2.0 RESEARCH DESIGN

Preliminary research, including the results of survey and evaluation investigations, suggested that the Black Diamond site (7NC-J-225) represented a single component occupation dating to the latter part of the Late Archaic period, and at which the manufacture of stone tools from a distinctive variety of quartzite was a major activity. True single component sites have rarely been studied in Delaware. This unusual aspect of the site would allow the interpretation of artifact and feature patterns without the interference of mixed contexts such as are typically encountered on unstratified or only partially buried, multi-component sites.

From the perspective of federal compliance, which was the motivating force behind the development and funding of the research at the Black Diamond site, the determination of eligibility of the site for inclusion in the NRHP was based on its potential to contribute information related to important research topics established by the DESHPO, including themes such as lithic technology, archaeological site structure, and local paleoenvironmental conditions. These topics were presented in Management Summaries, Scopes of Work, and Research Designs developed by the Principal Investigator and other project researchers, and thus they form the basis for the research presented in this report (Auman 1999a, 1999b; Auman and Egghart 1999; Parsons 2000).

2.1 General Orientation

The research design guiding investigations at the Black Diamond site was initially formulated to contribute to research priorities established in existing regional management plans for the early part of a period referred to in certain Delmarva studies as Woodland I, which spans roughly from the end of the Late Archaic through the Middle Woodland (Custer 1986a, 1994; Custer and De Santis 1986). In terms of research priorities, Delaware lists six main property types or site types for the period including macro-band and micro-band base camps, transient camps, procurement/processing locations, quarries, and quarry reduction sites. Arrayed against these site types is a series of eight general research questions that address issues such as the paleoenvironment; chronology; household, community, and regional settlement patterns; lithic technology; ceramic technology; and subsistence systems. Certain site types likely to contain information relevant to these subjects are also noted. Other research topics from existing management plans include trade and exchange, mortuary ceremonialism, prehistoric migrations, and trends in socio-cultural evolution. These latter themes have been cited as "theoretical…rely[ing] upon the use of data gathered in relation to the [standard] research issues" (Custer 1994:177).

In the years since these management plans were developed, the research concerns of Delaware archaeology have widened to embrace additional theoretical concepts related to a deeper understanding of the lives and experiences of the people who inhabited pre-Colonial Delmarva. The familiar definition of archaeology holds that archaeologists study past human societies by examining their physical remains, or the remains of material culture. But archaeological research has often become overwhelmed by material culture, spending its energy describing and analyzing artifacts and features in great detail. Recent research has shifted interpretive focus from material culture in and of itself to the relationship between material culture and society, asking questions about how materials both formed and inform

the societies of which they were a part; how societies were organized and were integrated with the physical and cultural landscape; and how people operated as individuals or agents both creating and altering the social structures within and by which they lived.

In the analysis and interpretation of the Black Diamond site, we have attempted to integrate these newer perspectives with the traditional research topics that initially guided the field investigations. For example, the usefulness of the existing system of property types in Delaware noted above is evaluated in light of perspectives on social organization such as heterarchy and cultural landscapes; the place of the Black Diamond occupation within the various schemes is assessed, while the type of research questions appropriate to the site and how the site addresses those questions is examined. Research topics outlined in the original work scopes for the project and incorporated into the present research design include: lithic technology, which is addressed under a wider examination of technology, material culture, and its effects on society and people's lives; intra-site settlement patterns, addressed as part of an examination of social organization; paleoenvironmental studies; and chronology.

2.2 Primary Research Topics

2.2.1 Technology

The majority of the archaeological data from the Black Diamond site consisted of artifacts, and more specifically, the remains of stone tool making and use. Thus, the focus of analysis and interpretation at the site is largely technological, examining how the processes of making and using stone tools were organized, how materials were manipulated, and what effects these processes had on the everyday lives of the people living at the site.

