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A PREHISTORIC ARMS RACE: A STUDY OF THE TECHNOLOGICAL ORGANIZATION OF PROJECTILE POINTS FROM THE LATE ARCHAIC SARPY BISON KILL SITE (24BH3078)

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Bachelor of Arts, Univeristy of Montana, Montana, 2013

Thesis

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Chapter 1: Introduction

This thesis is a technological analysis of projectile points from the Late Archaic period Sarpy Bison Kill (24BH3078).Through a technological organizational perspective (Andrefsky 2006, 2008a; Binford 1973, 1977, 1979; Kelly 1988; MacDonald 1999, 2009; Nelson 1991; Odell, 2000, 2001; Shott 1986; Torrence 1983), I try to understand the behaviors and strategies conducted by hunter-gatherers who lived at the Sarpy site on southeastern Montana during the Late Archaic period. The Sarp Bison Kill site's main occupation was from approximately from 2,100 BP to around 1,800 BP (Munson and McElroy 2015).

The Sarpy Bison Kill site was excavated by Gene Munson and GCM Services Inc. during the 2009, 2010, and 2011 field seasons (Munson 2012; Munson and McElroy 2015). Exploration was conducted in the campsites, kill area, and both bonebeds with both both lithic and faunal atifacts being found. The most recovered lithic tool type at the site was the 2,563 projectile points from the bonebeds, kill area, and campsites, which are the focus of this thesis. Each of the five chapters within this thesis will observe aspects of the technological organization of projectile points at the site to reveal behaviors and strategies used by the Late Archaic hunter-gatherers of the site and how these affected the projectile technology.

Chapter 2 dives into the issues surrounding communal bison hunting and the organizational complexity of these types of sites. The first half of the chapter gives a brief overview on communal hunting strategies and the analyses conducted by some researchers. The second half of the chapter gives an overall view of technological organization from earliest studies to present times. This background information on technological organization will focus on studies within procurement strategies, or the obtaining of lithic raw material for the

production of stone implements, tool design and manufacture, and maintenance/repair strategies, or work conducted on stone tools to prolong the use-life of that implement.

In Chapter 3 the Sarpy Bison Kill Site is examined in detail to understand the context of the site, including the relationships of the various site elements to function and aspects of the projectile points. This includes details on the four major parts of the site, the arroyo/drainage system, the kill area, the processing area, and the campsites, and how each part works to produce a functional hunting site. The environment and seasonal use of the site will be observed to see what natural conditions the hunter-gatherers of the communal hunt faced while conducting a harvest of this magnitude. Finally a regional cultural history will be examined to understand this site's place within the landscape and the overall history of the hunter-gatherer culture at this time.

Chapter 4 of this thesis discusses the analysis conducted to answer the questions on technological organization. The three technological organizational factors focused in this analysis are procurement strategies, point design and manufacture, and maintenance and repair. Each factor analyzes a particular part of the technological organization of the Sarpy Bison Kill points. Hypotheses are constructed for each factor to understand decisions made by the Late Archaic occupants of the site. Chapter 4 begins with these hypotheses being stated in detail and what each one is testing for in terms of technological decisions.

The different methods are developed to test the hypotheses for each part of the analysis. The methods for procurement will discuss the material and possible locations for procurement setting up ranges to sources to understand mobility and transportability of projectile technology to the Sarpy Bison Kill site. Methods for point design and manufacture utilize both metrical and non-metrical data collected from the points to understand overall design and variation. The methods for the maintenance and repair analysis uses specific indices to understand what type of

retouch is being conducted and how intensive the retouch on the points is to understand decisions on repair and maintenance at the Sarpy Bison Kill. Finally, Chapter 4 will discuss the results of each part of the analysis and what each factor means about the technological organization of the projectile point technology at the Sarpy Bison Kill site.

Chapter 5 will conclude the thesis by restating the results of the technological organization and clearly state what the preparation and organization of the projectile point technology was at the Sarpy Bison Kill site. All three parts of the analysis will be examined in connection to each other and reveal the overall organization of the projectile technology at the site. After examining the organization of projectile technology at the site, Chapter 5 will also highlight areas of future research this analysis can help with.

The main research goal of this thesis is to understand the Late Archaic hunter-gatherers of the Sarpy Bison Kill site and how the projectile technology was organized. This research also wants to understand the underlining behaviors or strategies that affect the overall organization of projectile points. The analysis conducted at the Sarpy Bison Kill site has major implications for the study of communal bison hunting sites located throughout the Great Plains. By comparing the results of this analysis to other point assemblages from other communal hunting sites, researchers will be able to reveal patterns in behaviors and strategies in projectile technology over both space and time furthering our understanding of these complex sites. By studying the large assemblage of projectile points from this site, researchers have a large sample size to build upon for future research.

Chapter 2: Communal Bison Hunting and Technological Organization Studies

Communal Bison Hunting

Hunter-gatherers around the world developed many strategies to adapt to their environments. These strategies, developed and fine-tuned through years and years of practice, not only allowed these groups to survive in the various environments they inhabited but allowed them to flourish in these places. Being successful, these strategies developed by hunter-gatherers to respond to their environment would affect all aspects of their daily life including their material culture. By studying the archaeological remains of these people we can try to understand certain decisions and behaviors. The sites produced by hunter-gatherers vary widely from simple residential camps to complex villages and specialized activity areas. On the Great Plains of North America one such sophisticated activity was the communal bison hunting system. This type of hunting system ranged from simple traps that allowed for a few animals to be harvested to complex driveline systems leading to a corral or a bison jump (Brink 2008; Frison 1971b, 1978, 1991, 2004; Kornfeld et al. 2010; Peck 2011). For these systems to be productive, hunter-gatherers had to develop many strategies to make the benefits of such complex systems worth the cost of preparation, time and energy spent.

One such communal bison hunting system is the Sarpy Bison Kill site located in southeastern Montana (Munson 2012; Munson and McElroy 2015). This communal hunting system is a natural corral utilizing the landscapes natural features to entrap and harvest the bison. This site was used during the Late Plains Archaic period for a short time period, but reveals that over 2,000 bison were harvested from the system. With the site occupation being relatively short and the high amount of bison harvested during this time, the hunting system employed by the occupants must have been reasonably successful. The overall question surrounding an

assemblage of this magnitude is what is the degree of preparation and organization of technology at a communal hunting system like that of the Sarpy Bison Kill?

The degree of hunter-gatherer organization and preparation to successfully complete a communal hunt ranges just as widely as the sophistication of the hunting system itself. Researchers have been trying to understand various types of organization surrounding these types of hunts (Brink 2008; Buehler 1997a, 1997b; Carlson and Bement 2013; Forbis 1978; Friesen 2013; Frison 1978,1991, 2004; Kornfeld et al. 2010; Reeves 1978a, 1978b; Verbicky-Todd 1984; Zedeno et al. 2014). One area that can help researchers comprehend the strategy and behaviors at these sites is to understand the technology employed in these systems. Technological organization (Bamforth 1985; Binford 1977,1979,1980; Nelson 1991; Schiffer 1972) is a major part of societies' plans for procuring of various resources and how it is organized and utilized to improve the cost and benefits of that system. Technological organization consists of many factors that affect technology and its use in activities. Some of these factors include transportation and mobility (Andrefsky 1994, 2009; Beck and Jones 1990; Beck 2008; Beck et al. 2010; Close 1996; Gramly 1980; Kelly 1988; Railey 2010; Shott 1986; Smith 1999), tool design and function (Andrefsky 1997; Bamforth 1985, 1986; Boldurian and Hubinsky 1994; Christenson 1986; Hughes 1998; Kuhn 1994; Morrow 1996; Nelson 1991; Odell 2001), durability and use-life (Andrefsky 2006, 2008a, 2010; Flenniken and Raymond 1986; Hayden 1987; Smith et al. 2013) to name a few. Each one of these factors affects different peoples in various ways and culminates in how each group organizes technology for use with these obstacles in mind. Due to being able to understand different behaviors and strategies for various types of technologies and their effect on daily life, technological organization will be employed to understand the projectile technology utilized at the Sarpy Bison Kill site and the decision making conducted by the occupants on this particular tool. Since technological

organization covers a wide range of factors that can affect projectile technology, the analysis will analyze procurement, tool design/manufacture, and maintenance/repair to fully understand the organization conducted by individuals at the Sarpy Bison Kill in relation to the points.

Technological Organization

Technological organization studies began with Binford's seminal work in the 1970's were he analyzed aspects of the decision making process conducted by hunter-gatherers (Binford 1977, 1979, 1980).Schiffer's (1972) work on the life history of atifacts also greatly affected the study of technological organization from material procurement to artifact discard. Since then other researchers have defined technological organization relatively in the same way with a few differences (Andrefsky 2006; Binford 1973, 1977, 1979; Kelly 1988; MacDonald 1999, 2009; Nelson 1991; Odell, 2000, 2001; Shott 1986; Torrence 1983). The overall concept is how humans organize themselves with regard to technology (Andrefsky 2008a). A more detailed definition for technological organization goes as follows:

…lithic technological organization (is) a strategy that deals with the way lithic technology (the acquisition, production, maintenance, reconfiguration, and discard of stone tools) is embedded within the daily lives and adaptive choices and decisions of tool makers and users. (Andrefsky 2008a, p. 4)

The decision making process for tool manufacturers and users is heavily affected by constraints in the environment and adaptive strategies. With these factors affecting technology, this study observes the procurement, design/manufacture, and maintenance/repairing tactics for projectile points to understand the preparation and organizational approaches of the individuals utilizing the Sarpy Bison Kill.

Procurement Strategies. Studies on the procurement of material such as Binford (1977, 1979, 1980) and Schiffer's (1972) work conducted in the 1970's were a major part in

understanding procurement strategies. Binford studied forager and collector patterns of landscape and resource exploitation and noted two different types of strategies for the procurement of resources for tools (Binford 1979, 1980). These strategies were described as direct procurement, the strategy of traveling and collecting a particular resource as a primary goal, and embedded procurement, the strategy of collecting a resource as one comes into contact with it while focusing on another goal (Binford 1977, 1979, 1980). This focus quickly grew into the study of the affects of mobility and transportation on tools and there organization (Andrefsky 1994, 2009; Beck and Jones 1990; Beck 2008; Beck et al. 2010; Close 1996; Gramly 1980; Kelly 1988; MacDonald 1999; MacDonald et al. 2006; McAnany 1988; Odell 2000; Railey 2010; Roth 1998; Sassaman et al. 1988; Shott 1986; Smith 1999). As these studies evolved, questions on the quality of material and the effects of transportation were questioned. An example of this is a study conducted by Andrefsky (1994). His study revealed that the Calispell project area had poor quality material locally and therefore certain parts of the toolkits utilized by occupants of the area utilized the poor local material while high quality material was used for specific tools which were transported to the region (Andrefsky 1994). This study revealed that it is possible for two types of procurement for materials were active within a hunter-gatherer's organization of technology.

Other researchers have gotten away for the direct and embedded procurement strategies and utilized other models to understand procurement. One such group of researchers have employed Human Behavioral Ecology (Beck 2008; Beck, et al. 2010) in studies on lithic material procurement. The model they adapted to stone procurement was the Field Processing and Transport model (Barlow and Metcalfe 1996; Metcalfe and Barlow 1992). This model was first developed originally to understand the transportation of food (Barlow and Metcalfe 1996; Metcalfe and Barlow 1992). The overall concept of the model is that it looks at the trade-offs in

field processing resources over transportation to various distances. The model looks at resources and the parts of the product and show how foragers decide on how far certain parts of resources are transported before it is no longer beneficial (Barlow and Metcalfe 1996; Metcalfe and Barlow 1992). In a paper studying this model through Great Basin plants, Barlow and Metcalfe (1996) focused on two food sources with multiple parts. One of these Great Basin foods was the pinyon nut. Their experiment revealed that at certain stages, the nut went through more and more field processing before transportation to residential camps as the distance grew further away from the pinyon nut source (Barlow and Metcalfe 1996).

Drawing from Barlow and Metcalfe's (1992, 1996) work, several researchers, such as Beck et al. (2010), designed and tested models to understand the transportation of lithic raw material from quarry sites to residential camps (Beck 2008; Beck et al. 2010). The researchers (Beck 2008; Beck, et al. 2010) studied the bifaces and debitage assemblages through the various stages they were recovered in to understand at what point is a biface reduced at procurement sites before it reaches the residential camps (Beck 2008; Beck et al. 2010). The results from the Beck et al. (2010) study showed raw material for stone tools quarried from close locations were less refined before arriving at the camp where further manufacture would happen. Raw material for tools quarried at distant locations were more manufactured and required less refining at the camps making them ready to use (Beck et al. 2010). This and other studies (Beck 2008) show the cost and behavior behind transporting lithic material over certain distances from sources. Overall these studies reveal that the procurement of material is a major factor on the organization of technology (Andrefsky 1994, 2009; Beck and Jone, 1990; Beck 2008; Close 1996; Gramly 1980; Kelly 1988; MacDonald 1999; MacDonald et al. 2006; McAnany 1988; Railey 2010; Roth 1998; Sassaman et al. 1988; Shott 1986; Smith 1999). The projectile technology at the Sarpy Bison Kill site has to involve an analysis of procurement to understand the hunter-gatherer decisions on

material, preparation of materials for consumption, and how raw material fits within the organizational plans of the manufacturer and user.

Projectile Point Design/Manufacture. In Great Plains archaeology, projectile points are a major tool type recovered in survey and excavations. Points are part of a complex projectile system and are a major factor in hunter-gatherer subsistence technology. Studies such as Peter Bleed's (1986) indentified two types of systems, reliable and maintainable, which govern the aspects and functions in these systems to produce an optimal benefit in certain hunting strategies (Bleed 1986). In this study Bleed was able to show factors and characteristics of both reliable and maintainable weapons systems that would affect the behavior and decision making process of the hunter constructing the weapon (Bleed 1986). Later on several researchers added to these concepts on technology by incorporating opportunistic behavior and versatility while also revealing that most tools and technologies are not one or the other but a mixture of all types of technologies to some extent (Nelson 1991; Odell 2003; Shott 1986). The weapon system used by Late Archaic Plains people is the atlatl or the spear throwing system (Frison 2004; Kornfeld et al. 2010). This system consists of a dart estimated to range from 1.25 to 2.5m (Palter 1977; Raymond 1986; VanPool 2006) in length and had several components fashioned together to produce a projectile which was then propelled through the air by an atlatl or also known as a spear thrower or throwing board (Baugh 1998; Butler 1975, 1977; Howard 1974; Palter 1977; Raymond 1986; Whittaker and Kamp 2006). One of these components was the projectile point or tip. The points function is to help penetrate the hide and flesh of the prey and cause fatal injury (Christenson 1986; Hughes 1998). This makes the point part of a complex technology and certain parameters in the production of each component must be followed to insure the construction of a functional system (Christenson 1986; Hughes 1998; Zeanah and Elston 2001).

With these types of parameters surrounding each component, the point has to be manufactured to not only fit within the haft of the dart but also built to perform for the predicted conditions of hunting the user will face. Hafting a point to the rest of the projectile is a major factor on how the point will be constructed and applies a number of factors restraining the size and shape (Keeley 1982; Zeanah and Elston 2001). One major constraint is the time to produce a point compared to the foreshaft (Zeanah and Elston 2001). A foreshaft is a small length of hard wood or bone that houses the point and is easily detachable from the mainshaft allowing for a replacement to be attached and the projectile to be fired again (Frison 2004, p. 212; Flenniken 1985; Zeanah and Elston 2001). The time to make a point from the flake blank to the finished product has been shown to take an estimated 20 to 40 minutes (Flenniken and Raymond 1986) while the construction of the foreshaft seems to take over an hour to produce (Keeley 1982; Spencer 1974; Zeanah and Elston 2001). This would force replacement points to be manufactured to fit one or a couple foreshafts rather than to constructing a foreshaft to only fit one point (Zeanah and Elston 2001). Another is the fact that each hafting style requires different binding strategies such as notches in the foreshaft and point for wrapped hafting styles and stem and socket for mastic hafting styles (Keeley 1982; Knecht 1997; Van Buren 1974).

A factor in determining the overall production of the point is the restraints applied to a projectile's property of flight and effectiveness in killing. Factors such as accuracy, stability, range, and killing power affect the size and shape of points due to the type of hunting strategy and prey hunter-gatherers subsist on (Christenson 1986; Hughes 1998). The decision making of the manufacturer is heavily dependent on the cost and benefit of each factor on one another and the targeted prey it is manufactured to harvest. With hafting and performance restrictions, points recovered from the Sarpy Bison Kill site will be tested to see what the design at the time of the sites occupation was and try to understand what this template could say about strategies and

behaviors being conducted. Some variations in design/manufacture could be the quality of production or how formal/informal a point is constructed and the hafting styles within the Sarpy Bison Kill assemblage.

Quality of Production: Formal versus Informal points. Formal tools are implements with a variety of additional effort in production (Andrefsky 1994).Formal tools have been characterized as flexible tools designed to be rejuvenated and capable to be used in various functions (Goodyear 1979) along with attributes of advance preparation, anticipated use, and transportability (Torrence 1983). Informal tools are unstandardized or casual with regard to form and described as being manufactured, used, and discarded over a relatively short time period (Andrefsky 1994). Most lithic analysts would consider all projectile points to be formal but for the purpose of this analysis, formal and informal will be used to describe points with varying degrees of effort applied to their production.

The reason for studying the points for this type of manufacturing behavior is to understand how much effort and time was conducted in the preparation of hunting equipment. An efficient projectile point is broken down into several categories of which are accuracy, killing power, range, flight stability, and to some lesser extent durability (Christenson 1986). Formal projectile points would be optimized for accuracy, flight stability, killing power, and range for certain targets, hunting strategies, environments, and other factors that would affect the outcome for successful procurement of food (Christenson 1986). Informal points could affect one or more of these categories making it less optimal for the procuring food. With these types of constraints, projectile points have to go under additional manufacturing processes to provide a projectile with the optimal functionality possible. Aspects such as curvature affect the stability, accuracy, and range of points (Christenson 1986) and therefore need to be removed from the point during manufacture. If more points fit within the formal category it would represent more time and

effort being placed upon the manufacturing process to remove imperfections and provide a tool optimal for the hunting weaponry utilized in this strategy. Informal points would represent less effort and time in manufacture suggesting different strategies and behaviors than just optimizing weaponry.

Hafting styles. Another manufacturing technique that may indicate preparation and time management behavior (Torrence 1983) is the hafting process. Experiments with flintknapping points have shown that of all the processes in constructing a projectile point, the notching process seems to produce the most manufacturing failures (Titmus 1985; Titmus and Woods 1986; Towner and Warburton 1990). Notching is conducted to allow for a tighter connection to the foreshaft with sinew (Keeley 1982). This hafting technique is known as wrapping or tied hafting (Keeley 1982). This is a relatively secure haft though when the sinew becomes wet due to humidity or contact with wet materials the haft can become loose (Keeley 1982). Some groups combined wrapping and mastic techniques for hafting to combat this issue (Keeley 1982). With this in mind notchless points can still be attached to the foreshaft though the point would not have the same secure haft as one with notches and would be more likely to fall out when the haft becomes loose (Keeley 1982). Other researchers have noted that notches could also be a strategy for an intended break allowing for the blade element to be detached into the animal furthering the damage to the wound while the hunter tracks the prey down (Flenniken and Raymond 1986; Odell and Cowan 1986; Titmus and Woods 1986; Towner and Warburton 1990; Van Buren 1974; Zeanah and Elston 2001). Ethnographic work has also shown that some people chose stone points believing they would break within the animal and cause damage as the above researchers hypothesized (Ellis 1997). Ahler (1992) noted notched points had more impact damage than unnotched points, confirming the idea that notching could be a strategy for intentional breaking. The study also could revealed notching as a last stage in manufacture and arrows could be tipped

with notched and unnotched points (Ahler 1992; Odell 2000). Other hafting styles are the decision to not notch points as seen in several archaeological assemblages (Clark and Wilson 1981; Frison 1971a; Odell 2000; Turpin and Bement 1992). Christenson (1997) examined notched and unnotched points to see if there was a difference in functionality. Christenson (1997) noted that there was no difference in function, hafting, and type of animal hunted to name a few factors. These hafting types noted here will be examined and compared to understand projectile point design and manufacture and what this can say about strategies and decisions.

Maintenance and Repair Strategies. The use and maintenance conducted on points indicates various functions and retooling behaviors preformed as part of technological organization. The durability of stone points has been a major part of projectile point research involving their use (Cheshier and Kelly 2006; Christenson 1986). Ethnographic studies by Ellis (1997) have shown that some groups chose stone as the material for choice due to certain qualities. The stone's ability to break and therefore cause more damage within the animal due to the stone shrapnel embedded in the wound (Ellis 1997). Though this has not been tested in experiments for this specific purpose, the durability of points for multiple shots into different materials has been tested (Cheshier and Kelly 2006; Dockall 1997; Frison 1989; Hunzicker 2008). On average projectile point tests seem to show points lasting one to a couple of shots before breaking with few points lasting more than this average (Cheshier and Kelly 2006; Odell and Cowan 1986; Titmus and Woods 1986). Most studies also revealed that some of the points after being damaged could be repaired if the damage was not too severe (Boldurian and Hubinsky 1994; Flenniken and Raymond 1986; Towner and Warburton 1990; Zeanah and Elston 2001). The advantage to repairing points has been noted that it is less time consuming to repair a point if possible than to start from a blank flake (Flenniken and Raymond 1986). This allowed for projectile points to extend their use-life as part of projectiles. Hofman (1992) and Bement

(1999) conducted a study on Folsom projectile points from several assemblages to see how much retouch was being conducted at these different locations and times. Their studies were able to show hunters with points at different stages from freshly constructed to completely exhausted (Bement 1999; Hofman 1992). A study by Andrefsky (2008b) on the provisoning strategies of points also reveals important information for resharpening. Andrefsky (2008b) was able to show through impact damage and resharpening that points constructed from distant quarries were heavily resharpened while near source points were less resharpened. This study revealed how resharpening techniques helped hunter-gatherers provsion materials between sources so a functional projectile was available at all times (Andrefsky 2008b).

Another type of maintenance/repair analysis is observing types and locations of retouch on a tool to understand the funcationality of the tool. With projectile points, the location of the retouch may reveal if the point was utilized as part of a projectile system or if it was used for cutting and sawing functions like knives (Ahler 1971; Andrefsky 1997; Harper and Andrefsky 2008; Kay 1996; Truncer 1990). The reasoning behind these interpretations comes from several studies where concepts on points were changed due to retouch and use-wear (Ahler 1971; (Andrefsky 1997; Harper and Andrefsky 2008). The first major difference is that if projectile points are to be part of a functioning missile, they have to perform optimally within the four major constraints of a projectile system noted by Christenson (1986; Hughes 1998). The four factors, range, accuracy, killing power, and stability, can all be majorly affected by retouch (Christenson 1986; Harper and Andrefsky 2008; Hughes 1998). For a projectile to remain stable in flight, the weight and aerodynamics of the point have to be as close to perfect (Christenson 1986; Hughes 1998). The more asymmetrical a point is the more weight is needed to achieve the same flight pattern as a small symmetrically designed point (Christenson 1986; Harper and Andrefsky 2008; Hughes 1998). The Harper and Andrefsky (2008) study was able to show the

possible function a point was used for due to the retouch on the blade element. These studies further improved our understanding of this technology and possible show variations in functional aspects may indicate a change in use and therefore a different set of decisions and organizational patterns surrounding this tool types.

As shown technological organization can solve many questions on decisions-making and tool use within the archaeological record. Procurement studies have revealed decisions on how technology is affected by groups mobility and transportation (Andrefsky 2009; Beck and Jones 1990; Beck 2008; Beck et al. 2010; Binford 1977, 1979, 1980; Goodyear 1979; MacDonald 1999; MacDonald et al. 2006; McAnany, 1988; Railey 2010; Roth 1998; Sassaman et al. 1988; Shott 1986; Smith 1999) and how raw material itself can affect the decision on what tools to construct and transport (Andrefsky 1994; Goodyear 1979; Gramly 1980). With design and manufacture, technological organization is able to reveal a tool's function and therefore help us better understand the activity it's used in (Andrefsky 1997; Bamforth 1985; Bleed 1986; Christenson 1986; Ellis 1997; Hughes 1998; Knecht 1997; Kuhn 1994; Morrow 1996; Nelson 1991). The studies of maintenance and repair within technological organization have revealed not only further evidence of function but the tool's life history from the finished product to a discarded exhausted tool (Ahler 1971; Andrefsky 2006, 2008a, 2008b; Bement 1999; Harper and Andrefsky 2008; Hayden 1987; Hofman 1992; Hunzicker 2008; McAnany 1988). Using these studies as a guide, the points from the Sarpy Bison Kill site will be examined to understand how prepared and organized the projectile technology was for the occupants of this hunting system.

Chapter 3: The Sarpy Bison Kill Site: Background

To understand the lithic technological organization of hunter-gatherers at the Sarpy Bison Kill site, I provide brief description of the site, regional environment, and cultural history. Along with understanding the region and local area the site's layout and material culture needs to be introduced to allow for some comparison between the overall site's preparation and organization and the projectile technology. This will allow for a better understanding on how elements of the projectile point may have been altered or created due to the effects from the environment and the site itself.

The Sarpy Bison Kill Site (24BH3078) is located in southeastern Montana in the Northwestern Plains region known as the Powder River Basin. Figure 3.1 shows the relative location of the site in the state of Montana. The Northwestern Plains are geographically considered to be the area from the southern Canadian Plains of the proveniences of Alberta and Saskatchewan at the northern most boundary to the western panhandle of Nebraska in the south (Greiser et al. 1982). The western boundary is considered to be the eastern side of the Rocky Mountains in Montana and Wyoming to the portion of the Dakotas west of the Missouri (Greiser et al. 1982). Within this region the Powder River Basin is located from just north of Laramie Wyoming, to Miles City in southeastern Montana and is confined in the west by the Little Wolf mountains an adjacent foothills, the Wolf mountains, and the Big Horn Uplift while in the east it's the Black Hills Uplift (Munson and McElroy 2015). The main formations within this region are from the Fort Union formation or younger and contains large deposits of coal (Fredlund 1976; Munson and McElroy 2015). The Sarpy Creek is an intermittent tributary to the Yellowstone River and the topography consists of ridges covered in pines with open gentle valleys (Munson and McElroy 2015). The vegetation in the area consists of a multitude of tree, shrub, fruit, grass, and other plant species creating a healthy and varied environment, a table of

the noted natural planet species on or around the site can be found in Munson and McElroy (2015:2-8). The mixed grass species within the region are historically well known to have been able to sustain large Great Plains species such as the deer, antelope, elk, and bison though only the first three species remain in the region.

Figure 3.1: ***Map location of the Sarpy Bison Kill site in Montana.***

The cultural history for the northwestern plains is based off George Frison's chronology (1978, 1991) which is reiterated in large part in MacDonald (2012). This chronology is used for understanding the areas prehistory through time needs to be slightly modified for the southeastern Montana (Munson 2007; Munson and McElroy 2015). The only modification in Frison's chronology (Frison 1978, 1991) is on the last 2,000 years, which has shown evidence of variations in material culture, settlement patterns, and radiocarbon dates making the change appropriate for the region (Munson 2007; Munson and McElroy 2015). The cultural periods for

the modified version are Paleoindian (10,000 BC to 5500 BC); Early Plains Archaic (5500 BC to 3000 BC); Middle Plains Archaic (3000 BC to 1000 BC); Late Plains Archaic (1000 BC to AD 300); Late Prehistoric I (AD 200 to AD 1200); Late Prehistoric II (AD 1200 to AD 1750) and Protohistoric (AD 1750 to AD 1800); note Late Plains Archaic and Late Prehistoric overlap by a span 100 years (Munson and McElroy 2015). The Powder River Basin has evidence of human occupation within the region from the Paleoindian period up to the present time. This thesis only focusing on the Sarpy Bison Kill site which was occupied during the Late Plains Archaic time period and this background section will focus on the regions Late Plains Archaic cultural history.

The Late Plains Archaic period (3000-1600 BP) is marked by sophisticated bison hunt strategies such as natural traps, pounds and jumps which some researchers have considered it as a prehistoric industrialization of bison hunting (Brink 2008; MacDonald 2012: 97-98; Peck 2011). Along with the rise in hunting techniques the time period is also marked by corner-notched dart points separated in two distinct types; Powers-Yonkee and another referred to here as Late Plains Archaic Corner-Notched or LPACN points. Both types area associated with similar subsistence and settlement patterns. The Powers-Yonkee points are considered to appear at the beginning of the Late Plains Archaic period and are associated with radiocarbon dates from around 2400 BP to 3000 BP (Ferguson 1993). This point seems to be a regional adaptation to a particular environment which is the Pine Breaks and Grassland ecozones in the Powder River Basin and Fort Union Formation (Ferguson 1993). The Powers-Yonkee components are also associated with stone circles and arcs associated with shelters or other structures and communal bison kills. The difference between Powers-Yonkee and the other Late Plains Archaic components is the butchering and processing methods. Analysis of the bison bonebeds and processing areas has shown that the Powers-Yonkee groups did not process the bones for marrow extraction and only showed evidence of soft tissues being removed leaving carcasses to be

largely intact (Ferguson 1993; Kornfeld et al. 2010). Further evidence that marrow extraction was not conducted is the lack of stone boiling indicative of the process has been reported on with Powers-Yonkee sites (Munson 2007; Munson and McElroy 2015). Neglect in this highly nutritional substance is very uncommon in prehistoric bison hunting (Kornfeld et al. 2010). Other than this difference in bison processing both the Powers-Yonkee and other Late Archaic Plains components are both temporally and geographically located in the same area. Several sites that have evidence of both Powers-Yonkee and Pelican Lake components within the region are: The Merle Site 24BH2634 (Munson and Ferguson 2000), South Fork Site 24BH2521 (Munson 1992), Kobold Kill Site 24BH406 (Frison 1970), and Ayers-Fraizer Bison Kill Site 24PE30 (Clark and Wilson 1981).

This time period is also associated with the common corner-notched dart points often referred to as Pelican Lake. Pelican Lake occupations cluster between 3200 to 1800 BP (Foor 1982) and within this time period the Pelican Lake point underwent a change from the type described from the Mortlach site (Wettlaufer 1955), the type site of Pelican Lake, to a variety of corner-notched point forms (Gregg and Davidson 1985, p. 116; Kornfeld et al. 2010; Peck 2011). The region surrounding the Sarpy Bison Kill site has a large amount of these corner-notched points types, which will be referred to as Late Plains Archaic Corner-Notch points or LPACN points (Munson and McElroy 2015). The local archaeological record associated with Pelican Lake components has three characteristics that define this region at the time. These three characteristics are hearth structure, spatial pattern of features and living areas, and land-use patterns (Munson 2007; Munson and McElroy 2015). The hearth structures for this time period are well-constructed and often lined with stone on both the walls and bottom. Evidence of cleaning and replacing of stone in hearths is frequent (Munson 2007; Munson and McElroy 2015). The spatial pattern within the living area suggests that hearths were located within living

area while refuse and stone dumps are located outside the living area (Munson 2007; Munson and McElroy 2015). The final characteristic is that the people during this time virtually occupy all types of geographic setting within the region however it should be noted that rockshelters are rarely used (Munson 2007). The Sarpy Bison Kill Site fits within these characteristics of the region however the hearths do not follow the local type. The construction of the hearths at the campsite is of simple construction with either a platform of rocks or a shallow rock lined pit being built. Researcher Gene Munson noted that a possible reason for the change in hearth structure maybe due to the duration of the groups stay at the site or different functions in which each type of hearth preformed (Munson and McElroy 2015). Within the region are 24BH148, 24BH1126 and 24BH150 are similar in campsite structure, radiocarbon dates and tool assemblage to the Sarpy Bison Kill Site (Munson and McElroy 2015). Excavations at the site were conducted during the 2009, 2010, and 2011 field seasons and focused primarily on the campsites, processing area (bonebeds), and sections of the kill area and units consisted of both 1x1m and 2x2m (Munson and McElroy 2015).

The Sarpy Bison Kill (24BH3078) had 50 radiocarbon dates extracted from the bonebeds, four bone collagen C14 dates, and associated campsites, 28 charcoal C14 dates and 18 bone collagen C14 dates from thermal features, revealing the sites main occupation started around 2,100 BP and was last used around 1,800 BP (Munson and McElroy 2015). Table 3.1 is a table of the four radiocarbon dates from the bonebeds by Beta Analytic, Inc. Miami, Florida.

Feature No.	Beta Analytic No.	C14 Age BP (measured)	C14 Age BP (conventional)	13C/12C Ratio	Calibrated Calendar Age**	Intercept Calendar Age
3078-S2-6N96W*	348370	1740+/-30	1890+/-30	-16.0 o/oo	AD 60 to 180, AD 190 to 210	AD 90, AD 100, AD 120
3078-S2-B1*	358433	1910+/-30	2050+/-30	-16.7 o/oo	BC 160 to 130, BC 120 to AD 10, AD 10 to 20	BC 50
S2-B2-10N24W*	313685	1860+/-30	1990+/-30	-17.3 o/oo	BC 50 to AD 70	AD 10, AD 20
S2-B2-3N44W*	282794	1860+/-40	1980+/-40	-17.5 o/oo	BC 50 to AD 90	AD 20
*bone collagen date **2 sigma (95% level of probability); ***range fire charcoal date						

Table 3.1*: Table of radiocarbon dates from the bonbeds. Radiocarbon dating was conducted by Beta Analytic Inc.*

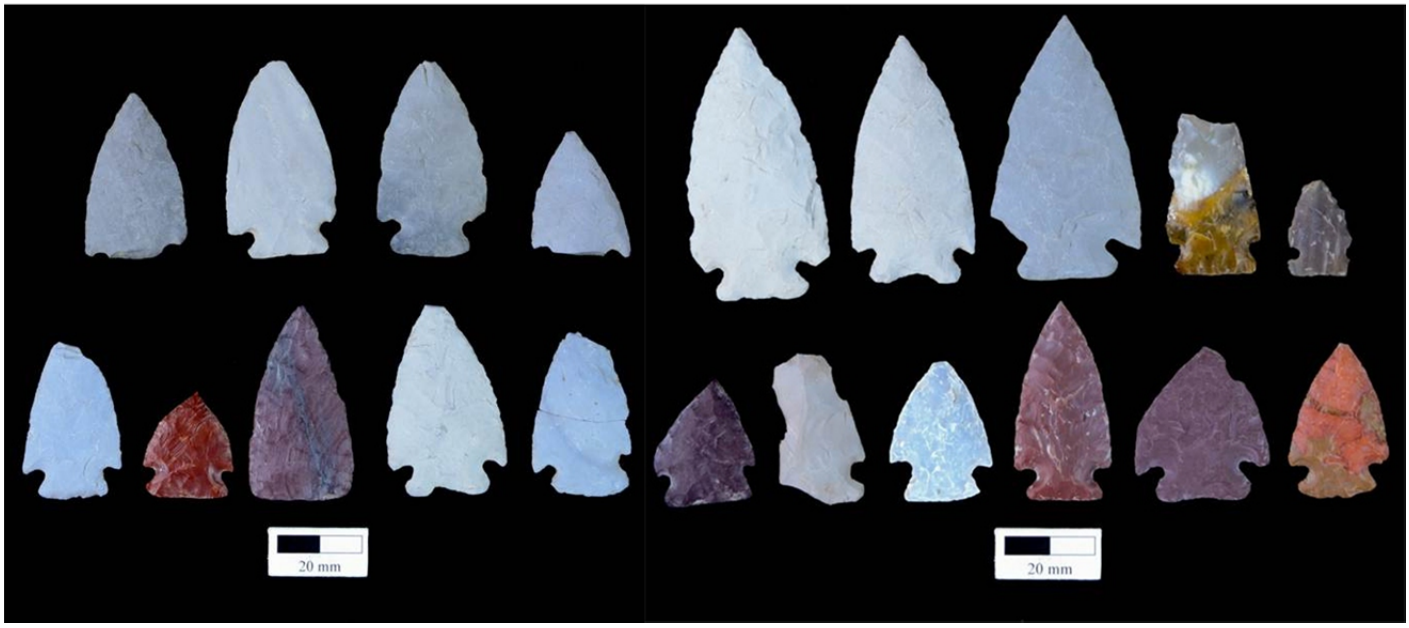
The site consists of an arroyo trap and processing area with a campsite located in close proximity. Researchers have noted variations of all types of traps utilizing the natural topography to their advantage (Buehler 1997b; Kornfeld et al. 2010; Reeves 1978a; Verbicky-Todd 1984; Zedeno et al. 2014). Dry arroyos like the Sarpy Bison Kill site are estimated to account for most of the systematic communal bison hunts (Kornfeld et al. 2010). The site functioned by moving bison from the Sarpy drainage system to a unnamed arroyo which was the driveline of the hunting system. Bison were then lead down the driveline drainage until they took an abrupt turn into an outcrop of sandstone that is in the rough shape of a horseshoe (Munson 2012; Munson and McElroy 2015). As the bison were herded into the outcrop, the hunters at the site utilized their weaponry to dispatch the prey. From this location the bison were be dragged downhill to an area east of the kill area where they would be processed. This processing area consists of two bonebeds of which the primary bonebed, approximately 1,092 square meters, contained the remnants of roughly 2,221 bison while the second bonebed is just southeast of the primary bonebed and consists of the remains of 7 bison. Evidence reveals a “heavy” butchering process was conducted (Verbicky-Todd 1984). This type of process included extracting fat and breaking of bones for bone marrow and bone grease which are essential parts in a Great Plains hunter-

gatherer diet (Outram 2001). From the processing area, the occupants would move to campsites located on both sides of the drainages system directly northeast of the kill and processing areas. At this location further processing of the animals along with tool manufacture and maintenance would be conducted (Munson and McElroy 2015). Figure 3.2 and Figure 3.3 show these activity areas and how each worked in association with each others. Photograph 3.2 through Photograph 3.8 are photos of each section of the Sarpy Bison Kill site.

The site contains no evidence of the hunter-gatherers constructing a corral or other structures to help in the procurement of bison. This may be due to the fact that erosion factors

may have removed evidence of such structures. As noted by some researchers (Kornfeld et al. 2010), arroyo traps are hard to fully understand due to the fact that these systems are affected by fluvial erosion. These erosion processes are great for past hunter-gatherers because it created these landforms for which they were capable to exploit bison for procurement but terrible for archaeologists due to the effects of erosion on the preservation of these sites and there materials after occupation (Kornfeld et al. 2010). Along with the fluvial effects to the site, research has also shown that a range fire engulfed the site around 530±30 BP and may have further affected the site preservation (Munson and McElroy 2015). Lithic artifacts were recovered in all areas excavated on the site and ranged from debitage to formalized tools (Munson 2012; Munson and McElroy 2015). Of the formal tools from the site, 2,563 projectile points were recovered from the kill area, processing area, and campsites making it the most frequently recovered tool type.

Late Archaic Projectile Point Technology at the Sarpy Bison Kill: To study part of the preparation and organization of the people at the Sarpy Bison Kill, a study of the technology used will allow for an in-depth look into the behaviors and decision making conducted by manufacturers and users and how it was entwined with the overall organization of the site. This thesis conducts a study of technological organization on the projectile technology for several reasons. The first reason is that of all the formalized tool types at the site, projectile points were the most recovered. This tool type also has been recovered from the kill area, processing area, and campsites allowing for not only a one area to be examined but the technologies use and involvement throughout all parts of the site. Photograph 3.1 is an example of projectile points recovered from Sarpy Bison Kill site.



Photograph 3.1: Example of the types of projectile points recovered from the Sarpy Bison Kill site.

Another reason for studying the points is due to the type of hunting strategy the hunter-gatherers of the Sarpy Bison Kill use. Unlike a bison jump which has the advantage of gravity and the injuries from the cliff fall to significantly immobilize or kill the bison, a arroyo and corral trap only gathers the bison to a spot where they are trapped and forces hunters and the projectiles thrown into the bewildered herd to do the majority of the immobilizing and killing work. Bison jumps force the bison to a location where they can't react after the trap is set. A bison jump drivelines and cliff leave very little to no chance for the animals to regroup and escape (Buehler 1997b; Frison 1971, 2004; Kornfeld et al. 2010; Verbicky-Todd 1984). Arroyos and corrals work the same way but at the end when the bison run into the corral or barrier, they are able to recover and escape if given the time. This makes the hunter and his projectiles extremely important for concluding the hunt in an efficient and speedy manner before the herd of bison breakout and cause havoc (Frison 2004; Kornfeld et al. 2010; Verbicky-Todd 1984). This type of hunting system puts an extreme amount of pressure on hunters and their technology to

perform, making the study of the projectile technology from this site necessary to understand preparation and organization.

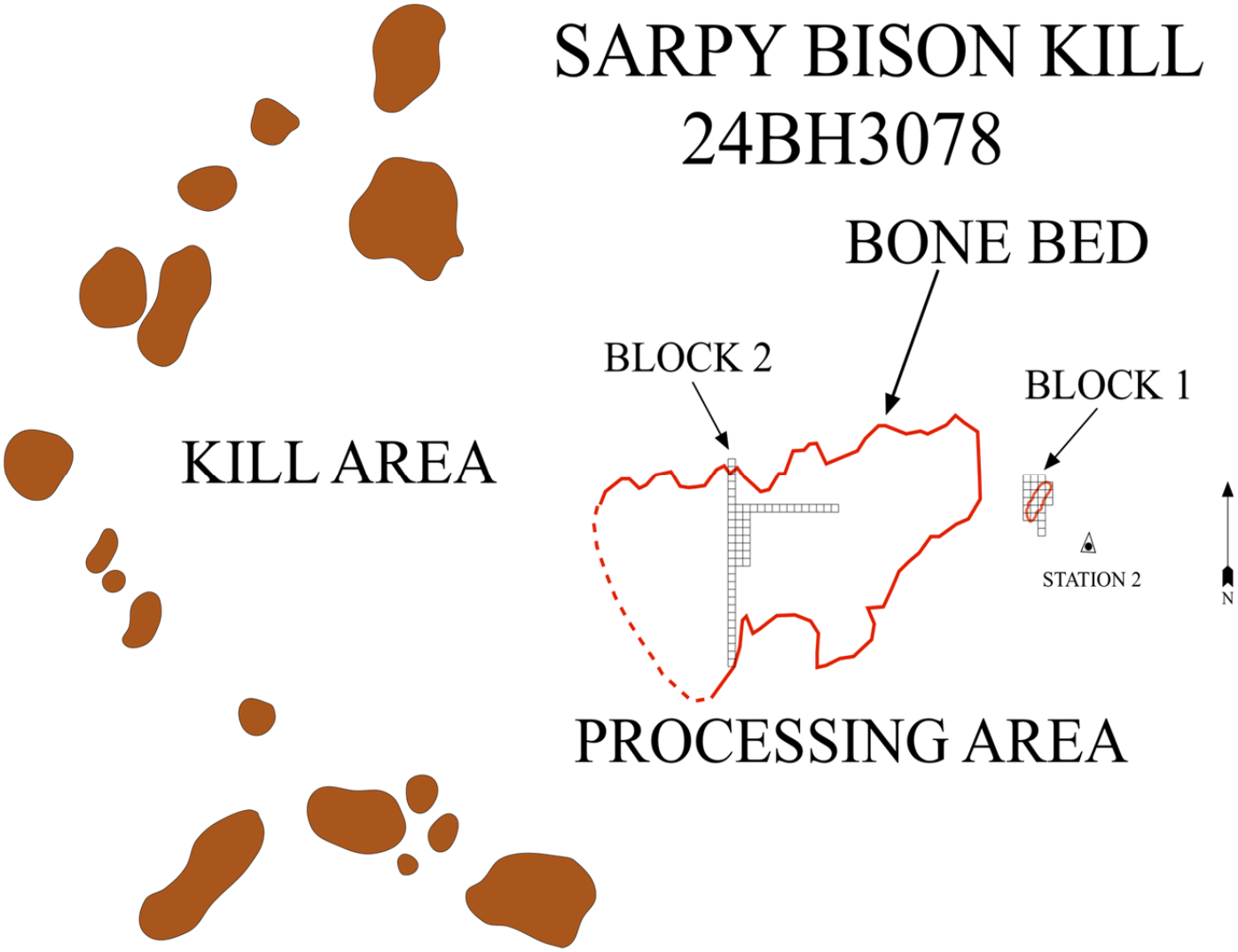


Figure 3.3: Sarpy Bison Kill 24BH3078 ***Blown up version of site map focused on the kill (brown blobs are surface remnants of sandstone outcrop) and processing area (red lines indicate main areas of bonebeds) courtesy of GCM Services, Inc.***

Chapter 4: Analysis of Sarpy Bison Kill Points

Hypotheses

Serveral analyes will be conducted to understand the overall technological organization of Late Archaic hunter-gatherers at the Sarpy Bison Kill site in southeastern Montana. These sections of the analysis will be on procurement, projectile design/manufacture, and maintenance/repair. Observing these main factors in the projectile technology at Sarpy Bison Kill site will allow for overall organization and preparation to be understood. Each of these sections will tackle the technological factors differently and therefore have different hypotheses. Each section's hypotheses will test what decision making processes the Late Archaic hunter-gatherer at Sarpy Bison Kill used. The following segment is on the hypotheses for each type of analysis;

Procurement

Hypothesis 1

The projectile points will be constructed mostly of nonlocal and exotic material with little debitage recovered from the site indicating manufacture and preparation activities being conducted prior to their transportation to the site.

Hypothesis 2

The projectile points will be constructed mostly of local material and with a large amount of debitage recovered indicating manufacture and preparation activities being conducted on site just prior to the hunt.

Hypothesis 3

Projectile points will vary in construction of material by base shape meaning different strategies towards procurement were utilized by different sets of people using the site or change in strategy over time.

Point Design/Manufacture

Hypothesis 1

The projectile points recovered from the Sarpy Bison Kill site will have little variation in the measurements observed revealing a template to fit within certain parameters for predicted performance and function and therefore reveal a well planned and executed design and manufacture process.

Hypothesis 2

The projectile points recovered from the Sarpy Bison Kill site will vary significantly in the measurements observed revealing no template or parameters in the projectile technology and therefore no set design or manufacture process.

Hypothesis 3

The projectile points recovered from the Sarpy Bison Kill will have little variation within either base shape types or material type in the observed measurements revealing different templates and production processes by different groups utilizing the hunting system or strategies changing over time.

Maintenance and Repair

Hypothesis 1

Projectile points manufactured from nonlocal and exotic material will have the heaviest evidence of maintenance/repair due to being repaired and maintained over a longer use-life then local.

Hypothesis 2

Projectile points manufactured from local material will have the heaviest evidence of maintenance/repair due to a reliance on local material and extending the use-life of the material.

Hypothesis 3

The retouch will vary between either the different base shapes or material type revealing different groups at the site having different strategies towards repair and maintenance or a change of strategy over time.

Methods

Each section will have specific methods to test each hypothesis and understand the degree of organization for projectile technology. Since each section covers different aspects of technological organization the methods have been tailored to each factor. The following describes the methods for each section and explains how they will indicate aspects that could reject one or all of the hypotheses and help understand the projectile technology at the Sarpy Bison Kill.

Procurement Strategies. To understand procurement and transportation of technology to the site, the first step is to locate and categorize the lithic material sources. By establishing a distance to sources from the site, the transport costs for different materials can be established (Andrefsky 1994, 2009; Beck and Jones, 1990; Beck 2008; Close 1996; Gramly 1980; Kelly 1988; MacDonald 1999; MacDonald et al. 2006; McAnany 1988; Railey 2010; Roth 1998; Sassaman et al. 1988; Shott 1986; Smith 1999). The categories utilized to understand different sources are local, nonlocal, and exotic. Each category represents a lithic material or materials located at source a certain distance from the site. Lithic material located from 0 to 15 km from the site will be labeled as local. Raw material sources located from 16km to 75km are labeled nonlocal. Materials that come from 76km or more are labeled as exotic.

The categories established for this analysis are based on Robert Kelly's examination of ethnographic material (Kelly 1995). Kelly (1995) suggested that a forager will travel a maximum round-trip distance of 20 to 30 km for daily food collection efforts. With foragers estimated to travel this distance for materials, the localized raw material would be located roughly 15km from

the site. Nonlocal and exotic raw material would take more than this daily trip distance and range from several days to an extended amount of time to procure prior to arriving to the site. This category system allows for the points to be put into groups which would have similar distances and parameters surrounding the materials acquisition. The terms used for each category are similar others utilized in studies on transportation and mobility mentioned above such as MacDonald's (1999) micromovement, mesomovement, and macromovement model. An even closer model setup similar to the one utilized here is MacDonald's (2009) utilization of local, semi-local, and nonlocal which only differs in the name of the second and final distance category from the site and ranges within each.

To determine if the acquisition of these materials is just a pattern within the points due to toolstone quality and its function, the debitage recovered from the site will also be analyzed and separated into these categories. Although the debitage collected from the site will represent the manufacturing of all tools produced, it will also allow for the transportation of raw material to be examined. The debitage were examined by GCM technicians using a descriptive flake analysis (Munson and McElroy 2015). The model was formed to understand patterns of tool manufacture through replication experiments and examination of debitage and tool assemblages of the Northern Plains and has been used in past research reports (Herbort and Munson 1984; Munson 1989, 1991; Stanfill 1988). This descriptive flake analysis and the flake types represent similar stages of reduction seen in Callahan's (1979) and Whittaker's (1994) reduction studies. The categories established for each flake type are based on attributes of flakes and flintknapping with focus on the striking platform (Crabtree 1972). These categories are as follows: Decortication spall/flake, primary reduction flake, secondary reduction flake, and tertiary reduction flake. The details of each flake category are described in further detail in Munson and McElroy's Excavations of Camps at Stations 1,3 and 4 Sarpy Bison Kill Site, 24BH3078, 2015. The

identifiable debitage will be compared to material type to understand what type of manufacturing process is being transported and conducted on and off site. A similar study of procurement is seen in the field processing models conducted by Beck (2008) and Beck et al. (2010). By studying the procurement in this fashion, the points and debitage will be able to show decisions surrounding the type of tool manufacture performed prior to the arrival and preparation and organization being conducted on site prior to the hunt.

Projectile Point Design/Manufacture. To understand the design and manufacture process conducted at the Sarpy Bison Kill, measurements from key locations on the points will be taken and compared to material type and hafting element to understand the preparation and organization. The metrical measurements taken were based on David Hurst Thomas standard measurement system in his articles entitled *Archaeology's Operational Imperative: Great Basin Projectile Points as a Test Case* (1970) and *How to classify the Projectile Points from Monitor Valley, Nevada* (1981). All measurements were taken with a RCBS electronic digital caliper, protractor, and a MTM DS-1250 mini digital scale. With these measurements, this study will conduct statistical analyses in SPSS version 21 to understand the construction of the projectile points and the template for the Sarpy Bison Kill site. The attached appendix has all the point measurements used in this research. The measurements retrieved from the projectile points for this analysis are as follows:

Maximum Length

Maximum distance parallel to the longitudinal axis (Thomas 1970, 1981), note this measurement was still taken even if the point was damaged and the true length is affected so the size of the fragment could be established.

Shoulder/Maximum width

Maximum distance perpendicular to the longitudinal axis (Thomas 1970, 1981), note this measurement was still taken when even if the point was damaged and the true width is affected just so a size can be established for the point fragment.

Basal width

Measured along the widest part of the base perpendicular to the longitudinal axis (Thomas 1970, 1981).

Neck Width

Measured between the notches/stem perpendicular to the longitudinal axis (Thomas 1970, 1981).

Thickness

Measured perpendicular to the longitudinal axis along the two sides of the projectile point (Thomas 1970, 1981).

Mass

Overall weight of projectile points measured in grams.

Distal shoulder Angle (DSA)

The angle formed between the shoulder and the neck of the hafting element and a line perpendicular to the longitudinal axis at the point where the first line intersects (Thomas 1970, 1981). Shoulder is defined as were blade edge ends and the hafting element starts. DSA should range between 90 and 270 degrees (Thomas 1970, 1981). Measurements were taken in 5 degree increments and asymmetrical points were measured to the smaller number.

Proximal Shoulder Angle (PSA)

The angle measured from the shoulder to the base and a line perpendicular to the longitudinal axis (Thomas 1970, 1981). PSA ranges from 0 to 270 degrees and was measured in

5 degree increments (Thomas 1970, 1981).The asymmetrical points were measured to the smaller number.

Along with using the David H. Thomas measurements I also took measurements based on several other studies and methods along with visual information not able to be measured by tools. They are as follows:

Blade Length

Measured from the distal tip of projectile point to the tip of the shoulder (Andrefsky 2005).

Basal Shape

Determined by placing the base of a projectile point vertical on a flat surface. If the projectile point sits flat on the surface without any rocking movement it is classified as a straight base. If the point sits on the surface and has the ability to rock back and forth then it is classified as a convex base and if the base sits flat on the surface and does not rock but has space between the middle of the base and the flat surface then it is classified as a concave base.

Condition

Projectile points were observed for what condition they were in after recovery. The conditions were as follows; complete (note this also includes near complete points missing roughly less than 3 millimeters missing or damaged) , distal, midsection, proximal, proximal lateral edge, lateral edge, and ear/shoulder absent.

Production Quality: Formal and Informal Manufactured Points. To determine between formal and informal projectile points found at the Sarpy bison kill, a set of variables were observed to conclude which projectile point was categorized as formal and informal. Five attributes of a flake blank which are normally worked out of formal projectile points due to the additional efforts applied in production process were analyzed (Callahan 1979; Whittaker 1994).

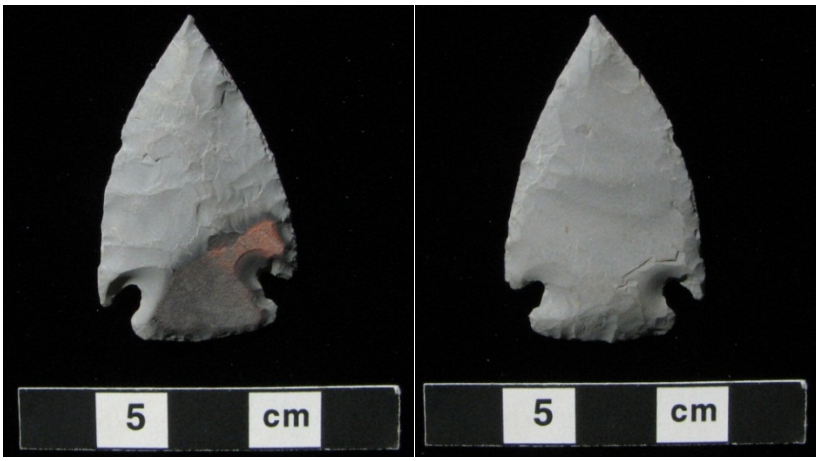
The attributes observed are as follows: Original flake blank striking platform, cortex, flake curvature, margin or edge modification, and original ventral flake blank side. This section details each flake attribute among the points and the reason for observing them.

The original flake blank striking platform is usually the original platform from the core removal and can be the thickest part of a flake. Experiments and studies of the archaeological record have shown removal of the original striking platform from the flake blank during stages in production between the flake blank and finished tool (Andrefsky 2005; Callahan 1979; Whittaker 1994). The projectile points also are constructed to fit within a foreshaft of a projectile or dart system (Zeanah and Elston 2001) and removal of the striking platform would allow for a better fit. Photograph 4.1: *Projectile point with bulb of procession still visible.* is a visual image of a point with the original flake blank platform still visible on a projectile point.

Photograph 4.1: *Projectile point with bulb of procession still visible.*

Another attribute observed was cortex, which is caused by either chemical or mechanical weathering on the surface of a nodule. Cortex is usually removed during early reduction stages based on experiments and the archaeological record (Andrefsky 2005; Callahan 1979; Whittaker 1994). The more reduction on the dorsal side of a flake the less amount of cortex should be present. The same concept is used when observing the original flake ventral side. During manufacturing the removal of more and more material should eradicate evidence of the ventral

side similar to the removal of cortex through the manufacturing stages (Callahan 1979; Whittaker 1994). Photograph 4.2 and Photograph 4.3: *Photograph of cortex and the original flake ventral side still visible is on a projectile point.* is a projectile point with large sections of the original flake blank ventral side visible and cortex still attached.



Photograph 4.2 and Photograph 4.3: *Photograph of cortex and the original flake ventral side still visible is on a projectile point.*

Flake Curvature is the arc formed on the ventral surface of a flake from being removed from the core (Andrefsky 1986). Formal projectile points have little to no original flake curvature remaining due to the fact that the straighter the point is the better the aerodynamics and accuracy of the projectile system becomes (Christenson 1986). Photograph 4.4 and Photograph 4.5: *Photographs of both sides of a projectile point with flake curvature.* are examples of one point with severe flake curvature.

