Englobe
Soils Materials Environment

# Public Services and Procurement Canada

## CAM-C Site Remediation
## Matheson Point, Nunavut
**(Ref.: EW699-172531)**

# Quality Assurance/Quality Control Plan

Date: February 2018
O/Ref. N°: P0012811

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# Quality Assurance/Quality Control Plan

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**Submitted to:**

**Caitlin Moore, P.Eng.**
Project Manager,
Public Services and Procurement Canada

**Submitted by:**

**Guillaume Robert**
Project Manager
Environmental Engineering - Northern Canada

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| REVISION AND PUBLICATION REGISTER | | |
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# 1 INTRODUCTION

In accordance with the water license issued by the Nunavut Water Board to Indigenous and Northern Affairs Canada (INAC) for the CAM-C cleanup project, the purpose of this document is to provide a Quality Assurance/Quality Control Plan for Englobe's remediation activities which are comprised of on-site remediation or off-site removal of contaminants. Water and soil sampling will be conducted throughout the remediation work to ensure the following waste water complies with discharge criteria and requirements set forth in the water license issued for this site:

- Sewage effluent
- Aqueous barrel contents
- Rinse water from tank and barrel cleaning operations
- Water ponded in contaminated soil excavations and bermed contaminated soil.
- Soil samples collected from the landfarm

This QA/QC program will be in effect for the duration of site remediation activities which are expected to last between mid-May and end of September 2018.

All sampling performed by Englobe Corp will be submitted for analyses to Maxxam Analytics in Edmonton, Alberta.

# 2 SAMPLE COLLECTION

## 2.1 DRINKING WATER

Potable water will be tested at a minimum frequency of every four weeks to verify that it is meeting the Canadian Drinking Water Quality (CDWQ) criteria. Samples will be collected at the water supply source and at the distribution source. Two consecutive sample results that meet the specified criteria will be required before camp drinking water can be considered potable. Sampling protocol will be as follows:

- Wear non-powdered latex gloves for all water sampling operations and wear clothing without long sleeves to prevent contaminating the sample.
- Label bottles with sample ID using a felt tipped marker and apply plastic tape over label to prevent smearing.
- Remove aerator from tap prior to sampling and run tap on cold water for thirty seconds.

- Fill sample bottle just below top to prevent preservative from spilling from the bottle.
- Cap sample immediately after being taken. Take note of location, time and corresponding ID number.
- Take field duplicates for 10% of the samples.
- Update sample tracking datasheet and chain-of-custody.
- Prepare samples for shipment.

Drinking water will be analyzed for potability and biological parameters. The results of potable water will be recorded and provided to the Public Services and Procurement Canada (PSPC) Departmental Representative within one day of receiving the results as per the project specifications.

Bottled water will be used if samples exceed the CDWQ criteria.

## 2.2 SEWAGE EFFLUENT AND CONTACT WATER

Prior to discharge, water samples will be collected from the sewage lagoons, wastewater handling facility and excavations. These samples will be analyzed in the laboratory to ensure they meet the discharge criteria in the project-specific Water Licence. If analytical results do not meet the discharge criteria in the case of waste processing or ponded water in excavations, then the water will be stored in water-tight containers and shipped off-site and disposed at an approved facility.

These samples will be taken as grab samples. The sampler will wear nitrile gloves and other appropriate personal protective equipment and will collect the sample by either dipping the sample bottle directly into the water or by using a swing sampler. When using a swing sampler to collect bacteriological samples, another bottle will be needed to collect the sample from which the sample will be poured in the appropriate bottle. This is done to prevent the spillage of preservatives contained within sample bottle. The bottle used to collect the sample will be rinsed three times prior to filling the sample bottle.

Duplicates will be taken for 10% of the samples. Regular trip blanks will also be used for all water samples.

## 2.3 HYDROCARBON-CONTAMINATED SOILS

Englobe will treat Type B petroleum hydrocarbon (PHC) impacted soil by landfarming at the on-site Soil Treatment Facility following removal of the impacted soil from the source area.

Landfarming is an ex-situ method of treating PHC impacted soil through a combined means of bio-stimulation and natural attenuation processes to degrade the PHCs. The bio-stimulation stimulates the naturally occurring hydrocarbon reducing microorganisms in the soil. Turning with aeration of the soil promotes mixing and aeration of the soil and exposes the contaminants to environmental conditions which aid in natural attenuation.

