews the entire collection of analytical data for completeness. The Project Manager must also review the entire body of data to ensure that any and all client-specified objectives were successfully achieved. A case narrative may be written by the project manager to explain any unusual problems with a specific analysis or sample, etc...

The Quality Assurance Program Manager provides overview support to the Project Manager if required to do so (e.g. contractually specified, etc...) The Quality Assurance Program Manager is also responsible for the oversight of all internal and external audits, for all performance evaluation sample and analysis programs, and for all laboratory certification/accreditation responsibilities.

The QAPM also prepares quarterly reports for the QA Director which summarizes the various QA/QC activities that have occurred during the previous quarter. These reports include a summary of the various audits performed during the last quarter, new accreditations/certifications received by the laboratory, scores of the most current performance evaluation studies, updates/revisions to controlled documents, etc...

On an annual basis, the lab director shall review the laboratory's quality system to introduce any necessary changes or improvements. The review will take into account the outcome of recent internal or external audits, proficiency results, changes in volume and type of work, feedback from clients or authorities, corrective action reports, complaints, etc. See SOP ADM-MGMTRVW.

17.0 PERSONNEL TRAINING

Technical position descriptions are available for all employees, regardless of position or level of seniority. These documents are maintained by the QA Program Manager and Human Resources. In order to assess the technical capabilities and qualifications of a potential employee, all candidates for employment at CAS are evaluated, in part, against the appropriate technical description.

Training begins the first day of employment at CAS when the administrative, quality assurance, and health and safety policies are presented and discussed. Each new employee is presented with example ethical dilemmas and resolutions as an initial Ethics training. Within 12 months, each employee shall participate in an 8-hour company Ethics Training Seminar. Thereafter, ethics training is on-going throughout the tenure of each employee.

Technical training is documented following SOP requirements discussed in *Documentation of Technical Training* (ADM-TRANDOC). Training for analytical procedures typically begins with the reading of the analytical SOP. Hands-on training begins with the observation of an experienced analyst performing the method, followed by the trainee performing the method under close supervision, and culminating with independent performance of the method on quality control samples. Successful completion of the analysis must include an Initial Demonstration of Capability Study of four replicate quality control samples. If quality control samples are not readily available, the following approach may be used to show adequate capability per analyst for particular parameters, such as solids, paint filter, peroxides, etc.

Analyze a fictitiously prepared sample volume or use excess sample volume from historical samples to demonstrate acceptable performance of the method. Use results from another analyst for the same four aliquots to demonstrate accuracy (relative) and precision.

Continued demonstration of capability is monitored by QA or departmental supervisor. Copies of all training forms and certifications (demonstrations of capability) are maintained by QA department.

Safety training begins with the reading of the *Safety Manual*. All employees are recommended to attend quarterly safety meetings during which the safety programs discussed and safety training is presented by the Environmental, Health and Safety Officer.

CAS encourages its personnel to continue to learn and develop new skills that will enhance their performance and value to the company. Ongoing training occurs for all employees through a variety of mechanisms. The "CAS University" education system, external and internal technical seminars and training courses, laboratory-specific training exercises and performance of external PE samples analysis are all used to provide employees with professional growth opportunities.

Safety and QA/QC requirements are integral parts of all technical SOPs and, consequently, are integral parts of all processes at CAS.

18.0 REFERENCES FOR ANALYTICAL PROCEDURES

The analytical methods used at CAS generally depend upon the end-use of the data. Since most of our work involves the analysis of environmental samples for regulatory purposes, specified federal and/or state testing methodologies are used and followed closely. Several factors are involved with the selection of analytical methods to be used in the laboratory. These include the method detection limit, the concentration of the analyte being measured, method selectivity, accuracy and precision of the method, the type of sample being analyzed, and the regulatory compliance objectives. Typical methods used at CAS are taken from the following references:

- *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW-846, Third Edition, 1986 and Updates I (7/92), II (9/94), IIA (8/93), IIB (1/95), and III (12/96). See Chapters 1, 2, 3, and 4.
- *Methods for Chemical Analysis of Water and Wastes*, EPA 600/4-79-020, Revised March 1983.
- *Methods for the Determination of Metals in Environmental Samples*, EPA 600/4-91-010, June 1991 and Supplement 1, EPA/600/R-94/111, May, 1994.
- *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater*, EPA 600/4-82-057, July 1982 and 40 CFR Part 136, Appendix A.
- *Methods for the Determination of Inorganic Substances in Environmental Samples*, EPA 600/R-93/100, August 1993.
- *Methods for the Determination of Organic Compounds in Drinking Water*, EPA 600/4-88-039, December 1988 and Supplement I (7/90) and Supplement II (8/92).
- *Standard Methods for the Examination of Water and Wastewater*, 16th Edition, 1985; 17th Edition, 1989; 18th Edition, 1992, and 19th Edition, 1995.
- 40 CFR Part 136, Guidelines for Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act.
- 40 CFR Part 141, National Primary Drinking Water Regulations.
- State-specific total petroleum hydrocarbon methods for the analysis of samples for gasoline, diesel, and other petroleum hydrocarbon products.

- Annual Book of ASTM Standards.
- EPA Contract Laboratory Program, Statement of Work for Organics Analysis, OLM04.2. May 1999 and OLM04.3.
- EPA Contract Laboratory Program, Statement of Work for Inorganics Analysis, ILM04.1 and ILM05.1.
- *Good Automated Laboratory Practices, Principles and Guidance to Regulations For Ensuring Data Integrity In Automated Laboratory Operations*, EPA 2185, August 1995.
- *National Environmental Laboratory Accreditation Conference, Quality Standards, Chapters 1-5*, July 2003.

APPENDIX A
MAJOR ANALYTICAL EQUIPMENT

March 29, 2006

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
MASS SPECTROMETERS - VOAs					
GC/MS #3	Gas Chromatograph	HP 5890II	3133A37456	VOAs	2001
	Mass Spec Detector	HP 5971A	3118A02764		
	AutoSampler	Archon	13070		
	Concentrator	Tekmar 2000	91227014		
	Computer Workstation	Gateway P5-133	5360356		
	Analytical Software	Enviroquant Chemstation G1032C v.C.01.00			
GC/MS #5	Gas Chromatograph	HP 5890II	3121A35679	VOAs	1991
	Mass Spec Detector	HP 5971	3118A02532		
	AutoSampler	Archon	12727		
	Concentrator	Tekmar 3000	98125008		
	Computer Workstation	Gateway P5-133	5360357		
	Analytical Software	Enviroquant Chemstation G1032C v.c.01.00			
GC/MS #6	Gas Chromatograph	HP 6890	US00023178	VOAs	1998
	Mass Spec Detector	HP 5973	US82311143		
	AutoSampler	Archon			
	Concentrator	EST Encon	261043003		
	Computer Workstation	HP Kayak XA	US3T653217		
	Analytical Software	Enviroquant Chemstation G1701BA v.B.00.00			
GC/MS #7	Gas Chromatograph	HP 5890II	3235A43994	VOAs	2001
	Mass Spec Detector	HP 5971	323A03964		
	AutoSampler	Archon	13589		
	Concentrator	Tekmar 2000	91267022		
	Computer Workstation	Compaq DeskPro	6124FR4ZD257		
	Analytical Software	Enviroquant Chemstation G1701BA v.B.01.00			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
GC/MS #8	Gas Chromatograph	HP 5890II	3126A36850	VOAs	2004
	Mass Spec Detector	HP 5972	3435A01975		
	AutoSampler	EST Centurion	CENT145061104		
	Concentrator	EST Encon	374062504		
	Computer Workstation	Compaq DeskPro	6946CJM7M878		
	Analytical Software	Enviroquant Chemstation G1701BA v.B.01.00			
GC/MS #9	Gas Chromatograph	HP 6890	US00029263	VOAs in air TO-15	2004
	Mass Spec Detector	HP 5973	US91922619		
	AutoSampler	Enteck 7016CA	00156		
	Concentrator	Enteck 7100	0088		
	Computer Workstation	HP Kayak XA	92181198		
	Analytical Software	Enviroquant Chemstation G1701BA v.B.01.00 Enteck Smart Lab 2000 v3.32			
GC/MS #10	Gas Chromatograph	Agilent 6890N	CN10633045	VOAs	2006
	Mass Spec Detector	Agilent 5975B	US62723782		
	Purge and Trap	EST-Varian Archon	14702		
	Concentrator	EST Encon	ELEC-523103006E PATH-523103006P		
	Computer Workstation	Dell E520	8PT52C1		
	Analytical Software	Chemstation	D.03.00.552		
Digital Display Channel	Mass Flow Controller Digital Display	MKS Instruments 247C	92290101A	VOAs	2006
Digital Display Channel		MKS Instruments 246B	94200203A	VOAs	2006
Flow Controller #1	Mass Flow Controllers	Model 1359C-10000SK	0258C10583442	VOAs	2006
Flow Controller #2		Model 1359C-00200SK	0258C10598442	VOAs	2006
Flow Controller #3		Model 1359C-000205SK	0258C15231304	VOAs	2006
Flow Controller #4		Model 1359C-00010SK	0258C10581442	VOAs	2006

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
MASS SPECTROMETERS -SVOAs					
GC/MS 5973A	Gas Chromatograph	HP 6890	US00024148	SemiVOAs/CLP	1998
	Mass Spec Detector	HP 5973	US82311266		
	AutoSampler	HP 7683	US00307019		
	Injector	Agilent 7683	US10301831		
	Computer Workstation	Gateway GP7-600	17904248		
	Analytical Software	HP Chemstation B.02.05 EnviroQuant G1701BA v.B.01.00			
GC/MS 5973B	Gas Chromatograph	HP 6890	US00029105	SemiVOAs/CLP	1999
	Mass Spec Detector	HP 5973	US91911849		
	AutoSampler	HP7683	US92005373		
	Injector	HP7683	US93408790		
	Computer Workstation	HP Kayak XA6/400	US92280466		
	Analytical Software	HP Chemstation B.02.05 EnviroQuant G1701BA v.B.01.00			
GC/MS 5973C	Gas Chromatograph	Agilent 6890N (G1530N)	US10232036	SemiVOAs	2002
	Mass Spec Detector	Agilent 5973 (G2578A)	US21853642		
	AutoSampler	Agilent 7683 (G2614A)	CN23021382		
	Injector	Agilent 7683 (G2613A) Agilent LVI being installed	CN23126455		
	Computer Workstation	Gateway P7-450	13645026		
	Analytical Software	HP Chemstation Enviroquant G1701 v.D.00.00.38			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
GAS CHROMATOGRAPHS - EXTRACTABLES					
HP5890(II)- A	Gas Chromatograph	HP 5890II	3203A41098	Petroleum Hydrocarbons	1990
	Detector	FID	(integrated)		
	Injector	HP7673	3120A26909		
	Autosampler	18596B	3050A23516		
	Controller	HP7673	3113A26132		
	Computer Workstation	Gateway P5-133	5360538		
Analytical Software	HPChemstation G1034C v.03.00				
HP5890(II)-B	Gas Chromatograph	HP 5890	2728A14298	Petroleum Hydrocarbons	1988
	Detector	FID	(integrated)		
	Autosampler	HP7673	3417A35264		
	Injector	HP7673	303A22979		
	Controller	HP7673	3416A35332		
	Computer Workstation	Gateway P5-133	5360538		
Analytical Software	HPChemstation G1034C v.03.00				
HP5890(II)-H	Gas Chromatograph	HP 5890II	3336A56596	Alcohols/ WAPA	2005
	Detector	FID	(integrated)		
	Autosampler	18596C	US22508157		
	Injector	Agilent 6890	CN34222775		
	Controller	G1512A	CN00005087		
	Computer Workstation	HP KAYAK XA	US8345093		
Analytical Software	HP Chemstation B.02.05 EnviroQuant G1701BA v.B.01.00				

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
HP5890(II)- C	Gas Chromatograph	HP 5890II	2643A11567	Herb/PCB	1989
	Detector	Dual ECO			
	Autosampler	18596B	3032A22303		
	Injector	HP7673	3205A29661		
	Computer Workstation	HP Vectra XA 5/233	U581450241		
	Analytical Software	HP Chemstation v.B.02.05 EnviroQuant G1701BA v.B.01.00			
HP5890(II)-L	Gas Chromatograph	HP 5890II	2950A27718	Herb/PCB	1989
	Detector	Quat ECD			
	Autosampler	18596C	U54008144		
	Injector	Agilent 6890	CN22321966		
	Computer Workstation	HP Vectra XA 5/233	U581450241		
	Analytical Software	HP Chemstation v.B.02.05 EnviroQuant G1701BA v.B.01.00			
HP6890- D	Gas Chromatograph	HP 6890	22174	Pest/PCB/8011	1998
	Detector	Dual ECD			
	Injector	HP7683	US81501041		
	Autosampler	G2614A	US81800809		
	Computer Workstation	DELL	7BQRS71		
	Analytical Software	Enviroquant MSD Chemstation D.01.02.16 15 June 2001			
6890N- G	Gas Chromatograph	Agilent 6890N	US10520018	Herb/PCB	2005
	Detector	Micro ECD			
	Injector	Agilent G2913A	CN51624717		
	Autosampler	Agilent G2614A	CN51032422		
	Computer Workstation	DELL	7BQRS71		
	Analytical Software	Enviroquant MSD Chemstation D.01.02.16 15 June 2001			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
EXTRACTABLES SUPPORT EQUIPMENT					
GPC	GPC	OI Analytical AP2000	A122330318	Cleanups	2002
RapidVap #1	Nitrogen Evaporation System	LabConco RapidVap	11296345E	Concentrations	2001
RapidVap #2	Nitrogen Evaporation System	LabConco RapidVap	20998065F	Concentrations	2002
N-EVAP	Organomation N-EVAP	Model 112	7531	Concentrations	
Hot Orbital Shaker		Armalab OR200	3560	Extractions	2004
Autoshaker#1	Lab-Line Extraction Mixer	Model 6000	0904-3735	Extractions	2004
Autoshaker#2	Lab-Line Extraction Mixer	Model 6000	0904-3736	Extractions	2004
Autoshaker#3	Lab-Line Extraction Mixer	Model 6000	0904-3737	Extractions	2004
SPE-DEX 4790#1	Solid Phase Extractor	Horizon	05-0593	Extractions	2005
SPE-DEX 4790#2	Solid Phase Extractor	Horizon	05-0595	Extractions	2005
SPE-DEX 4790#3	Solid Phase Extractor	Horizon	05-0594	Extractions	2005
Tekmar 500		TM-500	7460E	Sonication	
Tekmar 600		TM-600	13232	Sonication	
VibraCell #1		VC375	15144E	Sonication	
VibraCell#2		VC505	37629G	Sonication	

