

APPENDIX C: LITHIC RAW MATERIALS SUMMARY

This appendix includes descriptions of all of the lithic raw materials that I identified at the 11 sites that I studied during my research stay in Spain. I have divided the appendix into three sections: lithic raw materials with known geographic locations; flints without known geographic locations; and all other toolstones (e.g. quartzites, calcites, mudstones, etc.), which also do not have geographically known outcrops.

Each raw material is described based on the following attributes: color (and any variations therein), grain size, homogenous/heterogeneous/types of inclusions, texture, matte/shiny, opaque/translucent, fracture type, cortex, and patina. Lithic toolstones that come from unknown outcrops are identified using the following codes: flint (F), quartzite (QZ), quartz and calcite (QC), mudstones and lutites (M), limestone (L), other raw material (O), and unidentified stone (U). These codes are matched with numbers to distinguish each material, i.e. QZ25 was the 25th quartzite I identified. The reader may notice that some numbers are missing from the sequences, particularly among the flints. These flints were reclassified as geographically known materials after comparison with Tarrío's (2012) and Risetto's (2009) archaeopetrographic reference collections. Finally, some flints are summarized as "groups" which were defined based on co-occurrence of visually distinct flints (that were originally classified separately) on single artifacts. These flints are likely from highly variable geologic formations.

I would also like to make a brief note about how the raw material classifications used in this study relate to those used in older lithic analyses made at the ends of field seasons during the El Mirón excavation. The El Mirón lithic raw material reference collection was used as a basis for this study—it was compared to the *ad hoc* reference

collections I made for every other site I studied as well as to Tarriño's and Risetto's archaeopetrographic collections. However, through this study I added approximately 30 new reference materials to this collection. Unfortunately, this means that older analyses of El Mirón collections are limited in their ability to assess raw material provisioning because these new materials would have previously been called "unknown flints" and lumped together. This is particularly important with regard to white flints. Many of these were probably recorded as "too patinated to tell", as Group A (Barrika) or Group B (Llارانزا) with patina, or as unknown flints. This is consequential for any study of lithic provisioning. Chalosse (a material that occurs in appreciable quantities in El Mirón Level 17) is both a white material (when patinated) and also not a material included in the original El Mirón lithic reference collection. Urbasa is another transcordilleran flint that was absent in the El Mirón reference collection and that also occurs frequently in the El Mirón Level 17 assemblage. Quite simply, raw material analyses based on toolstone classifications made using the old El Mirón reference collection will underestimate the proportions of geographically known flints prehistoric groups used, except possibly that of Treviño, of which there were several samples in the El Mirón reference collection.

1. Lithic Raw Materials with Known Geographic Locations

1.1 Barrika (also called El Mirón "Group A")

Eight variants of this flint have been identified. Most of them are black to dark grey in color and very fine grained.

Barrika Variant 1:

Description: Black to dark grey, homogenous, very fine grained, smooth flint, with few or no inclusions, opaque, white to light grey chalk cortex, conchoidal fracture, shiny. Can have white “dot” or “blanket”-like patinas.

Barrika Variant 2:

Description: Grey to dark grey, homogenous, very fine-grained flint, with numerous small to medium sized light brown inclusions, slightly translucent, white to brown chalk cortex, conchoidal fracture, shiny. Reference piece has no patina. Smooth texture.

Barrika Variant 3:

Description: Dark grey flint with light grey-tan speckles <1mm in size, homogenous, slightly coarse grained, smooth texture, rough grey chalky cortex that is ~2mm thick, can have very small grey inclusions, slightly translucent at edges when held to light—otherwise opaque, shiny. Reference piece has no patina. Conchoidal fracture.

Barrika Variant 4:

Description: Brownish-grey flint with light grey streaks and black specks, fine-grained smooth flint, translucent, yellowish brown when held up to light, light grey chalky cortex, shiny. Conchoidal fracture. Homogenous, without inclusions. Occasionally white “dot” patina.

Barrika Variant 5:

Description: Banded dark grey (like variant 1) and light brown/dark tan-grey flint. Bands are thick, c. 2-3mm. Fine to slightly coarse grained. Opaque. Slightly shiny, esp. in dark grey areas. Homogenous without inclusions. Smooth texture. Conchoidal fracture. No patina or cortex on reference piece.

Barrika Variant 6:

Description: Dark grey (like variant 1) with light greyish tan flint. Smooth. Opaque in greyish tan area, but translucent in dark grey area. Dark grey is shiny, while greyish tan is matte. Homogenous, with few or no inclusions. Conchoidal fracture. Reference piece has no patina. White chalk cortex ~2mm thick. Fine grained.

Barrika Variant 7:

Description: Beige to light tan flint with small dark grey and brown speckles. Homogenous, but with some very small black inclusions. Thin light brown cortex with a slightly rough texture. Fine grained. Smooth. Opaque and shiny. Reference piece has no patina. Conchoidal fracture.

Barrika Variant 8:

Description: Off white to light grey flint (shades are blotchy—intergrading the colors), with small reddish-brown speckles. Homogenous. Medium-to-fine grained. Smooth. Reference piece has no cortex or patina. Opaque and matte. Conchoidal fracture.

1.2 Bidache Flysch

Medium to light grey with very very small blue speckles, the material generally alternates between light and medium greys in a linear fashion, so as to appear “striped”. The light grey can also appear tannish and whitish. Cortex is reddish brown and cobble worn. Very smooth texture. Opaque. Shiny. Conchoidal fracture. No patina on reference piece.

1.3 Cabo Mayor

Greyish brown flint. Coarse grained, nearly like quartzite. Heterogeneous, with grey chalky inclusions. Rough textured. Light brown cortex that is slightly rough textured, cobble-worn. Matte and opaque. No patina. Orthogonal fracture.

1.4 Chalosse Flint

Chalosse flint can vary somewhat in color, but it is all exceptionally fine grained and generally white with a yellowish to grey tan that is occasionally “Dijon mustard” colored (patinated). White areas typically have small greyish-tan speckles. The material is **very** smooth textured, with only occasionally large grained and rougher pieces. Some varieties of this flint are grey in color with dark grey speckles and occasionally have darker “patches”. This depends somewhat on the kinds of geologic processes that produced the flint. Some varieties of Chalosse (white ones) are very homogenous, while others are bioclastic, patinated, or containing *Lepidorbitoides* sp. (a macroforaminifer). The material can be matte or shiny (white areas tend to shine while tan ones don’t). The material is opaque. Conchoidal fracture. Cortex is dark brownish red and cobble worn.

1.5 Microcrystalline and Chalcedonic Flysch Flints

These two flysch flints were identified by A. Tarrío (2012). They outcrop in southern France near Bidache and possibly along the (now submerged) Cantabrian coast.

Microcrystalline Flysch with Sponge Spicules

Another variety of coastal flysch that is very fine grained. The material is generally grey, although this can appear more blueish in some samples. There are light blue dots and very small spicules from fossilized sponges. The material is homogenous, with no

inclusions. The texture is smooth. Opaque. Shiny. Conchoidal fracture. Cortex is greyish tan and cobble worn. When patinated, the material becomes chalky.

Chalcedonic Flysch with Sponge Spicules

Yet another variety of coastal flysch that is generally blue to grey in color and fine grained. This flint can be rather variable, however, depending on its patina (and often easy to confuse with other flysch varieties). The darkest pieces of this flint are a very dark, nearly navy blue, while most are a moderate grey-blue. Other varieties are light blue-grey, and in these the spicules are more readily visible than in the darker shades. The material becomes lighter when burned. Another variety of this flint is translucent and brownish blue, with a whitish patina that covers its entire surface. The material is fine-grained, homogenous, with a smooth texture. It can be slightly translucent at the edges when held to light (even the patinated version has this quality, which is the best way to distinguish it from the other flysch materials). Shiny. Conchoidal fracture. Cortex is tannish grey and worn; it can be quite thick.

1.6 Gaintxurizketa Flysch Flint

A very dark brown to black flint that is very fine-grained, but not always homogenous. It can have light brown streaks, blotches, or speckles that can make it appear like a starry night. At times there are quite large, somewhat chalky, rough textured inclusions that lead to imperfect conchoidal fracture. In many pieces, these are absent. The material is translucent at the edges when held to light, although on smaller pieces (i.e. bladelets) the entire piece may appear this way. Occasionally the flint will have a white, streaky patina. The cortex is reddish brown and cobble worn. Very smooth texture and shiny.