During the landfarm setup, the excavated soil is uniformly spread in a bed with a maximum thickness of 400 mm, then granular nutrients are applied to the soil. At CAM-C, Englobe will use the following treatment approach: a slow-release fertilizer with a sulfur-coated urea formula with a minimum nitrogen content of 20% by weight to be used. The application of the nutrients increases the nitrogen and phosphorus concentration in the impacted soil to achieve an effective carbon:nitrogen:phosphorus ratio of 100:10:1 for bio-stimulation of the microorganisms. During the treatment, the impacted soil is turning with aeration every five days to mix and aerate the soil, which further promotes stimulation of the microorganisms. The microorganisms drive the breakdown of PHCs, decomposing the PHCs into inert compounds such as carbon dioxide and water.

A Type B PHC Contaminated Soil is the summation of PHC fractions F1 to F4 found to exceed the guideline values as outlined in the INAC 2009 Abandoned Military Site Remediation Protocol (AMSRP).

Treated Soil is defined as a previously classified Type B PHC Contaminated Soil that has been treated, sampled, analyzed and determined to contain concentrations of PHCs lower than the applicable criteria as defined in the INAC 2009 AMSRP, and provided below:

| PHC Fraction | Soil Treatment Criteria (mg/kg) |
|---|---|
| F1 (C6 to C10) + F2 (>C10 to C16) + F3 (>C16 to C34) | 2,500 |

Contaminated soil is designated as treated soil if the laboratory analytical result of a composite sample obtained from five discrete soil samples representative of 100 m3 has a concentration below the applicable remediation criteria.

Samples will be collected to monitor effectiveness of the landfarm treatment process. All soil sampling instruments are will be cleaned between collection of each sample and samples will be placed in new unused sample jars.

### 2.3.1 Sampling Methodology

Prior to the construction of the landfarm facilities, baseline soil samples will be collected from the treatment pad. Since the treatment area at CAM-C will be 2,100 m², a 6 m x 6 m grid size will be used, divided into 58 plots. The total Type B concentrations will be determined by the summation of fractions F1 to F4.

For treatment progress monitoring, a grid system will also be used to split the landfarm into sections containing 100 m3 of soil based on the average thickness of the lift.

**F1 (BTEX)**: Five sub-samples will be taken at random from within each plot. Using a coring device, a core (app.5 g.) is obtained and extruded into a pre-weighed vial containing 10 mL of methanol. This would be done for each of the 5 subsamples and a composite sample would be made by the lab by taking aliquots of the methanol extract.

**F2-F4**: Using a trowel, one composite sample composed of five sub-samples will be taken. The sub-samples will be taken at random from within these sections to form one sample per section. Based on this protocol nine composite samples will be taken from the facility.

The subsequent sampling events will be performed after 4, 7 and 10 weeks of treatment in order to monitor the effectiveness of the contaminated soil treatment process. The sampling intervals may be changed based on local weather. When choosing sample locations for analysis, consideration will be given to areas of previously high concentrations. The remediation objective will be attained once all sample results or the mean of a duplicate sample meet the cleanup objective of below 2,500 mg/kg.

After the soil is successfully remediated, sampling will be performed to determine if the underlying sand and Type 2 layer have been contaminated as a result of the remediation activities. The sampling will follow the same protocol as described above for baseline sampling and the samples will be taken in the same relative location as determined by GPS (each sample will be marked with a GPS during the baseline sampling). Test pits will be dug with an excavator to sample soil at the appropriate depth.

Sampling protocols for the CAM-C Project will be in accordance with Canadian Council of Ministers of the Environment (CCME) procedures, INAC Abandoned Military Site Remediation Protocol, 2008, applicable regulations and industry best standards.

## 2.4 SAMPLING EQUIPMENT

Equipment required for sample collection and transport includes the following:

| | |
|---|---|
| Nitrile gloves | Field notebook |
| New sample jars | Sample jar labels |
| Sample preservatives | Packing tape to protect labels |
| Deionized water | Waterproof markers (Sharpies) |
| Ice packs | Project documentation/field data |
| Chain of custody forms | Coolers |
| GPS | Bubble wrap for packing |
| Trowel | Pre-filled (10 ml) methanol vials |

# 3 LABORATORY ANALYSES

For the analytical needs of the CAM-C Project, Englobe will be using Maxxam Laboratories located in Edmonton. The Edmonton laboratory was chosen because of the presence of Maxxam in Yellowknife and availability of daily flights from Yellowknife to Edmonton, thus ensuring acceptable turnaround times. Please refer to Appendix A for the proposed laboratory's current certification.

