EMSA | OIL SPILL SAMPLING SCENARIOS

Developed under the CTG MPPR

OIL SPILL SAMPLING SCENARIOS

INTERDISCIPLINARY PRACTICAL GUIDELINES ON OIL SPILL SAMPLING IN EUROPE

Developed by experts from EU/EFTA countries under the framework of EMSA's Consultative Technical Group for Marine Pollution Preparedness and Response (CTG MPPR)

A special mention to Mr Juan Carlos Arbex Sánchez for the technical drawings

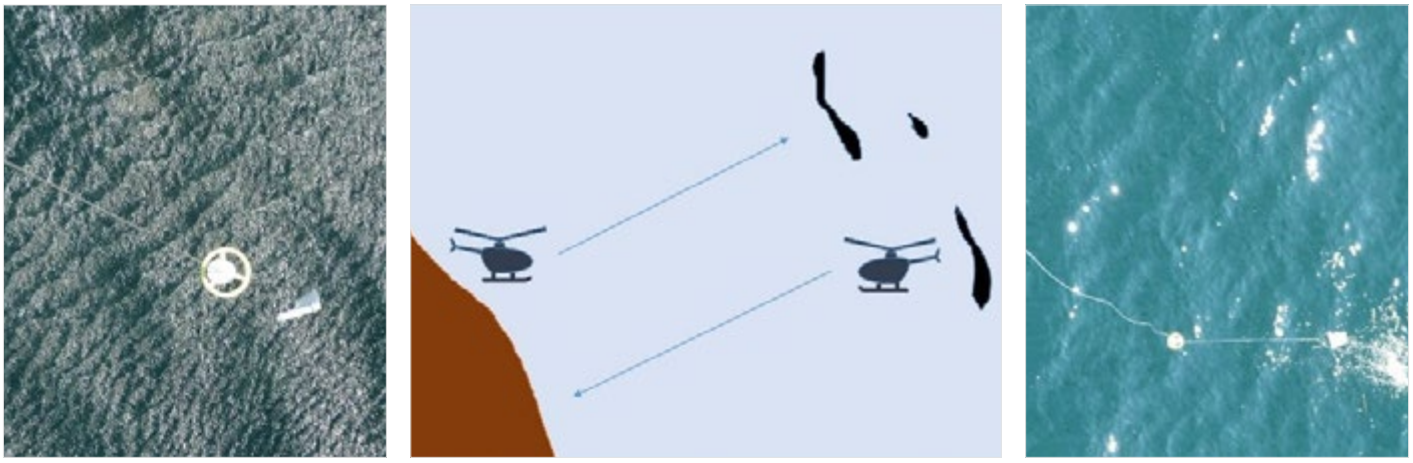
SCENARIO SAMPLING FROM HELICOPTERS

IMPORTANT NOTE

These scenarios are intended as a practical manual in the field. Please be sure to have familiarised yourself beforehand with the main text of the EMSA document "Interdisciplinary practical guidelines on oil spill sampling in Europe".

DEFINITION OF THE SCENARIO

Helicopters are capable of reaching remote areas like open-sea spill sites fast. This makes them ideal for both oil spill surveillance and sampling. However, sampling from helicopters requires special training of the flight crew. The helicopter must be positioned at a proper height avoiding any influence of the current from the rotor (downwash). In adverse wind conditions, the height of the helicopter should be lowered, as the rotor angle will move the flow pipe backwards.



Example of locations to be sampled

SAMPLING PURPOSES

Several purposes for sampling might be intended, these include:

- Characterisation of the oil and/or identifying the type of oil.
- Determination of the homogeneity of an oil spill.
- Determination of the degree of weathering of an oil spill.
- Determination of the source(s) of an oil spill.
- Providing evidence in criminal proceedings through the comparison of spill samples with samples of possible sources.

SAMPLING STRATEGIES

The sampling strategy for a case that is comparable with the given example could be:

- Decide on a sampling strategy before sampling starts. If necessary, coordinate your actions with other involved parties and other sampling strategies being used in the operation or at other sampling sites.
- Organise the sampling procedure so it progresses from the least contaminated to the most contaminated location to avoid cross contamination.
- Locate all possibly related geographically distinctive spill locations during all the days that the spill continues and include them in the sampling plan.
- Look for clues that can be an indication of the source of the spill. If potential sources are identified include them in sampling. Try to obtain samples of all potential sources for comparison with spill samples.
- Focus sampling on the areas of undisturbed, thick layers of oil (where possible).
- Also take samples from locations where the spill has a different visual oil appearance in colour or thickness of the layer, indicating e.g., different viscosity etc.
- Take representative samples of all geographically distinct spill locations during all the days that the spill continues.
- When a distinct spill site is large, take representative samples with maximum spatial difference covering the whole area.
- Take background samples during all the days that the spill continues or as appropriate.
- If a spill continues over a very long period (e.g. months), longer intervals between sampling might be appropriate in the latter stages of a spill.