1.7 Llaranza (also called El Mirón “Group B”)

Llaranza is a variable flint that is characterized by its translucence. The most common varieties of this material are white, orange, and tan, but other colors have been identified (see below). At El Mirón both Llaranza and Sonabia (described in a section to follow) are often patinated. To the untrained eye, these two materials can be difficult to distinguish, because they both have white patinas. However, Sonabia’s patina is streaky, with blueish/purplish/greyish lines that reflect the underlying flints. Llaranza, in contrast, has a speckled white patina, with speckles the same color as the interior flint (often reddish or tannish). These distinctions make it possible to determine which material is which when the artifacts are completely patinated. (Variants of each of these materials with at least $\frac{3}{4}$ patina were coded differently than non-patinated samples during analysis, and multiple samples of each material were included in the updated El Mirón raw material reference collection.)

Llaranza Variant 1:

Description: Very light grey to whitish flint with dark grey-pink streaks and cranberry-colored specks, slightly coarse grained with a generally smooth texture, chalcedony-like, very translucent, conchoidal fracture, white chalk cortex with a rough texture. Generally homogenous, but can include a “smokey variant with some black inclusions” according to a previous description of the material. Patina can be small white dots. Slightly shiny.

Llaranza Variant 2:

Description: Light reddish-brown (yellowish-grey when held to light) flint, slightly coarse-grained, imperfect conchoidal fracture, translucent, grey-brown to white chalk

cortex. Homogenous with no inclusions. Smooth texture. Reference pieces have no patina. Translucent and shiny.

Llaranza Variant 3:

Description: Greyish-tannish-brown flint with dark pinkish-grey streaks. Fine grained. Translucent at edges when held to light, otherwise opaque. Shiny. Cortex varies, based on a previous description of the material. Conchoidal fracture. Reference piece has no patina. Smooth texture. Homogenous.

Llaranza Variant 4:

Description: This material is extremely variable, but largely marked by a) translucency, b) matte shades of greyish white, and c) shades of dark purple-light pink. The material may or may not have matte shades, but it is always translucent. This material often has white streaks that are similar to Variant 10. Translucent shades range from very light beige to very dark grey, with reddish pinks somewhere in between. Patina is white. Fine grained. Smooth texture. Shiny. Homogenous with no inclusions. Cortex is a chalky tan to bright orange-brown material with a rough texture.

Llaranza Variant 5:

Description: This flint is highly variable in color, ranging from greenish yellow to yellowish-orange to clear-white to dark, purplish burnt orange. All are translucent. Coarse grained but smooth flint. Heterogeneous, often found with crystalline inclusions. Water-worn cobble cortex that is dark orange-brown and thin c. 2mm. Fracture is sometimes orthogonal, but mostly conchoidal. Generally matte. Patina is small white dots when it occurs.

Llaranza Variant 6:

Description: Light grey-brown flint, slight greenish tint, with small micaceous flecks.

Homogenous with no inclusions. Fine grained. Smooth texture. Cortex is thick, white, chalky. Matte and opaque. No patina. Conchoidal fracture.

Llaranza Variant 7:

Description: Dark purplish-bluish-greyish flint that is streaky in appearance, but that can also have dark blue flecks. Sometimes the darkest purplish shades are found without significant lighter streaks. Smooth. Cortex is white to grey, smooth, worn cobble.

Homogenous with no inclusions; internal fracture planes are encountered, though rarely.

Medium to fine grained. Translucent and matte. Occasional white dot patina.

Conchoidal fracture. Has been found heat treated, which makes its appearance more grey and less purplish.

Llaranza Variant 8:

Description: Translucent dark brown flint. Homogenous in appearance but with internal fracture planes that led to imperfect conchoidal fracture. Fine grained. Smooth.

Reference piece has no inclusions or cortex. White-to-light grey patina.

Llaranza Variant 9:

Description: Milky light grey-tan flint. Very fine-grained. Homogenous. Smooth.

Translucent. Conchoidal fracture. Cortex is light brown-tan, worn, but still rough

textured. Reference piece has no patina.

Llaranza Variant 10:

Description: Grey-blue slightly translucent flint. Homogenous. Very fine grained. No inclusions. No cortex on reference piece. Shiny. No patina on reference piece.

Conchoidal fracture.

1.8 Ojo Guarena

Dark beige-medium grey flint, with small dark blue/black speckles (<1mm) and unpatterned medium grey streaks. Lighter greyish white areas border the cortical surface. Cortex is light grey-tan, rough textured. Flint is smooth, very slight shine, opaque. No patina. Conchoidal fracture. Homogenous.

1.9 Salies de Bearn (N. Pyrenees)

Medium grey flint that is very fine grained and homogenous. Can have inclusions that are light tannish-brown and rough textured. Material is very smooth, opaque, only slightly shiny. Conchoidal fracture. No cortex or patina on reference piece.

*1.10 Sonabia Flysch***Sonabia Variant 1**

Description: Highly variable, but principally white flint, sometimes with dark blue “interior” streaks similar to those found in Variant 8. Sometimes it has highly concentrated dark brown speckles. Sometimes it has dark grey vein-like streaks on its surface. Homogenous, but sometimes with dark red matte inclusions. Some samples have light grey streaks. Coarse to medium grain, though sometimes there are fine grained pieces. Slightly rough texture. Opaque and matte. No patina. Conchoidal fracture. Cortex is light grey-brown and smooth textured.

Sonabia Variant 2

Description: Dark grey to black flint that is highly variable. Can also be dark greyish-brown and include semi-translucent, streaky blue-grey sections. Medium to fine grained. Homogenous, with no inclusions or rare “negative” inclusions, yet heterogenous in terms of intersections of different colored/textured flints. Texture varies from rough to smooth. Darkest grey materials are shiny. All samples are opaque. Cortex is dark brown, smooth, water worn, occasionally rough. Some cortex is patinating to chalk, although the material itself is rarely found with patina. When there is patina, it is light brown and “blanketed”. Conchoidal fracture.

Sonabia Variant 3

Description: A flint recognizable by intergradation of colors that range from dark blue-grey to whitish grey. Another less common variety includes dark-blue-grey to brown gradation. Homogenous with no inclusions. Medium to fine grained. No cortex or patina on reference pieces. Opaque and matte, except in darkest blue-grey areas, which are shiny. Conchoidal fracture.

Sonabia Variant 4

Description: Significantly variable flint that is principally dark greyish brown, but can occur in lighter grey, nearly white shades. All shades have black, vein-like patterns. White and crystalline inclusions c. 2mm in size occur. Heterogeneous. Fine grained. Smooth. Cortex is thin and chalky tan-gray. No patina. Conchoidal fracture. Opaque and matte.

Sonabia Variant 5

Description: Light grey with rare, interspersed, dark grey-blue speckles, intergrading into a dark blue-grey that borders the cortex. Homogenous. Fine-grained. Smooth.

Reference piece has no inclusions or patina. Cortex is porous, light grey to brown, rough textured, generally 2-3mm thick. Opaque. Shiny. Conchoidal fracture.

Sonabia Variant 6

Description: Light to dark grey and tannish-brownish flint, that is blotchy, but retains two separate color areas. Tannish brownish section has some dark grey-brown spots.

Homogenous with no inclusions. Fine grained, smooth, shiny, and opaque in light to dark grey sections. Medium grained, rough texture, opaque, and matte in tannish-brownish sections. No patina. Conchoidal fracture.

Sonabia Variant 7

Description: Light grey flint that has very subtle bluish bands and very small light brown speckles. Smooth texture. Homogenous, with no inclusions. Very fine grained. Cortex is thin, c.1mm, is water worn and smooth, varying from brown to dark blue grey to light grey (equal to the flint). Flint color closest to the cortex is a dark translucent blue c. 2mm thick. Slightly shiny and opaque. Reference piece has no patina. Conchoidal fracture.

Sonabia Variant 8

Description: Medium to light bluish grey flint with some very thin dark brown streaks.

Very fine grained and smooth textured. Homogenous. Reference piece has no inclusions, but a previous description notes that they can (rarely) occur. Opaque, edges translucent when held to light, shiny. White chalk cortex <1mm thick. Reference piece has no patina. Conchoidal fracture.

Sonabia Variant 9

Description: Very light grey to grey-brown flint. Translucent. Very fine grained and smooth textured. Homogenous with no inclusions. Cortex is thin, orangish-brown and can vary from smooth to rough. Can have a thin, chalk cortex. Shiny. No patina.

Conchoidal fracture.

Sonabia Variant 10

Description: Grey to dark grey flint that is slightly translucent. Heterogenous. The flint appears to have internal fracture planes and rough textured grey-brown inclusions that are c. 4-7mm in size. Smooth texture. Thin, rough textured reddish brown cortex. Shiny.

Orthogonal fracture. Reference piece has no patina.