The following table details analyses required for this project including the corresponding sample hold times and required sample containers.

| Parameter | Required containers | Preservatives | Hold time |
|---|---|---|---|
| **WATER** | | | |
| pH | 500 mlP | none | 7 days |
| Oil and Grease | 2 x 1L amber glass | HCl (pH <2) | 28 days |
| Arsenic (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Cadmium (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Chromium (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Cobalt (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Copper (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Lead (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Mercury (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Nickel (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Zinc (total) | 125 ml Plastic jar | HNO3 | 28 days |
| Benzene | 2 x 44 ml clear glass | NaHSO4 | 14 days |
| Toluene | 2 x 44 ml clear glass | NaHSO4 | 14 days |
| Ethylbenzene | 2 x 44 ml clear glass | NaHSO4 | 14 days |
| Microbiological: Total E. Coli & coliforms, fecal coliforms | 250 ml plastic jar | Sodium thiosulfate | 24 hours |
| **SOIL** | | | |
| CCME (F1-BTEX) | 125 ml glass jar | Na2S2O3 | 14 days |
| CCME (F2-F4) | 125 ml glass jar | none | 14 days |

## 4 SAMPLE HANDLING AND NOMENCLATURE

All samples sent to the analytical laboratory will be stored in coolers with ice packs to ensure that they stay within acceptable temperature ranges for the required analyses.

Samples will be labelled with a unique sample number which provides no information that can identify the location where the sample was collected on site. These numbers will be recorded in a tracking sheet and will be cross-referenced with Englobe's sample location. Sample locations are GPS referenced.

## 5 PACKAGING AND TRANSPORTATION METHODS

Sampling events will take place the same day as the weekly shuttle to Yellowknife to keep sample spoilage to a minimum. Samples for microbiology will be taken just before the weekly flight arrives on site to ensure that the lab will receives the samples within the same day. Samples will be transported in hard coolers equipped with freezer packs (to keep the temperature at or below 4°C), sealed with duct tape and marked "fragile" and "keep cool." Each sample sent for

chemical analyses will have holding times that they cannot exceed and will thus be expedited in a timely manner. Upon reaching Yellowknife the samples will be transferred for shipment to Edmonton by Maxxam staff at the airport. Then, the samples will be picked up at the Edmonton International Airport by Maxxam Laboratory staff for analyses.

A Chain-of-Custody form will be filled out and sent with the samples indicating the sample names, sampling date, the desired analysis, and all relevant contact information such as: The name of the Project Manager and the sampler, laboratory contact information, and signatures to ensure the samples were received.

# 6 DOCUMENTATION

Minimum documentation required for sample handling includes the following:

- Sampling date
- Sampling time
- Sample Identification number
- Sampler's name
- Sampling site
- Sampling conditions
- Sample type
- Sampling equipment
- Storage and preservation methods
- Time of storage and preservation
- Chain-of-custody form

# 7 REPORTING REQUIREMENTS

Englobe is required to report the following information to the Licensee (INAC) for Water License reporting purposes:

## 7.1 WATER USE

Water use is recorded daily using a flow meter and is recorded in a water use log. Water use volumes are reported weekly to the INAC representative on site.

## 7.2 WATER DISCHARGE

The sampling stations and discharge point shall be identified, surveyed and recorded in a tracking sheet. The GPS coordinates are reported weekly to the INAC representative on site.

## 7.3 BURN PERMIT INFORMATION

Volumes of unpainted wood that are burned on site are recorded along with the date of the burn event in a tracking sheet and submitted weekly to the INAC representative on site.

# 8 INTERPRETATION AND ANALYSIS OF RESULTS

Duplicate samples, trip samples, and field blanks will be required for each parameter. Definitions, frequency, purpose and interpretation of these are provided in Maxxam's QA/QC Interpretation Guide in Appendix B.

Laboratory detection limits are predetermined by the laboratory and will be below the recommended criteria limits. Analytical methodology will be provided as part of the analytical results. Laboratory QA/QC procedures are reviewed once results are received.