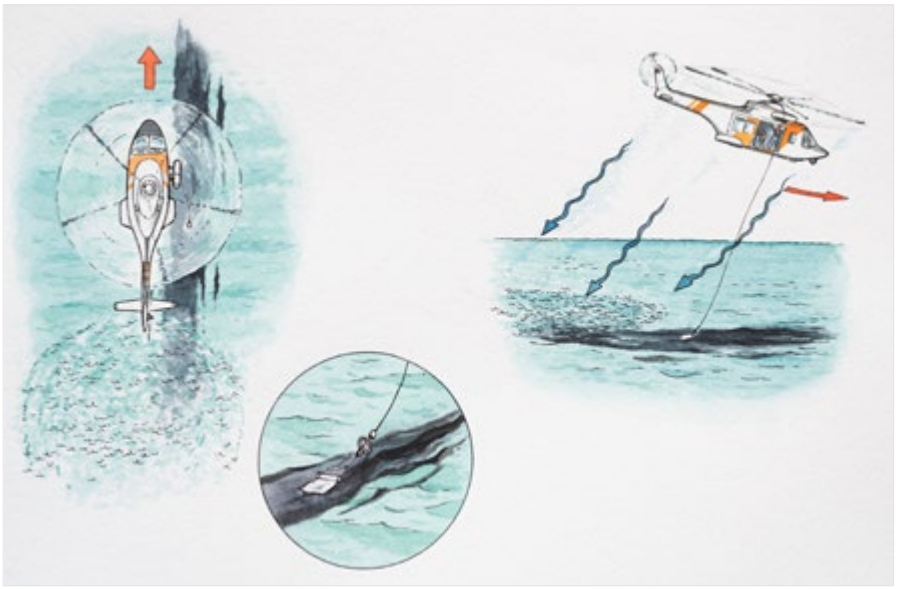
IMPORTANT NOTE

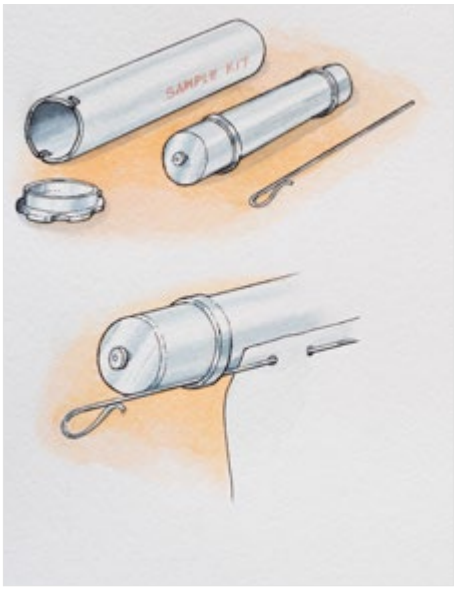
✓ **IT IS ADVISABLE TO TAKE MORE SAMPLES TO BE ON THE SAFE SIDE.**

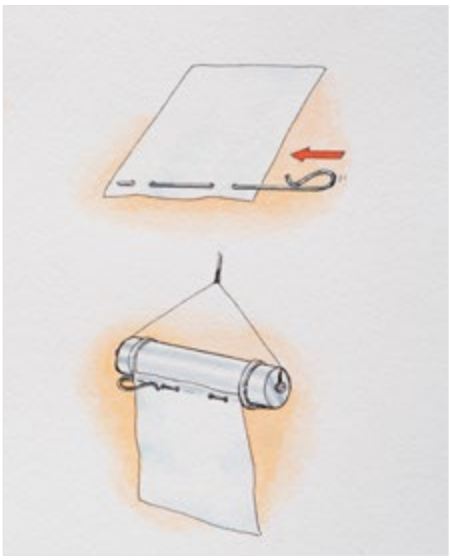
✓ **REMEMBER! THERE IS NO SECOND CHANCE FOR SAMPLING.**

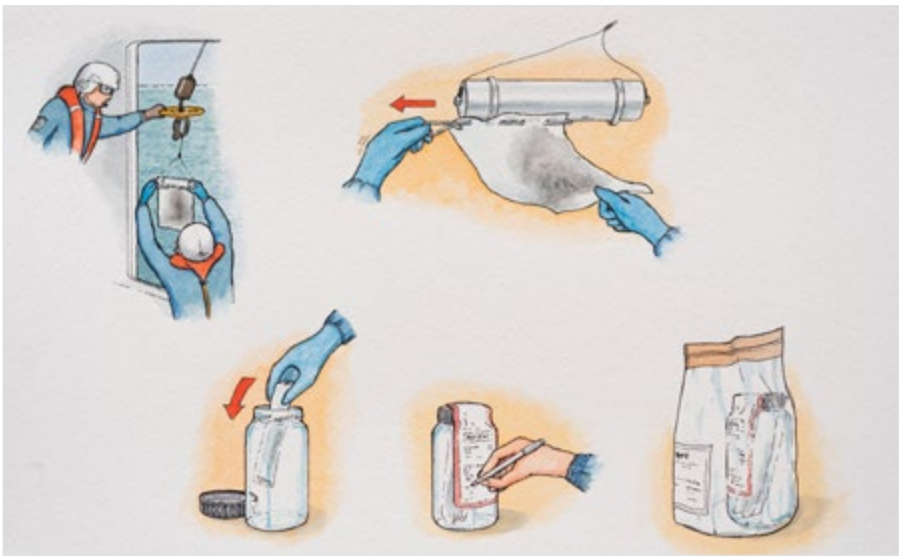
SAMPLING PLAN

Sampling plans are necessary tools for a coordinated sampling effort for a specific incident; they specify the locations and amounts of samples to be taken from the different pollution spots, from known and/or possible sources and from background areas, taking into consideration the available mobilisation of sample takers









SAMPLING EQUIPMENT

Nitrile gloves

Helicopter sampling device

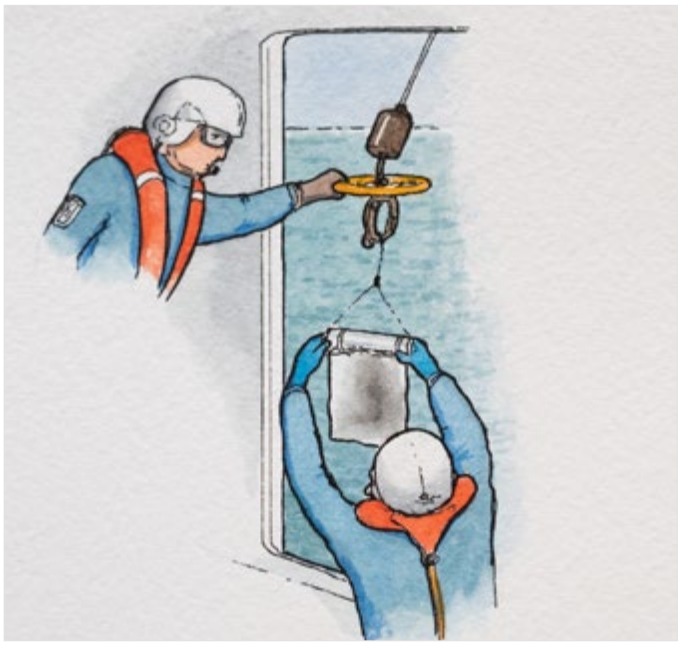
ETFE net

Glass bottles with inert lining in the lid

Sampling documentation and seals

Transport container (insulated and cooled, if needed)

If available: camera for photo/video



OVERVIEW OF POSSIBLE SAMPLING PROCEDURES TO USE IN THIS SCENARIO:

For oil layers on the water surface, the following technique should be used:

- Sampling by ETFE net, mounted on a helicopter sampling device

HOW AND WHERE TO SAMPLE (POSITION AND TECHNIQUE)

ETFE net

Use gloves and carefully connect the sampling device with the cable of the helicopter's winch. Lower the sampling device with the pre-mounted ETFE-net to the spill on the water surface and drag it through as much of the oil as possible. The sampling device will keep the net from sinking.