Sonabia Variant 11

Description: Bluish-grey translucent flint with black speckles <1mm in size. Alternately, clear to light tan/brown translucent flint with black flecks <1mm in size. Medium grained and slightly rough textured. Conchoidal, but somewhat scaly, fracture. Grey version is less translucent than the tan version. Small section of white, blotchy patina on tan reference piece. Shiny. Reference pieces have no cortex. Homogenous.

Sonabia Variant 12

Description: Bright white flint with blotches of light blue-grey and light brown streaks. Fine grained. Smooth texture. No inclusions/homogenous. Cortex is rough textured and chalky, >2mm thick. Matte and opaque. Conchoidal fracture. Reference piece has no patina.

1.11 Treviño Flint

Treviño Variant 1

Description: Very dark brown to dark brown flint with lighter grey-tan blotches. Very fine grained. Homogenous with no inclusions. Smooth texture. Cortex is thin and golden dark brown, cobble worn, smooth. Opaque and shiny. No patina. Conchoidal fracture.

Treviño Variant 2

Description: Dark greyish brown flint with small dark blue-grey circular inclusions, which may be fossils. Homogenous. Very fine grained. Very smooth. No cortex or patina on reference piece. Opaque and shiny. Conchoidal fracture.

Treviño Variant 3

Description: Dark brown flint with light brown inclusions/areas. Homogenous. Very fine grained. Smooth. Opaque. Shiny. Cortex is rough, dark grey-brown and battered. No patina. Conchoidal fracture.

Treviño Variant 4

Description: Dark and light brown blotchy flint intergrading with a beige color. The beige area has small quadrangular speckles that are light brown c. 1-2mm. The light brown blotches have beige streaks. The dark brown blotches prominently distinguish beige inclusions that are coarse grained. Heterogenous. Fine grained. Smooth. Cortex is dark brown, thin, and rough textured. Opaque and shiny. No patina. Conchoidal fracture.

Treviño Variant 5

Description: Medium to dark brown, blotchy flint. Homogenous, but with very small, <1mm bright white speckled inclusions that occur infrequently. Fine grained. Reference piece has no cortex or patina. Opaque. Shiny. Conchoidal fracture.

Treviño Variant 6

Description: Light greyish tan flint with beige, white, and black speckles. Beige speckles are significantly larger than the white or black speckles (3mm vs. 1mm). Very fine grained. Homogenous. No inclusions, cortex, or patina on the reference piece. Opaque and shiny. Conchoidal fracture. Smooth texture.

Treviño Variant 7

Description: Off-white to light tan flint with medium-to-dark brown bands that are c. 1mm thick, with white speckles. Bands are circular/ovular, akin to tree rings, and variously distanced from one another (range 2-13mm). Some variations include bands that are placed significantly closer together so as to form dark brown areas. Homogenous. Fine grained. Smooth. Opaque, but edges can appear translucent when held to light. Dark bands are shiny. No sample pieces have inclusions, cortex, or patina. Orthogonal fracture.

Treviño Variant 8

Description: Dark brown, nearly black flint with banding similar to Variant 7. Bands are very close and reveal a medium-brown flint. Fine grained. Opaque. Shiny. Reference piece has no inclusions, cortex, or patina. Conchoidal fracture. Smooth texture. Homogenous.

Treviño Variant 9

Description: Tan/dark beige flint with fine bands that are equidistant from each other. Similar to Variant 7 and 8 in the “tree ring” bands. Homogenous/no inclusions. Fine grained. Smooth texture. Opaque and shiny. No patina or cortex on the reference piece.

Treviño Variant 10

Description: Dark grey-brown flint with dark brown, medium brown, and grey-tan speckles that are c.1mm in size. Fine grained. Homogenous. Reference piece has no inclusions or patina. Cortex is light grey, c.1mm thick, smooth and worn. Opaque and shiny. Conchoidal fracture.

Treviño Variant 11

Description: This flint is variable and encompasses several shades of brown, from very light to very dark. A color breakdown is as follows: very light brown with small brown speckles and occasional medium brown stripes; medium brown, occasionally with darker brown stripes or streaks; and dark brown. Connection between these colors can be streaky, blotchy, ringed, or dotted. Medium to fine grained. Smooth texture. Homogenous, with no inclusions. Generally opaque, but can be slightly translucent at edges when held to light. Cortex can be white chalky to light grey. Conchoidal fracture.

Treviño Variant 12

Description: This flint is variable and encompasses several shades of brown, from very light to very dark. A color breakdown is as follows: very light brown with small brown speckles and occasional medium brown stripes; medium brown, occasionally with darker brown stripes or streaks; and dark Brown. Connection between these colors can be streaky, blotchy, ringed, or dotted. Medium to fine grained. Smooth texture.

Homogenous, with no inclusions. Generally opaque, but can be slightly translucent at edges when held to light. Cortex can be white chalky to light grey. Conchoidal fracture.

Treviño Variant 13

Description: Greyish-greenish brown flint that has small white specks near cortical areas and subtle brown speckles. Has been found in darker, chocolate-brown/grey shade. Fine grained. Smooth texture. Homogenous with no inclusions. Opaque and matte. Cortex is thick, cream-grey colored, rough texture, chalky. Can have a chalk-like patina.

Conchoidal fracture.

1.12 Urbasa Flint

Urbasa is another rather variable flint that takes two main forms: streaky grey or speckled tan. There are also white varieties. The streaky grey materials is medium grey with blueish grey streaks that vary in density (sometimes there are very high concentrations of these on a single piece, and other times only a single streak on a piece of equal size). These are coupled with blotches of darker grey that are sometimes small specks, other times larger. The tan variety is a Dijon mustard brown with darker reddish brown dots. This variety can also be very light grey with light brown, extremely tiny speckles. Sometimes this very light grey variety has a thin, translucent, dark brown section between the grey and the cortical surface. Occasionally spicules are visible. The white variety is creamy, with blotchy and streaky beige areas; this variety is not as fine grained as the others. The flint is generally very fine grained and homogenous, without inclusions. The texture is very smooth. The material is matte and opaque, fractures conchoidally, with a cortex that is dark reddish brown and cobble worn. No patina.

2. Flints without Known Geographic Locations

2.1 Black Flints

Type F1:

Description: Black, sometimes a very dark espresso brown with black spots and streaks.

Homogenous, although sometimes with internal fracture planes that result in imperfect conchoidal fracture. Fine grained. Smooth texture. Cortex is thin, medium grey, and rough textured. Opaque and shiny. No patina. Imperfect conchoidal fracture.

Type F2:

Description: Black flint with small light brown inclusions (<1mm). Generally homogenous. Fine grained. Very smooth texture. No cortex on reference pieces. Opaque. Very shiny. Patina is light brown “blanket”-style. Conchoidal fracture.

Flint 109:

Description: Black flint that is very fine grained. Homogenous, no inclusions. Very smooth. Shiny and completely opaque. Conchoidal fracture. No cortex or patina on reference piece.

Flint 116:

Description: Black flint with dark blueish grey speckles. Homogenous. Fine grained. Smooth texture. Shiny. Opaque. Conchoidal fracture. Cortex is dark brown and weathered. No patina.

2.2 Brown Flints

Type F5:

Description: Mustard brown flint with small, <1mm, dark brown flecks. Homogenous with no inclusions. Medium grain. Slightly rough texture. No inclusions. Cortex is very

thin and smooth dark red cortex. Opaque and slightly shiny. Reference piece has no patina. Conchoidal fracture.

Type F6:

Description: Light brown flint that is fine grained and homogenous. A previous description notes that it can contain a few little white inclusions. Smooth textured. Slightly translucent especially when held to light, but generally opaque. Shiny. Conchoidal fracture. Reference piece has no patina or cortex.

Type F7:

Description: Dark reddish-brownish-grey flint with black flecks. There is a variation that is very dark brown with black blotches and small “hole” inclusions. Homogenous. Fine grained. Smooth texture. Reference piece has no cortex, inclusions, or patina. Opaque and shiny. C_M sample shows that large, light brown, rough textured inclusions can occur in this material. Conchoidal fracture.

Type F8:

Description: Greenish-grey tinted dark tan flint that appears speckled with opaque, matte, grey-tan dots that vary in size and shape (round and ovular, ranging ~2mm – 1cm²), and with localized, unpatterned, slightly dark blue-grey streaks; generally homogenous with the exception of a few small chalky-fleck inclusions <1mm in size localized within the opaque grey-tan areas; very fine grained; smooth texture; no cortex or patina present on sample; shiny, with translucent edges; conchoidal fracture.

Type F10:

Description: Medium greyish-brown flint with very small dark brown speckles and occasional blue-grey streaks. Generally homogenous, though it does appear to have some

subtle internal fracture planes. Fine grained. Smooth texture. Reference piece has no inclusions, cortex, or patina. Opaque and shiny. Imperfect conchoidal fracture.