Furthermore, 10% of samples analyzed are field duplicates. A duplicate sample is a second portion of the original sample that is tested by using the same analytical procedures. Quality control is performed by calculating the Relative Percent Difference (RPD) between the duplicate and its original sample. RPD is calculated using the following equation:

$$\%RPD = \frac{(\text{result 1} - \text{result 2}) * 100}{(\text{result 1} + \text{result2}) / 2}$$

The RPD results are then compared to acceptable limit values which are 30% for this project. Should the acceptable limit values exceed 30%, then potential issues are investigated and rectified such as sampling and analysis techniques or sample transport conditions, among others.

# Appendix A Maxxam Certification

# CERTIFICATE OF ACCREDITATION

Standards Council of Canada
Conseil canadien des normes

# CERTIFICAT D'ACCRÉDITATION

## Maxxam Analytics International Corporation
## Edmonton Laboratory
## Petroleum Technology Center, 6744 - 50 Street NW and 9331 48th Street NW, Edmonton, Alberta, T6B 3M9, Canada

having been assessed by the Standards Council of Canada (SCC) and found to conform with the requirements of ISO/IEC 17025:2005 and the conditions for accreditation established by SCC is hereby recognized as an

**ACCREDITED TESTING LABORATORY**

for the specific tests or types or tests listed in the scope of accreditation approved by SCC and found on the SCC website at www.scc.ca.

ayant fait l'objet d'une évaluation réalisée par le Conseil canadien des normes (CCN), et été jugé conforme aux exigences énoncées dans ISO/CEI 17025:2005 et aux conditions liées à l'accréditation établies par le CCN, est de ce fait reconnu comme étant un

**LABORATOIRE D'ESSAIS ACCRÉDITÉ**

pour les essais ou types d'essais énumérés dans la portée d'accréditation approuvée par le CCN et figurant dans le site web du CCN au www.ccn.ca.

Accredited laboratory number: / Numéro de laboratoire accrédité : 160

Accreditation date: / Date d'accréditation : 1995-03-06

Issued on: / Délivré le : 2016-03-23

Expiry date: / Date d'expiration : 2019-03-06

*This certificate is valid until the date of expiration unless suspended, withdrawn or superseded by SCC. / Le présent certificat est valide jusqu'à la date d'expiration, à moins qu'il ne soit suspendu, retiré ou remplacé par le CCN.*

Vice-President – Accreditation Services / Vice-présidente – Services d'accréditation

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. The accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF communiqué dated January 2009).

Ce laboratoire est accrédité conformément a la Norme internationale reconnue ISO/IEC 17025:2005. Cette accréditation démontre la compétence technique d'un organisme pour une portée définie et l'exploitation d'un système de management de la qualité de laboratoire (cf. communiqué conjoint ISO-ILAC-IAF date de janvier 2009)