Lift the device from the spill back into the helicopter. Make sure that no oil from the winch comes into contact with the ETFE net attached to the sampling device.

Release the ETFE net from the sampling device and store the net in a clean sampling bottle with an inert lining in the lid. Prevent parts of the net becoming trapped between the mouth of the bottle and the lid, to avoid leaking.

Put the oiled sampling device carefully back into its outer container and close securely to prevent cross-contamination[1]. Prepare a clean device for the next sampling point.

[1] Used sampling devices should be cleaned separately at the lab before being reused.

KEYPOINTS FOR GOOD SAMPLING PRACTICE

For all optional sample procedures, the practical basic principles of forensic oil sampling apply

1. Personal safety - explosion or fire: Consider whether there is a risk of explosion or fire. High risk can be expected with fresh spills of crude oil and light fuel oils (lighter than diesel). Whenever there is high risk of explosion or fire due to the presence of highly volatile compounds, additional regulations apply.

2. Personal safety – toxic fumes: Oil spills can produce toxic fumes; use a suitable respiratory protection. Whenever possible approach the spilled oil from the wind direction limiting personal exposure.

3. Use disposable nitrile gloves for sampling. Change gloves for every new sample.

4. When using an ETFE net, put gloves on only directly before you touch the clean ETFE net and make sure to not touch anything else with the gloves to avoid contaminating the ETFE net.

