

HANDLING OF SAMPLES FOR CHEMICAL ANALYSIS



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Purpose of this document

This guide has been prepared to advise clients of the correct sampling protocols for soil and water samples that require chemical analysis. In order to meet the requirements of ISO 17025 any accredited laboratory now has a duty to inform clients of any samples received that may be regarded as 'deviating'. Deviating samples are classified into three distinct categories:

1. **The date of sampling has not been provided.** This is required in order to assess the correct holding time. The maximum holding time stated in this document is the period of time between sampling and testing of the preserved or stabilised sample.
2. **There has been a significant delay in analysing the samples.** Whilst the laboratory can make every effort to start testing as soon as possible, if there has been an excessive period of time between sampling and receipt, the maximum holding time may be exceeded.
3. **Samples have not been received in appropriate containers or stored under the correct conditions.** Containers should generally be filled with the minimum of headspace and kept cool, although this varies depending on the analysis required.

Terra Tek will advise clients in advance if any samples are classified as deviating and will continue with the testing unless the client specifies otherwise. If deviating samples are tested appropriate disclaimers will appear on the test report indicating that the test result(s) may be compromised.

On-site preservation

Terra Tek can supply sampling kits for on-site preservation on request. Please note that bottles pre-dosed with preservatives contain small quantities of hazardous substances. Health & safety guidance is provided with sampling kits. We appreciate that it is not always convenient to filter and preserve samples on site. Where preservation is not possible and un-dosed bottles are used, the samples should ideally be forwarded to the laboratory within 24 hours in the recommended sample containers. Samples will then be preserved on receipt at the laboratory. Terra Tek can provide information on the number and type of containers required for any suite of tests.

Hazardous materials

Clients are required to inform the laboratory if any sample is known, or is suspected to have been, contaminated by any chemical, radiological or microbiological sources that may be a hazard to health. **Terra Tek reserve the right not to test any sample that we consider would be hazardous to the health of employees.** We would make arrangements to return any such material to the client with an explanation of our reasons for not testing the material.

Asbestos Containing Materials (ACMs)

Any material which is known, or is suspected to contain, asbestos (or asbestos-related materials) must be notified to the laboratory prior to testing. The samples should be clearly labelled "suspected asbestos" and should be double-bagged. **Terra Tek reserve the right not to test any sample that we consider would be hazardous to the health of employees.**

We will inform the client in advance if we intend to quarantine any samples due to the possible presence of ACMs, and any additional cost or delays that will be incurred. Testing will only commence when the absence of asbestos is confirmed. We also reserve the right to return any sample to the client where we are unable to dispose of the material using our normal procedures.

SOIL

DO ensure containers are completely filled with the minimum of airspace.



DO provide a date of sampling.

DO keep samples cool wherever possible.

DO protect samples from light wherever possible.

DO NOT fill containers near a running motor or any type of exhaust system.

Container types

 <p>800ml Plastic tub</p>	<p>USED FOR</p> <p>Inorganics</p> <p>PAHs</p> <p>Leachates</p> <p>Asbestos</p>	<p>SAMPLING GUIDANCE</p> <p>If the sample contains significant amounts of large granular material, additional tubs may be required as the lab may discard this fraction.</p>
 <p>60ml Glass vial</p>	<p>USED FOR</p> <p>Organics</p>	<p>SAMPLING GUIDANCE</p> <p>Vials should be taken in duplicate and kept cool wherever possible.</p>

SOIL

Sampling Requirements – Organic tests

Parameter	Container type	Storage conditions*	Stability before preparation (days)	Reference
BTEX, MTBE, GRO	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Carbonyls	Glass	Cool	7	USEPA Method 556 (1998)
Diesel Range Organics (C10-C28)	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Dioxins & Furans	Glass	Cool	365	USEPA SW-846 Chapter 4 (2007)
EPH (C10-C40)	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Formaldehyde	Glass	Cool	7	USEPA Method 556 (1998)
Glycols	Glass	Cool	7	USEPA Method 1671 (1998)
Herbicides	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Mineral Oils (C10-C40)	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Mineral Range Organics (C28-C40)	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Organotins	Plastic/Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
PAHs	Plastic/Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
PCBs	Glass	Cool	365	USEPA SW-846 Chapter 4 (2007)
Pesticides, organochlorine	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Pesticides, organonitrogen	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Pesticides, organophosphorus	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Phenol, steam distillable	Plastic/Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Phenols, GC/MS, HPLC	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
SVOCs	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
Total Organic Carbon	Plastic/Glass	Cool	30	ISO 18512 (2007)
TPHCWG (C5-C12)	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
TPHCWG (C12-C40)	Glass	Cool	14	USEPA SW-846 Chapter 4 (2007)
VOCs	Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)