Canada

# Appendix B Maxxam QA/QC Interpretation Guide

# CCME QA/QC INTERPRETATION GUIDE - ENVIRONMENTAL SERVICES

Maxxam
A Bureau Veritas Group Company

| QA/QC Sample Type | Frequency and Purpose | Application and Regulatory Criteria | Recommended Actions |
|---|---|---|---|
| **LABORATORY** | | | |
| **Method Blank**<br><br>A laboratory control sample that is free of the target parameters and of any substance that may interfere with that analysis. A method blank is processed through the entire analytical method including any extraction, digestion or any other preparation procedure. | 1 in 20 samples or 1 in batch (whichever is most frequent).<br><br>Monitors laboratory background levels of target analytes and laboratory artifacts | Used for most analytical parameters.<br>Target analytes should be less than (<) the reporting detection limit (RDL) | The laboratory will repeat the analysis for all samples in the batch, if unacceptable concentrations of target analytes are identified in the method blank. If re-runs are not available, the data is reported flagged. |
| **Blank Spike (Laboratory Control Sample):**<br><br>A laboratory control sample free of the target analytes or interferences is fortified with a known concentration of all or selected target analytes. The blank spike is processed through the entire analytical method including any extraction, digestion or any other preparation procedure. Results are expressed as a percentage recovery. | 1 in 20 samples or 1 in batch (whichever is most frequent).<br><br>Monitors analyte recovery and potential loss during the preparation procedures (extraction efficiency). It also serves to validate the calibration of the instrumentation or technique. | Used for most parameters.<br>EC, Salinity: 90% - 110% water; 80% - 120% soil<br>Metals and Inorganics: 80% - 120%; HWS B 70% - 130%<br>FOC, Methyl Mercury: 70% - 130% (all matrices)<br>VOCs, THMs, BTEX except gases and ketones: 60% - 130% (water and soil)<br>PHCs: 60% - 140% (water and soil)<br>ABNs, CPs, PFOS, PAHs, OC Pest., Herb., PCBs, Volatile Gases & Ketones: 50% - 140% (water and soil); 30% - 130% for difficult compounds<br>Dioxins & Furans: 70% - 140% (water and soil)<br>1,4-Dioxane: 70% - 130% waters; 60% - 140% soils | Re-extract/re-analyse all associated samples, if possible. If not, report the data flagged for all failing analytes. Re-analysis is performed if the LCS in a single analyte test or > 10% of the analytes in a multielement scan are outside the control limits by > 10% absolute. |
| **Matrix Spike**<br><br>A second aliquot from a randomly chosen sample is fortified with a known concentration of target analytes. The sample is processed through the entire analytical method. Results are expressed as a percentage recovery. | 1 in 20 samples or 1 in batch (whichever is most frequent).<br><br>Evaluates any "matrix effects" that may exist in a sample due to its composition that may affect the recovery of analytes. An example is the presence of peat in soils, which tends to adsorb analytes such as benzene resulting in a poor matrix spike recovery. | Used for most analytical procedures. Matrix spike alert criteria apply when the MS targe concentration is ≥ the native analyte concentration.<br>ABNs, CPs, PFOS, PAHs, 1,4-Dioxane, Pesticides & Herbicides, VOCs, THMs, BTEX,: 50% - 140%; 30% - 130% for difficult compounds<br>PHCs, HWSB, Methyl Mercury: 60% - 140%<br>Dioxins & Furans: 50% - 150%<br>Metals and Inorganics, FOC: 70% - 130% | Re-analysis of the Matrix Spike is performed if the Matrix Spike for a single analyte test or 10% of the analytes in a multielement scan are outside the control limits by > 10% absolute. It should be noted that higher levels of uncertainty in the data are associated with situations when native analyte concentrations are >MS concentrations. |
| **Laboratory Duplicates (RPD)**<br><br>A second aliquot from a randomly chosen sample within an analytical batch processed through the entire analytical method. Laboratory duplicates are expressed as the Relative Percent Difference (RPD) between the two results. | 1 in 20 samples or 1 in batch (whichever is most frequent).<br><br>Evaluates analytical precision and sample homogeneity. | Applicable for all analytical parameters. Acceptance criteria are either as tabulated below or < 2x RDL at low concentrations<br>ABNs, CPs, PFOS, PAHs, 1,4-Dioxane, Ocs, PCBs, VOCs, BTEX: ≤30% waters and ≤50% soils<br>PHCs: ≤30% (methanol extract); ≤40% (soil)<br>Dioxins & Furans, Methyl-Hg: ≤30% waters and ≤40% solids<br>FOC, NH4, Cr, Cr(VI), CN: ≤20% waters and ≤35% soils<br>Metals & Inorganics: ≤20% waters and ≤30% soils<br>HWSB, Ag, Al, Ba, Hg, K, Mo, Na, Pb, Sn, Sr, Ti: ≤40% soils; for waters, see above<br>Salinity: ≤10% waters and <20% soils | **Laboratory duplicates collected from the same Methanol vial as the sample have a 30% RPD; if a second Methanol Vial is used, a RPD of 40% applies.**<br>Re-analysis of affected samples may not necessarily be required, as these are subject to sampling and analytical variability. Data may be reported as flagged if samples are visibly non-homogenous. For organics whole-bottle tests, laboratory duplicates are essentially field duplicates. |
| **Certified Reference Material (CRM)**<br><br>Purchased samples that have been certified by a recognized agency to contain specified levels of selected constituents, when measured by specified standard procedures. Results are expressed as a percentage of the design value. | During validation; optional otherwise.<br><br>Used for validating the performance of a method including precision, extraction or digestion efficiency. | Applicable for all analytical parameters where CRMs are commercially available. Acceptable recovery ranges are provided by the supplier. | Repeat the analysis for all samples in the batch, if CRM % recovery is outside control limits. |