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
GAS CHROMATOGRAPHS - VOLATILES					
V1	Gas Chromatograph	Varian 3400	4808	VOAs	1998
	PID Detector	OI 4430	OI 1009		
	PID Controller	OIA 5200	A240213		
	ELCD Detector	OIA 4420	2942-8-686		
	AutoSampler	Tekmar 2016	89016001		
	Concentrator	Tekmar 2000	91063007		
	Computer Workstation	GP6-233	9767125		
	Analytical Software	Varian System Control v.4.5.2	D57543610		
V2	Gas Chromatograph	Varian 3300	4130	Alcohols/Gases	1999
	Detector	FID	(integrated)		
	Computer Workstation	PowerFlex	120518		
	Analytical Software	Varian System Control v.4.51	D57543610		
V3	Gas Chromatograph	Varian 3400	10989	VOAs	1999
	PID Controller	OIA 5200	B509500481		
	PID Detector	OI 4430			
	ELCD Detector	OIA 5300	B05223456		
	AutoSampler	Varian Archon	13316		
	Concentrator	Tekmar 3000	98124003		
	Computer Workstation	Gateway 2000	10221502		
	Analytical Software	Varian System Control v.4.51	D57543610		
V4	Gas Chromatograph	Varian 3400	15248	VOAs	2001
	PID Detector	OI 4436	OI1000		
	ELCD Detector	OI 5300	C449553665		
	PID Controller		A218047		
	AutoSampler	Archon	13596		
	Concentrator	Encon	130122900 E/P		
	Computer Workstation	GP6-233	9767125		
	Analytical Software	Varian System Control v.4.5.2	D57543610		

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analysis Performed	Year Acquired
HP1	Gas Chromatograph	HP5890II	3121A35575	VOAs	2001
	PID Detector	OIA 4430	31030		
	FID Detector	(Integrated)	-		
	AutoSampler	Tekmar 2016	89220008		
	Concentrator	Tekmar 2000	89013002		
	Sample Heater	Tekmar	91065008		
	Computer Workstation	Gateway GP5-233	9352344		
	Analytical Software	Varian System Control v.4.5.2	00159-1908-cd1-22bd		

T6	Gas Chromatograph	Varian 3400	4143	VOAs/VPH/GRO	1998
	PID Detector	OI 4430	OI1006		
	FID Detector	Integrated	-		
	AutoSampler	Tekmar 2016	91298028		
	Concentrator	Tekmar 2000	91331001		
	Sample Heater	Tekmar	88264001		
	Computer Workstation	Gateway GP5-233	9352344		
	Analytical Software	Varian System Control v.4.5.2	00159-1a08-cd1-22bd		

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
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HPLC

HPLC02 (LC/MS)	Binary Pump	Agilent 1100	DE11108496	Perchlorate Explosives	2005
	Diode Array Detector	Agilent 1100	DE11112376		
	Column Thermostat	Agilent 1100	0E11120893		
	Wellplate Autosampler	Agilent 1100	DE11300879		
	Sample Thermostat	Agilent 1100	DEB2207519		
	MSD	Agilent G1946D	US12411208		
	Computer Workstation	HP Vectra	US12475439		
	Analytical Software	Chemstation for HPLC Rev.A.10.02			

HPLC03	Binary Pumps	Shimadzu LCD10ADV	1(A) C20963851348US 2(B) C20963851344US	Formaldehyde Metabolic Acids Hydroquinone Tolytriazole PAHs	2005
	UV/VIS Detector	Shimadzu SP010AVVP	C21004050470US		
	Electrochemical Detector	BAS LC4C/CC5	LC-4C 7014		
	AutoSampler	Shimadzu SIL10ADV	C21053850511US		
	System Controller	Shimadzu SCL10AVP	C21013851302US		
	Degasser	Shimadzu DGU 14A	101076		
	Temperature Control Module	Waters	TCM-001304		
	Computer Workstation				
Analytical Software					

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
METALS					
FIMS	CVAA-FIMS	Perkin Elmer	1258	Mercury	1997
	Computer Workstation	Soyata			
	Analytical Software	PE AA WinLab for Windows v.2.50			
4100ZL #1	AA	Perkin Elmer AA 4100ZL	6066	Furnace Metals	1991
	Computer Workstation	Gateway GP5-233			
	Analytical Software	PE AA WinLab for Windows v.2.50			
4100ZL #2	AA	Perkin Elmer AA 4100ZL	6245	Furnace Metals	1998
	Computer Workstation	Gateway GP6-400			
	Analytical Software	PE AA WinLab for Windows v.2.50			
Leeman Hydra AFG+	CVAF	Leeman Hydra AFG+	112-00067-1	Low Level Mercury (Method 1631)	2004
	Computer Workstation	Dell Dimension 2400	35180912881		
	Analytical Software	WinHg Runner 1.5 CT Rev0.286			
ICP #1	Instrument	Perkin Elmer Optima 3000XL	069N4060401	Metals - Low Level	1994
	Computer Workstation	Gateway GP5-233	10221500		
	Analytical Software	PE ICP WinLab v.1.42			
ICP #2	Instrument	Perkin Elmer Optima 3000XL	069N6062602	Metals - Low Level	1999
	Computer Workstation	Gateway GP5-233	9352702		
	Analytical Software	PE ICP WinLab v.1.42			
ICP #3	Instrument	Perkin Elmer 5300DV	077N5112802	Metals	2006
	Computer Workstation	Dell Optiplex GX620			
	Analytical Software	PE ICP WinLab v.3.1			
ICPMS	SCIEX ICP/MS	Perkin Elmer Elan 9000	PO370203	Metals	2002
	Autosampler	PE AS93Plus			
	Computer Workstation	Dell Optiplex GX150			
	Analytical Software	ELAN v.2.4			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer-Part	Serial Number	Analyses Performed	Year Acquired
HOTBLOCKS - METALS					
Hotblock #1		Environmental Express		Metals Digestions	2001
Hotblock #2		Environmental Express		Metals Digestions	2001
Hotblock #3		Environmental Express		Metals Digestions	2005
Hotblock #4		Environmental Express		Metals Digestions	2005
ModBlock A		CPI		Metals Digestions	2003
ModBlock B		CPI		Metals Digestions	2003

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
GENERAL CHEMISTRY					
TOC#1	TOC Analyzer	OI Model 1010	J245710349	TOC - waters	2003
	Autosampler	OI Model 1051	B247751184		
	Computer Workstation	Gateway GP6-300	10709094		
	Analytical Software	OI WinTOC for 1010 v.01 Rev. 225	-		
TOC#2	TOC Analyzer	Dohrman DC190	9507646	TOC - soils	2001
	Boat Sampler	Dohrman 183 s/sf	9507610		
Lachat 8000	Flow Injection System	Lachat 8000		Chloride, TKN, NO2/NO3, NH3, Alkalinity, Hardness, Phosphorus, Silica, Cr6+	1999
	Colorimeter	Lachat	A83000-1286		
	Pump	Lachat	A82000-525		
	Autosampler	Lachat	A81010-168		
	Computer Workstation	Gateway GP6-233	9767124		
	Analytical Software	Omnion FIA v.2	-		
QCIV	Flow Injection System	Lachat Quick Chem IV		Chloride, TKN, NO2/NO3, NH3, Alkalinity, Hardness, Phosphorus, Silica, Cr6+	1986
	Colorimeter	Lachat	125181		
	Pump	Lachat	125209		
	Module	Lachat	125304		
	Autosampler	Lachat	125203		
	Computer Workstation	IBM-compatible generic brand	-		
Technicon #1	Flow Injection System	Technicon		Cyanide	Pre-1982
	Colorimeter	Technicon	19900670		
	Pump	Technicon	TE80139		
	Chart Recorder	Technicon	199-051241		
	Autosampler	Technicon	worn-off		
Technicon #2	Flow Injection System	Technicon		Phenol	Pre-1982
	Colorimeter	Technicon	199-006701D		
	Pump	Technicon	PR0276		
	Chart Recorder	Technicon	82A3321		
	Autosampler	Technicon	681-Rest worn off		
	Module	Technicon	83035		
AquaKem	Instrument	AquaKem 200	A0419913	Nitrite, Ammonia, Phosphate, Chloride, Hexavalent Chromium	2005
	Computer Workstation	Seil SX280	3KSDF1J		
	Analytical Software	6.5.AQ1 rc4			

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
IC#1	Ion Chromatograph	Dionex Series 4000i		Anions	Pre-1982
	Basic Chromatography Module	Dionex	871602		
	Gradient Pump	Dionex	871608		
	Conductivity Detector	Dionex	871242		
	Controller Pump	Dionex	31528		
	Autosampler	Dionex	931526		
	Integrator	4270	037/24782		
	Computer Workstation	Gateway GP6-400	11809650		
	Analytical Software	Dionex PeakNet v.5.1	116-987-2806		
IC#2	Ion Chromatograph	Dionex Series 4000i	13458	Anions	Pre-1982
	Gradient Pump	Model APG-1	921553		
	Conductivity Detector	Model CDM-2	921513		
	Degas Module	EDM-2	930211		
	Autosampler	ASM-2	880113		
	Interface	ACI-1	925205		
	Computer Workstation	Gateway GP6-400	11809650		
	Analytical Software	Dionex PeakNet v.5.1	116-987-2806		
IC#3	Ion Chromatograph	Metrohm 861 Advanced Compact IC		Anions	2005
	Basic Chromatography Module	Metrohm	861-02114		
	Pump	Metrohm	62824100s20		
	Conductivity Detector	Metrohm	integrated		
	Autosampler	Metrohm	838-04105		
	Computer Workstation	Dell OptiPlex GX520	6VRC581		
	Analytical Software	IC NET 2.3 SR2	A.701.0016		

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer-Part	Serial Number	Analyses Performed	Year Acquired
IC # 4	Ion Chromatograph	Dionex 500DX		ANIONS	2007
	Basic Chromatography Module	LC20-1	97110393		
	Gradient Pump	GP40-1	97110534		
	Conductivity Detector	ED40-1	97110074		
	Autosampler	AS40-1	97110671		
	Computer Workstation	Gateway 2000 GP6-266	10239250		
	Analytical Software	Peaknet 5.21	192-994-1564		
Adiabatic Calorimeter	Adiabatic Calorimeter	Parr 1241	3744	BTU, Combustion Prep	1997
Isoperibol Calorimeter	Isoperibol Calorimeter	Parr 6300	27187	BTU, Combustion Prep	2004
Autoclave	Autoclave	Amsco	none	Micro/TPO4	Pre-1970
Midi A	Midi Cyanide Distillation System	BSL Co	none	Cyanide/Phenol/Sulfide Distillation	1997
Midi B	Midi Cyanide Distillation System	BSL Co	none	Cyanide/Phenol/Sulfide Distillation	1997
Midi C	Midi Cyanide Distillation System			Cyanide/Phenol/Sulfide Distillation	2004
Bullwinkle	pH Meter	Orion SA520	2305	pH	1990
Rocky	pH Meter	Orion 720A	5012		1992
	pH Electrode	Orion 915600			
	Fluoride Electrode	Orion 9409			
	Reference Electrode	Orion 90-01-00			
Jenway	pH/Conductivity Meter	Jenway 4330	1344	pH/Conductivity	2000
Turbidimeter	Turbidimeter	HF Scientific Micro 100	609246	Turbidity	2000

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
MR 21	Spectrophotometer	Milton Roy Spectronic 21	1225601	COD, MBAS, Cr6+, Ferrous Iron	1989
B&L	Spectrophotometer	B&L MSR002	114	Peroxide	1987
Buck IR	IR Spec / TPH Analyzer	Buck Scientific HC404	492	TPH	1994
DO Meter #1	Dissolved Oxygen Meter	YSI Model 54A	D8024621	DO, BOD	Pre-1990
DO Meter #2	Dissolved Oxygen Meter	YSI Model 57	A9016921	DO, BOD	Pre-1990
Open Cup	Open Cup Flashpoint Tester	Koehler Instru.Co. Model 420	none	Ignitability - solids	1989
Closed Cup	Closed Cup Flashpoint Tester	Boekel Model 152800	none	Ignitability - liquids	1993
Aquameter	Aquameter	Beckman KF4	none	% Water	1988

EQUIPMENT LIST

Instrument ID	Instrument Configuration	Manufacturer Part	Serial Number	Analyses Performed	Year Acquired
Mettler Toledo PB602-1	Top Loading Balances	Mettler Toledo PB602-1	1118331281	Wetchem/Metals	
American Scientific PTL2500-1		American Scientific PTL2500 1	20466	Wetchem	
Denver S-400		Denver S-400	25232	Extractables	
Fisher		Fisher	7384	Metals	
Fisher Scientific 7303 OA		Fisher Scientific 7303 OA	13556	Volatiles	

