



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

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March 19, 2007

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9742 Maryland Avenue
Norfolk, VA 23511-3095

3661

Re: Responses to EPA Comments on the Draft Work Plan for Non-Time Critical Removal
Action for the Old Fire Fighting Training Area

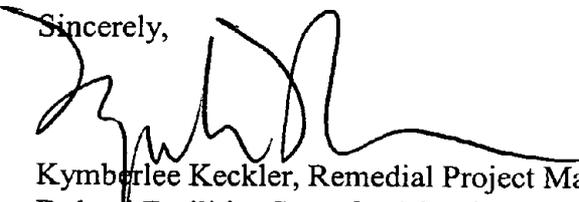
Dear Mr. Colter:

EPA reviewed the responses, dated March 8, 2007, to EPA's January 29, 2007 letter on the draft *Work Plan for Non-Time Critical Removal Action* at the Old Fire Fighting Training Area (OFFTA). Although the numbering provided does not correspond with the implied numbering of the EPA comments (e.g., EPA's third specific comment is numbered as specific comment 5), EPA retained the numbering used in the responses. Detailed comments are provided in Attachment A. I have also attached EPA's Standard Operating Procedure for sampling Concrete in the Field.

For clarification, EPA will provide additional locations for test pits, based on information obtained during the removal action, to better evaluate the effectiveness of the removal action. The number of test pits required will depend on the information obtained during the removal action and may not necessarily be limited to ten additional test pits.

I look forward to working with you and the RIDEM toward the cleanup of the OFFTA. Please do not hesitate to contact me at (617) 918-1385 should you have any questions before Wednesday.

Sincerely,



Kimberlee Keckler, Remedial Project Manager
Federal Facilities Superfund Section

Attachments

cc: Paul Kulpa, RIDEM, Providence, RI
Cornelia Mueller, NETC, Newport, RI
Jennifer Stump, Gannet Fleming, Harrisburg, PA
Steven Parker, Tetra Tech-NUS, Wilmington, MA

ATTACHMENT A

Page Comment

- 5a. EPA agrees that the only way to provide assurance that piping left in the ground does not contain significant amounts of residual contamination is to find all the piping, adequately sample within and under the piping, and if warranted, open and clean the piping or alternatively just remove it altogether and collect confirmation samples from the soil. EPA does not concur that the agreed-upon approach for the removal action did not include removal or adequate sampling and analysis of piping left in place. During the TIGER Team meeting the Navy agreed to remove all structures and EPA considers piping associated with the fire training facility to be an integral part of the structures.
- 5b. The work plan revision should elaborate on the process summary provided in the response. EPA is concerned that PID and headspace screening may not adequately identify TPH concentrations in the soil that could result in mixing highly contaminated soil with minimally contaminated soil. Please describe what site-specific procedures will be employed to verify that PID or headspace screenings will produce results that are reasonably representative of the actual contaminant concentrations in the soil. Explain how the screening results and the actual TPH concentrations in soil will be correlated. Consideration should also be given to using TPH field screening, although soil moisture could make TPH field screening results difficult to interpret.
- 6a. EPA assumes that the soil removed from the targeted 2,200 square-foot area will be designated for off-site disposal along with any additional contaminated soil removed as a result of confirmation sampling results. Please clarify this in the work plan. It is not appropriate to stockpile soil removed from this 2,200 square-foot area, then sample the stockpiles and manage the soil based on those sampling results as this would allow dilution as a means for managing the contaminated soil. To the extent that it is available, existing data should be used to manage soil removed from the initial excavations.
- 6b. For clarification, EPA will select additional test pit locations to ensure the effectiveness of the removal action. Because the size and number of test pits required to accomplish this will be dependent on the information obtained during the removal action, it will not be possible to put a specific limit on the size or number of additional test pits required. Any specific volumes or numbers provided in the work plan will be used as guidance only and should not be interpreted to limit EPA's authority to select the appropriate size and number of test pits to achieve the project objective.
- 6d. Please clarify how material likely to be hazardous would be identified using only visual and PID screening protocol and explain what criteria will be used to identify material likely to be hazardous.
7. GPS accuracy is often cited as sub-meter accuracy. Please confirm, if correct, that the GPS accuracy for the 500 series locations is sub-foot rather than sub-meter.