Sampling Requirements – Inorganic tests

Parameter	Container type	Storage conditions	Stability before preparation (days)	Reference
Ammoniacal Nitrogen	Plastic	Ambient	7	ISO 18512 (2007)
Asbestos	Plastic	Ambient	Indefinite	ICRCL Guidance note 64/85
Chloride	Plastic	Ambient	30	ISO 18512 (2007)
Chromium, hexavalent	Plastic	Ambient	30	ISO 18512 (2007)/ USEPA SW-846
Conductivity	Plastic	Ambient	7	ISO 18512 (2007)
Cyanides	Plastic	Ambient	14	USEPA SW-846
Fluoride	Plastic	Ambient	30	ISO 18512 (2007)
Loss on Ignition	Plastic	Ambient	30	ISO 18512 (2007)
Metals (not mercury)	Plastic	Ambient	180	ISO 18512 (2007)
Mercury	Plastic	Ambient	28	USEPA SW-846
Nitrate	Plastic	Ambient	7	USEPA method 1685
Nitrogen	Plastic	Ambient	30	ISO 18512 (2007)
Organic matter	Plastic	Ambient	30	ISO 18512 (2007)
pH	Plastic	Ambient	7	ISO 18512 (2007)
Sulphates	Plastic	Ambient	30	ISO 18512 (2007)
Sulphides	Plastic	Ambient	7	USEPA SW-846
Sulphur	Plastic	Ambient	30	ISO 18512 (2007)
Thiocyanate	Plastic	Ambient	14	USEPA SW-846

Sampling Requirements – Suites

Suite	Number of containers		Storage conditions	Max holding time (days)
BRE suites (all types)	1 tub		Ambient	7
EA (NRA) Leachate suites	1 tub		Cool	7
Topsoil suite (BS3882)	2 tubs		Ambient	7
Terra Tek Soil Suite 1 (Mini)	1 tub	2 vials	Cool	7
Terra Tek Soil Suite 2 (Midi)	1 tub		Cool	7
Terra Tek Soil Suite 3 (Maxi)	1 tub		Cool	7
Terra Tek Soil Suite 3 +EPH	1 tub	2 vials	Cool	7
UKWIR suite	1 tub	2 vials	Cool	7
WAC – Inert	1 tub	2 vials	Cool	7
WAC – Stable non-reactive	1 tub		Cool	7
WAC – Hazardous	1 tub		Cool	7
WAC – Leachate only	1 tub		Cool	7



WATER

DO ensure containers are completely filled with the minimum of airspace.

DO provide a date of sampling.




DO keep samples cool wherever possible.

DO protect samples from light wherever possible.

DO NOT fill containers near a running motor or any type of exhaust system.

DO NOT rinse the containers with the water sample to be tested.

Container types

 <p>1000ml Plastic bottle</p>	<p>USED FOR</p> <p>Inorganics</p>	<p>SAMPLING GUIDANCE</p> <p>If the sample contains a large amount of sediment, additional bottles may be required.</p>
 <p>1000ml Glass bottle</p>	<p>USED FOR</p> <p>Organics Inorganics</p>	<p>SAMPLING GUIDANCE</p> <p>If the sample contains a large amount of sediment, additional bottles may be required.</p> <p>Bottles should be kept cool.</p>
 <p>40ml or 60ml Glass vial</p>	<p>USED FOR</p> <p>Volatile organics Glycols PCBs Formaldehyde (60ml)</p>	<p>SAMPLING GUIDANCE</p> <p>If the sample contains a large amount of sediment, additional vials may be required.</p> <p>Vials should be taken in duplicate and kept cool wherever possible.</p>

