Sampling and Sample Receipt Changes and Issues

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Sample Collection is Important

- Samples represent the environment under investigation
- Sample analysis should represent some "truth" about the environment
- Samples and their analysis are part of investigations, improvements, and instill confidence

Sample Receipt

- Establishes samples are under control
- As much as possible maintains sample integrity
- Captures departures and issues leading to decisions whether analysis will represent reality

Why is the Subject So Hard?

- Lack of manuals, guidance, or instructions
- Almost no regulations
- Much of what is passed around is anecdotal
- Conflicting statements by accrediting bodies

What Does TNI Add?

5.7 Collection of Samples

- 5.7.1 Lab needs sampling plan and procedures when it carries out sample collection
- 5.7.2 Document any deviations required by "customer" and include in reports

5.7 Sample Collection

- 5.7.3 Procedure to create record of procedures used, sampler ID, environmental conditions, sample location ID
- 5.7.4.a) Documents to include date and time
- 5.7.4.b) Document deviations from procedure

Key Points for 5.7

- Required ONLY if you do sampling – even if only part time or rarely
- Record to include sample location ID but suggest diagrams
- Records for date and time will follow federal regulations especially for composite samples
- Note there is a requirement (5.7.1) that procedures be at sample collection locations

Tools for 5.7

- Will need a sample collection plan and procedure
- Plan/Procedure should include all information about the sample location, frequency, containers, equipment, and maintenance
- Consider including pictures of the sample locations and maps
- Reference all permits, and sample plans created by your organization

What if You NEVER Sample

- Nothing in 5.7 directs action if you will NEVER collect samples
- Consider it an outreach program (improvement opportunity) to devise a procedure and do training to those who do collect samples

5.8 Handling Samples

- 5.8.1 Procedures for transport, receipt, handling, protection, storage, retention, and disposal of samples
- 5.8.2 Sample identity system to prevent confusion. System shall apply to sub-units of samples within and when sent out
- 5.8.3 Deviations from expected conditions are recorded. Doubt about sample condition must be discussed with "customer"

5.8 Handling Samples

- 5.8.4 Have proper storage and handling procedures and facilities. Storage conditions must be monitored. A security system when required

5.8.5 Documentation

- 5.8.5.a) System to uniquely ID containers. Includes samples, subsample, preservations, sample containers, tests, and extracts/digestates
- 5.8.5.b) Lab code links with field ID code
- 5.8.5.c) ID as durable mark
- 5.8.5.d) Lab code in all lab records to link sample and analytical procedures
- 5.8.5.e) Field and Lab IDs may be the same

5.8.6 Sample Acceptance Policy

- 5.8.6 Lab shall have a sample acceptance policy
- 5.8.6.a) Documentation to include: sample ID, sample location, date/time collection, collector's name, preservations, sample type, and any additional remarks
- 5.8.6.b) Labelling to include unique ID. Labels must be durable and written in indelible ink

5.8.6 Sample Acceptance Policy

- 5.8.6.c) Proper sample containers
- 5.8.6.d) Holding times
- 5.8.6.e) Sufficient volume
- 5.8.6.f) Procedures covering damage, contamination, or inadequate preservation
- 5.8.6.g) Qualification procedure

5.8.7 Sample Receipt Protocols

- 5.8.7.1 Procedures for verifying and recording preservation
- 5.8.7.2 If sample does not meet requirements
- 5.8.7.2.a) Retain records of conversations concerning disposition of samples
- 5.8.7.2.b) Record decision to proceed anyway

5.8.7 Sample Receipt Protocols

- 5.8.7.2.b).i Sample condition noted on CoC, form, and receipt records
- 5.8.7.2.b).ii Results qualified
- 5.8.7.3 Chronological receipt record
- 5.8.7.3.a) Receipt log to have client/project name, receipt date/time, lab ID code (5.8.5.a)), and signature/initials of recorder

5.8.7 Sample Receipt Protocols

- 5.8.7.3.b) Link in log (must be retrievable if elsewhere) to field code/lab code; collection date/time to receipt date/time; analysis request to lab code; comments from inspection/rejection to lab code
- 5.8.7.4 Retain all communications including CoCs
- 5.8.7.5 Maintain a CoC form – if UTILIZED

5.8.8 Legal Chain of Custody

- 5.8.8 Legal CoC required only if sample is for evidentiary purposes
- Legal CoC will include internal transfers of samples/portions of samples
- Need a Procedure

5.8.9 Sample Storage and Disposal

- 5.8.9.a) Samples stored according to preservation protocols
- 5.8.9.a).i Refrigerators must be within ± 2°C unless otherwise specified
- 5.8.9.a).ii Samples stored away from standards, reagents, and food to prevent cross contamination