Photograph 4.4 and Photograph 4.5: ***Photographs of both sides of a projectile point with flake curvature.***

The last attribute observed in this study is margin or edge modification. The margins of projectile points are usually bifacial due to biface reduction from a flake blank to the finished product (Andrefsky 2005; Callahan 1979; Whittaker 1994). Unifacially modified margins are unlike the typical projectile points found within this time period (Frison 2004; Kornfeld et al. 2010; Peck 2011). Photograph 4.6 and Photograph 4.7: *Two projectile points with sections of the left margins not bifacial but unifacial.* show two projectile points with sections of their margins not modified bifacially.

Photograph 4.6 and Photograph 4.7: ***Two projectile points with sections of the left margins not bifacial but unifacial.***

After each point was examined for the flake attributes described above, an ordinal scale from 0 to 5 was set up to determine which points were formal and informal. A zero indicated no flake attributes were observed on the point leading it to be categorized as the formal end of the scale. A 5 indicated that the point had all five flake attributes and was categorized as the informal end of the scale. The cut off between formal and informal was set at 2 being that not all of these attributes needed to be or could be removed during flintknapping. Points with a 0 or 1 are considered formal and 2 through 5 are considered informal. After the points are separated into these categories, the metrical measurements will be compared to see similarities and difference between each type of point and see the variation in the template based on production quality.

Maintenance and Repair

To understand maintenance and repair on points from Sarpy Bison Kill site the retouch was examined. Although several studies developed indices to measure retouch on various stone tools (Andrefsky 2006; Clarkson 2002; Eren et al. 2005; Eren and Prendergast 2008; Kuhn 1990; Shott et al. 2007), only a two retouch indices were utilized to help understand the maintenance, repair, and use-life of points within the organization of projectile technology at the site.

The first part of the maintenance and repair research is to observe the location of retouch to indicate patterns of function. The two types of retouch on points are on the lateral edge and tip. Each pattern reveals different strategies of retouch and can lead to understanding the points use-life prior to and post hunting (Harper and Andrefsky 2008). The lateral edge retouch pattern has been interpreted by some as a point being utilized for cutting and sawing while the tip patterns are points that are resharpened to still perform as part of the projectile (Ahler 1971; Harper and Andrefsky 2008). With this in mind if the location of retouch indicates a pattern of tip resharpening then it shows a reduction strategy trying to keep the point as symmetrical as

possible so it could still be used as part of a projectile (Christenson 1986; Harper and Andrefsky 2008; Hughes 1998). A pattern of lateral edge retouch on points the same size or smaller than the average manufactured projectile point would have a more instable flight pattern and therefore not perform adequately enough as part of a projectile (Christenson 1986; Hughes 1998). This would reveal a reduction strategy indicative to being utlized as a cutting and sawing tool which changes the decisions surrounding it. This study should reveal which points came to the site repaired and therefore have a longer use-life and possible decisions and strategies on use pre- and post-hunt.

Another index used in this research is Andrefsky's (2006) hafted biface retouch index (HRI). The hafted biface retouch index or HRI measures retouch intensity by dividing the point into 16 segments excluding the hafting element and examines each segment for flake removal indicative to retouch (Andrefsky 2006). Each segment is then given a 1, .5, or 0. A 1 represents a segment that was completely full of retouch flake scars. A .5 is a segment that has some retouch scars but also has some original flake scars from manufacture. A 0 indicates that the segment had no evidence of retouch. The segments are then added up and divided by 16 (the number of segments) to give a HRI score between 0 (no retouch) and 1 (completely retouched) (Andrefsky 2006). For further details on the index utilized in this analysis see Andrefsky (2006). With the focus of this index on the blade element of the projectile point the sample of points to be analyzed will consist of complete points. The HRI analysis and the retouch location should expose not only the function which can affect the use life of points, but also how much maintenance and repair was conducted before the cost of retouch outweighed the benefits.

HRI is an excellent method for studying the intensity of retouch on a tool but cannot measure the amount of material removed from a point. To understand how much material was possibly removed from a point the use of allometric measurements or ratios were utilized (Shott et al. 2007). Shott et al. (2007) noted that while studies showed length and width changed over

reduction stages, the thickness seemed to stay consistent. Their study was able to show that points over their use-life and the stages of reduction due to retouch (Shott et al. 2007). Shott et al. (2007) used as their basic measurement L/T or length/thickness. Although this measurement was simple, the researchers were able to show significant correlation between L/T and the stages of reduction with their experimental Folsom points (Shott et al. 2007).

This study plans to employ a similar ratio though instead of just length it will be BL/T or blade length/thickness. The reason for the change is due to the fact that this analysis wants to focus on only the blade element of the projectile points for retouch. Studies on hafting have shown that the hafting element has the least amount of probability to be altered by maintenance and repair due to it being protected within the foreshaft/mainshaft of the projectile by wrapping and mastic techniques (Keeley 1982; Zeanah and Elston 2001). Another reason for the change is that the blade element is where the point is functioning and since this is the area of utilization this is where the decisions are made on how long the use-life of a point is given before the hunter substitutes the worn out point for a new one (Andrefsky 2006, 2009; Cheshier and Kelly 2006; Christenson 1986; Keeley 1982; Shott et al. 2007). Shott et al. (2007) estimated the original size of their experimental points by measuring the exact measurements prior to them conducting their retouch. To estimate what the original size of the Sarpy Bison Kill points were, the complete points with no indications of retouch based on the above analyses will first be tested. The BL/T of the complete non-retouched points will be collected then processed to get the mean and standard deviation. Then the points showing signs of retouch based on the HRI and the retouch location analyses will be examined and tested using the BL/T analysis. These points will then be compared to the original size estimation based on the complete non-retouched points for each material and base shape type to see if there is significant variation in material removed due to maintenance and repair.

Results

Procurement Strategies. The results of the procurement analysis on the projectile point technology revealed very detailed information on the transportation of raw material and finished points. With different types of materials utilized to construct the points these results will be broken down into the three categories mentioned to understand the procurement of materials. After understanding each category, all were compared to comprehend the procurement and its effect on the preparation and organization of the projectile technology at the Sarpy Bison Kill Site.

The local category consists of mainly one material known as porcellanite. The Sarpy Bison Kill site yielded 1,951 porcellanite projectile points or 76.1 percent of points and 9,270 identifiable flakes or 97.2 percent of debitage. Porcellanite is a rock formed from the metamorphism of shales and clays surrounding burning coal seams that are sufficiently thick enough for the metamorphic process (Fredlund 1976). The occurrence of this metamorphic rock is noted to have gone back to the Miocene/Pliocene time period (Bryson 1951; Fredlund 1976). The lithic raw material is formed by first an ignition of a coal seam at the surface that burns into the underground part of the seam (Rogers 1917). As the seam burns deeper into the ground, the ground above collapses forming cracks that allows oxygen deep underground to the burning seam, allowing the fires to continue (Rogers 1917). This material is found throughout eastern Montana, Wyoming, and the rest of the northwestern Great Plains within the Fort Union Formation, which contains large concentrations of coal seams (Fredlund 1976). It is found in many colors which are products of different minerals reacting to the burning of the coal seams in the deep prehistory. The site is located within an area with several outcrops allowing for procurement of material to be local to the site area. Porcellanite is located 400m, though it should be noted that this material is found in outcrops throughout the northern plains. Again the reason

why this material is demeaned local is that within the parameters of the 30km round trip (Kelly 1995). Two other materials are considered local but will be discussed later on in this section.

Nonlocal. The nonlocal category consists of materials located 15km to 75km from the site. This category consists of chert, chalcedony, agate, quartzite, silicified sandstone, petrified wood, and other various materials listed in Table 4.1. The sourcing of these materials is complex due to the fact that most come from secondary sources such as ancient alluvial deposits. Studies on secondary sources noted that though complex, these types of sites are viable sources of material and in some cases are very important in the organization of lithic technology (Andrefsky 2009; Bernstein and Lenardi 2005; Church 1996). Work conducted in the area by C.E. Dobbins (1929) in the 1920's and by other geologists and archeologists, including Gene Munson and the excavation crew, has narrowed the plausible locations of procurement of these types of materials to three regions. The first region is located roughly over 16 km north of Sarpy Creek. This source seems to be the least plausible of the three due to the nodule sizes available for flintknapping. The source is still considered due to its location to the site and the variety of material plausible for procurement. The next region of possible procurement is located northeast of the site located on the drainage of Armells and Sarpy Creek approximately 29 km away. This gravel deposit has large quantities of large nodule size material for flintknapping and is estimated to be around 18m deep in some areas before the gravel forms into a conglomerate rock (Dobbin 1929). The final region explored for plausible procurement of material is the Pleistocene terraces along the Yellowstone River located north of the Sarpy Bison Kill approximately 60 km away (Dobbin 1929). Though three areas were covered, it should be noted that there could be many other sources surrounding the site and the three highlighted here are the three closest to the site that have been investigated by either geologists or archaeologists within the area of the site.

Type of Material
Local
Porcellanite
Vitreous Porcellanite
Nonlocal
Chert
Chalcedony
Agate
Quartzite
Silicified Sandstone
Petrified Wood
Agate/Chert
Silicified Sandstone/Chert
Chert/Quartzite
Exotic
Obsidian
Knife River Flint

Table 4.1: ***Detailed list of material within the assemblage.***

Exotic .Two materials not located within the region of the site and would have come from a distance of more than 76 km are categorized as exotic. These materials are obsidian and Knife River Flint. Each material was further examined in detail through special processes on each one and will be discussed in the following sections.

Obsidian. All seven obsidian projectile points and fragments and one flake were sent to Richard Hughes, Ph.D., of Geochemical Research Laboratory for sourcing by means of Energy Dispersive X-Ray Fluorescence analysis (EDXRF) (Hughes 2012, 2013). Table 4.2 is a table with the results of the XRF analysis conducted by Dr. Hughes.

	Trace Element Concentrations										Ratio		
Location/ Station/ Block/ Unit/	**Zn**	**Ga**	**Rb**	**Sr**	**Y**	**Zr**	**Nb**	**Ba**	**Ti**	**Mn**	**FeO3T**	**Fe/Mn**	**Obsidian Source (Chemical Type)**
S2-B2/ 2N 24W	Nm	Nm	167 ±4	45 ±3	48 ±3	290 ±5	60 ±4	797 ±32	nm	Nm	1.66 ±.02	54	Bear Gulch, ID
S2-B3/ 10N 89W	Nm	Nm	111 ±5	68 ±4	33 ±3	84 ±4	14 ±3	1542 ±34	nm	Nm	.92 ±.02	39	Malad, ID
S2-B2/ 16N 8W	Nm	Nm	176 ±4	42 ±3	48 ±3	281 ±5	59 ±4	771 ±34	nm	Nm	1.53 ±.02	56	Bear Gulch, ID
S2-B2/ 22N 00	Nm	Nm	279 ±6	1 ±2	24 8 ±4	306 ±6	322 ±8	0 ±24	nm	Nm	Nm	53	Big Southern Butte, ID
S2-B2/ 24N 8W	Nm	Nm	249 ±4	2 ±3	85 ±3	170 ±4	50 ±3	0 ±24	nm	Nm	1.35 ±.02	73	Obsidian Cliff, WY
S2-T3/ 10S 30W	Nm	Nm	232 ±4	3 ±2	83 ±3	166 ±4	47 ±3	3 ±24	nm	Nm	1.22 ±.02	68	Obsidian Cliff, WY
S2-B2/ 00 22W	Nm	Nm	175 ±4	48 ±2	49 ±3	300 ±6	64 ±3	727 ±30	nm	Nm	1.78 ±.02	49	Bear Gulch, ID

Table 4.2: ***Table of XRF results on the obsidian projectile points courtesy of Dr. Hughes of Geochemical Research Laboratory.***

As seen in Table 4.2, the obsidian points were sourced to four locations. Two were from Obsidian Cliff, Wyoming; three points came from the Bear Gulch source, Idaho, and one each from the Malad and Big Southern Butte sources located in Idaho. The one obsidian flake not on Table 4.2 was sourced to Obsidian Cliff, Wyoming. The distance from the site to these sources ranges from approximately 260km to 530km away. Table 4.3 shows the obsidian sources and their approximant distance from the Sarpy Bison Kill site and Figure 4.1 is a map showing the distance and location of sources to the site. With the number of obsidian projectile points recovered from the site and the variety of sources in which the obsidian was procured, reveal that these sources are the furthest from the site fitting within the exotic category. A study conducted by Craig Smith (1999) on obsidian recovered at sites throughout the state of Wyoming and showed similarities seen in studies like that of the field processing model (Beck et al. 2010). For procurement his study revealed that the relatively close sites to the sources contained between 10%-40% obsidian while sites located farther from the source contained less than 1% obsidian

(Smith 1999). Smith's study fits perfectly the small number of points and debitage of obsidian from the Sarpy Bison Kill seems to follow. His study (Smith 1999) also showed that a majority of the obsidian studied throughout Wyoming was procured at three sources; Obsidian Cliff, Bear Gulch, and Malad which is where six of the seven projectile points and the only flake at the Sarpy Bison Kill site were sourced. These sources being the major ones, show a limited connection either through some sort of macromovement by a small amount of individuals from the group traveling to these sites or has a connection to this lithic material through groups of hunter-gatherers with access to the resource (Macdonald 1998, 1999). This extremely low quantity of debitage and projectile points is what is predicted for raw materials coming from distant sources (Beck et al. 2010; Beck 2008).

Exotic Material Source Location	Distance from Source to Site (Approx.)	Number of Points and flakes from each Source
Obsidian Cliff, WY	260km	3
Bear Gulch, ID	400km	3
Big Southern Butte, ID	490km	1
Malad, ID	530km	1
Knife River Flint, ND	360km	2

Table 4.3: ***Table of obsidian and Knife River Flint and their estimated distance from the site.***

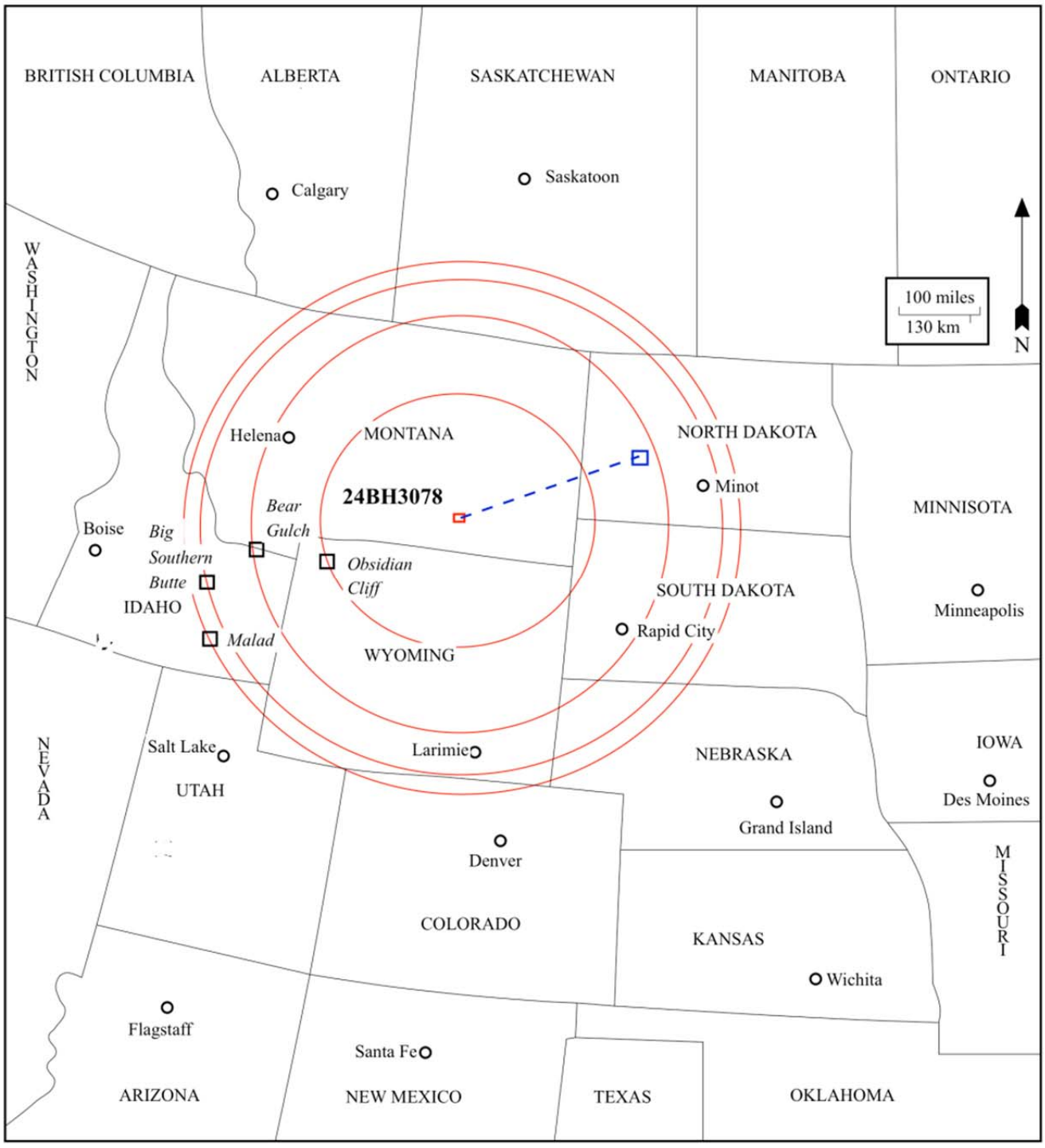


Figure 4.1: ***Map detailing the location and rough distance of obsidian (red circles) and plausible Knife River Flint (blue dotted line).***

Knife River Flint (KRF)

To get a more precise look into the lithic sourcing, the chalcedony projectile points from the Sarpy bison Kill site were analyzed by means of Ultraviolet Light Fluorescence analysis (UVF). Some traces of minerals respond differently to UVF allowing the plausibility of this type of material to be sourced (Andrefsky 2009; Church 1996; Macdonald 1998; Odell 2000). Although this process has been used in previous studies, problems have arisen because of the effects of different Ultraviolet light wave lengths and describing the florescence emitted (Andrefsky 2009). To tackle these problems in UVF analysis, I have utilized a lamp with both long wave and short wave bulbs and a munsell rock color chart to facilitate uniform description of the results along with a sample of confirmed KRF. Prior to the UVF analysis the projectile points were separated into chalcedony and agate based on color. The decision to make this separation between chalcedony and agate was based on focusing the UVF analysis on projectile points that had a high plausibility of being KRF. Knife River Flint is translucent brown in color and therefore projectile points that were translucent brown were classified as chalcedony. Other translucent materials in different colors were classified as agate. The instruments used in this analysis were a Model UVGL-55 mineral light lamp with both long wave and short wave lengths with an ultraviolet box and a munsell rock color chart (Macdonald 1998). The first step of the UVF analysis was put to the projectile points inside the ultraviolet box with a sample from the Knife River Flint source. Then the lamp was set to either the long or short wave frequency and the projectile points were exposed to the ultraviolet waves. After several moments exposed, the projectile point was examined next to the sample. If the sample and the projectile point were similar in color and glow then the projectile point had a high plausibility of coming from Knife River Flint quarry region. If the sample and the projectile point do not match then the projectile point is compared to the colors in the munsell rock-chart. The process is repeated for the other

wave frequency. After all the projectile points were subjected to the UVF analysis, the projectile points were separated by plausible Knife River Flint and by matching Munsell numbers on both long and short wave frequencies. This analysis and process has been utilized in studies of procurement, mobility, and other strategies of the Great Plains hunter-gatherers by researchers (Church 1996; Macdonald 1998, 1999).

Of the 54 projectile points subjected to the UVF analysis, two projectile points showed very close similarities to the sample rock of Knife River Flint under both long and short UV wave lengths. Although these two projectiles have a high plausibility of being constructed of Knife River Flint, this source is a secondary source created by alluvial and glacial processes covering 2,000 square km of western North Dakota (Root 1997). Along with the two projectile points likely from the Knife River Flint sources, nine projectiles matched four different color categories which show these points either came from four different sources still unknown or from four nodules. Further research on UV testing will further our understanding on sourcing. Table 4.4 shows all chalcedonies that match with a munsell color and the two plausible Knife River Flint points. Its distance to the site is also included in Table 4.3 and indicates that this material is roughly 360km from the site, though it should be noted that this material is spread through a vast region of North Dakota (Root 1997) and Figure 4.1 shows its location roughly to the site, indicated by a blue dotted line.

Projectile Point Unit and Number	Plausible Knife River Flint	Munsell Colors of non-KRF Matches
14N18W 4	No	10YR6/6 10YR5/4
8N34W 1	No	10YR6/6 10YR5/4
24N 14W 4	No	5YR2/2 5YR2/2
2S51W 8	No	5YR2/2 5YR2/2
6N26W 6	No	5YR3/4 5YR3/2
6S 44W 2	No	5YR3/4 5YR3/2
6N18W 7	No	10YR7/4 5Y6/4
2S 24W 4	No	10YR7/4 5Y6/4
6N 32W 1	No	10YR7/4 5Y6/4
12N 26W 7	Yes	Plausible KRF
4S 47W 2	Yes	Plausible KRF

Table 4.4: ***Results of the Ultraviolet Light Florescence analysis.***

Lithic Debitage

To make sure the procurement was not unique to the points, the debitage was examined to see what stage tools and raw material were transported to the communal hunting site. This analysis focused on only identifiable debitage and left all shatter and flake fragments out. The reason is because it's impossible to know at what point in the reduction stage that fragment is being removed from a tool or core. After the exclusion of the shatter and flake fragments, 9,537 identifiable flakes were left for analysis. Table 4.5 reveals the breakdown of local, nonlocal, and exotic flakes into the descriptive categories. As Table 4.5 shows 97.2 percent of the assemblage's flakes are of local material. To distinguish the effects of distance and the stage in which they were carried and further reduced at the site, the categories were broken down into 4 stages with one (decortication) and two being early and three and four (tertiary) being later stages of reduction. Table 4.6 and Table 4.7 reveal that 64.8 percent of local material is of early stages while nonlocal material is the opposite with 67.67 percent of flakes being late stages manufacture flakes. With local material showing more waste material being carried to the site than nonlocal material, the debitage coincides with other studies (Beck 2008; Beck et al. 20100

research. The debitage analysis shows that decisions were made on how much waste component of a resource should be carried over a given distance (Beck 2008; Beck, et al. 2010).

Type	Local	**C%**	**A%**	Nonlocal	**C%**	**A%**	Exotic	**C%**	**A%**
Decortication spall/flake	1088	11.74	11.41	28	10.53	0.29	0	0	0
Primary Reduction Flake	4919	53.06	51.58	58	21.8	0.61	0	0	0
Secondary Reduction Flake	2281	24.61	23.92	97	36.47	1.02	0	0	0
Tertiary Reduction Flake	975	10.52	10.22	77	28.95	0.81	1	100	0.01
Tertiary Notch Flake	1	0.01	0.01	1	0.38	0.01	0	0	0
Tertiary Flat Platform	6	0.06	0.06	5	1.88	0.05	0	0	0
TOTAL	**9270**	**100**	**97.2**	**266**	**100**	**2.79**	**1**	**100**	**0.01**

Table 4.5:***Table of flakes broken into the stages of reduction with C% representing categories percentage and A% representing assemblage percentage.***

Stage	**Local**
1	11.74
2	53.06
Early Stage Total	64.80%
3	24.61
4	10.59
Late Stage Total	35.20%

Table 4.6: ***Table of local flakes in different stages and the percentage of the early and late reduction. The numbers represent the flake categories from decortication (1) to the tertiary stages (4).***

Stage	**Nonlocal**
1	10.53
2	21.8
Early Stage Total	32.33%
3	36.47
4	28.95
Late Stage Total	67.67%

Table 4.7: ***Table of nonlocal flakes in different stages and the percentage of the early and late reduction. The numbers represent the flake categories from decortication (1) to the tertiary stages (4).***

Procurement Anomalies. The procurement for the projectile technology at the site has shown that local material was a major resource for this type of technology. The debitage and points reveal a heavy reliance on local material for the organization of projectile technology. Although these points observe a reliance on local material, the area has a source of other materials not used by the occupants of the Sarpy Bison Kill Site that is an anomaly in the strategy of procures material. These types of materials of relatively good quality should have been more heavily utilized than the porcellanite but instead had little to no evidence of use at the site.

Located less than one kilometer from the campsite, there is a source of vitreous porcellanite and non-volcanic glass. Vitreous procellanite is formed in the same manner as porcellanite with slightly different conditions in temperature and proximity to the burning coal seam (Fredlund 1976). Non-volcanic glass is a translucent natural glass that is formed on areas of intense heat and metamorphism, usually located around fissures and vents to the surface (Fredlund 1976). Non-volcanic glass is similar to obsidian though is a slightly lower quality due to the material usually forming small gas bubbles throughout it (Fredlund 1976).

The source is northeast of the campsite and is located on a ridge on the other side of the Sarpy Creek. The qualities of these materials are slightly better than the porcellanite located closer to the site. The distances from the closest camp to known source only differed approximently 600 meters. There was no debitage from the whole site that was of these materials and only one point was constructed of vitreous porcellanite. The question here is “Why is this better material not the main focus of raw material procurement?”. One possible reason is that this source was not known to the hunter-gatherers of the Sarpy Bison Kill Site. This possibility would explain the lack of production waste and small amount of tools constructed of these materials.

The problem with this possibility is the location of the source and the span of time the site was occupied. With being less than one kilometer from the site and over 250-300 years of hunting being conducted, the area would have been well scouted and understood to provide the best information on driving the bison to the trap (Barsh and Marlor 2003; Verbicky-Todd 1984). Looking into work conducted in the area there are sites that had vitreous porcellanite and non-volcanic glass recovered as both debitage and tools. Prior to the Sarpy Bison Kill there was a Powers-Yonkee occupation known as the Merle site dating to late Middle to early Late Plains Arachic time with the oldest radiocarbon dated feature being 3560±60 BP and youngest radiocarbon dated feature at 2890±110 BP that had evidence of these materials in both production and use (Munson and Ferguson 2000). The site was situated north/northeast of the source of material and was 1.2 km away. With this use of the source from different times the question still remains "Why did the Sarpy Bison Kill occupants not utilize this source during this time?"

MacDonald (2009) noted in a study of technological organization of several sites that the same issue arose. The sites had tools constructed of low to moderate materials while high quality material is located relatively close to some of the sites. This study was able to examine both techno-economic and sociocultural decision making within technological organization within a couple of site assemblages (MacDonald 2009). The Blind Horse Site in Virginia had a change in raw material and technological organization during the Terminal Late Archaic period (ca. 4,000-3,000 B.P. uncalibrated) and attributed this type of decision to several possible scenarios such as a shift in regional population and settlement patterns, restriction to sources, and technological and/or functional restrictions (MacDonald 2009). Understanding the lack of these materials being used will help reveal either a techno-economic or sociocultural decision by the hunter-gatherers of the Sarpy Bison Kill Site.

A shift in populations within the region may be able to explain the lack of the materials use due to having no knowledge of the source. The problem with this possible explanation is that the site was utilized long enough for the occupants to have gotten knowledge of the landscape the hunting system and surrounding resources was located. The restriction to the source scenario is probably not the case for the occupants of the Sarpy Bison Kill Site due to two factors. The first factor is that the source is within extremely close proximity to the site and within the domain of the occupants of the hunting system. The second factor reveals that there is a lack of evidence revealing that certain groups at the site controlled the source either within the campsites itself or the surrounding sites (Munson and McElroy 2015).

Another possible scenario for the lack of procurement from this source maybe a decision based function. Assuming the strategy of points purposely breaking to cause more damage as some of the ethnographic work (Ellis 1997) and experimental studies (Flenniken 1985; Flenniken and Raymond 1986; Odell and Cowan 1986; Titmus and Woods 1986; Towner and Warburton 1990; Zeanah and Elston 2001) have suggested, and then porcellanite may have been a suitable material for the task. As noted by Fredlund (1976) porcellanite is not as hard as chalcedonies and cherts and this characteristic allows the material to be a great material for flint-knapping. A softer material would also cause greater easy in breaking due to impact, creating damage beneficial to this strategy. Although porcellanite projectile points have not been tested for their durability compared to other lithic materials, researchers conducting impact damage analyses have noted that material could be a factor that affects durability (Cheshier and Kelly 2006). This could also explain the reason for the other sites using these materials while the occupants of the hunting system did not. The Merle Site was a general hunter-gatherer campsite that would require a wide range of tools constructed of materials better to perform general tasks at the site (Munson and Ferguson 2000). The inhabitants of the Sarpy Bison Kill Site understood the tasks

and the specific functions that would needed to be addressed at the site. This would then lead to a toolkit that should focus on the specific activities going to be conducted. With this in mind, the hunter-gatherers of the hunting system could have decided that the porcellanite performed well enough for the specific function and other local materials were not necessary.

The final test in this analysis is to see if different base shapes either from different groups using the site or a change in style over time affected the procurement of material. This was analyzed by means of a Chi square test. The Chi square test preformed to examine the relation between base shape and material revealed that these variables were not significant, $X=.853$; $df=1,633$; $p = .931$. This means that there is no relation between the type of base the points had and were the material was sourced. This test results in a rejection of hypothesis 3 in that neither different groups utilizing the site, nor different styles over the time changed the procurement strategy. Inhabitants of the Sarpy Bison Kill Site had a procurement strategy that was not changed by use of different groups or from generation to generation when it came to procuring lithic materials and transporting tools.

Summary of Procurement Results: Overall the procurement analysis revealed major aspects of the technological organization of the projectiles from the Sarpy Bison Kill. Reexamining the hypotheses for this part of the analysis reveals that hypothesis 1 and hypothesis 3 were rejected while hypothesis 2 could not be rejected. A majority of the projectile points recovered at the site were made of local material leaving a large amount of local debitage at the campsites. Although the debitage represent overall production being conducted at the site, it reveals hunter-gatherers preparing for pre- and post-hunt. Hypothesis 2 was rejected as nonlocal and exotic projectile points not make up the majority of points recovered at the site. The analysis did reveal that due to the quantity of debitage and the type of flakes recovered that were nonlocal and exotic material were transported as finished points or in the late stage of production. This

reveals a portion of the projectiles were brought ready for use while a majority of the points were constructed on site.

Hypothesis 3 was rejected due to no relationship between what type of base a point has and what material it was made. This means that different individuals or groups of manufacturers had the same behaviors and decision making processes that led to a uniform strategy of procurement for the whole site, at least as measured by characteristics of projectile points and debitage. Other tool types at the site may reveal different ideas of procurement strategies for tasks, but the projectile points and debitage do not reveal any evidence to suggest otherwise.

Hypothesis 1 which was that a majority of the points would be made of local material and that a large amount of debitage would be recovered indicating on site manufacture of the points has withstood the test and therefore cannot be rejected in this thesis. Examining further into the procurement strategy it was found that two sources of good quality material were within the local region but not utilized. Understanding why only the porcellanite and not the other materials were used revealed several factors that may have been the plausible reason for the decisions around procurement.

The first factor is the location of the porcellanite sources. Porcellanite sources of moderate to excellent quality surround the Sarpy Bison Kill site and are within a couple hundred meters from the campsites for the closest procurement. The second factor is the function of the point and the material itself. If the hunter-gatherers of the Sarpy Bison Kill manufactured their points to break to increase lethality within the targeted prey (Flenniken 1985; Flenniken and Raymond 1986; Odell and Cowan 1986; Titmus and Woods 1986; Towner and Warburton 1990; Van Buren 1974; Zeanah and Elston 2001) then porcellanite being a relatively soft material and easy to flintknap and break would be a great choice. Knowing that sources of this moderate material was close to the hunting system and understanding what will happen to the projectiles,

they could have done a cost benefit analysis and decided on procuring raw material for this technology from particular local sources.

Projectile point design and manufacture. To understand decisions on design and manufacture, the points were first analyzed for the overall quality of production as described in the methods section and were separated into formal and informal. The formal point measurements were then compared to see the overall design of the points. Table 4.8 is a list of all the measurement means and standard deviations for the formal points. The appendix to this thesis contains detailed information regarding measurements of projectile points.

Measurements	Mean	Standard Deviation
Maximum Length	38.9	9.2
Blade Length	31.5	9.4
Maximum Width	23.5	2.9
Neck Width	14.9	2.8
Basal Width	17.8	2.6
Thickness	5.4	0.7
Mass	5	2.1
DSA	159.7	13
PSA	118	8.4

Table 4.8:***Table of means and standard deviations for the measurements of formal points.***

To see if the point design was different between material types, a one way anova test was conducted to tell if there was a significant difference in a certain measurement and the type of a material that the point was constructed of. A post hoc Tukey HSD test was also conducted to reveal which measurement was different due to material type. Since certain measurements can be heavily effected by what the condition of the point was recovered in measurements may effected were used in statistical tests. Complete and proximal points were used in statistical analyses on maximum/shoulder width, basal width, neck width, thickness, DSA, and PSA, while only the complete points (N=832) were used in the statistical analysis of maximum length, blade length, and mass.

There is a significant difference between material type and maximum length (F= 12.7; df= 2, 831; p=less than .001), blade length (F=15.8; df= 2, 831; p=less than .001), mass (F= 11.7; df=2, 831; p= less than .001), maximum/shoulder width (F= 7.5; df= 2, 1470; p=.001), basal width (F= 8.0; df=2, 1466; p= less than .001), neck width (F =14.7; df= 2, 1467; p= less than .001), thickness (F= 10; df= 2, 1472; p= less than .001), DSA (F =4.9; df= 2, 1326; P=.008), and PSA (F = 4.1; df= 2, 1326; p=.017). The post hoc Tukey HSD test revealed that points made of local material had slightly larger maximum length, blade length, maximum/shoulder width, basal width, neck width, and thickness measurements. Points also fabricated from local material were slightly heavier and had slightly more obtuse corner notches then nonlocal points. Points manufactured of exotic material were not significantly different from local or nonlocal points. Table 4.9 shows the means and standard deviations from each measurement in within each material type.

Measurements	Mean	Standard Deviation
Maximum Length		
local	39.8	9.1
nonlocal	36.4	8.5
exotic	29	1.4
Blade Length		
local	32.8	9.3
nonlocal	28.8	8.4
exotic	20.9	6.6
Maximum Width		
local	23.6	3
nonlocal	22.9	2.8
exotic	21	5
Neck Width		
local	15.1	3
nonlocal	14.2	2.2
exotic	13.9	3.6
Basal Width		
local	17.9	2.7
nonlocal	17.3	2.5
exotic	16	3.5
Thickness		
local	5.3	0.8
nonlocal	5.1	0.7
exotic	3.9	0.7
Mass		
local	5.1	2.2
nonlocal	4.3	1.8
exotic	2.1	0.5
DSA		
local	160.6	13.2
nonlocal	158.5	12.3
exotic	173.3	11.5
PSA		
local	117.5	8.6
nonlocal	118.7	8.5
exotic	126.7	5.8

Table 4.9: ***Table of means and standard deviation of the different material types from the ANOVA test.***

Table 4.9 reveals that though many of the measurements are significantly different, the difference is very small and in some cases is only a couple millimeters off. These differences seem too small for the case that this was an intentional decision made by the occupants of the site for two reasons.

The first reason is a study conducted by Eerkens (2000) on the abilities of humans to be accurate with visual perception, motor skills, and memory in the production of artifacts. His study was able to reveal that humans in preindustrial societies using only themselves to produce objects are only able to get within a five percent range of the mental template (Eerkens 2000). The study also pointed out that flintknapping is a reduction manufacturing technique that is not as error minimizing and adjustable as pottery and coiling production techniques (Eerkens 2000). Eerkens (2000: 667) pointed out that some highly standardized stone tools have higher values then his experiment showed revealing that there is a higher degree of human error in flintknapping. The difference between most of the measurements is so small that it could be representing human error only. The second reason for doubting the results of the ANOVA test is that the points were not of equal sample sizes in each material type category and therefore the slight difference in measurements could be a result in a sampling error.

One aspect that could affect design and manufacture could be based on the different decisions by individuals on hafting. Three types of base shape were recovered from the site which was straight, convex, and concave. As studies of hafting styles (Keeley 1982; Zeanah and Elston 2001) have shown, each style of base shape would require slight modifications how the point is attached and to the foreshaft. The points were to be separated by these base types to see if the variation amongst the measurements is based off the bases and therefore based on separate hunter-gatherer templates for points. To compare these bases, a one way ANOVA test was conducted to see if there is a significant difference in the aspects of design measurements and base shape. The ANOVA test resulted in there being no statistical significant difference between the base shapes and the measurements of neck width, basal width, Maximum length, and blade length. There is a statistical significant difference between the base shape and maximum/shoulder width (F= 24.07; df= 2, 1456; p=less than .001), thickness (F=9.845; df= 2,

1456; p= less than .001), and mass (F=3.771; df= 2, 828; p=.023). To understand which measurements differed by base shapes a Tukey post hoc test was conducted. The Tukey post-hoc has revealed that concave bases (24.7+/-3.2mm; p= .004) have a slightly wider shoulder than straight bases (23.69+/-2.9mm) and convex bases (22.84+/-2.9mm; p= less than .001) are slightly smaller than straight bases. The tukey post-hoc revealed convex bases (5.2+/-.75mm) are slightly thinner than concave bases (5.46+/-.66mm; p=.002) and straight bases (5.35+/-.74mm; p=.001). There is no statistically significant difference in thickness between straight bases (5.35+/-.74mm; p=.27) and concave bases (5.46+/-.66mm). The tukey post-hoc test also revealed concave bases (5.44+/-2.2g) weighed heavier and convex (4.7+/-2.1g; p=.027) while there is no significant difference with straight bases (4.97+/-2.1g; p=.207). There is also no significant difference between convex base (4.7+/-2.1g) and straight base (4.97+/-2.1g; p=.198) weights.

The variation seen in both maximum/shoulder width, thickness, and mass for the Sarpy Bison Kill points is so minute between each basal shape, that the variation is considered due to sample size or human error (Eerkens 2000) in producing the points. The overall mean measurements for the points reveal a template for points utilized in projectile weaponry. After finding the template for formal points at the Sarpy Bison Kill, points that differed greatly in the average template were tested against it. Two types of points different from this template recovered from the site are informal points and unnotched points. These types of points are studied in detail to see how significant they were in the organization of the projectile technology at a communal hunting site, and what they tell about behavior and strategies used by these hunter-gatherers.

To compare the two different qualities of points recovered from the Sarpy Bison Kill site, the 2,332 formal and 231 informal points were analyzed by means of an independent t test. Since both types of points were recovered in various conditions measurements unhindered by damage

were utilized leaving only complete and proximal points used in the analysis. The t test revealed that there was no significant difference in neck width (t=.16; df= 211.9; p= .872), PSA (t=1.02; df=175.4; p=.308), maximum length (t=-.8; df=155.3; p=.426), and mass (t=1.93; df= 830; p= .054). There was a significant difference in maximum/shoulder width (t=4.01; df= 216.5; p= less than .001), basal width (t=2.6; df= 213.5; p= .008), thickness (t=8.0; df= 206.8; p=less than .001), blade length (t=-2.16; df= 157.7; p=.033), and DSA (t=-3.28; df= 1325; p= .001). Table 4.10 is the means and standard deviations for all the measurements tested between formal and informal. Closer examination shows that though these measurements are different, the difference is extremely small and therefore the results seem to be due to sampling size. These results reveal that though the production quality was not quite the same the basic attributes of the points were similar. Photograph 4.8 of a formal point (right one) and an informal (left one).

Photograph 4.8: ***Photograph of a formal (left) and informal point (right).***

Measurements	Mean	Standard Deviation
Maximum Length		
formal	38.9	9.2
informal	39.6	8.1
Blade Length		
formal	31.5	9.4
informal	33.4	7.9
Maximum Width		
formal	23.5	2.9
informal	22.5	3.3
Neck Width		
formal	14.9	2.8
informal	14.9	3.3
Basal Width		
formal	17.8	2.6
informal	17.2	3.1
Thickness		
formal	5.4	0.7
informal	4.8	0.9
Mass		
formal	5	2.1
informal	4.5	2
DSA		
formal	159.7	13
informal	163.3	12.5
PSA		
formal	118	8.4
informal	117.1	10.2

Table 4.10: ***Table of mean and standard deviation from the independent t test from the quality of production test.***

There are several plausible reasons why informal points were manufactured and used at the site. The first reason could have been a time management issue. Knowing the type of hunt and the approximant time/season this would be conducted, the hunter could have lacked the time to prepare before the hunt for this activity. This type of time management studied by Torrence (1983) would affect projectile technology in that the production of tools for the hunt would have been affected by times of relative little to high activity. The points from the Sarpy Bison Kill Site

are predominately formal well-crafted points showing support for the idea that the points were manufactured during a time of little activity prior to the hunt. The informal points may be part of a last minute preparation prior to the hunt when the time was very limited and the flintknapper opted for a point that was good enough to perform the task rather than manufacturing to the mental template.

Another reason why these points may have been used in this hunt is that the flintknapper who crafted these informal points did not have the same skill as the more experienced flintknapper who was creating the more formal points. Studies on several Paleoindian hunting sites have also shown evidence of varying degrees of production skill that reveal degrees of highly skilled and lower skilled stone tool making (Bamforth 1991; Bamforth and Hicks 2008). At the Allen site studied by Bamforth and Hicks (2008) a similar pattern that they determined as a range of experienced and novice knappers is similar to what the production skill at the Sarpy Bison Kill may indicated. Of the 231 informal points recovered, 226 or 97.8 percent were from within the kill/processing area, and with evidence of impact damage indicative to projectile use, these points may represent as small amount of participation from members in the society not as skilled in the production of points as others. The overall this study shows that the projectile points for the Sarpy Bison Kill site were prepared in advance and were highly formal with only a small portion of informal points being utilized in the hunt either due to a time constraint on their production or the skill of the manufacturer of the stone implement.

To understand and compare the notched points to the 92 unnotched points an independent t test was conducted to understand if these two types of points varied in their design. Again similar to the problems seen in the formal/informal test, measurements affected by impact damage were excluded from the analysis leaving the complete and proximal points to be used in this test. There was no significant difference in maximum length ($t=-.38$; $df= 830$; $p=.703$) and

mass (t=-.308; df= 830; p=.758). There was a significant difference in blade length (t=-6.72; df= 826; p=less than .001), maximum/shoulder width (t=2.62; df= 1462; p=.009), basal width (t=-15.6; df= 97.7; p= less than .001), neck width (t=-24.8; df= 95.4; p= less than .001), and thickness (t= 2.36; df=1462; p= .018). Table 4.11 is all the mean and standard deviation between the measurement and the presences of notching.

Measurements	Mean	Standard Deviation
Maximum Length		
notched	38.9	9
unnotched	39.4	9.6
Blade Length		
notched	31.2	9
unnotched	39.4	9.6
Maximum Width		
notched	23.5	2.9
unnotched	22.6	3.1
Neck Width		
notched	14.4	1.9
unnotched	22.6	3.1
Basal Width		
notched	17.4	2.3
unnotched	22.6	3.1
Thickness		
notched	5.3	0.7
unnotched	5.1	0.8
Mass		
notched	4.9	2.1
unnotched	5	2.8

Table 4.11: ***Table of means and standard deviations from the independent T test on notched and unnotched points.***

Closer examination of the differences in maximum/shoulder width and thickness reveal that they are off by less than one millimeter and with the sample size of each group being significantly different, 1,468 confirmed notched points versus 92 unnotched points, it was determined that the difference here was due to sample size. Examination of the difference

between the measurements for neck width, basal width, and blade length revealed that there was a significant difference as the t test concluded.

These differences can be explained by the different hafting techniques of each type. The neck width is so different between notched and unnotched points because notching conducted on the point makes the width of the area where the binding is narrower than points without notching. Unnotched points have an area in which the binding is the maximum width of the point. The same could be said about the basal width. Since most of the points recovered at the site are corner notched the base is modified. The base is affected by notching because as the notch starts at the corner material is removed making the base smaller than before the notching process began. The explanation for the blade length being significant is that since there was no notches to indicate where the hafting element ended and the blade element began. The full length of unnotched points was considered the possible blade length. This study suggests for better results to find the mean length of the hafting element on notched points and use this as a rough estimator to get an approximation on what the blade length could be for unnotched points.

There are a few reasons that unnotched points could have been used at the Sarpy Bison Kill Site. The first reason that unnotched points likely detached easier, resulting in increased blood loss for the prey. Notching is meant to help bind the point tip securely to the haft (Keeley 1982; Knecht 1997; Van Buren 1974). Unnotched points can still be hafted to foreshafts but are not as secure as notched points. This makes unnotched points more susceptible to coming loose (Keeley 1982; Engelbrecht 2014). If the point detaches from the haft within the prey the point would cause more damage to the prey just like fragments of points (Ellis 1997; Flenniken and Raymond 1986; Odell and Cowan 1986; Titmus and Woods 1986; Towner and Warburton 1990; Van Buren 1974; Zeanah and Elston 2001). This has been noted as a hunting strategy by other hunter-gatherers in North America (Engelbrecht 2014). Although it is possible reason why

unnotched points could have been used, it should be noted that only 92 points were unnotched out of 1,468 identifiable hafting elements and therefore this seems to not be a significant strategy utilized by the occupants of the site.

Another reason that unnotched points may have been utilized in the hunting process is due to production decisions. The notching process has been shown to be a stage where manufacture failures occur at a high rate (Titmus 1985; Titmus and Woods 1986; Towner and Warburton 1990). It could have been a decision by the manufacturer to skip this process to not run the risk of breaking the point at this stage in the production. This also could indicate a cost benefit decision with regards to time. If the flintknapper was low on time to produce points for the hunt, the decision to forgo the notching stage and just haft an unnotched point would have saved time and given the hunter a functional point. With the statistical analysis conducted and taking the two possible reasons explained in this thesis, the occupants of the Sarpy Bison Kill could have used the unnotched points as combination of both a cost benefit decision on production and the strategy for easy removal.

Summary of the Design and Manufacture Results: Overall the design and manufacturing process at the site show a projectile technology that was highly formal and prepared in advance knowing what and how much was needed to perform this type of hunt. The measurements revealed what the mental template a point should be designed and manufactured for hunting during the sites use. The analyses also revealed indications of limited use of different strategies of production along with the primary strategy. The informal points could indicate limited participation of individuals with novice or limited skills in the production of points or the effects of last minute gear being produced before the hunt. The unnotched points could represent a mix of both a cost benefit decision on production and the strategy of easy removal to increase the lethality. Reexamining the hypotheses for this part of the analysis shows

that hypothesis 2 was disproven since the points did not vary much from a set mental template for the site. The analysis also showed that hypothesis 3 was also disproven due to the fact that neither the material type nor the base shape differed from each other. Hypothesis 1 is the only one to withstand the tests. The analyses revealed that the points were well made and had very little variation from the template on what a point should be manufactured as during the sites occupation.

Maintenance and Repair. To study the maintenance and repair strategies with regards to the points, the location, HRI score, and BL/T ratio were taken from points not affected by impact damage. This left the complete points (n=832) to be the test subjects for this analysis. The study revealed that both types of retouch, lateral edge and tip, were present at the Sarpy Bison Kill site. I will first go over the tip retouch was studied to understand if there is any difference in strategy occurring between material and base shape and followed by the lateral edge retouch being examined for the same patterns. Table 4.12 is the 832 complete points tested for retouch and the number and percent of each type of retouch observed.

Table 4.12 reveals that though there are more points manufactured of local material, the percentage of retouch types was different amongst the material categories. The retouch pattern described as tip retouch, which indicates repair of a broken point to function again as part of a projectile (Christenson 1986), had a higher percentage of nonlocal points than local points. This shows that more of the nonlocal points were broken in previous hunting trips and were repaired prior to their use at the Sarpy Bison Kill.

retouch location	local	C%	nonlocal	C%	Exotic	C%
no retouch	531	84.96	161	78.54	1	50
tip retouch	55	8.8	37	18.05	1	50
lateral edge	39	6.24	7	3.41	0	0
Total	**625**	**100**	**205**	**100**	**2**	**100**

Table 4.12:*Table of the retouch location analysis and the percentage within each material category*.

Looking further into the tip retouch of both local and nonlocal points against complete points, the HRI scores were compared by means of an independent t test. The local points (t=-29.898; df=533; p=>.001) and nonlocal points (t=-19.829; df=195; p=>.001) resulted in both being significantly different indicating that there is a difference between complete points with no retouch and points with tip retouch. With the results of this independent t test, the points with tip retouch from both local and nonlocal points were examined against each other. The results of independent t test revealed that there was no significant difference (N=92 t=-.624; df=90; p=.534) between the HRI scores, or the intensity of retouch, of local and nonlocal points within tip retouch. With the intensity of retouch not being significant the BL/T was then analyzed by an independent t test to see if there was a significant difference between local and nonlocal points with tip retouch. The results of this test on BL/T indicated that there is no significant difference between the BL/T ratios of local and nonlocal points with tip retouch (N=92 t=.045; df= 90; p=.964). The results of the tip retouch analysis have shown that though a higher percentage of the nonlocal points had evidence of pre hunting use, the intensity of retouch and the BL/T ratio was equal for both the nonlocal and local points.

Since material type did not indicate maintenance or repair intensity, the base shapes were tested to see if the strategy would change with different haft styles. The points were tested to see if there was a significant difference in tip retouch between each base type by means of a one way

anova test. The test revealed that there was no significant difference in HRI (F=.146; df= 2, 92; p=.865) and blade length/Thickness ratio (F=.554; df= 2, 92; p=.577) based on basal shape. This shows that the strategy for maintaining and repairing points did not change between different groups using different base types at the site or over time.

As Table 4.12 revealed points with retouch located on one side, lateral edge, which is an indication of being used as a cutting or sawing tool (Ahler 1971; Harper and Andrefsky 2008) has a higher percentage within local material then nonlocal material. This reveals that more points manufactured of local material were used in post hunting activities such as butchering than nonlocal points. Another aspect to note is that of the 46 points with lateral edge retouch recovered from the Sarpy Bison Kill site; only one point was recovered outside processing area or more specifically the bonebeds. To understand if the HRI scores or the BL/T ratio differed due to material type an independent t test was conducted. The results revealed that there is no significant difference between the intensity of retouch, HRI (t =.94; df=44, 46; p=.354) and the BL/T ratio (t=1.31; df= 44, 46; p=.197). With the intensity of the point as a cutting tool not being affected by material type, a one way ANOVA test was conducted on lateral edge retouched points to if the strategy for the use of points for butchering tools is different between the different base types. The test resulted in there being no significant difference between HRI (F =1.53; df= 2, 46; p=.228) and BL/T ratio (F=1.42; df= 2, 46; p=.252). This shows that the strategy of using points as butchering tools did not differ in intensity of use between groups or over time.

Summary of Maintenance and Repair Analysis Results: Overall the results of various aspects of the maintenance and repair analysis have shown several interesting factors at Sarpy Bison Kill. The first aspect to note is that of the 832 points studied only 138 points showed indications of maintenance and repair or 16.6 percent of the complete points. This reveals that retouch was not as major part of projectile point strategy. This may also explain part of the

reason why 32.5 percent of the point assemblage consisting of complete points may have been left behind after the hunt. The hunter may have rationalized that the odds of it being complete were not good and therefore decided to count it as a loss. A reason for this not being a major part of the strategy is that if the points were intended to break for improved lethality then the occupants of the Sarpy Bison Kill may have considered cost and benefits and decided that it was too costly to retrieved and repair points compared to fashioning a new point onto the haft. Another aspect is that as Zeanah and Elston (2001) study revealed that points can only be damaged in certain ways or they could not repaired and to function the same again. The benefit of repair is then limited to what condition is the point in after its use (Zeanah and Elston 2001).

Noting that this is a minor strategy used by the hunters the next step is to understand the patterns within the retouched points to observe when and why points were maintained and repaired at the Sarpy Bison Kill. The two types of retouch observed within the points reveal two distinct patterns and functions. The 92 points with retouch on the tip reveal evidence of pre-hunt activity. These points were used in previous activities and were repaired and used at the Sarpy Bison Kill. The reason for these tip retouches maybe that these points were broke in a way that still made it beneficial to repair (Flenniken and Raymond 1986; Towner and Warburton 1990; Zeanah and Elston 2001). This also allowed the hunter to come to the site with some of the functional points already to go and therefore making the hunters/manufacturers' job slightly easier due to the fact that not all the points had to be constructed on site from scratch. Studies on retouch have shown that repairing a point can take a matter of minutes while constructing a new one can take 20 to 40 minutes (Flenniken and Raymond 1986; Keeley 1982; Spencer 1974; Zeanah and Elston 2001). The hunters may have made the decision at another activity to salvage the points knowing that they would have to gear up for the Sarpy Bison Kill hunt in the future. The percentage of nonlocal points being higher in tip retouch then the local material and one of

the exotic points reveal tip retouch, further adds to the subject that projectile tips used outside the area were repaired and used again within the Sarpy Bison Kill.

Unlike the tip retouch points, the points with lateral edge retouch reveal aspects of post hunting activities. Since this type of retouch pattern is indicative to cutting and sawing activities (Ahler 1971; Andrefsky 1997; Harper and Andrefsky 2008; Kay 1996; Truncer 1990) it reveals that after the hunt some individuals decided to change the function of the point and foreshaft form a projectile technology to a hafted knife or butchering technology. This type of tool change has been noted early on in the archaeological record and was first referred to as lateral use (Schiffer 1972).Later on researchers noted that points could conduct a variety of tasks other than just being a component of a projectile (Ahler 1971; Andrefsky 1997; Harper and Andrefsky 2008; Kay 1996; Nelson 1991; Truncer 1990). These types of points recovered at the site show that yes they could fulfill other tasks but in the overall view of projectile technology at the site was a very small part of the organization. The reason for this could be that while points were being manufactured for the hunt, butchering tools were also being manufactured and therefore they may have prepared enough butchering tools that required less need to retrieve and change points to perform the tasks. Another aspect of this strategy is that though only 46 points had this type of retouch, 39 or 84.8 percent of the lateral edge points were manufactured of local material. A reason for this high percentage could be connected to procurement. If porcellanite was chosen to produce the overall majority of the points just so they could be used at this site specifically, then points complete or slightly broken may have been recovered for butchering with the intent to discard after their use as was already planned.

Reexamining the hypotheses for the maintenance and repair study reveals that several hypotheses were disproven. Hypotheses one and two were disproven do to one major factor noticed in the analysis. Neither the local or nonlocal and exotic proved to show evidence of

heavier retouch than the other material types. Hypothesis three held up with the different material types revealing strategies utilized pre and post hunting activities. Nonlocal points with retouch indicate to repair and maintenance for continued use as part of projectile technology. This retouch strategy shows that some points used in other activities where repaired to a functional state and deployed at the Sarpy Bison Kill Site. The points constructed of local material revealed a different pattern of retouch. This different pattern of retouch indicative of butchering functions reveals post hunting activities in which points go from being part of a projectile to a hafted butchering strategy. These two types of repair and maintenance show that occupants of the Sarpy Bison Kill site extended the use life of a few points to fulfill a need either prior to or after the hunt. Overall the maintenance and repair of projectile points at the Sarpy Bison Kill was a small part of the organization of projectile technology and depended on immediate tasks the points needed to perform around the hunt.

Chapter 5: Conclusion

In this thesis I was able to examine how Late Archaic period hunter-gatherers at the Sarpy Bison Kill prepared and organized the projectile technology before and after the hunting activity. Approximately 2,000 years ago, Late Archaic Native Americans hunted an estimated 2,221 bison using a natural game trap system described in Chapter 2. The site occupants left behind 2,563 projectile points, which became the subject of this thesis. In this conclusion, I summarize the significant conclusions from my analysis of the lithic technological organization of Late Archaic hunter-gatherers at the Sarpy Bison Kill site in southeastern Montana.

The procurement study revealed that the main focus for material to construct the points was coming from local sources showing the decision to not transport material for construction of points over long distances. There is also a decision to choose one local type of material over others for a particular purpose. Materials coming from nonlocal and exotic sources were brought in late stages of manufacture or as complete points, showing part of the preparation of the projectile technology being produced off site.

The design and manufacture of points from the Sarpy Bison Kill Site revealed an overall point design with only a little variation. The overall quality of the projectile technology was for the majority highly formalized and well manufactured. The small amount of informal points constructed still fit within the basic measurements of the template for formal points. The same is seen within the smaller sample of unnotched points with the only major difference being seen in the measurements that were affected by the notching process. The informal points could be representing a flintknappers skill (Bamforth 1991; Bamforth and Hicks 2008) or a time management decision to produce a functional point during times of stress (Torrence 1983).Both possibilities would produce at least functional points with the basic attributes constructed to fit within the projectile system. The unnotched points represent again another cost benefit decision

on wither to conduct the notching process and the possibility of manufacture failure (Titmus 1985; Titmus and Woods 1986; Towner and Warburton 1990). This also could be a strategy for increased lethality just as notching is considered (Ellis 1997; Flenniken and Raymond 1986; Odell and Cowan 1986; Titmus and Woods 1986; Towner and Warburton 1990; Van Buren 1974; Zeanah and Elston 2001).With no notching the point has the ability to detach from the haft easier (Keeley 1982) and would be lodged within the prey causing damage (Ellis 1997; Zeanah and Elston 2001). This strategy has been popular in other regions of North America at different times (Christenson 1997; Engelbrecht 2014: Turpin and Bement 1992). If either of these concepts are true, it should be noted that only 92 of 1,372 identifiable points were unnotched making it a small part or decision in projectile technology. Overall the analysis showed that the points had a very distinct template to follow and did not vary from it significantly. This reveals that the organization of the projectile points was to some extent standardize to certain functions that the points needed to perform.