| **Surrogate Recovery**<br><br>Surrogates are deuterated analogues or compounds not normally found in nature but have chemical and physical behaviour similar to the analytes of interest. Known surrogate concentrations are added to samples prior to analysis and recoveries are calculated and expressed as a percentage. | Every organic analysis, included in every sample.<br><br>Monitors the efficiency of organic extractions, instrument performance and provides within-run quality control. | Applicable for all analytical parameters determined by Gas Chromatography or HPLC techniques.<br>ABNs, CPs, PFOS, PAHs, 1,4-Dioxane, Ocs, PCBs, Herbicides, VOCs, BTEX: 50% - 140% (water and soil)<br>PHCs (F2-F4): 60% - 140% (water and soil) | Repeat the analysis or qualify data, if interferences are suspected. |
| **FIELD** | | | |
| **Blind Duplicates**<br><br>A second sample is collected at the same time and location in separate containers. Samples are homogenized where possible (ie alternate filling of sample and duplicate for waters and bowl mixing for soils). Samples are submitted to the laboratory without identifying them as duplicates. VOCs in soil should not be homogenized. | 5% samples collected (ie. 1 in 20 samples); must be representative of all parameters. For programs with less than 20 samples, at least 1 field duplicate is required.<br><br>Evaluates analytical precision, field precision and sample homogeneity. Has limited use for samples that cannot be homogenized (ie VOCs in soil). | These samples normally include higher variability due to the nature of the matrix, so field duplicates alert limits should be considerably broader than laboratory duplicates.<br>Groundwater Samples: <40%<br>Soil Samples: <60% | Evaluate sample homogeneity and field collection technique. Although specific regulatory guidance on field duplicate RPDs is provided, this parameter requires judgement on behalf of the QP to properly validate and apply project specific alert criteria for field duplicates. |
| **Trip Blank**<br><br>A sample of analyte free media (supplied by the laboratory) taken to the site and returned to the laboratory unopened. The laboratory prepares the trip blank. A duplicate of the trip blank prepared at the same time is retained at the laboratory in a contaminant free location. | 1 per VOC water submission.<br><br>Identifies any potential cross-contamination that may occur from other samples, ambient conditions, or other sources that samples may be exposed. | Maxxam internal guideline and recommendation: Evaluate the impact on data for results >2x the RDL or that that approaches the concentration reported in the sample.<br><br>Specifically for methanol vials: Travel methanol vial blank is reweighed at the laboratory and compared to tared weight to determine methanol loss. Prepared with every batch of pre-weighed vials. | Contact and engage the laboratory for assistance in qualifying the data. Analyze the laboratory trip blank duplicate retained by the laboratory. While the CCME guidelines list Trip Blanks as an acceptable QC parameter to include in analytical programs, specific alert criteria are not provided. |
| **Trip Spike**<br><br>A sample prepared by the laboratory that is fortified with a known concentration of target analytes. This sample is shipped along with containers and is to be taken into the field, but returned unopened to the laboratory. Analysis is conducted and recoveries are reported expressed as a percentage. | 1 per VOC water monitoring program.<br><br>Monitors the breakdown or loss of analytes during the sampling process. Holding time, and temperature effects on concentration can be accessed. | Maxxam internal guidelines and recommendations: Usually volatile organics in water. May be applied to other analyses.<br>Majority of VOCs: 60% - 130%<br>Vinyl Chloride, Bomomethane, Chloromethane, Freon-12, Acetone, MIK & MIBK: 50% - 140% | Please note that in the absence of Regulatory prescribed warning or alert limits, Maxxam recommends these alert limits. Review storage conditions, temperatures of samples upon receipt. |
| **Field Blank**<br><br>Supplied by the laboratory and prepared in the field by filling container with analyte free water. | 1 per VOC monitoring program<br><br>Determines if the field or transporting environments have contaminated the sample. | Applicable for most parameters. For methanol vials, a field blank should be used for every batch of methanol vials.<br><br>Evaluate the impact on data for results >RDL or that that approach the concentration reported in the sample. | Evaluate any hits found in the sample that were also found in the trip blank. For methanol vials, also review the trip blank measurement to determine methanol loss. |
| **Blind Known**<br><br>A purchased CRM (see above) or a sample previously analyzed by an accredited laboratory multiple times is submitted to the laboratory blind. | 1 per remediation or large project.<br>Evaluates laboratory accuracy and precision. | Ideal for long holding time tests such as metals in soil. Submission of the same blind known multiple times during a large project provides excellent monitoring of the laboratory precision and accuracy. Acceptable recovery ranges are provided by the supplier. | Contact the laboratory. |