May 29, 2009

ARMS Note 2

SITE NOT RELOCATED
(a.k.a. Unrelocated Site)

ARMS never decommissions a site because it cannot be relocated.

The fact that a site cannot be relocated does not lessen its importance to the archeological record. Information gathered on earlier visits is relevant for a general understanding of the area, and may provide important information even though the site cannot be relocated.

When dealing with a site that is not located where it was previously reported, it is incumbent upon the recorder to investigate all potential reasons why the site could not be relocated. The methods employed and the results of those investigations should be clearly stated in the **project report** and on a **LA SITE UPDATE RECORD.** Also see **INSTRUCTIONS FOR COMPLETING THE LA SITE RECORD UPDATE** for further procedures regarding site updates. Reviewers and future researchers reading the report and updated site form need to know if the site was destroyed or still remains *lost*. Such information has a direct bearing upon determinations of eligibility done by land managing agencies and the SHPO.

The state-of-the art in site location recording has advanced from hand-drawn topographic diagrams to GPS-generated maps. Likewise, computer database capabilities have changed from a simple site listing with minimal information to the complex New Mexico Cultural Resources Information System (NMCRIS) and ARMS Map Server. As field methods and technology continue to change, data from earlier work should be utilized with the understanding—*that's how it was done back then.* This document is meant to educate users of the paper records, NMCRIS and the ARMS Map Server as to possible reasons why some sites cannot be relocated. In no way does it judge practices of past or present field archaeologists or ARMS staff.

REASONS

A site was field recorded, the site form with location information was submitted to ARMS, a new LA number was assigned, and the site was posted to an ARMS map. A later revisit to the reported location shows no evidence of cultural remains. **Why can't the site be relocated?** A single reason or combination of reasons can contribute to difficulties in relocating a site, or perhaps to not relocating the site at all. These include:

- **Human Error**
- **No Source Graphics and Poor Source Graphics**
- **Transfer of Sites Between Map Scales**
- **UTM Issues**
- **GPS Issues and NAD 1927 vs. NAD 1983**
- **Excavation**
- **Collection**
- **Destruction**
- **Environmental Change**
- **Inundation**
- **Isolates**

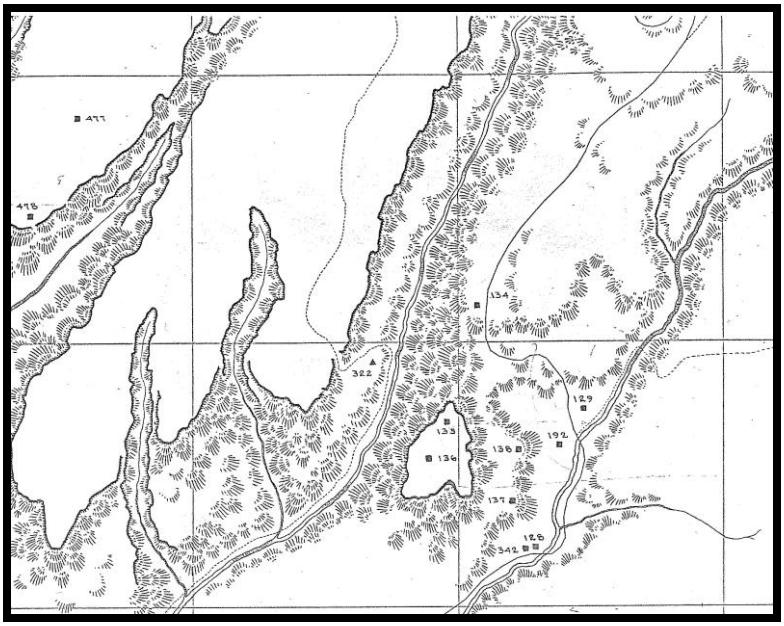
***Human Error:** All of the following scenarios, involving human error, have resulted in site mis-locations: 1) transposing UTM numbers while writing them on a site form, registering for the LA number, or during data entry; 2) misreading a UTM template, misaligning the template on the UTM tick marks, or misreading a GPS unit; or 3) transferring locations between map scales can *move* or even *lose* sites.

***No Source Graphics or Poor Source Graphics:** Today a map location is required to obtain a LA number for a newly discovered site. Some site recordings, especially early investigations, do not include **any** site location graphics. Poor graphics may provide only a *best guess* location. And on some graphics a symbol was used to depict the site. The symbol is larger or smaller than actual site size, thus site

representation in the ARMS Map Server is misleading. It is important to indicate the actual site boundary, as can best be depicted on the location map.

