REQUIREMENTS AND GUIDELINES FOR PREPARATION OF COLLECTIONS

FOR SUBMISSION TO
ARCHAEOLOGICAL RESEARCH INSTITUTE

DEPARTMENT OF ANTHROPOLOGY
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SECTION 1
INTRODUCTION

The Archaeological Research Institute (ARI) at Arizona State University, Department of Anthropology, is a repository established for the curation of federally-owned and administered archaeological collections. The ARI is contracted to curate in perpetuity the data and artifacts recovered by Central Arizona Project cultural resource projects conducted on the Tonto National Forest, according to established standards and procedures. Specific to this collection, the ARI provides for the long-term care and curation of archaeological materials, including artifacts, ecofacts, data, documents, and photographs recovered as part of Reclamation activities conducted within the boundaries of Tonto National Forest (TNF) in support of modifications to Theodore Roosevelt Dam and SOD projects on the Verde River. The ARI is a central Arizona Project repository (CAPR).

The Archaeological Research Institute (ARI) is administered through Arizona State University and the Department of Anthropology. Data and artifacts are accessible for research, publication, exhibition, education, and other purposes in conformance with policies and procedures outlined by the U.S. Department of the Interior, National Park Service, Cultural Resources (36 CFR Part 79, Curation of Federally-Owned and Administered Archaeological Collections).

The ARI, in consultation with a collection authorizing agency, such as the Tonto National Forest, or other, reserves the right to loan, conserve and authorize destructive analysis of such materials. Except for authorized destructive analysis, the ARI will not permanently dispose of any collections materials. Authorization for research access, loan, conservation, or destructive analysis of artifact collections being curated for Indian tribes must be obtained in advance, in writing, from the appropriate tribal authority or individual.

In serving as a qualified repository for the curation of federally-owned and administered archaeological collections, the ARI has a responsibility to implement a high standard of curation for such materials. Proper and systematic preparation of collections prior to transfer to the ARI is an integral part of ensuring this standard. This manual is provided for contractors doing cultural resource studies on federal land, or as part of federally funded contracts such as the Central Arizona Project, and should be used by all projects whose collections are destined for the ARI.

This manual is a revision of those guidelines provided at the commencement of the Central Arizona Projects prepared by the Central Arizona Project Repository (CAPR) at Tucson, Arizona (CAPR 1987; revised 1993). The content of the present ARI manual reflects many of the advancements of the field, particularly in collection preparation, conservation, data collection, data management, and transfer of electronic files.

The “Requirements and Guidelines for Preparation of Collections” contain the information needed to correctly prepare and deliver collections to the Arizona State University Laboratory for Archaeological Research (ARI). Each section may have up to three subsections: Background, Requirements, and Guidelines. Procedures required of the contractor are enumerated under the Requirements sections. The Background and Guidelines sections provide information on preferred methods of processing or commonly accepted curation standards which the contractor is encouraged to follow.

It is the responsibility of each contractor to ensure that all materials are properly prepared and delivered to ARI as detailed in these requirements. Assistance in complying with the described procedures is available at all times from the ARI staff. Consultation is encouraged, especially in dealing with conservation problems. A list of contacts follows:

ARI Director	Charles L. Redman	480/965-2975
ARI Curator	Arleyn W. Simon	480/965-9231

ARI Information Manager	James G. Ames	480/965-9231
Collections Manager/Curator (Dept. of Anthropology)	C. Michael Barton	480/965-6262

The nature and extent of materials that constitute a complete collection are outlined below. Topics covered in these guidelines relate to the materials and collections as they are prepared in the field and in the laboratory. The organization of collections is discussed as well as the preparation and transportation of collections. Materials that are incomplete or inadequately processed and documented may be refused.

1.1 - DEFINITION OF A COMPLETE COLLECTION

Collections deposited with the ARI must represent all information derived from the study that produced them in a form that is suitable for research and public interpretation. Originals of all materials generated by the contractor in the list below, shall be submitted for curation. When originals cannot be submitted, all copies shall be completely legible and shall be accompanied by a written statement explaining why copies are being submitted. All records shall be documented and processed according to ARI Requirements presented in this manual.

A COMPLETE COLLECTION is one that includes, but is not limited to:

1) SITE NUMBERS

A list of all Arizona State Museum (ASM) and other site survey numbers used in project reports and collections documentation and a master concordance of ASM numbers with any and all other site numbers used in the project records and documentation (such as Tonto National Forest Numbers, etc).

2) CONTRACT AGREEMENTS

All permits, curations agreements, or restrictions.

3) CORRESPONDENCE AND ADMINISTRATIVE RECORDS

All pertinent correspondence and administrative records,
such as those dealing with field or lab methodology,
use of or access to artifacts,
or anything pertaining to the materials generated by the project.

4) PAPERS DERIVED FROM AND GENERATED DURING A PROJECT

Research design
Archival or historical maps or materials related to project
Professional papers (copies)
Final reports (2 copies)

5) FIELD RECORDS

Field procedure manuals
Survey or excavation records
Field logs, journals, or forms
Project generated maps (hardcopies)

6) LABORATORY RECORDS

Laboratory procedure manuals

Laboratory analysis records
Specialized analysis reports and data

7) PHOTOGRAPHIC RECORDS

Prints
Contact prints
Negatives
Slides
Films
videotapes
Photographic logs (hardcopy)

8) OBJECTS (ARTIFACTS, SAMPLES, COLLECTIONS)

Artifacts	(ceramics, lithics, ground-stone, shell, historic, textile, wood, etc.)
Human remains and grave goods	(inhumations, cremations, miscellaneous, and accompaniments)
Environmental samples	(chronometric, faunal, pollen, macrobotanical, soil, etc.)

9) COMPUTERIZED DATA

Database and documentation of all files and structure
Final analyses that support reports
Inventories for all above categories
Project generated maps (computerized)

10) ARI SUMMARY FORMS AND INVENTORIES

ARI collection summary forms
Inventories for all above categories (hardcopies and computerized files)
computerized copies of inventories submitted under (9), above

Materials Destroyed or Released

Any materials *destroyed or released* during the process of analysis, as in radiocarbon or other samples, must be accounted for in the written documentation of the project.

It is the contractor's responsibility to see that collections analyzed by outside specialists are received by the ARI in conformance with the procedures outlined below.

Analysts are not permitted to retain specimens for their own collections, or arrange for curation of any materials other than at ARI.

There are two exceptions:

1) Retention of tree-ring specimens by the University of Arizona Laboratory of Tree-Ring Research
2) Retention by pollen analysts of their mounted slides (see sections 3.11 and 3.12)

The collections submission to ARI must contain inventories of any such samples, with identifying information about the laboratory.

1.2 - USE AND RESTRICTIONS

In general, archival materials are the property of the government, regardless of ownership of the artifact collections, and are considered to be freely available to ARI users and will be duplicated on request for a fee.

If part or all of the artifact collections or archival materials are to be restricted, the ARI requires a written statement explaining:

1) the reason for the restrictions,

2) the duration of the restrictions,

3) to whom the restrictions apply

4) the authority by which these restrictions are imposed

Restrictions may be imposed to prevent invasion of privacy, such as might be the case with oral history materials, or religious reasons.

SECTION 2
FIELD METHODS

Archaeologists are concerned primarily with the removal of materials from the ground, analysis, interpretations, and publication. Museum curators are concerned with the artifacts and records in perpetuity in a condition most appropriate for the longevity of the objects involved, as well as their possible future research use. Field and laboratory practices can have direct, sometimes negative, effects on the curation of specimens and records. In addition, research value may be lessened or negated by inappropriate or unnecessary treatments and handling. For these reasons, a conservative approach is recommended when dealing with archaeological objects in the field and laboratory. If there are questions concerning field methods, treatments or materials, contractors are encouraged to contact the ARI staff for clarification or suggestions, before going into the field, if possible.

2.1 - FIELD RECORDS

The ARI does not have requirements for general field forms and notes, however the following guidelines are highly recommended. These pertain primarily to the materials used for keeping field records, but labelling of field records is also addressed. The ARI requirements for the preparation of photographic records, maps and computer records are presented in later sections.

GUIDELINES

Field notes, or logs, and all field forms, including photographic logs, should be written on 8 1/2" x 11" paper. Undersized paper (old style federal government paper) and oversized paper ("legal size") is strongly discouraged. Other sizes of paper are acceptable if they are necessary, such as oversized graph paper.

White, acid-free paper is recommended for all forms and note paper. Use of colored papers is strongly discouraged because the inks that impart color to paper also increase its acidity and decrease its longevity. Black ink pens or #2 pencils are recommended for use on all notes. The use of colored pencils, pencils with very hard leads, and particularly colored markers, is discouraged. Photocopies of such records will not show fine pencil notations, color markers (especially yellow highlighters) rapidly fade or disappear, and color coded information is more difficult and expensive to copy.

Finally, it is highly recommended that every bound volume and every page of field notes include the following information: project name, site number, author/recorded and date.

2.2 - FIELD EXCAVATION

BACKGROUND

The environment of an artifact is abruptly changed as a result of excavation. For materials that may have undergone gradual deterioration in the ground this rapid environmental change may result in damage to the artifact. Some materials which appear sturdy upon excavation may deteriorate rapidly within the first few hours or days of excavation. Damage during this post-excavation period can be largely prevented by good handling techniques, controlling the environment, and providing adequate post-excavation transport and storage.

There are three basic types of deterioration that may occur with archaeological materials: (1) Biological agents such as insects, rodents, fungi, molds, and algae can cause great damage to both organic and inorganic artifacts. (2) Chemical deterioration results in changes in the chemical composition of artifact materials. The decay of organic materials in the soil can result in acidic by-products which are detrimental to bone and shell; chemical deterioration can also break down the molecular structure of vegetal materials or accelerate the corrosion of metals. (3) Physical deterioration includes breaks, cracks, tears, scratches and disassembly. Always keep in mind

that moisture, heat, light, and air accelerate may kinds of deterioration.

REQUIREMENTS

Prior to going into the field, contractors shall inform the ARI Curator, in writing, of the person(s) who will serve as an on-staff or on-call conservator for conservation consultations or treatments. A list of conservators can be obtained from ARI Curator.

For rare or extremely fragile finds, such as perishables, pieces of composite jewelry, or interments (e.g., macaws, other birds, domestic dogs), contractors shall contact their conservator or the ARI staff for guidance and take all possible steps to ensure safe removal and preservation of the objects.