The maintenance and repair analysis revealed that a small fraction of the points from the Sarpy Bison Kill showed evidence of retouch revealing that repair was not a major part of the organization of projectile technology. It should be noted that points salvaged from the site after the hunt may have been retouched off site and would skew the results of this analysis. The points that did show evidence of retouch revealed two distinct strategies of retouch that expose two functions the points' preformed pre and post hunt. The only test to show that material type affected the decision on organization comes from the maintenance and repair section. The nonlocal material revealed that more points had retouch indicative of tip retouch, which is seen as a retouch strategy to repair a point to a functional state as a part of a projectile (Christenson 1986; Harper and Andrefsky 2008). This shows that a large portion of the nonlocal points were used in other hunting activities and repaired for use at the Sarpy Bison Kill. The local points with

retouch seem to reveal lateral edged retouch suggestive of butchering functions. The use of local points as butchering tools after the hunt reveals that locally made points were made on site, used as a projectile to take down the bison, and on occasion temporaily used for cutting up the prey before being discarded. Even though occupants of the Sarpy Bison Kill site rarely engaged in this strategy, it was occasionally used to fill gaps in functional tool use for tasks prior to or after the hunt.

The Sarpy Bison Kill Site has shown well-prepared projectiles able to perform optimally in taking down the targeted prey. The points also reveal a major strategy in how points were organized and used. The aspect that seems to be revealed in the points design is the idea of increasing the lethality. The factors to support this organizational decision are as follows:

Factor One: The procurement focused on porcellanite while nonlocal, exotic, and even high quality local material were not the primary raw material. This decision to use this material over other types shows that the people of the Sarpy Bison Kill had a set plan and knew the material to fit the task the tool needed to perform.

Factor Two: The design of the points, though very formal for the most part, revealed that 1,731 out of the 2,563 points were broken. If the experiments conducted on impact damage are reliable then points only lasted on average a couple shots (Cheshier and Kelly 2006; Flenniken and Raymond 1986; Odell and Cowan 1986; Titmus and Woods 1986; Towner and Warburton 1990; Zeanah and Elston 2001). Ethnographic work reveals that some groups preferred stone because it would break and cause more damage (Ellis 1997). These show that points could increase their lethality if they were to break within the animal and have the stone shrapnel work within the wound causing more damage. If the occupants of the Sarpy Bison Kill used this concept to design the points, then porcellanite which is a softer material than most other lithic materials, like chert, would be a great material to shatter and case damage and may be the reason

why the close sources of porcellanite were so heavily used at the site. The informal and unnotched points still fit within this strategy. Informal points were built to the minimal functionality but still could cause damage like the formal points by breaking within the wound. Unnotched points could detach from their hafts easier and leave the entire point lodged within the wound to increase damage instead of pieces.

Factor Three: The repair of the points was minimal suggesting decisions of immediate disposal after the hunting was completed and revealing this to be a minor strategy in projectile technology. This factor comes from the fact that a larger portion of the local points had lateral edge retouch that show a change from one function to another. After these points were used in this function they would not perform well as part of a projectile and therefore would be useless the location these points are found supports immediate disposal at processing area. The other part of this factor is even with 139 points showing retouch, 693 complete points were recovered from the site. Some of these points may be just lost gear or even left in some sort of social or ritual behavior but the large number of complete points seem to show an effort was made to collect points after the hunt. If the idea was for the point was to break upon impact then the retrieval and repair of the points would not seem to be worth the cost. The amount of retouched points suggests in was a small part of the projectile strategy.

Factor Four: The type of communal hunting site the Sarpy Bison Kill is relies on the projectiles to conduct the majority of the animal haversting. Since the Sarpy Bison Kill consists of an arroyo that leads to a sandstone wall the projectile points play a major role in harvesting the bison. Other bison hunting traps such as the bison jumps of the Great Plains have a significant advantage in killing and/or immobilizing the prey. By pushing the herd over a cliff the impact of the fall either kills the bison instantly or breaks enough bones that leave the animal unable to escape (Frison 1970, 1978, 1991, 2004; Kornfeld et al. 2010; Verbicky-Todd 1984). Since the

occupants of the Sarpy Bison Kill did not have this advantage in dispatching their bison herds the projectiles had to bring down the animals efficiently and quickly before the herd broke free and the hunters lost control. Prehistoric weaponry relied on bleeding (Christenson 1986; Hughes 1998; Bleed 1986) to bring animals down and if experiments and ethnographic work (Ellis 1997; Flenniken and Raymond 1986; Odell and Cowan 1986; Titmus and Woods 1986; Towner and Warburton 1990; Van Buren 1974; Zeanah and Elston 2001) are reliable then the damage could be increased by leaving either the whole point or fragments within the wound improving the points lethality.

These factors noted within the analysis have shown that the technological organization of the projectiles from the site was created to perform optimally in lethality increasing the efficiency for executing the trapped bison herd. Knowing that to increase lethality the Sarpy Bison Kill hunters decided to procure material locally and of sufficient quality to ease the effects of transporting and manufacture. The points were designed to perform well for basic projectile properties (Christenson 1986; Hughes 1998) along with the aspects to increase lethality in bringing down prey (Ellis 1997; Flenniken 1985; Flenniken and Raymond, 1986; Odell and Cowan 1986; Titmus and Woods 1986; Towner and Warburton 1990; Van Buren 1974; Zeanah and Elston 2001). The repair and maintenance of the points was minimal due to the cost of increasing the lethality. What repair was conducted was to either make a point functional enough to perform as a projectile tip prior to the hunt or was used as a butchering tool and therefore making them useless after use causing immediate discard at the last position of use.

Future Research.

This analysis conducted at the Sarpy Bison Kill site on the projectile technology can significantly improved our understanding of communal hunting strategies and associated technology. The first area in which this study can improve our understanding in Great Plains

archeology is to compare the results of this analysis to other communal hunting systems within the region. By comparing the points of each communal hunting system we can understand if the decision and strategies at the Sarpy Bison Kill site were similar or different at other hunt sites. By understanding the similarities and differences within the points, researchers may be able to understand how the overall configuration of the site can affect technology and how it is organized.

This research can also help researchers see change over time in both technological organization and hunting strategy. Many researchers have pointed out that during the Late Plains Archaic period the points vary significantly in some areas from the type sites for the time period (Clark and Wilson 1981; Frison 1970; Keyser 1979: 9; Munson 1992, 2007; Peck 2011). By comparing points from communal hunting sites throughout Late Plains Archaic and even a little into the time periods prior to and after will allow researchers to understand what aspects are causing the variation in the points and why.

Late Archaic Native Americans clearly understood the dynamics of bison hunting at the Sarpy Bison Kill site in southeastern Montana. They prepared in advance of the hunting, transporting a portion of the projectile points to the kill site from great distances. However, understanding the intensity of the kill, the bulk of the projectile point manufacture was conducted at or near the site in order to complete their kill and butchery activites. They manufactured projectile points to a formal standard with a very small group of points deviating from this template. When they made those local points, they clearly preferred the ubiquitous porcellanite material to produce projectile points. This thesis has looked at a plethora of data to examine the life histories of projectile points at the Sarpy Bison Kill site. Future research will be able to utilize the data from the site to compare the lithic technological organization of Late

Archaic Native Americans at the site with people that came before and after, as well as those that lived in different regions.

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Appendix

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	Material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
6S59W1	Porcellanite	complete	63	56.7	27.7	14.8	14.7	7.7	11.23	150	100	1	straight	shoulder	3	0.09	7.36
6S59W2	Porcellanite	proximal	40		25.8	14.9	18.2	6.4	6.78	160	110	1	straight	shoulder			
6S59W3	Porcellanite	complete	31.1	24.1	23.8	12.6	16.1	5.9	4.27	165	120	0	straight	shoulder	2	0.66	4.08
6S59W4	Porcellanite	proximal	28.9		22.2	22.2	22.2	5.8	3.83			0	straight	unshouldered			
6S59W5	Porcellanite	proximal	25.7		18.5	9.7	12	3.9	2.05	160	105	0	convex	shoulder			
6S59W6	Porcellanite	midsection	33.2		24.7			6.4	6.04			1	unable	unable			
6S59W7	Porcellanite	midsection	18.6		23			4.9	1.85			0	unable	unable			
4S59W1	Porcellanite	Distal	46.8	36.7	22.8	14.7		5.5	5.65	155	110	0	convex	shoulder		0.03	6.67
4S59W2	Porcellanite	midsection	38		26.1	14.1		5.6	6.56	150	110	0	straight	shoulder			
4S59W3	Porcellanite	midsection	29.1		25.9	16.2		5.2	4.54	150	105	0	convex	shoulder			
4S59W4	Porcellanite	midsection	25.3		25.1	14.2		5.7	4.03			0	straight	shoulder			
4S59W5	Porcellanite	complete	28.2	20.1	19.3	15	18	4.6	2.56	165	135	1	convex	shoulder	1	0.69	4.37
4S59W6	Porcellanite	midsection	20.6		20.1			5.5	2.19			0	unable	unable			
4S59W7	Porcellanite	Distal	17.9		20.2			4.9	1.46			0	unable	unable			
2S59W1	Porcellanite	Distal	33		27.3	15.1		5.7	4.96			2	unable	shoulder			
2S59W2	Porcellanite	Distal	34.6		25.7			5.2	4.55			0	unable	unable			
2S59W3	Porcellanite	fragment	29.2		20.2			5.4	3.98	160	125	0	straight	shoulder			
2S59W4	Porcellanite	Distal	28.8		19			5.9	3.27			0	unable	shoulder			
2S59W5	Porcellanite	proximal	25.3		22.6	15.9	16.6	5.8	2.89	180	105	3	straight	shoulder			
0059W1	Porcellanite	Distal	51.6	51.7	28.9			6.4	9.36			0	unable	shoulder		0.09	8.08
0059W2	Porcellanite	proximal	30.9		25.4	14.1	16.9	5	4.8	165	120	1	straight	shoulder			
0059W3	Porcellanite	proximal	29.6		26.2	14.6	18.3	5.2	4.84	155	115	1	convex	shoulder			
0059W5	Porcellanite	midsection	18.5		28.4			5.4	3.8			0	unable	unable			
6S57W1	Porcellanite	complete	44.3	37.7	26.4	15.9	20.1	5.9	5.71	165	125	0	straight	shoulder	3	0	6.39
6S57W2	Porcellanite	Distal	44.6	36.8	27.2	17.8		5.9	6.62	165	110	1	unable	shoulder		0.06	6.24
6S57W3	Porcellanite	proximal	29.6		24.5	14.4	16.7	5.3	5.1	155	110	1	straight	shoulder			
6S57W4	Porcellanite	midsection	22.2		27			5.7	4.14			0	unable	unable			
4S57W1	Porcellanite	Distal	40.4	40.2	22.9			6	5.44			0	unable	shoulder		0.13	6.7
4S57W3	Porcellanite	midsection	34.1		23.1			4.4	4.12			0	unable	unable			
4S57W4	Porcellanite	Distal	27.5		23.3			5.6	3.89			0	unable	unable			
4S57W5	Porcellanite	midsection	25.1		25.8	16.3		5.3	3.79			1	unable	shoulder			
4S57W6	Porcellanite	midsection	17.2		23.5			4.4	2.16			1	unable	unable			
2S57W3	Porcellanite	complete	30.6	22	24.1	14.1	17	5.9	3.4	160	110	0	convex	shoulder	2	0.97	3.73

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
2S57W4	porcellanite	midsection	38		24.7	14.4		6	5.84			0	unable	shoulder			
0057W1	porcellanite	proximal	35.6		22.9	12.9	17.9	5.8	5	160	125	0	convex	shoulder			
0057W2	porcellanite	distal	13		22			5	1.58			0	unable	unable			
2N57W1	porcellanite	distal	37.9		24.2			4.3	3.76			2	unable	shoulder			
2N57W2	porcellanite	proximal	29.2		25.5	15.9	17.7	5.5	4.76	165	120	0	straight	shoulder			
2N57W3	porcellanite	proximal	28		23.7	14.7	18.5	5.5	4.25	165	120	0	straight	shoulder			
2N57W5	porcellanite	distal	23.3		17.6			4	1.63			0	unable	unable			
2N57W6	porcellanite	midsection	18.5		31.3	18.1		5.9	4.34			0	unable	shoulder			
4N57W2	porcellanite	proximal	36.4		25.3	14.7	16.3	5.7	5.82	130	90	1	straight	shoulder			
4N57W3	porcellanite	proximal	23.7		23.4	12.9	14.5	5	2.52	150	110	0	convex	shoulder			
8N57W1	porcellanite	complete	41.5	32.1	28	14.6	17.6	4.2	5.25	165	100	2	straight	shoulder	3	0	7.64
8N57W2	porcellanite	proximal	38		22	15.2	15.4	6.2	4.99			2	convex	shoulder			
8N57W4	porcellanite	midsection	28.5		20.8			5.4	3.94			0	unable	unable			
10N57W1	porcellanite	complete	56.7	59.3	27.9	15.2	17.6	6	8.79	140	100	1	straight	shoulder	3	0.16	9.88
10N57W2	porcellanite	complete	41.3	33.5	26.9	15.2	19.2	5.3	5.91	150	115	0	straight	shoulder	3	0.06	6.32
10N57W4	porcellanite	complete	30.2	21.4	20.2	14.7	17.7	5.6	3.45	205	100	0	straight	shoulder	3	0.09	3.82
10N57W5	porcellanite	proximal	24.8		26.3	13.6	15.5	5.1	3.19	140	100	1	straight	shoulder			
10N57W6	porcellanite	midsection	23.4		23			4.9	3.04			0	unable	unable			
10N57W7	porcellanite	midsection	15.2		27.3			5.8	2.75			0	unable	unable			
12N57W1	porcellanite	complete	27.3	22	21.1	14.9	17.3	4.5	1.94	160	110	0	straight	shoulder	1	0.63	4.89
4S55W1	porcellanite	complete	55	47	27.9	16.1	18.8	5.7	8.79	155	125	2	straight	shoulder	3	0.09	8.25
4S55W2	porcellanite	distal	51.5	45	25.3	14.8		6.3	7.75	155	115	0	unable	shoulder		0.06	7.14
4S55W3	porcellanite	complete	46.2	40.3	29	16.6	19.3	6	8.08	155	110	0	convex	shoulder	3	0.09	6.72
4S55W5	porcellanite	proximal	31.8		27	15.3	14.6	5.4	4.6			0	convex	shoulder			
4S55W6	porcellanite	proximal	29.1		20.5	13.6	15.4	4.7	3	160	115	0	convex	shoulder			
4S55W8	porcellanite	proximal	24.7		16.4	13.5	16.4	4.7	2.21			1	concave	shoulder			
4S55W9	porcellanite	midsection	25.6		19.4			5.8	3.47			0	unable	unable			
4S55W10	porcellanite	fragment	24.9		12.9			5.2	2.26			0	unable	shoulder			
4S55W11	porcellanite	distal	21.9		19.7			4.1	1.57			2	unable	unable			
2S55W1	porcellanite	complete	31.5	23.1	26.6	16.3	19.4	5.5	4.32	150	110	0	convex	shoulder	2	0.78	4.2
2S55W3	porcellanite	midsection	24.6		23.4			5	2.68			0	unable	unable			
2S55W4	porcellanite	midsection	14.5		22.3			4.1	1.41			1	unable	unable			
0055W3	porcellanite	distal	36.5	36.6	6.4			4.7	4.54			1	unable	shoulder		0.22	7.79

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
0055W4	porcellanite	distal	29.6		22.2			4.5	2.56			2	unable	unable			
2N55W2	porcellanite	complete	39.7	31	21.1	13.7	16.6	4.8	4.11	165	110	1	straight	shoulder	3	0.09	6.46
2N55W3	porcellanite	complete	36.1	27.7	25.2	14.8	17.4	6.3	5.37	160	105	0	straight	shoulder	3	0.19	4.4
2N55W4	porcellanite	proximal	39.7		25.4	12.2	13.8	6.2	5.5	150	130	0	straight	shoulder			
2N55W8	porcellanite	complete	25.1	17.7	21.3	16.7	21.1	4.5	2.52	230	120	0	straight	shoulder	1	0.78	3.93
2N55W9	porcellanite	midsection	33.5		30.9			6.6	8.16			1	unable	shoulder			
2N55W10	porcellanite	midsection	25.4		28.3			4.9	4.34			0	unable	unable			
2N55W12	porcellanite	midsection	30.7		18.6			5.4	4.15			0	unable	shoulder			
4N55W1	porcellanite	distal	48.8	40.7	23.4			6.9	6.76	155	110	0	convex	shoulder		0.06	5.9
4N55W3	porcellanite	proximal	36.6		18.8	11	16.6	5.8	3.75	175	125	0	convex	shoulder			
4N55W4	porcellanite	proximal	52.4		25.6	12.8	17	6	9.24	155	120	0	convex	shoulder			
4N55W5	porcellanite	midsection	19.5		16.8			4.9	1.75			0	unable	unable			
6N55W2	porcellanite	proximal	21		25.1	14.7	18.8	4.9	2.35	180	120	1	straight	shoulder			
6N55W3	porcellanite	distal	31.3	23.8	22.5	14.8		4.8	3.37			0	straight	shoulder		0.13	4.96
8N55W1	porcellanite	distal	59.7	51.2	29.6	15.2		6.5	10.53			0	straight	shoulder		0	7.88
8N55W2	porcellanite	proximal	45.4		28.6	16.4	19.6	5.4	7.05	150	120	0	straight	shoulder			
8N55W3	porcellanite	complete	37.9	30.5	25.6	14.5	16.6	6.6	5.16	150	100	0	convex	shoulder	3	0.09	4.62
8N55W5	porcellanite	proximal	19.7		22.3	13.5	16.8	5.4	2.34	170	115	1	straight	shoulder			
8N55W6	porcellanite	midsection	29		26.8			5.6	4.79			0	unable	shoulder			
8N55W7	porcellanite	lateral edge	23.8		12.4			6.2	2.11			0	unable	shoulder			
8N55W8	porcellanite	distal	21.6		20.4			7.5	1.33			0	unable	unable			
10N55W2	porcellanite	complete	35.3	27.2	23.3	12.6	15.9	6.2	4.96	165	105	0	straight	shoulder	2	0.56	4.39
10N55W3	porcellanite	midsection	33.5		16.2			5.9	3.27			0	convex	shoulder			
12N55W2	porcellanite	distal	19.5		18.5	12.5		4.6	1.95			0	unable	shoulder			
12N55W3	porcellanite	distal	23.9		18.6			2.8	1.46			2	unable	unable			
12N55W4	porcellanite	distal	17.1		15.1			2.8	0.73			2	unable	unable			
6S53W1	porcellanite	complete	34.4	34.3	18.5	18.5	18.5	4.1	2.65			2	straight	unshouldered	3	0.16	8.37
6S53W2	porcellanite	proximal	32.5		27.2	18.9	23.8	6.4	6.65	195	110	1	convex	shoulder			
6S53W3	porcellanite	proximal	31.3		22.7	14		5.6	4.39	160	110	0	convex	shoulder			
6S53W4	porcellanite	distal	35		24.7			5.5	5.27			1	unable	shoulder			
6S53W6	porcellanite	midsection	24.3		25.5			3.5	2.98			0	unable	shoulder			
4S53W2	porcellanite	complete	37.6	38.9	23.7	12.8	14.9	5.3	4.55	160	105	0	straight	shoulder	3	0.06	7.34
4S53W3	porcellanite	complete	32.4	26.5	24.2	17.4	21	5.5	3.97	190	125	0	concave	shoulder	1	0.41	4.82

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4S53W4	porcellanite	proximal	27.6		26.1	16.1	21.1	6.5	4.74	180	120	0	straight	shoulder			
4S53W6	porcellanite	distal	40.7	37.3	22.8	14.6		5.8	5.08			0	unable	shoulder		0.09	6.43
2S53W1	porcellanite	complete	40.6	31.5	23.7	12.2	16.4	7.1	7.11	170	105	0	straight	shoulder	3	0.13	4.44
2S53W2	porcellanite	complete	34.5	27.3	17.6	10.3	14.2	4.8	2.73	180	110	2	straight	shoulder	3	0	5.69
2S53W3	porcellanite	distal	46.3	40	26.9	15.7		5.6	5.93			0	unable	shoulder		0.09	7.14
2S53W4	porcellanite	midsection	34.9		27.4	16.5		6.5	6	150	115	0	unable	shoulder			
2S53W5	porcellanite	distal	37.3		22.5			4.5	3.69			1	unable	shoulder			
2S53W6	porcellanite	distal	27.1		23.7			4.9	3.36			0	unable	unable			
0053W1	porcellanite	distal	44.3	40	24.8			6	5.99			1	unable	shoulder		0.03	6.67
0053W5	porcellanite	midsection	21.1		21.8			5.2	2.73			0	unable	shoulder			
2N53W3	porcellanite	complete	44.4	34.6	25.8	16.6	19.6	4.6	5.29	155	105	2	straight	shoulder	3	0.06	7.52
2N53W4	porcellanite	complete	42.3	34.5	26.1	15.3	18.8	5.6	6.22	155	120	1	concave	shoulder	3	0.13	6.16
2N53W5	porcellanite	proximal	35.4		25.7	15.4	19.9	5.6	5.78	150	110	0	straight	shoulder			
2N53W7	porcellanite	distal	52	43.8	26.8	15.3		6.7	8.69	160	115	0	straight	shoulder		0.13	6.54
2N53W9	porcellanite	proximal	14.8		19.1	12.9	15.1	4.7	1.48			0	convex	shoulder			
4N53W4	porcellanite	proximal	29.4		26	15.2	18.1	5.1	4.55	145	120	0	convex	shoulder			
4N53W5	porcellanite	proximal	31.2		19.4	11.6	15.6	5.4	3.04	160	110	0	convex	shoulder			
4N53W6	porcellanite	distal	37.4		24.8			6.3	5.47			0	unable	unable			
4N53W8	porcellanite	distal	28		19.4			5	2.01			0	unable	unable			
4N53W9	porcellanite	distal	20.4		21.2			4.4	2.1			0	unable	unable			
4N53W10	porcellanite	distal	24		18.8			4.6	1.87			0	unable	unable			
6N53W1	porcellanite	complete	47.2	40.5	24.4	13.1	17.1	6.2	6.8	165	120	1	straight	shoulder	3	0	6.53
6N53W2	porcellanite	proximal	36.4		28.7	15.3	19.5	5.8	7.12	155	120	0	straight	shoulder			
6N53W3	porcellanite	midsection	36.5		29.1			6.8	7.5			0	unable	shoulder			
6N53W4	porcellanite	complete	33.6	25.5	24.9	12.7	15.9	5.1	3.8	160	125	1	straight	shoulder	1	0.53	5
6N53W6	porcellanite	proximal	24.9		21.9	11.7	13.5	5.7	3.22	155	105	0	convex	shoulder			
6N53W7	porcellanite	lateral edge	35.1		16.3			6.1	4.14			0	unable	shoulder			
8N53W1	porcellanite	complete	50.6	41.7	26	13.8	18.8	5.4	6.66	160	110	0	convex	shoulder	3	0.06	7.72
8N53W2	porcellanite	proximal	42.6		20.4	14	17	4.3	4.75	160	110	4	straight	shoulder			
8N53W4	porcellanite	complete	24.8	17.9	20.8	14.6	18.6	4.8	2.52	165	120	0	convex	shoulder	1	0.59	3.73
8N53W5	porcellanite	proximal	22.7		23.2	13.2	19.1	6.2	3.73	160	115	1	convex	shoulder			
8N53W6	porcellanite	proximal	19.6		20.3			6.7	2.97			0	straight	shoulder			
8N53W7	porcellanite	distal	24.5	23.7	19.8			5	2.52			0	unable	unable		0.38	4.74

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
10N53W1	porcellanite	proximal	48.8		28.3	15.8	20.7	5.6	8.28	160	115	0	convex	shoulder			
10N53W2	porcellanite	complete	42.8	35.6	23.3	12.6	14.9	5.5	5.38	165	120	1	convex	shoulder	3	0.06	6.47
10N53W3	porcellanite	complete	42.1	35.8	23.8	14	16	4.5	4.46	165	115	0	straight	shoulder	3	0.03	7.96
10N53W4	porcellanite	complete	27.9	20.5	22.8	12.9	16.3	5.1	3.26	170	110	0	straight	shoulder	2	0.72	4.02
10N53W5	porcellanite	distal	22.7		22.6			3.9	1.69			2	unable	unable			
12N53W1	porcellanite	complete	44.9	36.9	26.7	15.4	18.2	5.9	6.2	165	115	0	straight	shoulder	3	0.06	6.25
12N53W2	porcellanite	proximal	41.2		26.4	14.1	17.9	5.9	6.36	150	115	1	convex	shoulder			
12N53W4	porcellanite	proximal	16.8		26.2	17.9	16.4	4.7	2.74			1	straight	shoulder			
6S51W 2	porcellanite	proximal	18.7		22.7	14.5	17.8	6	2.84	175	135	0	convex	shoulder			
6S51W 3	porcellanite	lateral edge	20.7		18.9			4.3	1.67			0	straight	shoulder			
6S51W 4	porcellanite	midsection	30.1		26.4	14.6		5.3	5.01			0	unable	shoulder			
4S51W1	porcellanite	complete	45.1	45	24.3	24.3	24.3	5.8	6.13			0	straight	unshouldered	3	0.06	7.76
4S51W2	porcellanite	midsection	44.3		27.3			5.5	7.51			0	unable	shoulder			
4S51W3	porcellanite	distal	40.8	34.3	25.4			5.5	5.59			0	unable	shoulder		0	6.24
4S51W4	porcellanite	proximal	27.7		24.1	12.3	16.5	6.7	4.32	165	120	0	straight	shoulder			
4S51W5	porcellanite	proximal	31.2		31.5	15.5		6.7	6.86			0	straight	shoulder			
4S51W7	porcellanite	distal	30.2		24.3			5.3	4.21			0	unable	unable			
4S51W10	porcellanite	proximal	22.3		25.9	16.4	18.6	5.1	2.32			0	straight	shoulder			
4S51W11	porcellanite	proximal	26.6		16.9		16.9	5.1	1.93			0	concave	shoulder			
4S51W12	porcellanite	prox lateral edge	26.8		17.7			5.1	2.6			0	straight	shoulder			
4S51W13	porcellanite	lateral edge	27.5		16.2			4.9	1.97			0	unable	shoulder			
4S51W14	porcellanite	distal	17		18.6			4.4	1.41			0	unable	unable			
4S51W15	porcellanite	distal	18.8		22			5.1	2.38			0	unable	unable			
2S51W1	porcellanite	complete	56.5	56.3	28	28	28	5.9	8.39			0	straight	unshouldered	3	0.09	9.54
2S51W2	porcellanite	complete	49.7	42.6	25.2	12.9	16.3	5.8	7.19	155	115	1	straight	shoulder	3	0	7.34
2S51W3	porcellanite	proximal	37.8		27.2	17.4	21.8	5.2	6.49	160	115	0	straight	shoulder			
2S51W4	porcellanite	proximal	32.9		24.5	13.8	15.4	5.5	4.31	150	115	0	straight	shoulder			
2S51W5	porcellanite	complete	35.5	28.5	21.8	15.3	17.3	4.9	3.52	170	115	0	straight	shoulder	3	0.03	5.82
2S51W6	porcellanite	proximal	26.8		23.5	15.5	16.6	4.5	3.41	160	110	2	convex	shoulder			
2S51W7	porcellanite	distal	28.8		23.1			4.3	3.25			1	unable	unable			
2S51W10	porcellanite	proximal	33.5		22.8	22.8	22.8	5.8	4.5			0	convex	unshouldered			
2S51W11	porcellanite	complete	35.9	35.9	25	25	25	6.5	6.4			1	convex	unshouldered	3	0.19	5.52
0051W2	porcellanite	complete	52.9	43.1	22.6	14.3	17.4	6.3	6.94	180	110	2	straight	shoulder	3	0.09	6.84

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
0051W3	porcellanite	complete	33.8	26.2	18.1	9.4	11.2	4.6	2.46	155	105	1	convex	shoulder	3	0.16	5.7
0051W5	porcellanite	complete	38.7	30.2	23.7	13.7	17.2	4.4	3.72	165	110	1	convex	shoulder	3	0.06	6.86
0051W7	porcellanite	complete	33.4	23.8	19.1	13.3	17.3	4.9	3.11	185	120	1	convex	shoulder	3	0.09	4.86
0051W8	porcellanite	complete	34.4	29.5	18.4	12	14.7	4.8	2.72	200	130	0	straight	shoulder	3	0.09	6.15
0051W9	porcellanite	proximal	32.9		22.5	13.3	15	5.4	4.36	160	100	0	straight	shoulder			
0051W10	porcellanite	distal	29.7		15			4.4	1.68			0	unable	unable			
0051W11	porcellanite	distal	31.6		23.1			6.1	4.56			0	unable	unable			
0051W12	porcellanite	prox lateral edge	36.3		25.3	15.7		6.9	7.35			0	straight	shoulder			
0051W13	porcellanite	proximal	18.2		23.4	12.9		4.9	2.22			0	convex	shoulder			
2N51W1	porcellanite	proximal	46.3		27	17.7	21.6	6.3	8.16	160	110	0	straight	shoulder			
2N51W3	porcellanite	complete	37	28.9	25	16	22.2	6.2	5.67	165	120	0	convex	shoulder	3	0.19	4.66
2N51W4	porcellanite	proximal	24.8		23.3	17.4	19.4	5.4	3.41	180	105	0	straight	shoulder			
2N51W5	porcellanite	proximal	28.7		21.3	21.3	21.3	4.6	2.93			0	convex	unshouldered			
2N51W6	porcellanite	complete	32.1	24.6	21	13.2	15.4	4.5	2.93	160	110	1	straight	shoulder	3	0.06	5.47
2N51W9	porcellanite	midsection	25.2		28.4			5.1	4.51			2	unable	unable			
2N51W11	porcellanite	distal	30.6		21.9			5.2	3.87			0	unable	unable			
2N51W12	porcellanite	distal	19.7		23.1			5.3	2.06			0	unable	unable			
4N51W1	porcellanite	complete	49.3	41.3	22.7	12.9	16.4	5.1	6.3	180	120	0	straight	shoulder	3	0.16	8.1
4N51W2	porcellanite	complete	41.6	34.3	26	14	18.6	6.9	6.67	155	120	0	concave	shoulder	3	0.16	4.97
4N51W3	porcellanite	complete	35.7	27.7	21.4	13.3	16.5	4.7	3.49	170	120	1	straight	shoulder	3	0	5.89
6N51W1	porcellanite	proximal	34.5		22.2	12.5	16	4.1	3.42	150	110	1	convex	shoulder			
6N51W2	porcellanite	proximal	28.9		27.9	16.5	19.9	6.3	5.36	155	120	0	straight	shoulder			
6N51W3	porcellanite	complete	28.3	21.1	23.8	15.4	19.1	4.8	3.03	150	115	0	straight	shoulder	2	0.81	4.4
6N51W5	porcellanite	proximal	30		24.1	17.5	17.8	6.2	4.83			0	straight	unable			
6N51W6	porcellanite	distal	33.7	33.9	23.1			3.8	2.69			1	unable	shoulder		0.25	8.92
6N51W7	porcellanite	midsection	25.7		23.8			5.4	3.61			0	unable	unable			
6N51W8	porcellanite	midsection	17		19.6			4.2	1.39			0	unable	unable			
6N51W9	porcellanite	midsection	13.2		18.8			3.5	1.37			1	unable	unable			
6N51W11	porcellanite	distal	20.8	20.3	21.2			4.5	2.05			0	unable	shoulder		0.06	4.51
6N51W12	porcellanite	distal	14.8		16.5			4.1	0.98			0	unable	unable			
6N51W13	porcellanite	distal	44.7		25.7	14.7		5.5	6.07			0	unable	shoulder			
8N51W2	porcellanite	complete	42.9	35.9	22.7	14.7	17.7	5.4	5.28	160	125	0	straight	shoulder	3	0.09	6.65
8N51W3	porcellanite	midsection	35.9		26.3	15.4		6.4	5.98			0	unable	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
8N51W4	porcellanite	lateral edge	21.5		22.5			4.8	2.87			0	unable	unable			
10N51W1	porcellanite	complete	65.9	57.5	21.4	13	18.3	6.1	9.66	165	110	0	straight	shoulder	3	0.13	9.43
10N51W2	porcellanite	complete	53.9	45.5	26.1	16.1	21.2	6.1	8.66	155	125	0	straight	shoulder	3	0.09	7.46
10N51W3	porcellanite	complete	29	22.2	23.4	14.6	16.4	5.6	3.88	160	120	0	straight	shoulder	3	0.19	3.96
10N51W4	porcellanite	proximal	28.6		23.3	13.1	17.1	4.6	3.3	160	125	0	convex	shoulder			
10N51W5	porcellanite	proximal	28.4		17.8	13.4	15.2	4	2.51	160	125	1	straight	shoulder			
10N51W6	porcellanite	distal	23.5		24.1			4.3	2.55			1	unable	unable			
10N51W7	porcellanite	distal	22.4		16.5			4.7	1.7			2	unable	unable			
12N51W1	porcellanite	complete	53.8	47	28.2	15.7	17.3	7.6	10.43	160	105	1	concave	shoulder	3	0.09	6.18
12N51W2	porcellanite	complete	40.1	33.5	24.4	14.7	16.6	4.9	4.97	150	120	2	straight	shoulder	3	0.06	6.84
12N51W3	porcellanite	proximal	32.9		23.7	15.7	16.9	6.3	4.86	150	105	0	straight	shoulder			
12N51W4	porcellanite	midsection	23		25.3			4.2	2.65			0	unable	unable			
21S49W1	porcellanite	complete	50.1	43.6	24.8	13	13.9	7.2	8.78	170	110	0	straight	shoulder	3	0.06	6.06
21S49W2	porcellanite	proximal	48.3		26.4	12.7	14.9	5.6	8.12	150	120	0	straight	shoulder			
21S49W3	porcellanite	proximal	45.6		23.1	13.6	18.2	5.1	6.38	165	125	2	convex	shoulder			
21S49W4	porcellanite	proximal	46.3		23.4	15.7	18.8	6.2	6.7	160	115	0	straight	shoulder			
21S49W5	porcellanite	proximal	38		28.2	15.4	19	5.5	5.49	140	115	1	convex	shoulder			
21S49W7	porcellanite	proximal	30.5		26.6	18.9	23.6	5.1	4.62	160	130	0	straight	shoulder			
21S49W8	porcellanite	complete	36.8	30	21.6	14.1	15	5.3	3.82	165	115	2	straight	shoulder	2	0.25	5.66
21S49W9	porcellanite	proximal	31.2		23.1	13.7	16.3	5	3.76	160	105	0	straight	shoulder			
21S49W10	porcellanite	proximal	21.3		23.5	15.2	18.7	5	2.61	160	115	0	straight	shoulder			
21S49W11	porcellanite	proximal	14.3		27	17.6	19.9	5.1	2.02			0	straight	shoulder			
21S49W12	porcellanite	midsection	30		25.6	12		6.4	5.23			0	straight	shoulder			
21S49W13	porcellanite	distal	29.6		23.8			5.7	4.38			0	unable	shoulder			
21S49W14	porcellanite	distal	19.2		23.4			4.7	1.97			0	unable	unable			
21S49W15	porcellanite	midsection	26.8		21.5			4.6	3.88			2	unable	unable			
21S49W16	porcellanite	distal	26.2		24			5.3	3.42			0	unable	unable			
21S49W18	porcellanite	lateral edge	23.3		15.1			5.5	1.5			0	unable	unable			
19S49W2	porcellanite	distal	36.6	36.5	25.7			5	4.84			0	unable	unable		0.5	7.3
19S49W3	porcellanite	lateral edge	27.1		21.3			6.2	2.93			0	unable	unable			
19S49W4	porcellanite	distal	25.5		24.2	15.1		4.9	2.85			0	unable	shoulder			
19S49W5	porcellanite	midsection	19.2		30.5			6	3.42			0	unable	shoulder			
17S49W1	porcellanite	complete	52.3	44.8	30.1	18.4	21.4	6.1	10.3	165	110	0	straight	shoulder	3	0	7.34

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
17S49W2	porcellanite	complete	44.3	37.7	22.5	13.1	15.8	4	3.87	155	110	1	concave	shoulder	3	0.16	9.43
17S49W3	porcellanite	complete	41.8	34.7	26.1	15.2	18.9	4.9	4.99	150	115	3	convex	shoulder	3	0.13	7.08
17S49W4	porcellanite	proximal	27.9		26.1	14.7	18.4	5.5	4.53	150	115	1	straight	shoulder			
17S49W6	porcellanite	distal	38.5	33.8	20.3	13.1		4.9	3.64			1	unable	shoulder		0.09	6.9
17S49W7	porcellanite	distal	25.2		19.7			5.4	2.15			1	unable	unable			
17S49W8	porcellanite	lateral edge	18.9		16.5			4.2	1.97			0	unable	unable			
17S49W9	porcellanite	proximal	15.4		22	22	22	3.5	1.53			0	unable	unshouldered			
17S49W10	porcellanite	midsection	17.8		18.2			4.1	1.53			0	unable	unable			
8S49W1	porcellanite	complete	40.7	40.7	23.5	23.5	23.5	4.9	5.1			3	convex	unshouldered	3	0.13	8.31
8S49W2	porcellanite	complete	40.4	32.5	19.8	12	14.8	5.5	4.07	180	120	1	straight	shoulder	3	0.03	5.91
8S49W3	porcellanite	distal	29.9		18			4.9	2.63			0	unable	unable			
8S49W6	porcellanite	complete	30.1	22.1	23.6	15.5	18.8	5.1	3.28	160	125	0	straight	shoulder	2	0.5	4.33
6S49W4	porcellanite	complete	29.4	23.5	22.1	14.2	17.6	4.8	2.88	180	130	0	straight	shoulder	1	0.63	4.9
6S49W5	porcellanite	complete	36.1	36	18.8	18.8	18.8	5.4	3.36			0	convex	unshouldered	3	0.13	6.67
6S49W6	porcellanite	distal	41.3	39.3	24.6	13.7		5.1	4.97			0	unable	shoulder		0.13	7.71
6S49W7	porcellanite	distal	19		19.8			4.7	1.79			0	unable	unable			
4S49W1	porcellanite	distal	50.5	50.2	25.4			5.5	6.77			1	unable	shoulder		0	9.13
4S49W2	porcellanite	distal	33.2	30	20.4	11.9		4.4	2.97			2	unable	shoulder		0.03	6.82
4S49W3	porcellanite	complete	34.3	28	19.6	14.1	15.2	4.5	3.26			0	convex	shoulder	3	0.19	6.22
4S49W4	porcellanite	lateral edge	27.6		17.9			5.2	2.76			0	unable	unable			
4S49W5	porcellanite	distal	19.5		20.2			4.4	1.53			0	unable	shoulder			
4S49W6	porcellanite	proximal	17.8		19.3		15.5	5.4	1.71			0	unable	unable			
2S49W1	porcellanite	complete	50.7	42	25.7	13.9	18.3	5.2	7.35	165	135	2	straight	shoulder	3	0.13	8.08
2S49W2	porcellanite	complete	34.3	26.9	22.2	15.4	18.1	5.5	3.93	180	115	1	concave	shoulder	3	0	4.89
2S49W3	porcellanite	proximal	36		25.2	13.4	16.4	5	4.69	150	115	0	convex	shoulder			
2S49W5	porcellanite	distal	31.3		21.7			5.6	3.59			0	unable	unable			
2S49W6	porcellanite	midsection	13.4		23.4			5.1	2.17			0	unable	shoulder			
0049W2	porcellanite	proximal	29.1		25.1	17	19.5	6.3	4.4	160	110	0	straight	shoulder			
0049W3	porcellanite	midsection	15.1		22.3	13.1		4.7	1.94			0	unable	shoulder			
0049W4	porcellanite	distal	18.6		16			4.4	1.2			1	unable	unable			
2N49W1	porcellanite	complete	50	42	25	16.4	20	6.6	8.71	155	115	0	straight	shoulder	3	0	6.36
2N49W2	porcellanite	distal	40	33.7	23.3	14		5.8	5.18			0	convex	shoulder		0.09	5.81
2N49W4	porcellanite	distal	46.7	37.7	25.8	14.5		4.6	6.14	145	115	0	straight	shoulder		0.13	8.2

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
2N49W5	porcellanite	complete	33.5	24.7	19.9	15	19.6	5.4	3.26	190	130	1	straight	shoulder	3	0.13	4.57
2N49W6	porcellanite	proximal	28.8		23.3	14.3	16.1	5.5	3.62	180	110	1	convex	shoulder			
2N49W9	porcellanite	midsection	18.7		22.6			4.2	2.01			0	unable	unable			
4N49W1	porcellanite	distal	50.9	44.4	27.2	14.2		5.8	7.24	165	115	0	convex	shoulder		0.06	7.66
4N49W2	porcellanite	complete	46	39.3	23.6	12.4	13.8	6.1	6.23	180	110	0	straight	shoulder	3	0.13	6.44
4N49W5	porcellanite	midsection	33.5		25.6	16.7		5.3	4.71			0	unable	shoulder			
4N49W6	porcellanite	distal	35.3	34	23.3	13.9		6.4	4.86			0	unable	shoulder		0.06	5.31
4N49W7	porcellanite	proximal	20.7		24.5	13.2	16.4	4.9	3.04	155	105	0	concave	shoulder			
4N49W9	porcellanite	distal	24.5		25.1			5.1	3.03			0	unable	unable			
6N49W2	porcellanite	complete	43	36	24.7	15.4	18.8	6.1	5.53	165	110	0	straight	shoulder	3	0	5.9
6N49W3	porcellanite	complete	38	30.3	25.7	13.5	18.5	5.6	5.13	160	120	0	convex	shoulder	3	0.03	5.41
6N49W4	porcellanite	distal	66.3	57.3	27.1	15		5.9	9.52			1	concave	unable		0	9.71
6N49W5	porcellanite	distal	42.2	34.1	24.7	14.8	16.1	5.6	5.67	160	110	0	straight	shoulder			6.09
6N49W6	porcellanite	complete	39.2	32.2	23.9	12.9	14	5.5	4.78	165	115	2	straight	shoulder	3	0.19	5.85
6N49W7	porcellanite	proximal	32.2		23.6	13.9	17	5.2	4.14	165	110	0	convex	shoulder			
6N49W8	porcellanite	proximal	30.4		25.7	15.7	19.7	6.3	5.66	180	115	0	straight	shoulder			
6N49W9	porcellanite	distal	34.2	25.7	26.2	14.6		5.1	4.12			0	straight	shoulder		0.13	5.04
6N49W10	porcellanite	distal	29		15.7			5	2.49			0	unable	shoulder			
6N49W11	porcellanite	distal	39.7		26.1			6.6	6.3			1	unable	unable			
6N49W12	porcellanite	midsection	12.9		22			5.2	1.54			1	unable	unable			
8N49W1	porcellanite	complete	38.6	31.5	22.7	13.2	15.6	5.9	4.65	150	110	0	convex	shoulder	3	0	5.34
8N49W2	porcellanite	proximal	32.3		20.8	14	17.1	5	3.58	180	110	2	straight	shoulder			
8N49W3	porcellanite	complete	28.2	22.3	21.1	13.8	16.4	5.3	2.75	155	115	0	straight	shoulder	2	0.31	4.21
8N49W4	porcellanite	distal	21		23.3			4.5	1.95			0	unable	unable			
8N49W5	porcellanite	lateral edge	25		22.6			5.7	3.6			2	unable	shoulder			
10N49W1	porcellanite	complete	55.7	47	32.4	15.5	17.7	7.2	10.5	160	105	2	straight	shoulder	3	0.06	6.53
10N49W2	porcellanite	complete	40.7	32.2	25.9	15.6	17.6	5.5	4.84	180	115	2	straight	shoulder	3	0.25	5.85
10N49W3	porcellanite	proximal	33		28.8	15.3	18.6	5.7	5.77	155	115	0	straight	shoulder			
10N49W4	porcellanite	midsection	41.2		27.8	16.8		6.9	8.1	160	120	0	unable	shoulder			
10N49W8	porcellanite	complete	27.5	20	21.5	11.3	13	5.5	2.63	180	115	0	straight	shoulder	3	0.13	3.64
10N49W9	porcellanite	distal	48.6		20.3			5.4	5.89			2	unable	unable			
12N49W1	porcellanite	complete	43.9	35.4	26.5	14.2	17.3	6.1	6.79	155	110	2	convex	shoulder	3	0.06	5.8
12N49W3	porcellanite	distal	23.9		15			3.7	1.27			0	unable	unable			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
12N49W4	porcellanite	distal	33.7	25.7	21.3	14	15.4	4.4	3.12			2	straight	shoulder		0.13	5.84
12N49W7	porcellanite	complete	54.2	46	24.1	16.4	18.6	5.3	6.25	180	115	0	straight	shoulder	3	0.13	8.68
19S48W1	porcellanite	distal	53.8	45.7	29			6.1	9.73			0	straight	shoulder		0.16	7.49
19S48W3	porcellanite	distal	39.7		26			4.5	4.71			0	unable	shoulder			
19S48W4	porcellanite	complete	28.1	20.5	19.8	12.9	15.7	5.4	2.68	155	120	0	straight	shoulder	3	0.06	3.8
17S48W1	porcellanite	complete	40.6	33.9	22.4	14.6	17.2	4.7	3.93	160	110	0	convex	shoulder	3	0.03	7.21
17S48W3	porcellanite	midsection	20		25.6			5.5	4.22			0	unable	shoulder			
17S48W4	porcellanite	midsection	27.1		25.6			5.7	4.38			0	unable	unable			
17S48W5	porcellanite	complete	29.1	29.4	17.3	17.3	17.3	4.7	2.4			2	convex	unshouldered	3	0.19	6.26
17S48W6	porcellanite	midsection	20.4		23.5			5.7	2.81			0	unable	unable			
17S48W8	porcellanite	lateral edge	28.1		23.7			5.1	3.2			0	unable	unable			
14S48W1	porcellanite	proximal	24.4		15.8	10.1	12.1	5.7	2.54			0	convex	unable			
14S48W2	porcellanite	proximal	21.7		26.1	18.3	21.5	5	3.11	160	125	0	convex	shoulder			
14S48W3	porcellanite	distal	30.7		25.9			5.4	3.72			0	unable	unable			
17S47W1	porcellanite	complete	41.3	32.9	23.9	11.4	14.4	6.2	5.25	145	95	0	straight	shoulder	3	0.09	5.31
17S47W3	porcellanite	proximal	20		23.6	16.3	18.8	4.6	2.57	150	110	2	straight	shoulder			
17S47W4	porcellanite	proximal	28.5		25.5	17	21.7	4.9	3.66			0	straight	shoulder			
17S47W6	porcellanite	distal	25.8		23.8			4.9	2.88			1	unable	unable			
17S47W7	porcellanite	midsection	42.4		28.3	17.3		5.9	7.76			1	convex	shoulder			
17S47W8	porcellanite	lateral edge	19.7		18.9			4.7	1.9			0	unable	unable			
16S47W1	porcellanite	midsection	32.3		25.8			6.2	5.46			0	concave	shoulder			
16S47W2	porcellanite	distal	34.8		21.2	13.4		4.1	2.79			2	convex	shoulder			
16S47W3	porcellanite	midsection	18.1		27.4	13.5		4.9	3.06			0	unable	shoulder			
13S47W1	porcellanite	complete	31.2	22.5	24.4	16.3	20.6	4.8	3.78	155	130	1	straight	shoulder	3	0.13	4.69
13S47W2	porcellanite	lateral edge	27.1		14.1			5.4	2.26			0	unable	unable			
13S47W3	porcellanite	complete	36.3	29	22.2	13.5	15.4	5.5	4.33	160	115	0	straight	shoulder	2	0.63	5.27
8S47W1	porcellanite	proximal	23.4		19.9	11	12.9	5	2.48	160	125	1	straight	shoulder			
8S47W2	porcellanite	distal	20.9		18.7			5.7	2.13			0	unable	unable			
6S47W1	porcellanite	complete	63.7	55.1	19.5	12.7	14.4	5.7	6.89	160	100	2	convex	shoulder	3	0	9.67
6S47W2	porcellanite	proximal	42.6		28.1	15.6	20.2	5.8	7.66	150	115	0	convex	shoulder			
6S47W3	porcellanite	distal	43.4	40	28.1	16		5.1	6.17			1	unable	shoulder		0	7.84
4S47W1	porcellanite	complete	48.1	39	26.6	14.8	18.8	6	7.7	155	115	0	straight	shoulder	3	0.03	6.5
4S47W3	porcellanite	complete	48.9	41.7	24.7	14	15.5	5.7	7.27	140	100	1	convex	shoulder	3	0.03	7.32

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4S47W4	porcellanite	distal	45.1	40.3	23.4	13.6		6.9	7.61			1	unable	shoulder		0	5.84
4S47W5	porcellanite	distal	43.8	38.3	23.9	14.4		5.4	6.15			1	unable	shoulder		0.06	7.09
4S47W6	porcellanite	proximal	31.8		25.3	16.2	19.4	5.8	5.2	150	130	0	convex	shoulder			
4S47W7	porcellanite	complete	25.7	16.1	20.4	15.4	20.4	5.1	2.67	180	115	0	concave	shoulder	3	0.19	3.16
4S47W8	porcellanite	complete	29	20.5	18.9	14.2	16.3	5.1	2.59	170	125	0	straight	shoulder	3	0.16	4.02
4S47W9	porcellanite	complete	25	15.3	23.4	14	17.3	5.8	3.4	155	110	0	convex	shoulder	2	0.72	2.64
4S47W10	porcellanite	midsection	34.8		26			5.8	6.55			0	unable	shoulder			
2S47W1	porcellanite	complete	46.5	38.4	26.2	15.8	18	6.4	7.06	150	110	2	straight	shoulder	3	0.06	6
2S47W2	porcellanite	complete	42.5	34.3	25	15.9	19.2	5.6	5.97	180	120	0	straight	shoulder	3	0.06	6.13
2S47W4	porcellanite	complete	38.1	30	25.1	20.5	25.2	4.4	4.1	180	105	2	convex	shoulder	3	0	6.82
2S47W5	porcellanite	complete	32.1	25.7	20.4	11.6	12.7	4.6	3.29	180	125	1	straight	shoulder	3	0.03	5.59
2S47W8	porcellanite	distal	27.2		18.3			4.9	2.21			0	unable	unable			
2S47W9	porcellanite	midsection	28.4		25	13.5		4.7	4.39			0	unable	shoulder			
2S47W10	porcellanite	midsection	22.4		21			4.9	2.81			0	unable	shoulder			
2S47W11	porcellanite	distal	41.7	40	20.2			4.8	3.64			0	unable	unable		0	8.33
0047W1	porcellanite	proximal	58.5		28.2	15.6	20.5	6.7	10.37	165	120	0	straight	shoulder			
0047W2	porcellanite	proximal	27.1		24.3	14.7	17.6	6	4.73	165	125	1	straight	shoulder			
0047W3	porcellanite	midsection	32.4		25.4			5.3	5.01			0	unable	shoulder			
0047W4	porcellanite	distal	34.2		26.3			6.2	4.83			0	unable	unable			
0047W6	porcellanite	midsection	23.2		20.9			4.5	2.27			1	unable	unable			
0047W7	porcellanite	proximal	15.2		24.5	15.7	18.7	4.6	2.06			0	straight	shoulder			
0047W8	porcellanite	midsection	19.3		25.2			5.5	3.01			1	unable	unable			
2N47W3	porcellanite	complete	39.4	30.1	24.3	15.6	20.2	6.2	6	155	120	0	convex	shoulder	3	0	4.85
2N47W7	porcellanite	complete	29.8	20.6	22.4	16	18.9	5.4	3.74	180	130	1	convex	shoulder	1	0.5	3.81
2N47W8	porcellanite	proximal	26.8		21.2	15.1	17.3	6.1	2.77	180	120	0	convex	shoulder			
2N47W10	porcellanite	distal	30.2		22.3			5.2	2.88			0	unable	unable			
2N47W11	porcellanite	distal	30.9		18.9			4.7	2.36			0	unable	unable			
2N47W12	porcellanite	lateral edge	17.7		15.5			3.8	1.37			0	unable	shoulder			
4N47W1	porcellanite	midsection	45.4		24.9	14.1		6.3	7.83			1	unable	shoulder			
4N47W2	porcellanite	complete	43	33.2	25.3	17.1	21.1	5.4	5.78	140	120	0	convex	shoulder	3	0.09	6.15
4N47W3	porcellanite	proximal	31.6		25.4	16.5	20.4	5.9	4.75	160	125	0	convex	shoulder			
4N47W5	porcellanite	lateral edge	19.9		17.6			4.6	1.18			0	unable	unable			
4N47W6	porcellanite	distal	37.5		25.1			5.1	6.02			1	unable	unable			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
6N47W1	porcellanite	proximal	31.1		25.2	15.3	18.6	5.2	4.36	160	120	0	straight	shoulder			
6N47W2	porcellanite	complete	29.9	23.3	23.2	15.1	18.3	4.9	3.79	150	125	0	straight	shoulder	3	0.03	4.76
6N47W3	porcellanite	complete	32.8	25.2	23.3	15.2	18.1	5.4	3.58	180	130	0	convex	shoulder	1	0.38	4.67
6N47W4	porcellanite	proximal	25.4		21.7	11.2	14.8	5.5	3.15	180	130	0	convex	shoulder			
6N47W5	porcellanite	proximal	13		20.9	16	20.8	4.8	1.6			0	straight	shoulder			
6N47W6	porcellanite	midsection	27.8		26.1			5	4.52			0	unable	unable			
6N47W7	porcellanite	distal	33.5		23.8			5.4	4.01			0	unable	unable			
8N47W1	porcellanite	complete	50.9	40.7	26.7	16.5	20.8	6.4	8.97	150	110	1	straight	shoulder	3	0	6.36
8N47W2	porcellanite	distal	38.3		24.9	14.5		5.3	5.41	155	130	1	straight	shoulder			
8N47W3	porcellanite	proximal	32.5		19.1	11.1	14.1	4.7	3.29	160	115	0	straight	shoulder			
8N47W5	porcellanite	distal	27.3		21.1			5.9	3			0	unable	unable			
10N47W1	porcellanite	complete	40.3	33	23.5	14.8	15.9	4.8	4.82	160	120	0	concave	shoulder	3	0	6.88
12N47W2	porcellanite	complete	41.9	32.3	26.3	15.9	20	6.5	7.09	165	120	0	straight	shoulder	3	0.13	4.97
12N47W3	porcellanite	complete	39.8	30.6	24.4	15.5	17.2	6	5.33	180	110	0	convex	shoulder	3	0.03	5.1
12N47W5	porcellanite	midsection	32.8		38.8	19.9		6.5	10.85			0	unable	shoulder			
12N47W6	porcellanite	complete	32	24.2	21.8	12.4	16.2	4.9	3.48	145	120	1	straight	shoulder	3	0.06	4.94
12N47W7	porcellanite	distal	52.4	46	25.4	16.5		6	7.53			0	straight	shoulder		0.06	7.67
12N47W8	porcellanite	complete	31.2	24.5	20.2	11.3	13.4	5.3	3.16	155	110	1	convex	shoulder	3	0.03	4.62
12N47W9	porcellanite	proximal	27.6		19.1	13.9	17.3	5.3	3.34			0	convex	shoulder			
16S46W2	porcellanite	distal	47.7	45.4	24.2	14		4.9	5.14			0	unable	shoulder		0	9.27
16S46W3	porcellanite	distal	27.4		19.8			4.4	2.06			0	unable	unable			
15S46W1	porcellanite	distal	25.6		25			5.1	3.53			0	unable	unable			
15S46W2	porcellanite	proximal	36.3		23.3	13.7	16.1	6.3	5.67	155	100	0	straight	shoulder			
15S46W3	porcellanite	proximal	21.9		24.5	13.8	16.4	6.1	3.06	155	120	0	straight	shoulder			
15S46W5	porcellanite	lateral edge	16		18.9	13.3	16.8	5.3	1.49			0	convex	shoulder			
14S46W1	porcellanite	proximal	24.6		29.3	17.4	21.2	5	4.33	155	115	0	straight	shoulder			
14S46W3	porcellanite	midsection	16.5		21.8			4.7	1.8			0	unable	unable			
14S46W4	porcellanite	complete	38.7	30	22.8	15.7	18.2	6.3	5.29	165	115	0	convex	shoulder	3	0	4.76
14S46W5	porcellanite	complete	35.3	27.7	23.1	12.5	15	5.2	4.26	155	125	0	convex	shoulder	3	0.03	5.33
12S46W1	porcellanite	complete	44.9	35.3	24.2	16.1	21.8	5.6	5.55	165	140	0	convex	shoulder	3	0	6.3
12S46W2	porcellanite	distal	26.1		24.1			5	3.26			0	unable	unable			
15S45W2	porcellanite	complete	46.9	39	24.6	13.7	18.3	5.3	5.71	160	120	0	straight	shoulder	3	0.03	7.36
15S45W3	porcellanite	complete	41.7	33.8	23.3	14.8	16.5	5.4	4.63	160	115	0	convex	shoulder	3	0	6.26