Prior to the year 2000, site locations were posted to the ARMS Paper Topographic Maps [now a useable ARMS archive collection] and post-2000 the locations are now posted to the ARMS Map Server. Whenever possible, ARMS uses the plot appearing on the LA Site Record 7.5-minute topographic location map as the official site location. If this contradicts text descriptions then the map plot is considered the official source location.

In the 1930s H.P. Mera of the Laboratory of Anthropology began the LA numbering system. Due to the fact that topographic maps were hard to come by, (if they existed at all for parts of New Mexico), Mera drew his own topographic diagrams to plot site locations.



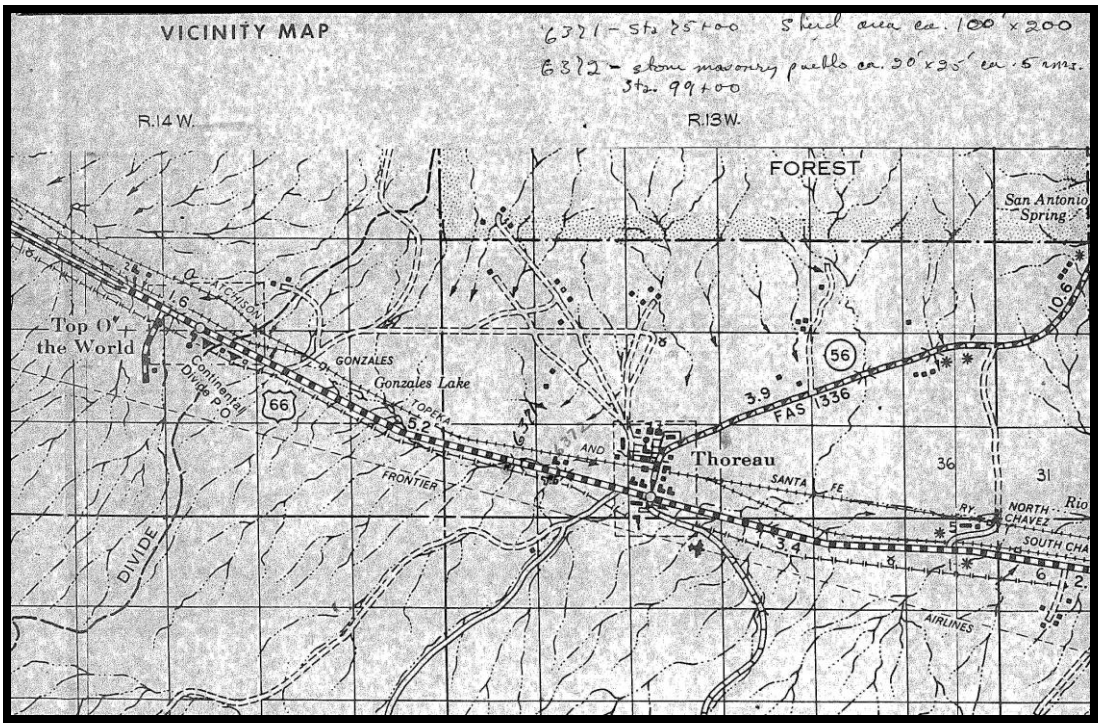
Example of a Mera Map Depicting Site Plots

Without adequate maps, early recorders were forced to provide *text* site locations based on the *lay of the land* or on triangulation to distant points. Often the text descriptions locate the next site based on the location of the previous site—a version of a child's dot-to-dot game. In that scenario if one cannot locate site #1 or track another site along the way, one may lose the locations of all sites thereafter.

Some site locations were recorded by Township, Range and Section, but the Section may not be broken down in the ¼ unit measurements system. Such sites are considered recorded ***to the Section only*** and ***were plotted to the center of the section*** on the ARMS Paper Topographic Maps. Most of these sites were transferred (in situ) unknowingly to the ARMS Map Server when it became available.

Field locations of some sites discovered by the Laboratory of Anthropology and other archaeological recording agencies in the *early* years of CRM were recorded on blueline construction maps, maps of various scales and maps with no scales at all as provided by clients. Some site locations could be plotted onto the ARMS Paper Topographic Maps with confidence while other sites could not.

Lack of maps, lack of confidence in locations and the *sameness* of sites in a project area created situations where some sites were later re-recorded under a new LA number. While these situations have largely been corrected, some site number questions still remain unresolved. Notable examples of this kind of confusion can be found in phases of the Highway Cultural Resources Inventory of the early 1960s.