Consolidants have deleterious chemical effects and may render specimens useless for many types of specialized chemical analyses. For these reasons, consolidants or preservatives shall not be used without prior consultation with the on-call conservator or with ARI staff. Such consultation should be done prior to the start of fieldwork and as special situations arise, and a consolidant selected for specified uses in the field can be kept on hand. Selection and use guidelines should be established with the advice of a conservator.

If any cleaning, consolidation, conservation or out-of-the-ordinary treatment is accorded to any artifacts in the field, a record of these actions shall be made at the time. If a specialist does the work, their notes should be part of the project records. Type of treatment, purpose of treatment, specific chemicals used, personnel involved, and any precautions to follow in future handling of the specimens shall all be included. This information is necessary to ensure the proper treatment of the artifact in the storage facility.

GUIDELINES

Flotation samples shall be double-bagged in heavy-weight paper bags, not plastic bags. This allows the sample to dry out, thereby preventing destruction of macrobotanicals by mold growth.

Pollen samples can be collected in either of two ways. (1) If the soil is very dry when sampled, previously unopened plastic bags ("whirlpaks", ziplock, or any polyethylene equivalent) are strongly recommended. New plastic bags are uncontaminated by pollen, and moisture which will promote bacterial and fungal growth and the destruction of pollen grains. (2) If the soil is damp or wet, or if the contractor has any question about the soil being too moist, the use of strong paper bags or envelopes is recommended. This allows the sample to dry out. When the sample is completely dry, place the unopened sample, bag and all, into a plastic bag as recommended in (1) above. Do not force-dry samples by heating; this too can destroy pollen grains. Although paper bags themselves can contain pollen (incorporated during the paper-making process), contamination can be removed or taken into account by modern pollen analysis techniques. It is more important that the samples be completely dry.

Fragile artifacts should be photographed *in situ*. The appearance of an artifact can lead to an assumption of structural stability or mechanical strength that may be unwarranted. Extremely fragile finds can be lifted in a block of their surrounding matrix without either plaster-jacketing (which may physically damage a specimen) or use of chemical consolidants (which may render specimens unsuitable for various chemical analyses). This would be done by what Sease (1987:29-30, Plate III) calls "Block Lifting Method 1" but without the plaster bandage. A specimen so packed can then be excavated in the lab under controlled conditions or sent to a conservator.

Fragile materials should always be kept out of direct sunlight and protected from extremes of temperature. Desiccated objects must be kept dry; place them in closed, but not sealed, plastic bags.

Wet objects should remain damp, or be allowed to dry slowly. They may be packaged in plastic, but do not seal them completely. A damp humid cloth or tissue can be used as a humicant to maintain the humidity level, but do

not wrap the object, and take care not to crush it, with the cloth. Arrangements should be made immediately for the material to be transferred to a conservator for treatment.

Fragile objects should not be wrapped or padded with cotton batting, toilet paper, or newspaper except in emergencies. Tissue paper, along with polyethylene or polyurethane foam, should be used instead. Fragile objects should not be packaged in paper bags, matchboxes, cigarette packets, or old envelopes; these are not particularly protective and can lead to confusion about their contents. Ziplock bags with perforations for air (if necessary), or suitably sized plastic vials or boxes are recommended.

When packing an object in a rigid container, add only enough padding to cushion the object. Too often, so much padding is jammed in that it crushes the object that is being "protected." Always transport fragile objects in sturdy boxes. Hand-carry these boxes to the laboratory rather than consigning them to the backs of trucks and the bumpy rides of carts or dollies (hand trucks).

Objects requiring special treatment should be clearly marked in the field, or laboratory processing procedures should be sufficiently rigorous to assure correct treatment of the objects after receipt from the field. These materials should be examined again, in the laboratory, within 48 hours of excavation, to determine if there is a need for treatment.

Stabilization of perishable and fragile materials should, in most cases, be performed by a conservator. In those cases where emergency conservation or stabilization must be performed in the field or analysis laboratory, the on-call conservator(s) for the project should be consulted immediately for advice.

SECTION 3
LABORATORY METHODS

Certain laboratory procedures that were routine in the past must be modified to ensure the stable, unchanged nature of materials for the future. A conservative approach has been recommended throughout this document. Frequently the long-term effects of treatments are not known by the technicians who apply them. Such treatments can destroy the scientific value of objects.

For example, the application of fungicides containing carbon compounds to organic materials will invalidate C-14 dates. Heat drying of wet ceramics can interfere with thermoluminescence (TL) dating and trace element distribution analysis. Heating iron objects over 400° C for thermo-stabilization procedures such as hydrogen reduction destroys the original metallurgical structure of the object. Consolidation of bone with organic resins will alter radiocarbon dates, and application of nitrogen-based glues and consolidants may invalidate nitrogen content measurements used for dating. Even "non-aggressive" treatments such as intensive washing to remove soluble salts from ceramics will also remove water sensitive material that was part of the original clay paste. Strong acids, applied inappropriately, will remove acid-soluble fractions in ceramic paste, as well as surface accretions and dirt, invalidating composition analysis often used for determining the prehistoric source of clay. Radiography, used to reveal previous repairs and methods of fabrication of ceramics, can also affect TL dating by giving too early a date.

These examples demonstrate the importance of minimal intervention in the treatment of archaeological materials. Perfunctory treatment procedures, such as routine washing, immersion in acid, consolidation of porous material, and removal of corrosion products, should be reevaluated in terms of the real necessity of treatment versus the danger of loss of information and long-range damage to the object.

3.1 - ARTIFACT CLEANING AND TREATMENT

REQUIREMENTS

Laboratory directors are required to submit along with the collection a complete laboratory manual that documents artifact treatment. Be sure to include a description of cleaning methods for each material type, labeling methods used, and what types of consolidants and adhesives were used and the method of application. All coatings, reconstruction adhesives and labeling methods must be reversible. Always specify concentrations of solutions used and the brand names of laboratory supplies. If certain artifacts receive treatment that differs from how the bulk of the collection was treated, submit this additional information in a separate section.

Materials shall be cleaned or washed only as required by research goals. All cleaning and conservation treatment of specimens shall be performed in a conservative manner. This is recommended both for the long-term benefit of the individual specimens and in anticipation of future analytical techniques that would be unusable on cleaned or chemically-altered specimens.

If it will not compromise research goals, contractors shall set aside some portion of uncleaned specimens of each artifact class for analysis by future researchers. Likewise, environmental and chronological samples are an integral part of a data set; if there are unanalyzed samples of these at the end of the project, they shall be submitted unprocessed to the ARI to be curated for future researchers.

ACID BATH FOR CERAMICS

If an acid bath is necessary to clean artifacts, they shall first be thoroughly soaked in fresh water. For ceramics this means soaking for at least half an hour prior to acid washing. This time can and should include a water wash to remove soil adhering to the surface. This soak time is necessary to saturate the body of the ceramic with water to prevent the acid from penetrating into the core and to buffer the initial acid contact. NEVER PLACE DRY CERAMICS INTO THE ACID BATH.

Hydrochloric acid (HCl), or its dilute form - Muriatic Acid (40% HCl), has been the traditional acid-bath of choice among archaeologists in the Southwest. However this mineral acid (along with nitric acid (HNO)) is quite aggressive and can often discolor ceramic paints and pastes, as well as dissolve significant proportions of both. Far more desirable is the use of acetic acid (vinegar - CH C OH). *Use of acetic acid is a contract requirement for CAP contractors.*

Contractors should obtain pure acetic acid and carefully dilute it to the desired strength of 3% to 5%.White vinegar (5% acetic acid) may be used if access to pure acetic acid is not possible. A 3% acetic acid solution can be achieved by mixing 1 part acid with 36 parts water, a 5% solution by mixing 1 part of acid with 18 parts of water. NEVER POUR WATER INTO ACID! ALWAYS ADD THE ACID TO THE WATER! Acid wash water may be stored in a large plastic bucket and can be reused a number of times, until its effectiveness is lost. Exhausted acid wash may be discarded as one would household vinegar.

It is recommended that the water source for the laboratory be tested for pH. Most ground water sources in central Arizona are highly alkaline (pH = 8-9). A 5% solution is recommended for such alkaline water sources. The water itself has a neutralizing effect on the acetic acid, reducing the strength of the final solution.

Place the water-soaked ceramics into the acid bath for several minutes. Note that an acetic bath does not “fizz” like muriatic acid, but it is still working. The amount of soaking time needed may vary depending on the amount of caliche (calcium carbonate) present. The soak time should be kept under 20 minutes. Sherds may be brushed with natural bristle brushes to facilitate cleaning. Thick, or hard, deposits on the surface that do not readily brush off should be left - these may be the result of residues or the effect of post-depositional sedimentation. Some of these effects are visible during washing and others appear as a “caliche bloom” during drying. These residues and deposits are part of the archaeological record and should be left in place. Repeated attempts to remove these residues may result in damage to the ceramic.

After the acid-wash, sherds must be given an initial water rinse to remove excess acid. Then the sherds should be soaked in fresh water for 15 minutes, the water changed and another 15 minute soak. The alkaline nature of the water source will neutralize the acid without adding additional substances. Following the two rinse soak cycles, the water is drained and the sherds can be placed on flats or racks to dry.

Contractors shall advise their special analysts that artifacts submitted to acid washes, (usually on ground-stone and ceramics for pollen washes using hydrochloric or nitric acid,) must be thoroughly rinsed afterward. For ceramics in particular, to avoid long-term damage to the clay body and vessel surface, soakings should be repeated as many times as needed to achieve a neutral pH. If the analysts fail to neutralize acid-washed artifacts, it is the contractor’s responsibility to do this prior to transferring materials to the ARI.

Washed objects are best air dried in the shade, if outdoors. If any type of ventilation system, fans, or heating system is used to enhance drying, it should be at room temperature, or less than 100° F.

If any artifact must be reassembled for analysis, use a reversible adhesive, that is, one that can be removed from the object if necessary. Commercially available adhesives are often unsuitable for reconstruction and conservation work. In general the recommended adhesives are *Paraloid B-72 and HMG*. B-72 is more stable long-term, but is

a little harder to use (forms "spider webs" easily). *HMG* is acceptable, but can become brittle over time. It is important to contact the ARI staff or a conservator for up-to-date information so that the adhesive chosen is appropriate to the artifact, long-lasting, and reversible. Under no circumstances shall CAP contractors use Duco Cement (TM), epoxies, or white glue for mending or reconstructing artifacts or bone.