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
15S45W4	porcellanite	proximal	17.7		21.3	13.8	15.2	3.5	1.69			2	straight	shoulder			
10S44W1	porcellanite	proximal	42		24.1	16.2	18.8	6.4	6.82	190	120	0	straight	shoulder			
10S44W2	porcellanite	prox lateral edge	31.7		22.6	14.2	19	6	5.52	180	120	1	straight	shoulder			
8S44W1	porcellanite	distal	59.8	53.7	28.4	15.1		6.5	10.4			0	unable	shoulder		0	8.26
8S44W2	porcellanite	complete	42.7	34.3	23.4	11.1	15.4	5.8	5.36	155	130	1	convex	shoulder	3	0.03	5.91
8S44W3	porcellanite	midsection	27.3		28.1	17.2		4.7	5.36			0	unable	shoulder			
6S44W1	porcellanite	distal	56.6	51.3	27.3	14.6		5.2	9.28			0	unable	shoulder		0	9.87
6S44W3	porcellanite	distal	46	39	25.4	14.2		6.2	7.5			0	unable	shoulder		0	6.29
6S44W4	porcellanite	complete	38.2	30	24.8	14	18.2	4.7	4.44	160	120	0	convex	shoulder	3	0.03	6.38
6S44W7	porcellanite	proximal	19.8		22.4	16.8	21.2	4.8	2.31	165	120	0	straight	shoulder			
6S44W8	porcellanite	proximal	16.8		25.5	15.2	18	4.1	1.94			1	convex	shoulder			
6S44W10	porcellanite	distal	18.6		18.6			4.3	1.09			0	unable	unable			
6S44W12	porcellanite	lateral edge	20.1		16.5			5.5	2.2			0	unable	shoulder			
4S44W2	porcellanite	distal	39.7	32.6	22.2	12.3		5.4	4.6	155	120	0	straight	shoulder		0.06	6.04
4S44W3	porcellanite	complete	41.9	30.5	19.8	14.7	19.8	5	4.35	165	120	0	convex	shoulder	3	0.25	6.1
4S44W5	porcellanite	complete	39.1	30.7	24.8	17.8	18.8	5.5	5.57	160	125	0	straight	shoulder	3	0	5.58
4S44W7	porcellanite	proximal	21.1		23.7	15.5	19.4	5.4	3.05	150	125	0	straight	shoulder			
4S44W8	porcellanite	distal	27		23.7			5	3.37			0	unable	unable			
2S44W1	porcellanite	distal	24		24.4			4.7	2.06			2	unable	unable			
2S44W2	porcellanite	proximal	33.6		18.5	11	14.5	5	3.23	150	100	0	straight	shoulder			
8N44W1	porcellanite	proximal	38.4		24.2	14.9	17.8	5.2	6.25	160	135	0	straight	shoulder			
8N44W2	porcellanite	complete	38.1	30.4	24.5	16.6	18	4.4	5.08	180	110	0	convex	shoulder	3	0.03	6.91
8N44W3	porcellanite	midsection	36.9		20.7	13.8		6.4	5.34			0	unable	shoulder			
8N44W4	porcellanite	complete	26.7	36.3	21.1	21.1	21.1	3.8	2.58			1	straight	unshouldered	3	0	9.55
8N44W5	porcellanite	proximal	27		19.4	12	15	5.7	3.14	180	115	0	straight	shoulder			
8N44W6	porcellanite	distal	24.3		22.6			4.8	2.71			0	unable	unable			
10N44W1	porcellanite	proximal	33.3		29.5	16.1	19.7	6.3	6.89	155	120	0	straight	shoulder			
12N44W2	porcellanite	complete	45	36	25.6	16.6	20.4	6.6	6.76	155	115	0	straight	shoulder	3	0.06	5.45
12N44W3	porcellanite	complete	43	38.6	24.4	13.7	15	6.4	6.59	165	110	0	straight	shoulder	3	0.03	6.03
12N44W4	porcellanite	midsection	17.8		24.8			4.8	2.7			0	unable	shoulder			
4S42W1	porcellanite	distal	48.1	39.8	24.7	15.2		6	7.6	140	100	0	convex	shoulder		0	6.63
2S42W1	porcellanite	proximal	45.2		24.9	17.7		6.2	6.81			0	straight	shoulder			
2S42W2	porcellanite	distal	44.3	43.8	25.6			4.9	5.5			0	unable	unable		0	8.94

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
2S42W3	porcellanite	distal	41.1	34.7	27.5	17.5		5.1	5.75	160	120	0	unable	shoulder		0.03	6.8
2S42W4	porcellanite	distal	36.5	36.7	25.6			5.8	4.94			0	unable	shoulder		0.06	6.33
2S42W5	porcellanite	midsection	29.3		26.5	16.5		5.4	5.42	165	110	0	unable	shoulder			
2S42W7	porcellanite	proximal	23.9		28.5	16.4	18.9	5.4	4.22	155	120	1	straight	shoulder			
2S42W8	porcellanite	complete	29	22.6	24.5	12.8	14.8	5.6	3.51	145	110	0	straight	shoulder	2	0.94	4.04
2S42W9	porcellanite	proximal	33.5		24.5	24.5	24.5	6.8	5.25			1	convex	unshouldered			
2S42W10	porcellanite	prox lateral edge	35.6		21.2		18.1	5.3	4.26	145	120	2	straight	shoulder			
2S42W11	porcellanite	proximal	35.7		21.2	12.3	16.1	4.9	3.93	150	125	1	convex	shoulder			
2S42W12	porcellanite	complete	42.1	34	21.3	11.8	14.9	5.6	4.7	180	110	0	convex	shoulder	3	0.03	6.07
2S42W13	porcellanite	complete	40.1	30.1	16.3	10.9	13.6	3.1	2.36	195	125	2	convex	shoulder	3	0	9.71
2S42W14	porcellanite	midsection	16.6		29.1			5.2	3.37			1	unable	unable			
0042W1	porcellanite	proximal	45.1		27.3	17.9	21.8	5.2	8.09	180	115	0	straight	shoulder			
0042W2	porcellanite	complete	42.8	35.2	23.5	13.3	15.9	5.3	5.36	165	120	0	convex	shoulder	3	0	6.64
2N42W1	porcellanite	complete	41.6	32.5	24.4	15	18.2	5.8	6	165	115	2	convex	shoulder	3	0.19	5.6
4N42W1	porcellanite	distal	60.1	53.5	25.7	18.1		5.3	8.7			0	unable	shoulder		0	10.1
4N42W2	porcellanite	proximal	33.2		29.8	17.7	22.2	6.2	6.14	155	120	0	concave	shoulder			
4N42W4	porcellanite	complete	42.1	41.7	24.2	24.2	24.2	6.4	6.5			0	convex	unshouldered	3	0	6.52
4N42W5	porcellanite	midsection	24.4		23.2			5	3.42			1	unable	unable			
4N42W6	porcellanite	midsection	24.6		23.9			4.6	3.92			0	unable	unable			
4N42W7	porcellanite	distal	19.3		19.1			4.6	1.36			0	unable	unable			
6N42W1	porcellanite	complete	38.5	30	22.5	13.5	17.8	4.6	3.96	150	115	0	convex	shoulder	3	0.06	6.52
6N42W2	porcellanite	proximal	34		26	13.7	17.9	5.3	4.66	150	110	3	convex	shoulder			
6N42W3	porcellanite	midsection	36.3		23.7			6.2	6.08			0	unable	shoulder			
8N42W3	porcellanite	proximal	28		23.4	12.8	13.8	6	4.42	155	125	0	convex	shoulder			
8N42W5	porcellanite	proximal	25.7		18.6	10.4	12.5	4.9	2.82	140	120	0	convex	shoulder			
8N42W6	porcellanite	midsection	17.1		23.5			4.1	1.74			0	unable	unshouldered			
10N42W1	porcellanite	complete	56.7	50.2	27.9	17.1	18.6	6	8.1	160	120	0	straight	shoulder	3	0	8.37
10N42W3	porcellanite	complete	34.1	23.1	24.9	16.3	20.2	5.8	4.09	180	120	0	convex	shoulder	2	0.63	3.98
10N42W4	porcellanite	proximal	30.7		28	14.9	18.7	5.4	6.05	160	110	1	straight	shoulder			
10N42W5	porcellanite	complete	34.1	25.2	20.9	13.9	18.2	4.8	3.22	165	100	2	convex	shoulder	3	0.03	5.25
10N42W8	porcellanite	distal	34.1		22.6			5.6	4.5			0	unable	unable			
10N42W9	porcellanite	distal	16.7		20.7			4.6	1.56			0	unable	unable			
10N42W10	porcellanite	distal	18		18.4			4.5	1.17			0	unable	unable			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
2S40W1	porcellanite	complete	56.1	46.6	26.3	14.5	15.3	6.8	9.36	150	110	0	convex	shoulder	3	0.13	6.85
2S40W3	porcellanite	complete	36.1	27.9	22	12.7	15.6	5.2	3.66	180	105	0	convex	shoulder	3	0.25	5.37
2S40W5	porcellanite	complete	28.7	28.8	13.2	13.2	13.2	5.3	2.33			0	straight	unshouldered	3	0.38	5.43
2S40W6	porcellanite	midsection	24.4		26.7			6.3	4.79			0	unable	unable			
2S40W7	porcellanite	proximal	30.8		22.8	14.2	18.1	5.6	3.88	155	120	1	convex	shoulder			
2S40W8	porcellanite	complete	33.5	25.9	22.2	15	18.3	4.9	3.54	160	110	0	convex	shoulder	3	0.06	5.29
2S40W9	porcellanite	distal	33.6		22.3			5.5	3.66			0	unable	unable			
2S40W10	porcellanite	distal	24.3		20.8			5.6	2.41			0	unable	unable			
2S40W11	porcellanite	distal	35.2		25.2			5.1	4.71			1	unable	unable			
2S40W12	porcellanite	distal	43.6		27.5			6	5.08			0	unable	unable			
0040W1	porcellanite	complete	38.6	30	23.5	17.1	19.5	3.5	3.25	180	110	2	straight	shoulder	3	0	8.57
0040W2	porcellanite	distal	28.7	20	18.9	11.2		5.2	2.45			0	straight	shoulder		0.13	3.85
0040W3	porcellanite	distal	21.8		22			5	1.96			0	unable	unable			
2N40W1	porcellanite	distal	52.8	49.2	29.1	17		6.5	8.95			0	unable	shoulder		0.03	7.57
2N40W2	porcellanite	distal	46.9	43.2	26.2	15.2		6.1	6.95			1	unable	shoulder		0	7.08
2N40W3	porcellanite	lateral edge	37.7		17.7			6.6	4.48			0	straight	shoulder			
2N40W4	porcellanite	midsection	24.6		21.6	15.1		4.9	3.17			0	unable	shoulder			
2N40W5	porcellanite	distal	28.7		18.5			5.5	2.51			0	unable	unable			
2N40W6	porcellanite	distal	27		20.1			5.3	2.69			0	unable	unable			
4N40W1	porcellanite	proximal	35		24.5	24.5	24.5	5.6	5.03			2	straight	unshouldered			
4N40W3	porcellanite	midsection	23.7		16.5			5.3	2.15			0	unable	unable			
4N40W5	porcellanite	distal	29.5		23.8			4.9	3.14			1	unable	unable			
4N40W6	porcellanite	distal	17.9		18			4.2	1.17			0	unable	unable			
4N40W8	porcellanite	distal	19.4		18.9			5	1.24			0	unable	unable			
6N40W1	porcellanite	complete	37.9	29.5	24	15.9	17.6	5.3	4.95	155	95	0	concave	shoulder	3	0.31	5.57
6N40W2	porcellanite	midsection	17.3		22.9			5.3	2.84			0	unable	unable			
8N40W1	porcellanite	complete	55.5	47.1	29.2	15	18.3	6.4	9.55	155	115	0	straight	shoulder	3	0	7.36
8N40W2	porcellanite	proximal	33.9		20.1	11.3	14.8	5.4	3.67	180	135	1	straight	shoulder			
8N40W3	porcellanite	midsection	23.3		20.4			5.4	2.61			0	unable	unable			
10N40W1	porcellanite	distal	44.4		23.9			6	6.15			1	unable	shoulder			
10N40W2	porcellanite	complete	45.7	38.4	24.7	15.2	18.9	5.6	6.39	150	115	0	straight	shoulder	3	0	6.86
10N40W4	porcellanite	proximal	31.9		26.3	15.8	19.6	6.5	5.88	150	120	0	convex	shoulder			
4S38W2	porcellanite	complete	43.6	35	22.1	13.8	16.5	6.3	5.86	160	110	0	convex	shoulder	3	0.06	5.56

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4S38W3	porcellanite	midsection	24		20.5			4.2	3.31			0	unable	unable			
0038W2	porcellanite	proximal	37.6		22.8	15.1	17.1	5.4	4.73			0	straight	shoulder			
0038W3	porcellanite	proximal	22.3		22.7	14.8	18	5.1	2.92	160	120	0	convex	shoulder			
2N38W1	porcellanite	complete	29.8	24	18.7	11.4	12.1	4.2	2.65	180	120	3	convex	shoulder	3	0	5.71
2N38W2	porcellanite	prox lateral edge	29.9		20.2	14.6	17.5	5.5	4.5			1	convex	shoulder			
4N38W1	porcellanite	complete	56.1	48.6	24.1	13	16.6	6.6	8.89	150	115	0	straight	shoulder	3	0	7.36
4N38W2	porcellanite	distal	34.3		20.7			5.7	3.5			0	unable	unable			
4N38W3	porcellanite	midsection	12.8		18			5	1.45			0	unable	unable			
6N38W1	porcellanite	complete	40.9	32.5	20.3	11.2	14.7	5.4	4.28	180	120	0	straight	shoulder	3	0	6.02
6N38W2	porcellanite	complete	42.2	33	24	14.1	17.6	5.5	5.69	160	130	0	convex	shoulder	3	0	6
8N38W1	porcellanite	complete	51.5	41.5	27.7	18.3	23.5	7.3	9.98	170	120	0	convex	shoulder	3	0	5.68
8N38W2	porcellanite	complete	45.4	38.2	26.7	12.8	15.8	5.7	6.4	155	105	1	straight	shoulder	3	0	6.7
8N38W3	porcellanite	complete	44.4	36.8	27.6	14.7	17.3	5.6	6.81	150	115	0	straight	shoulder	3	0	6.57
8N38W5	porcellanite	complete	45.3	35	24.4	12.4	16.7	5	5.45	160	130	1	convex	shoulder	3	0.06	7
8N38W6	porcellanite	midsection	25.4		26.1	14.5		5.8	3.94			0	unable	shoulder			
8N38W9	porcellanite	complete	22.8	15	24.9	14.9	18.4	5	2.4	155	120	0	straight	shoulder	2	1	3
8N38W10	porcellanite	midsection	12.7		23.2	13.4		4.7	1.59			1	unable	shoulder			
6S36W1	porcellanite	complete	41.7	34.5	23	14.2	17.8	4.9	4.72	150	110	0	convex	shoulder	3	0	7.04
6S36W2	porcellanite	complete	27.4	27.4	21.8	21.8	21.8	4.6	2.87			1	convex	unshouldered	3	0	5.96
4S36W1	porcellanite	distal	18.4		21.9			4.7	1.63			0	unable	unable			
2S36W2	porcellanite	complete	30	22.1	21.8	14.7	18.1	5.6	3.54	165	125	0	convex	shoulder	1	0.5	3.95
0036W1	porcellanite	complete	41.9	41	24.2	24.2	24.2	5.5	6.26			3	straight	unshouldered	1	0.5	7.45
0036W2	porcellanite	distal	40.2		19.3			4.1	2.58			0	unable	unable			
0036W5	porcellanite	proximal	31.4		22.6	13.2	15.7	6.4	4.19	150	110	0	straight	shoulder			
0036W6	porcellanite	midsection	17.1		19.6			5.4	1.72			0	unable	unable			
0036W7	porcellanite	proximal	25.3		30.2	30.2	30.2	6.6	6.42			0	straight	unshouldered			
0036W8	porcellanite	midsection	35.5		23.9	12.7		6.7	6.63			1	unable	shoulder			
2N36W1	porcellanite	complete	54.7	47.2	30.2	16.4	20.1	5.7	10.07	160	135	0	concave	shoulder	3	0	8.28
2N36W2	porcellanite	complete	50.6	43.6	27.2	15.3	18.5	5.4	7.17	155	115	0	concave	shoulder	3	0.03	8.07
2N36W3	porcellanite	complete	47.4	37.8	26.3	16.9	21	6.2	7.59	145	110	0	convex	shoulder	3	0	6.1
2N36W4	porcellanite	proximal	33.4		31.9	16.3	20.7	6.6	7.69	160	125	0	straight	shoulder			
2N36W5	porcellanite	distal	42.1	42.5	25.6	14.3		5.2	5.46			1	unable	shoulder		0	8.17
2N36W6	porcellanite	proximal	32.2		26.6	15.3	20.3	6.8	6.37	145	115	0	straight	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
2N36W7	porcellanite	midsection	29.7		27.9	18		6	6.28			0	straight	shoulder			
2N36W9	porcellanite	midsection	24.4		20	11.9		4.8	1.97			0	unable	shoulder			
2N36W10	porcellanite	proximal	22.6		22.8	14.8	17.8	5.2	3.17	150	115	0	straight	shoulder			
2N36W11	porcellanite	complete	26.2	19.3	18.5	12.9	16	4.9	2.47	160	110	0	straight	shoulder	3	0.06	3.94
2N36W12	porcellanite	distal	31.1	27.1	20.9	14.2		4.7	2.95			0	unable	shoulder		0.19	5.77
2N36W14	porcellanite	lateral edge	17.8		22.4			6.7	3.28			0	unable	unable			
4N36W1	porcellanite	complete	31	22.6	22.5	12.5	14.5	4.6	3.17	180	100	2	straight	shoulder	1	0.5	4.91
4N36W2	porcellanite	distal	33.6	33.3	25.9	15.6		5.1	4.62			0	unable	shoulder		0.19	6.53
4N36W3	porcellanite	midsection	23.8		24.1	14.7		4.6	2.38			0	unable	shoulder			
4N36W4	porcellanite	midsection	24.6		24	12.7		5.1	3.36			0	unable	shoulder			
4N36W5	porcellanite	distal	18.3		19.4			5.2	1.66			0	unable	unable			
4N36W7	porcellanite	distal	27.1		19.8			5.6	2.46			0	unable	shoulder			
4N36W8	porcellanite	distal	23.8		21.6			5.5	2.26			0	unable	unable			
10N36W1	porcellanite	proximal	40.8		24.2	14.1	15.6	6.5	6.67	150	120	0	straight	shoulder			
10N36W2	porcellanite	proximal	37.7		22.6	12.6	13.6	5.3	4.94	150	110	2	straight	shoulder			
10N36W5	porcellanite	midsection	15.3		19.8			5	2.16			0	unable	unable			
10N36W6	porcellanite	midsection	16.8		23.3	15.3		4.8	2.01			0	unable	shoulder			
12N36W2	porcellanite	proximal	36.7		26.5	16.1	20.5	5.1	6.36	160	125	0	concave	shoulder			
12N36W4	porcellanite	complete	40.1	34.4	22.1	12.6	13.6	5.9	4.45	150	110	0	straight	shoulder	3	0	5.83
12N36W5	porcellanite	proximal	30.6		20.8	13.2	17.5	5	4.06	180	135	0	convex	shoulder			
12N36W6	porcellanite	proximal	34.6		21.8	12.2	16.7	5.3	4.41	165	110	1	concave	shoulder			
12N36W7	porcellanite	complete	31.9	22.5	20.2	15.4	17.1	5.4	3.83	165	120	0	convex	shoulder	3	0.25	4.17
12N36W8	porcellanite	midsection	28.2		22.9			4.4	2.33			0	unable	unable			
12N36W9	porcellanite	midsection	13.7		22.6			3.8	1.02			0	unable	shoulder			
6S34W1	porcellanite	complete	52	52	25.6	25.6	25.6	5.6	7.02			0	straight	unshouldered	3	0	9.29
6S34W2	porcellanite	distal	42.2		22.9			6	6.17			0	unable	unable			
6S34W3	porcellanite	proximal	15.9		20.8	14.8	18.5	5.8	1.9			0	convex	shoulder			
4S34W2	porcellanite	complete	44.2	37	24.5	16	18.4	5.9	6.54	160	110	0	straight	shoulder	3	0	6.27
4S34W3	porcellanite	midsection	30.3		24.8	15.4		5.5	4.38			0	unable	shoulder			
4S34W4	porcellanite	prox lateral edge	29		18.9			5.5	3.14			0	straight	shoulder			
4S34W5	porcellanite	complete	28.6	28.8	17.2	17.2	17.2	4.8	2.46			0	straight	unshouldered	3	0.03	6
4S34W6	porcellanite	midsection	23		23.2			5.4	3.36			0	unable	unable			
2S34W3	porcellanite	complete	36.1	35.9	19.5	19.5	19.5	5.3	3.45			1	straight	unshouldered	3	0.25	6.77

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
2S34W4	porcellanite	distal	41.4	36	25.5	14.8		6	6.18			1	unable	shoulder		0.06	6
2S34W5	porcellanite	complete	35	26.7	23.1	16.1	18.7	5.8	4.42	155	120	1	straight	shoulder	3	0	4.6
2S34W6	porcellanite	proximal	23.4		22	11.6	15.4	4.8	2.81	155	120	0	convex	shoulder			
2S34W7	porcellanite	lateral edge	24.3		11			4.4	1.11			0	unable	shoulder			
0034W5	porcellanite	midsection	29.6		23.9	13.9		5.3	5.06			0	straight	shoulder			
0034W6	porcellanite	proximal	30		21	16.9	17.7	4.6	3.38			0	straight	shoulder			
0034W7	porcellanite	proximal	28.1		22.4	13.5	12.8	5.4	3.97	180	115	2	convex	shoulder			
0034W8	porcellanite	complete	26.2	17.2	19.3	14.4	17.6	5.2	2.25	180	125	0	convex	shoulder	1	0.75	3.31
0034W9	porcellanite	proximal	20.4		19.9	14.5	16.3	4.4	1.58	150	110	0	convex	shoulder			
2N34W2	porcellanite	complete	45.7	45.7	25	25	25	5.2	5.74			0	convex	unshouldered	3	0.06	8.79
2N34W3	porcellanite	complete	39.7	39.7	22.6	22.6	22.6	6	5.27			3	straight	unshouldered	3	0	6.62
2N34W4	porcellanite	complete	28.7	21.5	22	15.5	16.8	4.8	2.93	180	130	0	straight	shoulder	2	0.63	4.48
2N34W5	porcellanite	proximal	33.3		20.3	12.4	13.7	5.3	3.54	185	130	0	straight	shoulder			
2N34W6	porcellanite	complete	26.4	17.5	23	14	18	5	2.92	155	115	0	convex	shoulder	3	0	3.5
2N34W7	porcellanite	complete	38.4	30.5	21.9	13.4	16.8	4.8	3.78	155	125	1	straight	shoulder	3	0	6.35
2N34W8	porcellanite	midsection	33.2		21.9	13.7		5.7	4.84			1	unable	shoulder			
2N34W9	porcellanite	midsection	29.1		25.4	17		6.4	5.84			0	unable	unable			
2N34W10	porcellanite	proximal	17.5		23	15.1	17.6	5.2	2.07	160	125	1	straight	shoulder			
4N34W2	porcellanite	complete	37.4	31.5	20.7	12.5	15.2	4.9	3.15	160	120	0	straight	shoulder	3	0	6.43
4N34W3	porcellanite	distal	19.3		18.4			4.6	1.47			0	unable	unable			
4N34W4	porcellanite	midsection	33.3		26			5.8	5.91			0	unable	shoulder			
4N34W6	porcellanite	prox lateral edge	24		15.2			4.9	1.57			0	unable	shoulder			
4N34W7	porcellanite	proximal	34.4		24	13.7	17	5.1	4.59	150	115	0	straight	shoulder			
8N34W2	porcellanite	complete	36.2	36.7	19.8	19.8	19.8	5	3.67			2	convex	unshouldered	3	0	7.34
10N34W2	porcellanite	distal	21.7		18.3			5.1	1.63			0	unable	unable			
12N34W1	porcellanite	midsection	48.2		24.9	15		5.6	9.07			1	unable	shoulder			
12N34W2	porcellanite	distal	45.9	39.7	27.1	15.8		5.7	6.87	150	125	1	straight	shoulder		0.13	6.96
12N34W3	porcellanite	proximal	28.2		23.4	14.6	19.1	5.7	4.79	180	110	0	straight	shoulder			
12N34W4	porcellanite	proximal	27.3		22	22	22	6	3.7			0	convex	unshouldered			
12N34W5	porcellanite	midsection	23.4		23.9			4.4	2.84			0	unable	unable			
12N34W7	porcellanite	distal	23.3		19.9			5.1	2.15			0	unable	shoulder			
12N34W8	porcellanite	midsection	23.9		24			6	3.74			0	unable	unable			
10S32W1	porcellanite	proximal	33.8		24.9	14.6	15.6	4.3	4.14	165	100	0	straight	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
10S32W4	porcellanite	proximal	42.6		23.5	15.3	16.1	5.4	4.89	180	110	2	straight	shoulder			
8S32W1	porcellanite	complete	55.3	46.9	27.7	14.4	17.1	5.3	8.24	155	110	2	convex	shoulder	3	0	8.85
8S32W2	porcellanite	distal	47.9	47.7	27.1	14.7		5.8	7.12			0	unable	shoulder		0	8.22
8S32W3	porcellanite	proximal	33.7		27.6	15.1	19.1	4.8	5.21	150	120	2	convex	shoulder			
8S32W4	porcellanite	proximal	39.4		20.9	12.9	16.3	6.2	5.37	150	110	0	convex	shoulder			
8S32W5	porcellanite	midsection	35.1		25.4	14.4		5.4	5.31			0	straight	shoulder			
8S32W6	porcellanite	complete	25.3	18.5	20.4	11.4	14.1	4.2	1.94	150	125	0	convex	shoulder	3	0.25	4.4
8S32W7	porcellanite	proximal	15		16.9	16.9	16.9	4.4	1.27			0	straight	unshouldered			
8S32W8	porcellanite	midsection	22.5		27.1	15.8		5.7	3.3			0	unable	shoulder			
8S32W9	porcellanite	distal	35.4		21			4	2.82			1	unable	unable			
8S32W10	porcellanite	proximal	15.8		22.5	14.3	15.7	4.8	1.91	150	115	0	straight	shoulder			
8S32W11	porcellanite	complete	38.1	31.2	24.3	14.5	18.2	5.6	4.6	160	115	1	straight	shoulder	2	0.31	5.57
6S32W3	porcellanite	distal	35.5		21.5			3.9	2.98			1	unable	unable			
6S32W4	porcellanite	complete	37.4	30.2	19.3	11.6	15.3	5.8	3.77	185	120	0	straight	shoulder	3	0.03	5.21
6S32W6	porcellanite	complete	35.1	28.2	22	12.1	14.9	5.4	3.82	150	115	0	convex	shoulder	3	0.06	5.22
6S32W7	porcellanite	distal	31		23.4			4.6	3.33			1	unable	unable			
6S32W8	porcellanite	distal	31.7		20.7	12.5		4.5	2.71			0	unable	unable			
6S32W10	porcellanite	complete	32.9	32.8	23.8	23.8	23.8	4.5	3.43			0	straight	unshouldered	3	0	7.29
6S32W11	porcellanite	lateral edge	27		20.9			6.4	3.31			0	unable	unable			
6S32W12	porcellanite	midsection	21		25.8	16.5		5.3	3.88			1	unable	shoulder			
6S32W13	porcellanite	midsection	14.6		18.9			3.8	1.06			0	unable	unable			
6S32W14	porcellanite	midsection	17.2		22.2			5.1	1.74			0	unable	unable			
4S32W1	porcellanite	complete	40.2	31.5	25.8	17.1	19.7	5.8	6.33	165	115	0	straight	shoulder	3	0.06	5.43
4S32W2	porcellanite	proximal	37.7		22.5	13.5	15.4	5.8	5.05	180	95	1	convex	shoulder			
4S32W4	porcellanite	complete	33.3	25.4	22.5	16.5	17.8	5.6	3.69	180	115	0	straight	shoulder	1	0.5	4.54
4S32W5	porcellanite	distal	26.8	26.8	22.8	16.8		5.4	3.18			0	unable	shoulder		0	4.96
2S32W1	porcellanite	complete	50.1	41.9	28.7	16.9	18.7	6	8.2	180	125	0	straight	shoulder	3	0	6.98
2S32W2	porcellanite	midsection	37.7		28	13.8		5.7	7.01			1	convex	shoulder			
2S32W3	porcellanite	proximal	37		24.4	16	19.3	5.6	5.38	160	120	0	unable	shoulder			
2S32W5	porcellanite	distal	31.1		23.3			5.2	3.4			1	straight	unable			
2S32W6	porcellanite	midsection	14.4		19.5	19.5	19.5	5	1.78			0	convex	unable			
2S32W7	porcellanite	midsection	21		22.8	14.5		4.9	2.95			0	convex	shoulder			
2S32W8	porcellanite	distal	22.2		24.1			4.6	2.19			2	unable	unable			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
0032W1	porcellanite	complete	48.1	40.2	24.4	16.4	19.4	6.3	6.6	165	120	0	straight	shoulder	3	0.09	6.38
0032W2	porcellanite	complete	47.7	40.2	19.2	11.9	11.7	5.3	4.5	180	90	1	convex	shoulder	3	0.16	7.58
0032W3	porcellanite	lateral edge	38.5		16.9			5.2	4.21			0	unable	shoulder			
0032W4	porcellanite	proximal	27.9		23.4	15.9	18.1	4.8	3.61	180	110	1	convex	shoulder			
0032W5	porcellanite	proximal	25.6		28.5	15.9	19.3	6	3.97	160	115	1	straight	shoulder			
0032W6	porcellanite	proximal	21.1		23	14.2	16.8	5.1	3.01	160	105	0	convex	shoulder			
0032W7	porcellanite	distal	26	20.3	21.9	11.7		5.1	2.72	165	105	0	convex	shoulder		0.31	3.98
0032W8	porcellanite	distal	26.4		20			4.3	2.07			2	unable	unable			
4N32W1	porcellanite	complete	54.6	54.7	23.2	23.2	23.2	5.7	8.3			2	convex	unshouldered	3	0	9.6
4N32W2	porcellanite	complete	47.6	36	24.8	11.7	18.2	4.6	5.03	180	120	1	straight	shoulder	3	0	7.83
4N32W3	porcellanite	complete	30.9	24.5	19.1	12.1	16.9	4.8	3.07	150	125	0	convex	shoulder	3	0.09	5.1
4N32W5	porcellanite	midsection	27.9		21.1			5.9	4.19			0	unable	unable			
4N32W6	porcellanite	complete	30.8	30.8	21.8	21.8	21.8	5.3	3.2			0	straight	unshouldered	3	0	5.81
4N32W7	porcellanite	lateral edge	20.9		19.9			4.9	2.53			0	unable	shoulder			
4N32W8	porcellanite	lateral edge	23.8		13.2			4.5	1.9			0	unable	shoulder			
6N32W1	porcellanite	midsection	38.7		26.3			5.9	7.05			1	unable	unable			
6N32W2	porcellanite	complete	39.2	30.6	25.4	14.4	17.5	6.1	5.99	160	105	0	convex	shoulder	3	0.06	5.02
6N32W3	porcellanite	complete	34	26.1	19.4	12.3	14.9	4.1	3.16	160	125	2	convex	shoulder	3	0	6.37
6N32W4	porcellanite	proximal	27.6		21.6	12.3	16.4	5	3.1	145	110	1	convex	shoulder			
8N32W1	porcellanite	midsection	29.6		24.3	14.7		5	4.19			0	unable	shoulder			
8N32W2	porcellanite	complete	51.8	43.7	23.3	14.9	16.9	5	6.26	160	110	0	convex	shoulder	3	0.19	8.74
10N32W1	porcellanite	midsection	34.5		27.2	16.5		5.2	6.72			1	unable	shoulder			
10N32W2	porcellanite	midsection	16.1		22.4			4.4	1.9			0	unable	unable			
8S30W1	porcellanite	proximal	32.3		26.4	14.3	16.1	7.4	6.96	160	110	0	straight	shoulder			
6S30W1	porcellanite	complete	63.1	56	23.4	13.2	17.4	5.8	8.58	155	120	3	straight	shoulder	3	0	9.66
6S30W2	porcellanite	distal	39.8		26.1			5.5	5.69			1	unable	unable			
6S30W3	porcellanite	proximal	44.1		27.7	15.5	18.7	8.4	8.87	150	125	0	straight	shoulder			
6S30W4	porcellanite	complete	44.7	37.4	25.4	15.5	19.6	5.9	6.94	180	125	1	convex	shoulder	3	0.13	6.34
6S30W6	porcellanite	proximal	23.7		18.8	18.8	18.8	6	2.79			0	unable	unable			
6S30W7	porcellanite	prox lateral edge	20.5		16.9			6.3	2.6			0	convex	shoulder			
4S30W2	porcellanite	proximal	24		24.5	15.8	18.8	5.9	4.07	165	120	0	convex	shoulder			
4S30W3	porcellanite	midsection	48		27.5			5.7	8.13			1	unable	unable			
4S30W6	porcellanite	distal	31.5		23.2			5.9	3.97			1	unable	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4S30W7	porcellanite	proximal	24.7		22.1	13.3	15	4.9	2.54	180	130	0	straight	shoulder			
4S30W8	porcellanite	distal	28.7	20.6	19.2	10.7		4.2	2.33	160	110	0	convex	shoulder		0.06	4.9
4S30W9	porcellanite	proximal	26		22.4	22.4	22.4	6.4	3.93			0	straight	unshouldered			
2S30W1	porcellanite	distal	54.6	46.1	25	15.3		6.3	7.99	165	135	0	straight	shoulder		0	7.32
2S30W2	porcellanite	complete	51.7	44.2	22.8	13.4	17.1	4.9	5.59	160	125	1	convex	shoulder	3	0	9.02
2S30W3	porcellanite	proximal	25.7		17	10.8	13.3	3.9	2.12	150	120	2	convex	shoulder			
2S30W4	porcellanite	complete	44.5	37.1	22.7	13.7	15.3	5.9	5.08	170	120	1	straight	shoulder	3	0	6.29
2S30W5	porcellanite	midsection	41.9		29.5	16.4		5.2	7.18			0	straight	shoulder			
2S30W8	porcellanite	prox lateral edge	17		17.1			5.5	1.65			0	unable	unable			
2S30W9	porcellanite	midsection	28		23.6	15.2		4.7	3.11			0	unable	shoulder			
2S30W10	porcellanite	proximal	33.3		24.8	18.9	19	5.3	4.65			0	unable	shoulder			
2S30W11	porcellanite	distal	17.8		18.4			4.2	1.13			0	unable	unable			
2S30W12	porcellanite	proximal	29.9		22.5	16.4	19.3	5	3.6	145	115	0	straight	shoulder			
2S30W13	porcellanite	complete	28.8	21	24.9	15.4	15.9	6.1	4.25	160	110	0	straight	shoulder	3	0.19	3.44
2S30W14	porcellanite	midsection	21.4		19			3.6	1.39			0	unable	unable			
2S30W17	porcellanite	proximal	14.8		19.2			4.3	1.28			1	unable	shoulder			
2S30W18	porcellanite	proximal	31		21.1	13.8	16.9	4.5	3.48	155	115	0	convex	shoulder			
2S30W19	porcellanite	distal	35.2		25.8			6.9	4.98			0	unable	unable			
2S30W20	porcellanite	distal	36.1		20.4			5.8	4.59			0	unable	unable			
2S30W21	porcellanite	proximal	26		24.1	14	20.5	5.9	3.84	155	125	0	convex	shoulder			
2S30W22	porcellanite	midsection	21.9		21.3			3.8	1.69			0	unable	unable			
0030W6	porcellanite	lateral edge	26.3		17.6			5.8	2.38			1	unable	unable			
0030W7	porcellanite	complete	35.5	28.3	20.1	12.8	14.8	4.9	3.28	180	120	1	convex	shoulder	3	0	5.78
0030W8	porcellanite	proximal	34		23.4	14.3	16.3	5.6	4.41	155	115	1	convex	shoulder			
0030W9	porcellanite	proximal	22.8		22.3	13.2	17.7	6.3	3.7	155	115	0	convex	shoulder			
0030W11	porcellanite	proximal	23.3		18.8	16.2	16.3	4.7	2.37			0	convex	unable			
0030W13	porcellanite	midsection	16.9		14.4			4.5	1.47			0	unable	unable			
0030W14	porcellanite	midsection	45.3		27.6			5.9	8.32			0	unable	unable			
2N30W1	porcellanite	distal	42.4	42.8	26.2	16.1		5.7	6.96			1	unable	shoulder		0.13	7.51
2N30W2	porcellanite	distal	40.4		25.3			6.9	6.43			0	unable	unable			
4N30W1	porcellanite	proximal	43.2		27.6	17.5	20.5	6.3	9.56	150	105	1	convex	shoulder			
4N30W2	porcellanite	complete	41.4	41.4	23	14.3	18.3	4.6	4.78	155	125	2	straight	shoulder	3	0	9
4N30W3	porcellanite	complete	34.7	27.2	21.5	14.4	17.2	5.5	4.14	160	120	1	convex	shoulder	3	0	4.95

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4N30W4	porcellanite	complete	37.2	29.5	23.6	13	17	5.1	4.64	155	115	0	straight	shoulder	3	0.25	5.78
4N30W5	porcellanite	midsection	30.7		24.8	17.7		6.2	5.89			0	unable	shoulder			
4N30W6	porcellanite	proximal	24.6		28	16.6	19	5.4	4.3	155	105	0	concave	shoulder			
6N30W1	porcellanite	distal	31.3		23.6	16.6		4.7	3.51			0	convex	shoulder			
6N30W2	porcellanite	proximal	24.9		21.2	13.6	17.7	4.9	2.54	180	125	0	convex	shoulder			
8N30W1	porcellanite	complete	37.6	29.6	22.3	13.2	17	5.3	4.69	160	120	2	convex	shoulder	2	0.25	5.58
8N30W2	porcellanite	proximal	25		16.5	11.8	12.8	4.5	2.36	180	90	3	straight	shoulder			
8N30W3	porcellanite	distal	21.2		25			5.4	2.66			0	unable	unable			
10N30W1	porcellanite	complete	44.4	37.3	24.8	15	19.4	5.4	6.21	160	115	0	straight	shoulder	3	0	6.91
10N30W2	porcellanite	proximal	32.6		23.2	14.4	18.9	6.1	5.29	165	115	0	convex	shoulder			
10N30W3	porcellanite	complete	34.7	34.6	22.7	22.7	22.7	5	4.27			0	straight	unshouldered	2	0.5	6.92
10N30W5	porcellanite	distal	22		15.5			3.6	1.11			1	unable	unable			
12N30W1	porcellanite	proximal	48.2		27.1	15.6	18.1	5.3	7.84	160	120	0	straight	shoulder			
12N30W2	porcellanite	midsection	30.5		25.1	15		5.5	4.27			0	unable	shoulder			
12N30W4	porcellanite	midsection	31.4		26.4	14.1		5.3	4.9			1	unable	shoulder			
12N30W5	porcellanite	distal	29.7		20.7	12.6		5.3	3.11			1	unable	shoulder			
6S28W1	porcellanite	distal	57.2	53.6	25.9	15.2		6.7	10.53			0	unable	shoulder		0	8
4S28W1	porcellanite	complete	35.5	27.1	22.4	14.9	18.4	5.5	4.19	155	125	0	convex	shoulder	3	0.09	4.93
4S28W2	porcellanite	proximal	33.2		20.9	13.7	17	5.6	4.29	190	130	1	straight	shoulder			
4S28W3	porcellanite	proximal	23.1		18.6	14.9	18.6	4.9	2.08			1	straight	shoulder			
4S28W4	porcellanite	distal	29.6		23.7			5.7	3.48			0	unable	unable			
4S28W5	porcellanite	midsection	28.1		25			5.3	4.08			0	unable	unable			
4S28W6	porcellanite	distal	18.9		19.5			3.9	1.33			0	unable	unable			
2S28W1	porcellanite	complete	42.4	42.6	21.9	21.9	21.9	6.1	4.69			1	straight	unshouldered	3	0.09	6.98
2S28W2	porcellanite	proximal	37.1		29.7	17.8	21.6	7.2	8.87	155	115	0	straight	shoulder			
2S28W3	porcellanite	midsection	27.3		19.7			4.4	2.48			0	unable	unable			
2S28W5	porcellanite	complete	37.4	29.7	18.4	11.3	12.6	3.4	2.73	180	120	2	convex	shoulder	3	0	8.74
2S28W6	porcellanite	complete	34.7	27.5	25	15.8	18.7	4.9	4	180	120	1	straight	shoulder	3	0.03	5.61
2S28W7	porcellanite	distal	28.9	29	24.8	14.2		4.8	3.22			0	unable	shoulder		0	6.04
2S28W8	porcellanite	distal	26.3	28.8	21.5	15.9		5.3	2.79	185	130	0	convex	shoulder		0.5	5.43
2S28W9	porcellanite	lateral edge	20		23.7			4	1.78			0	unable	unable			
0028W3	porcellanite	complete	28.3	19.9	22.7	15	18.7	5.6	3.28	160	130	1	convex	shoulder	2	0.63	3.55
0028W4	porcellanite	proximal	41.6		27.2	16.8	20.5	4.9	6.4	180	120	1	straight	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
0028W5	porcellanite	distal	42.1		24			4.8	4.91			0	unable	unable			
2N28W1	porcellanite	distal	34.1		25.8	16.5		7	5.7			0	unable	shoulder			
2N28W2	porcellanite	midsection	32.4		25.6			5	4.65			0	unable	unable			
2N28W4	porcellanite	complete	32.7	32.7	21.1	21.1	21.1	6	3.81			0	straight	unshouldered	3	0	5.45
2N28W5	porcellanite	proximal	29.4		22.4	15.3	17.8	5.5	3.8	180	120	0	straight	shoulder			
2N28W6	porcellanite	distal	17.7		18			4.4	1.1			0	unable	unable			
4N28W4	porcellanite	complete	35.6	35.6	23.4	23.4	23.4	5.1	4.76			3	convex	unshouldered	1	0.5	6.98
4N28W6	porcellanite	lateral edge	27.9		16.7			4.5	2.04			0	unable	shoulder			
4N28W7	porcellanite	midsection	18.5		19.8			4.1	1.56			0	unable	unable			
6N28W1	porcellanite	complete	49.8	42.7	27.5	18.7	20.6	5.8	7.89	155	115	2	straight	shoulder	3	0.13	7.36
6N28W3	porcellanite	proximal	38.2		23.7	13.8	18.2	5.9	6.28	145	115	0	straight	shoulder			
8N28W1	porcellanite	distal	22.7		23.6			4.6	2.74			1	unable	unable			
8N28W2	porcellanite	proximal	15.5		17.9	12.8	16.5	3.9	1.34	165	125	0	straight	shoulder			
10N28W2	porcellanite	distal	29		22			5.4	3.11			0	unable	unable			
12N28W1	porcellanite	distal	53.9	48.1	30.7	17.1		6	9.52			0	unable	shoulder		0	8.02
12N28W2	porcellanite	distal	47.7	46.7	26.9			6.5	7.36			0	unable	unable		0	7.18
12N28W3	porcellanite	proximal	18.8		22.7	16.2	19.4	5.7	2.54	170	120	0	straight	shoulder			
14N28W1	porcellanite	complete	44.6	37.4	21.9	13	15.3	4.4	5.39	180	120	2	convex	shoulder	2	0.19	8.5
14N28W3	porcellanite	midsection	32.5		25.1			6.3	5.91			0	unable	unable			
16N28W1	porcellanite	distal	17.7		18.1			4.6	1.48			0	unable	unable			
4S26W1	porcellanite	complete	38	30.8	25.8	14.7	18.9	5.7	5.67	150	120	1	straight	shoulder	3	0.03	5.4
4S26W2	porcellanite	proximal	27.7		22.9	17	21.4	4.8	3.91	170	120	0	convex	shoulder			
4S26W3	porcellanite	distal	32	27.2	22.2	13.7		5.1	3.56			0	unable	shoulder		0	5.33
4S26W4	porcellanite	proximal	27.1		21.5	14.6	17.5	5.8	3.1	150	125	0	straight	shoulder			
4S26W5	porcellanite	proximal	24		21.8	14.9	17.3	5.8	2.74	180	110	0	straight	shoulder			
4S26W6	porcellanite	distal	30	29.4	27.7	17.5		5.5	4.44			0	unable	unable		0.03	5.35
4S26W7	porcellanite	midsection	20.1		22.5			4.9	2.45			0	unable	unable			
2S26W1	porcellanite	complete	46.4	38.8	26.2	15.9	19	6	7.73	150	105	2	straight	shoulder	3	0	6.47
2S26W2	porcellanite	complete	46.9	37.7	26.1	14.6	18.9	5.8	6.85	155	125	0	convex	shoulder	3	0	6.5
2S26W3	porcellanite	proximal	36.8		23.2	13.7	16.3	4.2	3.97	150	110	0	straight	shoulder			
2S26W4	porcellanite	complete	44.6	37.7	28.1	16.4	19.9	5.6	6.92	150	115	0	concave	shoulder	3	0.13	6.73
2S26W5	porcellanite	complete	45.8	45.8	24.9	24.9	24.9	5.3	6.3			1	straight	unshouldered	3	0.06	8.64
2S26W6	porcellanite	distal	39.2	37.1	24.4	13.5		6.6	6.04			0	unable	shoulder		0	5.62

