ONLINE SUPPLEMENTAL MATERIALS

Supplemental Text 1: *The Nature and Sources of Micaceous Materials*

Mica is a soft mineral and often breaks down during transport and sedimentation processes. It is therefore commonly encountered in finer grained sedimentary materials (Beckman 1982; Fanning and Keramidas 1989). Due to the geologic history of North America, mica is fine grained, mixed with other minerals, and not often found in sheets (Beckman 1982; Lovering and Goddard 1950). Hundreds of mica-rich pegmatites and other mica-bearing rocks exist in places where Precambrian rocks are exposed at the surface (Beckman 1982). Granite and granite gneiss are the most common type of Precambrian rock and are found along the northern and southern portions of the Front Range, while the central Front Range is dominated by schists, which are cut by small granite masses and small batholiths (Lovering and Goddard 1950). Biotite and muscovite micas also appear along the Laramie Mountain range in Wyoming and are commonly found in weathered sands (Frost et al. 1993).

Mica also occurs in decomposed micaceous clays that form from weathered mica schist in the Northern Rio Grande region of New Mexico and along the Front Range in central Colorado where mica is present in the bedrock geology. The Sangre de Cristo and San Juan mountain ranges in northern New Mexico are 63 million year old Precambrian complexes composed of metamorphosed volcanic rocks, quartzites, muscovite-biotite schists, and intrusive amphibolites (Beckman 1982; Gresens and Stensrud 1974). Muscovite is the most common type of mica found in this region and is derived from the erosion of rhyolitic volcanic rocks, with most of the minerals coming from the Precambrian Vadito group sequence of rocks (Bauer 1985; Eiselt 2006; Eiselt and Ford 2007).

Although micaceous clays do not form in the Central Plains, they are common in the alluvial plains of the Front Range and they can be mined from Precambrian pegmatite deposits in central Colorado (Beckman 1982; Lovering and Goddard 1950). In Boulder County, Colorado, Ellwood and Parker (1995) report that Woodland and Upper Republican ceramics recovered from the Rock Creek Site (5RB2712) (A.D. 850-1300) were made using local micaceous clays tempered with crushed Pikes Peak granite (a local source of rock that also contains small amounts of mica). These clays, however, include only very small percentages of silt-sized biotite mica (on the order of 1 percent) (Ellwood and Parker 1995). People living on the Central and High Plains who wished to acquire micaceous vessels may have relied on their connections with fellow Plains people in eastern Colorado and southeastern Wyoming or turned towards connections with Pueblo and Apache groups in northern New Mexico.

Supplemental Text 2*: Analytical Procedures*

The chemical profiles of the 81 NAA specimens were determined using procedures established by the Archaeometry Laboratory at the Missouri University Research Reactor (MURR). Analytical procedures outlined by Bishop et al. (1982), Glascock (1992), and Neff and Glowacki (2002) were followed and are described in Trabert (2015).

In his petrographic analysis, Hill analyzed a subset of the NAA sample (5 sherds) plus an additional 62 sherds and two sand samples. He used a Nikon Optiphot-2 petrographic microscope (between 20X and 200X power) employing both plain and cross-polarized light and recorded paste characteristics with the Wentworth Scale. A graduated reticle in the microscope's optics allowed him to measure isolated mineral grains and rock fragments, which were then

compared to standardized charts. Following methodology proposed by Terry and Chilingar (1955) and Matthew et al. (1991), Hill estimated the percentages of inclusions found in the paste using published comparative charts. Finally, he recorded information on mineral grain identification, shape, degree of sorting, and the color and texture of the clay matrix for each sample to assign the sherds to compositional groups (Trabert 2015 Appendix B).

Supplemental Text 3*: Chemical Characterization of Dismal River Gray Ware Sample*

Compositional groups for NAA data on sand tempered, Dismal River Gray Wares were established through visual inspection of elemental scatterplots and principal components analysis (PCA), refined and verified using Mahalanobis distance calculations. We identified two distinct chemical groups in the dataset and compared them to six reference groups from the Plains curated at the MURR facility (Figures 1 and 2). The first three principal components explain 58.2% of the variance in the combined analysis, and group probability results indicate samples from the two sand tempered groups (groups 2 and 3) were best affiliated with Central Plains reference materials (see Trabert 2015, Tables 18 and 19 for probability values) (Cobry 1999, Cobry and Roper 2002, Roper et al. 2007, Speakman 2010, and Speakman and Glascock 2004).

Although our Dismal River compositional groups did not perfectly match known reference materials from the Plains (Figure 2), this was expected given that previous attempts to characterize ceramics from this region had encountered difficulty in isolating distinct reference groups (Cobry 1999; Cobry and Roper 2002; Roper et al. 2007). Millions of years of stream migrations and run-off from the Rocky Mountains combined with a general lack of usable primary clay has led to the homogenization of materials available to potters on the Central

Plains. Other researchers who have attempted to characterize Central Plains' clays and ceramics were often not satisfied with their results (Cobry 1999; Cobry and Roper 2002; Roper et al. 2007) and the integrity of compositional groups occasionally fade when additional samples are added to the mix. Despite our inability to state with any certainty that these sand tempered groups originated in a specific area of the Central or High Plains, individual sand tempered samples do overlap with other Plains reference groups.

Supplemental Text 4*: Mineralogical Analyses of Additional Northern Rio Grande Mica Tempered Wares*

Comparisons were made between the Dismal River granite tempered ceramics and 18th century Northern Rio Grande types Apodaca Gray and Rodarte Striated (n = 8) collected from excavations at Picuris Pueblo. Dick et al. 1999 describe Apodaca Gray as light gray or tan in color, with fine quartzitic and arkosic sand temper with inclusions of biotite mica, and occasionally tuff, with polished surfaces. Rodarte striated is part of a larger set of Rio Grande Striated Wares and has a similar paste to Apodaca Gray (arkosic and quartzitic aplastics; biotite mica) but is more friable with a more coarse texture. Exterior surfaces are often lightly polished with faint striations and interior surfaces have a polished surface rich in mica (Eiselt 2006). Three of the four sherds of Apodaca Gray were tempered with glassy pumice, which is commonly associated with ceramic production in the Tewa Basin and the Pajarito Plateau (Curewitz 2008; Habicht-Mauche 1993). The fourth sherd was tempered with a very-fine textured well-sorted sandstone. This sandstone contained a trace amount of brown biotite.

The Rodarte Striated sherds are highly variable in terms of the material used in their construction. Two were manufactured using clay containing quartz muscovite schist. In addition to quartz mica schist, one of the Rodarte sherds also contained a coarse-sized grain of volcanic tuff. The fourth sherd was made using a clay source that contains sediments derived from quartzite. The particles of quartz range in size from very fine to very coarse. Trace amounts of biotite and muscovite are present in the ceramic paste and in a limited amount of quartzite fragments. The Rodarte Striated sherds also include quartzite and granite fragments that are available in the nearby Picuris Range. The last sherd in this sample displayed a highly biotite-rich paste that contained coarse-sized grains of quartz, plagioclase and potassium feldspar, indicating that it was made using clay weathered from a granitic source. While these sherds were manufactured using mica-rich granitic materials with pastes reminiscent of the micaceous ceramics from the Scott County Pueblo site, the Dismal River ceramics do not have the highly micaceous surfaces common to these Northern Rio Grande wares and differ from other micaceous wares in terms of thickness, surface treatment, and overall appearance.

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