Fisher Analytical Balance	Analytical Balances	Fisher Analytical Balance	8887	Volatiles	1990
Mettler AG204		Mettler Toledo Balance	120330501	Wetchem	2001
Mettler AE240		Mettler Analytical Balance	F96727	Wetchem	1996 used

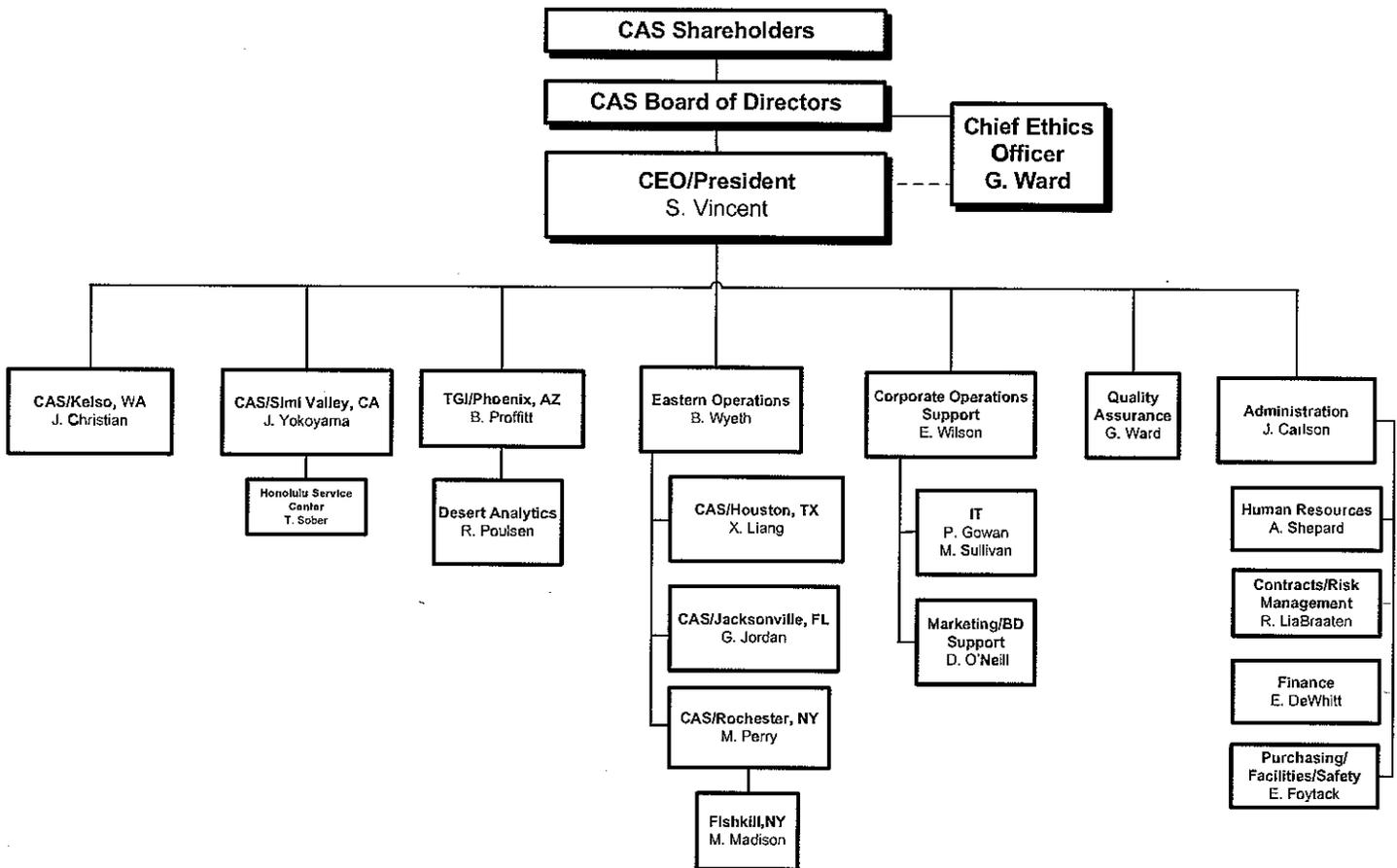
Note that the computers listed with the instruments are dedicated to that instrument for data acquisition, but the data files are saved to a lab-wide network and data may be accessed by any computer with the correct software - provided the user is authorized to do so.

APPENDIX B

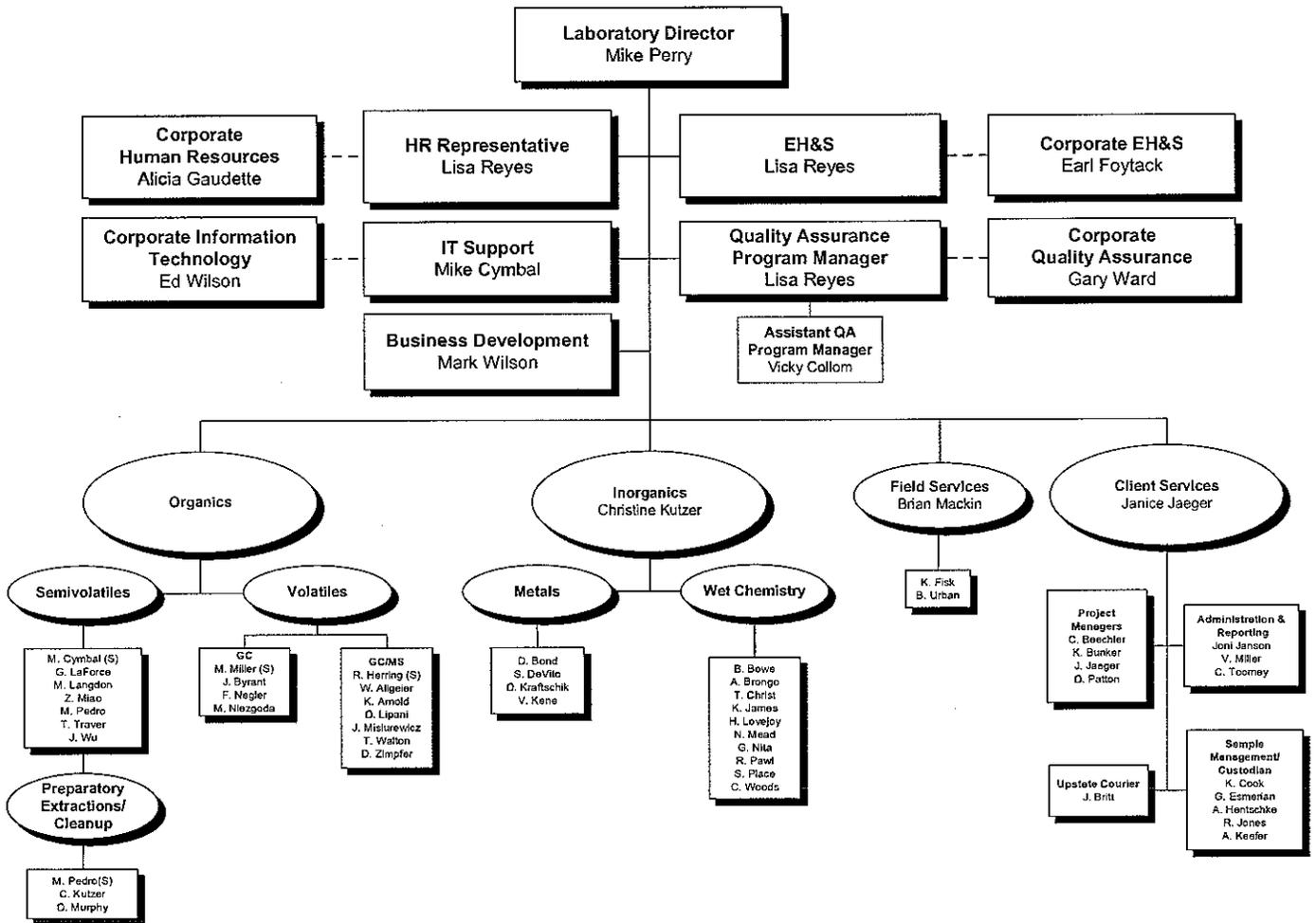
ORGANIZATIONAL CHART and RESUMES OF KEY PERSONNEL

March 29, 2006

Columbia Analytical Services, Inc. Laboratory Division Organization



**Columbia Analytical Services, Inc.
Rochester, New York Laboratory Organization**



MICHAEL K. PERRY
1996 TO PRESENT



Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 228-5380

Current Position

LABORATORY DIRECTOR – 1996 to Present

Responsibilities

Primary responsibilities include management of all laboratory departments, scheduling, productivity, reporting and evaluation of analytical methodologies, project planning and Quality Assurance/Quality Control protocols. In addition, other responsibilities include direct responsibility for contracts and consultants relating to the EPA SITE program, ACOE remediation program and the technical interface for the New York State ASP CLP program and other large national based clients.

Documentation of Demonstration of Capabilities is available for review.

Experience

Project Chemist, General Testing Corporation, Rochester, New York, 1995-1996. In addition to the duties of Laboratory Director listed below, responsibilities expanded to include the supervision of four teams of Project Chemists. Production management was shifted to the Laboratory Supervisors in order to increase client contact. Directly responsible for contracts and consultants relating to the EPA SITE program, ACOE remediation program and the New York State ASP CLP program.

Laboratory Director, General Testing Corporation, Rochester, New York, 1985-1995. Primary responsibilities included management of all laboratory departments, scheduling, productivity, reporting and evaluation of analytical methodologies and Quality Assurance/Quality Control protocols.

Instrument Manager, General Testing Corporation, Rochester, New York, 1979-1985. Responsibilities included operation and maintenance of all laboratory instruments and supervision of personnel associated with the instrumentation laboratory. Analyses included metals, volatile organics, pesticides/PCBs, and semi-volatile organics.

Senior Quality Assurance Technician, Coca-Cola Corporation, Atlanta, Georgia, 1976-1979. Responsible for analysis of raw materials and finished product using both wet chemistry and instrumentation techniques.

Laboratory Technician, Penwalt Pharmaceutical Company, Rochester, New York, 1975. Worked in the Quality Control Department.

Education

Coursework toward MS, Chemistry, Rochester Institute of Technology, Rochester, New York, 1983-1986
GC/MS, ACS Short Course, 1986

Effective Management of Chemical Analysis Laboratories, ACS Short Course, 1985

BS, Chemistry, Georgia State University, Atlanta, Georgia, 1979

AAS, Chemistry, State University of New York at Alfred, Alfred, New York, 1975

Affiliations

American Chemical Society



LISA M. REYES

1997 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 2285380

Current Position

QUALITY ASSURANCE/QUALITY CONTROL PROGRAM MANAGER – 1997 to Present

Responsibilities

Responsible for the overall coordination of the laboratory QA program and for ensuring that established quality objectives are met. Responsible for Quality Assurance functions including the Quality Assurance Manual, certifications, documenting standard operating procedures, and maintaining performance evaluation records. Oversees balance calibration and sample storage temperature control. Maintains certifications/accreditations for regulatory agencies and client certifications or approval programs. Acts as primary point of contact during laboratory audits. Provides audit responses and initiates any changes in procedures resulting from an audit. Coordinates the analysis of performance evaluation samples required for certification/accreditation programs. Reports and reviews results for these analyses. Conducts internal audits and makes recommendations for corrective action.

Provides technical assistance to laboratory staff on QA/QC issues, project feasibility, and methods interpretation/development.

Documentation of Demonstration of Capabilities is available for review.

Experience

Environmental Chemist, TreaTek-CRA Company/Conestoga-Rovers & Associates, Niagara Falls, New York, 1992-1997. Data quality, assessments and validations of ASP, CLP, and SW-846 organic and inorganic analytical data. Liaison with analytical contract laboratories, CRA field personnel, and state and federal agencies. Prepared QAPPs, laboratory bidding documents, and contracts. Also responsible for performance of laboratory audits

Manager of Quality Management Office, Huntingdon Analytical Services, Middleport, New York, 1989-1992. Manager of QA for Environmental, Agrochemical, Asbestos, and Engineering Soil laboratories. Responsible for in-house QA/QC programs, inspections, and instrument maintenance. Also responsible for employee safety and hazardous waste training, as well as manifesting hazardous waste. Routinely performed inorganic analyses, and reviewed analytical data, reports, and CLP packages.

Research Assistant, Research Foundation, State University of New York College at Brockport, Brockport, New York, 1986-1989. Performed routine sampling of surface water and lakes. Also did inorganic analyses on water and soil matrices. Assisted in graduate projects dealing with fish, plankton, water chemistry, and crayfish.

Education

CLP Inorganic Data Validation, US EPA Region II, Westchester Community, Westchester, New York, 1993.

CLP Organic Data Validation, US EPA Region II, Westchester Community, Westchester, New York, 1992.

BS, Biology, State University of New York at Brockport, Brockport, New York, 1988

Affiliations

American Chemical Society

MARK WILSON
1996 TO PRESENT



Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 228-5380

Current Position

DIRECTOR OF BUSINESS DEVELOPMENT II – 2004 to Present

Responsibilities

Responsible for sales maintenance for the Rochester laboratory territory including coordination of marketing and sales with national sales team.

Documentation of Demonstration of Capabilities is available for review.

Experience

Client Services Manager, *Columbia Analytical Services, Rochester, NY*, 1996-2004. Responsible for supervision of Project Chemists, sales staff, Sample Management Office (SMO) and reporting departments. Responsible for project management and client interface regarding analytical services.

Laboratory Manager, *Columbia Analytical Services, Rochester, New York*, 1996. Responsible for supervision of laboratory staff, scheduling of projects, evaluations of analytical QC procedures, and review of all analytical data.

Laboratory Manager, *General Testing Corporation, Rochester, New York*, 1992-1996. Responsibilities were primarily same as above.

Assistant Laboratory Director, *General Testing Corporation, Rochester, New York*, 1988-1992. Was responsible for assisting lab director with supervision of lab staff, scheduling of projects, evaluations of analytical and QC procedures, and review of all analytical data.