Type F11:

Description: Dark greyish-brown flint. Coarse grained. Heterogenous, with small <1mm “holes”. Matte and opaque. Reference piece has no patina or cortex. Conchoidal fracture. Slightly rough texture.

Type F14:

Description: Dark greyish brown flint with a waxy appearance. Homogenous. Fine grained. No inclusions. Smooth. Reddish brown, smooth cortex. Opaque. Glossy. No patina on reference piece. Conchoidal fracture.

Type F16:

Description: Very light brown flint that intergrades with a slightly translucent greyish tannish brown that has bluish streaks. Light brown area is matte and opaque. Translucent area is shiny. Smooth texture. Homogenous. Fine grained. No inclusions. Cortex is thin, light brown, and chalky, rough textured. No patina. Conchoidal fracture.

Type F18:

Description: Dark grey-brown flint that is subtly speckled. Homogenous. Fine grained. Very smooth texture. No inclusions or patina on the reference piece. Opaque and shiny. Cortex is thin, <1mm, and dark red.

Type F96:

Description: Very dark brown to black flint that is subtly blotchy. Fine grained. Homogenous. Smooth texture. Matte and opaque. No patina or cortex on reference piece. Conchoidal fracture.

Type F104:

Description: Very dark brown to black flint with medium and light grey blotches. Fine grained. Heterogeneous, with some tannish brown, slightly rough textured inclusions. Very smooth texture. Opaque. Shiny. Cortex is very thin <1mm and reddish brown. Conchoidal fracture. No patina on reference piece.

Flint 118:

Description: Greyish, medium brown flint that has lighter brown blotches. Translucent at edges when held to light. Fine grained. Homogenous. Smooth texture. Shiny. Conchoidal fracture. No patina or cortex on reference piece.

*2.3 Cream, Beige, or Tan Flints***Type F20:**

Description: Greyish-white to yellowish beige flint with light grey dots. Variants have been found that are slightly darker grey to light brown with small maroon splotches. Orange tints also are found occasionally. Homogenous. Fine grained. Very smooth. No inclusions. Cortex is thin and medium reddish brown. Cortex can also be water worn cobble, blue-grey and smooth with light brown. Occasionally cortex is pock-marked. Opaque and matte. No patina. Conchoidal fracture.

Type F21:

Description: Yellowish beige flint with a small area that is nicked and bright white. Orange and brown lines crisscross the piece. There are dark blueish streaks that look like they are underneath the yellowish-beige, as if the yellowish-beige is a patina. Has been found intergrading with flints that are darker, red-orange shades and lighter brown-beige-grey colors. This type was found in small amounts but is potentially highly variable.

Cortex is bright orange-brown, pock-marked, and shiny. Very smooth texture.

Homogenous. No inclusions on the reference piece, nor patina. Opaque and shiny (although white nick is matte). Conchoidal fracture. Fine grained.

Type F22:

Description: Cream and light beige colored flint that is striped, with the darker beige stripes nearly twice as thick as the cream-colored ones. Homogenous. Fine grained. Smooth texture. Opaque and matte. No cortex, inclusions, or patina on the reference piece. Conchoidal fracture.

Type F23:

Description: Light grey-tan flint that is yellowish when held to light and translucent at its edges. Sample pieces is homogenous, but an earlier description of the flint notes that it can have large inclusions. Smooth textured. Fine grained. Reference piece has no patina. Conchoidal fracture. Cortex is c.2mm thick, light tan, slightly rough textured, possibly water worn; there is a c.1mm light grey flint stripe between the cortical section and the grey-tan interior.

Type F24:

Description: Dark beige/tan flint with dark blue “streaks” that appear almost like they are an interior surface that has a beige, “blanket” patina. Heterogeneous with white/light grey chalk inclusions. Reference piece has no cortex. Medium grained. Generally smooth texture. Opaque and shiny. Conchoidal fracture.

Type F25:

Description: Dark camel-beige colored flint with very diminutive (unpatterned) white speckles. Waxy, smooth texture, but granular in appearance. Fine grained.

Homogenous. Opaque, but edges are translucent when held to light. Thin, <1mm orange-brown cortex that has a smooth texture, probably a water worn cobble. Very slight shine. Conchoidal fracture. Reference piece has no patina.

Type F26:

Description: Light beige flint that is homogenous and fine grained. Smooth texture. Though the reference piece has no inclusions, a previous description notes that white inclusions can occur. Opaque. Shiny. Reference piece has no cortex or patina. Conchoidal fracture.

Type F27:

Description: Grey to tan flint that is slightly rough textured and medium to coarse grained. There are some small white streaks. Homogenous. Reference piece has no inclusions or patina. Cortex is medium brown, smooth, and cobble-worn cortex. Conchoidal fracture. Opaque and matte.

Type F29:

Description: Creamy beige with light tan flint. Beige areas are opaque and shiny, with smooth texture. Light tan is rougher textured, opaque, and matte. Beige area has some small brown speckles. Homogenous. Fine grained. No inclusions. No cortex on reference piece. No patina. Conchoidal fracture.

Type F30:

Description: Light tan flint with some dark brown flecks. Homogenous. Smooth texture. Fine grained. No cortex or patina on reference piece. Conchoidal fracture. Opaque. Shiny. No inclusions.

Type F94:

Description: Tan/light brown flint with cream and dark grey streaks. Very smooth texture. Fine grained. Homogenous. Opaque and matte. No patina. Conchoidal fracture. No cortex on reference piece.

Type F102:

Description: Creamy beige flint with light grey-tan streaks and dots c. 1mm in size/thickness. Opaque. Shiny. Fine grained. Homogenous. Smooth texture. Conchoidal fracture. No patina. Cortex is greyish-white, rough textured, slightly chalky.

Type F103:

Description: Dark to light beige flint with translucent, mustard-brown colored edges. Interior dark-light beige section has some mustard-brown speckles. Fine grained. Shiny. Slightly translucent, but especially at edges. Conchoidal fracture. Smooth texture. No cortex or patina on reference piece. Homogenous.

Type F106:

Description: Light greyish-beige flint that intergrades with a medium-to-dark grey flint. Beige area has grey speckles. Medium-to-dark grey area is streaky, but not banded. Very smooth texture. Shiny and opaque. Fine grained. Conchoidal fracture. Homogenous. Reference piece has no cortex or patina.

Flint 111:

Description: Whitish beige flint with burnt orange patches. Fine grained. Homogenous. Smooth texture. Very shiny and opaque. Conchoidal fracture. No patina or cortex on reference piece.

2.4 White Flints

Type F32:

Description: White flint with yellowish orange areas and small black dots. Occasionally found with a greyish green tint. Homogenous. Medium to coarse grained. Smooth. No inclusions. Cortex is thin and light orangish-brown, cobble-worn and smooth. Matte and opaque. No patina. Conchoidal fracture.

Type F35:

Description: White and cream colored flint, with small dark pink streaks. Homogenous. Texture is generally smooth. Fine grained. No inclusions, cortex, or patina on the reference piece. Opaque and matte. Conchoidal fracture.

Type F36:

Description: Creamy white intergrading with light yellowish orange flint. Homogenous, but occasionally found with significant fracture planes. Yellowish-orange areas can have micaceous specks. Medium grained. No inclusions. Cortex is greyish-white, thick, porous, and chalky in appearance; rough textured. Flint is smooth textured. Opaque and matte. Reference piece has no patina. Imperfect conchoidal fracture.

Type F37:

Description: Bright white flint. Homogenous. Fine grained. Smooth. No inclusions. Cortex is beige-tan, slightly rough textured, c. 2mm thick. Between cortex and white interior of this flint is a very thin <1mm dark grey-beige line. Opaque. Slightly shiny. No patina. Conchoidal fracture.

Type F38:

Description: Bright grey-white flint with very small black speckles. Homogenous. Very fine grained. No inclusions. Very smooth texture. No cortex. Matte and opaque. Chalky white patina. Conchoidal fracture.

Flint 108:

Description: White flint that is medium to fine grained, homogenous without inclusions and a slightly rough texture. Matte and opaque. Conchoidal fracture. No cortex or patina on reference piece.

Flint 120:

Description: Creamy, whitish flint with green-beige areas delimited by green-grey streaks. Slightly translucent around edges, with some clear inclusions <1mm in size. Fine grained. Cortex is medium brownish tan with a rough texture. Shiny. Smooth texture. Conchoidal fracture. Patina is white, dotty. Homogenous.

*2.5 Lighter Grey Flints***Type F39:**

Description: Light grey to white flint with cranberry-colored speckles and a greyish tint. Homogenous with no inclusions. Fine grained. Smooth. No cortex or patina on reference piece. Opaque and matte. Conchoidal fracture.