Pottery, shell, bone and other materials that are weak or flaking or that have fugitive paint may need special attention. Dry organic artifacts of wood, basketry, textile or hide will almost certainly require special handling. Cleaning or stabilizing perishable and fragile materials shall be performed by a conservator. If reconstruction is deemed necessary for analysis, a conservator shall be consulted for appropriate methods and materials.

Finally, records shall be kept of all conservation performed on all specimens prior to their delivery to the ARI, including date of treatment, substance used, and personnel involved. A review of these records is essential prior to any future cleaning or conservation. Project lab manuals will serve as the record of treatment for routinely cleaned specimens. More detailed discussions of preferred routine treatments for ceramics, lithics, shell, bone, perishables, metal, samples and other materials are presented below.

3.2 - LABELING OF SPECIMENS

The ARI does not require the labeling of any specimens except oversize objects which do not fit in bags or boxes (see below). The contractor should insure that all individual bags or containers are properly labelled with project ID, site number, provenience, and specimen/bag number. If the contractor does label individual specimens, there are requirements for the materials used and for the manner in which it is done.

REQUIREMENTS

Labels shall consist of Field or Specimen numbers and the Arizona State Museum (ASM) site number. Use of other numbers shall be kept to the absolute minimum. A key to any codes used in labeling shall be provided with the collection, either as a separate file, or as part of the laboratory manual.

Labels shall be legible, small, neat, and unobtrusively placed. Whole ceramic vessels should be labeled near the exterior base. In general, artifacts should not be labeled where the label might be damaged in the normal course of storage, such as the very bottom of a metate or pot. Labels should not be applied over diagnostic or potentially informative features or attributes. Sherds, for example, should be labeled on the undecorated surface, and chipped stone artifacts on unflaked areas whenever possible. Bones should not be labeled on articular surfaces, tendonal attachments, or pathologies.

Perishable specimens, such as vegetal, fiber, feather, and hide objects, shall not be directly labeled. These types of objects shall be identified with labeled string-tie tags or carefully packed in acid-free tissue paper in labeled boxes. Very small artifacts, such as beads and fine lithic debitage, need not be labeled directly, but should be placed in clearly labeled boxes or vials, or small archival quality plastic bags; label the body (not the lid) of such containers.

Oversize and very heavy objects, regardless of whether they can be labeled directly, shall be additionally identified with an acid-free card-stock tag that is tied to the object with cotton string. Oversize historic metal and wood objects, and heavy ground-stone objects, generally need this type of labeling. The tag shall be placed so it can be read without moving the object. Loop the cotton string around or through the object as necessary to ensure that the string will not slip off. Metal rim tags, labels on flagging tape tied to an object, and labels attached with wire will not be accepted.

All tags shall be of acid-free card stock. All string shall be cotton. Plastic or paper coated metal twist-ties are not recommended, as the coating will deteriorate and the metal can react with the object. In addition, the sharp point of

the metal can damage the tagged or adjacent artifacts. If the contractor has any question about the use of the twist-ties, or any other aspect of labeling or tagging, contact the ARI staff.

There are two methods of labeling artifacts which are used depending on the situations described below: direct labeling of artifacts and the "sandwich" technique. There are advantages and disadvantages to both techniques.

For small and repetitive labels, such as individual artifact numbers on sherds or lithic debitage (for example, within a specimen bag with no other information on the label), direct labeling may be the most expeditious. Direct labeling on the artifact is permanent and so must be done legibly, unobtrusively, and as small as possible. Direct labeling is best done with a permanent, black, extra-fine tip sharpie marker. Do not use regular markers, or sharpie's as the tips are too blunt. India ink applied with a fine tipped pen may be used, but is discouraged because of the risk of accidental smudging and ink drops onto the artifact. Use a rapidograph type pen for India ink to avoid these problems. These pens work well on smooth lithic surfaces, but do not work well of porous or rough surfaces, such as ceramics and ground-stone. Use standard American numbers, not European numbers with extra cross bars and slashes. The numbers 6 and 9 must have an underscore to distinguish them.

For longer labels, such as those including site and specimen numbers, etc., the sandwich technique allows more information to be applied in a small space. The advantage of this technique is that it is removable. However, labels applied in such manner have been known to come off of artifacts and crumble to dust in the bottom of the bag. As insurance, label the containing bag with as much relevant information as possible. It is best to have a clean, dry surface, free of dust and dirt, on which to apply the label. Apply a light layer of a dilute solution of acryloid (paraloid) B-72 (*use of clear nail polish is discouraged because many types are unstable, shrink and flake*). After the base coat is completely dry, the label can be applied. Black india ink is required for the labeling of most specimens; do not use felt-tipped pens. Dark specimens may be labeled with white ink. *Do not use white typing correction fluid or paint to prepare a label surface on specimens.* Very coarse material, such as vesicular basalts, may be labeled by using a small artist's brush and black or white ink, as appropriate; otherwise, rough or porous surfaces should be prepared for labeling with one or more light applications of polish or B-72, until a sufficiently smooth area for writing has been achieved. Then labels should be protected by a light application of clear polish or B-72 atop the label after the ink has thoroughly dried, so as not to smear the ink.

3.3 - CERAMICS

REQUIREMENTS

Contractors should consider the outlay of money and time needed to wash ceramics to prepare for the needs of analysis. In many cases, analysis can proceed on the majority of the ceramics with minimal water washing and the least invasive acid wash (i.e., dilute acetic acid). Pottery should not be routinely washed in either water or acid, without saving some samples that are untreated. Such treatment may inadvertently remove evidence pertaining to vessel use, such as soot, fugitive paints, pollen and other vessel contents. Washing precludes any future analysis related to these attributes. Unfired ceramics, architectural daub, raw clay, and wasp nests should not be washed.

GUIDELINES

The ARI prefers that broken ceramic vessels be reconstructed only when demanded by the particular analysis. If reconstruction is necessary, people with previous experience mending pottery should do the work and reversible adhesives will be used (such as Acryloid B-72 or HMG). Tape will almost always pull paint or polished surfaces away from the paste, and must not be used in reconstructing pots.

Of all artifact classes, pottery is the one most often reanalyzed by subsequent researchers. Contractors are encouraged to set aside representative samples (both washed and unwashed) of the ceramic assemblage to be curated for future research. Selection of the samples should be based on as many variables as is feasible and should

follow the classification scheme used for discussion in the final report.

3.4 - LITHICS

REQUIREMENTS

Contractors should consider the outlay of money and time needed to wash lithics to prepare for the needs of analysis. In many cases, analysis can proceed on the majority of the lithics with minimal water washing. Acid washes should be used only when calcium carbonate obscures the flaking patterns and then the least invasive acid wash (i.e., dilute acetic acid) should be used. Dense deposits should not be removed.

Water washes, and especially acid washes, should not be a routine practice for either chipped or ground stone, and certainly not for mineral specimens, without saving untreated samples of these classes. Tool-use analyses related to pollen, oxylate crystals, shell dust and other plant and animal residues, and micro-wear analyses can be precluded by perfunctory washing of all lithics. Never acid wash calcareous artifacts, fossils, or mineral specimens.

Rubber cement is often used in the reassembly of cores and flakes to determine lithic reduction sequences. Such reassemblies should be disassembled and cleaned at the end of the analysis. Rubber cement is unstable and its long-term deterioration produces deleterious chemicals. If it is desirable to maintain these artifacts in a reassembled state, contact the ARI staff for guidelines.

3.5 - SHELL

GUIDELINES

If possible, shell should be dry brushed, rather than washed. Lab workers should be alert to the possibility of painted and etched shell, or shell intended for etching that retains traces of the resist material, as well as shell which had overlay attached with lac or pitch. In these cases, even dry brushing may remove pigments or other substances. Extreme caution and a very conservative approach are advised.

3.6 - FAUNAL MATERIAL

REQUIREMENTS

Bone is easily warped, split, or cracked by alternating wet and dry conditions. For these reasons, it should not be washed or wet brushed, but rather dry brushed. Bone should never be exposed to direct sun or heat once it is removed from the ground. Do not place damp bone in sealed containers as this encourages the growth of mold. Take care to pack fragile bone in padded, rigid containers. A dilute consolidant such as Acrysol may be used to strengthen the bone. This may be applied in the field during excavation or in the laboratory during cleaning.

Perishables must be handled with care and any treatments should be appropriate to the material and its condition. Careful dry-brushing should be the only treatment of animal perishables, including leather and rawhide, horn, sinew and hair, both prehistoric and historic (such as shoes, harness). Never use cleaners or consolidants. While they may enhance the short-term physical appearance of the object, all of them have known long-term deleterious effects.

3.7 - HUMAN REMAINS

REQUIREMENTS

Human remains shall be treated in a respectful manner. They shall not be displayed during excavation or in the field laboratory during public tours, nor shall they be publicly discussed outside of scientific gatherings unless approved by the contractor's Project Director.

The physical treatment of human remains should use a conservative approach. Cleaning and preservation treatments should be done only when necessary. Excavated bone must be allowed to dry out slowly and out of direct sunlight. All human remains shall be stored in high-security conditions both in the field laboratory and during analysis. If any questions arise concerning appropriate methods of excavation, cleaning, handling or storage of human remains, contact the ARI staff, or the project's on-call conservator.

INHUMATIONS

Skeletal remains shall be cleaned as gently as possible, by dry- or (if necessary) wet-brushing, rather than washing. Any dirt present in the medullary cavity should be left in place, as cleaning will damage the grabecular structure of the bone. After the bone has dried, if stabilization is to be done at all, an acrylic resin adhesive such as PVA (polyvinylacetate) or Acryloid B-72 shall be used. Emulsions should not be used to consolidate dried bone.

Acrosyl (in 1 - 2% solution) may be used to enhance the strength of fragile bone in the field applied as a spray or with a pipette. This solution may also be used in the lab as part of a standardized program of cleaning. The Acrosyl remains pliable and so allows further cleaning and removal of soil during study. The procedures should indicate which skeletal part is to be left untreated for the potential of chemical or other analyses. This may be the ribs, patellae, or a designated long bone. These bones should be bagged separately, labelled as untreated, and reserved for possible future chemical analysis.