120 Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
2S26W7	porcellanite	distal	29	29.4	23.4	13.1		6	3.87			1	unable	shoulder		0.25	4.9
2S26W8	porcellanite	midsection	25.9		23			5.6	3.4			0	unable	unable			
2S26W10	porcellanite	proximal	38.4		23.2	14.8	18.6	5.8	5.18	145	110	0	convex	shoulder			
0026W1	porcellanite	distal	47.8	47.9	26.9	16.8		5.9	7.09			0	unable	shoulder		0	8.12
0026W3	porcellanite	complete	36.6	27.8	22.5	13.7	14.7	4.7	3.75	180	105	1	straight	shoulder	3	0.06	5.91
0026W4	porcellanite	proximal	32.6		22.5	13.3	18.7	5.3	4.12	155	120	0	convex	shoulder			
0026W5	porcellanite	distal	35.8		22.6			4.8	3.26			1	unable	unable			
2N26W1	porcellanite	proximal	43.3		25.6	15.2	15.5	6.2	7.69	165	105	1	straight	shoulder			
2N26W2	porcellanite	complete	36.6	36.6	21.1	21.1	21.1	4.7	3.82			2	straight	unshouldered	3	0	7.79
2N26W3	porcellanite	complete	41.9	34.3	19.6	12.9	13.4	5.2	4.23	180	110	0	convex	shoulder	3	0	6.6
2N26W4	porcellanite	midsection	24.8		26.1	16.2		5	4.58			1	unable	shoulder			
2N26W5	porcellanite	proximal	25.7		25	15.4	17	5.4	3.66	160	115	0	straight	shoulder			
4N26W2	porcellanite	proximal	22.7		25.1	14.8	19.3	4.5	3.74	155	120	0	straight	shoulder			
4N26W3	porcellanite	proximal	19		22.9	14.6	17.3	5.8	2.93	180	135	0	straight	shoulder			
4N26W5	porcellanite	midsection	15.7		18			5.1	1.61			0	unable	unable			
6N26W1	porcellanite	proximal	31		27.1	17.5	21.8	6.2	5.93	160	125	1	straight	shoulder			
6N26W2	porcellanite	distal	41.7	37.9	23.4			6.1	5.94			0	unable	shoulder		0.25	6.21
6N26W5	porcellanite	proximal	19.8		20.7	13.4	17.4	5.2	1.99	180	135	0	convex	shoulder			
8N26W1	porcellanite	complete	46.1	37.7	26.1	13.6	16.6	5.3	6.97	150	115	1	convex	shoulder	2	0.25	7.11
8N26W2	porcellanite	complete	40.9	33.8	19.5	11.5	13.9	4.8	3.22	155	120	2	convex	shoulder	3	0	7.04
8N26W4	porcellanite	proximal	33.8		21.7	21.7	21.7	4.8	3.59			2	convex	unshouldered			
8N26W5	porcellanite	complete	32.9	26.9	21.6	14	14.5	5.9	3.66	180	95	0	straight	shoulder	2	0.19	4.56
8N26W6	porcellanite	proximal	35.4		22.6	14.1	18	5.5	5.34	160	125	1	convex	shoulder			
8N26W7	porcellanite	distal	35	27.2	21.2			5.6	3.73			0	convex	shoulder		0.25	4.86
8N26W9	porcellanite	midsection	28.2		24.6	15.1		4.8	4.11			0	unable	shoulder			
8N26W10	porcellanite	distal	27.9	27.8	22.8			5.1	3.15			1	unable	shoulder		0	5.45
8N26W11	porcellanite	midsection	20.5		20			5.2	2.42			0	unable	unable			
8N26W13	porcellanite	midsection	17.8		23.3			4.3	1.89			0	unable	unable			
10N26W1	porcellanite	complete	49.6	40.9	27.3	18.7	24.2	4	8.06	180	130	1	straight	shoulder	3	0	10.2
10N26W2	porcellanite	proximal	27.5		24.4	15.6	18.7	5.4	3.44	165	125	0	straight	shoulder			
10N26W3	porcellanite	proximal	31.5		24.1	17.1	18.8	5.2	4.2	180	110	2	convex	shoulder			
12N26W1	porcellanite	distal	51.7	46.5	27.3	16.5		5.7	8.56			0	unable	shoulder		0	8.16
12N26W2	porcellanite	midsection	38.3		26.3	16.9		6.4	6.51			1	unable	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
12N26W3	porcellanite	midsection	33.7		24.5			5.3	5.56			1	unable	shoulder			
12N26W5	porcellanite	complete	33.4	33.3	17	17	17	5.1	2.3			4	convex	unshouldered	3	0	6.53
14N26W1	porcellanite	proximal	54.5		29.4	15.8	19.3	5.7	8.61	150	110	1	straight	shoulder			
14N26W2	porcellanite	complete	30.9	22.4	26.3	18	19.1	5.5	4.18	180	105	0	concave	shoulder	2	1	4.07
14N26W3	porcellanite	prox lateral edge	18.2		19.2	14.1	16.8	5.3	2.02			0	straight	shoulder			
16N26W1	porcellanite	proximal	32.5		26.9	15.5	20.5	5.9	6.04	160	125	1	concave	shoulder			
16N26W2	porcellanite	proximal	28.4		23.5	13.9	15.8	5.4	3.8	155	120	0	convex	shoulder			
2S24W2	porcellanite	distal	49.9	45.7	27.5	15.8		5.7	7.87			1	unable	shoulder		0	8.02
2S24W3	porcellanite	complete	34.9	27.5	23	15	18.2	5.7	4.16	155	125	0	straight	shoulder	3	0.13	4.82
2S24W5	porcellanite	distal	35		22.4			4.8	3.46			0	unable	shoulder			
0024W1	porcellanite	complete	47.9	38.8	28.2	16.9	19.2	5	7.64	165	105	1	straight	shoulder	3	0	7.76
0024W4	porcellanite	distal	40.5	32.9	24.4	11.8		5.1	4.99	145	115	2	convex	shoulder		0	6.45
0024W6	porcellanite	complete	41	32.6	20.6	15.3	17.5	5.1	4.04	200	115	2	convex	shoulder	3	0.03	6.39
0024W7	porcellanite	proximal	36.2		24.8	15	18.3	5.3	6.32	150	120	0	convex	shoulder			
0024W8	porcellanite	distal	38.4	33.2	21.4			5	4.31			2	unable	shoulder		0	6.64
0024W9	porcellanite	complete	35.1	26	22.2	14.6	18.3	5.6	4.06	155	130	0	straight	shoulder	3	0.13	4.64
0024W10	porcellanite	complete	28.1	21.5	25.9	17.1	19	5.2	3.81	155	120	1	straight	shoulder	2	0.69	4.13
0024W13	porcellanite	midsection	22.5		21.9	13.8		4.4	2.38			0	unable	shoulder			
2N24W1	porcellanite	complete	57	48.4	27.4	14.3	18.4	6.7	9.74	140	105	0	convex	shoulder	3	0.06	7.22
2N24W3	porcellanite	complete	32.8	25	21.6	13.5	17.3	5.9	3.73	160	125	0	straight	shoulder	3	0	4.24
2N24W6	porcellanite	distal	20.1		17.8			5.3	1.16			1	unable	unable			
2N24W7	porcellanite	distal	23.8		20.5			4.7	1.7			0	unable	unable			
2N24W8	porcellanite	lateral edge	17		17.8			4.3	1.78			0	unable	unable			
4N24W1	porcellanite	complete	37.5	27.3	23.5	14.6	18.8	5.9	5.79	160	110	0	concave	shoulder	3	0.25	4.63
4N24W2	porcellanite	complete	55	46.8	25.5	15.1	18.6	6	7.85	160	120	0	straight	shoulder	3	0	7.8
4N24W3	porcellanite	distal	34.5	34.8	26.7	16.5		5.5	5.72			0	unable	shoulder		0.09	6.33
4N24W4	porcellanite	proximal	34.8		24.7	14.8	19.3	7.9	6.2	160	120	0	straight	shoulder			
4N24W5	porcellanite	proximal	30.5		26.8	14.2	16.9	5.3	6	165	120	0	concave	shoulder			
4N24W6	porcellanite	proximal	27.1		25.3	13.9	16.5	4.8	4.44	160	110	1	straight	shoulder			
4N24W7	porcellanite	distal	33.5		23.5			4.8	4.35			1	unable	unable			
4N24W8	porcellanite	distal	24.5		19.6			5	2.41			3	unable	unable			
4N24W9	porcellanite	midsection	17.7		20			4.5	1.64			0	unable	unable			
4N24W11	porcellanite	distal	19.7		18.6			5.7	1.41			0	unable	unable			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4N24W12	porcellanite	proximal	48.7		28.3	15.2	17.5	5.7	9.05	155	100	2	concave	shoulder			
6N24W2	porcellanite	proximal	35.9		24.9	14.9	16.7	6.4	6.85	160	110	0	straight	shoulder			
6N24W3	porcellanite	distal	43.4		20.7	13.4		4.7	4.53			0	unable	shoulder			
6N24W4	porcellanite	proximal	26.6		25.7	15.7	20	6	4.76	160	125	0	straight	shoulder			
6N24W6	porcellanite	midsection	36.7		25.6	15.1		5	5.48			0	unable	shoulder			
8N24W1	porcellanite	complete	60	49.8	26.7	15.5	20.2	6.2	9.95	150	120	0	concave	shoulder	3	0	8.03
8N24W2	porcellanite	distal	51.1	47	27.3	14.5		5.7	8.26			0	unable	shoulder		0.06	8.25
8N24W3	porcellanite	complete	45.2	37.3	24.7	13.2	16.1	6	6.25	140	115	0	straight	shoulder	3	0	6.22
8N24W4	porcellanite	midsection	38.8		28	16		5.4	5.88			0	unable	shoulder			
8N24W6	porcellanite	distal	34.2		24.7	17.3		5.5	5.6			0	unable	shoulder			
8N24W7	porcellanite	distal	23.5	17	20.5	11.3		3.4	1.66			2	unable	shoulder		0.38	5
8N24W8	porcellanite	lateral edge	30.2		21.6			4.8	3.08			2	unable	unable			
8N24W10	porcellanite	proximal	28.8		24.7	24.7	24.7	4.6	4.16			0	straight	unshouldered			
8N24W11	porcellanite	midsection	19.9		25	15		4.6	2.75			0	unable	shoulder			
8N24W12	porcellanite	midsection	25.8		24	16.8		5.9	3.59			0	unable	shoulder			
8N24W14	porcellanite	complete	25.3	15.3	21.2	15.3	17.8	5.8	2.98	170	115	0	convex	shoulder	2	0.91	2.64
8N24W15	porcellanite	distal	30	22.5	21.2			5.2	2.96			0	straight	shoulder		0.19	4.33
10N24W1	porcellanite	complete	44	34.9	26.6	14.8	18.8	5.6	6.43	150	110	1	concave	shoulder	3	0	6.23
10N24W2	porcellanite	distal	46.8	40.5	25.6	14.7		5.5	6.28	155	110	1	unable	shoulder		0	7.36
10N24W3	porcellanite	complete	37.6	38	22.8	22.8	22.8	5.6	4.96			1	convex	unshouldered	3	0.06	6.79
10N24W4	porcellanite	proximal	26.2		21	10.9	15	5.3	3.62	145	120	1	convex	shoulder			
10N24W5	porcellanite	distal	31.7	28.5	22.2	14.4		5.5	3.59			2	unable	shoulder		0	5.18
10N24W6	porcellanite	proximal	23.1		30.4	18.3	21	5.5	3.73	140	115	0	convex	shoulder			
12N24W1	porcellanite	proximal	35.9		27.4	15.1	20.1	5.8	6.44	150	120	1	straight	shoulder			
12N24W2	porcellanite	midsection	32.9		27.1	16.4		6.9	6.85			0	unable	shoulder			
12N24W3	porcellanite	complete	34	25.6	26.4	14.9	16.1	5.4	4.8	155	115	1	straight	shoulder	2	0.53	4.74
12N24W5	porcellanite	proximal	23.1		17.2	10.1	13.9	2.3	1.05	155	120	2	convex	shoulder			
12N24W6	porcellanite	proximal	23.3		23.6	13.1	16.5	5.7	3.82	160	125	0	convex	shoulder			
12N24W7	porcellanite	complete	32.4	23.2	25.8	15.7	18.7	5.3	3.73	165	115	0	convex	shoulder	3	0.25	4.38
12N24W8	porcellanite	distal	36.5		24.4			3.9	3.84			1	unable	unable			
14N24W1	porcellanite	complete	44.5	37.3	24.1	16.5	17.6	6.3	6.39	150	115	1	straight	shoulder	3	0.06	5.92
14N24W2	porcellanite	lateral edge	34.4		18.8			5.3	3.77			1	unable	unable			
14N24W3	porcellanite	proximal	26.3		21.8	15.2	18.8	4.7	3.34	145	120	0	convex	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
14N24W4	porcellanite	midsection	28.8		19.5	11.5		5.4	2.94			0	straight	shoulder			
14N24W5	porcellanite	proximal	26		23.6	15.4	17.6	4.9	3.05			0	convex	shoulder			
14N24W7	porcellanite	midsection	18		19.4			4	1.42			0	unable	unable			
0022W2	porcellanite	complete	47.2	36.5	29.1	16.3	19	6.3	7.49	145	105	0	convex	shoulder	3	0	5.79
0022W3	porcellanite	complete	45.6	37.3	21.5	11.8	14.1	6.1	5.57	150	105	0	convex	shoulder	3	0	6.11
0022W4	porcellanite	midsection	33.3		23.9			6.2	5.55			1	unable	shoulder			
0022W5	porcellanite	distal	34.4		20.3			5	3.53			0	unable	unable			
0022W8	porcellanite	proximal	21.1		25.3	12.9	17.2	4.7	2.91	135	120	0	straight	shoulder			
0022W9	porcellanite	midsection	28.2		22.2			4.9	3.06			1	unable	shoulder			
0022W10	porcellanite	distal	16.6		17.5			4.7	1.17			0	unable	unable			
0022W12	porcellanite	proximal	15.5		20.3	20.3	20.3	4.5	1.76			0	convex	unshouldered			
2N22W1	porcellanite	complete	50.6	41.2	25.1	17	19.2	5.7	7.26	150	120	0	straight	shoulder	3	0	7.23
2N22W2	porcellanite	complete	38.4	30.7	26.1	14.4	17.9	5.8	5.37	160	110	0	concave	shoulder	1	0.5	5.29
2N22W3	porcellanite	midsection	27		25.1			4.6	4.31			0	unable	unable			
2N22W4	porcellanite	complete	33.1	26.9	22.9	14.9	16.7	4.6	3.2	150	120	0	convex	shoulder	3	0	5.85
2N22W5	porcellanite	distal	31.9	24.6	22.2	13.9		5.2	3.09	160	120	0	convex	shoulder		0	4.73
2N22W6	porcellanite	midsection	17.7		24.8			5.4	2.73			0	unable	unable			
2N22W7	porcellanite	distal	28.8		23.1			4.4	2.97			1	unable	unable			
2N22W8	porcellanite	proximal	27.1		22.3	11.7	13.7	3.8	3.28	155	120	1	straight	shoulder			
2N22W9	porcellanite	lateral edge	27.8		17.5			5.7	3.64			0	unable	unable			
2N22W11	porcellanite	midsection	27.7		18.6			3.7	2.35			1	unable	unable			
2N22W12	porcellanite	midsection	22.5		24.7	16.1		5.1	3.44			1	unable	shoulder			
2N22W14	porcellanite	distal	21.1		20			4.3	1.58			0	unable	unable			
2N22W16	porcellanite	complete	40.9	33.2	20.7	13.7	16.3	5.2	4.69	140	115	0	straight	shoulder	3	0.06	6.38
2N22W17	porcellanite	complete	52.5	52.3	27.7	27.7	27.7	5.9	9.65			0	convex	unshouldered	3	0.19	8.86
2N22W18	porcellanite	complete	46.7	39.4	25.8	14.4	16.8	5.1	6.62	155	120	2	straight	shoulder	3	0.13	7.73
4N22W2	porcellanite	proximal	42.3		25	13.4	17.3	4.5	5.31	140	100	0	convex	shoulder			
4N22W3	porcellanite	complete	31.2	22.6	22.6	15.6	17.5	5.5	3.93	160	110	1	straight	shoulder	3	0	4.11
4N22W4	porcellanite	midsection	35.2		29.4	17.2	18.2	5	7.1			0	straight	shoulder			
4N22W5	porcellanite	proximal	28.3		26.9	15.3	19.9	7.1	6.03	160	120	0	straight	shoulder			
4N22W6	porcellanite	proximal	21.1		22.9	22.9	22.9	5.8	4.03			2	convex	unshouldered			
4N22W7	porcellanite	midsection	29		21.9	13.7		5.7	3.66			0	straight	shoulder			
4N22W10	porcellanite	midsection	34.5		27.4	15.5		5.6	5.78			1	unable	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4N22W11	porcellanite	midsection	20.4		22.1	12.3		4.9	2.8			0	unable	shoulder			
4N22W12	porcellanite	distal	25.5		22.4			5.2	2.52			0	unable	shoulder			
4N22W13	porcellanite	distal	25.2		20.4			4.7	2.19			0	unable	unable			
6N22W1	porcellanite	complete	50.5	42.1	27.5	14.9	19.7	7.7	10.26	150	120	1	convex	shoulder	3	0	5.47
6N22W2	porcellanite	complete	51.2	43.4	22.4	12.5	14.8	5.4	6.65	135	110	0	convex	shoulder	3	0	8.04
6N22W4	porcellanite	midsection	37		22.2			5.3	5.02			0	unable	unable			
6N22W5	porcellanite	complete	31.1	20.5	20	14.1	16.3	4.6	2.66	180	120	1	straight	shoulder	3	0	4.46
6N22W7	porcellanite	complete	31.2	24.5	22.5	17.8	19	5.9	3.96	180	110	0	straight	shoulder	3	0.19	4.15
6N22W8	porcellanite	midsection	30.7		21.8	13.1		4.6	3.34			0	unable	shoulder			
6N22W9	porcellanite	complete	30	22.8	21.8	15.7	18.7	5	3.03	180	115	0	straight	shoulder	1	0.44	4.56
6N22W10	porcellanite	proximal	26.7		20.9	14.4	16.4	4.9	3.05			0	convex	shoulder			
6N22W11	porcellanite	lateral edge	19.2		20.7			5.4	2.62			0	unable	unable			
8N22W1	porcellanite	complete	46.2	46.1	21.4	21.4	21.4	4.7	5.7			2	convex	unshouldered	3	0	9.81
8N22W2	porcellanite	complete	45.3	37.5	23.9	14.6	18.1	5.7	6.01	170	115	0	straight	shoulder	3	0	6.58
8N22W3	porcellanite	complete	41.8	35	24.3	14.6	16.5	5.1	5.15	180	130	1	straight	shoulder	3	0.09	6.86
8N22W4	porcellanite	complete	40.8	32.9	26.9	15.7	19.5	5.2	5.3	150	110	0	straight	shoulder	3	0	6.33
8N22W5	porcellanite	distal	46	36.2	28.1	14.1		6	7.5	160	115	0	straight	shoulder		0.13	6.03
8N22W6	porcellanite	complete	35.3	27.3	23.5	17.6	21.4	5.2	4.94	180	130	0	straight	shoulder	1	0.25	5.25
8N22W7	porcellanite	complete	29.4	21.6	20.7	14.7	16.8	6.1	3.61	180	125	0	convex	shoulder	3	0.09	3.54
8N22W9	porcellanite	proximal	36.2		23.4	13.1	15.1	4.7	4.7	150	120	1	straight	shoulder			
8N22W10	porcellanite	proximal	32.4		17.8	10	12.9	3.7	2.89	160	110	2	convex	shoulder			
8N22W11	porcellanite	distal	31.5	25.1	21.2	14.1		5	3.03	165	110	0	convex	shoulder		0.31	5.02
8N22W12	porcellanite	midsection	28		25.9	14.9		5.5	3.78			0	unable	shoulder			
8N22W13	porcellanite	midsection	16.7		19			3.7	1.53			0	unable	unable			
10N22W1	porcellanite	distal	50.7	44.5	24.1	14.4		5.3	5.67	150	130	0	convex	shoulder		0	8.4
10N22W3	porcellanite	proximal	36.6		29.7	15.8	22.1	5.7	6.8	155	120	0	straight	shoulder			
10N22W4	porcellanite	complete	36.7	33.7	18.4	9.2	13.6	4.8	3.29	180	130	1	convex	shoulder	3	0.06	7.02
10N22W5	porcellanite	proximal	22.4		23.9	13.8	18.5	4.7	3.04	150	115	0	convex	shoulder			
10N22W6	porcellanite	complete	39.6	29.4	23.3	15.2	16.8	4.9	4.65	165	120	0	straight	shoulder	3	0	6
10N22W7	porcellanite	distal	35.6		22.4			4.7	3.1			0	unable	unable			
10N22W8	porcellanite	proximal	31.3		21.8	13.6	16.7	4.3	4.03	160	110	2	convex	shoulder			
10N22W9	porcellanite	proximal	33.2		25.1	14.3	16.4	4.8	4.47	160	115	0	straight	shoulder			
10N22W10	porcellanite	proximal	16.1		23.7	11.9	14.9	4.6	2.17	150	115	1	straight	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
10N22W12	porcellanite	proximal	21.5		20.6	15.2	17.6	4.6	2.56	165	115	0	straight	shoulder			
10N22W13	porcellanite	proximal	19.6		23	14.3	18.9	4.7	2.66	170	110	0	straight	shoulder			
10N22W14	porcellanite	complete	38.1	38	23.1	23.1	23.1	4.7	4.54			1	convex	unshouldered	3	0	8.09
10N22W15	porcellanite	midsection	18.2		16.1	7.4		3.4	1.24			1	straight	shoulder			
10N22W16	porcellanite	distal	26.4		23.4			5.5	3.46			0	unable	shoulder			
10N22W17	porcellanite	midsection	16.6		21.3			5.1	1.9			0	unable	unable			
12N22W2	porcellanite	midsection	30.7		27.8	15.4		4.9	5.3	160	115	0	convex	shoulder			
12N22W4	porcellanite	proximal	37.5		26.8	15.8	20.8	6.5	6.05	160	125	1	convex	shoulder			
12N22W5	porcellanite	midsection	31.9		22			5.2	4.36			0	unable	unable			
12N22W6	porcellanite	midsection	15.8		20			4.6	1.62			1	unable	unable			
14N22W1	porcellanite	proximal	29.4		25.3	15.5	17.4	5.3	4.3	155	120	0	convex	shoulder			
14N22W2	porcellanite	proximal	17.5		24.1	17.6	21.3	6	2.97			0	concave	shoulder			
2N20W1	porcellanite	complete	42.3	36.7	26.6	15.1	18.1	4.7	5.47	160	120	2	straight	shoulder	3	0	7.81
2N20W2	porcellanite	distal	20.4		21.6			4.8	1.94			0	unable	unable			
2N20W3	porcellanite	lateral edge	23		16.2			4.5	1.61			0	unable	unable			
4N20W2	porcellanite	midsection	39.2		28.6	17.1		5.2	7.69			0	unable	shoulder			
4N20W3	porcellanite	midsection	34.2		29.7	17.3		5.6	7.57			0	unable	shoulder			
4N20W4	porcellanite	distal	41.4		23.9	13		6.5	6.4			0	straight	shoulder			
4N20W5	porcellanite	proximal	23.7		23.2	23.2	23.2	4.5	3.43			0	straight	unshouldered			
4N20W6	porcellanite	distal	24		25.5			4.7	3.03			1	unable	unable			
4N20W8	porcellanite	midsection	19.7		23	16.2		6.1	3.54			0	unable	unable			
4N20W9	porcellanite	distal	30.2		23.6	15		4.8	3.39	165	120	2	convex	shoulder			
6N20W1	porcellanite	proximal	37.6		27.7	17.3	18.9	4.9	5.06	150	105	1	straight	shoulder			
6N20W2	porcellanite	midsection	35.1		27.6	15.3		6	6.97			0	straight	shoulder			
6N20W3	porcellanite	complete	49.6	42.2	22.2	11.7	13.5	5.1	5.02	160	100	2	straight	shoulder	3	0	8.27
6N20W4	porcellanite	proximal	37.9		27.1	16	19.7	5.7	5.4	160	120	1	straight	shoulder			
6N20W5	porcellanite	complete	36.1	28.2	26.6	16.8	20.6	5.4	4.5	160	115	1	concave	shoulder	3	0.09	5.22
6N20W7	porcellanite	midsection	17.4		21.7			4.4	2.26			0	unable	unable			
8N20W1	porcellanite	complete	46	40.2	25.6	14.9	16.8	4.6	6.41	160	115	1	straight	shoulder	3	0	8.74
8N20W3	porcellanite	midsection	20.9		26.3			5.7	3.13			0	unable	unable			
10N20W1	porcellanite	complete	50.3	43.3	28.1	18.2	20.8	5.7	7.31	165	120	1	concave	shoulder	3	0	7.6
10N20W2	porcellanite	proximal	35.2		26.2	15.3	18.4	5.8	6.22	145	115	0	concave	shoulder			
10N20W4	porcellanite	complete	32.3	26	22.8	14.5	16.9	4.5	3.51	150	120	0	straight	shoulder	3	0.19	5.78

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
10N20W5	porcellanite	proximal	23		16.2	10.4	12.6	4.7	2.06	195	120	0	convex	shoulder			
10N20W6	porcellanite	midsection	23.5		22.2			5.4	2.94			0	unable	unable			
10N20W7	porcellanite	midsection	20.6		23.8			5.7	3			0	concave	shoulder			
10N20W8	porcellanite	complete	33.4	26.1	17	11.7	12.5	4.2	2.57	180	130	0	straight	shoulder	3	0.13	6.21
10N20W10	porcellanite	lateral edge	16.5		23.8			4.1	1.76			1	unable	shoulder			
12N20W1	porcellanite	complete	38.9	31.5	23.6	15.2	17.6	5.8	5.43	150	110	1	convex	shoulder	3	0	5.43
14N20W1	porcellanite	complete	53.7	46.2	24	15.7	16.7	5.4	7.13	180	100	0	straight	shoulder	3	0	8.56
14N20W2	porcellanite	distal	50.2	43.3	24.2	14.5		6.4	7.14			0	unable	shoulder		0.06	6.77
14N20W3	porcellanite	midsection	31.1		27	14.2		5.8	5.13	155	125	1	concave	shoulder			
14N20W5	porcellanite	complete	31.6	23.3	19.5	12.7	16.5	4.4	2.75	155	120	1	convex	shoulder	3	0.16	5.3
14N20W6	porcellanite	complete	30.6	24	20.4	11.1	15.9	5.5	2.97	160	125	0	concave	shoulder	3	0	4.36
14N20W9	porcellanite	midsection	22.1		20.1	12.5		4	2.26			0	unable	shoulder			
16N20W1	porcellanite	complete	52.5	45.4	24.7	14.5	15.8	4.8	7.2	180	125	1	convex	shoulder	3	0	9.46
16N20W2	porcellanite	complete	52.7	45.5	27.2	13.9	18.5	5.6	7.57	140	110	0	straight	shoulder	3	0	8.13
16N20W3	porcellanite	complete	44.1	35.4	20.6	12.9	16.2	5.7	4.79	180	120	0	straight	shoulder	3	0.13	6.21
16N20W4	porcellanite	complete	29.6	23.5	22.9	14.6	16.1	5.2	3.23	160	115	0	straight	shoulder	3	0.25	4.52
16N20W5	porcellanite	complete	25.5	19	19.3	10.1	11.9	5.3	2.4	155	120	0	straight	shoulder	3	0	3.58
16N20W7	porcellanite	midsection	29.8		23.2	14.3		4.8	3.38			1	straight	shoulder			
16N20W8	porcellanite	proximal	26.4		21.2	21.2	21.2	4.7	2.79			1	convex	unshouldered			
18N20W1	porcellanite	distal	43.7	35.6	27.2	15		6.2	7.15	155	120	0	straight	shoulder		0	5.74
18N20W2	porcellanite	proximal	41.5		24.7	15	17	5.7	6.08	155	105	0	concave	shoulder			
18N20W3	porcellanite	midsection	35.7		25.6			5.5	5.03			0	unable	unable			
18N20W4	porcellanite	midsection	26.4		26.4	15.2		5	4.2			0	unable	shoulder			
18N20W5	porcellanite	prox lateral edge	28.5		19.6			5.9	3.6			0	straight	shoulder			
18N20W6	porcellanite	complete	30.3	22	16	10.4	13.7	4.7	2.36	165	125	0	convex	shoulder	3	0	4.68
4N18W1	porcellanite	proximal	45.3		24.6	15.2	17.6	5	6.09	155	115	1	straight	shoulder			
4N18W2	porcellanite	complete	45.1	38.2	27.6	15.9	19.4	5.1	6.39	160	120	0	straight	shoulder	3	0	7.49
4N18W3	porcellanite	complete	37.5	29.5	25.6	13.8	18	5.2	4.45	160	115	2	straight	shoulder	3	0.16	5.67
4N18W4	porcellanite	complete	34.3	26.6	22.7	13.3	16.9	4.6	3.68	150	130	1	convex	shoulder	3	0.16	5.78
4N18W5	porcellanite	complete	34.9	35.1	23.1	23.1	23.1	3.7	3.13			3	straight	unshouldered	3	0	9.49
4N18W6	porcellanite	proximal	29.1		21.7	12.3	16.1	4.8	3.02	160	125	1	straight	shoulder			
4N18W7	porcellanite	complete	34.4	26.2	23.7	14.1	16.5	6	4.55	160	135	2	convex	shoulder	3	0	4.37
4N18W8	porcellanite	proximal	30.5		20.7	13.5	17.8	5.5	3.53	180	130	0	convex	shoulder			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4N18W9	porcellanite	distal	16.4		16.9			5	1.2			0	unable	unable			
4N18W11	porcellanite	midsection	21.8		23.3	13.9		5	3.26			0	unable	shoulder			
4N18W12	porcellanite	proximal	18.5		21.7	15.4	18.6	5.3	2.21	180	130	0	straight	shoulder			
6N18W1	porcellanite	proximal	53.2		26.4	14	14.8	5.6	7.66	155	125	1	straight	shoulder			
6N18W2	porcellanite	complete	53.2	45.9	28	15.5	20.2	6.8	10.08	155	120	0	concave	shoulder	3	0	6.75
6N18W3	porcellanite	complete	36.4	29.8	22.4	12.9	16.8	5.1	3.58	140	115	1	convex	shoulder	3	0.25	5.84
6N18W4	porcellanite	complete	39.5	31.7	25.1	14.4	17.2	5.4	4.72	150	115	0	straight	shoulder	3	0.25	5.87
6N18W8	porcellanite	complete	40.2	33.5	22.3	13.6	16.3	4.9	4.69	150	115	1	straight	shoulder	3	0.06	6.84
6N18W9	porcellanite	complete	44.4	36.1	27.4	15.6		6.4	7.08	160	120	1	convex	shoulder	3	0.25	5.64
6N18W10	porcellanite	complete	33.8	26.5	24.5	15.3	18.4	6.2	4.6	180	120	0	straight	shoulder	3	0.25	4.27
6N18W11	porcellanite	midsection	25.8		24.5			4.8	3.15			0	unable	unable			
6N18W12	porcellanite	proximal	29.3		25.6	15.6	19.5	5.6	4.76	160	130	0	straight	shoulder			
6N18W13	porcellanite	midsection	16.8		26.6	13.5		4.4	1.96			0	unable	shoulder			
6N18W14	porcellanite	proximal	22.2		24.3	17.3	21.3	5.2	3.17	165	120	1	straight	shoulder			
8N18W1	porcellanite	complete	48.8	40.6	27.2	16.6	19.7	5.5	7.07	150	110	0	straight	shoulder	3	0.03	7.38
8N18W2	porcellanite	complete	46.6	38.5	23.3	15.4	18.3	5.8	5.65	180	120	0	convex	shoulder	3	0	6.64
8N18W4	porcellanite	complete	42.2	33.8	21.7	14.2	17.2	5.5	5.3	165	120	0	straight	shoulder	3	0.03	6.15
8N18W5	porcellanite	midsection	32.1		27.4	17.6		5.4	6.2			0	unable	shoulder			
8N18W7	porcellanite	proximal	39.9		24.8	14.7	18.2	5.8	5.51	160	115	0	convex	shoulder			
8N18W9	porcellanite	distal	41	40.2	25.6	16.1		4.7	4.83			0	unable	unable		0.03	8.55
8N18W10	porcellanite	complete	34.9	39.6	18.5	11.9	12.7	3.4	2.59	150	115	2	straight	shoulder	3	0	11.6
8N18W11	porcellanite	proximal	23.4		20.6	15.5	16.8	4.9	2.78	180	120	0	straight	shoulder			
8N18W12	porcellanite	proximal	17.6		15.7	9.9	13.7	4.5	1.49	210	125	0	straight	shoulder			
8N18W13	porcellanite	proximal	27.9		26.6	15.1	15.8	5.5	4.32	150	115	0	straight	shoulder			
8N18W14	porcellanite	distal	26.2		25.4			5.1	3.54			0	unable	unable			
8N18W15	porcellanite	distal	29.3		19.4	13		4.4	2.49			0	straight	shoulder			
8N18W16	porcellanite	midsection	13.5		21			3.8	1.37			0	unable	unable			
10N18W2	porcellanite	complete	33.1	25.9	22.2	14.8	18.2	5.9	4.28	165	120	0	straight	shoulder	3	0	4.39
12N18W1	porcellanite	complete	43.5	33.4	22.9	15.8	20.4	5.5	6.32	180	125	0	convex	shoulder	3	0	6.07
12N18W2	porcellanite	midsection	31.6		23.6	14.7		4.9	3.72			0	unable	shoulder			
12N18W3	porcellanite	complete	42.4	33.7	26.1	15.4	16.9	5.1	5	180	105	2	straight	shoulder	3	0	6.61
12N18W4	porcellanite	midsection	45.2		24.2			5.1	5.82			0	unable	unable			
12N18W5	porcellanite	complete	46.6	37.7	21.1	12	14.6	5.2	4.97	160	115	0	straight	shoulder	3	0	7.25

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
14N18W1	porcellanite	distal	58.3	52.7	24.9	14.6		4.7	7.55			1	unable	shoulder		0	11.2
14N18W2	porcellanite	midsection	45.7		26.7	14.3		4.9	6.8			0	unable	shoulder			
14N18W5	porcellanite	distal	40	32.5	21.9	14		5	4.2	155	105	0	unable	shoulder		0	6.5
14N18W6	porcellanite	midsection	36.9		22.1			4.8	4.58			0	unable	shoulder			
14N18W7	porcellanite	complete	41.2	33.6	27.1	16.7	20.1	5.5	5.87	160	125	1	straight	shoulder	3	0.06	6.11
14N18W8	porcellanite	complete	45.6	36.7	24.4	15.3	18.3	5.9	6.79	160	120	1	convex	shoulder	3	0	6.22
14N18W9	porcellanite	proximal	31.8		24.1	13.5	16.3	6.1	4.45	150	120	0	straight	shoulder			
14N18W11	porcellanite	complete	28.6	18.1	23.4	14.1	17.7	5.5	3.69	155	105	0	convex	shoulder	3	0.38	3.29
14N18W12	porcellanite	midsection	27		20.4			4.7	3.15			1	unable	unable			
14N18W13	porcellanite	complete	26.3	17	22.2	12.2	16.9	5.3	2.89	130	115	0	straight	shoulder	1	1	3.21
14N18W14	porcellanite	complete	37.4	27.3	23.2	14.4	16.1	5.8	4.5	150	120	0	convex	shoulder	3	0	4.71
16N18W2	porcellanite	distal	39.9	40	26.6			5.8	6.16			1	unable	unable		0	6.9
16N18W3	porcellanite	distal	37.4	38.7	24.5			5.7	4.67			1	unable	unable		0	6.79
16N18W4	porcellanite	complete	32.2	25.5	23.6	11.7	14.2	2.9	2.83	150	115	3	straight	shoulder	3	0.25	8.79
16N18W5	porcellanite	complete	35.7	29.5	18.9	9.5	11.6	3.3	2.35	145	120	2	straight	shoulder	3	0	8.94
16N18W8	porcellanite	complete	33	26.1	20.3	14.9	17.3	6.2	3.46	160	115	0	straight	shoulder	3	0	4.21
16N18W9	porcellanite	complete	38.4	29.8	22.9	12.1	15.9	5.1	4.5	160	120	0	straight	shoulder	3	0	5.84
16N18W11	porcellanite	complete	35.1	34.9	22.5	22.5	22.5	4.4	3.32			1	convex	unshouldered	3	0	7.93
16N18W12	porcellanite	distal	33.9	34.3	28.1	15.9		5.3	5.18			0	unable	shoulder			6.47
16N18W13	porcellanite	midsection	29.9		29.4			6.3	5.74			0	unable	shoulder			
16N18W14	porcellanite	distal	40.4	34.6	23.2			4.7	4.8			0	straight	shoulder		0.13	7.36
16N18W15	porcellanite	proximal	28.8		22	13.5	16.6	4.9	3.48	180	130	1	straight	shoulder			
16N18W17	porcellanite	distal	22		20.3			5.1	1.98			0	unable	unable			
16N18W18	porcellanite	midsection	16.7		17.2			3.5	1			0	unable	unable			
18N18W1	porcellanite	complete	51.2	43.6	27.9	16.3	18.6	5.9	8.02	165	120	1	straight	shoulder	3	0.16	7.39
18N18W2	porcellanite	distal	57.8	50.5	28.4	15.7		6	9.39	180	100	0	unable	shoulder		0	8.42
18N18W3	porcellanite	complete	48	40	24	15.5	18.5	6.3	6.56	150	120	0	straight	shoulder	3	0	6.35
18N18W4	porcellanite	complete	40.1	32.7	25.5	14	17.5	5.5	5.95	145	115	1	convex	shoulder	3	0.03	5.95
18N18W5	porcellanite	complete	36.3	27.9	21.9	16.2	19.1	5.5	4.18	150	110	0	straight	shoulder	3	0.19	5.07
18N18W6	porcellanite	complete	41.5	33.3	28	16	20	5.1	6.04	145	120	0	straight	shoulder	3	0	6.53
18N18W8	porcellanite	complete	42.7	35	21.8	12.7	16.4	4.9	4.78	180	125	0	concave	shoulder	3	0	7.14
18N18W10	porcellanite	complete	33.4	26.8	21.9	12.4	13.8	5.4	3.18	145	115	2	convex	shoulder	3	0	4.96
18N18W11	porcellanite	proximal	31.6		23.4	14.1	16.2	6.5	5.18	160	135	0	straight	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
18N18W12	porcellanite	proximal	34.5		24.7	13.8	15.4	5.4	5.2	145	120	0	straight	shoulder			
18N18W14	porcellanite	complete	37.8	30.8	20.5	11	12.5	4.9	3.35	155	125	0	convex	shoulder	3	0.13	6.29
18N18W15	porcellanite	proximal	40.1		24.6	15.1	17	6	5.97	165	120	0	convex	shoulder			
18N18W16	porcellanite	proximal	35.7		17.7	12.3	15.8	4.5	2.74	170	130	2	convex	shoulder			
18N18W18	porcellanite	proximal	25		17.6	14.3	16.9	3.7	1.81	180	120	2	convex	shoulder			
18N18W20	porcellanite	proximal	34.4		22.6	14	16.2	7.5	5.54	140	105	0	straight	shoulder			
18N18W21	porcellanite	distal	25.2		25.4			5.5	3.16			0	unable	unable			
18N18W22	porcellanite	midsection	24.1		24			4.9	3.43			0	unable	unable			
18N18W23	porcellanite	midsection	22.7		24.8			5.9	3.84			0	unable	unable			
18N18W24	porcellanite	proximal	25.6		25.4	12.9	18.1	6.1	4.26	180	125	0	straight	shoulder			
20N18W1	porcellanite	distal	43.9		20.4			4.6	4.66			2	unable	unable			
20N18W2	porcellanite	distal	46.1	40.2	24.9	13.9		5.6	5.95	155	115	2	unable	shoulder		0.22	7.18
20N18W3	porcellanite	complete	42.4	32.5	24.9	16.9	19.7	6.2	5.77	150	120	0	convex	shoulder	1	0.5	5.24
20N18W4	porcellanite	complete	40.8	32.6	22.9	15.3	17.2	4.4	4.82	160	120	1	straight	shoulder	3	0	7.41
20N18W6	porcellanite	complete	22.4	14.9	15	9.7	12.2	4.6	1.44	160	115	0	straight	shoulder	3	0	3.24
20N18W8	porcellanite	distal	31.2		20.5			5.4	3.11			0	unable	unable			
20N18W9	porcellanite	lateral edge	28.7		17.3			3.3	2.1			2	unable	shoulder			
22N18W1	porcellanite	distal	32.3		23			4	3.76			1	unable	unable			
22N18W2	porcellanite	proximal	31.9		22.2	14.4	19.2	5.3	3.87	165	130	2	straight	shoulder			
22N18W3	porcellanite	proximal	35.9		24.3	24.3	24.3	5.3	5.26			1	straight	unshouldered			
22N18W4	porcellanite	complete	38.1	29.5	23	15.7	19.6	5.5	5.19	140	120	0	straight	shoulder	3	0.13	5.36
22N18W5	porcellanite	complete	42	42	22.5	22.5	22.5	5.7	5.08			0	convex	unshouldered	3	0	7.37
10N16W1	porcellanite	complete	52	43	28.9	16.4	21.6	5.1	8.34	150	125	1	straight	shoulder	3	0.16	8.43
10N16W3	porcellanite	complete	48.5	38	21.9	15.5	16.8	6.2	6.57	200	105	0	straight	shoulder	3	0.25	6.13
10N16W4	porcellanite	proximal	36.4		22.5	14.9	17.6	6.1	5.68	180	130	0	straight	shoulder			
10N16W9	porcellanite	distal	28.1		20.4	12.4		4.5	2.91			1	unable	shoulder			
10N16W10	porcellanite	distal	27.9		25			5.7	5.07			0	unable	unable		0	
10N16W11	porcellanite	midsection	25.9		25.7			6.7	5.35			0	unable	shoulder			
10N16W12	porcellanite	complete	28.5	20.1	20.7	13.8	17	5.1	3.1	180	125	1	straight	shoulder	3	0.25	3.94
10N16W13	porcellanite	midsection	26.3		21.8	14.2		5.1	3.09			1	unable	shoulder			
12N16W1	porcellanite	proximal	28.8		24	14.7	17.4	5.6	4.46	150	120	0	concave	shoulder			
12N16W2	porcellanite	proximal	39.8		24.1	14.3	16.7	5.8	5.18	145	110	1	convex	shoulder			
12N16W3	porcellanite	complete	42.3	34.3	24.1	14.8	16.6	6.1	5.86	155	110	0	straight	shoulder	3	0	5.62

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
12N16W4	porcellanite	distal	40.3	36	19.7	10.3		6	4.69			0	unable	shoulder		0	6
12N16W5	porcellanite	proximal	33.3		25.7	25.7	25.7	4.7	4.99			0	convex	unshouldered			
14N16W1	porcellanite	distal	65	56	29.4	14.8		6.5	11.58			0	unable	shoulder		0	8.62
14N16W2	porcellanite	complete	52	43.1	28.2	14.9	16.1	5.4	8.85	155	110	1	straight	shoulder	3	0	7.98
14N16W3	porcellanite	distal	56.4	49.2	26.1	14.3		6.3	8.34	150	120	0	unable	shoulder		0	7.81
14N16W4	porcellanite	complete	42.3	42.2	25	25	25	4.6	4.61			0	convex	unshouldered	3	0	9.17
14N16W5	porcellanite	complete	41	33.6	27.2	14.7	18.3	5.8	5.47	140	115	0	straight	shoulder	3	0.09	5.79
14N16W6	porcellanite	proximal	39.2		25.4	15.3	19.5	5.9	5.55	170	120	0	straight	shoulder			
14N16W8	porcellanite	complete	30.1	21.9	21.3	14.1	17.3	5	2.89	160	120	1	convex	shoulder	1	0.31	4.38
14N16W9	porcellanite	proximal	28		24.6	13.8	19	5.8	4.03	155	130	0	convex	shoulder			
14N16W11	porcellanite	proximal	35.9	27.3	24.3	16.6	18.2	4.7	3.43	180	125	2	convex	shoulder			5.81
14N16W12	porcellanite	complete	28.2	19.9	24.8	17.7	20.7	5	3.58	180	125	0	straight	shoulder	2	1	3.98
14N16W13	porcellanite	proximal	17.9		27.3	16.6	19.7	5.1	3.03	145	115	0	straight	shoulder			
16N16W1	porcellanite	complete	47.8	40.4	26.6	15.9	17.7	5.3	7.3	150	115	0	straight	shoulder	3	0	7.62
16N16W2	porcellanite	complete	44.3	36.8	24.3	14.7	17.7	6	5.75	160	125	2	straight	shoulder	3	0.09	6.13
16N16W3	porcellanite	complete	47.5	40	27.6	18	21.4	5	6.77	145	115	1	convex	shoulder	3	0	8
16N16W4	porcellanite	complete	45.7	37	25.5	13.3	18.4	5.5	6.2	145	120	0	convex	shoulder	3	0	6.73
16N16W5	porcellanite	distal	42.4	34.2	27.3	15.6		5.1	6.42	140	115	1	unable	shoulder		0.13	6.71
16N16W6	porcellanite	complete	47	39.4	24	15.8	18.1	5	5.8	150	115	1	concave	shoulder	3	0	7.88
16N16W7	porcellanite	complete	37.8	29.5	24.9	14.1	17.5	3	2.99	155	120	2	convex	shoulder	3	0	9.83
16N16W9	porcellanite	proximal	14		24.7	15.6	19	5.3	2	160	110	0	straight	shoulder			
16N16W10	porcellanite	distal	26.7		23.3			5.4	3.02			0	unable	unable			
16N16W11	porcellanite	midsection	24.2		18.8	13		4.5	2.44			0	unable	shoulder			
16N16W13	porcellanite	prox lateral edge	20.1		21.8			5.2	2.53			0	straight	shoulder			
18N16W2	porcellanite	complete	43.1	35.2	22.3	13.5	16.6	6.1	5.21	160	125	1	straight	shoulder	3	0.03	5.77
18N16W3	porcellanite	proximal	48.6		24.4	13.6	17.3	6.1	7.54	150	120	1	convex	shoulder			
18N16W5	porcellanite	complete	31.6	24	23.1	17.6	20.4	5.1	3.47	180	130	2	straight	shoulder	3	0	4.71
18N16W6	porcellanite	complete	35.4	28.5	22.4	14.3	16.6	4.5	3.8	155	115	1	convex	shoulder	3	0	6.33
18N16W7	porcellanite	proximal	21.4		17.9	17.9	17.9	3.7	1.77			2	convex	unshouldered			
18N16W8	porcellanite	proximal	21.7		27.8	22.3	24.7	5.7	4.32	180	130	0	convex	shoulder			
18N16W9	porcellanite	complete	29.5	29.5	24.4	24.4	24.4	3.7	2.93			1	straight	unshouldered	3	0	7.97
18N16W10	porcellanite	midsection	31.3		22.2			4.9	4.19			1	unable	shoulder			
18N16W11	porcellanite	distal	32.5		22.7			5.8	4.35			1	convex	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
20N16W1	porcellanite	complete	70.5	62.7	27	14.9	18.9	5.9	13.53	160	130	1	straight	shoulder	3	0	10.6
20N16W2	porcellanite	complete	55	48.2	27.7	14.7	18.9	6	9.01	150	120	0	straight	shoulder	3	0	8.03
20N16W3	porcellanite	complete	54.5	44.8	24.8	14.3	19.1	4.3	5.63	180	125	1	straight	shoulder	3	0	10.4
20N16W5	porcellanite	proximal	52.8		27.8	16.6	19.7	5.1	9.15	150	125	2	convex	shoulder			
20N16W6	porcellanite	distal	41.3	41.5	28.7	16.4		5.4	6.49			0	unable	shoulder		0	7.69
20N16W7	porcellanite	distal	47.4	40.7	25.9	12.9		5.9	6.25			0	unable	shoulder		0	6.9
20N16W8	porcellanite	complete	45.2	38.3	24.5	14.7	19.1	6	6.19	150	130	1	straight	shoulder	3	0.06	6.38
20N16W9	porcellanite	midsection	38.5		28.1	17.5		5.8	7.27			0	unable	shoulder			
20N16W10	porcellanite	distal	47.2	47	26.1	15.5		4.8	6.21			0	unable	shoulder		0	9.79
20N16W11	porcellanite	complete	37.6	28.5	25.9	16.7	19.1	5.1	4.87	150	120	1	straight	shoulder	3	0	5.59
20N16W13	porcellanite	proximal	31.5		23.1	14.7	17.3	5.2	3.26	155	125	0	convex	shoulder			
20N16W14	porcellanite	distal	24.9		20.5			5.5	2.75			0	unable	unable			
20N16W17	porcellanite	lateral edge	34.6		18.3			5	3.34			2	unable	unable			
20N16W18	porcellanite	proximal	29.9		21.8	14.2	16	4.9	3.45	155	105	2	concave	shoulder			
22N16W2	porcellanite	complete	47.6	38.3	23.2	14.5	18.5	6	6.44	150	115	0	convex	shoulder	3	0	6.38
22N16W3	porcellanite	complete	42.9	33.3	25.3	15.5	17.8	5.1	4.75	160	115	2	straight	shoulder	3	0	6.53
22N16W4	porcellanite	complete	42.1	34.6	26.2	14.4	17.6	5.5	6.07	145	115	0	straight	shoulder	3	0	6.29
22N16W5	porcellanite	distal	32.9	32.7	25.7	16.2		6.4	5.45			1	unable	shoulder		0	5.11
22N16W7	porcellanite	midsection	32.6		27.2	16.1		5.6	6.21			1	unable	shoulder			
22N16W8	porcellanite	complete	38.5	30	23.7	15.5	18.5	5	4.44	180	130	1	straight	shoulder	3	0.09	6
22N16W10	porcellanite	proximal	22.4		22.5	17.1	21.3	4.6	2.61	180	130	1	straight	shoulder			
22N16W11	porcellanite	proximal	19.9		24.6	13.5	18.6	5.4	2.62	140	110	0	convex	shoulder			
22N16W15	porcellanite	proximal	23.9		26.1	26.1	26.1	6.2	4.5			4	convex	unshouldered			
12N14W1	porcellanite	midsection	44		25.8	15.7		5.7	8.83			1	unable	shoulder			
12N14W2	porcellanite	distal	38.2		27.9	16.2		5.6	6.57			0	unable	shoulder			
12N14W3	porcellanite	midsection	29.3		28.4	18.3		4.7	5.3			1	unable	shoulder			
12N14W4	porcellanite	complete	33.9	28.6	23.8	15.6	18	6.3	4.94	150	115	2	concave	shoulder	3	0.31	4.54
12N14W5	porcellanite	distal	42.1	35	24.5	13.2		5.3	4.68	145	115	0	unable	shoulder		0	6.6
12N14W6	porcellanite	proximal	31.3		24	15.2	16.8	6	4.13	140	110	0	straight	shoulder			
12N14W7	porcellanite	proximal	32.7		22.9	22.9	22.9	4.7	3.74			3	convex	unshouldered			
12N14W8	porcellanite	complete	30.8	30.6	22.9	22.9	22.9	4.5	3.4			0	convex	unshouldered	2	0.25	6.8
12N14W9	porcellanite	midsection	23.9		24.6			4.9	2.89			0	unable	unable			
12N14W10	porcellanite	proximal	18.9		26	11.8	14.9	5.2	2.76	145	110	0	concave	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
14N14W1	porcellanite	complete	53	45.1	26.7	13.5	14.8	6.2	8.4	150	120	1	straight	shoulder	3	0	7.27
14N14W2	porcellanite	complete	46.8	34.7	25.5	13.5	19.2	7.1	8.02	160	130	1	straight	shoulder	3	0	4.89
14N14W3	porcellanite	proximal	36.1		30.1	16.4	20.1	5.4	7.5	140	120	0	straight	shoulder			
14N14W4	porcellanite	proximal	40.1		24.4	16.1	18.6	4.9	4.93	180	120	0	straight	shoulder			
14N14W5	porcellanite	proximal	41		26.1	14.8	18.9	6.5	6.96	150	130	0	straight	shoulder			
14N14W6	porcellanite	complete	42	34.7	22.4	12.8	14	5	4.85	160	105	0	straight	shoulder	3	0.03	6.94
14N14W7	porcellanite	distal	32.9	24	19.7	13.3		5	3.22	160	125	1	straight	shoulder		0.5	4.8
14N14W8	porcellanite	midsection	26.6		25.6			6.6	5.83			0	unable	unable			
14N14W9	porcellanite	complete	32	26.2	19.1	13.5	15.1	4.8	2.73	180	115	0	straight	shoulder	3	0	5.46
14N14W10	porcellanite	midsection	26.2		24.7			5.6	4.4			0	unable	unable			
14N14W11	porcellanite	distal	24.5		20.3			5.5	2.12			0	unable	unable			
14N14W12	porcellanite	proximal	23.8		23.3	23.3	23.3	4.5	3.86			3	convex	unshouldered			
14N14W13	porcellanite	distal	14.5		20.8			4	1.1			0	unable	unable			
16N14W1	porcellanite	complete	43.1	34.9	23.4	14.2	17	5.6	5.25	155	130	0	concave	shoulder	3	0.06	6.23
16N14W2	porcellanite	complete	41.1	34.2	26.4	14	16.5	5.1	5.69	150	120	0	convex	shoulder	3	0.13	6.71
16N14W3	porcellanite	distal	33		25.2			4.7	3.75			0	unable	unable			
16N14W4	porcellanite	complete	34.1	26.7	22.8	13.2	15.1	5	3.64	150	105	1	straight	shoulder	3	0	5.34
16N14W6	porcellanite	complete	33.7	25.8	24	13.4	16.1	5.9	4.26	150	110	0	straight	shoulder	3	0.25	4.37
16N14W7	porcellanite	midsection	29.3		26.6	15.4		5.7	5.29			0	unable	shoulder			
16N14W8	porcellanite	complete	23.5	14.6	18.6	13.8	16.6	5.3	2.27	160	130	1	concave	shoulder	2	1	2.75
16N14W9	porcellanite	complete	32.4	22.6	23.1	15.6	18.4	5.5	3.49	160	115	1	convex	shoulder	3	0.31	4.11
16N14W11	porcellanite	complete	29.8	24.1	17.3	9.4	9.8	3.9	1.8	180	90	1	straight	shoulder	1	0.25	6.18
16N14W12	porcellanite	midsection	20.9		19.6			6.4	2.64			0	unable	unable			
16N14W15	porcellanite	distal	19.6		19.2			5.2	1.42			0	unable	unable			
16N14W16	porcellanite	midsection	24.5		22			5.4	2.79			0	unable	unable			
18N14W1	porcellanite	complete	57.6	49.6	27.6	17.3	20.2	8.3	12.43	155	115	0	straight	shoulder	3	0	5.98
18N14W2	porcellanite	complete	61	49.7	27.1	13.8	19.4	6.3	9.69	145	115	1	straight	shoulder	3	0	7.89
18N14W3	porcellanite	distal	55.5	55.3	27.7	15.4		6.4	9.23			0	unable	shoulder		0	8.64
18N14W4	porcellanite	complete	52.3	44	26	12	19.8	5.9	7.41	145	120	1	straight	shoulder	3	0	7.46
18N14W5	porcellanite	distal	42.9	39.5	25.5	13.5		5.6	5.63			0	unable	shoulder		0	7.05
18N14W6	porcellanite	midsection	38.5		22.6	12.7		5.7	5.62	160	140	0	straight	shoulder			
18N14W7	porcellanite	lateral edge	38.2		19.1			6.9	5.27			0	concave	shoulder			
18N14W8	porcellanite	complete	33.8	25.9	21.3	12.9	17	5.9	4.02	150	125	0	straight	shoulder	3	0.06	4.39

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
18N14W9	porcellanite	complete	27.5	22.9	20.5	11.4	11.4	5.7	2.74	150	90	0	straight	shoulder	3	0.13	4.02
18N14W11	porcellanite	complete	31.4	25.6	23.1	11.9	15.8	4.7	2.81	145	120	1	straight	shoulder	3	0	5.45
18N14W13	porcellanite	midsection	30.9		23.9	13.6		4.8	4.22			0	unable	unable			
19N14W1	porcellanite	complete	44.3	37	19.4	10.8	13.4	4.9	3.97	150	105	2	straight	shoulder	3	0	7.55
21N14W1	porcellanite	complete	60.2	52.5	28.9	16.4	18.6	6.1	9.11	145	110	0	concave	shoulder	3	0	8.61
21N14W2	porcellanite	complete	52.1	45.2	25	14.2	18.6	5.7	8.44	145	120	0	straight	shoulder	3	0.19	7.93
21N14W4	porcellanite	complete	29.2	19.5	24.1	17.8	21.5	5.9	4.26	180	135	0	convex	shoulder	2	1	3.31
21N14W6	porcellanite	complete	47.3	40	25.7	15.4	18.5	5.9	7.27	155	115	0	straight	shoulder	3	0	6.78
21N14W7	porcellanite	complete	42.3	34.3	22.2	12.5	15.5	5.2	4.38	150	120	0	straight	shoulder	3	1	6.6
21N14W8	porcellanite	distal	31.4		24.3			5.1	3.7			0	unable	unable			
21N14W9	porcellanite	complete	31.7	25.4	21.2	13.8	15.7	4.8	2.79	180	130	0	straight	shoulder	3	0.19	5.29
21N14W10	porcellanite	complete	30.9	20.3	23.5	14.3	16.4	4.6	3.47	165	125	1	straight	shoulder	2	0.5	4.41
21N14W11	porcellanite	complete	29.1	21.5	20.4	11.1	15.2	4.7	2.29	150	130	0	convex	shoulder	3	0	4.57
21N14W12	porcellanite	complete	32.7	24	25.4	14.7	16.9	5	3.39	150	120	0	convex	shoulder	3	0.25	4.8
21N14W13	porcellanite	proximal	32.8		22.7	13	16.9	5.6	5.31	150	130	2	convex	shoulder			
21N14W15	porcellanite	complete	30.3	22.9	24	16.9	20.9	5.4	3.83	140	115	0	straight	shoulder	2	1	4.24
21N14W17	porcellanite	proximal	28.7		26	14.2	17.4	5.5	4.81	145	120	0	straight	shoulder			
21N14W19	porcellanite	complete	28.9	21	21.2	12	16.2	4.4	2.81	150	115	1	convex	shoulder	3	0.25	4.77
23N14W1	porcellanite	complete	72.2	72.2	28.5	28.5	28.5	5.8	13.22			1	convex	unshouldered	3	0	12.4
23N14W2	porcellanite	proximal	52.8		25.4	15.4	17.7	6.1	8.94	150	110	0	straight	shoulder			
23N14W3	porcellanite	complete	52.7	45.5	28.4	15	18.2	6.1	8.99	140	110	1	straight	shoulder	3	0	7.46
23N14W4	porcellanite	complete	54.8	47.4	26.5	15	18.2	5.8	8.1	150	120	0	straight	shoulder	3	0	8.17
23N14W5	porcellanite	complete	39.5	28.2	27.6	13.5	19	5.6	5.1	145	115	1	convex	shoulder	2	0.38	5.04
23N14W6	porcellanite	complete	32.8	25.3	25.3	14.7	19.1	4.8	3.71	160	125	0	straight	shoulder	1	0.38	5.27
23N14W7	porcellanite	complete	43.3	35.7	23.6	15.5	19.1	5.4	5.78	180	125	1	straight	shoulder	3	0	6.61
23N14W8	porcellanite	complete	37	30.6	19.8	13.4	17.3	4.6	3.44	165	135	0	straight	shoulder	3	0.09	6.65
23N14W9	porcellanite	proximal	37.5		22.7	13.9	16.5	5.6	5.07	150	120	0	convex	shoulder			
23N14W10	porcellanite	midsection	34		22.8	13.3		5.2	4.77			0	unable	shoulder			
23N14W11	porcellanite	midsection	29.4		26.2			6	5.35			0	unable	unable			
12N12W1	porcellanite	complete	35.3	28.5	22.4	14.9	16.9	4.6	3.96	150	115	0	convex	shoulder	3	0.25	6.2
12N12W2	porcellanite	complete	41.3	34.4	22.5	12.7	14.9	5.7	4.82	150	115	0	convex	shoulder	3	0	6.04
12N12W3	porcellanite	complete	48.5	41.7	24.5	15.2	17	4.9	6.17	155	115	0	straight	shoulder	3	0	8.51
12N12W4	porcellanite	distal	37	36.9	26.8			5.7	5.86			0	unable	shoulder		0.06	6.47

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
12N12W6	porcellanite	complete	36.3	29	21.1	12.9	15.9	4.8	3.61	145	115	0	convex	shoulder	3	0.25	6.04
14N12W1	porcellanite	distal	62.5	57.5	28.1			5.7	10.51	140	110	0	concave	shoulder		0	10.1
14N12W2	porcellanite	proximal	55.2		29.9	15.3	19.1	6.2	10.3	140	110	1	concave	shoulder			
14N12W4	porcellanite	complete	50	42.7	27.5	16	18.9	5.6	8.31	140	110	0	straight	shoulder	3	0.06	7.63
14N12W5	porcellanite	complete	61.7	52.5	28	16.1	19.3	7.4	12.82	160	130	1	convex	shoulder	3	0	7.09
14N12W6	porcellanite	complete	52.9	45.7	26.5	15.7	18	5.7	7.69	140	110	1	straight	shoulder	3	0	8.02
14N12W7	porcellanite	proximal	41.5		28.1	16.5	21.3	6.4	7.5	150	120	0	concave	shoulder			
14N12W8	porcellanite	complete	53	44.5	30.1	19	20.4	4.6	8.18	155	120	0	straight	shoulder	3	0	9.67
14N12W9	porcellanite	complete	51.9	44.5	27.8	16.9	17.1	5.4	7.79	150	110	1	straight	shoulder	3	0	8.24
14N12W11	porcellanite	complete	40.8	32.3	23.9	13.9	17.8	4.9	4.82	150	120	2	straight	shoulder	3	0	6.59
14N12W12	porcellanite	complete	51.5	42.7	25.2	13.9	17.8	5.8	9.22	150	115	0	convex	shoulder	3	0	7.36
14N12W16	porcellanite	complete	37.7	29.7	19.9	10.7	14.6	5.1	4.37	150	135	0	convex	shoulder	3	0.13	5.82
14N12W18	porcellanite	proximal	36		25	16.2	19.1	5.9	6.71	180	140	1	straight	shoulder			
14N12W19	porcellanite	distal	40.7	40.7	21.8			4.8	4.54	155	120	0	unable	shoulder		0	8.48
14N12W20	porcellanite	complete	40.5	40.3	21.1	21.1	21.1	5.6	4.45			0	straight	unshouldered	3	0.06	7.2
14N12W21	porcellanite	proximal	42.4		21.8	15	16.5	6.4	5.32	150	115	1	convex	shoulder			
14N12W22	porcellanite	distal	44.5	44.4	26.2	14.9		5.1	6.35			1	unable	shoulder			8.71
14N12W23	porcellanite	distal	32.4		26.4			5.2	3.81			0	unable	unable			
14N12W24	porcellanite	distal	38	38.3	23.4	14.5		4.9	5.61			0	unable	shoulder		0	7.82
14N12W27	porcellanite	midsection	25		24.4	16.3		5.5	4.07			0	straight	shoulder			
14N12W29	porcellanite	midsection	30.5		19.7			6.2	4.06			0	unable	unable			
14N12W31	porcellanite	midsection	24		25			4.6	3.34			0	unable	unable			
14N12W33	porcellanite	distal	26.2		23.1			5	2.66			0	unable	unable			
14N12W34	porcellanite	lateral edge	25.3		19.6			5.6	3.84			0	unable	unable			
16N12W1	porcellanite	complete	52.8	46.7	27.5	15.8	18.1	6.3	7.88	145	115	1	convex	shoulder	3	0	7.41
16N12W2	porcellanite	distal	50.5	45.3	27.4	13.5		4.8	6.88	140	115	0	unable	shoulder		0	9.44
16N12W3	porcellanite	complete	42.6	36.4	28.1	16.4	20.6	5.6	7.01	145	120	0	concave	shoulder	3	0.09	6.5
16N12W4	porcellanite	distal	45.6	40.5	24.2	15.2		4.7	5.19	180	135	0	unable	shoulder		0	8.62
16N12W5	porcellanite	proximal	32		20.7	12.6	14.6	4.4	3.39	145	110	0	straight	shoulder			
16N12W7	porcellanite	proximal	31		19.2	12.6	15.9	5	3.5	150	125	0	convex	shoulder			
16N12W10	porcellanite	proximal	26.5		20.6	14.6	14.6	5.1	3.22	160	110	0	unable	shoulder			
18N12W1	porcellanite	distal	63.1	63	24	16.3		6.7	11.69			0	unable	shoulder		0	9.4
18N12W2	porcellanite	complete	53.8	44.6	31.6	17.3	22.1	5.9	8.85	150	120	0	convex	shoulder	3	0	7.56

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
18N12W3	porcellanite	complete	49.3	42	24.2	17.3	20.8	4.8	6.44	180	135	0	concave	shoulder	3	0	8.75
18N12W4	porcellanite	proximal	37.6		22	13.3	18.3	5.7	5.01	165	130	0	concave	shoulder			
18N12W5	porcellanite	complete	43.3	34.2	23.4	17.2	19.7	5.3	5.21	155	130	0	straight	shoulder	3	0	6.45
18N12W6	porcellanite	proximal	41.7		22.2	13.2	15.2	5.8	5.9	140	105	0	straight	shoulder			
18N12W7	porcellanite	proximal	23.7		20.1	13.1	14.4	5.2	2.27	160	110	0	convex	shoulder			
18N12W9	porcellanite	distal	29.3		25.2			5.2	3.46			0	unable	unable			
18N12W10	porcellanite	distal	23.5	15.5	19.5	13.1		4.9	2.05			0	straight	shoulder		1	3.16
18N12W11	porcellanite	complete	33.3	33.2	23.4	23.4	23.4	3.8	3.3			2	straight	unshouldered	3	0	8.74
20N12W1	porcellanite	distal	49.3	47.4	26.2	13.9		4.9	6.45			0	unable	shoulder		0.06	9.67
20N12W3	porcellanite	midsection	32.4		23.4			6.2	6.27			0	unable	unable			
20N12W4	porcellanite	proximal	32.7		24.5	14.2	17.8	6.5	5.1	150	120	0	convex	shoulder			
20N12W5	porcellanite	complete	34.8	34.8	19.5	19.5	19.5	4.8	3.44			0	convex	unshouldered	3	0.13	7.25
20N12W6	porcellanite	complete	45.7	38.3	22.6	12.4	15.2	4.8	4.85	150	120	1	straight	shoulder	3	0	7.98
20N12W7	porcellanite	distal	23.5		20.4			5.8	2.45			0	unable	unable			
22N12W1	porcellanite	complete	47.1	39.1	27.3	13.9	17.1	5	7.11	150	110	0	straight	shoulder	2	0.28	7.82
22N12W2	porcellanite	distal	41.3		25.1	14.1		5.8	6.58			0	unable	shoulder			
22N12W3	porcellanite	proximal	32.3		25.9	17.2	20.5	5.6	4.5	160	130	0	straight	shoulder			
22N12W4	porcellanite	proximal	27.5		19.5	19.5	19.5	4.1	2.49			2	convex	unshouldered			
22N12W6	porcellanite	distal	39.4	33.2	25.2	15.4		5.8	5.75	165	130	0	straight	shoulder		0.13	5.72
22N12W7	porcellanite	distal	36.7		23.7	14.6		6.2	5.47			2	unable	unable			
22N12W8	porcellanite	complete	36.5	28.3	23.1	14.3	17.7	5.1	4.04	165	120	0	concave	shoulder	3	0	5.55
22N12W9	porcellanite	lateral edge	25.8		20.5			6.2	3.54			0	straight	shoulder			
22N12W10	porcellanite	complete	31.3	22	20.4	13.4	15.7	4.8	2.87	160	130	0	straight	shoulder	3	0.13	4.58
22N12W12	porcellanite	proximal	38.3		26.2	17	22	5.7	5.74	180	135	0	straight	shoulder			
22N12W13	porcellanite	proximal	33.6		23.8	15	18.8	5.6	4.87	155	125	0	straight	shoulder			
22N12W14	porcellanite	lateral edge	28.2		26.6	14.5	17.5	5.6	5.36			0	straight	shoulder			
24N12W1	porcellanite	proximal	57		29.3	17.6	21.9	6.9	11.74	145	110	0	straight	shoulder			
24N12W2	porcellanite	complete	44.3	47.3	26.2	15.7	18.5	5.8	8.03	180	95	2	concave	shoulder	3	0	8.16
24N12W3	porcellanite	complete	43.7	36.4	26	13.8	18	4	4.57	150	125	2	convex	shoulder	3	0	9.1
24N12W5	porcellanite	midsection	39.3		26.7	15.4		5.5	6.7			1	straight	shoulder			
24N12W6	porcellanite	proximal	32.4		26.7	14.6	18.3	6.5	6.07	150	110	0	straight	shoulder			
24N12W7	porcellanite	complete	40.4	32	23.2	13.4	16.5	5	4.5	155	115	2	convex	shoulder	3	0	6.4
24N12W10	porcellanite	complete	38.6	29.6	26	15.7	19.2	5.2	4.48	180	135	0	straight	shoulder	1	0.5	5.69