Organics Department Manager, *General Testing Corporation, Rochester, New York*, 1986-1996. Responsible for supervising all organics analyses including GC/MS, GC volatile organics, and GC extractables, and coordinating production and method development.

Organic Extractables Manager, *General Testing Corporation, Rochester, New York*, 1985-1992. Was responsible for GC operation and analysis, GC maintenance, trouble shooting, development, and GC/MS operation and start up.

Staff Technician II, *Medical Center University of Kentucky, Lexington, Kentucky*, 1979-1985. Was responsible for GC and AA analysis on biological fluids, drug screening and monitoring, heavy metals analysis, thin-layer chromatography, HPLC, and water testing.

Education

BS, Medical Technology with 32 hours of Chemistry, *State University of New York at Buffalo, Buffalo, New York*, 1978.



JANICE M. JAEGER

1996 TO PRESENT

Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 288-5380

Current Position

CLIENT SERVICES MANAGER I, 2004-Present

Responsibilities

Responsible for the supervision of Project Managers, Sample Management Office (SMO) and Reporting Departments. Assist clients to determine what analyses are required. Oversee projects from quote initiation to final report submission. Act as liaison between client requirements and laboratory capabilities for projects. Update clients on progress if their project and answer any questions they may have. Respond promptly to client requests and develop new client contacts within and outside of our current client base.

Documentation of Demonstration of Capabilities is available for review.

Experience

Project Manager III, Columbia Analytical Services, Rochester, NY, 1996-2004. Assist clients to determine what analyses are required. Responsibilities primarily as above without the supervisory role.

Customer Service Representative/Sample Receiving, General Testing Corporation, Rochester, New York, 1989-1996. Primary responsibilities included client services as listed above. Also responsible for sample receipt, log in and distribution as well as bottle preparation.

Surgical Assistant, Penfield Veterinary Hospital Rochester, New York, 1984-1989. Primary responsibilities included preparation of instruments, surgical area, and animal for surgery. Also responsible for monitoring the animal before and after surgery.

Education

BA, Pre-Veterinary Medicine and Pre-Professional Zoology (double Major), Ohio Wesleyan University, Delaware, Ohio, 1983.

CHRISTINE M. KUTZER

1996 TO PRESENT



Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 288-5380

Current Position

TECHNICAL MANAGER II, INORGANICS LABORATORY – 2004 to Present

Responsibilities

Plans and manages all activities in the Inorganics Department, including Metals and General Chemistry. Responsible for coordinating the workload and scheduling employees' daily activities. Assist in the operation, troubleshooting, and maintenance of instrumentation. Responsible for scheduling samples. Accountable for analytical data entry, analytical data approval and High Level metals package generation through MARRS.

Documentation of Demonstration of Capabilities is available for review.

Experience

Technical Manager II, Metals and Organics Prep Laboratories, Columbia Analytical Services, Inc., Rochester, New York, 2002-2004. Duties as above for Metals Department. Responsible for coordinating the workload and scheduling employees' daily activities and troubleshooting in the organics preparation laboratory.

Technical Manager I, Metals Laboratory, Columbia Analytical Services, Inc., Rochester, New York, 1996-2002. Duties as above for Metals Department.

Analyst III, Columbia Analytical Services, Rochester, New York, 1996. Responsible for instrument troubleshooting and maintenance, digestion of samples, and TCLP extractions. Also responsible for data entry, approval, and package review.

Chemist, General Testing Corporation, Rochester, New York, 1992-1996. Duties were as listed above.

Education

BS, Chemistry, St. Bonaventure University, Olean, New York, 1992

MICHAEL W. CYMBAL
1996 TO PRESENT



Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 288-5380

Current Position	TECHNICAL MANAGER I – Information Technology 1998 to Present - Extractables Department 2004 to Present
Responsibilities	Responsible for computer systems (Novel Lan, Starlms) and instrument analysis of software. Also responsible for client spreadsheets and disk deliverables, computer maintenance and upgrades. Responsible for the oversight of the extractables department including extractions and instrumental analysis (HPLC, GC, and GC/MS). Documentation of Demonstration of Capabilities is available for review.
Experience	Systems Analyst III , <i>Columbia Analytical Services, Inc., Rochester, New York</i> , 1997-1998. Duties primarily as above. Systems Analyst I , <i>Columbia Analytical Services, Inc., Rochester, New York</i> , 1996-1997. Duties primarily as above. Computer Administration , <i>General Testing Corporation, Rochester, New York</i> , 1995-1996. Oversaw computer systems (Novel Lan, StarLIMS, Seven Reporting Systems) and created client spreadsheets and disk deliverables. Analyst , <i>General Testing Corporation, Rochester, New York</i> , 1990-1995. Responsible for Organic Analyses (Volatile and Semi-Volatile Pesticides) for GC and GC/MS. Also responsible for Instrument Maintenance and Sample Preparation.
Education	BS, Chemistry , <i>Robert's Wesleyan College, Rochester, New York</i> , 1990.

RODERICK "ROD" J. HERRING

1996 TO PRESENT



Columbia Analytical Services, Inc., 1 Mustard St., Suite 250, Rochester, NY 14609 (585) 288-5380

Current Position

TECHNICAL MANAGER II, MS VOLATILES – 2002 to Present

Responsibilities

Responsible for the daily operations of the GC/MS laboratory, including the scheduling of department analyses, instrument calibration, and troubleshooting/maintenance activities. Accountable for personnel training, data approval, quality program support.

Documentation of Demonstration of Capabilities is available for review.

Experience

Scientist I, GC/MS VOA Laboratory, Columbia Analytical Services, Inc., Rochester, New York, 1996-2002. Responsible for analysis of water, soil, and air samples for specific target contaminants using EPA methods by GC/MS technology. Also responsible for generation of analytical reports via Laboratory Information Management System (LIMS), monitoring activities for second shift, and helping in other laboratory areas as needed.

Scientist I, GC/MS VOA Laboratory, General Testing Corporation, Rochester, New York, 1991-1996. Responsibilities were as listed above.

GC VOAs/2nd Shift Supervisor, General Testing Corporation, Rochester, New York, 1998-1991. Was responsible for analysis of water, soil, and air samples via EPA methods, maintaining instrumentation, and helping with departmental organization.

TOX/TOC Operator, General Testing Corporation, Rochester, New York, 1988. Was responsible for analysis of water and soil for organic halogens and organic carbon, maintaining instrumentation, and organizing department and workload.

Wet Chemistry Technician, General Testing Corporation, Rochester, New York, 1987-1988. Was responsible for solids, grease and oils, MBAs, TKNs, alkalinities, other inorganic analyses, organizing daily workload, and reporting.

Education

BA, Natural Science and Biochemistry, State University of New York, Utica, New York, 1987.

AS, Biology, Jamestown Community College, Olean, New York, 1984.

Publications/ Presentations

The Effects of Phthalate Esters on Spinach and Pea Seedlings, FEBS Letters 1987 co-authored with Larry Bering, PhD and presented at ACS Conference, Rochester, New York, 1988.

APPENDIX C
DATA QUALITY CAPABILITIES

March 29, 2006



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
504.1	1,2-DIBROMOETHANE	WATER	0.06		UG/L	0.0060	30	60-140	50-150
504.1	1,2-DIBROMO-3-CHLOROPROPANE	WATER	0.06		UG/L	0.0040	30	60-140	50-150
524.2	1,1,1,2-TETRACHLOROETHANE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,1,1-TRICHLOROETHANE	WATER	0.50		UG/L	0.082	20	70-130	70-130
524.2	1,1,2,2-TETRACHLOROETHANE	WATER	0.50		UG/L	0.078	20	70-130	70-130
524.2	1,1,2-TRICHLOROETHANE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,1-DICHLOROETHANE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	1,1-DICHLOROETHENE	WATER	0.50		UG/L	0.094	20	70-130	70-130
524.2	1,1-DICHLOROPROPENE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	1,2,3-TRICHLOROBENZENE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	1,2,3-TRICHLOROPROPANE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	1,2,4-TRICHLOROBENZENE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,2,4-TRIMETHYLBENZENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	1,2-DIBROMO-3-CHLOROPROPANE	WATER	0.50		UG/L	0.29	20	70-130	70-130
524.2	1,2-DIBROMOETHANE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,2-DICHLOROBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	1,2-DICHLOROETHANE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	1,2-DICHLOROPROPANE	WATER	0.50		UG/L	0.097	20	70-130	70-130
524.2	1,3,5-TRIMETHYLBENZENE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,3-DICHLOROBENZENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	1,3-DICHLOROPROPANE	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	1,4-DICHLOROBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	2,2-DICHLOROPROPANE	WATER	0.50		UG/L	0.075	20	70-130	70-130
524.2	2-CHLOROTOLUENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	4-CHLOROTOLUENE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	BENZENE	WATER	0.50		UG/L	0.099	20	70-130	70-130
524.2	BROMOBENZENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	BROMOCHLOROMETHANE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	BROMODICHLOROMETHANE	WATER	0.50		UG/L	0.085	20	70-130	70-130
524.2	BROMOPORM	WATER	0.50		UG/L	0.12	20	70-130	70-130
524.2	BROMOMETHANE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	CARBON TETRACHLORIDE	WATER	0.50		UG/L	0.19	20	70-130	70-130
524.2	CHLOROBENZENE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	CHLOROETHANE	WATER	0.50		UG/L	0.17	20	70-130	70-130
524.2	CHLOROFORM	WATER	0.50		UG/L	0.10	20	70-130	70-130
524.2	CHLOROMETHANE	WATER	0.50		UG/L	0.22	20	70-130	70-130
524.2	CIS-1,2-DICHLOROETHENE	WATER	0.50		UG/L	0.081	20	70-130	70-130
524.2	CIS-1,3-DICHLOROPROPENE	WATER	0.50		UG/L	0.077	20	70-130	70-130
524.2	DIBROMOCHLOROMETHANE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	DIBROMOMETHANE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	DICHLORODIFLUOROMETHANE	WATER	0.50		UG/L	0.13	20	70-130	70-130
524.2	ETHYLBENZENE	WATER	0.50		UG/L	0.089	20	70-130	70-130
524.2	HEXACHLOROBUTADIENE	WATER	0.50		UG/L	0.076	20	70-130	70-130
524.2	ISOPROPYLBENZENE	WATER	0.50		UG/L	0.16	20	70-130	70-130
524.2	M+P-XYLENE	WATER	1.0		UG/L	0.29	20	70-130	70-130
524.2	METHYLENE CHLORIDE	WATER	0.50		UG/L	0.15	20	70-130	70-130
524.2	NAPHTHALENE	WATER	0.50		UG/L	0.085	20	70-130	70-130



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
524.2	N-BUTYLBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	N-PROPYLBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	O-XYLENE	WATER	0.50		UG/L	0.16	20	70-130	70-130
524.2	P-ISOPROPYLTOLUENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	SEC-BUTYLBENZENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	STYRENE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	TERT-BUTYLBENZENE	WATER	0.50		UG/L	0.16	20	70-130	70-130
524.2	TETRACHLOROETHENE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	TOLUENE	WATER	0.50		UG/L	0.085	20	70-130	70-130
524.2	TRANS-1,2-DICHLOROETHENE	WATER	0.50		UG/L	0.11	20	70-130	70-130
524.2	TRANS-1,3-DICHLOROPROPENE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	TRICHLOROETHENE	WATER	0.50		UG/L	0.16	20	70-130	70-130
524.2	TRICHLOROFLUOROMETHANE	WATER	0.50		UG/L	0.14	20	70-130	70-130
524.2	VINYL CHLORIDE	WATER	0.50		UG/L	0.20	20	70-130	70-130
524.2	BROMOFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	70-130	70-130
524.2	1,2-DICHLOROBENZENE-D4 -SURR	WATER	NA		UG/L	NA	NA	70-130	70-130
524.2 ADDITIONAL COMPOUNDS BY REQUEST									
	TERT-BUTYL ALCOHOL	WATER	20		UG/L	3.7	20	70-130	70-130
	METHYL-TERT-BUTYL-ETHER	WATER	0.50		UG/L	0.097	20	70-130	70-130
	2-BUTANONE (MEK)	WATER	5.0		UG/L	1.7	20	70-130	70-130
	2-HEXANONE	WATER	5.0		UG/L	1.8	20	70-130	70-130
	4-METHYL-2-PENTANONE (MIBK)	WATER	5.0		UG/L	1.6	20	70-130	70-130
	ACETONE	WATER	5.0		UG/L	1.9	20	70-130	70-130