Type F40:

Description: Translucent, light-medium grey flint with small, light brown-to-reddish-brown (almost cranberry-colored) speckles. Fine grained. Smooth. Shiny. Reference piece has no cortex, but earlier descriptions from the Mirón collection note a thin, water-

worn cortex that can be orange-brown. Homogenous. Reference piece has no patina.

Conchoidal fracture.

Type F41:

Description: Light blue-grey, blotchy flint with dark blue streaks. Fine grained.

Homogenous. No inclusions. Cortex is thin and orange-brown, smooth texture. Flint is smooth textured. Opaque. Matte. No patina on reference piece. Conchoidal fracture.

Type F42:

Description: Light grey-brownish-beige flint that is slightly translucent, with light tan blotches that are c.2mm in size. Heterogeneous with small 1-2mm “negative/hole” inclusions. Coarse grained. Smooth texture. Shiny. Reference piece has no patina. Conchoidal fracture. Cortex is very thin, smooth cobble-worn with “pores”, brownish grey in color.

Type F43:

Description: Light grey to medium brown flint; greyish portions are closer to cortical sections (cortex is the same light grey-brown shade) and ~1mm thick, suggesting a flint that is medium brown in the interior of the nodule. Homogenous, without inclusions or banding. Very fine grain. Opaque, but edges are translucent when held to light. Shiny. Reference piece has no patina. Cortex is rough, light grey-brown, ~2mm thick. Conchoidal fracture.

Type F44:

Description: Medium blue-grey flint with very small light brown and dark brown speckles. Homogenous. No inclusions. Very smooth texture. Fine grained. Reference piece has no cortex or patina. Opaque and very shiny. Conchoidal fracture.

Type F45:

Description: Light grey flint with dark beige/light tan circular sections that are slightly rougher in texture than the light grey sections, which are smooth. Dark beige/light tan sections are outlined by very thin, <1mm, blue-grey color. Homogenous and fine grained. Previous description notes that pieces can have small to medium sized inclusions. Cortex is thin, <1mm, and orange-brown in color, cobble worn, and very smooth. Reference piece has no patina. Conchoidal fracture. Opaque. Matte in dark beige/light tan areas and shiny in light grey flint.

Type F47:

Description: Very blotchy, light grey flint with blueish-purplish and algae-green streaks and white specks. Very smooth texture. Homogenous. Fine grained. Rough textured, light tan-grey cortex that appears like a worn cobble. Opaque and shiny. Conchoidal fracture. Reference piece has no patina or inclusions.

Type F48:

Description: Light to medium blue-grey flint that is subtly banded. Opaque and slightly shiny. Reference piece has no patina, cortex, or inclusions. Homogenous. Smooth texture. Fine grained. Conchoidal fracture.

Type F50:

Description: Light grey flint with darker blue-grey and white areas that are sometimes dots, streaks, or blotches. Some pieces also have small brown speckles. Homogenous with no inclusions. Medium to fine grain. Smooth texture. Cortex is greyish tan and battered, thin, rough textured, and can turn to crumbly chalk. This type can be highly

variable and is often found with chalk patina. Opaque and slightly shiny. Conchoidal fracture.

Type F52:

Description: Light to medium grey flint with medium to dark brown, rough textured inclusions. Inclusions are encircled by light grey bands c. 1mm thick. Heterogenous. Smooth textured except for inclusions. Medium to fine grained. Cortex is the same medium grey as the flint, with a battered and worn appearance. Opaque and slightly shiny. Conchoidal fracture. Reference piece has no patina.

Type F53:

Description: Light grey flint with bluish streaks. Very fine grained. Cortex is rounded and weathered, also blue-grey. Very smooth. Homogenous. Reference piece has no inclusions or patina. Opaque and shiny. Conchoidal fracture.

Type F93:

Description: Medium grey flint with dark grey dots and light grey streaks. Homogenous with no inclusions. Very fine grained. Smooth texture. Opaque. Slightly shiny. No patina. Conchoidal fracture. Medium tan, rough textured cortex.

Type F95:

Description: Light grey flint with slightly darker grey streaks and blotches. Very fine grained. Homogenous. Very smooth texture. Shiny. Opaque. Conchoidal fracture. No cortex on reference piece.

Type F97:

Description: Medium grey-brown with slight light brown/grey speckles. Light tan dot patina. Fine grained. Homogenous. Smooth texture. Matte. Opaque. Conchoidal fracture. No cortex on reference piece.

Type F99:

Description: Medium grey-brown flint that is blotchy, with dark grey streaks and light grey patches. A small section has dark-light grey bands c. 1mm thick. Fine grained. Homogenous, but sometimes with very small brown inclusions <1mm. Smooth texture. Opaque. Shiny. Imperfect conchoidal fracture—occasionally very chunky with internal fracture planes. No cortex or patina on reference piece.

Type F105:

Description: Light blueish grey flint with light grey dots and very small micaceous speckles. Medium to fine grained. Slightly rough textured. Opaque. Matte with exception of speckles. Reference piece has no cortex or patina. Conchoidal fracture. Homogenous.

Type F107:

Description: Blueish grey flint that is slightly translucent, and streaky/blotchy such that it has lighter blue-grey and darker-blue grey areas. Medium to fine grained. Slightly coarse texture. Translucent and slightly shiny. Conchoidal fracture. Homogenous. Reference piece has no cortex or patina.

Flint 113:

Description: Completely translucent yellowish grey flint, homogenous, smooth texture, fine grained. Shiny. Conchoidal fracture. No patina.

Flint 114:

Description: Light grey flint that is homogenous and fine grained. Smooth textured, shiny and opaque. Conchoidal fracture. Patina is white and dotted. No cortex on reference piece.

Flint 117:

Description: A flint that is somewhat variable, from light tannish grey to dark tannish grey, but always with a significant amount of black speckles. Some areas are translucent black at the edges (between the lighter sections and the cortex), but, material is not translucent. Fine grained. Smooth texture. Shiny. Opaque in most areas except as described above. Cortex is dark grey and weather worn cobble. No patina. Conchoidal fracture.

Flint 121:

Description: Medium greyish green flint with very small white speckles and light grey streaks. Medium reddish brown cobble worn cortex. Very small micaceous speckles. Smooth texture. Homogenous. Fine grained. Shiny. Opaque. Conchoidal fracture. No patina.

*2.6 Darker Grey Flints***Type F54:**

Description: Dark grey-brown translucent flint with light grey-tan blotches c. 1mm in size and circular in shape. Intermittent black and white speckles. Homogenous. Fine grained. Smooth. Reference piece has no inclusions. Patina can be tan “blanket”-style with speckles. Cortex is thin and dark brown, slightly rough cobble. Shiny. Conchoidal fracture.

Type F55:

Description: Dark blue-gray to light grey flint; the color is “noisy” and intergrades so as to appear blotched, perhaps banded—the colors are not distinguished enough as to be “speckled”. Homogenous, but with some small inclusions <1mm. Very smooth texture. Fine grained. A small portion of cortex on the sample piece is dark grey-brown, <1mm thick. Opaque. Shiny. Reference sample has no patina. Conchoidal fracture.

Type F58:

Description: Medium grey-brown flint that appears subtly speckled. Generally homogenous, but with a rough textured, dark grey-brown streak inclusion that looks similar to a fracture plane, but has not impacted the fracture of the piece. Fine grained. Smooth texture. No cortex or patina on reference piece. Opaque and shiny. Conchoidal fracture.

Type F59:

Description: Dark reddish grey, slightly translucent flint with black and red-brown speckles. Fine grained. Homogenous. Reference piece has no inclusions, patina, or cortex. Smooth texture. Shiny. Conchoidal fracture.

Type F60:

Description: Medium grey flint with dark grey streaks. The medium grey is “noisy”, it looks like very closely concentrated speckles that are occasionally interrupted by lighter grey speckles—it isn’t speckled in a traditional sense because the dots are so concentrated, but they are not “blurred” so as to appear blotchy. Generally homogenous, but with negative, “hole”-like inclusions. Fine grained. Reference piece has no patina or cortex. Conchoidal fracture. Opaque and shiny.

Type F61:

Description: Dark blue-grey flint with darker blue-black speckles. Homogenous. Fine grained. Smooth texture. No inclusions. Cortex is dark brown –grey and slightly rough textured. Opaque and shiny. Reference piece has no patina. Conchoidal fracture.

Type F62:

Description: Medium blue-grey, slightly translucent flint with light brown streaks and small white speckles. Reference piece has no cortex, patina, or inclusions. Homogenous. Fine grained. Opaque and shiny. Conchoidal fracture.