- 11b. The response provides information that is not consistent with the quoted Source Removal Evaluation Report. Three of the test pit aqueous samples were not able to be analyzed because of an accident at the laboratory. The sample collected from TP-12 contained too little potential LNAPL in the sample to permit analysis. This is different than the statement in the response, "no free product was found by the laboratory." Also, please refer to EPA's comment on the response to Specific Comment 5a.
- 11c. Please refer to EPA's comment on the response to Specific Comment 5d.
- 11d. Please refer to EPA's comment on the response to Specific Comment 5a.
- 12a. The process needs to be defined in the work plan. It is not clear whether the material will be sorted into stockpiles at the point of excavation and then transported to the staging area or if the excavated material will be directly loaded into trucks and each load will be evaluated to determine how to sort it. The work plan needs to explain the proposed material handling and sorting process so all stakeholders understand how the work will be conducted. This is not a matter of which piece of equipment will transport the soil. EPA cannot allow contaminated soil to be stockpiled with non-contaminated soil before characterization occurs. The soil needs to be characterized in smaller volumes so dilution is not used to avoid transporting contaminated soil off site. To the extent that it is available, existing data needs to be used to manage soil removed from the initial excavations.
14. As discussed above, EPA cannot allow contaminated soil to be stockpiled with non-contaminated soil before characterization occurs. The soil needs to be characterized in smaller volumes so that dilution is not used to avoid transporting contaminated soil off site. See also EPA's comment on the response to Specific Comment 5b. It is not apparent that the screening methods proposed will be accurate enough in characterizing soil for TPH. TPH field screening has been used elsewhere at NETC and it may have value in this application but there is concern about testing wet or very moist soil samples. Further discussion of data correlation procedures or the use of TPH field screening is warranted.
- 17c. This response appears to contradict the response to Specific Comments 5b and 14 that refer to the use of clean fill in the top two feet of fill. Please correct as appropriate.
23. Additional constraints will be required for the screening and sorting process to ensure that soil contaminated in excess of the TPH threshold is not diluted with minimally-contaminated soil and by dilution is determined to not require off site disposal. This may be done by using existing data, to the extent it is available, to manage soil removed from the initial excavations and by limiting the size of the stockpiles characterized for potential on-site reuse.

25. In the proposed clarification please describe what criteria the contractor will use to segregate potentially characteristic hazardous waste. It is presumed this would be based on already-existing data.
- 32a. All structures associated with the fire training facility except administrative buildings are considered likely sources of contamination until proven otherwise. Piping is an integral component of the fire training facility structures and also a likely source of contamination until proven otherwise. Investigations at NETC have demonstrated that such structures have been previously abandoned while still containing free product. Please refer also to EPA's comment on the response to Specific Comment 5a.
- 32b. Please refer to EPA's comment on the response to Specific Comment 5a.
- 34a. Please refer to EPA's comment on the response to Specific Comment 5b.

REGION I, EPA-NEW ENGLAND

DRAFT STANDARD OPERATING PROCEDURE FOR SAMPLING CONCRETE IN THE FIELD



U.S. EPA-NEW ENGLAND Region I Quality Assurance Unit Staff Office of Environmental Measurement and Evaluation

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Date: 12/30/97

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Senior Technical Specialist

Date: 12/30/97

Approved by: Nancy Barmakian
Branch Chief

Date: 12/30/97

**Region I, EPA New England
Standard Operating Procedure for Sampling Concrete in the Field**

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Region I, EPA New England
Standard Operating Procedure for Sampling Concrete in the Field

1.0 Scope and Application

The following Standard Operating Procedure (SOP) describes a concrete sampling technique which uses an impact hammer drill to generate a uniform, finely ground, powder which is easily homogenized, extracted and analyzed. This procedure is primarily geared at providing enough sample for one or two different analyses at a time. That is, the time required to generate sufficient sample for a full suite of analyses may be impractical. The concrete powder is suitable for all types of environmental analyses, with the exception of volatile compounds, and may be analyzed in the field or at a fixed laboratory. This procedure is applicable for the collection of samples from concrete floors, walls, and ceilings.