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
601	BROMODICHLOROMETHANE	WATER	1.0		UG/L	0.34	30	42-172	42-172
601	BROMOFORM	WATER	1.0		UG/L	0.18	30	13-159	13-159
601	BROMOMETHANE	WATER	1.0		UG/L	0.13	30	d-144	d-144
601	CARBON TETRACHLORIDE	WATER	1.0		UG/L	0.41	30	43-143	43-143
601	CHLOROBENZENE	WATER	1.0		UG/L	0.21	30	38-150	38-150
601	CHLOROETHANE	WATER	1.0		UG/L	0.47	30	46-137	46-137
601	2-CHLOROETHYL VINYL ETHER	WATER	1.0		UG/L	0.26	30	14-186	14-186
601	CHLOROFORM	WATER	1.0		UG/L	0.33	30	49-133	49-133
601	CHLOROMETHANE	WATER	1.0		UG/L	0.38	30	42-172	42-172
601	DIBROMOCHLOROMETHANE	WATER	1.0		UG/L	0.25	30	13-159	13-159
601	DICHLORODIFLUOROMETHANE	WATER	1.0		UG/L	0.31	30	70-130	50-150
601	1,2-DICHLOROBENZENE	WATER	1.0		UG/L	0.12	30	d-144	d-144
601	1,3-DICHLOROBENZENE	WATER	1.0		UG/L	0.15	30	43-143	43-143
601	1,4-DICHLOROBENZENE	WATER	1.0		UG/L	0.15	30	38-150	38-150
601	1,1-DICHLOROETHANE	WATER	1.0		UG/L	0.32	30	46-137	46-137
601	1,2-DICHLOROETHANE	WATER	1.0		UG/L	0.30	30	14-186	14-186
601	1,1-DICHLOROETHENE	WATER	1.0		UG/L	0.32	30	49-133	49-133
601	TRANS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.36	30	d-193	d-193
601	1,2-DICHLOROPROPANE	WATER	1.0		UG/L	0.29	30	d-208	d-208
601	CIS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.27	30	7-187	7-187
601	TRANS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.19	30	42-143	42-143
601	METHYLENE CHLORIDE	WATER	1.0		UG/L	0.39	30	47-132	47-132
601	1,1,2,2-TETRACHLOROETHANE	WATER	1.0		UG/L	0.25	30	51-147	51-147
601	TETRACHLOROETHENE	WATER	1.0		UG/L	0.31	30	28-167	28-167
601	1,1,1-TRICHLOROETHANE	WATER	1.0		UG/L	0.50	30	38-155	38-155
601	1,1,2-TRICHLOROETHANE	WATER	1.0		UG/L	0.28	30	39-136	39-136
601	TRICHLOROETHENE	WATER	1.0		UG/L	0.45	30	35-146	35-146
601	TRICHLOROFLUOROMETHANE	WATER	1.0		UG/L	0.42	30	21-156	21-156
601	VINYL CHLORIDE	WATER	1.0		UG/L	0.40	30	28-163	28-163
601	BROMOCHLOROMETHANE -SURR	WATER	NA		UG/L	NA	NA	60-117	60-117
601	1,2,3 -TRICHLOROPROPANE -SURR	WATER	NA		UG/L	NA	NA	70-124	70-124
601	CHLOROFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	61-120	61-120
602	BENZENE	WATER	1.0		UG/L	0.20	30	39-150	39-150
602	CHLOROBENZENE	WATER	1.0		UG/L	0.21	30	55-135	55-135
602	1,3-DICHLOROBENZENE (M)	WATER	1.0		UG/L	0.36	30	50-141	50-141
602	1,2-DICHLOROBENZENE (O)	WATER	1.0		UG/L	0.15	30	37-154	37-154
602	1,4-DICHLOROBENZENE (P)	WATER	1.0		UG/L	0.39	30	42-143	42-143
602	ETHYLBENZENE	WATER	1.0		UG/L	0.23	30	32-160	32-160
602	TOLUENE	WATER	1.0		UG/L	0.18	30	46-148	46-148
602	M+P-XYLENE	WATER	2.0		UG/L	0.36	30	70-130	50-150
602	O-XYLENE	WATER	1.0		UG/L	0.17	30	70-130	50-150
602	CHLOROFLUOROBENZENE (PID) -SURR	WATER	NA		UG/L	NA	NA	73-110	73-110
601/602 ADDITIONAL COMPOUNDS BY REQUEST									
	CIS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.30	30	24-191	24-191
	FREON 113	WATER	1.0		UG/L	0.36	30	70-130	50-150
	METHYL-TERT-BUTYL ETHER (MTBE)	WATER	1.0		UG/L	0.25	30	70-130	50-150
	TOTAL XYLENES	WATER	3.0		UG/L	0.52	30	70-130	50-150



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
624 PPL	ACROLEIN	WATER	10		UG/L	4.0	30	36-124	36-124
624 PPL	ACRYLONITRILE	WATER	10		UG/L	1.2	30	71-111	71-111
624 PPL	BENZENE	WATER	1.0		UG/L	0.18	30	37-151	37-151
624 PPL	BROMODICHLOROMETHANE	WATER	1.0		UG/L	0.24	30	35-155	35-155
624 PPL	BROMOFORM	WATER	1.0		UG/L	0.57	30	45-169	45-169
624 PPL	BROMOMETHANE	WATER	1.0		UG/L	0.75	30	d-242	d-242
624 PPL	CARBON TETRACHLORIDE	WATER	1.0		UG/L	0.44	30	70-140	70-140
624 PPL	CHLOROBENZENE	WATER	1.0		UG/L	0.20	30	37-160	37-160
624 PPL	CHLOROETHANE	WATER	1.0		UG/L	0.33	30	14-230	14-230
624 PPL	2-CHLOROETHYLVINYL ETHER	WATER	10		UG/L	0.31	30	d-305	d-305
624 PPL	CHLOROFORM	WATER	1.0		UG/L	0.17	30	51-138	51-138
624 PPL	CHLOROMETHANE	WATER	1.0		UG/L	0.33	30	d-273	d-273
624 PPL	DIBROMOCHLOROMETHANE	WATER	1.0		UG/L	0.26	30	53-149	53-149
624 PPL	1,1-DICHLOROETHANE	WATER	1.0		UG/L	0.30	30	59-155	59-155
624 PPL	1,2-DICHLOROETHANE	WATER	1.0		UG/L	0.14	30	49-155	49-155
624 PPL	1,1-DICHLOROETHENE	WATER	1.0		UG/L	0.31	30	d-234	d-234
624 PPL	TRANS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.22	30	54-156	54-156
624 PPL	1,2-DICHLOROPROPANE	WATER	1.0		UG/L	0.25	30	d-210	d-210
624 PPL	CIS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.36	30	d-227	d-227
624 PPL	TRANS-1,3-DICHLOROPROPENE	WATER	1.0		UG/L	0.23	30	17-183	17-183
624 PPL	ETHYLBENZENE	WATER	1.0		UG/L	0.17	30	37-162	37-162
624 PPL	METHYLENE CHLORIDE	WATER	1.0		UG/L	0.20	30	d-221	d-221
624 PPL	1,1,2,2-TETRACHLOROETHANE	WATER	1.0		UG/L	0.27	30	46-157	46-157
624 PPL	TETRACHLOROETHENE	WATER	1.0		UG/L	0.27	30	64-148	64-148
624 PPL	TOLUENE	WATER	1.0		UG/L	0.11	30	47-150	47-150
624 PPL	1,1,1-TRICHLOROETHANE	WATER	1.0		UG/L	0.13	30	52-162	52-162
624 PPL	1,1,2-TRICHLOROETHANE	WATER	1.0		UG/L	0.47	30	52-150	52-150
624 PPL	TRICHLOROETHENE	WATER	1.0		UG/L	0.26	30	71-157	71-157
624 PPL	VINYL CHLORIDE	WATER	1.0		UG/L	0.18	30	d-251	d-251
624	4-BROMOFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	77-117	77-117
624	DIBROMOFLUOROMETHANE -SURR	WATER	NA		UG/L	NA	NA	86-126	86-126
624	1,2-DICHLOROETHANE-D4 -SURR	WATER	NA		UG/L	NA	NA	85-122	85-122
624	TOLUENE-D8 -SURR	WATER	NA		UG/L	NA	NA	85-115	85-115



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
624	ADDITIONAL COMPOUNDS BY REQUEST								
624	1,1,1,2-TETRACHLOROETHANE	WATER	1.0		UG/L	0.37	30	70-130	50-150
624	1,2,3-TRICHLOROPROPANE	WATER	5.0		UG/L	0.10	30	70-130	50-150
624	1,2-DIBROMO-3-CHLOROPROPANE	WATER	1.0		UG/L	0.17	30	70-130	50-150
624	1,2-DIBROMOETHANE	WATER	1.0		UG/L	0.27	30	70-130	50-150
624	1,2-DICHLOROBENZENE	WATER	1.0		UG/L	0.31	30	18-190	18-190
624	1,3-DICHLOROBENZENE	WATER	1.0		UG/L	0.35	30	59-156	59-156
624	1,4-DICHLOROBENZENE	WATER	1.0		UG/L	0.20	30	18-190	18-190
624	1-BROMO-2-CHLOROETHANE	WATER	10		UG/L	1.9	30	70-130	50-150
624	2-BUTANONE (MEK)	WATER	10		UG/L	0.75	30	70-130	50-150
624	2-HEXANONE	WATER	10		UG/L	0.73	30	70-130	50-150
624	4-CHLOROBENZOFLUORIDE	WATER	10		UG/L	1.80	30	50-150	50-150
624	4-METHYL-2-PENTANONE (MIBK)	WATER	10		UG/L	0.54	30	70-130	50-150
624	ACETONE	WATER	10		UG/L	1.3	30	50-150	50-150
624	BROMOCHLOROMETHANE	WATER	1.0		UG/L	0.082	30	70-130	50-150
624	CARBON DISULFIDE	WATER	10		UG/L	0.99	30	70-130	50-150
624	CIS-1,2-DICHLOROETHENE	WATER	1.0		UG/L	0.33	30	70-130	50-150
624	DIBROMOMETHANE	WATER	1.0		UG/L	0.10	30	70-130	50-150
624	DICHLORODIFLUOROMETHANE	WATER	1.0		UG/L	0.29	30	70-130	50-150
624	IODOMETHANE	WATER	5.0		UG/L	1.2	30	70-130	50-150
624	ISOBUTYL ALCOHOL	WATER	100		UG/L	18	30	70-130	50-150
624	M+P XYLENE	WATER	2.0		UG/L	0.25	30	70-130	50-150
624	METHYL-TERT-BUTYL ETHER	WATER	1.0		UG/L	0.17	30	70-130	50-150
624	NAPHTHALENE	WATER	5.0		UG/L	0.14	30	70-130	50-150
624	O-XYLENE	WATER	1.0		UG/L	0.27	30	70-130	50-150
624	STYRENE	WATER	1.0		UG/L	0.33	30	70-130	50-150
624	TERT-BUTYL ALCOHOL	WATER	100		UG/L	3.9	30	50-150	50-150
624	TETRAHYDROFURAN	WATER	10		UG/L	1.1	30	50-150	50-150
624	TRANS-1,4-DICHLORO-2-BUTENE	WATER	1.0		UG/L	0.17	30	70-130	50-150
624	TRICHLOROFLUOROMETHANE	WATER	1.0		UG/L	0.42	30	17-181	17-181
624	TRICHLOROTRIFLUOROETHANE	WATER	1.0		UG/L	0.35	30	70-130	50-150
624	VINYL ACETATE	WATER	5.0		UG/L	0.45	30	70-130	50-150