5.8.9 Sample Storage and Disposal

- 5.8.9.b) Sample preparations stored the same as samples or method specifications
- 5.8.9.c) Procedures for disposal of all samples and sample preparations

Key Points for 5.8

- Need a procedure covering sample receipt
- Procedure will cover proper preservation, storage, and handling of samples, parts of samples, and sample preparations
- Need a logbook or some other record of sample receipt. Logbook includes sample ID codes and links to sample collection info
- Need a P/P regarding sample acceptance
- Need sample disposal procedures

Tools for 5.8

- Write a sample receipt/acceptance/ storage/handling P/P
- Create a sample receipt logbook
- Reference specifics in federal regulations for holding times/containers/preservations
- You can determine never to accept a sample that is not properly preserved or in the wrong container – BUT you might not have a choice
- CoCs are NOT REQUIRED but might be useful

Training and Skill Requirements

- V1M2 5.2.5 Requires labs authorize persons performing specified sample procedures,
- Maintain records of relevant authorization(s), competence, educational and professional qualifications, training, skills and experience of all technical personnel

Requirements added by M4, 5,7

- M4 1.7.4 conditions of samples at receipt
- M5 1.7.5 chilling and requires Cl2 analysis unless conditions met
- M7 1.7.3 requires chilling during or immediately after collection

V1M4 1.7.4

- Temperature acceptable within 2°C of required.
- Samples received on the same day as collection are acceptable if the samples were received on ice/freezer packs.
- Analysis begun within 15 minutes of collection do not need to meet any requirements
- Samples refrigerated within 15 minutes of collection.
- Preservation check procedure.
- Exception granted where allowed by method.

V1M5 1.7.5

- Samples received same day they are collected acceptable if on ice/freezer packs
- Samples from known or suspected chlorinated sources and all DW samples shall be checked for absence of residual unless ***all*** of the following are met:

Exemption Requirements

- Containers are from lab or have been appropriately tested and documented;
- Thio. to neutralize 5 mg/L for DW or 15 mg/L for WW
- Container from each batch/lot is checked to ensure efficacy of thio.
- Field measurement noted in collection records provided to lab.

V1M7 1.7.3

- Chilled to 0-6°C during or immediately after collection except as prescribed by the method and approved by the regulatory agency

OOPS! Federal Regulations

Federal Regulations Supersede

- Regulations can't be modified except through specified procedure.
- 40CFR Part 136.3.e in the preface to Table II states the contents of Table II supersede anything stated in method or other source.

Regulatory Requirements

- EPA states all temperatures are storage temperatures not transit temperatures
- Tests may require averaging of grabs (min. 4 in 24 hrs.)
- Hold time starts after last grab or the end of collection
- Filter o-PO_4 within 15 minutes

So, What Does This Mean?

So, the Outcome

- Need procedures if sampling
- Must have unique sample IDs when sampling
- Sample collection IDs must be connected to a sample receipt ID if not the same
- No longer can just bring in samples straight to analysis

More Outcomes

- Need written procedures to check preservations and sample acceptance/rejection
- Training and qualification requirements for sample collection and/or receipt
- No exceptions for utility labs

Good Things

- Sample collection is no longer just "fill the bottle"
- Effort is made to assess sample viability and efficacy
- Procedures provide training materials

Difficulties

- Small utility labs tended to skip over sample receipt for analysis speed
- Unique IDs versus everything is EFF-001
- Keeping actual records over verbal assurances

Sample Collection Issues

Collecting Bacterial Samples

- Things changed from good old MTF days
- Required 100 mL sample volumes
- Difficulties collecting from bodies of water, tanks, or anywhere there is no faucet
- Not a lot of rules or even instructions

What Labs Do

- Pour off excess including flicking small amounts
- Collect in one container and pour into sample bottle
- Issues – sterility of sample collection container, contaminating sample during pour out

Rules – What Rules

- There are no federal regulations regarding sample collection procedures
- The only requirement is analysis of 100mL
- "guidance" can be found in EPA's DW certificate manual and Standard Methods

Guidance

- DW Cert Manual Chapter V section 6
- Standard Methods 23rd edition 9060
- At least 100 mL with 1" headspace
- No headspace – do not pour off sample. Pour into larger sterile bottle, mix and measure.
- Assure only source of bacteria is sample
- Mixing important – "uniform" distribution of bacteria in sample

Collecting Duplicates

- No issues when can collect large volume and split
- Issues with bacterial, O&G, and organics
- Co-location for samples where there is loss
- Larger initial containers. Must leave room for mixing

Any Other Issues or Questions

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