The impact hammer drill is far less labor intensive than previous techniques using coring devices, or hammers and chisels. It allows for easy selection of sample location and sample depth. Not only can the project planner control the depth to sample into the concrete, from surface samples (0 - 1/2 inch) down to a core of the entire slab, but the technique can also be modified to collect samples at discrete depths within the concrete slab.

Another issue with concrete sampling is the fact that the amount of time spent drilling translates into the weight of sample produced. Thus, to maximize sampling time, it is important to know the minimum amount of sample required for each analysis. To do this, the project planner should take the following steps: 1) Use the Data Quality Objective (DQO) process and familiarity with the site to develop the objectives of the sampling project and the depth(s) of sample to be collected. 2) Review the site history and any previous data collected to determine possible contaminants of concern. 3) Establish the action levels for those possible contaminants and determine the appropriate analytical methods (both field and/or fixed laboratory) to meet the DQOs of the project. 4) Based on the detection limits of these methods, determine the amount of sample required for each analysis and the total sample weight required for each sample location (including quality control samples).

As with any environmental data collection project, all aspects of a concrete sampling episode should be well thought out, prior to going out in the field, and thoroughly described in a Quality Assurance Project Plan (QAPP). The QAPP should clearly state the DQOs of the project and document a complete Quality Assurance/Quality Control program to reconcile the data generated with the established DQOs. For more information on these subjects, refer to EPA documents QA/R-5, EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, and QA/G-4, Guidance for the Data Quality Objective Process.

2.0 Method Summary

A one-inch diameter carbide drill bit is used in a rotary impact hammer drill to generate a fine concrete powder suitable for analysis. The powder is placed in a sample container and homogenized for field or fixed laboratory analysis. The procedure can be used to sample a single depth into the concrete, or may be modified to sample the concrete at distinctly different depth zones. The modified depth sampling procedure is designed to minimize any cross contamination between the sampling zones. If different sampling depths are required, two different diameter drill bits and a vacuum sampling apparatus are employed.

3.0 Health and Safety

Eye and hearing protection are required at all times during sample drilling. A small amount of dust is generated during the drilling process. Proper respiratory protection and/or a dust control system must be in place at all times during sampling.

4.0 Interferences and Potential Problems

Since this sampling technique produces a finely ground uniform powder, physical matrix effects from variations in the sample consistency (i.e., particle size, uniformity, homogeneity, and surface condition) are minimized. Matrix spike analysis of a sample is highly recommended to monitor for any matrix related interferences.

As stated in Section 1.0 above, this sampling procedure is not recommended for volatile organic compound (VOC) analysis. The combination of heat generated during drilling and the exposure of a large amount of surface area will greatly reduce VOC recovery. If low boiling point semi-volatile compounds (i.e., naphthalene) are being analyzed, then the drill speed should be reduced to minimize heat build-up.