Type F63:

Description: Medium blue-grey flint with small light brown speckles that are slightly coarser grained than the rest of the piece, which is fine grained. Homogenous. Smooth textured. No inclusions. No cortex. No patina. Opaque and shiny. Conchoidal fracture.

Type F64:

Description: Medium grey flint with small dark blue specks. Homogenous. Medium to coarse grained. Slightly rough texture. Thin, light brown, cobble worn cortex. Opaque. Slightly shiny. No patina. Imperfect conchoidal fracture. No inclusions.

Type F65:

Description: Dark grey flint with very fine light grey/black speckles. Homogenous. Fine grained. No inclusions. Cortex is thin dark brown, smooth textured. Opaque and shiny. No patina. Conchoidal fracture. Is almost always found with evidence of heat-treatment.

Type F66:

Description: Medium grey-tan flint with small white speckles. Fine grained. Homogenous with no inclusions. Smooth texture. Cortex is light grey-brown, very

smooth, water-worn cobble surface. Opaque and matte. No patina. Conchoidal fracture. Occasionally found with bluish stripes.

Type F67:

Description: Medium grey flint with small white and/or dark blue speckles. Coarse grained. Homogenous. No inclusions. Slightly rough texture. Thin brown cortex that is smooth. No patina. Conchoidal fracture. Opaque and shiny.

Type F68:

Description: Grey flint with dark grey and white speckles. Homogenous. Fine grained. No inclusions. Cortex is c.2mm thick and light tan/orange, slightly rough. Opaque and matte. No patina on reference piece. Conchoidal fracture.

Type F69:

Description: Blue-grey flint with translucent blue-tan inclusions. Heterogeneous. Inclusions. Glossy. Opaque in blue-grey areas. No patina on the reference piece. Cortex is thin and light orange-brown, smooth texture. Fine grained.

Type F71:

Description: Dark grey flint with very light brown specks. Very fine grained. A variation of this material has light tan stripes that are 2-3mm wide. Homogenous. Smooth texture. No inclusions or patina or cortex on the reference piece. Opaque, but edges are slightly translucent when held to light. Shiny. Conchoidal fracture.

Type F72:

Description: Dark grey-brown flint with light brown speckles. Fine grained. Homogenous. Smooth texture. No inclusions, cortex, or patina on the reference piece. Opaque. Slightly shiny. Conchoidal fracture.

Type F73:

Description: Greenish light to dark grey flint with dark blue /navy flecks. Homogenous. Fine grained. Smooth texture. Reference piece has no inclusions, but an earlier description of the flint notes that it can have very large white inclusions. Reference piece has no cortex or patina. Conchoidal fracture. Opaque. Slightly shiny. A variant of this material has significant dark grey bands that vary in thickness from c.2-5mm and very thin <1mm greyish tan cortex that is cobble worn.

Flint 122:

Description: Dark greyish tan flint, coarse grained. Small micaceous speckles. Light brown rough textured cortex. Conchoidal fracture. Homogenous. Matte and opaque. Slightly rough texture. No patina.

*2.7 Blue and Purplish Flints***Type F74:**

Description: Dark purplish-blue flint with greyish blotches. Very fine grained. Homogenous. No inclusions. Cortex is thin and reddish brown, cobble worn, smooth. Smooth. White spotty patina. Opaque. Shiny. Conchoidal fracture.

Type F101:

Description: Blotchy grey and purplish tan flint with small c.2mm streaky white inclusions. Fine grained. Generally homogenous. Smooth texture. Slightly shiny and slightly translucent. No cortex or patina on the reference piece. Conchoidal fracture.

2.8 Pink Flints

Type F75:

Description: Medium pink flint. Homogenous/no inclusions. Fine grained. Translucent edges when held to light, otherwise opaque. Shiny. Conchoidal fracture. Reference piece has no patina or cortex. Smooth texture.

Type F76:

Description: Medium pink flint with small (<1mm) white inclusions. Flint is heterogenous, with internal fracture planes and dark brown, rough textured inclusions. Flint has a smooth texture. Fine grained. Reference piece has been burned. Reference piece has no patina or cortex. Flint is opaque and shiny. Imperfect conchoidal fracture.

Type F77:

Description: Streaky medium pink to light grey flint. Homogenous. Fine grained. No inclusions. No cortex or patina on reference piece. Translucent and matte. Conchoidal fracture.

Type F98:

Description: Multicolored flint. Reference piece intergrades between clear/white, pink, Dijon brown, and orange-red. Shiny. Smooth. Opaque. Homogenous. Conchoidal fracture. No patina or cortex. Fine grained.

Type F100:

Description: Light grey to medium pink flint that is significantly translucent, with dark grey streaks, and reddish-brown speckles. Fine grained. Homogenous. Smooth texture. Matte. Conchoidal fracture. Reference piece has no patina or cortex.

Flint 119:

Description: Creamy light pink flint with magenta streaks. Fine grained. Homogenous, smooth texture. Slightly translucent at edges, otherwise opaque. Shiny. Conchoidal fracture. No cortex on reference piece. Has a patina that is white.

*2.9 Red and Orange Flints***Type F78:**

Description: Dark red flint. Fine grained. Opaque. Shiny. Conchoidal fracture. No inclusions/homogenous. Dark red, <1mm thick cortex. Smooth texture. Reference piece has no patina.

Type F79:

Description: Dark maroon flint with thin black streaks. Homogenous. Fine grained. Smooth texture. Cortex is greyish brown and appears to have metamorphosed layers. Opaque and slightly shiny. No patina. No inclusions. Conchoidal fracture.

Type F80:

Description: Dark maroon flint. Homogenous. Fine grained. Smooth texture. Cortex is dark maroon and slightly rough textured. Opaque and slightly shiny. No patina or inclusions. Conchoidal fracture.

Type F81:

Description: Dark maroon flint that occasionally has very thin lighter maroon/dark pink bands. Homogenous, with no inclusions. Fine grained. Smooth texture. Cortex is dark maroon and very smooth, cobble worn, and occasionally battered. Opaque and shiny. Banded areas area matte. Conchoidal fracture. Reference piece has no patina.

Flint 112:

Description: Maroon flint that is medium grained. Homogenous. Smooth texture. Shiny and opaque. Conchoidal fracture. No cortex or patina on reference piece.

Flint 115:

Description: Burnt orange flint with mustard yellow streaks, homogenous and fine grained. Translucent. Slightly shiny. Conchoidal fracture, no cortex or patina. Smooth texture.

*2.10 Banded Flints***Type F84:**

Description: Light grey flint with dark grey bands. Homogenous. Fine grained. Smooth texture. No cortex, patina, or inclusions on reference piece. Opaque and matte.

Conchoidal fracture.

Type F85:

Description: Greyish tan to light brown flint that is banded/speckled with beige flecks that are between 1-2mm in size. Heterogeneous, with inclusions c. 2mm in size, with light brown matte color and rough texture. Flint has a rough texture and medium-to-coarse grain size. Reference piece has no cortex or patina. Generally opaque, but edges are translucent when held to light. Shiny. Conchoidal fracture.

*2.11 Speckled Flints***Type F87:**

Description: Extremely speckled flint that is generally greyish-brown in color. Speckles are: dark blue-black, white, grey-brown, dark grey, and light brown. All are <1mm in size. Heterogenous. Fine grained. Smooth texture. No inclusions. Cortex is very thin

tannish tinted, smooth, and underlying speckled surface is visible through it. Other cortex that is mixed light/dark brown, rough textured and grainy has been found.

Opaque. Shiny. No patina. Conchoidal fracture.

Type F88:

Description: Light greyish tan flint with dark blue and cranberry colored speckles. Fine grained. Homogenous. No inclusions. Cortex is very thin, light brown, shiny, smooth. Smooth textured flint. Opaque and matte. No patina on reference piece. Conchoidal fracture.

Type F89:

Description: Greyish/tannish extremely speckled flint—so much that the color of the flint itself is difficult to discern because it seems a speckled mixture. Speckles are: light grey, tan, white, bluish grey. Greyish speckles appear translucent, but the rest is opaque. Material is matte. Heterogenous, with a grey chalk inclusion. Cortex is cobble worn and smooth, light greyish tan. No patina. Conchoidal fracture. Smooth.

Type F90:

Description: Grey flint with light brown, highly concentrated speckles. Fine grain. Homogenous. No inclusions. Smooth texture. Opaque and shiny. No patina on reference piece. Conchoidal fracture.

Type F92:

Description: Light tan, grey to light grey blotchy flint that is slightly translucent—especially the light grey areas. Edges are translucent when held to light, regardless of color. Blotched colors appear almost speckled because of their intergradation. Heterogenous, with some dark patches that have rougher textures than the rest of the

piece, which is slightly rough textured. Coarse grained. Reference piece has no cortex or patina. Slightly shiny. Imperfect conchoidal fracture.