5. While taking samples always work from the least contaminated to the most highly contaminated location to avoid cross contamination.

6. No spill is too small to be sampled. Even if you don't see oil on the ETFE net, it can be enough for analysis.

7. Always try to minimise the handling of the sample as much as possible to make sure that your handling of samples and equipment does not contaminate the samples. Look out for lids not to be contaminated during sampling and not to switch lids between samples.

8. Take care to not switch samples, label each sample at once after taking it.

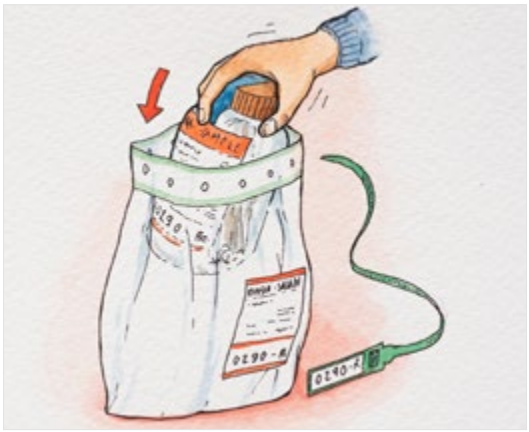
WHAT TO DO AFTER SAMPLING IS COMPLETED (SEAL, LABEL, TRANSPORT)

Sample documentation and labelling

- Carefully label all samples and fill in the required documents to maintain the chain of custody during transport and for the request for analysis.
- Check whether sampling has been properly completed according to the field checklist of table 1 of chapter 4 (main document: Interdisciplinary practical guidelines on oil spill sampling in Europe).
- At all times keep documents like the analysis request form and the chain of custody form together with the samples.

WHAT TO DO AFTER SAMPLING IS COMPLETED (SEAL, LABEL, TRANSPORT) (CONT.)

Transportation



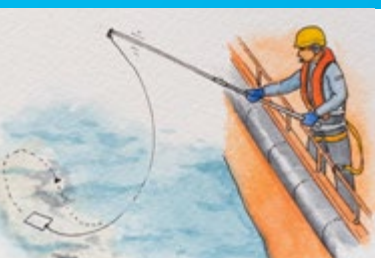
- Seal sample bottles and when appropriate, the transport box.
- Inform the laboratory ahead of delivery to prepare the controlled reception of samples.
- Transport samples to the laboratory directly after sampling. Keep samples in the dark and cooled (4°C) during transport.
- Make sure that the chain of custody is maintained by every responsible handler of the samples by ensuring the chain-of-custody forms are completed and signed.
- If you can, use a temperature logger in the transport box or cooler to prove proper transport conditions.
- Ensure that sample bottles are shatter-proof and are packed properly. If samples contain liquids, use absorbing material in the package to reduce the effects of leakage.
- Follow applicable regulations regarding the shipping of oil-containing samples.

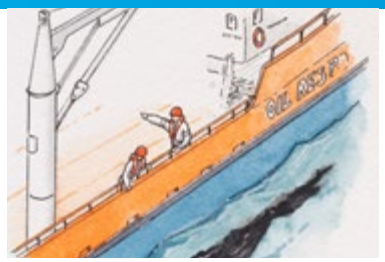
CAUTION

- ✓ THE (OILED) CABLE OF THE HELICOPTER'S HOISTING WINCH IS A POTENTIAL SOURCE OF CONTAMINATION AND EXPLICIT CARE HAS TO BE TAKEN THAT THE SAMPLING DEVICE AND THE ETFE NET DO NOT GET IN CONTACT WITH THE CABLE!
- ✓ USED SAMPLING DEVICES SHOULD BE CLEANED SEPARATELY AT THE LAB BEFORE BEING REUSED.

DON'T FORGET

- ✓ USE CLEAN NEW NITRILE GLOVES AND CLEAN TOOLS FOR EVERY SAMPLE.
- ✓ FOCUS SAMPLING ON THE AREAS OF UNDISTURBED, THICK LAYERS OF OIL.
- ✓ REMEMBER THAT THERE IS NO SECOND CHANCE FOR SAMPLING.
- ✓ IF IN DOUBT ABOUT DETAILS OF THE PROCEDURE, CHECK BACK TO THE MAIN TEXT OF THE OIL SPILL SAMPLING GUIDELINES.






ABOUT THE EUROPEAN MARITIME SAFETY AGENCY

The European Maritime Safety Agency is one of the European Union's decentralised agencies. Based in Lisbon, the Agency's mission is to ensure a high level of maritime safety, maritime security, prevention of and response to pollution from ships, as well as response to marine pollution from oil and gas installations. The overall purpose is to promote a safe, clean and economically viable maritime sector in the EU.

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