5.0 Equipment and Supplies

5.1 Single Depth Concrete Sampling

- Rotary impact hammer drill
- 1-inch diameter carbide drill bits
- Stainless steel scoopulas
- Stainless steel spoonulas (for collecting sample in deeper holes, >2-inches)
- Rectangular aluminum pans (to catch concrete during wall and ceiling sampling)
- Gasoline powered generator (if alternative power source is required)

5.2 Multiple Depth Sampling (in addition to all the above)

- ½ inch diameter carbide drill bits
- Vacuum/sample trap assembly (see Section 7.2 and Figure 1)
- Vacuum pump
- 2-hole rubber stopper
- Glass tubing (to fit stopper)
- Large glass test tubes, or Erlenmeyer flasks, for sample trap (several are suggested)
- Polyethylene tubing for trap inlet (Tygon tubing may be used for the trap outlet)
- Pasture pipets
- Pipe cleaners
- In-line dust filter (glass fiber filter, or equivalent)

6.0 Sample Containers, Preservation, and Storage

Concrete samples must be collected in glass containers for organic analyses, and may be collected in either glass or plastic containers for inorganic analyses. In general, a 2-ounce sample container with Teflon-lined cap (wide-mouth jars are preferred) will hold sufficient volume for most analyses. A 2-ounce jar can hold roughly 90 grams sample. Note, samples which require duplicate and/or matrix spike/matrix spike duplicate analyses may require a larger sample container, or additional 2-ounce sample containers.

Organic samples are to be shipped on ice and maintained at 4°C ($\pm 2^\circ\text{C}$) until the time of extraction and analysis. Inorganic samples may be shipped and stored at room temperature. Refer to 40 CFR Part 136 for guidelines on analysis holding times.

To maintain sample integrity, chain-of-custody procedures must be implemented at the time of sampling to 1) document all sample locations and associated field sample identification numbers, 2) document all quality control samples taken, including field duplicates, split samples for confirmatory analyses, and PE samples, and 3) document the transfer of field samples from field sampler to field chemist or fixed laboratory.

7.0 Procedure

7.1 Single Depth Concrete Sampling

Lock a 1-inch diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source. (A gasoline generator will be needed if electricity is not available.) For easy identification, sample locations may be pre-marked using a crayon or a non-contaminating spray paint. (Note, the actual drilling point must not be marked.) Depending on the appearance of the sample location, or the objectives of the sampling project, it may be desired to wipe the concrete surface with a clean dry cloth prior to drilling. All sampling decisions of this nature should be noted in the sampling logbook. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground concrete powder that can be easily collected, homogenized and analyzed. Having several decontaminated impact drill bits on hand will help expedite sampling when numerous sample locations are to be drilled.

Sample Collection

A ½-inch deep hole (using a 1-inch diameter drill bit) generates about 10 grams of concrete powder. Based on this and the action levels for the project, determine the sampling depth, and/or the number of sample holes to be composited, to generate sufficient sample volume for all of the required analyses. (Note, with the absorbency of concrete, a ½-inch deep hole can be considered a surface sample.)

A decontaminated stainless steel scoopula can be used to collect the sample. The powder can either be collected directly from the surface of the concrete and/or the concrete powder can be scraped back into the hole and the less rounded back edge of the scoopula can be used to collect the sample. For holes greater than 2-inches in depth, a stainless steel spoonula will make it easier to collect the sample from the bottom of the hole.

To ensure collection of a representative sample when multiple analyses are required, a concrete sample should always be collected and homogenized in a single container and then divided up into the individual containers for the various analyses or split samples. This is particularly important when sample holes are deep, or when several holes are drilled adjacent to each other to form a sample composite.

Wall and Ceiling Sampling

A team of two samplers will be required for wall and ceiling sampling. The second person will be needed to hold a clean catch surface (i.e., an aluminum pan) below the drill to collect the falling powder. For wall samples, a scoopula, or spoonula, can be used to collect remaining