If the bones are to be labelled, all pieces (larger than a 25 cent coin) shall be labelled with the ASM Site Number and the burial provenience. Labels are to be done with India ink between clear protective applications of Acryloid B-72. Whenever possible, labels should not be placed on the articular surfaces of any bone, nor on the outer table of the skull.

Skeletal remains will be packaged carefully in standard size boxes, either the standard size ARI box, or longer boxes specifically designed for this purpose. Bones must be padded well with acid-free tissue paper to prevent any damage during transport. New ziplock polyethylene bags will be used to contain smaller pieces, including all unlabeled pieces. Special care must be taken to separate and protect the cranium from the post cranial remains (with a special sized box, if possible) inside the larger box.

CREMATIONS

Cleaning of cremated human bone shall involve only the separation of osseous material from the dirt. Neither water nor graduated screens shall be used in this process. No stabilization or direct labeling of bone should be done. After hand-separating the bone, the remains shall be bagged in new polyethylene bags and labeled with all appropriate provenience information. Again, care must be taken in packing these remains for transport.

3.8 - UNCARBONIZED WOOD AND OTHER VEGETAL PERISHABLES

REQUIREMENTS

Like animal perishables, vegetal materials must not be washed, consolidants should not be used, and the materials should be kept dry and safe from insect attack. Uncarbonized wood (both prehistoric and historic) is subject to termite infestation, both in the field and in the laboratory. If perishable materials need cleaning or conservation, contact the on-call conservator, or the ARI staff, for advice.

3.9 - METAL

REQUIREMENTS

Both prehistoric and historic metal artifacts should never be washed because water will accelerate corrosion. Do not use chemical treatments or cleaning solutions. Any cleaning or stabilization, other than dry-brushing, should be performed by a conservator. Gloves should be worn when handling metals to avoid deposition of salts and oils from hands onto the object.

3.10 - FLOTATION SAMPLES

BACKGROUND

At present, flotation samples commonly consist of about 4 liters (two 8-pound bags, each two-thirds full) of soil. However, samples of smaller size from important contexts may be saved. Samples of larger size are acceptable if there is some reason to believe rare or important materials are present.

REQUIREMENTS

Selection of Samples for Curation

Archaeological residues from all processed flotation samples, whether analyzed or not, shall be saved for curation. Unprocessed float samples shall be culled by the contractor prior to transferring a project collection to the ARI. All samples from burial contexts, floors, and hearths shall be kept for curation. From other types of features, the contractor should select a representative sample for curation. Only 20 percent of unprocessed samples collected from stripping units, and the upper fills of structures and features should be kept for curation. A complete record shall be kept of which samples were discarded.

Processing and Bagging of Samples

Unprocessed flotation samples shall be double-bagged in heavy-weight paper bags for strength and to allow moisture to evaporate. Newspaper should not be used for either storage or drying because of its acidity and ink. After processing, the various flotation fractions will be stored in new ziplock polyethylene bags (note ziplock sandwich bags are not made from archivally acceptable plastics). Make sure the contents are completely air dried prior to the bag being closed. Do not oven dry samples, as this can damage carbonized remains. Punching holes in these bags to prevent condensation is not practical because of the potential for contents to fall out of the holes. The label from the original field bag should be placed inside a second zip-lock bag, and this placed inside the bag holding the processed sample (such that it can be read without opening either bag). Alternatively, all provenience information could be written on the polyethylene bag with a permanent marker, although saving the original field labels is still required.

3.11 - POLLEN SAMPLES

BACKGROUND

In the laboratory, the primary concerns for storing pollen samples are two: keeping the samples dry and keeping the samples uncontaminated by modern pollen. Requirements for bagging pollen samples in the field appear in Section 2.2.

GUIDELINES

Consultation with several pollen analysts has produced different views concerning the best way to prepare pollen with long-term curation in mind. As with flotation sample residues, preserving materials from a project for reanalysis by future researchers is desirable. Contractors should have their pollen samples analyzed in a liquid glycerin preparation. Ortho-phenylphenol should be added to inhibit growth of microorganisms. Mounted slides may be kept by the analyst or discarded. Glycerin jelly and silicon oil preparations are discouraged because of difficulties in their preparation or use by the analyst and concomitant problems for their long-term curation.

REQUIREMENTS

Any unprocessed soil from the original pollen sample and any prepared, but unmounted, liquid solution shall be retained for curation by the ARI. Unprocessed pollen samples shall be culled by the contractor prior to transferring a project collection to the ARI. All samples from burial contexts and floors shall be kept for curation. The contractor will select a representative sample from other types of features for curation. Only 20 percent of unprocessed samples collected from stripping units, and the upper fills of structures and features should be kept for curation. A complete record shall be kept of which samples were discarded.

3.12 - CHRONOMETRIC SAMPLES

GUIDELINES

Archaeometric Samples

Samples saved for archaeomagnetic studies should be stored on wooden (rather than metal) shelves, as far away as possible from any large metal objects (wheelbarrows, pipes, large machines). Although it is common to store archeomagnetic plaster cubes with all the labelled faces up, to randomize any magnetic realignment that may occur, it is recommended that these cubes be stored in various orientations. Both analyzed and unanalyzed cubes and samples shall be turned in to the ARI for curation.

Dendrochronology and Radiocarbon Samples

For both tree-ring specimens and radiocarbon samples the primary concerns are to keep the specimen dry and, for radiocarbon samples, uncontaminated by modern dust. Do not store these materials in plastic bags or other sealed containers. Well-closed paper bags or aluminum foil are best.

Thermoluminescence Samples

Any materials collected for thermoluminescence testing should be collected with a sample of the surrounding matrix and stored in polyethylene bags. Samples should not be exposed to excessive heat or light. For detailed information on the collection and care of thermoluminescence samples see Joukowsky 1980:449-450.

REQUIREMENTS

Prior to transferring any chronometric sample to a laboratory for analysis, a "Collections Released" form must be completed. This form must include an itemized list of sample numbers with provenience data for all samples submitted to the laboratory. The contractor will obtain the signature of a representative of the laboratory, to acknowledge that the itemized samples were received. Archaeomagnetic and thermoluminescence samples should be retrieved from the analysis lab and submitted with the rest of the project materials. In the event that materials cannot be retrieved from the laboratory, the "Collections Released" form *with the signature of the laboratory representative* may be submitted in place of the materials. The ARI Curator will then contact the laboratory directly to arrange for transfer of the outstanding materials. In the event that a "Collections Released" form was not completed, the contractor will be held responsible for retrieving any outstanding materials. See Chapter 5 for additional information on procedures for handling collections released for analysis.

At present, materials submitted by contractors for tree-ring and radiocarbon analysis are the only materials which are not curated by the ARI. Tree-ring specimens are curated by the Laboratory of Tree-Ring Research, University of Arizona, and radiocarbon samples are destroyed in analysis. "Collections Released" forms must be submitted by the contractor for all such materials not submitted to the ARI.

3.13 - OTHER MATERIALS AND SPECIALIZED ANALYSES

A host of historic materials, including glass, plastics and rubber, has not been specifically discussed. For these, and some of the more exotic prehistoric materials, such as lac, pitch and rubber, or guayule, simply return to the rule of this section: be cautious and conservative in their treatment, and if questions arise, contact your on-call conservator, or the ARI staff for advice.

A variety of specialized analyses were also not discussed. Recovery and examination of phytoliths, oxylate crystals, stone pressure flakes, ostracodes, snails, shell dust, and parasites may be included in collections. Again these same rules apply.

Field and lab workers should remember that the same soil taken for pollen or flotation analyses can be put to these and other analytical uses later. Although unprocessed flotation samples are often considered a curatorial headache, in fact, they should not be discarded by the contractor unless the samples have contamination or provenience problems that would render them unsuitable for any sort of analyses in the future. If soil samples are discarded, a record shall be made of which samples were discarded, when, and the reason for discarding them.

Any materials recovered by or produced by specialized analyses shall be submitted to the ARI for curation, including such things as voucher specimens, slide mounts, and thin-sections. Centralized curation of the entire database from a project is essential to future research on the collections. (see Section 5).

SECTION 4
PREPARATION OF ARTIFACTUAL MATERIALS FOR CURATION

Federal and state preservation legislation has contributed to the rapid growth of cultural resource studies and an accompanying growth in archaeological collections. At the same time, developments in archaeological theory and methodology have resulted in changes in the ways researchers use these collections. Materials that once were studied and discarded are now routinely saved and subjected to various kinds of analyses. It is now commonplace for archaeologists to retain essentially 100% of the artifactual materials they collect.

All these factors impose new standards for the curation of archaeological collections and their accompanying documentation. The ARI is committed to curating these collections in such a way that their potential as sources of information and public enjoyment will not be impaired. At the same time these materials must be made accessible in a manner that is consistent with their responsible use.

4.1 - ORGANIZING PRINCIPLES

BACKGROUND

The ARI organizes its archaeological collections into three basic categories:

1) Research Collections, including Special Collections,

2) Archives (see Section 6 for organization of archives), and

3) Computer Files and Documentation (see Section 6.5 for organization of computer files).

Each category is characterized by different patterns of use and by different requirements for access, storage, and documentation. Within the first category (Research Collections including Special Collections), materials are generally organized by 1) artifact class/material type, 2) artifact class/material subtype (e.g., bulk lithics separated from projectile points), and then 3) site number and further provenience. In other words, the collection should be organized into separate boxes by material type, subtype, and site number.

This approach is predicated on two factors. First, there is a need to store different materials under conditions appropriate for their long-term preservation. For example, organic flotation sample residues, susceptible to damage by extremes of temperature and humidity, will be stored in an environment with more rigorous climate control than is needed for chipped stone. Second, many researchers request a particular material type or artifact class, rather than all artifacts from a particular provenience.

As each project will present specific, unique problems of organization, only general procedures are offered in the following sections. When questions arise, contractors are urged to contact the ARI staff for assistance. These procedures are designed to standardize the organization of collections as much as possible among federal contractors.

REQUIREMENTS

Upon completion of analyses and the illustration and photography of all necessary specimens, project collections shall be organized according to the categories and organization scheme noted above and as follows:

Research Collections (including Special Collections)

Research collections include all bulk artifact and sample collections. These materials will be divided into material types, or samples types, and organized by provenience (by ASM site number, minimally) with these types. Contractors will keep like materials in the same or sequential boxes.