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
625 PPL	1,2,4-TRICHLOROBENZENE	WATER	5.0		UG/L	0.65	30	44-142	44-142
625 PPL	1,2-DICHLOROBENZENE	WATER	5.0		UG/L	0.67	30	32-129	32-129
625 PPL	1,2-DIPHENYLHYDRAZINE	WATER	5.0		UG/L	0.48	30	59-113	59-113
625 PPL	1,3-DICHLOROBENZENE	WATER	5.0		UG/L	0.50	30	d-172	d-172
625 PPL	1,4-DICHLOROBENZENE	WATER	5.0		UG/L	0.58	30	20-124	20-124
625 PPL	2,2-OXYBIS (1-CHLOROPROPANE)	WATER	5.0		UG/L	0.78	30	36-166	36-166
625 PPL	2,4,6-TRICHLOROPHENOL	WATER	5.0		UG/L	0.59	30	37-144	37-144
625 PPL	2,4-DICHLOROPHENOL	WATER	5.0		UG/L	0.37	30	39-135	39-135
625 PPL	2,4-DIMETHYLPHENOL	WATER	5.0		UG/L	1.8	30	39-135	39-135
625 PPL	2,4-DINITROPHENOL	WATER	50		UG/L	14	30	d-191	d-191
625 PPL	2,4-DINITROTOLUENE	WATER	5.0		UG/L	0.53	30	39-139	39-139
625 PPL	2,6-DINITROTOLUENE	WATER	5.0		UG/L	0.55	30	50-158	50-158
625 PPL	2-CHLORONAPHTHALENE	WATER	5.0		UG/L	0.55	30	60-118	60-118
625 PPL	2-CHLOROPHENOL	WATER	5.0		UG/L	0.69	30	23-134	23-134
625 PPL	2-NITROPHENOL	WATER	5.0		UG/L	0.61	30	29-182	29-182
625 PPL	3,3'-DICHLOROBENZIDINE	WATER	5.0		UG/L	0.73	30	d-262	d-262
625 PPL	4,6-DINITRO-2-METHYLPHENOL	WATER	50		UG/L	0.51	30	d-181	d-181
625 PPL	4-BROMOPHENYL-PHENYLETHER	WATER	5.0		UG/L	0.67	30	53-127	53-127
625 PPL	4-CHLORO-3-METHYLPHENOL	WATER	5.0		UG/L	0.50	30	22-147	22-147
625 PPL	4-CHLOROPHENYL-PHENYLETHER	WATER	5.0		UG/L	0.49	30	25-158	25-158
625 PPL	4-NITROPHENOL	WATER	50		UG/L	6.7	30	d-132	d-132
625 PPL	ACENAPHTHENE	WATER	5.0		UG/L	0.48	30	47-145	47-145
625 PPL	ACENAPHTHYLENE	WATER	5.0		UG/L	0.33	30	33-145	33-145
625 PPL	ANTHRACENE	WATER	5.0		UG/L	0.60	30	27-133	27-133
625 PPL	BENZIDINE	WATER	100		UG/L	43	30	10-113	10-113
625 PPL	BENZO (A) ANTHRACENE	WATER	5.0		UG/L	0.54	30	33-143	33-143
625 PPL	BENZO (A) PYRENE	WATER	5.0		UG/L	0.42	30	17-163	17-163
625 PPL	BENZO (B) FLUORANTHENE	WATER	5.0		UG/L	0.54	30	24-159	24-159
625 PPL	BENZO (G, H, I) PERYLENE	WATER	5.0		UG/L	0.62	30	d-219	d-219
625 PPL	BENZO (K) FLUORANTHENE	WATER	5.0		UG/L	0.53	30	11-162	11-162
625 PPL	BIS (-2-CHLOROETHOXY) METHANE	WATER	5.0		UG/L	0.86	30	33-184	33-184
625 PPL	BIS (2-CHLOROETHYL) ETHER	WATER	5.0		UG/L	0.74	30	12-158	12-158
625 PPL	BIS (2-ETHYLHEXYL) PHTHALATE	WATER	5.0		UG/L	0.48	30	8-158	8-158
625 PPL	BUTYL BENZYL PHTHALATE	WATER	5.0		UG/L	0.59	30	d-152	d-152
625 PPL	CHRYSENE	WATER	5.0		UG/L	0.53	30	17-168	17-168
625 PPL	DIBENZO (A, H) ANTHRACENE	WATER	5.0		UG/L	0.63	30	d-227	d-227
625 PPL	DIETHYLPHTHALATE	WATER	5.0		UG/L	0.31	30	d-114	d-114
625 PPL	DIMETHYL PHTHALATE	WATER	5.0		UG/L	0.53	30	d-112	d-112
625 PPL	DI-N-BUTYLPHTHALATE	WATER	5.0		UG/L	0.39	30	1-118	1-118
625 PPL	DI-N-OCTYL PHTHALATE	WATER	5.0		UG/L	0.45	30	4-146	4-146
625 PPL	FLUORANTHENE	WATER	5.0		UG/L	0.32	30	26-137	26-137
625 PPL	FLUORENE	WATER	5.0		UG/L	0.47	30	59-121	59-121
625 PPL	HEXACHLOROBENZENE	WATER	5.0		UG/L	0.43	30	d-152	d-152
625 PPL	HEXACHLOROBUTADIENE	WATER	5.0		UG/L	0.69	30	24-116	24-116
625 PPL	HEXACHLOROCYCLOPENTADIENE	WATER	5.0		UG/L	1.1	30	10-130	10-130
625 PPL	HEXACHLOROETHANE	WATER	5.0		UG/L	0.48	30	40-113	40-113
625 PPL	INDENO (1,2,3-CD) PYRENE	WATER	5.0		UG/L	0.49	30	d-171	d-171
625 PPL	ISOPHORONE	WATER	5.0		UG/L	0.61	30	21-196	21-196
625 PPL	NAPHTHALENE	WATER	5.0		UG/L	0.62	30	21-133	21-133
625 PPL	NITROBENZENE	WATER	5.0		UG/L	0.78	30	35-180	35-180
625 PPL	N-NITROSODIMETHYLAMINE	WATER	5.0		UG/L	0.79	30	27-130	27-130
625 PPL	N-NITROSO-DI-N-PROPYLAMINE	WATER	5.0		UG/L	1.19	30	d-230	d-230
625 PPL	N-NITROSODIPHENYLAMINE	WATER	5.0		UG/L	0.75	30	70-130	70-130
625 PPL	PENTACHLOROPHENOL	WATER	50		UG/L	0.60	30	14-176	14-176
625 PPL	PHENANTHRENE	WATER	5.0		UG/L	0.45	30	54-120	54-120
625 PPL	PHENOL	WATER	5.0		UG/L	0.54	30	5-112	5-112
625 PPL	PYRENE	WATER	5.0		UG/L	0.65	30	52-115	52-115
625	TERPHENYL-d14 -SURR	WATER	NA		UG/L	NA	NA	45-135	45-135
625	NITROBENZENE-d5 -SURR	WATER	NA		UG/L	NA	NA	41-129	41-129
625	PHENOL-d6 -SURR	WATER	NA		UG/L	NA	NA	15-58	15-58
625	2-FLUOROBIPHENYL -SURR	WATER	NA		UG/L	NA	NA	51-111	51-111
625	2-FLUOROPHENOL -SURR	WATER	NA		UG/L	NA	NA	27-78	27-78
625	2,4,6-TRIBROMOPHENOL -SURR	WATER	NA		UG/L	NA	NA	44-146	44-146
625	ADDITIONAL COMPOUNDS BY REQUEST								
625	1,1-BIPHENYL	WATER	5.0		UG/L	0.55	30	50-130	50-130



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
625	1-METHYLNAPHTHALENE	WATER	5.0		UG/L	0.62	30	50-130	50-130
625	2,4,5-TRICHLOROPHENOL	WATER	5.0		UG/L	0.84	30	40-110	40-110
625	2-CHLOROPYRIDINE	WATER	10		UG/L	0.42	30	58-130	50-130
625	2-METHYLNAPHTHALENE	WATER	5.0		UG/L	0.45	30	42-107	42-107
625	2-METHYLPHENOL	WATER	5.0		UG/L	0.79	30	16-102	16-102
625	2-NITROANILINE	WATER	50		UG/L	0.59	30	63-112	63-112
625	3-CHLOROPYRIDINE	WATER	10		UG/L	0.67	30	56-130	50-130
625	3-NITROANILINE	WATER	50		UG/L	0.43	30	56-111	56-111
625	4-CHLOROANILINE	WATER	5.0		UG/L	0.72	30	39-107	39-107
625	4-METHYLPHENOL	WATER	5.0		UG/L	1.5	30	26-99	26-99
625	4-NITROANILINE	WATER	50		UG/L	0.59	30	50-130	50-130
625	ACETOPHENONE	WATER	5.0		UG/L	1.35	30	40-130	40-130
625	ANILINE	WATER	5.0		UG/L	0.78	30	13-123	13-123
625	ATRAZINE	WATER	5.0		UG/L	1.3	30	50-130	50-130
625	BENZALDEHYDE	WATER	5.0		UG/L	1.3	30	50-130	50-130
625	BENZOIC ACID	WATER	50		UG/L	15	30	30-130	30-130
625	BENZYL ALCOHOL	WATER	5.0		UG/L	1.1	30	31-109	31-109
625	CAPROLACTAM	WATER	50		UG/L	1.0	30	50-130	50-130
625	CARBAZOLE	WATER	5.0		UG/L	0.47	30	70-130	70-130
625	DIBENZOFURAN	WATER	5.0		UG/L	0.41	30	70-130	70-130
625	PYRIDINE	WATER	5.0		UG/L	1.0	30	10-130	10-130
680	MONOCHLOROBIPHENYLS, TOTAL	WATER	0.005		UG/L	0.0017	30	50-125	50-125
680	DICHLOROBIPHENYLS, TOTAL	WATER	0.006		UG/L	0.0014	30	50-125	50-125
680	TRICHLOROBIPHENYLS, TOTAL	WATER	0.006		UG/L	0.0015	30	50-125	50-125
680	TETRACHLOROBIPHENYLS, TOTAL	WATER	0.010		UG/L	0.0023	30	50-125	50-125
680	PENTACHLOROBIPHENYLS, TOTAL	WATER	0.010		UG/L	0.0045	30	50-125	50-125
680	HEXACHLOROBIPHENYLS, TOTAL	WATER	0.020		UG/L	0.0032	30	50-125	50-125
680	HEPTACHLOROBIPHENYLS, TOTAL	WATER	0.020		UG/L	0.0033	30	50-125	50-125
680	OCTACHLOROBIPHENYLS, TOTAL	WATER	0.040		UG/L	0.0054	30	50-125	50-125
680	NONACHLOROBIPHENYLS, TOTAL	WATER	0.025		UG/L	0.0057	30	50-125	50-125
680	DECACHLOROBIPHENYLS, TOTAL	WATER	0.040		UG/L	0.0085	30	50-125	50-125
680	GAMMA-BHC -SURR	WATER	NA		UG/L	NA	30	59-128	59-128
680	4-4'-DDT -SURR	WATER	NA		UG/L	NA	30	45-155	45-155
8011	1,2-DIBROMOETHANE	WATER	0.06		UG/L	0.0062	30	70-130	50-150
8011	1,2-DIBROMO-3-CHLOROPROPANE	WATER	0.06		UG/L	0.0057	30	70-130	50-150
8011	TETRACHLORO-META-XYLENE (TCMX) -SU	WATER	NA		UG/L	NA	NA	70-130	50-150



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8015B-SVOA-SILOX	N,N-DIMETHYLFORMAMIDE	WATER	2000		UG/L	411	30	50-150	50-150
8015B-SVOA-SILOX	HEXAMETHYLCYCLOTRISILOXANE	WATER	2000		UG/L	447	30	50-150	50-150
8015B-SVOA-SILOX	OCTAMETHYLCYCLOTRISILOXANE	WATER	2000		UG/L	460	30	50-150	50-150
8015B-SVOA-SILOX	OCTAMETHYLTETRASILOXANE	WATER	2000		UG/L	473	30	50-150	50-150
8015B-SVOA(WAPA)	1,4-DIOXANE	WATER	1000		UG/L	310	30	70-130	70-130
8015B-SVOA(WAPA)	2-PROPANOL (ISOPROPANOL)	WATER	1000		UG/L	339	30	70-130	70-130
8015B-SVOA(WAPA)	ETHYL ACETATE	WATER	1000		UG/L	320	30	70-130	70-130
8015B-SVOA(WAPA)	ISOBUTYL ALCOHOL (ISOBUTANOL)	WATER	1000		UG/L	275	30	50-150	50-150
8015B-SVOA(WAPA)	METHANOL	WATER	1000		UG/L	260	30	70-130	50-150
8015B-SVOA(WAPA)	N-BUTANOL (1-BUTANOL)	WATER	1000		UG/L	322	30	70-130	70-130
8015B-SVOA	1-BUTANOL (N-BUTANOL)	WATER	1000		UG/L	320	30	70-130	70-130
8015B-SVOA	1-METHOXY-2-PROPANOL	WATER	1000		UG/L	190	30	70-130	70-130
8015B-SVOA	1-PROPANOL (N-PROPANOL)	WATER	1000		UG/L	215	30	65-143	65-143
8015B-SVOA	2-ETHOXYETHANOL (CELLOSOLVE)	WATER	1000		UG/L	130	30	70-130	50-150
8015B-SVOA	2-ETHYLHEXANOL	WATER	1000		UG/L	464	30	70-130	50-150
8015B-SVOA	2-PROPANOL (ISOPROPANOL)	WATER	1000		UG/L	340	30	70-130	70-130
8015B-SVOA	DIMETHYLSULFOXIDE	WATER	1000		UG/L		30	50-150	50-150
8015B-SVOA	ETHANOL	WATER	1000		UG/L	440	30	70-130	50-150
8015B-SVOA	ETHER (DIETHYL ETHER)	WATER	1000		UG/L	296	30	50-150	50-150
8015B-SVOA	ETHYL ACETATE	WATER	1000		UG/L	320	30	70-130	70-130
8015B-SVOA	ISOPROPYL ETHER	WATER	1000		UG/L	135	30	50-150	50-150
8015B-SVOA	METHANOL	WATER	1000		UG/L	260	30	70-130	50-150
8015B-SVOA	METHYL CELLOSOLVE (2-METHOXYETHANOL)	WATER	1000		UG/L	79	30	50-150	70-130
8015B-SVOA	METHYL-TERT-BUTYL ETHER	WATER	1000		UG/L		30	70-130	70-130
8015B-SVOA	N-BUTYL ACETATE	WATER	1000		UG/L		30	40-150	40-150
8015B-SVOA	N-PROPYL ACETATE	WATER	1000		UG/L		30	40-150	40-150
8015B-SVOA	SEC-BUTANOL (2-BUTANOL)	WATER	1000		UG/L	260	30	70-130	50-150
8015B-SVOA	TETRAHYDROFURAN	WATER	1000		UG/L		30	50-150	50-150
8015B-SVOA	1-PROPANOL-OPTIONAL SURR	WATER	NA		UG/L	NA	NA	50-150	50-150
8015B-SVOA	2-HEXANONE-OPTIONAL SURR	WATER	NA		UG/L	NA	NA	50-150	50-150
8015B-SVOA	n-BUTANOL-OPTIONAL SURR	WATER	NA		UG/L	NA	NA	50-150	50-150
8015B -VOA	METHANOL	WATER	1000		UG/L	488	30	70-130	50-150
8015B -VOA	ETHANOL	WATER	1000		UG/L	267	30	70-130	50-150
8015B -VOA	ISOPROPANOL	WATER	1000		UG/L	164	30	70-130	50-150
8015B -VOA	N-PROPANOL	WATER	1000		UG/L	279	30	70-130	50-150
8015B -VOA	SEC-BUTANOL	WATER	1000		UG/L	214	30	70-130	50-150
8015B -VOA	N-BUTANOL	WATER	1000		UG/L	172	30	70-130	50-150
8015B -VOA	N-PROPANOL -SURR/TARGET	WATER	NA		UG/L	NA	NA	65-143	65-143
8015B -VOA	MINERAL SPIRITS	WATER	100		UG/L	35	30	41-145	41-145
8015B -VOA	1,4-DIFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	59-122	59-122
8015B -VOA	MINERAL SPIRITS	SOIL	100		UG/KG		30	70-130	50-150
8015B -VOA	1,4-DIFLUOROBENZENE -SURR	SOIL	NA		UG/KG	NA	NA	85-115	85-115
8015B	GASOLINE RANGE ORGANICS	WATER	50		UG/L	10	30	70-130	50-150
8015B	CHLOROFLUOROBENZENE (FID) -SURR	WATER	NA		UG/L	NA	NA	65-136	65-136
8015B	GASOLINE RANGE ORGANICS	SOIL	50		UG/KG	7.7	50	70-130	50-150
8015B	CHLOROFLUOROBENZENE (FID) -SURR	SOIL	NA		UG/KG	NA	NA	44-131	44-131
8015B	DIESEL RANGE ORGANICS	WATER	100		UG/L	61	30	10-154	10-154
8015B	O-TERPHENYL -SURR	WATER	NA		UG/L	NA	NA	56-128	56-128
8015B	DIESEL RANGE ORGANICS	SOIL	40000		UG/KG	13000	50	51-114	51-114
8015B	O-TERPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	68-138	68-138