Sampling Requirements – Organic tests

Parameter	Container type	Storage conditions*	Max holding time (days)	Reference
BTEX, MTBE, GRO	Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)
Diesel Range Organics (C10-C28)	Glass	Cool	28	BS EN ISO 5667-3 (2012)
Dioxins & Furans	Glass	Cool	365	USEPA SW-846 Chapter 4 (2007)
EPH (C10-C40)	Glass	Cool	28	BS EN ISO 5667-3 (2012)
Formaldehyde	Glass (60ml)	Cool	7	USEPA Method 556 (1998)
Glycols	Glass	Cool	7	USEPA Method 1671 (1998)
Herbicides	Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)
Ketones	Glass	Cool	20	In-house validation
Mineral Oils (C10-C40)	Glass	Cool	28	BS EN ISO 5667-3 (2012)
Mineral Range Organics (C28-C40)	Glass	Cool	28	BS EN ISO 5667-3 (2012)
Organotins	Plastic/Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)
PAHs	Plastic/Glass	Cool	15	In-house validation
PCBs	Glass	Cool	365	USEPA SW-846 Chapter 4 (2007)
Pesticides, organochlorine	Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)
Pesticides, organonitrogen	Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)
Pesticides, organophosphorus	Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)
Phenols	Glass	Cool	21	BS EN ISO 5667-3 (2012)
SVOCs	Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)
Total Organic Carbon	Glass	Cool	28	USEPA SW-846 Chapter 3 (2007)
TPHCWG (C12-C40)	Glass	Cool	28	BS EN ISO 5667-3 (2012)
VOCs	Glass	Cool	7	USEPA SW-846 Chapter 4 (2007)
VPHCWG (C5-C12)	Glass	Cool	20	In-house validation

* samples will be stored at 1-6°C on receipt at the laboratory and preserved where necessary



Sampling Requirements – Inorganic tests

Parameter	Container type	Storage conditions	Max holding time (days)*	Reference
Alkalinity	Plastic/Glass	Cool	14	BS EN ISO 5667-3 (2012)
Ammoniacal nitrogen	Plastic	Cool	21	BS EN ISO 5667-3 (2012)
BOD	Plastic/Glass	Cool	1	BS EN ISO 5667-3 (2012)
Chloride	Plastic/Glass	Cool	30	BS EN ISO 5667-3 (2012)
Chromium, hexavalent	Plastic/Glass	Cool	28	In-house validation
COD	Plastic	Cool	30	BS EN ISO 5667-3 (2012)
Conductivity	Plastic/Glass	Cool	7	In-house validation
Cyanides	Plastic	Cool	7	BS EN ISO 5667-3 (2012)
Dissolved Solids	Plastic/Glass	Cool	7	BS EN ISO 5667-3 (2012)
Fluoride	Plastic	Cool	30	BS EN ISO 5667-3 (2012)
Hardness	Plastic	Cool	30	BS EN ISO 5667-3 (2012)
Metals	Plastic	Cool	30	BS EN ISO 5667-3 (2012)
Nitrate	Plastic	Cool	7	BS EN ISO 5667-3 (2012)
Nitrite	Plastic	Cool	1	BS EN ISO 5667-3 (2012)
Nitrogen	Plastic	Cool	30	BS EN ISO 5667-3 (2012)
pH	Plastic	Cool	7	In-house validation
Phosphate	Plastic/Glass	Cool	30	BS EN ISO 5667-3 (2012)
Sulphate	Plastic/Glass	Cool	30	BS EN ISO 5667-3 (2012)
Sulphide	Plastic	Cool	7	BS EN ISO 5667-3 (2012)
Sulphur	Plastic/Glass	Cool	30	BS EN ISO 5667-3 (2012)
Surfactants, anionic	Glass	Cool	2	BS EN ISO 5667-3 (2012)
Suspended solids	Plastic/Glass	Cool	2	BS EN ISO 5667-3 (2012)
Thiocyanate	Plastic	Cool	7	BS EN ISO 5667-3 (2012)

*** assumes samples will be preserved either on site or on receipt**

Sampling Requirements – Suites

Suite	Number of containers		Storage conditions	Max holding time (days)
BRE suites (all types)	1 plastic		Cool	7
Terra Tek Water Suite 1 (Mini)	1 plastic	1 glass	Cool	7
Terra Tek Water Suite 2 (Midi)	1 plastic	1 glass	Cool	7
Terra Tek Water Suite 3 (Maxi)	1 plastic	1 glass	Cool	7
Terra Tek Water Suite 3 +EPH	1 plastic	1 glass	Cool	7