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
24N12W11	porcellanite	complete	31.2	23.1	25.9	15.1	17.9	4.7	3.56	150	120	0	convex	shoulder	3	1	4.91
24N12W12	porcellanite	proximal	30.5		25	15.3	18.2	5	4.29	155	110	0	straight	shoulder			
24N12W13	porcellanite	proximal	32.9		23.6	11.6	13.4	5.5	4.49	145	105	0	convex	shoulder			
24N12W14	porcellanite	distal	30.6		20.4			4.4	2.96			0	unable	unable			
24N12W15	porcellanite	proximal	16.4		20.4	15.6	17.2	4.3	1.88	165	105	0	straight	shoulder			
24N12W16	porcellanite	distal	31.1	24.6	22.6			5.5	3.61	145	115	0	convex	shoulder		0.25	4.47
24N12W18	porcellanite	proximal	13.1		22.3	14.8	19.9	4.9	1.71	160	145	0	straight	shoulder			
24N12W19	porcellanite	complete	28.3	22.5	14.7	9.6	11.6	3.4	1.27	180	145	3	convex	shoulder	3	0	6.62
14N10W1	porcellanite	complete	50.9	42.2	24.9	15.4	19.1	5.7	7.62	160	115	0	straight	shoulder	3	0	7.4
14N10W2	porcellanite	complete	38.2	30.7	27.4	17	21.1	5.6	6.28	160	115	2	convex	shoulder	3	0	5.48
14N10W6	porcellanite	complete	47.3	39.3	24.6	15.3	19.5	4.8	5.86	155	120	1	convex	shoulder	3	0	8.19
14N10W7	porcellanite	midsection	46.3		25.9	16.2		5.8	7.9			0	unable	shoulder			
14N10W8	porcellanite	complete	47.5	39.9	22.1	10.7	13.9	4.9	5.58	155	115	0	convex	shoulder	3	0.19	8.14
14N10W9	porcellanite	complete	43.2	33	22.2	13.3	17.5	5	4.82	150	120	0	convex	shoulder	3	0	6.6
14N10W10	porcellanite	complete	36.1	29.4	23.7	16.8	18.2	4.9	4.29	170	110	0	convex	shoulder	3	0	6
14N10W11	porcellanite	distal	31	30.8	21.6			5.3	3.57			0	unable	shoulder		0	5.81
14N10W12	porcellanite	midsection	27.8		23.5			5.9	4.07			0	unable	shoulder			
14N10W13	porcellanite	proximal	24.9		24.6	24.6	24.6	6.2	4.84			1	convex	unshouldered			
14N10W14	porcellanite	midsection	23.6		24.3	6.9		5.4	3.61			0	unable	unable			
14N10W15	porcellanite	lateral edge	36.1		18.8			4.7	4.26			0	unable	shoulder			
14N10W16	porcellanite	complete	48.5	40.4	25	15.9	20.6	5.5	6.88	155	125	0	straight	shoulder	3	0.09	7.35
14N10W18	porcellanite	distal	35.6		22.7			4.9	4.03			1	unable	unable			
14N10W22	porcellanite	complete	32.1	23.5	24.9	16.5	17.6	5.3	4.15	160	105	0	convex	shoulder	2	0.56	4.43
14N10W23	porcellanite	complete	30.4	21.6	21.6	16.3	19.5	5.2	3.55	160	115	0	straight	shoulder	3	0.25	4.15
14N10W25	porcellanite	midsection	26.3		24.5			4.3	3.47			0	unable	unable			
16N10W1	porcellanite	complete	56.8	49	28	14.6	16.6	6.7	10.14	140	120	1	straight	shoulder	3	0	7.31
16N10W2	porcellanite	complete	53.1	46.2	26.2	15.8	17.2	5.6	8.16	150	110	0	convex	shoulder	3	0.06	8.25
16N10W3	porcellanite	midsection	47.8		25.1	12.2		5.6	7.89			0	unable	shoulder			
16N10W4	porcellanite	complete	47.6	41.2	21.7	13.4	17.5	5.5	5.65	150	115	1	convex	shoulder	3	0	7.49
16N10W5	porcellanite	complete	45.4	37.5	25.1	16	18.6	5.1	5.99	160	115	0	straight	shoulder	3	0	7.35
16N10W6	porcellanite	proximal	42.5		25.4	15.9	21.3	6	7.51	160	130	2	straight	shoulder			
16N10W7	porcellanite	distal	46.2	41.2	23.1	13.5		5.2	4.7			0	unable	shoulder		0	7.92
16N10W8	porcellanite	proximal	37.3		28.7	16.2	19.7	5.1	6.36	155	125	0	convex	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
16N10W9	porcellanite	complete	37.5	30.2	21.9	13.6	16.9	4.9	3.77	150	105	0	convex	shoulder	3	0	6.16
16N10W10	porcellanite	complete	44.2	36.1	23.2	11.9	15.1	5.9	4.75	140	125	0	convex	shoulder	3	0.13	6.12
16N10W11	porcellanite	midsection	36.4		24.6			4.4	4.84			0	unable	unable			
16N10W12	porcellanite	complete	40.5	33.8	22.8	13.5	16.8	5.2	4.99	145	115	0	straight	shoulder	3	0	6.5
16N10W13	porcellanite	complete	35.4	27.7	23.9	14.6	19.7	4.2	3.76	160	120	2	convex	shoulder	3	0	6.6
16N10W14	porcellanite	midsection	39.3		21.1			5.4	4.48			1	unable	shoulder			
16N10W15	porcellanite	midsection	35		20.5	13.1		4	4.06			1	unable	shoulder			
16N10W16	porcellanite	midsection	26.1		22.7			4.4	2.98			0	unable	unable			
16N10W17	porcellanite	distal	20.5		16.9			4.7	1.13			0	unable	unable			
16N10W18	porcellanite	complete	23.7	16.8	18.8	13	14.5	4.7	2.18	165	110	0	straight	shoulder	2	1	3.57
16N10W19	porcellanite	proximal	43.3		26.2	16.3	18.4	5.6	6.35	155	110	0	straight	shoulder			
16N10W20	porcellanite	complete	43.6	34.5	24	13.7	17.7	5.5	5.17	160	125	0	straight	shoulder	3	0	6.27
16N10W22	porcellanite	distal	33	29.5	23.1	13.5		5	3.57			0	unable	shoulder		0	5.9
16N10W23	porcellanite	complete	29.8	22.5	25.8	15.2	17.8	4.8	3.79	150	115	0	straight	shoulder	2	1	4.69
16N10W24	porcellanite	proximal	29.3		25.2	15.3	17.8	5.7	4.61	160	110	0	straight	shoulder			
16N10W25	porcellanite	proximal	31.4		20.5	20.3	20.3	5.8	3.8			0	convex	unable			
16N10W26	porcellanite	proximal	29.1		19.8	19.8	19.8	4.7	2.78			0	convex	unshouldered			
16N10W32	porcellanite	proximal	30.8		24.2	14.5	16	5.5	4.55	150	120	1	straight	shoulder			
18N10W1	porcellanite	complete	65.5	58.8	25.5	15	17.3	6	10.14	150	120	0	concave	shoulder	3	0	9.8
18N10W2	porcellanite	distal	40	33.6	25.7	15		4.7	5.21	160	110	1	unable	shoulder		0	7.15
18N10W3	porcellanite	complete	37.1	29.6	23.3	16.2	18.5	5.8	4.98	180	110	1	straight	shoulder	3	0.25	5.1
18N10W4	porcellanite	complete	35.6	27.8	22.7	15.8	18.7	5.5	4.71	150	110	1	straight	shoulder	3	0.25	5.05
18N10W5	porcellanite	distal	29.9		23.6			3.5	2.81			1	unable	unable			
18N10W6	porcellanite	midsection	36.4		20.3			5.4	3.92			1	unable	unable			
18N10W7	porcellanite	complete	25.9	18.2	19.6	11.9	14.5	4.4	2.43	180	120	0	convex	shoulder	3	0.25	4.14
18N10W8	porcellanite	distal	38	34.8	24.1	14		6.6	5.73			0	unable	shoulder		0	5.27
18N10W10	porcellanite	proximal	38.6		23.8	14.4	17.6	5.4	4.73	150	115	0	straight	shoulder			
18N10W11	porcellanite	complete	30.7	23.4	22.1	12.9	16.3	4.8	3.03	155	110	0	concave	shoulder	2	0.31	4.88
20N10W1	porcellanite	complete	61	52.7	27.6	17.1	20.7	6.5	9.23	160	115	1	straight	shoulder	3	0	8.11
20N10W2	porcellanite	distal	43.1	44.1	30.7			6	8.38			0	unable	unable		0	7.35
20N10W3	porcellanite	distal	44.3	35.6	25.1	13.6		5.7	6.17			0	concave	shoulder		0	6.25
20N10W4	porcellanite	proximal	42.6		24.2	11.7	16	5.8	6.01	165	110	0	convex	shoulder			
20N10W5	porcellanite	proximal	33.3		22.7	13.1	16.4	5.4	4.65	150	115	0	convex	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
20N10W6	porcellanite	proximal	31.5		27.3	15.2	19.6	5.3	4.86	165	120	0	straight	shoulder			
20N10W7	porcellanite	complete	31.7	24.3	21.1	13.9	16.1	4.9	3.1	185	125	0	straight	shoulder	2	0.31	4.96
20N10W8	porcellanite	complete	25.8	16	20.7	15.4	20.7	4.7	2.81	180	130	0	convex	shoulder	2	1	3.4
20N10W9	porcellanite	complete	24.9	15	20.7	14.2	17.4	5.4	2.74	155	115	0	straight	shoulder	2	1	2.78
20N10W10	porcellanite	complete	60.3	52.6	30.8	16.8	20.9	6.7	10.79	155	130	0	straight	shoulder	3	0	7.85
22N10W1	porcellanite	proximal	57.8		28.5	14.4	14.9	5.6	10.29	150	110	0	concave	shoulder			
22N10W2	porcellanite	complete	45.1	37.5	29.8	18	20.6	5.9	7.91	150	110	0	concave	shoulder	2	0.28	6.36
22N10W3	porcellanite	distal	38.4	36.7	27.8	16.4		5.3	5.83			0	unable	shoulder		0	6.92
22N10W4	porcellanite	midsection	36.1		32.3	19.3		5.5	7.55			0	unable	shoulder			
22N10W5	porcellanite	proximal	32.7		26	14.9	18.2	5.3	5.02	140	100	2	convex	shoulder			
22N10W6	porcellanite	complete	33.2	24.2	24.2	15.8	18.2	5.3	3.78	180	115	0	concave	shoulder	1	0.34	4.57
22N10W7	porcellanite	proximal	55.3		29.4	17.6	22.1	6.2	10.8	160	120	0	straight	shoulder			
22N10W8	porcellanite	proximal	44.4		26.3	14	15.4	5.3	6.96	150	110	0	convex	shoulder			
22N10W9	porcellanite	complete	44.2	36	28.9	17.2	20.6	5.6	6.58	155	120	0	straight	shoulder	3	0	6.43
22N10W10	porcellanite	proximal	41.7		24.9	15.8	19.3	6.4	6.89	160	130	0	convex	shoulder			
22N10W11	porcellanite	proximal	30.6		21.1	12.1	13.3	6.2	3.78			0	straight	shoulder			
22N10W12	porcellanite	proximal	23.6		22.1	13.3	15.6	5.7	2.79	145	105	0	straight	shoulder			
24N10W1	porcellanite	proximal	49.5		29.4	16.3	21	5.8	8.08	140	110	0	convex	shoulder			
24N10W2	porcellanite	complete	45.4	44.8	25.5	25.5	25.5	4.8	5.33			0	straight	unshouldered	3	0	9.33
24N10W3	porcellanite	midsection	32.3		30.8			4.6	6.02			1	unable	unable			
24N10W4	porcellanite	complete	32.8	24	22.6	14.4	18.9	5.7	3.65	145	115	0	convex	shoulder	3	0	4.21
24N10W5	porcellanite	complete	35.7	27.3	23.3	15.2	18.1	3.8	3.62	160	115	1	convex	shoulder	3	0	7.18
24N10W6	porcellanite	proximal	35		23.3	15.3	17.1	4.9	4.7	150	115	0	convex	shoulder			
24N10W7	porcellanite	midsection	27.8		23.2			5.6	4.63			0	unable	unable			
24N10W8	porcellanite	proximal	29.7		19.8	11.3	15.6	5.6	3.34	150	115	0	convex	shoulder			
24N10W9	porcellanite	proximal	27.5		21.4	14.6	18.7	6.8	3.63	150	120	0	convex	shoulder			
24N10W10	porcellanite	complete	55	49.2	24.1	15.3	17.7	4.9	6.9	150	120	0	straight	shoulder	3	0	10
24N10W11	porcellanite	complete	48.3	40.6	26.2	15.7	18.6	6.7	7.96	155	125	1	convex	shoulder	3	0	6.06
14N8W1	porcellanite	distal	47.7	41.8	28.4	16.1		6.7	7.55			0	unable	shoulder		0	6.24
14N8W2	porcellanite	distal	43.2	38.5	26.1	15		5	4.84			1	unable	shoulder		0	7.7
14N8W3	porcellanite	complete	43.5	36.4	24.1	15.1	19.1	4.8	4.99	170	135	1	concave	shoulder	3	0	7.58
14N8W4	porcellanite	proximal	41.6		24.6	16.5	20.4	6.3	6.42	170	125	0	concave	shoulder			
14N8W5	porcellanite	complete	29	29.1	22.6	22.6	22.6	4.8	3.05			0	straight	unshouldered	3	0.06	6.06

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
14N8W6	porcellanite	proximal	26.8		22.2	15.5	19.1	6.4	4.28	180	125	0	straight	shoulder			
14N8W7	porcellanite	complete	32.3	24.1	19.8	13.4	14.1	4.6	2.5	160	110	2	concave	shoulder	3	0	5.24
14N8W8	porcellanite	distal	22.6		19.9			3.5	1.73			0	unable	unable			
14N8W9	porcellanite	complete	21.3	12.4	21.2	15.8	18.2	5.4	2.51	180	130	0	straight	shoulder	2	1	2.3
14N8W10	porcellanite	proximal	15.5		23.3	14	16	4.5	1.62	160	115	1	straight	shoulder			
14N8W11	porcellanite	distal	42.3	38	27.2	15.3		5.6	5.64			1	unable	shoulder		0	6.79
14N8W12	porcellanite	distal	38.1	38.2	21.7	15.7		6.4	4.55			1	unable	shoulder		0	5.97
14N8W13	porcellanite	proximal	40		26.6	14.7	18.3	6.2	6.84	150	115	0	convex	shoulder			
14N8W14	porcellanite	proximal	38.3		25.3	14.2	19	6	5.4	165	115	0	convex	shoulder			
14N8W15	porcellanite	complete	34.4	27.3	25.5	14.7	18.7	4.7	4	160	125	0	straight	shoulder	3	0.09	5.81
14N8W16	porcellanite	midsection	28.7		23.4			4.6	3.83			0	unable	unable			
14N8W17	porcellanite	midsection	29.1		20.1	12.7		4.7	2.56			1	unable	shoulder			
16N8W1	porcellanite	complete	44.1	36	21.2	11.8	15	4.4	4.28	165	120	2	convex	shoulder	3	0	8.18
16N8W2	porcellanite	complete	43.2	35.3	22.8	13.3	17	5.7	5.44	180	130	1	straight	shoulder	3	0.13	6.19
16N8W3	porcellanite	complete	38.3	30	22.7	14.1	16.8	6.1	4.94	165	120	1	straight	shoulder	3	0	4.92
16N8W4	porcellanite	proximal	40.1		26	16.9	18.9	5	6.42	180	120	1	convex	shoulder			
16N8W5	porcellanite	proximal	37.7		24.7	16.1	18.6	5	5.5			1	convex	shoulder			
16N8W6	porcellanite	proximal	38.2		24.4	24.4	24.4	5.4	5.05			0	convex	unshouldered			
16N8W7	porcellanite	proximal	29.6		30.3	16.1	20.7	6.2	6.65	145	120	0	straight	shoulder			
16N8W8	porcellanite	distal	30.6		20.7			3.8	2.77			1	unable	unable			
16N8W9	porcellanite	complete	24.1	14.9	22.3	12.9	17.3	5.2	2.44	160	120	0	straight	shoulder	2	1	2.87
16N8W10	porcellanite	complete	22.9	16.2	24.2	16.3	19.6	5.9	3.11	180	130	1	straight	shoulder	1	1	2.75
16N8W12	porcellanite	complete	31.5	22.5	23.6	15.1	18.7	5.6	3.96	170	120	1	convex	shoulder	2	0.75	4.02
16N8W13	porcellanite	distal	41.2	38	24.7	14.2		6.9	7.41			1	unable	shoulder		0.25	5.51
16N8W15	porcellanite	distal	28.4	19.4	23.6	14.3		5.6	3.33			0	unable	shoulder		1	3.46
18N8W1	porcellanite	proximal	34.2		26.6	16.6	19.8	4.9	5.12	140	110	1	straight	shoulder			
18N8W2	porcellanite	complete	39	27.8	24.6	13.6	18.6	6	5.42	155	110	1	convex	shoulder	3	0.25	4.63
18N8W3	porcellanite	midsection	37		23.4	14.4		6.2	4.79			0	straight	shoulder			
18N8W4	porcellanite	distal	37.2	24.9	20.5	13.3		4.7	3.38	165	115	0	convex	shoulder		0	5.3
18N8W5	porcellanite	lateral edge	36.1		20.9			4.1	3.39			0	unable	shoulder			
18N8W6	porcellanite	complete	35	27.4	24.4	15	18.3	4.2	3.97	170	125	3	straight	shoulder	3	0.06	6.52
18N8W7	porcellanite	complete	32.6	30.4	22.1	12.1	14.1	4.9	3.23	155	110	1	straight	shoulder	3	0	6.2
18N8W8	porcellanite	complete	30.6	22.1	22.2	14.3	17.8	4.6	2.7	165	115	0	convex	shoulder	3	0.13	4.8

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
18N8W9	porcellanite	proximal	24.5		24.9	15.5	19.3	4.8	4.25	155	110	1	concave	shoulder			
18N8W10	porcellanite	proximal	29.2		24.2	14.8	18.2	5.6	4.21	150	120	0	straight	shoulder			
18N8W11	porcellanite	midsection	18.8		24.6			4.5	2.25			0	unable	unable			
18N8W12	porcellanite	distal	22		21.1			5.1	2.14			0	unable	unable			
18N8W14	porcellanite	proximal	42.5		26.2	14.9	18.1	4.8	4.74	150	115	0	concave	shoulder			
18N8W15	porcellanite	complete	31.3	22.8	25.4	16	20.8	5.4	4.32	145	130	0	straight	shoulder	1	0.5	4.22
20N8W1	porcellanite	complete	75.3	65.6	31.4	16.6	18.4	5.3	14.63	180	110	1	convex	shoulder	3	0	12.4
20N8W2	porcellanite	complete	52.3	43.7	29.3	15.8	20	6.3	9.56	155	120	2	straight	shoulder	3	0.09	6.94
20N8W3	porcellanite	proximal	47.4		27.7	16.3	20.3	6.1	9.23	155	125	0	convex	shoulder			
20N8W4	porcellanite	complete	43	36.6	24.9	15.1	18.5	5.7	5.79	145	120	0	straight	shoulder	3	0	6.42
20N8W5	porcellanite	complete	42.3	33.5	22	15.4	18.4	4.6	3.9	180	130	1	convex	shoulder	3	0.13	7.28
20N8W6	porcellanite	proximal	38.1		24.1	14.9	18.8	6.3	5.43	160	130	0	straight	shoulder			
20N8W7	porcellanite	complete	33.5	24.6	24.2	15.6	19.2	5.4	3.4	150	120	1	straight	shoulder	2	0.25	4.56
20N8W8	porcellanite	complete	33.6	25	22.6	16.4	16.4	5	4.04	185	90	1	straight	shoulder	3	0.19	5
20N8W9	porcellanite	lateral edge	32.9		19.7			5	3.29			0	unable	shoulder			
20N8W10	porcellanite	proximal	30.8		21.7	13.4	17.5	5.5	3.5	155	125	0	straight	shoulder			
20N8W11	porcellanite	complete	29.8	20	23.1	14.9	19.2	5.7	3.43	160	135	0	straight	shoulder	2	1	3.51
20N8W12	porcellanite	lateral edge	28.7		19.3			5.1	3.65			0	unable	shoulder			
20N8W13	porcellanite	proximal	21.2		25.1	16.9	19.6	5.9	3.91	155	125	0	straight	shoulder			
20N8W14	porcellanite	distal	14.2		17.1			4.6	1.1			0	unable	unable			
20N8W16	porcellanite	complete	56.3	46	24.4	14.4	19.3	3.9	5.88	180	135	1	convex	shoulder	3	0	11.8
20N8W17	porcellanite	complete	35.8	30	19.8	12.3	15.8	4.8	3.37	160	115	1	straight	shoulder	3	0	6.25
22N8W1	porcellanite	complete	47.7	38.7	27.1	16.9	19.8	5.2	6.77	155	110	0	convex	shoulder	3	0	7.44
22N8W2	porcellanite	complete	43.3	35.6	26.2	14.3	17.3	5.2	5.82	155	125	0	straight	shoulder	3	0	6.85
22N8W3	porcellanite	midsection	35.9		28.3			6.1	6.97			0	unable	unable			
22N8W4	porcellanite	complete	39.6	34.2	22.5	11.7	13.1	4.8	4.1	145	115	0	straight	shoulder	3	0.06	7.13
22N8W5	porcellanite	complete	33.6	25.8	24.9	13.7	17.4	5.4	3.97	155	130	1	straight	shoulder	1	0.5	4.78
22N8W6	porcellanite	distal	20		22			4.8	1.67			0	unable	unable			
22N8W7	porcellanite	complete	54.1	46	24.7	14.3	16.6	5.1	6.52	150	110	1	convex	shoulder	3	0	9.02
22N8W8	porcellanite	distal	37	34.2	27.1	17.9		5.1	4.94			0	unable	shoulder		0	6.71
22N8W9	porcellanite	distal	47.9	47	27.4	16.3		4.8	7.7			0	unable	shoulder		0	9.79
22N8W10	porcellanite	proximal	44.4		25.2	16.2	19	6.1	7.05	160	125	2	convex	shoulder			
22N8W11	porcellanite	distal	36		22			5.7	4.38			0	unable	unable			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
22N8W13	porcellanite	complete	36.6	28.8	18.9	13.7	15.7	6	3.19	150	115	0	convex	shoulder	3	0.25	4.8
22N8W17	porcellanite	distal	49		30.8			8.3	10.05			3	unable	unshouldered			
24N8W1	porcellanite	distal	48.6	48.9	27.8	15.8		5.3	7.25			0	unable	shoulder		0	9.23
24N8W2	porcellanite	proximal	47.1		24.9	12.5	16.7	5.3	6.34	160	120	0	straight	shoulder			
24N8W3	porcellanite	midsection	39.1		23.9	14.7		5	5.67			0	unable	shoulder			
24N8W4	porcellanite	complete	36.7	29.5	22.4	15.1	17.3	4.8	4.25	180	130	0	straight	shoulder	3	0.06	6.15
24N8W5	porcellanite	proximal	27.9		25.6	17	17.9	6.5	5.03	180	115	0	straight	shoulder			
24N8W6	porcellanite	proximal	31.9	22.4	20.9	14.7	17.5	6.1	3.93	180	110	0	straight	shoulder			3.67
24N8W7	porcellanite	midsection	36.6		26.7			5	5.9			0	unable	unable			
24N8W8	porcellanite	lateral edge	29.4		15.6			4.7	2.3			0	unable	shoulder			
24N8W9	porcellanite	lateral edge	25.5		21.1			5.2	2.14			0	unable	shoulder			
24N8W10	porcellanite	complete	62.6	55.3	28.8	14.1	17.8	5.2	10.25	145	115	1	convex	shoulder	3	0	10.6
24N8W13	porcellanite	complete	41.8	34.5	28.6	15.7	19.9	5.6	6.19	145	115	0	straight	shoulder	3	0.09	6.16
24N8W14	porcellanite	distal	33.3		21.5			5.4	3.92			0	unable	unable			
14N6W1	porcellanite	distal	35.3		24.8			4.8	4.41			1	unable	unable			
14N6W2	porcellanite	proximal	27.7		22.3	14.7	15.7	5.1	3.25	180	120	0	convex	shoulder			
14N6W3	porcellanite	distal	28.5		18.1			4.9	2.29			0	unable	unable			
14N6W4	porcellanite	proximal	26.9		20.3	11.7	14.9	4.9	2.8	165	115	0	straight	shoulder			
14N6W8	porcellanite	lateral edge	21.4		22.7			4.7	2.28			0	unable	shoulder			
16N6W1	porcellanite	proximal	39.2		26.8	14.4	16	5.6	6.49	125	100	0	straight	shoulder			
16N6W2	porcellanite	complete	51.7	43.3	30.5	17	20.2	6.4	8.89	150	115	0	concave	shoulder	3	0	6.77
16N6W3	porcellanite	complete	44.9	34.5	27.3	14.4	18.1	6.1	7.22	160	110	1	convex	shoulder	3	0	5.66
16N6W4	porcellanite	proximal	46.8		30.2	14.6	19.3	6.1	9.27	140	110	0	concave	shoulder			
16N6W5	porcellanite	complete	44.3	36.5	26.9	13.5	18.8	4.2	4.99	155	120	2	straight	shoulder	3	0.25	8.69
16N6W6	porcellanite	complete	41.3	34.5	21.8	13.6	17	3.5	3.33	150	110	1	convex	shoulder	3	0	9.86
16N6W7	porcellanite	complete	28.5	28.3	23.5	23.5	23.5	6.1	3.65			1	convex	unshouldered	3	0	4.64
16N6W8	porcellanite	complete	29.3	29.3	21.7	21.7	21.7	4.5	3.18			1	convex	unshouldered	3	0	6.51
16N6W9	porcellanite	distal	23	18	18.3			4.2	1.92			0	straight	shoulder		1	4.29
16N6W10	porcellanite	distal	25.4	16.4	22.4	14		4.6	2.8			0	unable	shoulder		0.25	3.57
16N6W11	porcellanite	distal	29.1		19.1			5	2.56			1	unable	unable			
16N6W12	porcellanite	distal	56.6	51	29.2	15.3		6.3	10.21	130	115	0	straight	shoulder		0	8.1
16N6W13	porcellanite	distal	50.7		25.9			6.4	8.03			0	unable	unable			
16N6W14	porcellanite	complete	40.9	31.7	22.9	14.3	18.8	5	4.92	180	135	1	convex	shoulder	3	0.13	6.34

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
16N6W15	porcellanite	proximal	37.7		23.7	13.1	15.3	5.3	4.67			2	unable	shoulder			
16N6W16	porcellanite	complete	31.3	24.3	20	14.6	16.7	4.5	2.66	155	130	1	straight	shoulder	1	0.5	5.4
16N6W17	porcellanite	complete	32	25.3	18	10.2	12.8	4.1	2.52	160	115	1	convex	shoulder	3	0	6.17
16N6W18	porcellanite	complete	39.2	31.9	22.2	14.1	17	5.3	4.49	180	125	0	straight	shoulder	3	0.13	6.02
16N6W19	porcellanite	midsection	26.1		25.6			5.2	3.78			1	unable	shoulder			
16N6W20	porcellanite	midsection	19.2		21.6			6.7	2.72			0	unable	unable			
16N6W26	porcellanite	proximal	13.8		21.7	14.8	19.8	3.6	1.45			2	convex	shoulder			
16N6W27	porcellanite	complete	64.2	63.8	35	35	35	6.5	15.8			0	convex	unshouldered	3	0	9.82
18N6W1	porcellanite	proximal	40.7		30.1	15.6	19.6	6.3	8.84	155	120	0	straight	shoulder			
18N6W2	porcellanite	distal	40.1	32.5	22.7	15.3		6.6	5.58	180	100	0	unable	shoulder		0	4.92
18N6W3	porcellanite	proximal	33.5		29.1	15.4	19.5	4.7	6.42	150	110	0	straight	shoulder			
18N6W4	porcellanite	distal	40.2	32.7	23	13.2		5	4.41			2	straight	shoulder		0.06	6.54
18N6W5	porcellanite	distal	37.5	29.6	24.7	16.4		5.5	5.26	165	115	0	unable	shoulder		0	5.38
18N6W6	porcellanite	proximal	33.6		22.4	14.2	17.3	5	4.5	155	115	0	convex	shoulder			
18N6W7	porcellanite	complete	34.7	26.1	24.2	15.5	19.6	5.3	4.8	155	125	0	straight	shoulder	3	0.13	4.92
18N6W8	porcellanite	proximal	34		17.9	8.2	9.9	3.8	2.46	170	115	0	convex	shoulder			
18N6W9	porcellanite	proximal	26.8		24.9	14.1	16.9	4.1	2.98	180	120	2	convex	shoulder			
18N6W10	porcellanite	distal	18.5		17.4			4.5	1.08			0	unable	unable			
18N6W11	porcellanite	midsection	39.6		24.6	14.4		5.3	5.76	150	110	0	unable	shoulder			
18N6W12	porcellanite	proximal	38.1		24.6	14.2	16	5.9	6.53	155	130	1	straight	shoulder			
18N6W13	porcellanite	complete	52.3	45.5	23.3	13.6	15.8	5.5	7.35	155	120	2	convex	shoulder	3	0	8.27
18N6W14	porcellanite	complete	37.3	29.8	27	14.3	18.7	5.7	5.29	155	120	1	straight	shoulder	3	0.25	5.23
18N6W15	porcellanite	proximal	36.5		21.8	12.4	16.9	5.1	3.89	150	125	1	convex	shoulder			
18N6W16	porcellanite	midsection	38.1		21.1	11.8		5.4	4.3			2	convex	shoulder			
18N6W17	porcellanite	distal	35.9		25.8			7	6.16			0	unable	unable			
18N6W18	porcellanite	proximal	31		24.5	16	21.3	5.3	4.67	155	115	0	straight	shoulder			
18N6W19	porcellanite	complete	37.8	37.9	19.3	19.3	19.3	5.2	3.85			2	straight	unshouldered	3	0	7.29
18N6W20	porcellanite	distal	19.9		21.6			4.9	1.88			0	unable	unable			
18N6W21	porcellanite	midsection	27.6		26.3	15		5.1	4.33			2	unable	shoulder			
18N6W22	porcellanite	complete	48.5	41.2	25.9	15.9	18	6.5	7.39	155	130	0	straight	shoulder	3	0	6.34
18N6W23	porcellanite	distal	45.8	45.6	26.3	15.9		5.8	7.44			1	unable	shoulder		0	7.86
18N6W25	porcellanite	midsection	40.7		24.5	13.7		5	5.93			0	convex	shoulder			
18N6W26	porcellanite	proximal	23.1		22.4	14.9	18.1	4.8	3.13	160	130	0	straight	shoulder			

143 Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
18N6W27	porcellanite	complete	37.9	31	21.7	12.7	14.4	4.4	3.3	160	115	0	convex	shoulder	3	0	7.05
18N6W28	porcellanite	complete	30.9	23.5	24.4	16.7	19.6	5.5	4.05	180	115	0	straight	shoulder	1	0.56	4.27
18N6W29	porcellanite	distal	33.2		23.6			4.8	3.66			1	unable	unable			
18N6W30	porcellanite	proximal	21		18.3	11.6	13.6	4.3	1.97	180	125	2	concave	shoulder			
18N6W31	porcellanite	proximal	41.4		24.8	13.9	16.8	4.4	5.57	135	115	1	convex	shoulder			
20N6W1	porcellanite	distal	57.2	50.2	27.1	16.1		5.9	8.79			0	unable	shoulder		0	8.51
20N6W2	porcellanite	distal	44.1	41.8	27.9	13.7		4.2	5.03			1	unable	shoulder		0	9.95
20N6W3	porcellanite	midsection	37.8		26.7			5.1	6.03			1	unable	shoulder			
20N6W4	porcellanite	distal	43.1	40	19.8	12		4	3.77			1	unable	shoulder		0	10
20N6W5	porcellanite	complete	33.2	26.2	24	15.3	17	4.8	3.86	180	115	0	straight	shoulder	3	0.16	5.46
20N6W10	porcellanite	proximal	30		28	14.9	15.7	5.5	4.55	160	120	0	concave	shoulder			
20N6W11	porcellanite	complete	27.7	21.5	19.7	12.1	13.1	4.6	2.48	180	100	0	concave	shoulder	3	0.13	4.67
20N6W12	porcellanite	distal	25.1		20.3			4.5	2.38			1	unable	unable			
22N6W1	porcellanite	midsection	39.2		27.6	17.6		5.5	7.58			1	straight	shoulder			
22N6W2	porcellanite	complete	47.6	47.5	19.4	19.4	19.4	4.7	4.91			0	straight	unshouldered	3	0	10.1
22N6W3	porcellanite	midsection	33.7		25.3	14.9		5.7	5.61			0	unable	shoulder			
22N6W4	porcellanite	proximal	35		22.7	15.2	17.2	4.7	3.94	155	105	0	convex	shoulder			
22N6W5	porcellanite	complete	33.8	26.4	22.3	17.2	20.5	6.7	6.2	180	140	0	straight	shoulder	3	0.06	3.94
22N6W6	porcellanite	complete	33.2	24.7	23.5	14	15.2	5.1	3.77	160	135	1	convex	shoulder	3	0.25	4.84
22N6W7	porcellanite	distal	29.5		23.9			4.9	3.1			0	unable	unable			
22N6W8	porcellanite	proximal	29		19.7	12.9	15.6	3.3	2.13	160	115	1	convex	shoulder			
22N6W9	porcellanite	midsection	17.5		19.9			4.4	1.88			1	unable	unable			
22N6W10	porcellanite	complete	31.7	25	23.5	13.8	16.9	5.3	3.83	150	130	1	convex	shoulder	3	0	4.72
24N6W1	porcellanite	midsection	49.3		26.6			6.1	7.79			1	unable	unable			
24N6W2	porcellanite	midsection	40.3		24.3	15.1		6.3	6.09			1	unable	shoulder			
24N6W3	porcellanite	complete	37.5	30.6	22.5	12.6	13.3	5.2	4.32	130	95	0	convex	shoulder	3	0	5.88
24N6W4	porcellanite	proximal	41.1		21.9	13.3	16.7	6.4	5.98	155	125	0	straight	shoulder			
24N6W5	porcellanite	complete	41.3	31.6	22.1	12.2	15.4	5.3	4.81	150	120	1	concave	shoulder	3	0	5.96
24N6W6	porcellanite	proximal	27.7		23.2	14.9	18.4	4.8	3.11	160	130	0	straight	shoulder			
24N6W7	porcellanite	complete	33.9	26.2	20.9	13.2	16.5	6.1	4.1	160	130	0	straight	shoulder	3	0	4.3
24N6W9	porcellanite	proximal	22.4		22.5	13.8	16.1	4.5	2.51	160	135	0	straight	shoulder			
14N4W1	porcellanite	distal	49	41.5	23.8	16.8		5.2	5.47			0	straight	shoulder		0	7.98
14N4W2	porcellanite	proximal	35.6		22.1	14.1	19.3	5.6	4.77	165	125	0	convex	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
14N4W3	porcellanite	proximal	20.8		23.5	14.9	17.4	5.3	3.27	155	130	0	straight	shoulder			
14N4W4	porcellanite	complete	51.3	42.4	23.4	12.9	16.1	5.3	6.61	180	125	0	straight	shoulder	3	0	8
14N4W6	porcellanite	complete	28.3	23.4	16.7	14.3	15.6	5	2.46	220	130	0	convex	shoulder	3	0.5	4.68
14N4W7	porcellanite	lateral edge	14.8		22.2			3.6	3.63			2	unable	unable			
16N4W1	porcellanite	midsection	46.3		25.8	16.4		6.5	7.87			0	unable	shoulder			
16N4W2	porcellanite	lateral edge	46.3		18.6			5.8	4.96			0	straight	shoulder			
16N4W3	porcellanite	complete	43.8	35.6	24.3	13.5	18.4	5.6	5.84	145	110	1	straight	shoulder	3	0	6.36
16N4W4	porcellanite	complete	37.3	29.7	27.1	16.5	20.7	6.5	5.48	150	120	0	convex	shoulder	3	0.06	4.57
16N4W5	porcellanite	distal	34	26.8	21.6	13.2		5	3.47			0	unable	shoulder		0.03	5.36
16N4W6	porcellanite	midsection	27.1		23.8	14		5	3.79			0	unable	shoulder			
16N4W7	porcellanite	midsection	29.1		22.6			5.7	3.55			0	unable	unable			
16N4W8	porcellanite	proximal	47.6		23.5	14.6	15.3	6	6.06	160	105	2	convex	shoulder			
16N4W9	porcellanite	lateral edge	32.9		18			6	3.65			0	unable	shoulder			
16N4W10	porcellanite	complete	31.1	26.6	20.6	16	16	4.8	2.95			1	convex	unshouldered	3	0	5.54
16N4W11	porcellanite	proximal	31.9		19.2	13.5	15.2	6	3.92	180	120	1	convex	shoulder			
16N4W12	porcellanite	distal	25.8	23.9	22.6			4.9	2.89			0	unable	unable		0	4.88
16N4W13	porcellanite	proximal	27.2		28.3	17	20.8	6.2	5.09	145	115	0	convex	shoulder			
16N4W14	porcellanite	complete	34.8	26.4	28.5	17.1	21.7	5.4	5.44	145	105	0	concave	shoulder	2	0.28	4.89
16N4W15	porcellanite	distal	53.7	53.4	25.4	15.4		5.5	7.53			0	unable	shoulder		0	9.71
16N4W16	porcellanite	complete	30.5	23.6	24.2	14.6	17.1	5.7	3.22	180	125	0	straight	shoulder	3	0.06	4.14
16N4W17	porcellanite	lateral edge	18.2		16.3			4.4	1.65			1	unable	unable			
18N4W1	porcellanite	midsection	44.5		30.1	15.7		5.4	8.85			1	unable	shoulder			
18N4W2	porcellanite	complete	46	39	30.5	16.1	19.9	5.9	8.05	155	125	1	convex	shoulder	3	0.09	6.61
18N4W3	porcellanite	distal	48.2	47.9	26.5			6.9	8.37			0	unable	unable		0	6.94
18N4W4	porcellanite	complete	37.1	37.1	20.7	20.7	20.7	4.9	3.97			0	convex	unshouldered	3	0	7.57
18N4W5	porcellanite	complete	36.3	29.2	22.9	13.7	15.5	5.7	4.57	150	110	1	convex	shoulder	3	0.25	5.12
18N4W6	porcellanite	proximal	35.2		23.4	15.5	15.8	5.1	4.89	160	120	2	straight	shoulder			
18N4W7	porcellanite	midsection	34.3		26.4			5.7	5.62			0	unable	shoulder			
18N4W8	porcellanite	midsection	24.2		26.3	14.2		5.1	3.46			0	unable	shoulder			
18N4W9	porcellanite	complete	31.9	23	21	12.8	16.3	5.3	3.08	180	140	0	straight	shoulder	3	0	4.34
18N4W10	porcellanite	midsection	24.4		21.4	13.1		4.8	2.77			0	unable	shoulder			
18N4W11	porcellanite	complete	39.4	30.5	26.3	14.5	18.3	5.1	5.78	170	125	2	straight	shoulder	3	0.03	5.98
18N4W12	porcellanite	distal	38.7	38.2	26.2			5.1	5.2			0	unable	shoulder		0	7.49

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
18N4W13	porcellanite	proximal	27.6		21.4	21.4	21.4	4.3	3.08			1	straight	unable			
18N4W14	porcellanite	midsection	19		20.2			5.1	1.9			0	unable	unable			
18N4W15	porcellanite	distal	27.5	27.3	17.8	9.9		4.4	2.11			1	unable	shoulder		0	6.2
18N4W16	porcellanite	lateral edge	24.8		20			5.7	2.88			0	unable	unable			
18N4W19	porcellanite	complete	32.3	26.2	23.6	15.1	16.7	5.1	4.37	170	110	0	straight	shoulder	3	0	5.14
20N4W1	porcellanite	distal	55.7	51	25.2	14.3		5.6	6.89			0	unable	shoulder		0	9.11
20N4W2	porcellanite	complete	42.9	36	23.4	15.7	18.9	5.4	5.55	180	120	0	straight	shoulder	3	0	6.67
20N4W3	porcellanite	complete	52.8	45.7	23.6	15.7	16.9	6.8	7.97	180	100	0	straight	shoulder	3	0	6.72
20N4W4	porcellanite	proximal	45.3		25.8	14.3	17.8	6.3	8.48	180	115	1	straight	shoulder			
20N4W5	porcellanite	complete	37.6	27.5	21.4	16.8	20.7	4.9	4.71	200	110	0	convex	shoulder	3	0	5.61
20N4W6	porcellanite	midsection	21.5		19.5			4.7	1.84			0	unable	unable			
20N4W8	porcellanite	complete	47.7	41.5	24.5	15.3	17.6	4.9	5.13	145	105	0	straight	shoulder	3	0	8.47
20N4W9	porcellanite	complete	39.9	31.6	24	12.5	16.2	5.6	4.57	150	120	2	straight	shoulder	3	0	5.64
20N4W10	porcellanite	complete	37.2	28.2	24.4	14.3	15.9	6.6	4.86	165	105	0	convex	shoulder	3	0.19	4.27
20N4W13	porcellanite	distal	19.1		17.4			4.2	1.05			0	unable	unable			
22N4W1	porcellanite	complete	47.3	38.4	23.4	13.6	16.9	5	5.68	160	125	0	convex	shoulder	3	0	7.68
22N4W2	porcellanite	proximal	41.7		23.1	23.1	23.1	6	6.82			0	convex	unshouldered			
22N4W3	porcellanite	distal	46.7		25.4			5.4	6.98			0	unable	unable			
22N4W4	porcellanite	complete	29	20.6	21.1	15.1	18.9	5.2	3.27	180	125	0	convex	shoulder	1	0.75	3.96
22N4W5	porcellanite	proximal	28.5		17.8	11	12.9	4	2.78	170	115	2	straight	shoulder			
22N4W6	porcellanite	distal	20.2		19.6			4.7	1.89			0	unable	unable			
22N4W7	porcellanite	distal	24		18.5			4.6	1.87			0	unable	shoulder			
22N4W8	porcellanite	distal	17.8		20.1			4.5	1.15			0	unable	unable			
22N4W9	porcellanite	proximal	22.5		21.6	14.3	18.9	4.3	2.21	165	120	0	convex	shoulder			
24N4W1	porcellanite	midsection	39.3		27	17.2		5.1	7.55			0	unable	shoulder			
24N4W2	porcellanite	distal	39.3	37	25			6	5.57			0	unable	shoulder		0	6.17
24N4W3	porcellanite	proximal	45.3		26.4	14.9	20.5	5.3	6.34	145	120	0	convex	shoulder			
24N4W4	porcellanite	proximal	33.1		22.4	13.6	17	4.1	2.98	155	125	1	convex	shoulder			
24N4W5	porcellanite	proximal	35.8		20	11	16.1	5.3	3.82	140	125	0	convex	shoulder			
24N4W6	porcellanite	distal	21.5		16.6			3.8	1.09			0	unable	unable			
24N4W7	porcellanite	complete	36.1	29.5	24.1	12.4	15.5	5.3	3.83	145	115	0	straight	shoulder	3	0	5.57
24N4W8	porcellanite	midsection	18.4		23	14.8		4.9	2.6			0	unable	unable			
24N4W11	porcellanite	complete	62.1	62.1	30	30	30	6.3	14.85			1	convex	unshouldered	3	0.06	9.86

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
24N4W12	porcellanite	distal	37.7		26.8			6.4	5.75			1	unable	unable			
14N2W1	porcellanite	proximal	27.9		20.1	10.9	14.8	4.7	2.84	150	115	0	convex	shoulder			
16N2W1	porcellanite	proximal	19.5		23.1	14.9	17.8	5.7	3.09	160	120	0	concave	shoulder			
16N2W2	porcellanite	proximal	30.7		19.8	14.6	17.9	4.9	3.24	180	125	1	straight	shoulder			
16N2W3	porcellanite	midsection	20.7		22.3	13.3		5.2	3.1			1	unable	shoulder			
16N2W4	porcellanite	distal	23.7		18.8			4.5	1.69			0	unable	unable			
16N2W5	porcellanite	complete	35.9	24.2	20.5	11	16.2	7.2	4.62	180	130	1	convex	shoulder	3	0	3.36
16N2W6	porcellanite	missing ear	32.4		22.4	13.3	15.8	6.1	4.17	160	105	0	convex	shoulder			
16N2W7	porcellanite	distal	24.6		21.4			5.3	2.5			0	unable	unable			
16N2W8	porcellanite	distal	19		16.7			4.8	1.33			0	unable	unable			
18N2W1	porcellanite	complete	57.2	45.8	25.1	13.8	19.5	6.1	8.8	160	105	0	concave	shoulder	3	0.09	7.51
18N2W2	porcellanite	proximal	43		26	15	18.7	6.2	7.78	155	120	0	concave	shoulder			
18N2W3	porcellanite	proximal	36.6		23.5	14.5	16.4	5.6	5.23	160	105	0	convex	shoulder			
18N2W4	porcellanite	midsection	36.9		24.8	13.8		5.2	4.96			0	unable	shoulder			
18N2W5	porcellanite	complete	37.9	29.6	20.7	10.2	15	4.9	3.56	160	120	0	convex	shoulder	3	0	6.04
18N2W7	porcellanite	complete	43.7	37.5	24.2	13	17.2	5.2	5.26	140	120	0	straight	shoulder	3	0	7.21
18N2W8	porcellanite	distal	39.4		22.9			4.8	3.85			0	unable	unable			
18N2W9	porcellanite	complete	37.8	30.5	19.6	9.8	11.2	4.5	3.45	140	120	0	convex	shoulder	2	0.13	6.78
18N2W10	porcellanite	complete	35.4	27.8	23.3	26.7	20.9	5.9	4.45	160	120	0	concave	shoulder	3	0.25	4.71
18N2W11	porcellanite	complete	34.2	25.6	21.4	16.3	19.3	5.2	3.54	200	120	0	convex	shoulder	3	0.25	4.92
18N2W12	porcellanite	midsection	27.4		19.4	11.7		5	2.62			0	unable	shoulder			
20N2W1	porcellanite	midsection	38		2.7	12.6		4.7	5.05			0	unable	shoulder			
20N2W2	porcellanite	distal	33.8	28.2	25.2	14.6		5.2	4.34			0	unable	shoulder		0	5.42
20N2W3	porcellanite	distal	33.3		20.8	12.3	15.6	4.8	3.45	150	120	0	convex	shoulder			
20N2W4	porcellanite	proximal	26.2		23	15.5	16.4	5.8	3.65	145	110	0	straight	shoulder			
20N2W5	porcellanite	proximal	26.3		25.7	15.3	19.7	5	3.89	145	120	0	straight	shoulder			
20N2W6	porcellanite	complete	36	27.2	22.3	14.7	16.7	4.1	3.35	180	120	0	straight	shoulder	3	0	6.63
20N2W7	porcellanite	complete	43.8	36	23.8	14	17.6	6	6.18	150	110	0	straight	shoulder	3	0.09	6
20N2W8	porcellanite	complete	37.9	30.2	20.9	14.5	18.4	4.7	3.94	160	125	2	straight	shoulder	3	0	6.43
20N2W10	porcellanite	proximal	26.6		21.2	12.8	15.4	6.2	3.69	155	115	0	straight	shoulder			
20N2W11	porcellanite	proximal	20.2		20.1	11.7	12.4	2.7	1.35	180	110	2	convex	shoulder			
22N2W1	porcellanite	distal	43.8	38	23.6	12.9		5	5.25			0	unable	shoulder		0	7.6
22N2W2	porcellanite	complete	39	30.8	24.2	14.4	18.9	4.7	4.34	165	125	1	convex	shoulder	3	0	6.55

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
22N2W3	porcellanite	lateral edge	34.5		20.1			5.9	4.94			0	unable	unable			
22N2W4	porcellanite	proximal	27.5		23	15.6	19	5.2	3.38	165	125	0	straight	shoulder			
22N2W5	porcellanite	complete	27.1	19.1	15.9	9.9	13.1	4.4	1.83	180	130	0	straight	shoulder	3	0	4.34
22N2W6	porcellanite	complete	38.7	30.6	23.6	14.4	18.1	6.1	5.22	155	110	0	straight	shoulder	3	0.09	5.02
22N2W8	porcellanite	complete	32.1	21.8	21.3	13	16.9	4.8	3.46	180	120	1	straight	shoulder	1	0.5	4.54
24N2W1	porcellanite	proximal	42.6		24.6	14.3	17.1	6	6.3	155	115	1	straight	shoulder			
24N2W2	porcellanite	distal	48.5	42.6	24.5	12.9		5.5	6.37			0	unable	shoulder		0	7.75
24N2W3	porcellanite	complete	48.6	40.7	26	13.5	17.1	3.6	5.25	140	110	1	straight	shoulder	3	0	11.3
24N2W4	porcellanite	proximal	45.4		26.5	14.7	18.5	6	7.88	160	115	0	concave	shoulder			
24N2W5	porcellanite	complete	45.3	37	28.3	17.2	20.2	5.2	6.47	150	115	1	straight	shoulder	3	0	7.12
24N2W6	porcellanite	complete	33.3	24.4	21.3	13.4	17.5	6.3	4	150	110	0	convex	shoulder	3	0	3.87
24N2W7	porcellanite	midsection	25.9		23			4.3	2.45			0	unable	unable			
24N2W8	porcellanite	proximal	21.1		20.3	14.3	18.6	5.3	2.4			0	straight	shoulder			
24N2W9	porcellanite	complete	47	38.6	27.8	16.2	20.4	5.6	5.88	155	120	0	convex	shoulder	3	0	6.89
24N2W10	porcellanite	complete	49.7	49.8	22.6	22.6	22.6	6.4	6.44			1	convex	unshouldered	3	0	7.78
24N2W11	porcellanite	complete	35.5	29.1	25.6	15.7	17.1	5.4	4.95	145	110	0	convex	shoulder	3	0	5.39
24N2W12	porcellanite	proximal	29		19.8	14.5	17	4.9	2.72	160	120	0	convex	shoulder			
24N2W13	porcellanite	distal	23		19.4			5	1.91			0	unable	unable			
16N001	porcellanite	proximal	28.5		22.3	14.6	17.7	4.7	3	160	140	0	convex	shoulder			
16N002	porcellanite	proximal	25.5		21.5	15.1	14.3	5.3	2.94	180	90	0	unable	shoulder			
16N003	porcellanite	complete	38.1	31.6	16	9.7	11.9	3.4	2.28	180	130	3	convex	shoulder	3	0	9.29
16N004	porcellanite	midsection	18		18.3			4.1	1.33			0	unable	unable			
18N001	porcellanite	distal	49	46	26.8	18.2		4.8	7.32			2	unable	shoulder		0.13	9.58
18N003	porcellanite	complete	31.1	23.4	21.7	13.6	17.5	5.9	3.66	180	130	0	straight	shoulder	3	0.25	3.97
18N004	porcellanite	complete	33.8	27.3	23.5	12.9	14.4	5.7	3.9	145	105	0	concave	shoulder	3	0.13	4.79
18N005	porcellanite	distal	20	19.9	20.1	13.5		4.1	1.64			2	unable	shoulder		0	4.85
18N006	porcellanite	midsection	18.9		21.1			4.7	1.74			0	unable	unable			
18N007	porcellanite	midsection	19.3		21.1	14.5		4.8	2.33			0	unable	shoulder			
18N008	porcellanite	complete	34.8	29	23.2	12.7	14.9	4	3.08	160	125	1	straight	shoulder	3	0	7.25
18N009	porcellanite	complete	37.8	30.3	20.5	12.1	14.8	5.2	3.66	160	125	1	convex	shoulder	3	0	5.83
18N0010	porcellanite	missing ear	29.8		20.9	13.8	15.4	5.6	3.17	160	110	0	straight	shoulder			
20N001	porcellanite	midsection	50.7		26.8	17		5.6	8.84	165	115	0	unable	shoulder			
20N002	porcellanite	distal	35.6		25.9			5.5	4.97			1	unable	unable			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
20N003	porcellanite	complete	39.9	31.2	24.4	14.7	18.9	5.9	4.88	165	120	0	concave	shoulder	3	0	5.29
20N004	porcellanite	complete	31.5	23.3	20.3	13.2	15.4	2.8	1.97	180	115	2	convex	shoulder	3	0	8.32
20N005	porcellanite	midsection	22.1		21.3			5.2	2.69			0	unable	unable			
20N006	porcellanite	distal	38.8		24.9			4.9	4.42			0	unable	unable			
20N007	porcellanite	complete	37.8	29.8	21.7	12.6	17.5	4.4	3.41	160	130	0	straight	shoulder	3	0.25	6.77
20N008	porcellanite	distal	20.6		17.3			2.7	1.03			2	unable	unable			
20N009	porcellanite	complete	33.3	24.4	22	15.7	20.6	4.8	3.58	180	125	1	convex	shoulder	3	0.06	5.08
20N0010	porcellanite	distal	28.8		20			4.7	2.56			0	unable	shoulder			
22N001	porcellanite	complete	56	45.8	26.5	18.2	21.3	7.1	8.77	150	120	0	straight	shoulder	3	0	6.45
22N002	porcellanite	complete	50.7	42.1	26.1	15.5	20	5.6	7.17	150	125	0	convex	shoulder	3	0	7.52
22N003	porcellanite	midsection	38.3		24.3	13		5.7	5.6			0	straight	shoulder			
22N004	porcellanite	proximal	33.2		23.5	11.5	13.4	4.6	4.76	145	110	1	convex	shoulder			
22N005	porcellanite	complete	36.9	28.2	21.3	14.1	18.9	7.1	5.32	190	125	2	convex	shoulder	1	0.75	3.97
22N006	porcellanite	proximal	18.5		26.1	16.1	18.3	3.5	1.96	145	105	2	convex	shoulder			
24N001	porcellanite	proximal	46.9		24.1	14.9	18.7	6.2	7.13	160	120	0	straight	shoulder			
24N002	porcellanite	complete	36.7	28.2	25.8	12.6	17.1	5.8	4.53	155	115	0	straight	shoulder	1	0.5	4.86
24N003	porcellanite	midsection	24.1		23.1	14.6		5.5	3.06			0	unable	shoulder			
24N004	porcellanite	distal	27		23.8			5.2	2.93			0	unable	unable			
25N001	porcellanite	complete	39.6	30.1	22.8	13.1	20.1	6.3	5.48	165	130	0	straight	shoulder	3	0.13	4.78
25N002	porcellanite	complete	52.5	44.9	23.5	14.6	17	5.8	6.81	160	135	1	convex	shoulder	3	0	7.74
25N003	porcellanite	midsection	36		19.8			4.2	3.23			0	unable	shoulder			
18N2E1	porcellanite	distal	32	32	25	14.5		5.4	3.6			1	straight	shoulder		0	5.93
18N2E3	porcellanite	lateral edge	13.9		20			6.3	2.58			0	unable	unable			
20N2E1	porcellanite	complete	25.4	26.5	22.1	15.4	18.2	5.3	3.83	180	120	0	convex	shoulder	1	0.5	5
20N2E2	porcellanite	proximal	28.3		22.9	16.5	20.5	5.2	3.63	160	120	0	straight	shoulder			
20N2E3	porcellanite	complete	22.7	18.2	14.9	8.7	8.8	2.9	0.93	180	120	2	convex	shoulder	3	0	6.28
20N2E4	porcellanite	proximal	20.4		22.6	13	16.3	5.2	2.71	180	115	0	straight	shoulder			
20N2E5	porcellanite	lateral edge	25.4		20.1			4.7	2.2			0	unable	shoulder			
20N2E6	porcellanite	proximal	30.5		24.2	14.6	17.3	5.7	4.24	155	115	0	convex	shoulder			
20N2E7	porcellanite	complete	47.3	40.4	27.9	16.6	22.2	6	7.85	140	120	1	straight	shoulder	3	0.13	6.73
22N2E1	porcellanite	complete	33	22.8	23.2	15.5	20.7	5.3	4	185	120	0	convex	shoulder	3	0	4.3
22N2E2	porcellanite	complete	40.3	32.5	24.5	14.9	15.9	5	4.36	160	115	2	concave	shoulder	3	0	6.5
22N2E3	porcellanite	midsection	20.9		23.9	16.5		5.7	3.62			0	unable	shoulder			