For example, the first 50 boxes from a project could all be for ceramics, the next 40 boxes for flaked-stone, then 20 boxes for ground-stone, 30 boxes for unprocessed flotation samples, 5 boxes for unworked animal bone, 10 unboxed pieces of oversize ground-stone. If more than one site is involved, the boxes shall be sequenced by ASM site number within each artifact class/material type.

The order of the material or sample types in the research collections box sequence should follow the order on the ARI box label (see appendix for sample box label).

Please note that "special collections" should be pulled from the various material types for boxing in the special collections category prior to the organization and boxing of the research collections. These collections will be organized according to the same organizational principles as the rest of the research collections.

Sample of Research Collections Organization:

Boxes 1-3	Ceramics from site AZ U:8:23
Boxes 4-6	Ceramics from site AZ U:8:400
Boxes 7-10	Ground Stone from site AZ U:8:23
Boxes 11-13	Ground Stone from site AZ U:8:400
Boxes 14-17	Chipped Stone from site AZ U:8:23
Boxes 18-20	Flotation Samples from site AZ U:8:23
Boxes 20-21	Pollen Samples from site AZ U:8:23
Boxes 22-24	Pollen Samples from site AZ U:8:400
Box 27	Oversized Ceramic (partial vessel) from site AZ U:8:23
Items 26-28	Unboxed Ground-stone (oversized) from site AZ U:8:23
Items 29-30	Unboxed Ground-stone (oversized) from site AZ U:8:400

Whole or reconstructed ceramics should be included in Special Collections. Any oversized boxes of ceramics or other material not classified as special collections will be placed at the end of the research collection sequence as noted above.

Special Collections (included in Research Collections)

Special Collections will include all human remains, all whole or reconstructed vessels, all artifacts illustrated in reports and any materials of particular research or economic value or any artifacts of a particularly fragile nature. These latter categories will include all perishable artifacts (basketry, wood, or textile), all diagnostic tools (such as projectile points) and all jewelry such as shell, or stone pendants, or bracelets. Other materials included in special collections may include trade items (such as obsidian, or turquoise) or unusual, or highly decorated items such as copper bells, carved stone bowls, or slate palettes.

Special Collection: Human Remains and Associated Grave Goods

All human remains and associated grave goods are considered special collections. Feature, inhumation or cremation numbers, must be noted for all human remains and associated grave goods. Associated grave goods must be boxed in an accompanying sequence of boxes with related human remains and must be separated from the remainder of the collection.

Should human remains and associated grave goods be retained by the contractor for repatriation following NAGPRA negotiations with the contracting agency, a full inventory of such material must accompany the collection documentation, including and "items released" form.

Should human remains and associated grave goods be included in the total project collection turned over to ARI, this special collection must include a detailed inventory and record of feature association of artifacts with the human remains to facilitate potential future repatriation.

Special Collection: Tools and Fine Goods

An inventory of the box location of illustrated artifacts will accompany the collection including information from the contractor's report format (volume, chapter, and illustration #). These items may be included in other boxed research or special collections (e.g., boxes of projectile points, etc.)

The remaining special collections will be organized according to the scheme described for research collections, with oversized special collections at the end of the sequence.

Sample of Special Collections Organization:

Boxes 31-37	Human Remains/Associated Materials from site AZ U:8:23
Box 38	Human Remains/Associated Materials from site AZ U:8:400
Box 39-40	projectile points from site AZ U:8:23
Boxes 41-43	special ceramics from site AZ U:8:23
Boxes 44-45	agave knives from site AZ U:8:23
Boxes 46-48	reconstructed ceramics from site AZ U:8:23
Boxes 49-50	reconstructed ceramics from site AZ U:8:400
Boxes 51-52	perishable artifacts AZ U:8:23 & AZ U:8:400
Boxes 53-54	fine goods, all sites
Boxes 55-58	oversized ceramics (whole and reconstructed vessels)

Numbering

Boxes of project materials need to be numbered in a single sequence, with each number unique within the collection. Note that there is to be only one Box # 1, Box # 2, and so forth for each project. As noted in the previous examples, numbering will begin with research collections and continue through special collections. The listing of box numbers should account for all numbers in the sequence. If any are voided, these numbers should be marked as such on the master list of box numbers.

Boxes of archival material will follow special collections and be numbered in the same sequence as the rest of the collection. Map tubes should be numbered as items in the consecutive box sequence. These should be added to the "Boxed Collections Inventory Form" (see Section 4.2 for a discussion of this form).

4.2 BOXED COLLECTIONS INVENTORIES

BACKGROUND

Standard forms for the inventory of collections are necessary to ensure that all the information and documentation accompanying collections is preserved. These forms document the occurrence of specific materials in a collection and identify their location for easy retrieval. These inventories will provide the base from which ARI staff will generate more detailed inventories for in-house use.

In the current age of computerized databases, inventorying should be an integral part of the collection and database management of the project. Electronic listings of the project inventory can be readily adopted for in-house use at the ARI and will facilitate access to the collections and verification of the contents.

Computerized collections inventories are mandatory and should be accompanied by manually produced collections forms or computer generated listings. The box inventory must be sorted and produced in two formats to allow a cross-check of the collection:

1) sorted by Box Number and Specimen/Bag Number, and

2) sorted by Specimen/Bag Number and Box Number.

If a contractor plans to maintain a computerized database of collections for tracking, analysis or synthesis purposes, box inventories may be generated from this central database. However, it is recommended that contractors design the database at the outset with this purpose in mind so that all the necessary inventory information is included in the database. The structure and content of collections inventories are crucial to the management of collections transferred to the ARI. Contractors are encouraged to contact ARI staff for assistance in developing appropriate inventory databases.

REQUIREMENTS

A “Boxed Collections Inventory Form”, or a printout from the contractors database with equivalent information must be completed for each box of material transferred to the ARI. Each individually packed oversize item shall also have a copy of this form prepared for it. Indicate the total number of bags in each box in the space labelled “# items in box.” Remember to indicate which material type/subtype the box contains and for which site. Under “Material Type” select a term from those on the sample box label as explained below:

Research and Special Collections:

Type		Subtype	
1	Ceramics	1.1	Ceramics - bulk
1	Ceramics	1.2	Ceramics - whole vessels

Type		Subtype		
1	Ceramics	1.3		Ceramics - special (modeled clay artifacts, spindle whorls, disks, unusual pieces fired and unfired clay samples and artifacts)
2	Lithics	2.1		Lithics - bulk (debitage, etc.)
2	Lithics	2.2		Lithics - special (Projectile points, tabular knives, hammerstones, etc.)
3	Ground-Stone	3.1		Ground-Stone - bulk
3	Ground-Stone	3.2		Ground-Stone - special
3	Ground-Stone	3.3		Ground-Stone - oversized
4	Human Remains	4.1		Human Remains
5	Faunal bone	5.1		Faunal bone - bulk
5	Faunal bone	5.2		Faunal bone - special (artifacts)
6	Shell	6.1		Shell - bulk
6	Shell	6.2		Shell - special (artifacts)
7	Ethnobotanical Samples	7.1		Pollen
7	Ethnobotanical Samples	7.2		Macrobotanical
7	Ethnobotanical Samples	7.3		Flotation Samples
8	Soil	8.1		Soil Samples
9	C-14, Charcoal	9.1		C-14, Charcoal
10	Archaeomagnetic		10.1	Archaeomagnetic Samples
11	Wood	11.1		Dendrochronological Sample
11	Wood	11.2		Wooden Artifact
12	Basketry		12.1	Basketry
13	Daub/adobe	13.1		Daub/burned daub/adobe
13	Daub/plaster	13.2		Daub/plaster fragments

Type		Subtype	
14	Architectural element	14.1	Architectural Stones
15	Metal	15.1	Metal-bulk
16	Glass	16.1	Glass - bulk

Other categories of material that have been separated for analysis, such as all obsidian artifacts, or all turquoise artifacts, may be listed as a special lithic collection. Other classes of special collections within major material categories may include: axes, abraders, tabular knives, pigment, ornaments, and projectile points. Consult the ARI staff regarding questions concerning special collections within the Research Collections.

Boxed Collections Inventory Form

A individual Boxed Collections Inventory Form, should be present for each box, material type category and site. Spaces are provided at the top of the form for noting box number material type and site #. The site number should be listed in the "ASM Site #/Name" blank at the top of the page. If other site numbers are used they must also be noted. It is preferred that the contractor generate inventory forms from a database. Material type and site number must be included on the inventory form, either as additional categories in the body of the form or as part of a page heading like that of the ARI form.

Within each box and material type, artifacts are further defined within the column labeled "object." The object category will provide the artifact type or name such as projectile point, biface, sherd, bone awl, pendant, etc. Contractors will use their own categories to identify artifacts at this level. Object names may be general artifact types assigned at the time of field collection or more specific identifiers assigned by analysts. How terms are selected for use as object names must be explained in the Contractors laboratory manual, database documentation, and the use of these terms must be consistent throughout the project.

Field Numbers, or Sample Numbers, or Specimen Numbers, are entered in the "BAG#" column. In the "PROVENIENCE" column enter feature numbers and/or structure numbers, point locations are not required. In the "COUNT" column, enter either actual counts of individual objects, or some indication of quantity. For example, a bag containing 47 sherds should be entered as"47".

The identifaction of illustrated specimens may be listed separately, including box # information and the appropriate Volume, page, or Figure, or Plate numbers, from project reports and publications.

The contractor shall submit THREE complete hardcopy sets of the "Boxed Collections Inventory Form" to the ARI:
1) one set should be divided up and placed inside the appropriate boxes.
2) the second set will be part of the project archives and must be included in the archive documents.
3) the third set (two copies) will be used as a working copy by the ARI and the contractor will submit this set with the completed curation forms (see Section 7 for a discussion of curation forms). One copy will be sorted by Box Number and Bag/Specimen Number and the other copy will be sorted by Bag/Specimen Number and Box Number.

Research and Special Collections

The "Boxed Collections Inventory Form" provides a space for noting site number and material type and subtype. Inventories created from a database should designate in a heading or separate column which category the materials belong to. All items (bags or separated artifacts) listed on the inventory, including all Research or Special Collections, will include provenience information.