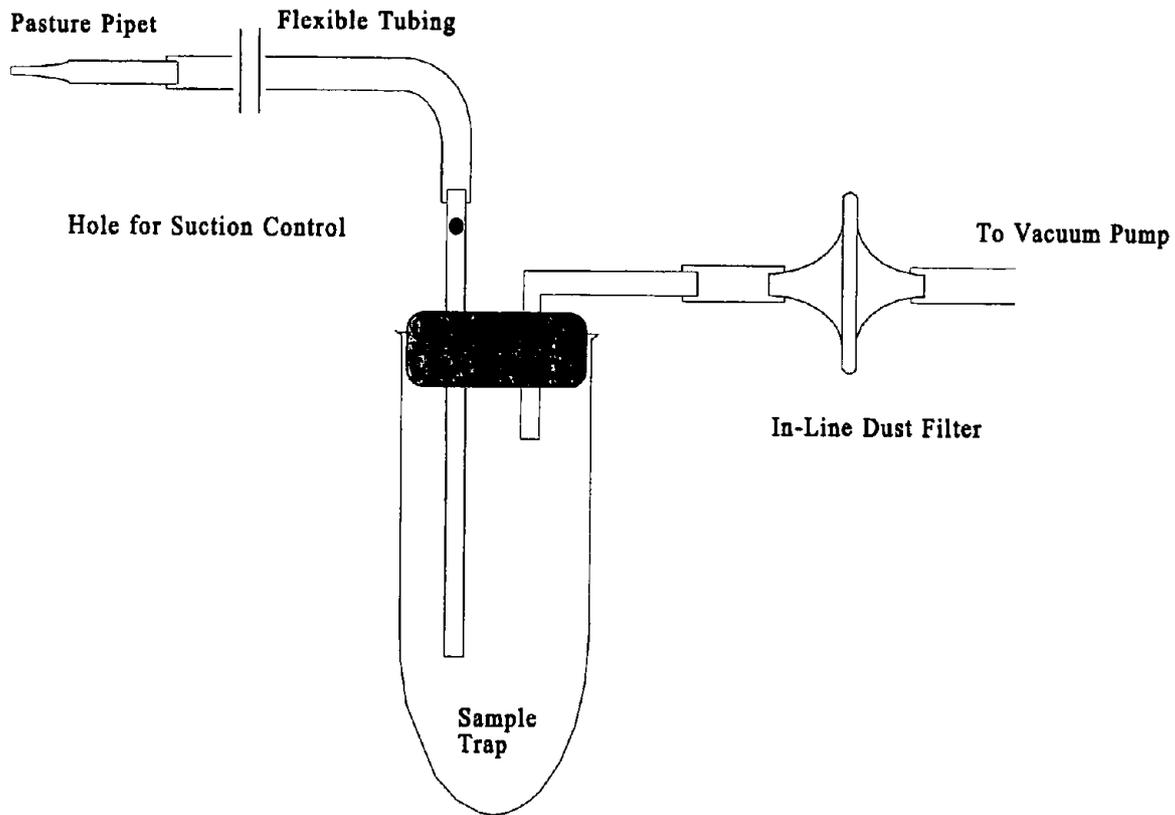
concrete powder from within the hole. For ceiling holes, it may be necessary to drill the hole at an angle so the concrete powder can fall freely in the collection pan (and avoid falling on the drill). Another alternative might be to use the chuck-end of the drill bit and punch a hole through the center of the collection pan. The drill bit is then mounted through the pan and into the drill. Thus, the driller can be drilling straight up while the assistant steadies the pan to catch the falling dust. As a precaution, it may be advantageous to tape a piece of plastic around the drill, just below the chuck, to avoid dust contaminating the body of the drill and entering the mechanical vents. (Note, the plastic should deflect dust from the drill, but be loose enough underneath to allow for proper ventilation.)

7.2 Multiple Depth Concrete Sampling

The above method for concrete sampling can also be used to collect samples from different depths within the concrete. To do this, two different sized drill bits (i.e., ½ inch and 1 inch) and a simple vacuum pump with a vacuum trap assembly is required (see Figure 1). First, the 1 inch drill bit is used to drill to the first level and the concrete sample is collected as described in Section 7.1. The vacuum pump is then turned on and the hole is cleaned out using the vacuum trap assembly. The drill bit is then changed to the ½ inch bit and the next depth is drilled out (the ½ inch bit is used to avoid contact with the sides of the first hole). A clean tube or flask is placed on the vacuum trap, and the sample from the second drilling is collected. To go further, the 1 inch drill is used to open up the hole to the second level, the hole is cleared, and then the ½ inch drill is used again to go to a third level, etc. Note, the holes and concrete surface should be vacuumed thoroughly to minimize any cross-contamination between sample depths.