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8015B ETPH-CT	ETPH	WATER	75		UG/L	14	30	50-150	50-150
8015B ETPH-CT	FUEL OIL #2	WATER	100		UG/L	11	30	50-150	50-150
8015B ETPH-CT	FUEL OIL #4	WATER	100		UG/L	NA	30	50-150	50-150
8015B ETPH-CT	FUEL OIL #6	WATER	100		UG/L	NA	30	50-150	50-150
8015B ETPH-CT	KEROSENE	WATER	100		UG/L	NA	30	50-150	50-150
8015B ETPH-CT	MOTOR OIL	WATER	1000		UG/L	NA	30	50-150	50-150
8015B ETPH-CT	O-TERPHENYL-SURR	WATER	NA		UG/L	NA	NA	44-148	44-148
8015B ETPH-CT	ETPH	SOIL	2500		UG/KG		30	50-150	50-150
8015B ETPH-CT	FUEL OIL #2	SOIL	3300		UG/KG		30	50-150	50-150
8015B ETPH-CT	FUEL OIL #4	SOIL	3300		UG/KG		30	50-150	50-150
8015B ETPH-CT	FUEL OIL #6	SOIL	3300		UG/KG		30	50-150	50-150
8015B ETPH-CT	KEROSENE	SOIL	3300		UG/KG		30	50-150	50-150
8015B ETPH-CT	MOTOR OIL	SOIL	33000		UG/KG		30	50-150	50-150
8015B ETPH-CT	O-TERPHENYL-SURR	SOIL	NA		UG/KG	NA	NA	25-148	25-148
8015B FINGERPRINT	FUEL OIL #2	WATER	1000		UG/L	220	30	50-150	50-150
8015B FINGERPRINT	GASOLINE	WATER	1000		UG/L	190	30	50-150	50-150
8015B FINGERPRINT	KEROSENE	WATER	1000		UG/L	290	30	50-150	50-150
8015B FINGERPRINT	MINERAL SPIRITS	WATER	1000		UG/L		30	50-150	50-150
8015B FINGERPRINT	MOTOR OIL	WATER	10000		UG/L		30	50-150	50-150
8015B FINGERPRINT	FUEL OIL #2	SOIL	100		MG/KG	29	30	50-150	50-150
8015B FINGERPRINT	GASOLINE	SOIL	100		MG/KG	23	30	50-150	50-150
8015B FINGERPRINT	KEROSENE	SOIL	100		MG/KG	66	30	50-150	50-150
8015B FINGERPRINT	MINERAL SPIRITS	SOIL	100		MG/KG		30	50-150	50-150
8015B FINGERPRINT	MOTOR OIL	SOIL	1000		MG/KG		30	50-150	50-150
8015B RSK	ETHANE	WATER	1.0		UG/L	0.11	30	50-150	50-150
8015B RSK	ETHYLENE	WATER	1.0		UG/L	0.11	30	50-150	50-150
8015B RSK	METHANE	WATER	1.0		UG/L	0.18	30	50-150	50-150
8015B RSK	PROPANE	WATER	1.0		UG/L	0.34	30	50-150	50-150
NY 310-13	FUEL OIL #2	WATER	1000		UG/L	220	30	46-150	46-150
NY 310-13	FUEL OIL #4	WATER	1000		UG/L	410	30	50-150	50-150
NY 310-13	FUEL OIL #6	WATER	1000		UG/L	400	30	50-150	50-150
NY 310-13	GASOLINE	WATER	1000		UG/L	190	30	50-150	50-150
NY 310-13	KEROSENE	WATER	1000		UG/L	290	30	50-150	50-150
NY 310-13	LUBE OIL	WATER	1000		UG/L	250	30	50-150	50-150
NY 310-13	N-DODECANE	WATER	1000		UG/L	120	30	50-150	50-150
NY 310-13	FUEL OIL #2	SOIL	100		MG/KG	29	30	70-155	70-155
NY 310-13	FUEL OIL #4	SOIL	100		MG/KG	22	30	50-150	50-150
NY 310-13	FUEL OIL #6	SOIL	100		MG/KG	26	30	50-150	50-150
NY 310-13	GASOLINE	SOIL	100		MG/KG	23	30	50-150	50-150
NY 310-13	KEROSENE	SOIL	100		MG/KG	66	30	50-150	50-150
NY 310-13	LUBE OIL	SOIL	100		MG/KG	29	30	50-150	50-150
NY 310-13	N-DODECANE	SOIL	100		MG/KG	8.5	30	50-150	50-150



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8021	1, 1, 2, 2- TETRACHLOROETHANE	WATER	1.0		UG/L	0.25	30	70-130	70-130
8021	1, 1, 2- TRICHLOROETHANE	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	1, 1- DICHLOROETHANE	WATER	1.0		UG/L	0.21	30	70-130	70-130
8021	1, 1- DICHLOROETHENE	WATER	1.0		UG/L	0.27	30	70-130	70-130
8021	1, 2- DICHLOROBENZENE	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	1, 2- DICHLOROETHANE	WATER	1.0		UG/L	0.15	30	70-130	70-130
8021	1, 2- DICHLOROPROPANE	WATER	1.0		UG/L	0.16	30	70-130	70-130
8021	1, 3- DICHLOROBENZENE	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	1, 4- DICHLOROBENZENE	WATER	1.0		UG/L	0.16	30	70-130	70-130
8021	2- CHLOROETHYL VINYL ETHER	WATER	1.0		UG/L	0.14	30	50-150	50-150
8021	BENZENE	WATER	1.0		UG/L	0.31	30	70-130	70-130
8021	BROMODICHLOROMETHANE	WATER	1.0		UG/L	0.34	30	70-130	70-130
8021	BROMOFORM	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	BROMOMETHANE	WATER	2.0		UG/L	0.12	30	50-150	50-150
8021	CARBON TETRACHLORIDE	WATER	1.0		UG/L	0.42	30	70-130	70-130
8021	CHLOROBENZENE	WATER	1.0		UG/L	0.22	30	70-130	70-130
8021	CHLOROETHANE	WATER	1.0		UG/L	0.48	30	50-150	50-150
8021	CHLOROFORM	WATER	1.0		UG/L	0.30	30	70-130	70-130
8021	CHLOROMETHANE	WATER	1.0		UG/L	0.39	30	50-150	50-150
8021	CIS-1, 2- DICHLOROETHENE	WATER	1.0		UG/L	0.23	30	70-130	70-130
8021	CIS-1, 3- DICHLOROPROPENE	WATER	1.0		UG/L	0.21	30	70-130	70-130
8021	DIBROMOCHLOROMETHANE	WATER	1.0		UG/L	0.11	30	70-130	70-130
8021	DICHLORODIFLUOROMETHANE	WATER	1.0		UG/L	0.29	30	50-150	50-150
8021	ETHYLBENZENE	WATER	1.0		UG/L	0.23	30	70-130	70-130
8021	FREON 113	WATER	1.0		UG/L	0.38	30	70-130	70-130
8021	M+P- XYLENE	WATER	2.0		UG/L	0.36	30	70-130	70-130
8021	METHYLENE CHLORIDE	WATER	1.0		UG/L	0.24	30	70-130	70-130
8021	O- XYLENE	WATER	1.0		UG/L	0.17	30	70-130	70-130
8021	TETRACHLOROETHENE	WATER	1.0		UG/L	0.30	30	70-130	70-130
8021	TOLUENE	WATER	1.0		UG/L	0.18	30	70-130	70-130
8021	TRANS-1, 2- DICHLOROETHENE	WATER	1.0		UG/L	0.26	30	70-130	70-130
8021	TRANS-1, 3- DICHLOROPROPENE	WATER	1.0		UG/L	0.19	30	70-130	70-130
8021	TRICHLOROETHENE	WATER	1.0		UG/L	0.15	30	70-130	70-130
8021	TRICHLOROFLUOROMETHANE	WATER	1.0		UG/L	0.42	30	50-150	50-150
8021	VINYL CHLORIDE	WATER	1.0		UG/L	0.41	30	50-150	50-150
8021	1, 2, 3 TRICHLOROPROPANE -SURR	WATER	NA		UG/L	NA	NA	61-117	61-117
8021	BROMOCHLOROMETHANE -SURR	WATER	NA		UG/L	NA	NA	70-114	70-114
8021	CHLOROFLUOROBENZENE -SURR	WATER	NA		UG/L	NA	NA	72-116	72-116
8021	CHLOROFLUOROBENZENE (PID) -SURR	WATER	NA		UG/L	NA	NA	77-113	77-113



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8021	1,1,1-TRICHLOROETHANE	SOIL	1.0		UG/KG	0.33	30	70-130	70-130
8021	1,1,2,2-TETRACHLOROETHANE	SOIL	1.0		UG/KG	0.10	30	70-130	70-130
8021	1,1,2-TRICHLOROETHANE	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021	1,1-DICHLOROETHANE	SOIL	1.0		UG/KG	0.27	30	70-130	70-130
8021	1,1-DICHLOROETHENE	SOIL	1.0		UG/KG	0.29	30	70-130	70-130
8021	1,2-DICHLOROBENZENE	SOIL	1.0		UG/KG	0.22	30	70-130	70-130
8021	1,2-DICHLOROETHANE	SOIL	1.0		UG/KG	0.29	30	70-130	70-130
8021	1,2-DICHLOROPROPANE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021	1,3-DICHLOROBENZENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021	1,4-DICHLOROBENZENE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021	2-CHLOROETHYLVINYL ETHER	SOIL	1.0		UG/KG	0.12	30	50-150	50-150
8021	BENZENE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021	BROMODICHLOROMETHANE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021	BROMOFORM	SOIL	1.0		UG/KG	0.12	30	70-130	70-130
8021	BROMOMETHANE	SOIL	2.0		UG/KG	0.26	30	50-150	50-150
8021	CARBON TETRACHLORIDE	SOIL	1.0		UG/KG	0.34	30	70-130	70-130
8021	CHLOROBENZENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021	CHLOROETHANE	SOIL	1.0		UG/KG	0.29	30	50-150	50-150
8021	CHLOROFORM	SOIL	1.0		UG/KG	0.26	30	70-130	70-130
8021	CHLOROMETHANE	SOIL	1.0		UG/KG	0.64	30	50-150	50-150
8021	CIS-1,2-DICHLOROETHENE	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021	CIS-1,3-DICHLOROPROPENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021	DIBROMOCHLOROMETHANE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021	ETHYLBENZENE	SOIL	1.0		UG/KG	0.21	30	70-130	70-130
8021	FREON 113	SOIL	1.0		UG/KG	0.28	30	70-130	70-130
8021	M+P-XYLENE	SOIL	2.0		UG/KG	0.39	30	70-130	70-130
8021	METHYLENE CHLORIDE	SOIL	1.0		UG/KG	0.63	30	70-130	70-130
8021	O-XYLENE	SOIL	1.0		UG/KG	0.19	30	70-130	70-130
8021	TETRACHLOROETHENE	SOIL	1.0		UG/KG	0.27	30	70-130	70-130
8021	TOLUENE	SOIL	1.0		UG/KG	0.17	30	70-130	70-130
8021	TRANS-1,2-DICHLOROETHENE	SOIL	1.0		UG/KG	0.27	30	70-130	70-130
8021	TRANS-1,3-DICHLOROPROPENE	SOIL	1.0		UG/KG	0.21	30	70-130	70-130
8021	TRICHLOROETHENE	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021	TRICHLOROFLUOROMETHANE	SOIL	1.0		UG/KG	0.26	30	50-150	50-150
8021	VINYL CHLORIDE	SOIL	1.0		UG/KG	0.80	30	50-150	50-150
8021	1,2,3-TRICHLOROPROPANE -SURR	SOIL	NA		UG/KG	NA	NA	57-141	57-141
8021	CHLOROFLUOROBENZENE -SURR	SOIL	NA		UG/KG	NA	NA	41-146	41-146
8021	CHLOROFLUOROBENZENE (PID) -SURR	SOIL	NA		UG/KG	NA	NA	20-155	20-155
8021	BROMOCHLOROMETHANE -SURR	SOIL	NA		UG/KG	NA	NA	64-130	64-130