149 Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
Surface8.82S13.3W1	porcellanite	proximal	38.7		25.9	14.9	17.6	5.9	6.53	150	110	0	convex	shoulder			
Surface15.38S18.56W1	porcellanite	midsection	39.2		28.2	16.4		5.8	7.56			0	unable	shoulder			
Surface16S15.5W1	porcellanite	distal	33.5	24.4	17.7	11.2	11.2	4.5	3.23			0	straight	shoulder		0	5.42
Surface16.5N16W1	porcellanite	midsection	22.8		21.8			5.8	2.6			0	unable	unable			
Surface17S4.7E1	porcellanite	proximal	16.4		21	21	21	4.8	1.89			0	straight	unable			
test trench #1 2	porcellanite	proximal	40.7		22.9	14.7	17.3	5.5	6.94	160	110	1	straight	shoulder			
St.2B.412N96W1	porcellanite	midsection	27.3		26.3			5.7	3.92			1	unable	unable			
St.2B.410N96W1	porcellanite	midsection	29.9		21.6			5.9	3.91			0	unable	shoulder			
St.2B.410N96W2	porcellanite	midsection	25.2		24.4	15		5.1	3.05			0	unable	shoulder			
St.2B.4 8N96W1	porcellanite	midsection	24.1		27			4.8	4.22			0	unable	shoulder			
St.2B.4 6N96W1	porcellanite	midsection	28.9		24.3			5.2	3.58			0	unable	unable			
St.2B.4 4N96W1	porcellanite	distal	33.3	28.6	25.1	13.3		5	3.96			0	unable	shoulder		0	5.72
St.2B.4 4N96W2	porcellanite	midsection	22		20.1			5.8	2.59			0	unable	unable			
St.2B.4 4N96W3	porcellanite	distal	29.9		18.7			5	3.02			0	unable	shoulder			
St.2B.4 2N96W1	porcellanite	proximal	25.6		27.4	13.7	18.6	6.5	4.89	155	120	0	straight	shoulder			
St.2B.4 2N96W2	porcellanite	proximal	36.5		23.8	14.5	18.4	5.3	5.47	160	120	1	straight	shoulder			
St.2B.4 2N96W3	porcellanite	complete	32.2	24.8	21	13.8	17.8	5.4	3.23	160	120	0	straight	shoulder	3	0.25	4.59
St.2B.4 2N96W4	porcellanite	distal	18.3		21			3.6	1.49			0	unable	unable			
St.2B.4 2N96W5	porcellanite	midsection	15.5		21			5.4	2.1			0	unable	unable			
St.2B.4 6N94W1	porcellanite	midsection	22.7		25.5			5.4	4.28			0	unable	unable			
St.2B.4 6N94W2	porcellanite	proximal	20.9		23.8	14.5	18.1	3.6	3.46	180	120	1	straight	shoulder			
St.2B.4 6N94W3	porcellanite	distal	21.7		19.1			4.6	1.71			0	unable	unable			
St.2B.4 6N94W4	porcellanite	distal	16.8		19.1			4.3	1.27			1	unable	unable			
St.2B.4 6N94W5	porcellanite	proximal	21.2		21.7	15.9	19.7	5.3	2.24	180	120	0	convex	shoulder			
St.2B.4 4N94W1	porcellanite	proximal	27.1		22.1	15.5	19.3	5.8	3.78	170	120	1	convex	shoulder			
St.2B.4 4N94W2	porcellanite	proximal	32.4		17.1	10	10	3	1.76	180	95	4	convex	shoulder			
St.2B.4 4N94W3	porcellanite	lateral edge	26.1		13.4			4.6	1.93			2	convex	shoulder			
St.2B.4 4N94W4	porcellanite	distal	33	33	27.4			5.7	5.21			0	unable	unable		0	5.79
St.2B.4 4N94W5	porcellanite	distal	31.6		21.8			4.4	2.59			0	unable	unable			
St.2B.4 4N94W6	porcellanite	lateral edge	22.2		17			4.6	2.3			0	unable	unable			
St.2B.4 2N94W2	porcellanite	distal	28.2	27.7	22.2			5.2	2.44			1	unable	unable		0	5.33
8N76W1	porcellanite	proximal	24.1		18.8	13.4	17	4.7	2.25	160	125	0	straight	shoulder			
6N76W1	porcellanite	proximal	43		25.7	15.9	18	5.6	6.95	180	120	1	straight	shoulder			

150 Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
6N76W2	porcellanite	distal	34	33.3	24.7			4	4.28			2	unable	shoulder		0	8.33
12N74W1	porcellanite	proximal	22.6		20.9	14.7	16.3	5.1	2.28			0	convex	shoulder			
10N74W1	porcellanite	complete	38.3	28.2	23.6	16	19.2	6.1	5.19	160	125	1	concave	shoulder	3	0	4.62
10N74W2	porcellanite	prox lateral edge	20.5		22.7			6.3	3.61			0	unable	shoulder			
10N74W3	porcellanite	midsection	19		22.8			4.4	1.85			0	unable	shoulder			
8N74W1	porcellanite	proximal	34.9		22.1	22.1	22.1	5.3	5.22			0	convex	unshouldered			
8N74W2	porcellanite	midsection	32.6		21			6.5	4.15			0	concave	shoulder			
8N74W3	porcellanite	proximal	15.5		19.8	10.6	11.5	3.8	1.28	155	115	0	straight	shoulder			
8N74W4	porcellanite	midsection	18		19.3			4.2	1.69			0	unable	unable			
8N74W9	porcellanite	midsection	28.8		25.6			4.2	3.29			1	unable	unable			
4N74W1	porcellanite	midsection	22.6		28.3	18.5		5	4.87			1	unable	shoulder			
St.2tests9N17W1	porcellanite	proximal	26.1		25.9	16.6	21.4	5.4	3.97	150	120	0	convex	shoulder			
St.2tests10N17W1	porcellanite	proximal	42.3		24.5	13.2	14.8	5.7	6.87	160	125	1	convex	shoulder			
St.2tests14N27W1	porcellanite	proximal	33.3		28.5	17.9	17.9	5.8	5.58	150	120	1	straight	shoulder			
St.2tests14N27W2	porcellanite	complete	40.1	30.3	22.5	13.4	17.6	5.6	4.86	180	135	1	convex	shoulder	3	0.06	5.41
St.2tests14N27W3	porcellanite	complete	33.1	26	25	15.7	18.4	6	4.41	170	115	1	straight	shoulder	1	0.5	4.33
St.2tests14N27W4	porcellanite	complete	46.8	38.6	25.1	14.4	18.3	6.5	6.57	155	120	2	straight	shoulder	3	0	5.94
St.2tests15N27W1	porcellanite	missing ear	45.9		24.5			4.3	4.68	155	120	2	convex	shoulder			
St.2tests15N27W2	porcellanite	lateral edge	11.5		11.8			4	0.4			0	unable	unable			
St.2tests9S30W1	porcellanite	proximal	34.9		25.8	17.8	21.4	6.6	5.56	165	115	0	straight	shoulder			
St.2tests9S30W2	porcellanite	complete	61.6	54.1	30.3	15.7	20.2	6.5	11.17	150	120	0	straight	shoulder	3	0.06	8.32
St.2tests9S30W3	porcellanite	midsection	11.5		20			4.3	1.19			0	unable	unable			
St.2tests9S30W4	porcellanite	lateral edge	17.5		10.7			3.8	0.57			1	unable	unable			
St.2tests9S30W5	porcellanite	midsection	11.8		18.4			4.4	1.09			0	unable	unable			
St.2tests10S30W1	porcellanite	midsection	28.2		23.4			4.6	2.34			1	unable	unable			
St.2tests10S30W2	porcellanite	proximal	30.5		25.8	14.1	18.6	5	4.42	155	120	0	convex	shoulder			
St.2tests10S30W3	porcellanite	proximal	23.6		24.5	12.6	15.3	4.5	2.8	145	115	0	convex	shoulder			
St.2tests6S33W2	porcellanite	distal	18.4		15.4			4.8	1.06			0	unable	shoulder			
St.2tests6S33W4	porcellanite	prox lateral edge	23.1		21.9			5.1	3.25			0	concave	unable			
St.2tests10N69W1	porcellanite	distal	22.5		19.7			4.4	1.6			1	unable	unable			
St.2tests10N69W2	porcellanite	proximal	16.2		21.8	21.8	21.8	3.2	1.48			1	convex	unshouldered			
St.2tests10N69W3	porcellanite	complete	46.3	39	27.8	18.3	20.4	5.1	6.93	155	115	0	convex	shoulder	3	0	7.65
St.2tests6N96W1	porcellanite	complete	28.9	22.4	19.6	11.7	12.6	5.2	2.48	150	115	0	straight	shoulder	3	0	4.31

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
St.2tests5N96W1	porcellanite	complete	26.7	19.3	25	16.5	18.9	5.3	3.74	165	115	0	concave	shoulder	2	1	3.64
St.2tests4N96W1	porcellanite	complete	33.8	27.8	22.5	14	17.6	5.3	3.87	160	115	0	convex	shoulder	3		5.25
St.2tests7N77W1	porcellanite	midsection	25.1		20.6	12.7		5.5	2.73			0	straight	shoulder			
St.2tests14N113W1	porcellanite	midsection	26.4		17.5			5.1	2.75			0	unable	unable			
St.2B.1 7N2W1	porcellanite	prox lateral edge	29.5		18.5			5.3	3.11			0	unable	shoulder			
St.2B.1 5N3W1	porcellanite	complete	23.2	16.9	19.2	11.2	12.1	4.2	1.68	150	130	2	convex	shoulder	3	0	4.02
St.2B.1 6N3W2	porcellanite	midsection	23.3		23.9	14.4		4.9	3.55			0	unable	shoulder			
St.2B.1 6N3W3	porcellanite	midsection	18.1		21.1	12		4.6	1.82			1	unable	shoulder			
St.2B.1 7N3W1	porcellanite	complete	26.6	18.5	15.3	12.7	14.9	3	1.31	180	130	3	straight	shoulder	3	0	6.17
St.2B.1 8N3W1	porcellanite	distal	20.4		15.9			4.6	1.21			0	unable	unable			
St.2B.1 9N3W1	porcellanite	proximal	24.1		19.1	16	19.1	5	2.8			0	straight	shoulder			
St.2B.1 10N3W1	porcellanite	proximal	42.1		25.4	15.7	16.7	5.3	6.77	145	115	1	convex	shoulder			
St.2B.1 6N4W2	porcellanite	distal	36.7	28.5	21	14.7		5.7	4.72			0	unable	shoulder		0	5
St.2B.1 6N4W3	porcellanite	distal	33.5	29.7	23.2	15.3		5.6	4.09			0	unable	shoulder		0	5.3
St.2B.1 8N4W1	porcellanite	distal	24.8	24.7	25.6			5.8	3.76			1	straight	unable		1	4.26
St.2B.1 8N4W2	porcellanite	complete	25.5	20.2	15.9	9.7	10.7	4.5	1.43	150	110	0	straight	shoulder	3	0.5	4.49
St.2B.1 9N4W1	porcellanite	proximal	12.3		18.9	9.6	10.1	3.7	0.84	180	95	2	straight	shoulder			
St.2B.1 10N4W1	porcellanite	complete	44.2	34.8	26.5	16.6	20.8	6.6	6.61	150	115	0	straight	shoulder	3	0.06	5.27
St.2B.1 10N4W2	porcellanite	proximal	10.7		17.7	14.3	17.7	4.5	0.87			0	convex	shoulder			
St.2B.1 5N5W1	porcellanite	midsection	44.8		29.1	18.9		5.5	8.05			0	straight	shoulder			
St.2B.1 6N5W3	porcellanite	proximal	28.3		22.5	12	14.7	4.4	3.09	140	115	0	unable	shoulder			
St.2B.1 7N5W1	porcellanite	midsection	25.1		23.9			5.2	3.8			0	unable	unable			
St.2B.1 8N5W1	porcellanite	distal	9.3		10			2.9	0.18			1	straight	unable			
St.2B.1 9N5W1	porcellanite	proximal	33.8		25.3	13.3	17	5.3	5.31	155	115	1	straight	shoulder			
St.2B.1 9N5W2	porcellanite	proximal	18.3		27.4	15.5	21.8	5	2.81	145	125	0	convex	shoulder			
St.2B.1 9N5W3	porcellanite	midsection	31.5		21.5	11.5		4.9	3.47			0	straight	shoulder			
St.2B.1 10N5W2	porcellanite	midsection	21.8		20.3	10.5		4.7	2.2			0	convex	shoulder			
St.2B.1 10N5W3	porcellanite	distal	19.9		18.2			4.8	1.36			0	straight	unable			
ST.2B.310N83W2	porcellanite	complete	46.6	37.6	27.3	16	18.1	6.5	7.76	150	115	2	convex	shoulder	3	0.03	5.78
ST.2B.310N84W1	porcellanite	proximal	24.5		24.1	13.2	16.4	5.1	3.73	155	110	1	convex	shoulder			
ST.2B.310N84W2	porcellanite	midsection	17.5		17.4			5.7	1.67			0	straight	shoulder			
ST.2B.39N87W1	porcellanite	distal	13		18.3			3.2	0.74			1	unable	unable			
ST.2B.39N87W2	porcellanite	proximal	8.4		16.6	13.3	16.6	5	0.79			0	convex	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
ST.2B.310N87W1	porcellanite	lateral edge	34.2		19.4			5.7	3.77			1	concave	shoulder			
ST.2B.310N87W2	porcellanite	proximal	17.6		25.3	16.5	20.2	4.7	2.57	160	110	1	straight	shoulder			
ST.2B.39N89W2	porcellanite	complete	33.4	25.7	18.8	15.1	16.6	4.8	2.91	180	100	2	convex	shoulder	3	0	5.35
ST.2B.39N89W3	porcellanite	distal	18.7		21.9	14.2		5.2	1.97			0	unable	unable			
ST.2B.39N89W4	porcellanite	proximal	14.5		20.2	13.4	16.9	5.5	1.81			0	convex	shoulder			
ST.2B.39N89W5	porcellanite	midsection	15.5		21.9			4.7	2.14			1	unable	unable			
St2 B2 11N45W1	porcellanite	midsection	29.9		27.2			6.4	5.36			0	unable	unable			
St2 B2 11N45W2	porcellanite	midsection	21.1		20.5			5.1	1.94			0	unable	unable			
St2 B2 10N45W1	porcellanite	midsection	38.8		20.7	13.2		5.8	6.08			0	unable	shoulder			
St2 B2 10N45W2	porcellanite	proximal	26.5		19	13.5	17.4	4.9	2.78	165	135	1	convex	shoulder			
St2 B2 10N45W3	porcellanite	distal	14.9		17.7			3.1	0.67			0	unable	unable			
St2 B2 10N45W4	porcellanite	proximal	33.8		23.9	12.8	15.2	5.5	4.7	150	115	1	straight	shoulder			
St2 B2 9N45W1	porcellanite	midsection	24.7		23.3	14.7		5.9	3.74			1	unable	unable			
St2 B2 9N45W2	porcellanite	distal	39.5		24.2	13.8		5	4.4			0	unable	unable			
St2 B2 8N45W1	porcellanite	proximal	43.5		22.5	11.9	15.9	5	6.1	140	110	0	straight	shoulder			
St2 B2 8N45W2	porcellanite	complete	32.3	24.7	17.5	11.1	14.7	4.3	2.5	180	125	0	convex	shoulder	3	0	5.74
St2 B2 6N45W1	porcellanite	proximal	25.8		27.7	15.1	18.4	5.7	3.45	155	115	0	convex	shoulder			
St2 B2 3N45W1	porcellanite	midsection	21.3		26			5.4	3.88			0	unable	shoulder			
St2 B2 3N45W2	porcellanite	proximal	23.6		26	15.4	18.6	5.5	4.1	155	135	0	concave	shoulder			
St2 B2 2N45W1	porcellanite	proximal	44.7		26.3	15.5	17	5.2	6.55	150	125	0	straight	shoulder			
St2 B2 1S45W1	porcellanite	midsection	32		25.3			5.7	4.33			2	unable	shoulder			
St2 B2 1S45W2	porcellanite	distal	16		14.7			2.9	0.56			0	unable	unable			
St2 B2 2S45W4	porcellanite	prox lateral edge	8.1		13.7			3.8	0.47			0	straight	shoulder			
St2 B2 3S45W1	porcellanite	midsection	25.2		28.4			5.4	4.77			0	unable	unable			
St2 B2 3S45W2	porcellanite	complete	34.3	26.8	22	13.7	16.4	5	3.77	160	125	1	convex	shoulder	3	0	5.36
St2 B2 4S45W1	porcellanite	complete	26.4	26.3	20.5	20.5	20.5	3.9	2.08			2	convex	unshouldered	3	0	6.74
St2 B2 4S45W2	porcellanite	distal	14.7		14.6			3.8	0.62			0	unable	unable			
St2 B2 5S45W1	porcellanite	distal	20		16.9			3.6	1.06			1	unable	unable			
St2 B2 6S45W1	porcellanite	proximal	46.3		22.9	16	18.3	5.1	5.88	160	120	0	straight	shoulder			
St2 B2 6S45W3	porcellanite	proximal	25.2		18.6	10.9	12.2	4.6	2.52	160	125	2	convex	shoulder			
St2 B2 6S45W4	porcellanite	lateral edge	23.2		20.7			4.8	1.86			0	unable	unable			
St2 B2 7S45W1	porcellanite	midsection	19.6		20.9			5.4	2.14			0	unable	unable			
St2 B2 7S45W2	porcellanite	midsection	27.8		23.4	13.9		5.8	4.61			0	unable	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
St2 B2 7S45W3	porcellanite	distal	29.4	27.1	23.3	16.3		5.3	3.67			1	convex	shoulder		0.25	5.11
St2 B2 7S45W4	porcellanite	distal	28.5		22.2	15.4		6.3	3.29			0	convex	shoulder		1	
St2 B2 7S45W5	porcellanite	complete	31.6	24.6	22.7	15	16.4	5.7	3.59	155	115	1	convex	shoulder	1	0.5	4.32
St2 B2 8S45W1	porcellanite	complete	31.9	23.3	23.2	14.6	17.2	4.7	3.69	160	110	0	straight	shoulder	3	0.25	4.96
St2 B2 8S45W2	porcellanite	complete	36.4	27	20.9	14.6	19.1	5	3.9	160	120	0	convex	shoulder	3	0	5.4
St2 B2 9S45W1	porcellanite	midsection	25.9		25			5.6	4.8			0	unable	unable			
St2 B2 9S45W3	porcellanite	proximal	32.4		24.4	15.5	19.7	5.1	5.24	180	110	2	straight	shoulder			
St2 B2 9S45W4	porcellanite	proximal	28.6		20.8	14.2	19.2	5	3.86	180	110	0	straight	shoulder			
St2 B2 9S45W5	porcellanite	distal	32.7		25.7			5.3	4.43			0	unable	unable			
St2 B2 9S45W6	porcellanite	proximal	21.5		21.5	13.8	15.9	4.7	1.88	160	105	0	convex	shoulder			
St2 B2 11S45W1	porcellanite	distal	33.5		23.1			4.9	3.92			0	unable	unable			
St2 B2 11S45W2	porcellanite	midsection	33.8		25.4	15.3		4.7	4.44			2	unable	shoulder			
St2 B2 11S45W3	porcellanite	complete	32.3	24.7	24.1	14.8	19.5	5.4	4.32	160	125	2	convex	shoulder	2	0.31	4.57
St2 B2 12S45W1	porcellanite	midsection	40.1		27.6			5.4	5.89			1	unable	unable			
St2 B2 12S45W2	porcellanite	distal	14.5		12.4			3.4	0.42			0	unable	unable			
St2 B2 12S45W3	porcellanite	midsection	23.8		24	14.7		4.9	3.04			0	unable	shoulder			
St2 B2 12S45W4	porcellanite	distal	46.2	45.6	31.1	16.5		6.1	8.9			0	unable	shoulder		0.09	7.48
St2 B2 12S45W5	porcellanite	proximal	28.1		20.6	13.3	15.8	4.5	2.79	180	130	0	straight	shoulder			
St2 B2 12S45W6	porcellanite	complete	38.3	20.5	22.8	14.4	18.3	4.8	4.18	155	115	1	convex	shoulder	3	0.13	4.27
St2 B2 13S45W1	porcellanite	proximal	23.6		15.7	8.8	7.9	2.5	1.04	180	90	0	concave	shoulder			
St2 B2 13S45W2	porcellanite	proximal	18.7		27.1	17.6	21	5.4	3.01	155	115	2	straight	shoulder			
St2 B2 14S45W1	porcellanite	distal	39.9	34.2	20.3			5.2	3.89			0	unable	shoulder		0	6.58
St2 B2 14S45W2	porcellanite	proximal	34.4		27.5	16.2	21	5.6	5.69	150	120	1	convex	shoulder			
St2 B2 5N44W1	porcellanite	lateral edge	23.6		18.2			4.1	1.48			0	straight	shoulder			
St2 B2 5N44W2	porcellanite	proximal	38.8		25.4	14.5	19.5	5.8	6.25	145	120	0	convex	shoulder			
St2 B2 4N44W1	porcellanite	distal	15		17.3			3.6	0.72			1	unable	unable			
St2 B2 4N44W2	porcellanite	complete	50.2	43.5	24.6	14.3	16.5	5.5	6.65	145	110	1	straight	shoulder	3	0	7.91
St2 B2 4N44W3	porcellanite	midsection	26.2		25.9	16.1		5.4	4.3			0	unable	shoulder			
St2 B2 1N44W1	porcellanite	midsection	10.4		13			3.5	0.52			0	unable	unable			
St2 B2 1N44W2	porcellanite	distal	33.4		12.9			5	2.41			0	unable	unable			
St2 B2 1N44W3	porcellanite	proximal	38		24.4	14.3	19	5.9	5.6	155	125	0	convex	shoulder			
St2 B2 0044W1	porcellanite	complete	49	49	24	24	24	5	5.91			0	convex	unshouldered	3	0.06	9.8
St2 B2 0044W2	porcellanite	distal	22.6		19.8			3.2	1.16			0	unable	unable			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
St2 B2 0044W4	porcellanite	distal	12.6		12.2			3.3	1.17			0	unable	unable			
St2 B2 1S44W1	porcellanite	midsection	12.5		25.1			5	3.44			0	unable	unable			
St2 B2 1S44W2	porcellanite	distal	14.8		14.6			6.1	1.39			0	unable	unable			
St2 B2 1S44W3	porcellanite	midsection	14.6		26.3	14.4		5.7	2.41			1	straight	unable			
St2 B2 1S44W4	porcellanite	proximal	24.9		24.4	13.9	17.1	5.2	4.15	155	115	2	convex	shoulder			
St2 B2 1S44W5	porcellanite	complete	27.1	21.5	18.4	12.9	13.8	3.7	1.19	180	110	2	straight	shoulder	3	0	5.81
St2 B2 5N43W1	porcellanite	lateral edge	21.9		18.7			4.6	1.63			0	unable	unable			
St2 B2 5N43W3	porcellanite	midsection	36.8		22.9			5.4	4.26			0	unable	shoulder			
St2 B2 5N43W4	porcellanite	proximal	29.5		23.9	15	18.8	5.1	4.37	180	120	2	convex	shoulder			
St2 B2 4N43W3	porcellanite	proximal	23		23.1	11.9	16.1	4.9	3.13	150	115	0	straight	shoulder			
St2 B2 4N43W4	porcellanite	midsection	39.2		27.9	15.4		5.1	6.55			0	unable	shoulder			
St2 B2 3N43W1	porcellanite	proximal	28.1		20.4	14	14.8	5	3.48	180	90	0	straight	shoulder			
St2 B2 2N43W1	porcellanite	complete	32	24.9	19.8	13.8	16.2	5.6	3.52	180	110	0	concave	shoulder	3	0.19	4.45
St2 B2 1N43W1	porcellanite	midsection	27.1		24.5	14.3		5.4	3.92			0	unable	shoulder			
St2 B2 1N43W3	porcellanite	missing ear	59.8		33.5	17.3	23.3	5.5	10.38	155	130	0	concave	shoulder			
St2 B2 1S43W1	porcellanite	midsection	19.4		21.3			5.5	2.14			0	straight	unable			
St2 B2 1S43W3	porcellanite	complete	18.4	13.3	17.5	13.3	15.2	4.9	1.4	180	110	0	straight	shoulder	2	1	2.71
St2 B2 1S43W4	porcellanite	distal	38.1		25.3			4.8	5.18			0	straight	unable			
St2 B2 1S43W5	porcellanite	missing ear	31.3		22.4	17.3	20.2	4.6	3.3	165	135	1	straight	shoulder			
St2 B2 1S43W6	porcellanite	complete	27.3	20	22	15.9	19.1	5.6	3.35	150	105	0	straight	shoulder	1	0.59	3.57
St2 B2 6N42W1	porcellanite	midsection	29.1		22.7			5.4	3.7			0	unable	shoulder			
St2 B2 6N42W2	porcellanite	complete	35.5	35.4	20	20	20	5.3	3.99			1	convex	unshouldered	3	0.03	6.68
St2 B2 6N41W1	porcellanite	complete	38.7	27.1	17.9	12.6	14.2	4.5	2.42	180	140	2	convex	shoulder	3	0	6.02
St2 B2 6N41W2	porcellanite	proximal	27.3		17.3	9.3	12.1	3.7	1.85	180	125	3	convex	shoulder			
St2 B2 6N40W1	porcellanite	prox lateral edge	17.9		13.3			5.2	1.1			1	unable	shoulder			
St2 B2 6N40W2	porcellanite	complete	48.4	40.7	24.5	15	18.2	6.3	7.26	160	120	0	straight	shoulder	3	0	6.46
St2 B2 6N40W3	porcellanite	complete	56.2	48.6	27.5	16.9	20.2	6.4	9.08	145	110	1	concave	shoulder	3	0	7.59
St2 B2 6N40W4	porcellanite	proximal	38.9		25.2	14.7	17.1	5.7	6.01	150	115	1	straight	shoulder			
St2 B2 6N40W5	porcellanite	lateral edge	24.8		21.9			4.9	2.36			0	unable	shoulder			
St2 B2 6N39W2	porcellanite	midsection	25.8		26.9	14.4	16	4.9	4.25			1	straight	shoulder			
St2 B2 6N38W3	porcellanite	complete	34.5	26.7	29.8	16.7	21.2	5.6	5.55	150	110	0	concave	shoulder	2	0.47	4.77
St2 B2 6N36W1	porcellanite	distal	20.1		18.6			5.4	1.57			0	unable	unable			
St2 B2 6N36W2	porcellanite	distal	21.1		16.2			5.2	1.71			0	unable	unable			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
St2 B2 6N35W1	porcellanite	distal	29		20.4			4.6	2.34			1	unable	unable			
St2 B2 6N35W2	porcellanite	distal	17.5		16.8			4.5	0.96			0	unable	unable			
St2 B2 6N35W4	porcellanite	proximal	21.8		21.3	12.4	16.4	5.1	2.49	180	125	1	straight	shoulder			
St2 B2 6N33W2	porcellanite	distal	44.6	35	27.4	15.9		5.7	5.69	180	120	1	straight	shoulder		0	6.14
St2 B2 6N33W3	porcellanite	complete	32.5	25.4	26.6	16.6	17.1	5.5	4.46	160	115	0	straight	shoulder	2	0.38	4.62
St2 B2 6N32W2	porcellanite	complete	25.9	17.9	23.8	16.9	20.6	5.4	3.13	160	115	0	straight	shoulder	2	1	3.31
St2 B2 6N32W3	porcellanite	proximal	15.5		17.1	11.6	13.6	3.9	1.29	180	120	1	straight	shoulder			
St2 B2 6N32W4	porcellanite	midsection	24.4		27.4	16.6		4.9	4.47			0	unable	shoulder			
St2 B2 6N32W5	porcellanite	midsection	39.2		24.5			6.4	6.68			0	straight	shoulder			
St2 B2 6N32W6	porcellanite	midsection	21.8		18.9			4.7	1.92			1	unable	unable			
St2 B2 6N32W7	porcellanite	distal	37.8		19.2			4.8	3.8			3	convex	unable			
St2 B2 6N31W3	porcellanite	complete	50.7	44	26.9	14.5	17.8	5.7	7.5	140	110	0	straight	shoulder	3	0	7.72
St3 22N14E1	porcellanite	distal	20.4		18.3			3.3	1.11			2	unable	unable			
St3 19N14E1	porcellanite	complete	32.1		22.5	13.9	16.7	4.4	3.04	150	125	0	straight	shoulder	3	0.06	
St3 22N11E1	porcellanite	proximal	32.5		20.4	12.5	15.5	4.8	2.98	170	115	1	convex	shoulder			
St3 004W1	porcellanite	midsection	16.2		25.4	15.8		5	2.5			0	unable	shoulder			
St3 40S47W?1	porcellanite	proximal	18.7		23.6	13.9	18.1	4.5	2.32	165	120	2	convex	shoulder			
St.4 48.25N37.8E1	porcellanite	complete	38.8	34.5	24.1	24.1	24.1	5.3	5.05			0	convex	unshouldered	3	0	
St.4 48N37E2	porcellanite	proximal	16.6		19.2	13.6	17.8	4.9	1.88	180	125	0	convex	shoulder			
St.4 32N35E1	porcellanite	missing ear	27		21.8	16.5	20.3	5.2	3.2	180	120	0	straight	shoulder			
St.4 32N35E2	porcellanite	distal	28.6		20.4			4.3	1.65			0	unable	unable			
St.4 30N37E1	porcellanite	distal	35.2	34.6	25.8	12.3		6.9	6.46			2	unable	shoulder		0	
St.4 30N35E1	porcellanite	proximal	25		23	15.5	19.7	5.2	2.93	155	120	0	convex	shoulder			
St.4 32N34E1	porcellanite	distal	11.6		13.4			4.5	0.4			0	unable	unable			
St.4 43N29E1	porcellanite	proximal	23.5		24.4	24.4	24.4	5.1	3.51			1	straight	unshouldered			
St.4 64.8N27.1E1	porcellanite	complete	30.8	25.5	21.7	13.6	15.4	5	2.9	145	115	0	convex	shoulder	3	0	5.1
St.4 41N27E1	porcellanite	midsection	14.1		19.6			5.3	1.55			1	unable	unable			
St.4 63N23E1	porcellanite	missing ear	25.7		18.1	12.3	15.6	4.7	2.03			0	straight	shoulder			
St.4 70N37E1	porcellanite	midsection	36.4		18.2	12.9		5.2	3.15			0	unable	shoulder			
St.4 69N38E1	porcellanite	proximal	28.2		21.3	15.1	18.6	4.9	3.48	150	130	0	convex	shoulder			
St.4 69N36E1	porcellanite	proximal	30.1		24.5	15.3	17.8	5.1	4.1	160	120	1	convex	shoulder			
St.4 62N23E1	porcellanite	distal	32.6		22.5			5.5	3.9			0	unable	unable			
St.4 62N25E1	porcellanite	distal	22.6		19.5			5.1	1.8			1	unable	unable			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
St.4 50N36E1	porcellanite	midsection	17.4		22.6			5.4	2			0	unable	unable			
St.4 49N36E1	porcellanite	complete	18.8	11.8	19.1	15.1	19.1	5.5	2.05	180	130	0	convex	shoulder	1	1	2.15
St.4S4 2010?1	porcellanite	proximal	22.5		23.1	14.4	16.9	5.8	3.5	150	125	0	straight	shoulder			
St.4st4block9?1	porcellanite	proximal	7.6		16.7	14.9	16.7	3.8	0.35			0	straight	shoulder			
4S59W8	chert	distal	16.4		21.7			4.9	1.85			0	unable	unable			
0059W4	chert	proximal	22.9		25.8	13.3	17.4	4.6	3.22	155	110	1	straight	shoulder			
6S57W5	chert	midsection	18.4		18.8			4.4	1.63			0	unable	unable			
4S57W2	chert	complete	36.6	29.7	23.7	12.6	15.2	6	4.45	160	125	0	convex	shoulder	3	0.06	4.95
2S57W1	agate	distal	37.1	30	23.5	12		4	3.53			2	unable	shoulder		0	7.5
2S57W2	chert	complete	27.5	19.7	25.2	14.2	17.9	5.4	3.7	165	120	1	straight	shoulder	2	1	3.65
2N57W4	chert	complete	25.1	17.9	19.1	13.3	16.5	4.2	2.09	205	110	1	convex	shoulder	3	0	4.26
4N57W1	chert	complete	51.4	41.9	26.1	16.4	20.2	6.6	8.21	170	120	2	convex	shoulder	3	0	6.35
8N57W3	chert	proximal	23.4		22	15.1	18.9	5.1	3	170	115	1	straight	shoulder			
10N57W3	chert	distal	37.8	37.4	26.2			6.8	6.45			0	unable	unable		0.13	5.5
4S55W4	chert	complete	44.2	35	27.8	15.9	20.7	5.7	7.5	160	120	0	straight	shoulder	3	0	6.14
4S55W7	chalcedony	complete	29	21	21.7	16.3	17.9	6.2	3.76	165	120	0	convex	shoulder	2	1	3.39
2S55W2	chert	distal	24.7		18.3			5	2.12			0	unable	unable			
0055W1	chert	proximal	32.1		27.1	13.6	15.8	4.7	3.8	150	100	0	convex	shoulder			
0055W2	chert	midsection	37.6		26.8			4.5	5.32			1	unable	shoulder			
2N55W1	chert	proximal	40		27.9	15.7	18.2	5.3	7.4	150	115	1	concave	shoulder			
2N55W5	agate	complete	37.1	30	23.2	13.2	16.3	4.8	4.35	155	110	0	straight	shoulder	3	0	6.25
2N55W6	chert	complete	39.6	33.3	18.7	12.5	12.5	4	2.94	150	105	2	convex	shoulder	3	0	8.33
2N55W7	agate	proximal	26.5		24.6	15.8	17.8	5.2	4.3	160	120	2	straight	shoulder			
2N55W11	agate/chert	distal	27		21.7			4.5	2.5			0	unable	unable			
2N55W13	chert	distal	26.6		21			4.9	2.83			0	unable	unable			
4N55W2	chert	distal	38.3	30	27.7	15		5.8	5.69	160	115	0	straight	shoulder		0.13	5.17
6N55W1	quartzite	complete	36.5	29.9	25.4	14.7	16.7	6	5.09	160	110	0	concave	shoulder	3	0	4.98
8N55W4	quartzite	complete	36.7		23.3	12.9	18.4	6.1	4.51	160	130	0	convex	shoulder	3	0	
8N55W9	chert	distal	17.7		22			4.1	1.65			0	unable	shoulder			
10N55W1	chert	complete	44.7	27.9	27.1	15.9	19.2	5.7	6.98	160	115	0	convex	shoulder	3	0.13	4.89
12N55W1	chert	distal	37.9		22			5.3	4.45			0	unable	shoulder			
6S53W5	quartzite	distal	32.7	32.5	18			4	2.61			0	unable	shoulder		0	8.13
6S53W7	agate	distal	14.1		19.3			4.5	1.1			0	unable	unable			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4S53W1	chert	distal	40.4	32	25.2	15.2		6.1	5.72			0	convex	shoulder		0	5.25
4S53W5	quartzite	proximal	24.7		18.7	13.8	15.8	3.8	1.83	160	120	2	straight	shoulder			
2S53W7	chalcedony	distal	24.8		19.5	12.4		5.4	3.01			0	unable	shoulder			
0053W2	chert	complete	32.5	25.6	21.1	14.9	15.6	5	3.67	165	100	0	straight	shoulder	3	0.25	5.12
0053W3	chert	proximal	31.1		20.9	13.3	16.3	4.9	3.35	145	110	0	convex	shoulder			
0053W4	chert	proximal	18.3		20.6	13.1	17.1	4.3	1.92	160	120	0	convex	shoulder			
2N53W1	chert	distal	52.8	44.5	26.6	15.6		5.9	7.63			0	unable	shoulder		0	7.54
2N53W2	chalcedony	complete	45.4	38.5	18.7	9.4	13.7	4	3.86	150	120	2	straight	shoulder	3	0	9.63
2N53W6	chalcedony	proximal	31		22.6	15.1	17.2	4.3	3.59	160	110	2	convex	shoulder			
2N53W8	agate	proximal	33.7		20.6	12.6	14.4	5.2	3.78	155	125	2	straight	shoulder			
4N53W1	silicified sandstone	complete	50.8	44.3	28.3	16.1	19.8	5	6.92	165	115	0	straight	shoulder	3	0	8.86
4N53W2	chert	complete	47.4	36.5	26.3	13.9	19.2	6.2	7.47	160	110	0	convex	shoulder	3	0.06	5.89
4N53W3	agate	proximal	31.2		25.6	13.5	17.3	5.5	5.48	150	110	1	straight	shoulder			
4N53W7	chert	proximal	12.3		23.9	16.7	19.2	5	1.71			0	straight	shoulder			
6N53W5	chalcedony	complete	28.2	20.8	20.3	13.8	18.2	4.4	2.06	160	130	0	convex	shoulder	3	0.19	4.73
8N53W3	chert	complete	34.7	27.3	25.2	17.6	22.6	5.6	5.24	150	125	0	straight	shoulder	3	0.5	4.88
10N53W6	chert	lateral edge	30.5		18.3			5.2	3.2			0	unable	shoulder			
12N53W3	silicified sandstone	complete	29.7	20.7	20.2	14.6	17.4	4.7	3.05	180	120	1	concave	shoulder	3	0.06	4.4
6S51W 1	chert	complete	27.3	21.2	21.9	12.4	14.9	4.3	2.45	160	115	0	straight	shoulder	2	0.25	4.93
4S51W6	chalcedony	distal	39.1	38.8	30.1			4.8	5.45			1	unable	shoulder		0	8.08
4S51W8	chert	proximal	22.2		20.3	12.6	15.3	5.1	2.54	155	100	0	convex	shoulder			
4S51W9	chert	proximal	32.4		20.2	11.7	15.4	5.2	3.05	165	110	0	convex	shoulder			
2S51W8	chalcedony	distal	17.4		20.2			4.2	1.21			0	unable	unable			
2S51W9	chert	lateral edge	16		17.6			4.3	1.11			0	unable	shoulder			
0051W1	chert	complete	40.5	33	27.2	15.7	19.3	5.4	5.87	150	120	1	straight	shoulder	3	0	6.11
0051W4	chalcedony	proximal	26.5		19.5	19.5	19.5	4.6	2.46			0	straight	unshouldered			
0051W6	chert	proximal	29.8		26	15.5	17.5	4.8	3.78	145	110	0	convex	shoulder			
2N51W2	chert	complete	36.3	27.8	22.8	12.2	13.7	5.1	4	160	110	1	convex	shoulder	3	0	5.45
2N51W7	chert	midsection	30.9		21.5	13.7	16.6	4.1	3.17	180	140	2	convex	shoulder			
2N51W8	chert	midsection	31.6		24.5			5.6	5.35			0	unable	shoulder			
2N51W10	chert	distal	25.5		20.9			5.3	2.26			0	unable	unable			
4N51W4	chert	complete	33.6	25.7	24.4	12.7	17.6	4.5	3.55	155	120	0	convex	shoulder	3	0	5.71
4N51W5	chert	midsection	25.5		35.6	17.2		5.6	6.7			0	unable	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
6N51W4	chert	complete	22.4	12.5	20.6	14.5	19.2	4.5	2.12	190	135	0	convex	shoulder	2	1	2.78
6N51W10	chert	midsection	20.4		23.6			4.2	2.4			1	unable	unable			
8N51W1	chalcedony	complete	60	50	24.5	16	19.8	5	8.12	155	125	2	straight	shoulder	3	0.03	10
8N51W5	chalcedony	distal	14.4		22.2			3.8	1.05			0	unable	unable			
21S49W6	chert	complete	38.5	30.4	25.6	16.5	19.8	5.6	5.5	155	110	1	concave	shoulder	3	0	5.43
21S49W17	chert	midsection	14.2		23.9	14		5.7	2.84			1	unable	shoulder			
19S49W1	chert	complete	38.6	31.7	23.6	11.7	14	5.7	4.39	150	115	0	concave	shoulder	3	0	5.56
17S49W5	agate	distal	29.5		24.5			5.4	3.98			0	unable	shoulder			
8S49W4	chert	midsection	37.1		23.2	15.1		6.5	5.92			0	convex	shoulder			
8S49W5	silicified sandstone	prox lateral edge	31.1		21.5	12.9	16	5.9	4.22	145	110	0	straight	shoulder			
8S49W7	chert	complete	28.9	22.7	20.5	12	14.8	5.6	2.74	155	125	0	convex	shoulder	3	0.25	4.05
8S49W8	chert	midsection	14		18.6			4.4	1.24			0	unable	unable			
6S49W1	silicified sandstone	complete	46.9	36.2	26	16.7	19.5	7.3	8.89	180	120	1	convex	shoulder	3	0	4.96
6S49W2	chalcedony	proximal	42.5		24	14.2	17.6	5.3	5.84	165	120	0	convex	shoulder			
6S49W3	chalcedony	complete	29	19.7	23.9	14.5	19.5	5.3	3.32	160	125	0	straight	shoulder	2	0.38	3.72
2S49W4	chert	proximal	34.6		27.2	15.2	19.3	5.6	5.49	140	115	1	straight	shoulder			
0049W1	agate	complete	33.2	24.4	24.3	14.7	19.2	6.1	4.44	165	120	0	straight	shoulder	3	0.25	4
2N49W3	agate	distal	43.7	38.8	23.4	11.4		4.8	4.14			0	unable	shoulder		0	8.08
2N49W7	chert	distal	38.9		24.2			6.8	5.35			0	unable	unable			
2N49W8	chert	midsection	30.1		27.1			6.1	0			0	unable	unable			
4N49W3	chert	proximal	41.5		26.6	15.9	18.2	5.6	6.2	150	110	0	straight	shoulder			
4N49W4	agate	complete	42	32.4	23.4	14.2	18.1	5.8	4.91	160	120	0	convex	shoulder	3	0	5.59
4N49W8	chert	distal	28.4		23.5			5.1	3.25			1	unable	unable			
6N49W1	chert	distal	48.1	40	28.7	15.7		6.1	8.87	160	125	1	convex	shoulder		0.19	6.56
10N49W5	chert	complete	31.5	23	23	14.7	18.3	5	3.71	165	120	0	straight	shoulder	2	0.25	4.6
10N49W6	chert	proximal	29.7		22.4	13	16.2	6.3	4.61	150	120	0	convex	shoulder			
10N49W7	chert	proximal	25.3		20.2	12.6	15.4	3.8	2.72	165	115	1	convex	shoulder			
12N49W2	chert	complete	32	25.4	19.6	13.3	15.1	4.4	2.64	150	100	0	straight	shoulder	3	0.13	5.77
12N49W5	chert	midsection	24.9		22.2			3.2	3.57			1	unable	unable			
12N49W6	quartzite	midsection	29.9		24.1	15.4		5.6	5.31			0	unable	shoulder			
19S48W2	chert	midsection	42.3		24.3	15		7.3	7.25	150	130	0	convex	shoulder			
17S48W2	chert	proximal	24.1		25.7	15.5	19	5.3	3.74	150	120	0	straight	shoulder			
17S48W7	chert	distal	21.8		19.9			5.7	1.87			0	unable	unable			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
17S47W2	chert	complete	33.9	26.3	23.6	15.9	18.5	5.5	3.93	155	115	1	straight	shoulder	3	0	4.78
17S47W5	chert	midsection	27		25.8	17		5.3	4.89			0	unable	unable			
13S47W4	chert	midsection	6.94		17.9			3.1	0.44			0	unable	unable			
4S47W2	Knife River Flint	proximal	38.9		25.2	18.1	19.9	5.7	6.48	160	120	0	straight	shoulder			
2S47W3	chert	proximal	35.9		25.7	12.3	14.7	5.7	5.7	155	120	0	concave	shoulder			
2S47W6	chalcedony	proximal	26.1		18	9.8	12.1	4.2	1.88	145	110	0	straight	shoulder			
2S47W7	chert	complete	25.6	19.7	16.6	13.7	16.6	5.1	2.34	185	120	0	convex	shoulder	3	0.31	3.86
0047W5	chert	midsection	17.7		25.4	14.3		5.5	3.66			0	unable	shoulder			
2N47W1	agate	proximal	30.1		26.3	16.2	20.1	4.8	5.02	150	120	1	convex	shoulder			
2N47W2	chert	complete	27.7	18.3	23.4	13.7	17.8	5.1	3.59	160	130	0	straight	shoulder	1	0.5	3.59
2N47W4	chert	complete	29.3	21	23.6	14.7	18.1	5.1	3.49	155	115	1	convex	shoulder	2	0.75	4.12
2N47W5	chert	complete	42.8	36.6	19.5	10.7	11.7	5.2	4	155	125	0	convex	shoulder	3	0	7.04
2N47W6	chert	distal	32.6	26	20.4	12.3		4.4	2.93	165	105	0	straight	shoulder		0.5	5.91
2N47W9	chert	midsection	21.6		26.4			5.7	3.86			0	unable	unable			
4N47W4	chert	distal	34.7	27.8	22.9	13.7		5.1	3.55	160	105	0	straight	shoulder		0	5.45
4N47W7	chert	distal	25.9		23.1			5.7	3.16			0	unable	unable			
8N47W4	chert	complete	31.7	25.1	19.3	10.8	12.5	4.4	2.54	150	110	0	straight	shoulder	3	0.09	5.7
8N47W6	chalcedony	lateral edge	16.8		15.8			4	0.89			0	unable	unable			
12N47W1	chert	complete	41.7	34.1	24.6	16	19.2	5.7	5.97	150	105	0	straight	shoulder	3	0.22	5.98
12N47W4	chert	proximal	23.3		19.5	10.4	13	4.3	2.32	150	130	0	straight	shoulder			
16S46W1	silicified sandstone	midsection	28.4		28.3			5.1	5.33			0	unable	unable			
15S46W4	chert	proximal	21		17.4	10.8	12.2	3.4	1.56	180	110	1	straight	shoulder			
14S46W2	chalcedony	complete	51.9	44.3	26.4	16.2	18	6.1	7.52	155	130	0	straight	shoulder	3	0.13	7.26
15S45W1	chert	complete	48	38.8	28.2	17.2	21.9	6.5	8.4	155	125	0	straight	shoulder	3	0	5.97
8S44W4	quartzite	distal	23.5		21			4.4	1.94			0	unable	unable			
6S44W2	chalcedony	complete	54	45.9	28.2	17.8	21	5.7	8.62	160	125	0	convex	shoulder	3	0	8.05
6S44W5	chert	complete	34.9	26.9	23	15.1	19.1	5.7	4.11	165	130	0	convex	shoulder	3	0	4.72
6S44W6	chert	complete	33.2	26.1	20.6	14.7	16.5	5.3	3.38	180	130	0	straight	shoulder	3	0.16	4.92
6S44W9	chert	midsection	30.4		21.2			5	3.09			1	unable	unable			
6S44W11	chert	midsection	23.9		22.8			6.4	4.83			1	unable	unable			
6S44W13	chert	distal	23.9		21.5			4.5	2.2			0	unable	unable			
4S44W1	chert	proximal	53.3		24.1	14.5	19.2	5.1	7.76	150	130	0	straight	shoulder			
4S44W4	quartzite	proximal	37.7		27.2	16.6	18.4	5.3	6.5	150	105	0	straight	shoulder			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4S44W6	chert	proximal	32.5		23.4	14.4	18.1	6	4.67	150	130	0	straight	shoulder			
10N44W2	chert	complete	32.6	25.5	24.4	15.9	20.3	4.7	3.94	165	130	1	straight	shoulder	2	0.44	5.43
12N44W1	chert	complete	44.5	38.3	26.7	15.2	17.1	5.6	7.02	160	120	1	straight	shoulder	3	0.06	6.84
2S42W6	chert	complete	32.6	24.1	26.6	15.8	20.1	6.1	5.22	160	110	0	straight	shoulder	2	0.44	3.95
0042W3	chert	missing ear	42		21.9	12.9	16.2	5.3	4.62	180	120	0	convex	shoulder			
0042W4	chert	proximal	23.4		22	14	15.1	5.2	2.7	180	95	0	straight	shoulder			
2N42W2	chert	complete	33.8	25.9	24	15.3	18.2	5	4.21	160	125	1	straight	shoulder	2	0.31	5.18
2N42W3	chert	proximal	30.8		18.4	10.3	12.3	4.3	2.82	180	100	0	concave	shoulder			
4N42W3	chert	proximal	29.1		27.5	14.3	17.7	5.7	4.68	150	105	0	convex	shoulder			
8N42W1	chert	distal	37.5	37.1	22.1			5.6	4.49			0	unable	shoulder		0	6.63
8N42W2	agate	midsection	29.4		25.6	13.3		4.9	3.66			0	unable	shoulder			
8N42W4	chert	proximal	28		24	24	24	6.2	4.92			0	convex	unshouldered			
10N42W2	chalcedony	midsection	38.3		28.5	19.6		5.8	6.47			0	unable	shoulder			
10N42W6	chert	complete	27.4	20	22	14.4	16.3	4.5	2.42	160	115	1	straight	shoulder	3	0	4.44
10N42W7	chert	complete	25.8	16.9	24.5	13.9	16.5	4.6	2.8	180	130	0	convex	shoulder	2	1	3.67
12N42W1	chert	complete	30.8	23.3	21	15.8	18.4	5.2	3.43	180	105	0	concave	shoulder	3	0	4.48
12N42W2	chert	distal	28.6		25.8			5.2	2.87			0	unable	shoulder			
2S40W2	chert	complete	47.8	39	28.4	14.8	17.7	6.5	8.52	150	110	0	straight	shoulder	3	0.03	6
2S40W4	chalcedony	prox lateral edge	40		20.7	16.6	19.6	4.8	4.17			0	straight	shoulder			
2N40W7	chert	complete	27.4	20	18.7	11	13.2	4.5	2.02	155	110	0	straight	shoulder	3	0	4.44
4N40W2	chert	complete	28.4	20	21.4	15.6	18.4	4.5	2.86	160	110	2	convex	shoulder	3	0	4.44
4N40W4	chert	distal	32.4	31.6	24.8			6.2	4.43			0	unable	unable		0	5.1
4N40W7	chert	distal	31.7	31.7	20.4			5	3.45			0	unable	unable		0	6.34
10N40W3	chert	complete	41.4	32.5	22.6	13.4	15.7	6	5.69	180	130	1	convex	shoulder	3	0	5.42
10N40W5	quartzite	midsection	20.6		27.5	15.3		4.2	3.3			0	unable	shoulder			
4S38W1	chert	complete	36.1	26.3	24.3	14.9	19.6	5.7	5.21	155	125	0	straight	shoulder	2	0.31	4.61
2S38W1	chert	complete	46.7	37.8	24	15.3	18.9	6	6.96	150	115	0	convex	shoulder	3	0	6.3
0038W1	quartzite	proximal	34.8		22.6	17.5	19.9	5.9	5.14	190	125	0	straight	shoulder			
8N38W4	agate	complete	51.8	44.4	24.7	15.1	17.9	5.5	7.4	160	125	0	straight	shoulder	3	0	8.07
8N38W7	chert	proximal	29.8		22.3	13.9	19.1	4.7	3.16	165	140	2	straight	shoulder			
8N38W8	chert	complete	27.4	18	22.6	14.1	16.2	5.2	2.86	170	110	0	straight	shoulder	1	0.63	3.46
6S36W3	chert	proximal	27.2		17.7	12.5	14.7	6	2.92	190	115	0	straight	shoulder			
6S36W4	chert	proximal	22.4		21.7	12.7	15.3	4.1	2.02	155	120	2	straight	shoulder			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
2S36W1	chert	distal	30	30	27.2	16.5		5.5	3.99			1	unable	unable		0.19	5.45
2S36W3	chert	complete	26.3	21.2	19.5	11.9	13.8	4.7	2.1	180	110	0	straight	shoulder	3	0	4.51
0036W3	chert	lateral edge	34.2		12.6			5.3	2.17			0	straight	shoulder			
0036W4	chert	distal	30.5	29.8	21.4	12.3		3.9	2.43			0	unable	shoulder		0	7.64
2N36W8	chert	lateral edge	29.1		19.2			5.9	4.84			0	unable	shoulder			
2N36W13	chert	complete	28	21.7	24.2	14.7	19.3	5.5	3.38	160	130	0	straight	shoulder	2	1	3.95
4N36W6	chert	midsection	19		21.7			4.7	1.97			0	unable	unable			
10N36W3	chert	complete	33.4	26.4	24.5	13.2	16.4	6	4.07	150	115	0	straight	shoulder	2	0.25	4.4
10N36W4	chert	complete	28.3	20.4	21.6	10.8	13.4	5.5	2.85	150	115	0	straight	shoulder	1	0.25	3.71
12N36W1	agate	complete	45.9	38.3	25.2	14.9	18.6	5.8	5.96	150	115	0	straight	shoulder	3	0	6.6
12N36W3	chert	complete	41.7	35.2	21.1	11.9	13.4	5.5	4.75	150	110	1	straight	shoulder	2	0.44	6.4
4S34W1	chert	complete	41.5	33.1	24.8	14.7	16.1	4.8	4.59	165	125	2	convex	shoulder	3	0.06	6.9
2S34W1	chalcedony	proximal	43.8		24.1	15.4	17.4	5.5	5.99			0	convex	shoulder			
2S34W2	chalcedony	proximal	36.4		23.6	13.7	17.6	5.4	5.26	160	125	0	convex	shoulder			
0034W1	chert	complete	47.8	41.3	25.4	16.6	19.5	5.5	6.05	150	115	0	convex	shoulder	3	0	7.51
0034W2	agate	complete	29.3	21.6	23.7	17.2	20.5	4.9	3.12	165	120	0	convex	shoulder	2	0.81	4.41
0034W3	chert	distal	23.4		14.9			4.4	1.36			2	unable	unable			
0034W4	chert	complete	27.9	19.5	18.2	11.7	15.2	4.3	2.01	160	110	0	straight	shoulder	3	0.25	4.53
2N34W1	quartzite	distal	39.9	39.8	29.1			5.2	6.92			0	unable	unable		0.06	7.65
4N34W1	chalcedony	proximal	27.7		25.2	16.8	21.6	5.6	4.03	180	120	0	straight	shoulder			
4N34W5	silicified sandstone	midsection	28.6		26.2			5.5	4.6			0	unable	unable			
8N34W1	chalcedony	distal	23.2		20.9			3.9	1.86			0	unable	unable			
10N34W1	chalcedony	midsection	30		26.5			4.4	5.68			0	unable	shoulder			
12N34W6	quartzite	midsection	25.8		21.9	14.3		5.8	3.31			0	concave	shoulder			
10S32W2	chert	distal	36.5	29.5	25.1	16.9		5	4.82	160	130	0	concave	shoulder		0.25	5.9
10S32W3	agate	complete	37.8	28.4	24	13.9	18.1	5.3	4.34	155	110	2	convex	shoulder	3	0	5.36
6S32W1	chert	complete	34.7	26.4	23.3	12.5	14.5	5.5	4.42	160	110	0	straight	shoulder	2	0.31	4.8
6S32W2	silicified sandstone	complete	34.5	30.4	26.3	16.7	18.9	5.6	5.15	180	100	1	straight	shoulder	3	0	5.43
6S32W5	chert	midsection	34.3		20.4	12.8		5.5	4.63			0	unable	unable			
6S32W9	chert	complete	37.4	25.6	22.3	14.5	17.3	5.1	4.51	155	120	0	straight	shoulder	3	0	5.02
4S32W3	chert	distal	43.2	35.5	24.1	14.3		5.8	6.07	180	140	0	straight	shoulder		0.06	6.12
2S32W4	chert	complete	36.1	29.3	19.8	12.3	13.8	4.6	3.36	180	115	1	convex	shoulder	3	0	6.37
4N32W4	chert	complete	28.6	21.5	22.5	15.8	18.8	4.9	3.2	180	125	0	convex	shoulder	3	0	4.39