Vacuum Trap Design and Clean-out

The trap presented in Figure 1 is a convenient and thorough way for collecting and removing concrete powder from drilled holes. The trap system is designed to allow for control of the suction from the vacuum pump and easy trap clean-out between samples. Note, by placing a hole in the inlet tube (see Figure 1), a finger on the hand holding the trap can be used to control the suction at the sampling tip. Thus, when this hole is left completely open, there will be no suction, and the sampler can have complete control over where and what to sample. To change-out between samples the following steps should be taken: 1) The pasture pipet and piece of polyethylene tubing at the sample inlet should be replaced with new materials, 2) the portion of the rubber stopper and glass tubing that was in the trap should be wiped down with a clean damp paper towel (wetted with deionized water) and then dried with a fresh paper towel, 3) a clean pipe cleaner should be drawn through the glass inlet tube to remove any concrete dust present, and 4) the glass tube or flask used to collect the sample should be swapped out with a clean decontaminated sample trap. Having several clean tubes or flasks on hand will facilitate change-out between samples.



7.3 Decontamination Procedure

Necessary supplies for decontamination include: two small buckets, a scrub brush, potable water, deionized water, a squirt bottle for the deionized water, and paper towels. The first bucket contains a soap and potable water solution, and the second bucket contains just potable water. Place all used drill bits and utensils in the soap and water bucket. Scrub each piece thoroughly using the scrub brush. Note, the concrete powder does cling to the metal surfaces, so care should be taken during this step, especially with the twists and curves of the drill bits. Next, rinse each piece in the potable water bucket, and follow with a deionized water rinse from the squirt bottle. Place the deionized water rinsed pieces on clean paper towels and individually dry and inspect each piece. Note, all pieces should be dry prior to reuse.

8.0 Field Documentation

All Site related documentation and reports generated from concrete sampling should be maintained in the central Site file. If personal logbooks are used, legible copies of all pertinent pages must be placed in the Site file.

8.1 Field Logbooks

All field documentation should be maintained in bound logbooks with numbered pages. If loose-leaf logsheets are used to document site activities, extra care should be taken in keep track of all logsheets. The original copy of all logsheets should be maintained in the central Site file. Note, all sample locations must be documented by tying in their location to a detailed site map, or by using two or more permanent landmarks. The following information should be documented in the field logbooks:

- Site name and location,
- EPA Site Manager,
- Name and affiliation of field samplers (EPA, Contractor company name, etc.),
- Sampling date,
- Sample locations and IDs,
- Sampling times and depths, and
- Other pertinent information or comments

8.2 Sample Labeling and Chain-of-Custody

8.2.1 Sample Labels

Sample labels will be affixed to all sample containers. Labels must contain the following information:

- Project name,
- Sample number, and/or location
- Date and time of sampling,
- Analysis,
- Preservation, and
- Sampler's name.

8.2.2 Chain-of-Custody

All samples must be traced from collection, to shipment, to laboratory receipt and laboratory custody. The Chain-of-Custody (COC) Record is a multi-part form that is initiated as samples are acquired and accompanies a sample (or group of samples) as they are transferred from person to person. The COC form is signed by all individuals responsible for sampling, sample transport, and laboratory receipt. (Note, overnight deliver services, often used with sample transport, are exempt from having to sign the COC form. However, copies of all shipping invoices must be kept with the COC documentation.) One copy of the COC is retained by the field sampling crew, while the original (top, signed copy) and remaining carbonless copies are placed in a zip-lock bag and taped to the inside lid of the shipping cooler. If multiple coolers are required for a sample shipment to a single laboratory, the COC need only be sent with one of the coolers. The COC should state how many coolers are included with the shipment. All sample shipments to different laboratories require individual COC forms. The original COC form accompanies the samples until the project is complete, and is then kept in the permanent project file. A copy of the COC is also kept with the project manager, the laboratory manager, and attached to the data package.