Flint 110:

Tannish to light brown flint that is significantly speckled—speckles are black, dark brown, and dark grey, and between 1-2mm in size. The material is slightly coarse grained. There are occasional inclusions that are medium brown and rough textured. The material is matte, and slightly translucent at the edges when held to light. Conchoidal fracture. Cortex is very thin (<1mm) and reddish brown.

2.12 Group F Flints

Flint groups were defined based on co-occurrence of visually distinct flints (that were originally classified separately) on single artifacts. These flints are indicative of what may be highly variable geologic formations.

Group F Variant 1:

Description: Dark brown to light tan blotchy, speckled flint. Sometimes speckles can be black. Translucent. Cortex is light tan, typically patinated so seriously that it is disintegrating. Patina—which is very prevalent—is contained to the tan areas of the flint. Variations are found that are solely translucent dark brown with very few tan blotches. Smooth. Generally homogenous, although patina can eat away at large sections of the material. Fine grained. Shiny. Conchoidal fracture.

Group F Variant 2:

Description: Light greyish brown flint with clear crystalline inclusions c. 1mm in size. Heterogeneous. Fine grained. Smooth. Cortex is light grey and very smooth, weather worn. Opaque and matte. No patina. Conchoidal fracture.

Group F Variant 3:

Description: Light grey flint with dark grey streaks, blueish-grey dots, and lighter grey streaks. Significantly patinated. Patina is light tan to white and disintegrating the material. Pieces that are not patinated are exceptionally rare. Fine grained.

Heterogenous with some rough-textured, tan inclusions. Opaque and matte. Conchoidal fracture.

Group F Variant 4:

Description: Light greyish tan flint with “negative” black inclusions and dark grey-brown streaks. Generally coarse grained, but has been found with finer grained materials.

Heterogeneous. Slightly rough texture. Cortex is light orange-brown with black speckles. Matte and opaque. No patina. Conchoidal fracture.

Group F Variant 5:

Description: Blotchy, medium grey-tan flint. Has been found with slightly darker tan gradations that have a slightly rough texture and black speckles. Flint has a smooth texture in general. Inclusions are rare, though when they occur they are large and crystalline. Cortex is rough, chalky. Patina is also chalky. Matte and opaque.

Conchoidal fracture. Fine grained.

3. All Other Lithic Toolstones*3.1 Quartzites***Type QZ1:**

Description: Dark grey to very dark grey quartzite, coarse-grained, opaque, matte, imperfect conchoidal fracture, thin water-worn cortex (quartzite according to A. Aranburu).

Type QZ2:

Description: Red quartzite (w/ iron content) with medium grey streaks, water-worn cortex, orthogonal fracture, matte, waxy texture, opaque but translucent at edges (sandstone according to Aranburu, sourced to Carranza, Trucios, Oriñón, Castro). Coarse grained.

Type QZ3:

Description: Crystalline quartzite that is light grey, coarse grained, with small brown bands, opaque, matte, conchoidal fracture (quartzite according to A. Aranburu).

Type QZ4:

Description: Light grey quartzite, fine grained, slightly translucent. Can be banded. Dark red smooth cortex. Smooth. Generally opaque and matte. Homogenous.

Type QZ5:

Description: Dark grey, very fine grain, opaque quartzite, slightly shiny, conchoidal fracture (fine-grain quartzite or coarse-grained flint according to A. Aranburu). Opaque. Thin cobble worn cortex that is very smooth. Smooth textured quartzite. Homogenous.

Type QZ6:

Description: Grey to light grey, coarse-grain, opaque, matte quartzite with mica flecks, conchoidal fracture, Thin, grey, cobble-worn cortex. Homogenous. (quartzite according to A. Aranburu).

Type QZ7:

Description: Dark grey quartzite that has a brownish tint. Homogenous. Fine grained. Smooth and waxy. No inclusions. No cortex. Matte. Opaque. Conchoidal fracture.

Type QZ8:

Description: Medium grey quartzite. Coarse grained. Homogenous. Brown cobble worn cortex that is smooth. Smooth texture. Opaque. Matte. Conchoidal fracture.

Type QZ9:

Description: Light tannish grey quartzite. Coarse grained. Homogenous. No cortex. Micaceous specks. Opaque. Shiny. Conchoidal fracture.

Type QZ10:

Description: Dark grey quartzite with light grey inclusions. Medium grained. Grey weather-worn cortex. Rough texture. Opaque. Shiny. Conchoidal fracture.

Type QZ11:

Description: Light grey quartzite. Coarse grained. Homogenous. Waxy texture. No cortex. Opaque and shiny. Conchoidal fracture.

Type QZ12:

Description: Dark greyish tan quartzite. Coarse grained. Homogenous. Rough texture. Dark grey-brown cobble worn cortex. Shiny. Opaque. Conchoidal fracture.

Type QZ13:

Description: Dark grey quartzite with a reddish tint. Very fine grained. Smooth. Dark grey worn cortex that is smooth. Homogenous. Shiny. Opaque. Conchoidal fracture.

Type QZ14:

Description: Bright red quartzite. Fine grained. Smooth. Dark greyish-tannish-brown, smooth cortex. Opaque. Matte. Conchoidal fracture.

Type QZ15:

Description: Light grey quartzite with cranberry colored specks. Medium grained. Rough texture. No cortex on reference piece. Opaque. Matte. Conchoidal fracture.

Type QZ16:

Description: Dark purplish-maroon quartzite. Fine grained. Bright red cortex. Homogenous. Smooth texture. Matte. Opaque. Conchoidal fracture. Micaceous specks.

Type QZ17:

Description: Dark grey-brown quartzite. No cortex. Fine grained. Slightly rough texture. Homogenous. Opaque. Matte. Conchoidal fracture.

Type QZ18:

Description: Dark grey with a brownish tint. Homogenous. Coarse grained. Rough texture. No inclusions or cortex. Matte. Opaque. Micaceous specks. Conchoidal fracture.

Type QZ19:

Description: White quartzite with grey blotches. Homogenous. Coarse grained. Rough texture. Reddish-brown cortex. Matte. Opaque. Imperfect conchoidal fracture.

Type QZ20:

Description: Bright yellowish tan quartzite. Fine grained. Homogenous. No cortex. Smooth. Shiny. Opaque. Conchoidal fracture.

Type QZ21:

Description: Pinkish white quartzite. This material has been burned. Homogenous. Medium grain. Dark red cortex. Matte. Opaque. Conchoidal fracture. Possibly a burned, coarse grained flint.

Type QZ22:

Description: Light grey quartzite. Fine grained. Homogenous. Smooth. No cortex. Opaque. Shiny. Conchoidal fracture.

Type QZ23:

Description: Grey quartzite with a pinkish tint. Fine grained. Translucent. Homogenous. Smooth. Shiny. Conchoidal fracture.

Type QZ24:

Description: Dark purplish grey quartzite. Fine grained. Opaque. Shiny. Light grey and thin cortex. Conchoidal fracture.

Type QZ25:

Description: Dark tan/mustard-colored quartzite. Fine grained. Opaque. Shiny. Homogenous. Conchoidal fracture. Medium orange-brown cortex. Smooth texture.

Type QZ26:

Description: Medium grey quartzite. Homogenous. Medium grained. Rough and waxy texture. Shiny. Translucent at edges, otherwise opaque. Conchoidal fracture. No cortex on reference piece.

Type QZ27:

Description: Medium grey quartzite with small micaceous speckles. Medium grain. Homogenous. Rough texture. Matte and opaque. Conchoidal fracture. No cortex on reference piece.

Type QZ28:

Description: Medium grey quartzite with dark grey streaks. Coarse grained. Homogenous. Rough texture. Shiny micaceous speckles, otherwise matte. Conchoidal fracture. Opaque. No cortex on reference piece.

Type QZ29:

Description: Light blue-grey quartzite, medium grained, homogenous, no inclusions, smooth and slightly waxy texture, translucent, shiny, conchoidal fracture, no cortex or patina.

Type QZ30:

Description: Light greyish blue quartzite, fine to medium grained, homogenous, no inclusions, smooth textured, shiny, translucent, imperfect conchoidal fracture, cortex reddish cobble worn, no patina.

Type QZ31:

Description: Barn red quartzite, medium to fine grained, homogenous, slightly rough texture, matte, opaque, imperfect conchoidal fracture due to internal breakage planes, cortex is thin and also red, rounded cobble surface, no patina.

Type QZ32:

Description: Light grey quartzite, rough texture, homogenous, conchoidal fracture, opaque, brown cobble cortex, no patina. Coarse grained.