4.3 - PACKING

REQUIREMENTS

Boxes and Box Labels

All materials that will fit must be packed in standard ARI cardboard boxes. These boxes measure 8 inches tall, 8 inches wide and 20 inches front to back. They are made of 200-pound Kraft cardboard and are assembled by folding. The lid is attached to the body of the box. No glue or tape is used in box construction. A sample box may be obtained from ARI on request.

Box labels must be stamped directly onto the box with permanent ink. The contractor can have either his own box label, or that of the ARI (see appendix for box label), printed in black ink on one end of the box by the manufacturer. If the contractor chooses to use their own box label the information and organization must closely resemble that of the ARI label.

Information on where to order boxes and box samples are available from the ARI. If the contractor needs 200 boxes or more, they must order them directly from the manufacturer. If smaller quantities are needed, arrangements can be made to receive boxes from the ARI.

Organization

As noted above, the organization and boxing of materials from a project should be done first by separating them into material types/artifact classes and subclasses, such as ceramics, chipped stone, ground-stone, bone, shell, glass, metal, and so forth, and then separating them in order by site and then intrasite proveniences, or specimen number.

Different material/specimen types are not to be boxed together, so that any given box should contain only one type/subtype of material separated by site. The only exception to this procedure is when too little material was collected to justify separate boxing of either sites or materials. In these cases the contents of a box should be clearly identified, and, if necessary for the protection of the materials involved, packed in smaller boxes within the standard ARI box.

Oversized Objects

Large ceramic vessels (or other oversize items) that will not fit into a standard box should be packed into a sturdy box of suitable size. Large ground-stone artifacts that are too heavy for boxing, or will not fit in the standard box, should be wrapped in cushion foam (ethafoam) with a paper box label attached. The contractors label for the object should provide Project Identification, ASM Site Number, specimen number and provenience information and should be wrapped with the artifact (inside the foam). Each oversized item should be given an item number that is part of the box number sequence (see sample of numbering for research collections in Section 4.1).

Samples

Unprocessed flotation (and other types of soil) samples shall be double-bagged in heavy-weight paper bags. If the bags are torn or have holes, they shall be replaced prior to transfer to the ARI. Mending with tap will not be accepted. Processed flotation samples shall be packed in new ziplock polyethylene bags. Unprocessed and processed pollen samples shall be packed as described in Sections 2.2 and 3.11.

Packing Materials

If padding is needed when packing individual artifacts, or artifact bags in boxes, it is recommended that crumpled tissue paper or polyethylene cushion foam be used. Non-buffered, acid-free tissue is recommended for packing organic materials, including shell and bone, while regular acid-free tissue paper is acceptable for pottery and delicate stone objects.

Padding is often needed for boxes of Research or Special Collections, especially bone, shell, fragile artifacts, and reconstructed vessels. Likewise, heavy materials (such as ground-stone) should be padded to prevent abrasion to their surfaces, and breakage from hard contact during transport.

Some packing materials are not acceptable for long-term storage, but may be useful for transporting oversize or very heavy objects to the ARI. If foam peanuts are used, they should not come in direct contact with an object. Place the object in a polyethylene or paper bag, or wrap it in tissue or polyethylene cushion foam. Bubblepak is acceptable only as a temporary packing material for short-term transport; the plastic is non-archival, and the bubbles eventually loose their air and provide no cushion whatsoever to an object. However, several wraps of bubblepak or cardboard are probably the best way to cushion large groundstone objects. If bubblepak is used for this purpose, these objects should be packed just prior to transport. Cushion-pak may be used for padding between ceramic vessels and other delicate objects for transportation.

Printed paper stock, such as newspaper and old computer printouts, shall not be used because of the danger of transfer of ink to objects. Newsprint is also quite acidic, which is damaging to a variety of materials. Likewise, cotton batting shall not be used; it attracts pests and moisture and can snag on artifacts, pulling off delicate surfaces or parts.

SECTION 5
COLLECTIONS RELEASED FOR ANALYSIS

REQUIREMENTS

Materials released for any reason to another department, laboratory, individual analyst, or institution shall be documented with a ARI "Collections Released Form." The form shall be prepared in duplicate, with one copy accompanying the materials, and the other copy being retained by the contractor.

The situations and required actions related to collections released for analysis are presented below. All analyzed materials shall be submitted to the ARI for curation. These collections include all human bone and related grave goods, unless otherwise allocated through NAGPRA agreements with the contracting agency. Other categories that are often studied by specialists include: faunal bone, botanicals, pollen, shell, archaeomagnetic, XRF, obsidian hydration, thin sections.

Analysts are encouraged to sort out and separate materials that should be maintained as representative or unique specimens; however, these specimens will be curated at the ARI as part of the contractor's special collections. Analysts shall not retain any project materials (archaeological or modern) for their comparative collections.

MATERIAL RELEASED FOR ANALYSIS

If the analysis is completed, and the material is returned to the contractor before the project is completed, the material shall be placed with the Special Collections, and all relevant data, reports, photos, maps, etc., clearly identified and differentiated from the rest of the archival materials.

If the analysis is completed, and the material is returned to the contractor after the project is completed, the contractor must forward the material to the ARI with its accompanying documentation, including a completed "Collections Released Form."

If the analysis involves the partial or complete destruction of the material, the contractor should note on the form whether there will be any materials returned, and if so, will it need any special storage facilities (e.g., must it be stored in alcohol, or is it radioactive?). The contractor is responsible for the delivery of the material to the ARI.

If the analyzed material is to be retained by the laboratory performing the analysis, the contractor must thoroughly document this material and explain why the material is being permanently separated from the main body of the project material.

NOTE: at present, the only permissible examples of this situation are the release of tree-ring specimens to the Laboratory of Tree-Ring Research, and retention of mounted pollen slides by the analyst; no other retention of specimens by analysts is allowed.

SECTION 6
PREPARATION OF ARCHIVAL MATERIALS FOR CURATION

All CAP (Central Arizona Project) project documentation is the property of the Bureau of Reclamation, regardless of the ownership of the artifactual materials. It is the contractor's responsibility to provide the ARI with original copies of all paper documentation, photographic materials, and maps identified with a complete inventory. Contact the ARI staff regarding any questions about the organization or culling of archival materials.

6.1 - PAPER DOCUMENTS

BACKGROUND

At the ARI, paper documents, photographic materials and maps are organized by project and stored in archival boxes, folders and sleeves. Inventories and finding aids for these materials are maintained by the ARI.

Paper documents must be organized in a consistent, and logical manner compatible with indexed fields in any electronic catalogs that accompany them. Any and all criteria used to sort paper documents (fiscal year, locus, site number, feature number, etc.) must be identified and indexed in the accompanying inventory catalog, in both electronic and paper form.

GUIDELINES

Paper documentation submitted to the ARI shall be organized in a logical manner, for example: by the project working order, by chronological order, or by site number order. Contractors must specify the organizational order of the paper documentation.

REQUIREMENTS

All archival materials submitted to the ARI shall be clearly labeled. The individual parts or sections of the material must be clearly marked, with subject matter and authorship adequately identified. A written explanation of the arrangement must accompany the inventory of the material.

If materials are submitted in 3-ring binders, these binders shall either be of the cloth-and-cardboard type, or, if of plastic, shall have a sheet of acid-fee paper at the front and back. This is necessary because plastic binders pull the ink off printed forms.

Computer Printouts. The contractor is responsible for culling their computer printouts. The ARI requires the final version of a printout, not all copies leading to the final version. For example, we do not want the copies of printouts used for editing. Label the printouts with a title and a date.

6.2 - PHOTOGRAPHIC MATERIALS

BACKGROUND

All original photographic materials: negatives, prints, slides and photograph logs shall be transferred to the ARI. The ARI must have the most complete set of documentation available. The only original images that the contractor may keep are those which are identical to the set submitted to the ARI. Any images that the contractor wishes to retain shall be copied at the contractor's expense. Contact the ARI staff if you have questions regarding photographic materials.

GUIDELINES

Processing and handling of photographic materials should be done in a stable environment, avoiding excessive heat, dust, humidity, or chemical contaminants. This work should not take place near the artifact processing areas of a contractor's laboratory. Lightweight, 100% cotton gloves should be worn when sorting, numbering, and filing materials, to protect the film emulsions from dirt and oil on the hands.

Contractors should process their photographic materials into appropriate archival quality storage materials as soon as possible. Storage pages will protect photograph materials better than the boxes and envelopes that the developers use. These pages should be stored away from light and dust.

Contractors may use their own photographic log or use the one supplied by the ARI. Electronic files that contain the photo log are preferred and should be accompanied by original hardcopy records and a printout.

REQUIREMENTS

Black-and-white negatives are considered the primary archival record for archaeological projects. Due to the chemical instability, color film shall be used in project documentation only as a supplemental record.

Organization

Contractors will record one roll of film per photo log. Organize photographic materials by the assigned roll number, keeping the prints and the negatives together with their corresponding photo log. If the photo collection is extensive, three sets of notebooks may be used: 1) photo log, 2) negatives, and 3) prints. All three should be organized in roll number order. It is strongly recommended that each image have an identifier: a roll number and exposure number.

Labeling

Assign roll and exposure number using a soft-lead (#2) pencil in the upper right-hand corners for prints, contact sheets and slides. Slides and negatives should be labeled on the non-emulsion side (the non-emulsion side is the side from which the image is correctly oriented and the film surface is shiny). Negatives should be labeled with a rapidograph and India Ink. Alternately, labeling for negatives may be done on the archival negative sheets.

Storage

Photographic materials should be transferred into archival photo sheets. These are transparent polyethylene or polypropylene pages or contractors may use triacetate, or polyester (i.e., "Mylar," "Melinex") storage pages. Polyvinyl chloride (PVC) pages will not be accepted by the ARI, and shall not be used by the contractor under any circumstances, even for temporary storage.

Culling

The contractor is responsible for culling redundant, irrelevant, and poor quality images. DO NOT cut negative strips or contacts sheets. To "cull" these materials draw a diagonal line through the image from corner to corner and NOTE ON PHOTO LOG. Do not label "culled" images.