8.2.3 Custody Seal

The Custody seal is an adhesive-backed label which is also part of the chain-of-custody process. The custody seal is used to prevent tampering with the samples after they have been collected in the field and sealed in coolers for transit to the laboratory. The Custody seals are signed and dated by a sampler and affixed across the opening edges of each cooler containing samples. Clear packing tape should be wrapped around the cooler, and over the Custody seal, to secure the cooler and avoid accidental tampering with the Custody seal.

9.0 Quality Assurance and Quality Control (QA/QC)

A solid QA/QC program is essential to establishing the quality of the data generated so that proper project decisions can be made. The following are key quality control elements which should be incorporated into a concrete sampling and analytical program.

9.1 Equipment Blanks

An equipment blank should be performed on decontaminated drill bits and collection utensils at a frequency of 1 per 20 samples or 1 per day, whichever is greater. To prepare the equipment blank, place the decontaminated drill bit and utensils in a large clean stainless steel bowl. Pour sufficient deionized water into the bowl to fill all of the required sample containers. Next, stir the drill bit and utensils in the bowl with a clean utensil to thoroughly mix the blank. Finally, decant off the equipment blank into the sample containers. Note, a clean funnel may help to pour off the equipment blank into the containers.

9.2 Field Duplicates

Field duplicates are samples collected adjacent to each other (collocated) at the same sample location (not two aliquots of the same sample). Field duplicates not only help provide an indicator of overall precision, but measure the cumulative effects of both the field and analytical precision, and also measure the representativeness of the sample. Field duplicates must be prepared and analyzed at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater. An example of a non-related concrete matrix might be the investigation of two different types of chemical spills.

Calculate the Relative Percent Difference (RPD) between the sample and its duplicate using Equation 1.

$$RPD = \frac{|S - D|}{\frac{(S + D)}{2}} \times 100$$

Equation 1

Where:

S = Original sample result
D = Duplicate sample result

The following general guidelines have been established for field duplicate criteria:

- If both the original and field duplicate values are \geq practical quantitation limit (PQL), then the control limit for RPD is $\leq 50\%$,
- If one or both values are $< PQL$, then do not assess the RPD.

If more rigorous field duplicate criteria are needed to achieve project DQOs, then that criteria should be documented in the project QAPP.

If the field duplicate criteria specified above are not met, then flag that target element with an "*" on the final report for both the original and field duplicate samples. Report both the original and field duplicate analyses; do not report the average. Field duplicate samples should be indicated on the sample ID. For example, the sample ID can contain the the suffix "FD".

9.3 Laboratory Duplicates

Laboratory duplicates are two aliquots of the same sample that are prepared, homogenized and analyzed in the same manner. (Note, proper sample homogenization is critical in producing meaningful results.) The precision of the sample preparation and analytical methods is determined by performing a laboratory duplicate analysis. Laboratory duplicates can be prepared in the field and submitted as blind samples, or the laboratory can be requested to perform the laboratory duplicate analysis. In the case of laboratory prepared duplicates, the field sampling team must be sure to provide sufficient sample volume. Laboratory duplicates must be prepared and analyzed at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater.

Calculate the RPD between the sample and its duplicate using Equation 1. The following general guidelines have been established for laboratory duplicate criteria:

- If both the original and laboratory duplicate values are \geq PQL, then the control limit for RPD is $\leq 25\%$,
- If one or both values are $<$ PQL, then do not assess the RPD.

If duplicate criteria are not met, then flag that target element with an "*" on the final report for both the original and duplicate samples. Report both the original and duplicate analyses; do not report the average.