Example of a Blueline Engineering Map from the Highway Cultural Resources Inventory

Any sites plotted based on text descriptions, to the Section only, or with little confidence are called ***poorly located*** sites.

Poorly located sites were posted to the ARMS Paper Topographic Maps in pencil. The letters **PL** were added to the LA number to highlight a site's poor accuracy location. If an accurate location was determined later on, the dot location and LA number could be easily moved and the PL was then removed.

In NMCRIS poorly located sites are indicated under Source Graphics. *Locacc* is the abbreviation for location accuracy. **Unknown (ARMS locacc = poor)** identifies such sites.

> ***NOTE: At present (2008) poorly located sites on the ARMS Map Server are not visually distinguished from any other site. When using the ARMS Map Server compare against NMCRIS data to determine if sites in the investigation area are poorly located.***

***Transfer of Sites Between Map Scales:** Early LA site locations were recorded either in a book of non-topographic 30-minute scale highway quadrangles or, where available, on 15-minute topographic quadrangles. Obviously, accurate site plots at 30 or 15-minute scale are questionable at best.

Site locations were transferred to the 7.5-minute ARMS Paper Topographic Maps as the maps became available. As noted under Human Error any data transfer from one medium to another creates the possibility of inaccuracies, especially when the scaled maps vary drastically from each other. *Losing* a site, (mistakenly omitting it during transfer), is another potential historic consequence of updating location media.

With today's technology some commercially available programs allow for digital recording of site locations on one kind of map coverage and then with the click of a mouse transfer that information to a different map scale. This can be particularly misleading when moving from an aerial photographic plot to a USGS 7.5-minute topographic map plot. This is due to the fact that 7.5-minute maps lack the accuracy of rectified aerial photographs. The result--the site is mis-located on the 7.5-minute topographic map.

***UTM Issues:** Early site forms did not contain a recording field for the UTM coordinates. When the use of UTMs became standard practice, UTM readings were calculated and added to site forms already on file at ARMS. For many of these calculations an early digitizing

machine was used. It was later found that improper calibration and paper map flatness issues caused digitizer miscalculations. Unfortunately no one could determine exactly which sites had been calculated incorrectly.

Even so, some sites still did not receive UTMs. The USGS printed some 7.5-minute topographic quadrangles without UTM tick marks. In addition UTMs were not calculated for sites considered ***poorly located.***

Quality control protocols tightened up at ARMS over time. After 1991, all sites were subjected to UTM verification with a template on a paper topographic map, and later with GIS. Prior to the widespread adoption of GPS it was determined that roughly 80% of all site forms received at ARMS contained incorrect UTMs.

Besides human error, another reason for such a high percentage rate could be that recorders often use a **site datum** for generating UTM coordinates of a site location. For consistency requirements of a database and now the ARMS Map Server, ARMS has always used the **site center** as the UTM point of a site location. For larger sites the distance between **datum** and **center** can be substantial. A site datum might even be located off site.

The NMCRIS site registration program applies the submitted UTMs to generate a site center location on the ARMS Map Server. The length registered generates the proxy site boundary. This location remains on the ARMS Map Server until ARMS receives the project paperwork and site form(s) and verifies the site location and boundary. Therefore, incorrect site locations may remain on the ARMS Map Server for some time.

***GPS Issues and NAD 1927 vs. NAD 1983:** Increased use of GPS technology has spawned new ways to misrepresent site locations.

GPS technology was developed by the military. Prior to the ubiquitous incorporation of GPS technology into everyday American life, GPS recordings required post-processing to unscramble deliberately altered readings. If this step was not performed the coordinates were inaccurate, and were represented in a random manner.

While ARMS is a **NAD 1927** shop, and has always been, the federal government and some state agencies operate on different coordinate systems such as NAD 1983. The ability to easily change coordinate systems either in the field, or through digital conversions currently multiplies the potential for registration of sites in non-NAD 1927 projections. The NMCRIS site registration screen does not distinguish between NAD 1927 and NAD 1983. In many documented cases recorders have not converted UTMs from NAD 1983 to NAD 1927 prior to site registration. This type of error results in site locations that can be off by 200 meters or more. Because datum conversions are made with the aid of an algorithm, (in conformance to the curvature of the earth's surface) there is no uniformity to the resulting mis-location.

As mentioned under Human Error, inexperienced GPS users also cause location errors. Understanding fully how to operate the equipment and recognizing concepts such as datum shifts are necessary to produce highly accurate site locations. It is also important that GPS units are set up properly prior to use.