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8021 STARS	1,2,4-TRIMETHYLBENZENE	WATER	1.0		UG/L	0.27	30	70-130	70-130
8021 STARS	1,3,5-TRIMETHYLBENZENE	WATER	1.0		UG/L	0.24	30	70-130	70-130
8021 STARS	BENZENE	WATER	0.7		UG/L	0.18	30	70-130	70-130
8021 STARS	ETHYLBENZENE	WATER	1.0		UG/L	0.21	30	70-130	70-130
8021 STARS	ISOPROPYLBENZENE	WATER	1.0		UG/L	0.18	30	70-130	70-130
8021 STARS	M+P-XYLENE	WATER	2.0		UG/L	0.41	30	70-130	70-130
8021 STARS	METHYL-TERT-BUTYLETHER	WATER	1.0		UG/L	0.29	30	70-130	70-130
8021 STARS	NAPHTHALENE	WATER	1.0		UG/L	0.73	30	70-130	70-130
8021 STARS	N-BUTYLBENZENE	WATER	1.0		UG/L	0.24	30	70-130	70-130
8021 STARS	N-PROPYLBENZENE	WATER	1.0		UG/L	0.21	30	70-130	70-130
8021 STARS	O-XYLENE	WATER	1.0		UG/L	0.28	30	70-130	70-130
8021 STARS	P-ISOPROPYLTOLUENE	WATER	1.0		UG/L	0.25	30	70-130	70-130
8021 STARS	SEC-BUTYLBENZENE	WATER	1.0		UG/L	0.20	30	70-130	70-130
8021 STARS	TERT-BUTYLBENZENE	WATER	1.0		UG/L	0.19	30	70-130	70-130
8021 STARS	TOLUENE	WATER	1.0		UG/L	0.20	30	70-130	70-130
8021 STARS	CHLOROFLUOROBENZENE (PID) -SURR	WATER	NA		UG/L	NA	NA	77-113	77-113
8021 STARS	1,2,4-TRIMETHYLBENZENE	SOIL	1.0		UG/KG	0.29	30	70-130	70-130
8021 STARS	1,3,5-TRIMETHYLBENZENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021 STARS	BENZENE	SOIL	1.0		UG/KG	0.19	30	70-130	70-130
8021 STARS	ETHYLBENZENE	SOIL	1.0		UG/KG	0.19	30	70-130	70-130
8021 STARS	ISOPROPYLBENZENE	SOIL	1.0		UG/KG	0.21	30	70-130	70-130
8021 STARS	M+P-XYLENE	SOIL	2.0		UG/KG	0.44	30	70-130	70-130
8021 STARS	METHYL-TERT-BUTYLETHER	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021 STARS	NAPHTHALENE	SOIL	1.0		UG/KG	0.27	30	70-130	70-130
8021 STARS	N-BUTYLBENZENE	SOIL	1.0		UG/KG	0.25	30	70-130	70-130
8021 STARS	N-PROPYLBENZENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021 STARS	O-XYLENE	SOIL	1.0		UG/KG	0.19	30	70-130	70-130
8021 STARS	P-ISOPROPYLTOLUENE	SOIL	1.0		UG/KG	0.23	30	70-130	70-130
8021 STARS	SEC-BUTYLBENZENE	SOIL	1.0		UG/KG	0.20	30	70-130	70-130
8021 STARS	TERT-BUTYLBENZENE	SOIL	1.0		UG/KG	0.24	30	70-130	70-130
8021 STARS	TOLUENE	SOIL	1.0		UG/KG	0.17	30	70-130	70-130
8021 STARS	CHLOROFLUOROBENZENE (PID) -SURR	SOIL	NA		UG/KG	NA	NA	20-155	20-155



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)	
8081A TCL	4,4'-DDD	WATER	0.10		UG/L	0.0051	30	63-107	63-107	
8081A TCL	4,4'-DDE	WATER	0.10		UG/L	0.0032	30	30-127	30-127	
8081A TCL	4,4'-DDT	WATER	0.10		UG/L	0.0079	30	39-154	39-154	
8081A TCL	ALDRIN	WATER	0.05		UG/L	0.0034	30	24-122	24-122	
8081A TCL	ALPHA-BHC	WATER	0.05		UG/L	0.0023	30	70-130	50-150	
8081A TCL	ALPHA-CHLORDANE	WATER	0.05		UG/L	0.0022	30	36-127	36-127	
8081A TCL	ALPHA-ENDOSULFAN	WATER	0.05		UG/L	0.0019	30	39-125	39-125	
8081A TCL	BETA-BHC	WATER	0.05		UG/L	0.0046	30	63-107	63-107	
8081A TCL	BETA-ENDOSULFAN	WATER	0.10		UG/L	0.0049	30	64-107	64-107	
8081A TCL	DELTA-BHC	WATER	0.05		UG/L	0.0026	30	49-116	49-116	
8081A TCL	DIELDRIN	WATER	0.10		UG/L	0.0051	30	37-151	37-151	
8081A TCL	ENDOSULFAN SULFATE	WATER	0.10		UG/L	0.0022	30	17-134	17-134	
8081A TCL	ENDRIN	WATER	0.10		UG/L	0.0052	30	39-146	39-146	
8081A TCL	ENDRIN ALDEHYDE	WATER	0.10		UG/L	0.0033	30	10-115	10-115	
8081A TCL	ENDRIN KETONE	WATER	0.10		UG/L	0.0021	30	70-110	70-130	
8081A TCL	GAMMA-BHC (LINDANE)	WATER	0.05		UG/L	0.0018	30	44-131	44-131	
8081A TCL	GAMMA-CHLORDANE	WATER	0.05		UG/L	0.0039	30	48-122	48-122	
8081A TCL	HEPTACHLOR	WATER	0.05		UG/L	0.0037	30	37-123	37-123	
8081A TCL	HEPTACHLOR EPOXIDE	WATER	0.05		UG/L	0.0049	30	74-104	70-130	
8081A TCL	METHOXYCHLOR	WATER	0.50		UG/L	0.0046	30	62-130	62-130	
8081A TCL	TOXAPHENE	WATER	1.00		UG/L	0.20	30	46-84	46-84	
8081A TCL	DECACHLOROBIPHENYL (DCB) -SURR	WATER	NA		UG/L	NA	NA	11-131	11-131	
8081A TCL	TETRACHLORO-META-XYLENE (TCMX) -SU	WATER	NA		UG/L	NA	NA	13-125	13-125	
8081A	ADDITIONAL COMPOUNDS BY REQUEST									
8081A	CHLORDANE, TECHNICAL	WATER	0.25		UG/L	0.045	30	50-150	50-150	
8081A	FAMPHUR	WATER	1.0		UG/L	0.240	30	50-150	50-150	
8081A	HEXACHLOROBENZENE	WATER	0.05		UG/L	0.008	30	70-130	50-150	
8081A	KEPONE	WATER	5.0		UG/L	3.5	30	50-150	50-150	



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATREX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8081A TCL	4,4'-DDD	SOIL	3.3		UG/KG	0.19	30	65-106	65-106
8081A TCL	4,4'-DDE	SOIL	3.3		UG/KG	0.078	30	33-124	33-124
8081A TCL	4,4'-DDT	SOIL	3.3		UG/KG	0.17	30	45-159	45-159
8081A TCL	ALDRIN	SOIL	1.7		UG/KG	0.070	30	53-115	53-115
8081A TCL	ALPHA-BHC	SOIL	1.7		UG/KG	0.31	30	38-108	38-108
8081A TCL	ALPHA-CHLORDANE	SOIL	1.7		UG/KG	0.15	30	27-130	27-130
8081A TCL	ALPHA-ENDOSULFAN	SOIL	1.7		UG/KG	0.10	30	34-127	34-127
8081A TCL	BETA-BHC	SOIL	1.7		UG/KG	0.25	30	61-106	61-106
8081A TCL	BETA-ENDOSULFAN	SOIL	3.3		UG/KG	0.091	30	66-105	66-105
8081A TCL	DELTA-BHC	SOIL	1.7		UG/KG	0.089	30	44-119	44-119
8081A TCL	DIELDRIN	SOIL	3.3		UG/KG	0.26	30	26-174	26-174
8081A TCL	ENDOSULFAN SULFATE	SOIL	3.3		UG/KG	0.09	30	37-122	10-138
8081A TCL	ENDRIN	SOIL	3.3		UG/KG	0.11	30	45-143	45-143
8081A TCL	ENDRIN ALDEHYDE	SOIL	3.3		UG/KG	0.83	30	10-110	10-110
8081A TCL	ENDRIN KETONE	SOIL	3.3		UG/KG	0.12	30	70-130	50-150
8081A TCL	GAMMA-BHC (LINDANE)	SOIL	1.7		UG/KG	0.12	30	47-133	47-133
8081A TCL	GAMMA-CHLORDANE	SOIL	1.7		UG/KG	0.12	30	38-127	38-127
8081A TCL	HEPTACHLOR	SOIL	1.7		UG/KG	0.088	30	50-120	50-120
8081A TCL	HEPTACHLOR EPOXIDE	SOIL	1.7		UG/KG	0.11	30	77-106	77-106
8081A TCL	METHOXYCHLOR	SOIL	17		UG/KG	0.26	30	73-125	73-125
8081A TCL	TOXAPHENE	SOIL	33		UG/KG	9.7	30	46-130	46-130
8081A TCL	DECACHLOROBIPHENYL (DCB) -SURR	SOIL	NA		UG/KG	NA	NA	18-176	18-176
8081A TCL	TETRACHLORO-META-XYLENE (TCMX) -SU	SOIL	NA		UG/KG	NA	NA	24-136	24-136
8081A ADDITIONAL COMPOUNDS BY REQUEST									
8081A	CHLORDANE, TECHNICAL	SOIL	8.3		UG/KG	1.9	30	50-150	50-150
8081A	FAMPHUR	SOIL	33		UG/KG	6.8	30	50-150	50-150
8081A	HEXACHLOROBENZENE	SOIL	1.67		UG/KG	0.48	30	70-130	50-150
8081A	KEPONE	SOIL	167		UG/KG	57	30	50-150	50-150
8081A	MIREX	SOIL	1.67		UG/KG	0.27	30	70-130	31-134



ROCHESTER ORGANIC QC LIMITS

METHOD	ANALYTE	MATRIX	MRL	DOD LOQ**	UNITS	MDL/ LOD	DUP (RPD)	LCS (% REC)	MS (% REC)
8082	PCB 1016	WATER	1.0	2.0	UG/L	0.39	30	53-118	53-118
8082	PCB 1221	WATER	2.0	3.0	UG/L	0.96	30	70-130	50-150
8082	PCB 1232	WATER	1.0	2.0	UG/L	0.58	30	70-130	50-150
8082	PCB 1242	WATER	1.0	2.0	UG/L	0.59	30	70-130	50-150
8082	PCB 1248	WATER	1.0	2.0	UG/L	0.41	30	56-119	56-119
8082	PCB 1254	WATER	1.0	2.0	UG/L	0.46	30	60-143	60-143
8082	PCB 1260	WATER	1.0	2.0	UG/L	0.44	30	57-129	42-132
8082	PCB 1268	WATER	1.0	2.0	UG/L	0.32	30	70-130	50-150
8082	DECACHLOROBIPHENYL -SURR	WATER	NA		UG/L	NA	NA	10-129	10-129
8082	TETRACHLORO-META-XYLENE -SURR	WATER	NA		UG/L	NA	NA	34-113	34-113
8082	PCB 1016	SOIL	33	67	UG/KG	9.1	30	34-130	33-132
8082	PCB 1221	SOIL	67	133	UG/KG	28	30	70-130	50-150
8082	PCB 1232	SOIL	33	67	UG/KG	11	30	70-130	50-150
8082	PCB 1242	SOIL	33	67	UG/KG	18	30	70-130	50-150
8082	PCB 1248	SOIL	33	67	UG/KG	19	30	49-140	49-140
8082	PCB 1254	SOIL	33	67	UG/KG	9.8	30	32-159	32-159
8082	PCB 1260	SOIL	33	67	UG/KG	8.6	30	57-141	24-178
8082	PCB 1268	SOIL	33	67	UG/KG	14	30	70-130	50-150
8082	DECACHLOROBIPHENYL -SURR	SOIL	NA		UG/KG	NA	NA	29-153	29-153
8082	TETRACHLORO-META-XYLENE -SURR	SOIL	NA		UG/KG	NA	NA	27-134	27-134
8082	PCB 1016	WIPES	33		UG/WIPE	9.1	30	70-130	50-150
8082	PCB 1221	WIPES	67		UG/WIPE	28	30	70-130	50-150
8082	PCB 1232	WIPES	33		UG/WIPE	11	30	70-130	50-150
8082	PCB 1242	WIPES	33		UG/WIPE	18	30	70-130	50-150
8082	PCB 1248	WIPES	33		UG/WIPE	19	30	70-130	50-150
8082	PCB 1254	WIPES	33		UG/WIPE	9.8	30	70-130	50-150
8082	PCB 1260	WIPES	33		UG/WIPE	8.6	30	70-130	50-150
8082	DECACHLOROBIPHENYL -SURR	WIPES	NA		UG/WIPE	NA	30	75-150	75-150
8082	TETRACHLORO-META-XYLENE -SURR	WIPES	NA		UG/WIPE	NA	30	73-139	73-139
8151A	2,4-D	WATER	0.5	1.0	UG/L	0.19	30	23-141	23-141
8151A	DICAMBA	WATER	0.5	1.0	UG/L	0.18	30	11-116	11-116
8151A	DINOSEB	WATER	0.5	1.0	UG/L	0.14	30	17-103	17-103
8151A	2,4,5-T	WATER	0.5	1.0	UG/L	0.24	30	18-140	18-140
8151A	2,4,5-TP (SILVEX)	WATER	0.5	1.0	UG/L	0.15	30	18-127	18-127
8151A	PENTACHLOROPHENOL	WATER	1.0		UG/L	0.14	30	40-115	40-115
8151A	DCAA -SURR	WATER	NA		UG/L	NA	NA	24-127	21-132
8151A	2,4-D	SOIL	100		UG/KG	26	30	45-134	45-134
8151A	DICAMBA	SOIL	100		UG/KG	20	30	50-150	50-150
8151A	2,4,5-T	SOIL	100		UG/KG	22	30	55-119	55-119
8151A	2,4,5-TP (SILVEX)	SOIL	100		UG/KG	22	30	45-112	45-112
8151A	PENTACHLOROPHENOL	SOIL	200		UG/KG	15	30	50-150	50-150
8151A	DCAA -SURR	SOIL	NA		UG/KG	NA	NA	20-150	20-150
METACIDS -HPLC	ACETIC ACID	WATER	1.0		MG/L	0.31	30	50-150	50-150
METACIDS -HPLC	BUTYRIC ACID	WATER	1.0		MG/L	0.18	30	50-150	50-150
METACIDS -HPLC	LACTIC ACID	WATER	1.0		MG/L	0.018	30	50-150	50-150
METACIDS -HPLC	PROPIONIC ACID	WATER	1.0		MG/L	0.17	30	50-150	50-150
METACIDS -HPLC	PYRUVIC ACID	WATER	0.1		MG/L	0.15	30	50-150	50-150