9.4 Matrix Spike/Matrix Spike Duplicate Samples

Matrix spike/matrix spike duplicate samples (MS/MSDs) are two additional aliquots of a sample which are spiked with the appropriate compound(s) or analyte(s) of concern and then prepared and analyzed along with the original sample. (Note, proper sample homogenization, prior to spiking, is critical in producing meaningful results.) MS/MSDs help evaluate the effects of sample matrix on the analytical methods being used. The field sampling team must provide sufficient sample volume such that the field or fixed laboratory can prepare and analyze MS/MSDs at a frequency of 1 per 20 samples or 1 per non-related concrete matrix, whichever is greater.

Calculate the recovery of each matrix spike compound or analyte using Equation 2.

$$MSR = \frac{SSR - SR}{SA} \times 100$$

Equation 2

Where,

MSR	=	Matrix Spike Recovery,	SA	=	Spike Added
SSR	=	Spiked Sample Result,	SR	=	Sample Result

Calculate the relative percent difference (RPD) between the recoveries of each compound or analyte in the matrix spike and matrix spike duplicate using Equation 3.

Equation 3

$$RPD = \frac{|MSR - MSR_D|}{\frac{(MSR + MSR_D)}{2}} \times 100$$

Where,

MSR = Matrix Spike Recovery
MSR_D = Matrix Spike Duplicate Recovery

9.5 Performance Evaluation Samples

In accordance with the EPA Region I Performance Evaluation Program Guidance, performance evaluation (PE) samples should be submitted for each type of analysis to be performed in the field or by the fixed laboratory performing full protocol EPA methods. PE samples provide information on the quality of the individual data packages. PE samples are certified standard reference materials (SRMs) from a source other than that used to calibrate the instrument. If both field and fixed laboratories are being used to analyze samples, at least one solid PE sample should undergo both field analysis and confirmatory full protocol EPA method analysis to facilitate data comparability. A copy of the certified values for the SRM must be submitted with the final data packages to facilitate data evaluation.

9.6 Data Verification and Validation

All field data and supporting information (including chain-of-custody) that is collected during a concrete sampling episode should be verified daily, by a person other than that performing the work, to check for possible errors.

During the project planning process, a plan for data validation should be established for all data, both for field and fixed laboratories. All data must be validated to assure that it is of a quality suitable to make project decisions. For help in developing a data validation program refer to Region I, EPA New England, Data Validation Functional Guidelines for Evaluating Environmental Analyses.

9.7 Assessments

9.7.1 Internal Assessments

As part of the Quality Assurance/Quality Control Program for any sampling project, a series of internal assessment checks should be instituted to monitor and maintain the integrity of the sample collection process. Timely internal reviews will insure that proper sampling, decontamination, chain-of-custody and quality control procedures are being followed. Also, the internal assessment review is there to monitor any corrective actions taken, and/or institute corrective actions that should have been taken and were not. All corrective actions taken must be documented in an appropriate logbook, and if any corrective actions impact the final data reported, then they must also be documented in the final report narrative. The results of all internal assessments must be documented in a report, and copies of the report

issued to the Project Manager and the Quality Assurance Manager. The original copy of any assessment report must remain with the main project file and be available for review.

9.7.2 External Assessments

The Agency reserves the right to perform periodic field audits to ensure compliance with this SOP.

10.0 References

- 1) Guidance for the Data Quality Objective Process, QA/G-4, EPA/600/R-96/055, September 1994.
- 2) EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations, QA/R-5, Interim Final, October 1997.
- 3) Guidance for the Preparation of Standard Operating Procedures for Quality-related Operations, QA/G-6, EPA/600/R-96/027, November 1995.
- 4) Region I, EPA-New England Data Validation Functional Guidelines for Evaluating Environmental Analyses, July 1996.
- 5) EPA Region I Performance Evaluation Program Guidance, July 1996.
- 6) U.S. EPA Code of Federal Regulations, 40 CFR, Part 136, Appendix B, Revised as of July 1995.