

# TEXAS ARCHEOLOGICAL SOCIETY

## SAMPLING FOR FLOTATION, POLLEN, PHYTOLITHS, STARCH GRAINS, VIBRATIONAL SPECTROSCOPY, AND CHEMICAL RESIDUES

These guidelines were compiled in Spring 2014 based on the references below, TAS flotation sampling in 2010, 2011, and 2013, and conversations with Linda Scott-Cummings, Laura Short, Marybeth Tomka, Alston Thoms, and Kevin Hanselka. Many thanks to all for generously sharing information and advice.

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### References

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## FLOTATION SAMPLING

### WHEN TO SAMPLE

#### High Priority Contexts

Visible Charcoal

Cultural feature (pit feature, post mold, occupation surface, burned rock midden, housefloor)

High integrity contexts (intact)

2 of these 3 characteristics are sufficient cause to take flotation samples

#### Low Priority Contexts

No visible charcoal

Context not interpretable (can't tell what it is or whether it's archeological)

Low integrity contexts (disturbed)

#### Control samples

Will be taken by the flotation crew and/or at the discretion of the Principal Investigator. Excavation crews need not take control samples unless specifically directed.

\*\*If a feature has discernable cultural strata or zones, each of those strata or zones should be sampled separately.

\*\*Extensive areas with visible charcoal such as sheet midden, housefloors, and non-central areas of burned rock middens may be subsampled on a grid system, with flotation taken (for example) from the southwest corner of every or alternate squares.

\*\*If charcoal for radiocarbon dating is removed from a flotation sample, items removed (and ideally the lot number) should be noted on the flotation sample. Otherwise, the sample will appear to contain less charcoal than was actually the case.

### COLLECTING THE SAMPLE

Flotation samples should be collected with as little disturbance to the soil as possible, ideally taken in a single shovelful from earth to bag. **12" x 12" bags** work well with the current TAS flotation system, and **gallon bags** will do in a pinch. If the flotation context is an intact, interpretable feature with visible charcoal, **fill 4 to 6 bags**. A 20 x 20 x 10 cm rectangle of soil should fit nicely into a 12" x 12" bag, and it's easy to draw on feature maps.

Samples should be double-bagged with a flotation label card placed between the bags.

### DOCUMENTING THE SAMPLE

Fill out the flotation card as completely as possible with special attention to **depth**. Map the location of flotation samples on unit plan and feature profile maps.

## FLOTATION LABEL CARDS

Field bags may be filled out and used as flotation cards. Alternately, this sample flotation card may be modified and reproduced on paper, cardstock or tyvek. Remember that paper-based cards should not come indirect contact with the soil sample.

Site #		Lot #
Area	Block	Trench
Unit	N	E
Level	Depth	Stratum/Zone
Feature	Portion	
Description		
Excavator		Date

## **SPECIAL SAMPLING**

### **Artifacts**

(Starches, Pollen, Phytoliths, Residues, Vibrational Spectroscopy)

Groundstone Tools

Earth oven elements > 10 cm

Tools (e.g., when pitches or waxes are evident on points)

Pottery (e.g., with evidence of cooking residue)

1. Expose tops only of the artifacts.
2. Wash your hands and clean your trowel. If possible, put on powder-free latex gloves.
3. Remove artifact from the soil with a layer of dirt around it (especially from under the artifact) and place in a new, labeled paper bag. Write on the bag with pencil, not Sharpie, to avoid off-gassing.
4. No food or smoking in the area during collection. Any food or smoking the day of collection should be noted on field forms.
5. Samples in paper bags should not be transported from the field in any container that also contains plastic bags or gloves.

### **Soil contexts**

Small subsamples from flotation will be reserved for pollen, phytolith, and other studies. Although this is not optimal procedure, it is often informative.

Crew members need not collect pollen and phytolith column samples unless specifically instructed. Usually these will be collected by specialists or their representatives in the field using the hand method described by Pearsall with additions from Scott-Cummings:

1. Wash hands and trowel and tie hair back.
2. Clean the profile and re-clean the trowel. Sample collection should be completed within ten minutes of exposing the profile.
3. Sample bottom to top, one stratum per sample. Contiguous strata of 2 cm or less are preferred.
4. Trowel should move across a single stratum.
5. Each sample should consist of ½ to one liter of soil collected in a sterile container.
6. Rubbing alcohol can be added to phytolith samples to discourage microbial activity, but this can damage pollen. Drying or freezing samples is preferred.
7. Clean the trowel between samples.
8. Map the sample locations.

## **CONTROL SAMPLES**

Unless other arrangements are made, soil control samples will be taken by the flotation crew prior to and during field school. Air samples should be taken by crews during collection of pollen or phytolith column samples or collection of artifacts for special analysis (e.g., manos or earth oven elements for starch grains). Artifact control samples should be taken by the crew that took the archeological artifact samples for special analysis.

### **Soil**

#### Flotation

Off-site at depths comparable to those from which cultural flotation samples will be taken

On-site in “sterile” areas between features

#### Phytoliths and pollen

Should be taken from near-surface soil (5-10 cm deep) prior to site disturbance for excavation. Take pinch samples from a 10 x 10 m area with special attention to leeward areas of rocks and areas with fine soil texture. Total soil collected should be approximately 50 g.

Artifact studies: residues, fibers, and starch, pollen, and phytolith washes

If sampling earth oven elements, collect off-site rocks using the same procedures. Dirt collected along with other artifacts is usually sufficient.

### **Air**

Microfossil, vibrational spectroscopy, and molecular studies

Other air samplers are available, but this is the most simple:

1. Line a sterilized petri dish with distilled water.
2. Leave it exposed to the atmosphere at the site for the duration of the artifact sampling procedures.
3. When finished, pipette the water into a test tube.
4. Seal and save to be sent along with sample for analysis.

### **Artifacts**

If earth oven elements or manos are collected from archeological deposits, off-site rocks of the same type should be collected as control samples using the Special Samples-Artifacts procedures described above.