Documentation

Photograph logs will be accepted in handwritten and computerized form. The problem most consistently encountered in photo logs is their brevity. Contractors are encouraged to construct a form with plenty of space for identification of the subject and the following completed information.

a. the contractor's name and the project name.

b. the size (35 mm, 120 mm, 2 1/4 x 3 1/4, 4 x 5) and type (b/w, color slide, color transparency) of film.

c. date.

d. an identifier for each exposure; a combination of roll number and exposure number.

e. site number and corresponding prefix or suffix, for example, AZ T:16:85 (ASM), AZ BB:4:76 (ASU), NA18, 003.

f. identification of the subject of the photo.

List proveniences, loci, feature numbers. If a relationship is being shown, indicate what that is, e.g., "Feature 32 inhumation pit intruding through the floor of the Feature 9 pithouse;" which direction the camera is facing (e.g., N, S, E, W, SE, NNW: camera can also be identified as looking "down" or "up" in conjunction with a direction: "SE and down"); the people in the photo, especially if they are being used to identify proveniences, e.g., "Fred Jones standing in Feature 32 inhumation pit, with Georgia Smith sitting on floor of Feature 9 pithouse;" the size of the scale, if scales are include in the photo. If an arrow (or trowel, pocketknife, etc.) is included to indicate a direction or an object, identify what that direction is (e.g., N, S, NNW, etc.) or what the object is (e.g., "knife points to projectile point in ribs"). If mug boards are used, make sure any abbreviations used in them are explained, either on the photo log, or in an accompanying key.

g. full name of the photographer.

Developing

Photographic film should not be submitted for "overnight" or "1-hour" developing. This process is inferior to standard developing, and will shorten the life of negatives.

Special groups of photographs and corresponding negatives should be kept together with their documentation. These would include such things as aerial photos, the negatives of artifact photos taken for publication, record shots of artifacts, analyzed materials (e.g., sherds for thin-sectioning, microscope photos of pollen grains, seeds, use-wear on lithics, etc.), conservation record photos, or slides prepared for public presentations (photos, charts, maps).

6.3 - MAPS

BACKGROUND

All maps generated and used shall be submitted as a complete collection to the ARI. This includes field maps; photocopies, inked copies, and blue-and black-line reproductions of USGS "quad" maps; regional and project area maps; survey and excavation maps; collection grid maps; profiles; and construction right-of-way maps. Contact the staff at the ARI if you have questions concerning maps.

GUIDELINES

Maps are usually produced with pencil or ink on a variety of papers. Use of high quality mapping papers is strongly recommended. Remember color-coded maps do not reproduce on most photocopying machines. Efforts should be made to keep maps clean and in good condition.

REQUIREMENTS

Use large sheets of paper when making maps to avoid having to tape together smaller sheets. Tape eventually dries up and falls off. If smaller sheets are used, draw "match lines" on the various parts. If pieces must be taped together, or if tears must be repaired, a variety of acid-free, water-activated or adhesive paper and linen tapes are available. All are relatively inexpensive, and far superior to using masking tape, scotch tape, or other commercial tapes.

Maps will be documented with the following information:

a. name of cartographer

b. date the map was drafted.

c. scales, both drawn and written.

d. directional arrows (usually true and magnetic north)

e. a key or legend to all symbols used.

f. points or lines which reference the map to its coordinate system

g. provenience identifications, such as site numbers (with their institutional suffix), feature numbers, grid numbers, and site names.

h. project name, contract number, and contractor's name.

In addition to the information required for each individual map, an inventory consisting of a complete list of all maps shall accompany the collections.

Provide documentation of the defined coordinate system used to produce the project maps. If the map is based on a *published* USGS map sheet, citation of the sheet by name, series and publication date is adequate.

Projection information should accompany each individual map - it's not necessarily the "site" datum that is needed, but the datum used for the particular map. If this is repetitious on a number of maps, attach an explanations sheet and reference it by name. For example, define the AZ U:8:24 (ASM) grid in full requested detail on one sheet, then reference maps as being on that grid. Provide the path and filename for the electronic source of the map, if any.

Otherwise, full documentation of a coordinate system includes:

1) identification of the datum by name or by delta offsets from a well-known datum such as WGS84,

2) identification of the ellipsoid by name or by values for the major and minor sub-axes, and,

3) name and relevant parameters for the coordinate transformation, such as zones, false eastings/northings, etc.

Colloquial, or generic, reference to “UTM” or “State Plane” coordinates without citation of the relevant USGS sheet or projection parameters information does not adequately document a map’s projection.

If data are projected using arbitary plane coordinates, the grid origin and axes must be referenced to a standard coordinate system documented as above. Indicate units of measurement for the axes.

6.4 - FINAL REPORTS

The ARI requires two copies of the Contractor’s final report and any other reports containing project data not included in the final report.

NOTE: The final reports supplied to Reclamation and the ARI by the contractor do not satisfy the contractor’s obligation to supply the Arizona State Museum with two copies of the final report, as stipulated in the contractor’s permit.

CONTRACTORS MUST DIRECTLY SUPPLY TWO COPIES OF THEIR FINAL REPORT TO THE ARIZONA STATE MUSEUM PERMITTING OFFICER.

6.5 - COMPUTER DATA

BACKGROUND

The ARI considers computerized data an essential component of the research collections from modern archaeological projects. Making these data accessible in the long-term is vital and can be facilitated by contractors. Data files also are expected to be in a variety of proprietary file formats created by assorted software programs. It is crucial that the magnetic media and the data files submitted be thoroughly documented.

REQUIREMENTS

The long term viability of electronic information can be ensured only through upgrading its format and refreshing the medium upon which it is written. It is the responsibility of the contractor to submit such data in a form that will permit ARI to read, translate and maintain this information in a form compatible with future developments in computer technology.

Electronic files will be imported onto ARI media in the current standard formats for the repository. Once the data format, content, and integrity have been verified against the accompanying documentation, notification of receipt will be released. The actual media on which the data are transferred to ARI will be retained, but do not satisfy the contractor’s responsibility if they cannot be read and/or imported.

Contractors are requested to fill out a general **Electronic Data Submission Form** well in advance of the anticipated transferral date. For large collections, it is strongly encouraged that this form be accompanied by a small, representative set of data prepared with the formats and media that the contractor proposes to use so that compatibility can be verified in advance.

All contractors using machine-readable information stored on magnetic media shall provide:

1) the latest versions of all proprietary data files

2) electronic versions of those data files, and

3) documentation of the above.

MEDIA

FTP file transfer

The preferred medium for submission of electronic data is via direct FTP transfer to ARI's server. For contractors with this capability, a directory and password will be established prior to transfer and a schedule for transfer and verification of files will be arranged.

Physical Media

Floppy disks

For contractors without Internet access, or for smaller databases, ARI can accept standard 3.5" 7M DS/HD DOS or Macintosh floppy disks, or Zip Disks.

CD-ROM

Larger databases may also be submitted on CD, provided the contractor has the capability to master the disks in an industry standard format.

External Hard Disk

A portable external SCSI hard drive compatible with current Microsoft Windows or Macintosh operating systems may be brought to the repository for direct transfer. Removable disk media such as Zip Drives are supported.

Tape

The ARI can accept Quarter Inch Tape (QIC) cartridges and 4mm Digital Audio Tape (DAT) cartridges. Be aware that devices and software vary in how they format these media and document what was used.

Other Media

Obsolete media such as punch-cards, 9-track tape, 8" or 5-1/4" disks, should be avoided as they are no longer supported. Contractors wishing to use any other medium should contact ARI to verify support prior to preparing their materials.

Compressed Archives

Data files may be compressed to reduce transfer time or floppy disk space. Three compression formats are supported - PKZIP, GZIP (both of which will work in DOS/Windows or Unix) and Stuffit (Macintosh). Shareware utilities for these compression formats are widely available on most software archive sites or may be obtained from ARI (be aware that the contractor is responsible for purchasing the appropriate license(s) for these programs). Other compression formats including commercial backup software such as Fastback, Restrospect, Central Point, Arcada, Norton and MS-DOS/Windows Backup may not be supported.

Uncompressed Archives

Some archival formats do not compress data, but can facilitate the use of portable media by gathering a large number of files into one single file that may be streamed over several disks/tapes. Tape Archive Record (TAR) format is a standard on most Unix systems and is accepted. MS-DOS BACKUP.EXE, which once served a similar function in MS-DOS, is no longer supported and cannot be accepted.

Data Files

Modern computer databases are often made up of an interrelated set of tables - a two-dimensional array of data expressed as columns (fields) and rows (records). Because tables contain information relevant to different levels of organization, the content, structure and articulation of each table must be explicitly documented. The ARI will curate all electronic data files in a common database format.

Proprietary File Formats

Proprietary data formats are convenient because they carry information about the structure of the data within the header of the file, thus ensuring the data are read correctly. ARI currently has the ability to import data files from a large number of common commercial data formats. Supported formats include:

Format	Description	Remarks
dBase	Borland relational database	Versions II, III, IV
Foxpro	Microsoft relational database	Versions 3.0, 2.x
Foxbase	Fox relational database	
Sybase	Sybase relational database	
Microsoft Access	Microsoft Office integrated database	
Paradox	Borland relational database	
Lotus 123	Lotus spreadsheet format	all versions
Lotus Symphony	Lotus integrated spreadsheet	
Microsoft Excel	Microsoft spreadsheet format	all versions
Framework	integrated spreadsheed format	
SPSS	SPSS statistical package	portable, Windows
SYSTAT	Systat statistical package	all versions
SAS	SAS statistical package	all versions
MapInfo	MapInfo data table	all versions

Many other formats may be compatible with one or more of the above formats. Contractors should verify the acceptability of any format with ARI prior to preparation of their files for submission.

ASCII File Formats

If one of the above formats cannot be used, the contractor should export data to an ASCII (TEXT) file. ASCII typically are structured two ways:

Delimited

Delimited ASCII files use a reserved character, usually a comma, space, or tab character to separate the columns. In addition to the documentation requirements specified below, the contractor should indicate what character is used as the delimiter, and whether or not field names appear as the first row of data in the table.

Card Image

Card image data, or fixed-length records, have field data written in predetermined columns with no delimiting characters. In addition to the documentation requirements specified below, the contractor should indicate the beginning and ending column for each field in the file (e.g. , SITE 1-10, NORTH 11-15, ...etc.) and whether the field is numeric (F8.2, number of decimals if any) or alpha-numeric.

File Documentation

Every data file submitted to ARI must be fully documented using the **Electronic Data File Form** provided or a facsimile. Note that many database programs are capable of generating a report showing file structure that will quickly list much of this information in an acceptable form.