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
4N32W9	chert	prox lateral edge	19		16.9			5.3	1.86			0	straight	shoulder			
6S30W5	chert	distal	28.1		21.1			5.4	2.76			0	unable	unable			
4S30W1	chert	proximal	33.5		25	15	18.2	4.7	4.52	155	120	0	convex	shoulder			
4S30W4	chert	proximal	33		21.4	13.4	16	5.9	4.18	155	110	0	convex	shoulder			
4S30W5	agate	distal	29.7	29.7	24.1	16.6		6.4	4.14			0	unable	shoulder		0	4.64
2S30W6	chert	complete	41.2	33.5	25.4	14.3	18.1	5.3	5.32	150	130	2	straight	shoulder	3	0	6.32
2S30W7	chert	complete	34.4	25.7	24.2	14.3	18.3	5	4.76	160	130	1	concave	shoulder	2	0.31	5.14
2S30W15	chalcedony	proximal	28.6		23.2	12.1	14.3	4.6	3.89	165	115	1	convex	shoulder			
2S30W16	chert	distal	33.7		20.3			4.2	3.11			1	unable	unable			
0030W1	quartzite	distal	43.1	34.9	24	13		6.6	5.71	160	125	0	straight	shoulder		0	5.29
0030W2	chert	proximal	34.2		22.8	14.5	17.7	5	4.81	155	115	2	convex	shoulder			
0030W3	chert	complete	25.4	16.2	19.5	13.8	16.8	5.1	2.66	150	115	1	convex	shoulder	1	0.75	3.18
0030W4	chert	proximal	27.7		23.7	13.5	15.9	5	3.45	155	115	2	straight	shoulder			
0030W5	chert	proximal	29.2		24.6	15.9	17.5	4.9	4.01	150	105	0	straight	shoulder			
0030W10	chert	proximal	25.7		22.3	12.5	15.7	4.7	2.53	140	115	0	concave	shoulder			
0030W12	chert	midsection	22		22			4.6	2.05			0	unable	unable			
2N30W3	chert	midsection	29.1		26.9	14		5.1	4.23			0	convex	shoulder			
6N30W3	chert	midsection	22.2		21.1			4.4	2.48			0	unable	shoulder			
10N30W4	chert	proximal	24.3		23.5	11.8	14.7	5	3.19	150	110	0	convex	shoulder			
12N30W3	agate	proximal	32.4		22.8	15.3	15.4	4.8	4.02	155	120	3	straight	shoulder			
6S28W2	chert	distal	48.6	42.7	27.1	12.2		4.5	5.49	140	110	0	unable	shoulder		0.06	9.49
4S28W7	chert	proximal	24.2		21.4	13.4	18.2	4.9	2.88	155	125	0	convex	shoulder			
2S28W4	chalcedony	proximal	27.2		22.1	13.8	16	6	3.59	155	110	0	straight	shoulder			
0028W1	chert	complete	32.4	25	23.7	13.4	17.8	4.9	3.53	155	120	1	straight	shoulder	1	0.25	5.1
0028W2	chert	proximal	29.9		25.2	14	15.4	5.4	4.56	150	105	0	straight	shoulder			
2N28W3	chert	proximal	54		23.5	13.7	18.1	5.6	9.11	180	125	0	concave	shoulder			
4N28W1	quartzite	complete	47.6	38.1	24.7	17.1	19.8	4.5	6.23	140	110	1	straight	shoulder	3	0	8.47
4N28W2	chert	complete	33.6	26	23.7	14.5	18.2	5.3	3.98	150	120	0	convex	shoulder	3	0	4.91
4N28W3	chert	proximal	26		22.5	14.6	18.3	5	3.2	160	130	1	straight	shoulder			
4N28W5	chert	proximal	22.1		20.3	15.4	19.2	5.2	2.63	180	115	0	convex	shoulder			
6N28W2	chert	midsection	37.7		29.8	15.8		5.5	8.61			0	unable	shoulder			
6N28W4	chert	midsection	27.3		20.1	11.2		3.8	2.35	160	120	1	straight	shoulder			
10N28W1	agate	proximal	24.1		25.6	13.3	15.9	4.7	3.53	150	115	0	straight	shoulder			

163 Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
14N28W2	chert	distal	38.3	38.1	26.6			6	5.95			0	unable	shoulder		0	6.35
2S26W9	chert	complete	24.8	17.4	21.1	15.4	19.2	4.9	2.53	160	110	0	straight	shoulder	2	0.88	3.55
0026W2	chert	midsection	29		27.6			5.3	5.11			0	unable	unable			
2N26W6	chert	distal	29.2	28.8	23	12.7		4.7	3.1			0	unable	shoulder		0.06	6.13
4N26W1	chert	complete	35.7	29.5	22.5	11.1	13.5	4.6	3.03	150	110	0	straight	shoulder	3	0	6.41
4N26W4	chert	distal	22.6	22.5	18			4.5	1.87			0	unable	shoulder		0.06	5
6N26W3	chert	complete	34.4	26.9	19.7	12.5	15.2	4.5	3.22	150	110	0	convex	shoulder	3	0	5.98
6N26W4	chalcedony	distal	31.3		25.3			5.3	4.11			0	unable	unable			
6N26W6	chalcedony	complete	28.9	20.5	17.4	15.1	16.4	5.2	2.82	190	95	1	convex	shoulder	3	0	3.94
6N26W7	chert	proximal	22.6		21.1	12	15.4	5.2	2.65	165	125	0	convex	shoulder			
6N26W8	chert	midsection	15.8		19.3			4.7	1.26			0	unable	unable			
8N26W3	chert	proximal	27.3		21.5	14.4	16.2	5	3.13	150	110	0	straight	shoulder			
8N26W8	chert	midsection	26.6		22.4	13.1		5	2.77			0	unable	shoulder			
8N26W12	chert	complete	30.6	21.5	21.6	12.8	17	5.2	2.85	160	115	0	straight	shoulder	3	0	4.13
10N26W4	chert	proximal	19.5		28.3	16.6	20.1	5.1	3.68	155	110	0	straight	shoulder			
10N26W5	chert	midsection	23.9		21.5	10.9	13.1	3.8	2.26			0	convex	shoulder			
12N26W4	chert	proximal	28		22.4	13.1	16.5	5.4	4.04	160	130	0	convex	shoulder			
12N26W6	chert	lateral edge	20.1		19.3			4.9	2.06			0	unable	unable			
12N26W7	Knife River Flint	distal	21.4		19.8			4.5	1.81			0	unable	unable			
2S24W1	chert	complete	49.9	43.3	29.9	15.5	19.4	5.6	9.86	145	115	0	straight	shoulder	3	0.03	7.73
2S24W4	chalcedony	midsection	27.8	29.1	28.2	16		5.1	4.81			0	unable	shoulder			5.71
0024W2	chert	proximal	47.2		26.9	17.3	17.7	6	8.93	160	115	0	concave	shoulder			
0024W3	chert	complete	42.5	34.3	21.8	12.1	14.4	6.1	5.37	150	115	1	convex	shoulder	3	0.25	5.62
0024W5	chert	lateral edge	22.4		14.1			4.1	1.51			0	unable	unable			
0024W11	chert	distal	17.7		19.4			3.7	1.13			0	unable	unable			
0024W12	chert	proximal	27.3		25.2	16.1	19.3	4.1	3.65	155	120	0	straight	shoulder			
2N24W4	chert	proximal	23.8		23.4	12.8	18.6	4.5	3.02	155	130	0	convex	shoulder			
2N24W5	chert	proximal	30.1		23.4	14.8	15.8	5.4	5.23	190	105	1	straight	shoulder			
4N24W10	chert	midsection	18.6		26.8	17		4.9	2.67			0	unable	shoulder			
6N24W1	chert	distal	39.2	35.4	27.7			7.3	7.6			0	unable	unable		0.5	4.85
6N24W5	chert	proximal	22.5		19.2	10.3	15.1	4.9	2.23	155	115	0	convex	shoulder			
8N24W5	chert	proximal	39		23	13.4	17	7.5	6.29	150	120	0	convex	shoulder			
8N24W9	chert	midsection	40.8		27.2	16.1		5.2	7.29			1	unable	shoulder			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
14N28W2	chert	distal	38.3	38.1	26.6			6	5.95			0	unable	shoulder		0	6.35
2S26W9	chert	complete	24.8	17.4	21.1	15.4	19.2	4.9	2.53	160	110	0	straight	shoulder	2	0.88	3.55
0026W2	chert	midsection	29		27.6			5.3	5.11			0	unable	unable			
2N26W6	chert	distal	29.2	28.8	23	12.7		4.7	3.1			0	unable	shoulder		0.06	6.13
4N26W1	chert	complete	35.7	29.5	22.5	11.1	13.5	4.6	3.03	150	110	0	straight	shoulder	3	0	6.41
4N26W4	chert	distal	22.6	22.5	18			4.5	1.87			0	unable	shoulder		0.06	5
6N26W3	chert	complete	34.4	26.9	19.7	12.5	15.2	4.5	3.22	150	110	0	convex	shoulder	3	0	5.98
6N26W4	chalcedony	distal	31.3		25.3			5.3	4.11			0	unable	unable			
6N26W6	chalcedony	complete	28.9	20.5	17.4	15.1	16.4	5.2	2.82	190	95	1	convex	shoulder	3	0	3.94
6N26W7	chert	proximal	22.6		21.1	12	15.4	5.2	2.65	165	125	0	convex	shoulder			
6N26W8	chert	midsection	15.8		19.3			4.7	1.26			0	unable	unable			
8N26W3	chert	proximal	27.3		21.5	14.4	16.2	5	3.13	150	110	0	straight	shoulder			
8N26W8	chert	midsection	26.6		22.4	13.1		5	2.77			0	unable	shoulder			
8N26W12	chert	complete	30.6	21.5	21.6	12.8	17	5.2	2.85	160	115	0	straight	shoulder	3	0	4.13
10N26W4	chert	proximal	19.5		28.3	16.6	20.1	5.1	3.68	155	110	0	straight	shoulder			
10N26W5	chert	midsection	23.9		21.5	10.9	13.1	3.8	2.26			0	convex	shoulder			
12N26W4	chert	proximal	28		22.4	13.1	16.5	5.4	4.04	160	130	0	convex	shoulder			
12N26W6	chert	lateral edge	20.1		19.3			4.9	2.06			0	unable	unable			
12N26W7	Knife River Flint	distal	21.4		19.8			4.5	1.81			0	unable	unable			
2S24W1	chert	complete	49.9	43.3	29.9	15.5	19.4	5.6	9.86	145	115	0	straight	shoulder	3	0.03	7.73
2S24W4	chalcedony	midsection	27.8	29.1	28.2	16		5.1	4.81			0	unable	shoulder			5.71
0024W2	chert	proximal	47.2		26.9	17.3	17.7	6	8.93	160	115	0	concave	shoulder			
0024W3	chert	complete	42.5	34.3	21.8	12.1	14.4	6.1	5.37	150	115	1	convex	shoulder	3	0.25	5.62
0024W5	chert	lateral edge	22.4		14.1			4.1	1.51			0	unable	unable			
0024W11	chert	distal	17.7		19.4			3.7	1.13			0	unable	unable			
0024W12	chert	proximal	27.3		25.2	16.1	19.3	4.1	3.65	155	120	0	straight	shoulder			
2N24W4	chert	proximal	23.8		23.4	12.8	18.6	4.5	3.02	155	130	0	convex	shoulder			
2N24W5	chert	proximal	30.1		23.4	14.8	15.8	5.4	5.23	190	105	1	straight	shoulder			
4N24W10	chert	midsection	18.6		26.8	17		4.9	2.67			0	unable	shoulder			
6N24W1	chert	distal	39.2	35.4	27.7			7.3	7.6			0	unable	unable		0.5	4.85
6N24W5	chert	proximal	22.5		19.2	10.3	15.1	4.9	2.23	155	115	0	convex	shoulder			
8N24W5	chert	proximal	39		23	13.4	17	7.5	6.29	150	120	0	convex	shoulder			
8N24W9	chert	midsection	40.8		27.2	16.1		5.2	7.29			1	unable	shoulder			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
8N24W13	chert	lateral edge	22.7		21.4			4.9	2.47			0	unable	unable			
12N24W4	chert	proximal	35		20.9	11.2	14.5	5.1	3.62	160	130	0	convex	shoulder			
14N24W6	chert	lateral edge	15.5		17			5	1.48			0	unable	unable			
16N24W1	chert	proximal	29.5		24	15.4	19.5	5.9	5.41	160	120	0	convex	shoulder			
16N24W2	chert	distal	27.7		21.4			4	2.36			0	unable	unable			
0022W6	chert	proximal	19.7		24.6	15	17.1	5.2	2.92	145	115	0	straight	shoulder			
0022W7	vitrious porcellanite	distal	35.5	28.2	19.8	13		4.9	3.3	180	150	1	straight	shoulder		0.03	5.76
0022W11	agate	distal	26.9		19.4			5.3	2.4			0	unable	unable			
2N22W10	chert	proximal	27.3		23.8	15.5	19.4	5.3	3.4	160	125	1	straight	shoulder			
2N22W13	chert	lateral edge	18.8		20.4			4.9	1.57			0	unable	unable			
2N22W15	chert	midsection	20.4		22.5			4.7	1.85			0	unable	shoulder			
4N22W1	chalcedony	complete	43.2	36.6	26.2	17.2	20.9	5	5.86	150	110	0	concave	shoulder	3	0	7.32
4N22W8	chert	proximal	33.5		23.2	16.2	19.4	5.7	4.35	155	120	0	straight	shoulder			
4N22W9	chert	complete	26.1	16.4	18	10.4	13.6	4.5	1.76	180	120	0	convex	shoulder	3	0	3.64
6N22W3	chert	distal	43.5	40	24	13.2		4.6	5.04			0	unable	shoulder		0.03	8.7
6N22W6	chert	midsection	32.8		27.8			5.1	5.7			0	unable	shoulder			
6N22W12	chert	distal	20		19.5			4.6	1.45			0	unable	unable			
8N22W8	chert	complete	33.7	26.8	22.7	14.3	17.4	5.3	3.96	150	110	0	convex	shoulder	3	0	5.06
10N22W2	chert	complete	42.7	36.6	22.9	12.5	13.8	5.1	4.23	150	110	0	straight	shoulder	3	0.06	7.18
10N22W11	chert	complete	32.5	23.3	22.6	14.5	17.8	5.5	4.33	180	130	1	straight	shoulder	3	0.06	4.24
12N22W1	chert	complete	45.9	37.6	28.9	17.1	21.3	5.3	7.41	160	125	0	straight	shoulder	3	0.16	7.09
12N22W3	chert	complete	38.8	31.1	26.3	14.2	16.5	4.4	4.48	145	115	0	straight	shoulder	3	0.13	7.07
16N22W1	agate	complete	41	32.6	25.7	15.4	18.3	5.8	5.86	150	105	0	straight	shoulder	3	0	5.62
16N22W2	agate	proximal	26.9		20.4	11.3	14.3	5.3	3.33	155	120	0	convex	shoulder			
4N20W1	chert	proximal	48.6	15.9	27.6	15.8	19.4	5.3	7.79	150	125	0	straight	shoulder			3
4N20W7	chert	complete	24.4	15.9	18.2	14.6	18.2	5.5	2.55	190	130	0	convex	shoulder	2	1	2.89
6N20W6	chert	complete	35.5	26.9	22.7	13.2	14.8	5.3	3.59	155	120	0	convex	shoulder	3	0	5.08
6N20W8	chert	complete	26.6	18.1	20.7	14.7	18.8	5.8	2.94	160	115	0	straight	shoulder	2	1	3.12
6N20W9	quartzite	midsection	20.2		22.8			4.9	2.59			0	unable	unable			
6N20W10	agate	midsection	26.4		25.7			5.1	3.87			0	unable	unable			
8N20W2	chert	distal	30.5		18.7			5	2.63			0	unable	unable			
10N20W3	chert	midsection	25.6		25	14.5		4.9	4.16			0	unable	shoulder			
10N20W9	chert	proximal	19		20.1	10.1	12	4.9	2.05	145	110	0	straight	shoulder			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
12N20W2	chert	distal	38.3		23.3			5.5	5.55			1	unable	unable			
12N20W3	chalcedony	complete	30.2	22.7	21.1	12.3	14.1	6.1	3.45	150	125	0	straight	shoulder	3	0.13	3.72
12N20W4	chert	distal	31.9	26	20.9	12.9		5	3.16	160	120	1	straight	shoulder		0	5.2
14N20W4	chert	proximal	32		21.9	14.6	18	5.7	4.62	160	125	1	convex	shoulder			
14N20W7	chert	lateral edge	37.8		15.3			5.2	3.36			0	unable	unable			
14N20W8	quartzite	midsection	24.9		23.2	15.2		5	3.19			0	unable	shoulder			
16N20W6	chert	complete	35.6	28.4	21.2	10.5	12.4	5.2	3.76	145	110	0	straight	shoulder	3	0	5.46
18N20W7	chert	lateral edge	23.2		14.8			6.5	2.29			0	unable	unable			
18N20W8	chert	proximal	23.1		23.5	15.3	18.3	5.7	3.23	150	130	0	concave	shoulder			
4N18W10	chert	midsection	23.1		23			4.6	3.28	130	110	0	straight	shoulder			
6N18W5	silicified sandstone	distal	20.3		19.3			4.4	1.77			0	unable	shoulder			
6N18W6	chalcedony	proximal	34		28.1	15.4	28.6	6	6.01	155	110	1	straight	shoulder			
6N18W7	chalcedony	proximal	45.5		24.7	15.2	21.9	4	5.71	155	135	1	concave	shoulder			
6N18W15	chert	distal	19.9		22.2			4.5	1.96			0	unable	unable			
8N18W3	chert	complete	42.8	37.6	25.2	11.4	15.3	4.6	5.41	140	110	0	straight	shoulder	3	0.03	8.17
8N18W6	chert	complete	43.4	37	21.5	11	12.6	4.1	3.91	145	110	1	straight	shoulder	3	0.03	9.02
8N18W8	chert	proximal	25.8		23.3	14.6	19.9	4.9	3.06	155	125	0	convex	shoulder			
10N18W1	chert	complete	34.5	26.7	20.2	11.8	14.3	4.3	3.15	150	120	0	straight	shoulder	3	0	6.21
12N18W6	chalcedony	complete	38	30.2	23.2	13.7	17.7	4.9	4.31	160	115	0	convex	shoulder	3	0.06	6.16
12N18W7	chert	complete	32.4	24	24.1	15.9	18.3	5.4	3.68	155	105	0	straight	shoulder	2	1	4.44
12N18W8	chert	distal	20.5		22.3			5	2.2			0	unable	unable			
14N18W3	petrafied wood	proximal	38.4		23.7	14.1	17.7	5.1	4.75	160	130	0	straight	shoulder			
14N18W4	chalcedony	proximal	38.5		22.1	13.9	16.9	4.9	4.64	150	120	1	straight	shoulder			
14N18W10	chert	proximal	29.1		23.9	15.8	17.1	5.3	3.68	150	110	1	straight	shoulder			
16N18W1	chert	complete	47	39.5	29.4	14.7	17.8	5.9	8.05	150	120	0	straight	shoulder	3	0	6.69
16N18W6	chert	distal	34.8		24.6			4.3	2.95			1	unable	unable			
16N18W7	chert	distal	17.6		18.2			5.2	1.46			0	unable	unable			
16N18W10	chert	complete	35.9	27.3	21.3	12.3	15.4	5	3.82	160	110	0	convex	shoulder	3	0	5.46
16N18W16	agate	midsection	20		23.7			4.4	2.5			1	unable	unable			
18N18W7	chert	complete	42.5	33.8	25.7	17.6	21.5	5.8	5.75	155	125	0	straight	shoulder	3	0	5.83
18N18W9	chert	proximal	30.9		19.8	11.8	14.9	4.8	3.03	190	120	1	convex	shoulder			
18N18W13	chert	complete	37.6	30.3	24.1	14.4	18.1	5.7	4.59	150	120	0	concave	shoulder	1	0.5	5.32
18N18W17	chalcedony	complete	32.7	26.1	20.7	15.1	18.7	4.9	3.1	150	120	0	convex	shoulder	3	0.25	5.33

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
18N18W19	chert	midsection	25		21.7			4.4	2.54			0	unable	unable			
20N18W5	chert	complete	36.6	27.8	21.4	12.1	14	5	3.92	140	110	1	convex	shoulder	3	0	5.56
20N18W7	agate	proximal	26.6		19.9	14.4	18.2	5	3.02	155	120	0	convex	shoulder			
10N16W2	chert	distal	45.4	41.1	25.6	14.2		4.4	5.61			2	unable	shoulder		0	9.34
10N16W5	chert	distal	36.3	32	19.3	11.3		3.9	2.68			2	unable	shoulder		0	8.21
10N16W6	agate	distal	30.3	29.5	22.7			4.5	3.85			0	unable	unable		0.25	6.56
10N16W7	agate	proximal	30.4		22	14.1	17.6	4.5	3.1	150	120	1	straight	shoulder			
10N16W8	chert	complete	25.4	18.3	16.8	10.3	13.4	3.8	1.75	155	120	0	straight	shoulder	3	0.25	4.82
14N16W7	chert	proximal	32.8		22.8	15.1	16.8	4.9	3.11	165	125	1	straight	shoulder			
14N16W10	agate	proximal	31.7		25.6	15.1	18.3	5.3	5.71	150	120	0	convex	shoulder			
14N16W14	chert	proximal	17.6		28.5	15.6	19	5.8	2.95	155	125	0	concave	shoulder			
16N16W8	chert	complete	35.7	28.9	25.6	16.4	19.7	5.7	4.95	160	125	1	straight	shoulder	2	0.5	5.07
16N16W12	chert	midsection	20.9		22.4			6.4	3.07			0	unable	unable			
16N16W14	chert	prox lateral edge	29.3		18			4.9	2.18			0	unable	shoulder			
16N16W15	chert	complete	21.9	16.3	15.9	10.8	12.6	4	1.32	160	125	1	straight	shoulder	3	0.06	4.08
18N16W1	chert	complete	42.3	35.8	27.3	13.5	16.9	5.8	5.99	145	125	1	concave	shoulder	2	0.38	6.17
18N16W4	chert	complete	39	30	22.8	14.7	17.7	4.8	3.85	180	140	0	convex	shoulder	3	0.06	6.25
18N16W12	chert	proximal	23.3		21.1	15	18.6	4.7	2.57	155	120	0	convex	shoulder			
20N16W4	chalcedony	proximal	51		26.4	17.6	20	5.3	9.01	150	110	1	convex	shoulder			
20N16W12	chert	complete	37.4	29.7	22.9	15.7	20.3	6.4	4.95	145	125	0	straight	shoulder	3	0	4.64
20N16W15	chert	complete	38.1	30	22.3	14.3	17.8	5.3	4.54	155	125	1	straight	shoulder	3	0	5.66
20N16W16	chalcedony	proximal	35.9		21.3	10.9	12.7	4.8	3.79	135	110	0	straight	shoulder			
20N16W19	chert	proximal	31.7		28.6	16	19.1	4.6	3.96	140	110	0	convex	shoulder			
22N16W1	chert	distal	48.7	47.6	30.8	16.6		5.8	9.34			0	unable	shoulder		0	8.21
22N16W6	chert	midsection	24.4		23.8			4.9	3.29			0	unable	shoulder			
22N16W9	chalcedony	midsection	24.9		24.2	16.3		5.9	4.43			0	unable	shoulder			
22N16W12	chert	complete	27.3	18.4	21.6	12.1	13.6	5.2	2.68	180	120	0	straight	shoulder	2	1	3.54
22N16W13	chert	midsection	29.6		20.3			5.4	4.17			0	unable	unable			
22N16W14	chert	distal	24.3	25.2	20.3			5.2	2.76			0	unable	unable		0.5	4.85
22N16W16	chert	midsection	39.7		45.7	23		6.8	16.3			0	unable	shoulder			
12N14W11	chert	complete	32.4	24.4	21.1	13.1	16.6	4.8	3.57	155	120	1	straight	shoulder	3	0.25	5.08
16N14W5	quartzite	distal	33.1	33	25	15.3		5.3	3.99			0	unable	shoulder		0	6.23
16N14W10	chert	midsection	35.9		19.1	11.2		5.4	4.08			0	unable	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
16N14W13	chert	distal	17.2		8.2			4	0.99			0	unable	unable			
16N14W14	chert	complete	28.5	22	19.3	11.7	13.9	5.4	2.65	150	120	0	concave	shoulder	3	0.13	4.07
18N14W10	chert	complete	29.2	21.8	22.4	12	15.9	4.6	3.09	160	135	1	straight	shoulder	3	0.31	4.74
18N14W12	chert	lateral edge	19.5		14.9			2.1	0.51			0	unable	shoulder			
19N14W2	quartzite	proximal	39.5		24.2	13.6	14.9	6.9	7.19	150	120	0	straight	shoulder			
21N14W3	chert	complete	36.8	27.8	26.6	15.3	18.3	6.7	5.95	140	110	0	straight	shoulder	3	0.09	4.15
21N14W5	chalcedony	complete	42.5	42.2	25.4	25.4	25.4	4.8	5.82			0	straight	unshouldered	3	0	8.79
21N14W14	agate	complete	31.8	24.1	21.7	12.1	13.6	5.1	3.13	155	110	0	straight	shoulder	3	0	4.73
21N14W16	chert	complete	28.7	21.7	24.1	13.5	17	4.9	3.25	155	125	1	straight	shoulder	2	1	4.43
21N14W18	chert	midsection	34.7		22.1	14.7		5.6	4.72			0	unable	unable			
12N12W5	chert	midsection	24.4		23.6	14		6	3.76			0	unable	shoulder			
12N12W7	chert	complete	34.7	27.1	20.6	14.7	18.1	4.1	3.62	170	130	1	convex	shoulder	3	0	6.61
14N12W3	agate	complete	44.8	37.2	24.1	15.2	17.3	5.3	5.65	155	120	1	straight	shoulder	3	0	7.02
14N12W10	chert	complete	48.3	40	23.9	14.4	17.4	5.3	5.6	160	130	0	convex	shoulder	3	0	7.55
14N12W13	agate	complete	58	49.5	21.9	12.3	16.1	4.7	7.45	145	120	1	convex	shoulder	2	0.31	10.5
14N12W14	silicified sandstone	proximal	39.3		27.1	17.6	21	5.4	6.35	155	120	0	concave	shoulder			
14N12W15	chert	complete	33.8	24.8	21.9	13.5	16.9	4.3	3.09	150	120	0	convex	shoulder	3	0	5.77
14N12W17	quartzite	proximal	34.4		25.3	16.7	21.4	5.1	4.79	150	120	0	straight	shoulder			
14N12W25	chert	proximal	29.8		17	9.6	12.6	4.8	2.96	170	120	0	convex	shoulder			
14N12W26	chert	midsection	30.4		19.4	11		4.9	2.91			0	unable	shoulder			
14N12W28	chert	proximal	27.6		20.4	13.3	16.1	3.6	2.22	140	120	0	convex	shoulder			
14N12W30	chert	proximal	23.2		21.3	13.4	16	4.7	2.85	150	115	0	straight	shoulder			
14N12W32	chert	lateral edge	31.2		24.8			6.2	6.08			0	unable	unable			
16N12W6	chert	distal	28.6		20.4			4.9	2.98			0	unable	unable			
16N12W8	chert	complete	30.7	21.8	20.8	13.3	17	3.8	2.72	155	120	2	convex	shoulder	3	0	5.74
16N12W9	petrafied wood	midsection	26.6		20.1			4.6	2.98			0	convex	unable			
16N12W11	chert	proximal	16		23.5	23.5	23.5	3.6	1.44			0	unable	unable			
18N12W8	chert	midsection	28.2		26.9			5.5	4.03			0	unable	unable			
20N12W2	chert	distal	38.4	33	24.5	12.8		5.4	4.97	150	110	0	unable	shoulder		0	6.11
20N12W8	agate	proximal	20		24.1	12.7	15.5	5.4	3.25	150	125	1	straight	shoulder			
22N12W5	chalcedony	complete	35.6	29.8	17.6	10.4	12.9	4.9	2.98	155	120	0	convex	shoulder	3	0	6.08
22N12W11	chert	proximal	29.7		25.1	12.5	18.7	5.4	4.03	155	125	0	convex	shoulder			
24N12W4	chalcedony	complete	38.2	30.3	24.8	14.6	18.9	4.8	4.53	150	120	0	straight	shoulder	3	0	6.31

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
24N12W8	chert	complete	34.2	27.7	22.3	13.1	15.9	5	3.82	150	110	0	straight	shoulder	3	0.16	5.54
24N12W9	chert	complete	34.9	25.8	15.7	10.5	14.6	4.6	2.4	180	125	0	straight	shoulder	3	0	5.61
24N12W17	chert	midsection	22.5		21.3			5.3	1.98			0	unable	unable			
14N10W3	chert	proximal	21.7		22.2	16.6	19.3	5.4	2.7	160	110	0	straight	shoulder			
14N10W4	chert	distal	21.8		19.8			4.7	1.61			0	unable	unable			
14N10W5	chert	complete	29.4	21.5	23.1	15.4	16.8	5.8	3.71	160	120	0	straight	shoulder	2	0.88	3.71
14N10W17	chert	complete	42.8	36.5	27.6	16.3	19.4	5.6	7.14	150	115	1	straight	shoulder	3	0	6.52
14N10W19	chalcedony	complete	38.5	30.2	21.5	12.8	18.1	5	3.7	155	130	1	convex	shoulder	3	0	6.04
14N10W20	chert	proximal	30.5		21.7	13.5	17.5	4.4	3.73	165	120	0	convex	shoulder			
14N10W21	chert	complete	33.5	24.9	22.9	14	18.2	6.1	4.4	150	120	0	convex	shoulder	1	0.5	4.08
14N10W24	chert	distal	28.9		23	14		5	3.36			0	unable	unable			
16N10W21	chert	midsection	34		24.5			5.3	4.71			0	unable	shoulder			
16N10W27	chert	complete	57.6	49.3	27.4	17	20.7	5.8	8.9	155	125	1	convex	shoulder	3	0	8.5
16N10W28	chert	complete	40.2	31.5	24.6	14.4	19.1	6.3	5.7	155	130	0	straight	shoulder	3	0.09	5
16N10W29	chert	proximal	37.2		20.3	11.3	13.9	5.9	4.79	155	120	1	convex	shoulder			
16N10W30	chert	complete	40.3	32	25.7	15.2	17.5	6.2	6.66	160	115	1	straight	shoulder	3	0	5.16
16N10W31	chert	proximal	27.7		25.9	14.6	18	6.5	5.58	155	125	1	straight	shoulder			
18N10W9	chert	proximal	33.9		20.5	13.1	16.2	4.9	4.28	180	110	1	straight	shoulder			
20N10W11	chert	proximal	44.2		24.6	14.7	18.8	4.2	5.27	150	115	1	convex	shoulder			
20N10W12	chert	complete	44	35.9	23.8	14.2	14.6	5.2	4.89	155	100	0	straight	shoulder	3	0	6.9
20N10W13	chert	complete	40	34.5	24.8	13.3	16.9	4.2	3.81	140	105	2	straight	shoulder	3	0	8.21
20N10W14	chert	midsection	39.3		26.2	14.6		5.1	5.71			0	unable	shoulder			
22N10W13	chert	proximal	19.5		20.4	12.5	15.7	3.8	1.83	150	125	1	straight	shoulder			
22N10W14	chert	distal	48.2	42.7	27.7	17.4		3.9	5			0	unable	shoulder		0	10.9
22N10W15	chert	complete	33.7	27	21	14.7	18.2	4.5	3.2	160	120	0	convex	shoulder	2	0.25	6
24N10W12	chalcedony	distal	45.2	38	26.2	15.3	18.4	5.7	7.38	150	105	0	straight	shoulder		0.34	6.67
14N8W18	chert	midsection	26		25.9			5.6	4.51			1	unable	shoulder			
14N8W19	chalcedony	distal	36.3	36.5	28.1			4.8	5.13			1	unable	shoulder		0	7.6
16N8W11	chert	proximal	27.1		21.8	10.2	13.5	5	2.61	200	120	0	convex	shoulder			
16N8W14	chert	proximal	34.2		25	16.5	19.5	5	5.52	165	120	0	concave	shoulder			
16N8W16	chert	proximal	25.5		23.1	13.3	16.1	4.9	3.41	150	110	0	convex	shoulder			
16N8W17	chert	midsection	20.5		20.7			4.5	2.15			0	unable	unable			
16N8W18	chert	midsection	30.2		22.1	14.8		5.3	4.11			0	convex	shoulder			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
16N8W19	agate	complete	35	28.2	19.9	14	16.5	4.1	3	180	135	2	straight	shoulder	3	0	6.88
16N8W20	agate	midsection	22.2		22.3			4.6	2.26			0	unable	shoulder			
18N8W13	chert	complete	46	38	24.1	13.8	18.5	6.1	7.03	155	130	0	straight	shoulder	2	0.25	6.23
18N8W16	chert	distal	31.7	31	23	14.9		4.4	2.92			1	unable	shoulder		0	7.05
18N8W17	chert	complete	46.3	37.7	26	13.8	18.1	4.9	6.43	155	130	1	straight	shoulder	3	0	7.69
18N8W18	chert	complete	35.9	28	22.8	12.5	16	4.8	3.5	155	125	0	concave	shoulder	3	0	5.83
18N8W19	chert	proximal	32.9		23	13.5	14.9	5.5	4.13	145	110	0	convex	shoulder			
18N8W20	chert	proximal	29.7		24.8	14.9	19.1	4.9	4.18	165	125	2	convex	shoulder			
20N8W15	silicified sandstone	complete	46.4	36.9	24.4	12.8	16.6	6.3	7.02	150	115	0	convex	shoulder	3	0	5.86
20N8W18	chert	complete	47.6	40.3	24.9	15.1	16.2	4.8	6.45	155	100	1	straight	shoulder	3	0	8.4
20N8W19	chert	proximal	39.3		24	14.7	18.9	4.3	4.35	155	120	0	straight	shoulder			
20N8W20	chert	lateral edge	20.8		18.1			3.9	1.53			0	unable	unable			
22N8W12	chert	proximal	19.3		18.2	10.7	14.5	4.4	1.4	165	125	0	convex	shoulder			
22N8W14	agate	complete	71.7	64	24.2	14.5	18.6	4.7	9.49	155	130	0	straight	shoulder	3	0	13.6
22N8W15	chalcedony	complete	56.3	48	26.8	15.2	19.5	6.4	8.73	165	130	0	straight	shoulder	3	0	7.5
22N8W16	chert	distal	28.3		20.4			3.5	1.61			0	unable	shoulder			
24N8W11	chert	complete	50.5	43.6	25.5	13.7	16.9	5.1	6.59	155	125	0	straight	shoulder	3	0	8.55
24N8W12	chert	proximal	44		23.4	12.3	15.8	5.6	6.27	155	130	0	convex	shoulder			
14N6W5	chert	midsection	26.4		21.4	13.1		4.9	2.85			1	unable	shoulder			
14N6W6	chert	distal	26.1	26.5	23.6			3.9	2.63			1	unable	unable		0	6.79
14N6W7	chert	distal	27.9	27.7	21.7			4.8	2.84			0	unable	unable		0.5	5.77
14N6W9	chert	complete	20.2	12.8	17.3	13.2	15.6	4	1.62	180	130	1	straight	shoulder	2	1	3.2
16N6W21	chert	proximal	26.8		27.3	14.1	18.3	4.6	3.78	145	125	0	straight	shoulder			
16N6W22	chert	proximal	35		23.9	14.2	16.6	5.4	4.63	160	115	0	convex	shoulder			
16N6W23	chert	complete	24.2	17.5	21.8	13.6	17.2	5.1	2.38	165	125	0	convex	shoulder	2	1	3.43
16N6W24	chert	proximal	29.4		26.3	15.4	19.1	4.7	4.56	140	115	1	convex	shoulder			
16N6W25	chert	midsection	16.5		17.7			4.4	1.35			0	unable	unable			
18N6W24	chert	complete	38.3	39.4	24.7	14.6	17.7	5.2	5.3	155	115	2	convex	shoulder	3	0	7.58
18N6W32	chalcedony	complete	46.7	38.1	27.2	18.1	18.9	6	7.14	180	130	0	straight	shoulder	3	0.09	6.35
18N6W33	chert	proximal	36.4		25	16.4	19.9	5.5	5.29			0	convex	shoulder			
18N6W34	chert	complete	38.5	32.9	23.5	11.9	12.9	4.7	4.5	150	120	0	convex	shoulder	3	0	7
18N6W35	chert	complete	57.8	49.8	24	14.5	17.9	5.3	6.51	140	120	0	straight	shoulder	3	0	9.4
18N6W36	chert	proximal	29.3		19.8	13.3	15.9	5	3.12	145	115	0	straight	shoulder			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
20N6W6	chert	complete	40.6	32	24.7	14.8	19.5	4.6	4.72	165	130	0	convex	shoulder	3	0	6.96
20N6W7	agate	proximal	28.7		22.2	16.7	18.7	5.4	3.85	180	110	0	straight	shoulder			
20N6W8	chert	midsection	38.7		25	13.4		4.6	5.6			0	unable	shoulder			
20N6W9	chert	proximal	24.8		23.5	13	15.2	4.9	3.2	145	120	1	convex	shoulder			
22N6W11	agate	complete	25.3	17.8	22.6	17.1	21.2	5.3	3.18	185	120	1	straight	shoulder	2	1	3.36
24N6W8	chert	prox lateral edge	20.4		18.9			4.4	1.63			0	unable	shoulder			
14N4W5	chert	complete	36.8	28.3	22.7	15.5	19.2	5.8	4.48	180	125	0	convex	shoulder	3	0	4.88
16N4W18	chert	complete	33.7	25.7	23.5	12.5	17.9	4.6	3.57	150	120	0	straight	shoulder	3	0	5.59
16N4W19	chert	lateral edge	16.3		18.4			4.4	1.27			0	unable	unable			
16N4W20	chert	midsection	27.3		21.3	13.5		4.8	2.82			0	unable	shoulder			
18N4W17	chert	midsection	32.1		24.3			5.7	5.09			0	unable	shoulder			
18N4W18	chert	distal	30.2	29.7	23.7			4.3	3.01			0	unable	unable		0	6.91
18N4W20	chert	midsection	24.9		21.9			5.6	3.44			0	unable	unable			
18N4W21	agate	complete	29.3	21.3	20.7	13.9	16.5	4.8	2.93	170	115	0	convex	shoulder	3	0	4.44
20N4W7	petrafied wood	distal	29		21.7			3.9	2.35			0	unable	unable			
20N4W11	chert	midsection	43.4		22.4	12.9		4.4	4.82			0	unable	shoulder			
20N4W12	chert	proximal	40.7		22.1	15.5	18.3	6.6	5.69	180	130	0	straight	shoulder			
20N4W14	chert	complete	33.8	26.9	21.1	12.6	14.3	4.3	3.32	180	110	0	straight	shoulder	3	0.03	6.26
22N4W10	chert	lateral edge	36.9		21.3	12.2		4	3.18			2	unable	shoulder			
22N4W11	chert	proximal	31.7		25.5	14.8	17.2	5.3	4.76	135	115	0	convex	shoulder			
22N4W12	chert	complete	33.8	24.4	19	10.6	15.8	5.6	3.18	135	120	1	straight	shoulder	3	0	4.36
24N4W9	chert	proximal	35.4		25.7	15.3	19.2	5	4.68	150	115	0	straight	shoulder			
24N4W10	chert	proximal	19.8		20.7	20.7	20.7	3.4	1.37			0	convex	unshouldered			
16N2W9	chert	complete	26.9	22.2	15.6	8.5	11.8	5.2	2.03	180	135	0	straight	shoulder	3	0	4.27
16N2W10	chert	complete	28.4	19.8	18.7	12.6	16.6	4.1	2.35	180	135	0	convex	shoulder	3	0.13	4.83
16N2W11	chert	proximal	15		17.3	12.2	15.3	3.8	1.22	180	130	0	convex	shoulder			
18N2W6	silicified sandstone	distal	16.6		18.7			4.4	1.05			0	unable	unable			
18N2W13	chert	complete	34.6	27.8	26.3	16.7	19.5	5	4.21	155	125	0	convex	shoulder	3	0.09	5.56
18N2W14	chert	complete	26.6	19.7	19.4	13.5	17	4	2.18	150	120	0	straight	shoulder	3	0	4.93
18N2W15	chert	midsection	19.3		21.8	14		3.6	1.34			0	unable	shoulder			
18N2W16	chert	complete	38.4	38.5	23.5	23.5	23.5	4.5	3.95			0	convex	unshouldered	3	0	8.56
20N2W9	chert	midsection	24.6		24.7	14.6		5.8	4.24			0	unable	shoulder			
20N2W12	silicified sandstone/chert	distal	31.3	31.4	23.4			6.1	4.63			0	unable	unable		0	5.15

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
20N2W13	chert	proximal	26.3		22.5	13.2	15.6	5.5	3.33	155	100	0	convex	shoulder			
22N2W7	chert	complete	36.9	31	21.6	13.8	15.5	5	3.72	155	110	1	straight	shoulder	3	0	6.2
22N2W9	chert	complete	55.1	46.1	25.3	13.8	20.8	6.1	7.43	160	130	0	straight	shoulder	3	0	7.56
24N2W14	agate/chert	complete	32.6	22.5	18.8	13.7	18	5.3	3.25	190	120	1	convex	shoulder	3	0	4.25
16N005	chert	lateral edge	13.4		19.8			4	1.55			0	unable	unable			
16N006	silicified sandstone	midsection	12		21.6			4.8	1.56			0	unable	unable			
18N002	chert	midsection	32		26.5	15.6		5.4	6.04			0	unable	shoulder			
18N0011	chert	proximal	35		24.6	14.3	16	4.5	4.12	150	110	0	straight	shoulder			
18N0012	chert	proximal	31.1		22.6	14	17.1	5.2	4.29	160	130	0	convex	shoulder			
18N0013	chert	proximal	31.6		25.2	15.4	19.1	4	4.21	150	120	0	straight	shoulder			
20N0011	silicified sandstone	complete	29.3	20.4	23.3	15.6	18.1	5.4	3.33	165	115	0	concave	shoulder	2	1	3.78
20N0012	chert	complete	56.1	48.3	21.4	13.5	14.2	6.3	7.31	160	120	0	straight	shoulder	3	0	7.67
20N0013	agate	complete	31.5	24	20.6		18.3	6	3.46	165	120	0	straight	shoulder	3	0	4
22N007	chert	proximal	31.4		25.1	16.1	19.8	4.4	4.59	155	125	0	convex	shoulder			
22N008	chert	midsection	35.2		22.5			4.7	4.84			1	unable	unable			
22N009	chalcedony	complete	32.7	26.2	19.2	9.3	13.1	4.8	2.59	140	110	0	straight	shoulder	3	0	5.46
24N005	chert	proximal	28.2		20.4	13	15.7	5.1	3.2	145	120	1	convex	shoulder			
24N006	chert	midsection	25.7		21.7	11.8		4.5	2.54			0	straight	shoulder			
24N007	chert	complete	32.4	23.8	19.6	13.9	16.8	4.4	2.93	160	120	0	convex	shoulder	3	0	5.41
24N008	chert	complete	40.4	34.9	19.9	19.9	19.9	5.5	4.39	195	110	0	concave	shoulder	3	0.03	6.35
18N2E2	chert	complete	26.5	20	20.7	13	16	3.8	2.06	145	115	1	straight	shoulder	3	0	5.26
20N2E8	chert	proximal	23.2		28.8	18.3	20.3	5.9	4.35	160	115	0	straight	shoulder			
22N2E4	quartzite	complete	38.1	29.7	21.5	13.8	15.4	4.4	3.63	140	110	0	concave	shoulder	3	0.03	6.75
24N2E1	chert	distal	31.9	29.2	22.7	15.7		5.1	3.45			1	unable	shoulder		0	5.73
24N2E2	chert	proximal	22.3		26.5	16.7	17.7	5.3	3.61	140	115	0	straight	shoulder			
24N2E3	chert	midsection	18.1		23.6	14.2		3.9	1.78			0	unable	shoulder			
Surface23.7N32.5W1	chert/quartzite	complete	35.1	26.3	22	13.6	17	5.2	4.06	150	120	0	convex	shoulder	3	0	5.06
test trench #1 1	chert	proximal	24.3		23.5	14.2	17	4.7	3.27	145	115	0	convex	shoulder			
St.2B.410N96W3	chalcedony	complete	29.4	20.4	24.6	17.1	21.5	5.6	3.66	180	125	0	straight	shoulder	2	1	3.64
St.2B.4 8N96W2	chert	proximal	36.2		25.6	15.6	19.2	6.8	6.1	155	130	0	straight	shoulder			
St.2B.4 8N96W3	chalcedony	distal	44	43	25.7			5.6	5.87			0	unable	shoulder		0	7.68
St.2B.4 2N94W1	chert	distal	39.9	31.7	27.9	15.2		6.1	7.05	160	130	0	straight	shoulder		0.31	5.2
St.2B.4 2N94W3	chert	distal	22.9		17.1			4.4	1.39			0	unable	unable			

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
St.2B.4 2N94W4	chert	proximal	18		18.4	12.3	14.8	5.5	1.86	180	125	0	convex	shoulder			
6N76W3	quartzite	midsection	33.3		42	24.7		8.5	17.5			0	unable	shoulder			
10N74W4	chert	midsection	17.5		23.6			3.9	1.99			0	unable	unable			
8N74W5	chert	distal	29.5	22	19.2	11.6	12.1	5.1	2.49	190	120	0	straight	shoulder		0.5	4.31
8N74W6	chert	complete	26.5	18.2	19.6	14.6	15.7	6.7	3.08	185	105	0	convex	shoulder	3	1	2.72
8N74W7	chert	distal	29.4		20			6.4	3.35			0	unable	unable			
8N74W8	chert	complete	35.8	27.5	21.7	12.2	15.6	4.6	3.68	150	120	2	straight	shoulder	3	0	5.98
6N74W1	chalcedony	proximal	35.7	25.1	25.4	16.4	20.4	6	5.4	180	135	0	convex	shoulder	3	0.06	4.18
6N74W2	chert	distal	20.2		19.2			4.1	1.41			0	unable	unable			
4N74W2	chert	midsection	23.7		16.2	11.5		4.4	2.15			1	straight	shoulder			
st1blk4 41N22E1	agate	complete	27.3	20.4	20.6	13.1	16.2	5.4	2.93	160	105	0	straight	shoulder	3	0.25	3.78
St.2tests9N17W2	agate	complete	31.1	22.1	22.7	13.2	16.7	4.6	3.13	155	120	1	convex	shoulder	3	0	4.8
St.2tests10N17W2	chert	lateral edge	25.6		16			5.9	2.62			0	unable	unable			
St.2tests10N17W3	chert	lateral edge	12.3		12.7			4.7	0.59			0	unable	unable			
St.2tests6S33W1	chert	distal	26.5	26.5	18.8	12		4	2.14			0	unable	shoulder		0	6.63
St.2tests6S33W3	chert	distal	21.8		14.9			3.8	0.88			0	unable	unable			
St.2tests7N77W2	chert	proximal	24.9		24.7	14.8	18	4.5	3.06	150	115	2	unable	shoulder			
St.2B.1 7N2W2	chert	distal	16.3		15.4			3.9	0.97			0	unable	unable			
St.2B.1 5N3W2	chert	proximal	26		23.4	13.1	16.5	5	3.47	145	120	0	convex	shoulder			
St.2B.1 6N3W1	chert	distal	12.1		13.8			3	0.36			0	unable	unable			
St.2B.1 5N4W1	chert	proximal	27.2		23.8	16.1	19.2	4.6	2.71			2	convex	shoulder			
St.2B.1 6N4W1	chert	distal	24.7		23.6			4.7	2.37			1	convex	unable			
St.2B.1 4N5W1	agate	midsection	23.7		22.3	13.2		4.9	2.49			0	convex	shoulder			
St.2B.1 6N5W1	chert	midsection	13.2		15.5			3.1	0.61			1	convex	shoulder			
St.2B.1 6N5W2	agate	proximal	23.3		24.9	14	17.8	4.7	2.33	145	115	0	convex	shoulder			
St.2B.1 8N5W2	chert	proximal	34.4		25.3	12.9	15.5	5	5.03	155	105	0	unable	shoulder			
St.2B.1 10N5W1	chert	prox lateral edge	16.6		18.3			4.8	1.71			1	straight	shoulder			
St.2B.1 10N5W4	chert	complete	30.3	21.3	22.1	13.5	18.3	6.2	3.84	150	120	0	straight	shoulder	3	0.25	3.44
St.2B.1 10N5W5	chert	complete	36.2	29.7	22.4	13.2	17.1	5.6	3.97	150	120	0	convex	shoulder	3	0.06	5.3
ST.2B.310N83W1	chert	complete	32	25.6	23	14.3	16.8	5.4	3.71	150	120	2	convex	shoulder	3	0	4.74
ST.2B.310N86W1	chert	midsection	24.7		21.9			5.3	3.22			0	unable	unable			
ST.2B.310N87W3	chert	lateral edge	12.3		14.8			3.8	0.88			1	unable	unable			
ST.2B.39N89W1	chert	distal	40.1	34	21.5	12.1		4.8	3.98	145	115	0	convex	shoulder		0	7.08

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Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
St2 B2 11N45W3	quartzite	proximal	12.8		30	24.7	30	5.5	0			0	straight	shoulder			
St2 B2 5N45W1	chalcedony	midsection	29.8		21.7			6	3.85			0	unable	unable			
St2 B2 5N45W2	chert	distal	9.7		13			4	0.51			0	unable	shoulder			
St2 B2 5N45W3	chert	distal	27.1	22.9	20.2	12.9		4.5	2.53			0	unable	shoulder		0	5.09
St2 B2 1N45W1	chert	midsection	9		11.7			3.3	0.36			0	unable	unable			
St2 B2 1N45W2	chert	distal	18.4		13			3.5	0.62			0	unable	unable			
St2 B2 0045W1	chert	lateral edge	29.7		9.3			3.4	0.86			0	unable	unable			
St2 B2 2S45W1	chert	distal	40.3	39.8	28	17.1		5.1	6.15			0	unable	shoulder		0	7.8
St2 B2 2S45W2	chert	proximal	23.9		22.7	18.4	22.7	6.4	3.4			0	straight	shoulder			
St2 B2 2S45W3	chert	lateral edge	16.5		10.6			4.3	0.58			0	unable	shoulder			
St2 B2 3S45W3	chert	proximal	36.9		21.4	15.4	18.3	5.9	5.31	160	120	0	straight	shoulder			
St2 B2 4S45W3	chalcedony	distal	34.5	34.6	24.7	14.1		5.6	4.77			0	unable	shoulder		0	6.18
St2 B2 6S45W2	chert	missing ear	41.8		21.4	11.2	14	4.5	4.48	140	105	1	straight	shoulder			
St2 B2 7S45W6	chert	complete	44.5	36.5	21.7	12.5	16.9	4.8	4.46	150	130	0	straight	shoulder	3	0	7.6
St2 B2 9S45W2	chert	midsection	14.6		20			4.5	1.47			1	unable	unable			
St2 B2 10S45W1	quartzite	distal	18.5		14.4			3.2	0.77			1	unable	unable			
St2 B2 10S45W2	chert	proximal	31.3		18.5	10.6	13	4.9	2.95	150	120	0	convex	shoulder			
St2 B2 11S45W4	chert	proximal	25.4		22.3	13.8	16.1	5.2	3.33	150	120	0	straight	shoulder			
St2 B2 14S45W3	chert	distal	53.1	45.7	28.6	15		5.3	7.77	150	125	1	straight	shoulder		0	8.62
St2 B2 6N44W1	silicified sandstone	complete	33.3	24.4	21.5	12.2	15.8	4.7	2.9	160	130	1	convex	shoulder	3	0	5.19
St2 B2 5N44W3	chert	proximal	17.6		22.3	15.3	19.2	5.4	2.15	180	135	1	convex	shoulder			
St2 B2 1N44W4	chert	proximal	35.5		24.5	13.5	16.4	4.9	4.95	150	110	1	convex	shoulder			
St2 B2 0044W3	agate	midsection	44.6		24.9	12.9		6.9	7.2			1	straight	shoulder			
St2 B2 1S44W6	chert	complete	39.6	32	17.3	11.3	13.2	5.2	3.6	160	120	0	straight	shoulder	3	0	6.15
St2 B2 6N43W1	chert	midsection	29		26.2	13.1		5.4	4.76			0	unable	shoulder			
St2 B2 5N43W2	chalcedony	midsection	20.3		22.2			4.3	2.04			0	unable	unable			
St2 B2 4N43W1	chert	complete	33.7	26.3	23.2	14.2	16.5	4.6	3.41	160	110	0	straight	shoulder	3	0.13	5.72
St2 B2 4N43W2	chert	complete	23.6	15.3	18.7	10.7	14.5	4.1	1.83	155	125	1	straight	shoulder	2	1	3.73
St2 B2 1N43W2	chert	midsection	22.4		23.7	14.5		5.1	3			0	unable	shoulder			
St2 B2 1N43W4	chert	proximal	48.3		27.5	16.2	19.6	6.2	9.25	150	125	1	straight	shoulder			
St2 B2 1S43W2	chert	midsection	15		17.3			4.9	1.19			0	unable	unable			
St2 B2 6N39W1	chert	proximal	13.1		18.8	14.5	18.8	4.4	1.2			0	straight	shoulder			
St2 B2 6N39W3	chert	complete	36.2	28.5	23.5	15.2	18.4	5.8	5.45	160	125	0	straight	shoulder	2	0.38	4.91

175 Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

Unit Point	material	condition	max length	blade length	max width	neck width	basal width	thickness	mass	DSA	PSA	flake attributes	basal shape	shouldering	retouch	HRI	BLT
St2 B2 6N39W4	chert	proximal	13.1		19	14.3	19	4.7	1.22	145	115	1	straight	shoulder			
St2 B2 6N38W1	chert	distal	29.7	24.4	23.6	15.2		5.3	3.24			1	unable	shoulder		0.25	4.6
St2 B2 6N38W2	chert	complete	35.4	29.5	20.7	13.7	14.7	5.4	3.65	165	130	0	straight	shoulder	3	0	5.46
St2 B2 6N35W3	chert	midsection	27		21.9	13.8		4.7	3.1			0	unable	shoulder			
St2 B2 6N33W1	chert	distal	18.6		20.3			4.6	1.23			1	unable	unable			
St2 B2 6N32W1	chalcedony	distal	13.9		14.8			4.2	0.78			0	unable	unable			
St2 B2 6N31W1	chert	midsection	14.3		13.9			4.8	0.89			1	straight	unable			
St2 B2 6N31W2	agate	distal	15.9		14.9			3	0.62			0	unable	unable			
St3 21N11E1	chert	distal	31.5	28.2	19.6			4.6	2.81			0	unable	shoulder		0	6.13
St.4 48N37E1	chalcedony	complete	21.8		14.3	10.3	13.4	3.4	1.12	180	160	2	straight	shoulder	3	0	
St.4 47N37E1	chert	proximal	14.3		18.3	13.1	15.8	4.5	1.32	180	130	0	convex	shoulder			
St.4 15N4E?1	agate	missing ear	29.2		20.7	14.9	17.3	6.4	3.95	155	120	0	convex	shoulder			
St.4 63N22E1	chert	complete	20.9		15.9	12.8	13.1	4.6	1.63	180	120	1	straight	shoulder	3	0	
St.4 61N22E1	chert	lateral edge	16.6		8.3			4.5	0.55			0	unable	unable			
St.4 60N22E1	chert	complete	31.9	22.4	24.5	12.2	15.4	5.5	4	150	125	2	straight	shoulder	2	0.44	
2N24W2	obsidian	midsection	19.4		26.9			5.5	2.77			0	unable	unable			
0022W1	obsidian	midsection	28.2		24			5.9	3.7			0	unable	unable			
16N8W21	obsidian	lateral edge	25.7		21.1			7.6	3.8			0	unable	shoulder			
24N8W15	obsidian	complete	28	16.2	22.3	11.6	15	4.6	2.51	180	130	0	convex	shoulder	2	1	3.52
22N0010	obsidian	midsection	43.9		27.9	15.4		6.7	8.93			0	unable	shoulder			
St.2tests10S30W4	obsidian	complete	30	25.5	15.5	12.1	13.1	4.5	1.78	180	130	2	straight	shoulder	3	0	5.67
ST.2B.310N89W1	obsidian	lateral edge	11.7		9			4.7	0.46			0	unable	unable			

Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.

Projectile Point Datasheet
Metrical and Non-Metrical Measurements

177 Note: Points labeled complete also include near comlpete points missing approximately 3mm. Maximum Width is shoulder width unless notching is absent in which the measurement is taken at the widest section on point. Retouch type goes as follows; 1= Lateral edge retouch, 2=tip retouch, and 3=no retouch.