Type QZ33:

Description: White to light grey quartzite with a dark, brownish red cobble cortex.

Conchoidal fracture. Micaceous speckles. Coarse grained. Often found burned, looking dark brown/blackened. Texture is rough. Matte and opaque. May be a kind of quartzitic sandstone.

*3.2 Quartzes and Calcites***Type QC1:**

Description: Transparent quartz crystal, clear.

Type QC2:

Description: Milk (white) quartz crystal.

Type QC3:

Description: Calcite crystal, translucent, “soft”. Homogenous. Smooth texture. No cortex on reference piece. Shiny in light. Conchoidal fracture.

Type QC4:

Description: Milk calcite crystal, opaque, matte.

*3.3 Mudstones and Lutites***Type M1:**

Description: Dary grey-black, possibly metamorphosed; slightly coarse grained, homogenous, opaque, conchoidal fracture, water-worn cortex, matte, smooth texture (probably not a quartzite according to Farrand; a lutite according to Marez del Cueto and A. Aranburu, but not a lutite according to M. Lopez).

Type M2:

Description: Dark grey, coarse-grained, homogenous, opaque, conchoidal fracture, thin water-worn cortex, matte, smooth texture (a lutite according to A. Aranburu).

Type M3:

Description: Reddish-brownish-grey, fine grained, homogenous, opaque, conchoidal fracture, matte (lutite according to Barez del Cueto and A. Aranburu; but a flint according to Farrand).

Type M4:

Description: Light brownish grey, coarse-grained with small black inclusions, generally homogenous, opaque, imperfect conchoidal fracture, thin water-worn cortex, matte, slightly rough texture (probably a quartzite according to Farrand, but lutite according to Barez del Cueto; a fine-grained siltstone or sandstone with or equal to glauconite according to A. Aranburu).

Type M5:

Description: Medium grey-brown mudstone, homogenous, coarse grained, rough texture, micaceous specks, with brown rough cortex, matte, opaque, conchoidal fracture. Possibly a quartzite (?).

Type M6:

Description: Dark greenish greyish brown, medium to coarse grained, homogenous, rough texture, matte, opaque, conchoidal fracture, thin black cobble worn cortex, no patina.

Type M7:

Description: Greenish-grey, medium to coarse grained, homogeonos, rough textured, mate, opaque, conchoidal fracture, green-grey cobble worn cortex, no patina.

Type M8:

Description: Medium grey mudstone with dark grey streaks. Coarse grained. Conchoidal fracture. Opaque. Matte. Cortex is cobble worn and identical in color to the mudstone, though occasionally has a whitish, or lighter grey surface. May be a kind of limestone. Rough texture.

Type M9:

Description: Greenish brown mudstone with red streaks and tan stripes. Cortex is medium tan with light tan streaks and cobble worn. Conchoidal fracture. Slightly rough texture. Opaque and matte. Medium grained.

*3.4 Limestones***Type L1:**

Description: Light grey limestone, slightly rough-grained, conchoidal fracture, opaque, homogenous. matte (probably a quartzite according to Farrand, but possibly a lutite according to Barez del Cueto; not a quartzite according to Aranburu, who says it is a calcaranite or sandy limestone).

Type L2:

Description: Light yellowish brown, smooth-grained, opaque, conchoidal fracture, cortex is light yellowish brown and smooth, matte (could be glauconite according to Aranburu, from Trucios or Castro Urdiales).

Type L3:

Medium grey-tan limestone, slightly rough grained, conchoidal fracture, opaque, homogenous, matte, no cortex or patina on reference piece. Rough textured.

*3.5 Other Raw Materials***Type O1:**

Description: Yellow ochre (limonite).

Type O2:

Description: Red ochre (hematite, goethite).

Type O3:

Description: Amber

Type O4:

Description: Jet black, possible igneous rock with tiny micaceous specks. Matte.

Opaque, though some areas are shiny (perhaps patina?). No cortex on reference pieces.

Homogenous. Medium to coarse grained. Smooth. Conchoidal fracture.

Type O5:

Description: Quartzitic sandstone. Indurated/Metamorphic (?). Cortex is smooth, light tannish brown. There are micaceous specks. Grey-tan with a reddish-brown streak.

Opaque and matte. Coarse grained.

Type O6:

Description: Sandstone. Rough, worn cortex. Dark grey. Rough texture. Coarse grain.

Opaque and matte. Conchoidal fracture. Homogenous.

3.6 Unidentified Stone

Type U1:

Description: Unidentified stone. This raw material description was used for all microdebris <1cm in size in every assemblage analyzed.

Type U2:

Description: Possibly quartzitic sandstone. Tiny micaceous flecks. Coarse grained. Light brown/tan with light brown bands (possibly metamorphic?). Light brown/tan water worn smooth cortex. Conchoidal fracture. Opaque. Matte.

Type U3:

Description: Possibly mudstone? Slightly coarse grained. Dark brown. Smooth cobble cortex. Rough texture. Matte. Opaque. Conchoidal fracture. Homogenous.

Type U4:

Description: Possibly mudstone? Dark red/maroon. Slightly coarse grained. Rough texture. Smooth cobble cortex that is also maroon. Matte. Opaque. Homogenous. Imperfect conchoidal fracture.

Type U5:

Description: Possibly mudstone? Dark grey with black speckles. Light grey with black speckled smooth cobble cortex. Rough texture. Coarse grained. Opaque. Matte. Conchoidal fracture.

Type U6:

Description: Dark grey-brown, possibly mudstone. Homogenous. Coarse grained. Rough texture. No cortex on piece. Matte. Opaque. Conchoidal fracture.

Type U7:

Description: Possibly limestone? Dark blue-gray. Coarse grained. Matte. Opaque.

Orthogonal fracture (?). Rough texture. Homogenous.

Type U8:

Description: Dark grey with crystalline inclusions. Possibly quartzite? Coarse grained.

Dark pink-tan cobble smooth cortex. Conchoidal fracture. Rough texture. Opaque.

Matte.

Type U9:

Description: Dark grey, possibly quartzite. Coarse grained. Dark grey smooth cobble cortex. Homogenous. Matte. Opaque. Conchoidal fracture.

Type U10:

Description: Quartzitic sandstone? Light grey-brown. Slightly coarse grained. Light brown cortex. Homogenous. Slightly rough texture. Matte. Opaque. Conchoidal fracture.

Type U11:

Description: Possibly limestone? Medium grey. Very rough texture. Coarse grained. No cortex. Matte. Opaque. Conchoidal fracture. Appears heterogenous because of a concretion.

Type U12:

Description: Possibly calcite? Greenish grey with purple streaks, homogenous, coarse grained, rough texture, matte, opaque, conchoidal fracture, no cortex or patina.

Type U13:

Description: Quartz conglomerate. Sedimentary rock. Generally white quartz pieces, some rounded, with small pieces of black flint incorporated. Components generally less than 1 centimeter in diameter. Heterogeneous. Slightly rough texture. Matte. Opaque. Fractures along quartz shearing planes. No cortex or patina.

Type U14:

Description: Possibly calcite? Greenish-grey with tan stripes that are very fine. Coarse grained. Rough textured. Homogenous. Matte. Opaque, Conchoidal fracture. Cortex is rounded cobble, thin, with same appearance as the stone. No patina.

Type U15:

Description: Possibly mudstone? Dark maroon to black stone, homogenous, coarse grained. Smooth texture. Matte, opaque. Conchoidal fracture. No cortex or patina on reference piece.

Type U16:

Description: Possibly mudstone? Reddish orange stone with black streaks. Very coarse grained, homogenous, rough textured. Matte. Opaque. Conchoidal fracture. Cortex is thin, cobble worn, and appears like the interior of the piece. No patina.

Type U17:

Description: Possibly mudstone? Medium to dark grey stone, very coarse grained, homogenous, matte, opaque, rough textured. Cortex is grey and cobble worn. No patina. Conchoidal fracture.

Type U18:

Description: Possibly mudstone? Red to maroon colored stone with a dark red cortex that is a “pock marked” rounded cobble. Homogenous. Coarse grained. Rough texture (but very smooth cortex), matte, opaque, with conchoidal fracture and no patina.

Type U19:

Description: Possibly calcite? Light brown to tan stone that is coarse grained. May have been metamorphosed. Rough texture. Homogenous. Matte. Opaque. Imperfect conchoidal fracture due to horizontal (relative to sample’s flaking axis) internal fracture planes. Cortex is white and chalky. No patina.

Type U20:

Description: Possibly quartzite or very very coarse grained flint? Greyish tan stone that is coarse grained, with a rough, light tan/brown cortex. Smooth texture, slightly shiny, opaque, conchoidal fracture, no patina.