File name & Path

Pathnames need only be relative to the root directory for the entire database, as the host device will have changed. - eg: /rpms/dbf/feat.dbf

General description of file content

File format

Indicate the software manufacturer, program name, version, platform - e.g., Microsoft Foxpro 2.6 for Macintosh.

Field Documentation - In Order Of Appearance In File:

Field name - The name as it appears in the file - e.g., BLENGTH

Description - Short description of the field's data - e.g., blade length.

Data type - Possibilities depend on the file format. Common types include: character, binary byte, binary integer, binary float, logical, date, fixed numeric (stored as characters), pointer to an external object such as a memo field or OLE object.

Length - number of bytes reserved for the field. If this is allowed to vary, estimate the maximum length for the longest entry in the data file.

Format - For fixed numeric fields, indicate the number of decimal places reserved. For logical fields indicate the two symbols used 0/1; T/F;P/A. For formatted string fields, indicate the format mask.

Units - For all metric fields, indicate the units of measurement and the precision – e.g., recorded in centimeters to a precision of .1 cm.

For ordinal or nominal data that have been recorded with arbitrary codes attach a separate table listing each unique value that appears in the file and its meaning. Be sure to account for any zeros, blanks, or missing data codes.

For logical fields, indicate clearly the meaning of a True and a False state for the value.

Relations

Relations list any associated index files or memo files. Identify key fields, and how they link to other files in the database. Indicate any key fields that are unique (non-repeating).

Image Files

Electronic image files may consists of photos, slides, or paper documents that have been scanned to produce a computer image file. The preference is for uncompressed image formats. However, special compressed for very large images may be acceptable, please inquire IT staff at ARI. The following image file formats are acceptable:

Format	Description	Remarks
JPEG	Joint Photographic Experts Group	Universal image compression format
EPS	encapsulated postscript	
GIF (87a/89a)	Compuserve Graphic Interchange Format	
Macintosh Pict	Native Macintosh image format	uncompressed
PCX	Zsoft PCX	
PPM	Portable Pixmap Popular Unix format	
PSD	Adobe Photoshop Image	Versions up to Photoshop 5.5
Targa	Truevision Targa	
TIFF	Aldus Tagged Image Format File	Universal image format - compressed and uncompressed types. Not all types are supported. Please verify.
Windows Bitmap	Native Windows image format	uncompressed

Documentation

Image files should be documented using the **Image Data Form**, or facsimile. Documentation must include paths and names of all files, format (vendor, program, version), description of relevant subject and medium information. Provide reference if the image was used in a publication or is based on another cataloged portion of the collection, such as a photo or map.

Maps & GIS Data

All electronic files used to produce maps or to represent any spatial information are part of the collection. The nature of the file format depends in part on whether the Map/GIS data are image (raster) based or object (vector) based.

The *preferred format* for GIS data is as follows:

Raster: ESRI Grid Format
Vector: ESRI Shapefile or Coverage

Projection: UTM Zone 12
Datum: NAD 1927
Spheroid: WGS 1972

Although, the following formats are acceptable:

Format	Description	Remarks
Arc	ESRI Arc Vector files	can include 3D shapefiles
ArcInfo EXPORT	ArcInfo GIS export format	Use compression=NONE option
Autocad DWG	AutoCAD native format	
DXF	Drawing exchange format	ASCII. Universal CAD exchange format
Grass	GRASS Raster	ASCII format
Grid	ESRI grid Format	
Idrisi image	Idrisi raster GIS files	ASCII or Binary. Must include accompanying documentation file.
Idrisi vector	Idrisi vector GIS files	ASCII or Binary. Must include accompanying documentation file.
MapInfo	MapInfo vector GIS	include all accompanying index, table and documentation files.
MapInfo MIF	MapInfo Interchage Format	ASCII exchange format. Include database documentation file.
MOSS	Raster	
OSUMAP	Raster	
Shapefile	ESRI ArcView Shapefiles	
TIN	ESRI TIN files	

Documentation

The data portion of a GIS database should be doumented as database files described above. Documentation of map drawings and GIS files should be provided using the Map and GIS File form or a facsimile. Include listing of file name(s) & path(s), format (vendor, program, version) and a general description of contents. Provide a reference if the map was used in a publication or if it is an electronic version of a paper map cataloged separately in the collection. Relations between GIS files and other files should be documented following guidelines for database. Instructions in Section 6.3 above regarding projections and coordinate systems apply equally to electronic map and GIS files.

Word Processing Files

All document files to be submitted to ARI should be provided in both their native format and in a format compatible with those supported by ARI. These include:

Format	Vendor	Remarks
ASCII text	Windows, Macintosh, DOS, Unix	
EMAC	unix program	All versions.
HTML	Universal hypermedia mark-up language	Versions 1.0, 2.0
MS Word, MS Office	Microsoft	Windows, Macintosh, DOS - all versions.
MS Works	Microsoft	Windows, Macintosh, all versions.
PDF	Adobe portable document format	
Rich Text Format	Universal exchange format supported by many vendors	
RFT-DCA		
WordPerfect	WordPerfect	Windows, Macintosh, DOS - all versions.
Wordstar	Wordstar	DOS - up to version 7.0
Windows Write	Microsoft	
Quark Express	Quark Express	Macintosh - up to version 3.5

Documentation

Use the Document File form or facsimile. Documentation consists of the path and file name, Format (vendor, program, format), content of the document. Provide the reference to the published manuscript produced from this file.

SECTION 7
TRANSFER OF THE COMPLETE COLLECTION TO THE ARI

After completion of a project and acceptance of the project report, the Bureau of Reclamation will authorize the transfer of the collections and notify the ARI that the collection is eligible for transfer. A pretransfer visit to review the organization of the collection and determine if the collection is ready for delivery will be scheduled. If the organization of the collection is approved by the ARI staff, delivery of the collection will be scheduled and shipment procedures arranged with the contractor. It is the contractor's responsibility to deliver the collection to the ARI.

7.1 - PROJECT CURATION FORMS

REQUIREMENTS

The ARI requires that the contractor complete a series of curation forms prior to transfer of the collection. These forms must be complete for review during the pretransfer visit.

Project Registration Form

The "Project Registration Form" (a sample is provided in the Appendix) serves as the primary record for every archaeological project using the ARI. The form summarizes certain basic and critical information about each project, including a brief description of the project, the name of the sponsoring agency, ASM site numbers, and information on the disposition of the various project materials. This form must accompany the project collections to the ARI at the time of delivery of the collections. It should be completed in duplicate as the last step in preparation of project collections.

Survey Project Form

For survey projects, a "Survey Project Form" (a sample is provided in the Appendix) shall be completed in addition to a "Project Registration Form," to provide future researchers with critical information such as sampling strategy, which may be difficult to extract from the project reports or archives.

Summary of Project Collections Form

This form (a sample is provided in the Appendix) is used to summarize the major categories of collections recovered and generated from each site. Sites should be listed in order by ASM site number at the top of the chart, and the appropriate categories checked for each site. This form is not required for non-collection surveys.

7.2 - PRE-TRANSFER VISIT

The pretransfer visit serves as an inspection of the collections organization and will determine if the collections are ready to be delivered to the ARI. Misinterpretation of the requirements and guidelines can result in organizational problems that may be very time-consuming to correct and may delay the transfer of collections to the repository. Therefore, contractors are encouraged to contact the ARI staff at anytime regarding the organization and processing of collections. Arrangements can be made for the contractor's personnel to visit the repository or meet with ARI staff, or for ARI staff to travel to the contractor's facility. Questions regarding the general organization of collections should be addressed as they arise and not saved until the pretransfer visit.

REQUIREMENTS

The contractor will have all collections boxed, packaged and organized according ARI requirements prior to scheduling the pretransfer visit. All curation paper work must be completed and all project documentation organized in an appropriate format as outlined in the ARI Requirements and Guidelines. In the event that there are problems with the

organization of the collections, the contractor will be notified of the changes that must be made and an additional visit will be scheduled to review the requested changes. Delivery of the collection will not be scheduled until the ARI staff has approved all aspects of the organization of collections.

7.3 - DELIVERY OF COLLECTIONS

REQUIREMENTS

The contractor shall deliver in good condition all materials, artifactual and archival, to the ARI. All project materials shall be delivered together; partial shipments of either artifacts or archives will not be accepted.

Check Off List

The contractor shall supply three clean copies of a brief inventory of the boxes being delivered. This will be used by the ARI staff as a check-off list, to check in the boxes as they are delivered to the ARI. It need only have as much information on it as is necessary to confirm the presence of the box, and its contents. Usually this would include an indication of the site number(s) and artifact class/material type to be found in the box, or what type of archival material is inside (e.g., photos, maps, computer files). Each box entry need only be one line long.

The detailed "Boxed Collections Inventory Form" (see Section 4.2) included inside each box can answer any specific questions that might arise. Collections will be checked against the inventory list provided by the contractor to account for all materials. When the collections are accepted, the Bureau of Reclamation shall be notified by the ARI Curator. If the collections are not acceptable, the contractor may reprocess and resubmit the collections prior to any official refusal and notification of such action to the Bureau by the ARI.

GUIDELINES

When planning to deliver the collections, contractors should bear in mind that boxes cannot be stacked the full height of most trucks. Boxes of light materials such as bone, shell, and processed flotation samples can be stacked several high, or on top of heavier boxes. Sherds, stone and unprocessed soil samples of any kind generally can be stacked only two high, unless sheets of plywood are used to support the rows. There are still limits to height and weight of each load that will prevent damage to the collections. Ground-stone should not be stacked at all, unless it is extremely well padded, and should not be packed atop any other materials. Contractors will be asked to replace any crushed boxes; crushed artifacts cannot be replaced!

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1980 A complete manual of field archaeology : tools and techniques of field work for archaeologists. Prentice-Hall, Englewood Cliffs, N.J..

Sease, Catherine
1987 A Conservation Manual for the Field Archaeologist. Archaeological Research Tools, Volume 4. Institute of Archaeology, University of California, Los Angeles.

APPENDIX: ARI COLLECTION SUBMISSION FORMS

Project Registration Form

Survey Project Form

Summary of Project Form

Project Collection Box Count Summary

Document Documentation Summary

Electronic Media Submission Form

Database File Submission Form

Image File Submission Form

Map and GIS File Submission form