Another GPS problem involves high resolution coordinates obtained from quality GPS units vs. USGS 7.5-minute topographic quadrangle resolution. The improvement of hand-held GPS units, especially those with sub-meter accuracy point out the lack of resolution for topographic maps.

***Excavation:** If a site has been subjected to post-survey work, (i.e. testing or excavation), there may be instances where evidence of the site cannot be found during a site revisit. Is the site considered *not relocated*? **NO**. Tested and excavated sites are always considered ACTIVE even if no cultural materials are currently evident. The site might be *excavated out of existence* but information is still available which should be considered and discussed.

A word of caution about post-survey work: Because of legacy database entry issues, NMCRIS may not necessarily reflect that a site has been subjected to excavation. Why? In its infancy, ARMS was known as the *Survey Room* and archived mainly survey reports along with site forms. Testing and excavation reports were sent to the Laboratory of Anthropology library, an open, public library. Location maps in post-survey reports seldom indicated exact site locations and most site forms were not updated to reflect excavation results. Reports were *safe* to share with the public, but quickly turning over these reports to the library also meant information regarding testing and excavation may not have been adequately reflected in the database or even in the paper records of the site files.

By the mid-1980's reporting standards changed. Review agencies required topographic quadrangle maps noting site locations and site plan maps showing excavated vs. unexcavated areas. Thus reports contain a *treasure map* and could no longer be housed in the LOA library. With the institution of these new reporting standards and the introduction of different types of archaeological investigation such as

monitoring, the Survey Room began to accession to the report stacks and database more types of report documents to the report stacks and database.

Recent absence of information concerning post-survey work reflects the growing ARMS backlog and an emphasis on data entry for newly recorded sites. Updating NMCRIS with excavated site information is a time-consuming process, especially when updated site forms are not submitted. Often when post-survey reports are received at ARMS, the project/activity data entry will be completed but updating individual sites are put on hold. This highlights the need to **link all sites (new and previously-recorded) during NMCRIS Activity Registration.** For post-survey work be sure to link all sites where testing, excavation or on-site monitoring occurred.

Another reason for absence of post-survey information is that some reports are submitted to ARC (MIAC-LOA-Archaeological Research Collections) along with all the excavation paper documentation and collected artifacts. When this happens the chance to capture post-survey site documentation must wait until ARC has the opportunity (money and manpower) to deal with these collections and direct the project report to ARMS.

***Collection:** Early archaeological site recording standards allowed for 100% surface collection. Given a site can be an artifact scatter with no evident features the site could be *collected out of existence.*

Collection status is similar to testing and excavation status. Due to legacy database entry issues, artifact collections may not be indicated in NMCRIS, when indeed, collections were made. NMCRIS carries data fields addressing the collection method. Older versions of the database were not so specific. For entries prior to 1993 there is some confusion as to whether collections were the result of scientific investigation or due to vandalism as there was no clear distinction between the two options. A full review of the paper records (reports and site forms) may be needed to determine if the site was 100% collected, specific items collected, a sample technique scientifically employed or if the site was vandalized.

***Destruction:** Sites are sometimes destroyed, through deliberate vandalism or by permitted construction. Site information gathered prior to destruction is still important for a general understanding of the area or to provide specific research information. A destroyed site will always remain active in NMCRIS. As with post-survey work and collection, noting a site has been destroyed is another late addition to the database. Information on destruction can be gathered from several data items: Site Accessibility = not accessible (destroyed or could not relocate); along with Surface Visibility, Disturbance Sources, Vandalism, and Percentage of Site Intact.

***Environmental Change:** Environmental impacts (i.e. erosion, fire, vegetation growth, etc.) can destroy or obscure a site. Shifting sands can cover sites and floods can erase evidence of cultural remains.

***Inundation:** Sites recorded prior to building water control features (i.e. reservoirs) and are now under water are listed in NMCRIS under Site Accessibility = flooded.

***Isolates:** For a period in the *early days* of CRM collected isolated artifacts were assigned LA numbers. When federal and state agencies began to develop non-collection policies, this practice was dropped. Since installation of the 2000 version of NMCRIS when such *"sites"* are found in the site file records they are corrected in NMCRIS to read Site/Component Type = Isolated Occurrence. As is true with other legacy data there is no guarantee that all IOs once assigned LA numbers have been identified. If the site record has not been corrected it will not be readily apparent in a NMCRIS query nor is it graphically distinguishable on the ARMS Map Server.