Materiality and Agency

Materiality is the study of material culture and its interrelationship with social practices. As an investigative approach, materiality involves the assessment of material culture from a descriptive and functional perspective, characterizing the material properties of artifacts while addressing the ways in which making and using artifacts may affect or intervene in the social lives of individuals and societies (Jones 2004). Some archaeologists have further adopted a theoretical approach referred to as agency, which emphasizes the power of individuals to act knowledgeably and independently in their interactions with one another and with respect to the material world (Barrett 2001; Gardner 2008; Hodder and Hutson 2003). Built in part on Pierre Bourdieu's notion of social *habitus*, or learned cultural structures (the constraints of social norms or traditions) (Bourdieu 1977), the individual is viewed as an agent of action, operating within traditions but with the power to work against convention and customary practice, recasting custom in the process. The reflexivity implied in this view of culture is part of the dialectical nature of materiality and is integral to a theory of agency, in that material culture is seen as both the product of and directly influencing technology and the individuals practicing that technology.

Contrary to facile interpretations of the theory, the key concept of agency is not individuals but relationships—interactions between individuals and the material world (Robb 2010; Shanks 2008). People develop experience through their engagement with their material environment. This engagement begins within the context of deeply embedded cultural and psychological structures, "the implicit, unquestioned and unquestionable values which

Bourdieu calls 'doxa'". Yet the structures are ambiguous, seen as "the raw material for creativity, conflict and heterodoxy as well as orthodoxy" (Robb 2001). Individuals may, thus, understand the rules of their society but choose to manipulate them rather than follow them directly, and in so doing they change the rules.

Technology

Even seemingly mundane tasks can have meaning beyond their direct functional or utilitarian aspects. Meaning can be explicit, as in overt symbolism that is often associated with the planting of crops at the start of the growing season or re-plastering the walls of a mud house (Boivin 2008). Yet, implicit meanings may also reside in ordinary activities, wider social meanings wherein, to use current theoretical phraseology, creative and innovative dimensions of day-to-day acts are played out in the context of materiality and agency.

Lithic tool manufacture is one such activity in which several levels of meaning may be found. Stone tool making is a process of reduction, in which fragments are systematically removed or chipped away eventually leaving behind a finished tool form. Considering the structured aspect of lithic reduction, models of sequential process have been found to be useful as interpretive devices (Bleed 2001; Shott 2003). This form of analytical modeling considers entire artifact assemblages and artifact life-histories, going beyond simple morphological descriptions of types and supposedly finished artifacts. Often associated with experimental or lithic replication analysis, sequence models focus on production steps rather than end-products, examining how a tool is made and used rather than the appearance of its final form. As a result, several researchers have observed that apparent type differences may merely represent forms at intermediate stages in a sequence (Dibble 1984, 1987, 1995), or may even be forms taken well beyond the initial manufacturing process, being the results of extensive use or recycling (Flenniken and Raymond 1986; Goodyear 1974; Hoffman 1985; Morrow 1997).

The *chaîne opératoire* is one such model, providing an approach that both describes the structure of the process while also accounting for diversity and situational variability within that structure. Characterized as "a syntax of decision making" Gargett (n.d.), the model focuses on the relationship between design, raw material, and end product, as well as on problem-solving aspects of artifact production, use, and repair (Dobres 2000). Drawing to some extent on agency theory, the model acknowledges that cultural traditions shape the sequential operations of lithic reduction technology, effectively constraining the actions of the individual artisans; the artisan consciously chooses particular strategies from within the existing tool-making tradition, thereby reinforcing it, or diverges from the tradition and in so doing restructures the process (Mounier 2006).

Figure 2-1 depicts a typical *chaîne opératoire* model for stone tools. Circles denote the major segments of the sequence, following the material from acquisition through artifact manufacture, use and re-use, and discard. Along the top are some of the major types of information potentially available in the archaeological data that may result from each segment. Procurement, for example, can provide information about decisions made as to what materials were needed and where and how they were acquired (directly or through exchange, for example), and how the landscape was viewed and used. Information regarding

manufacturing technology is plentiful, addressing questions of production and the choices made during that process. How artifacts were used can provide information about the kinds of activity people engaged in, how they managed space, how they managed social relationships, how they obtained or used other resources besides lithics. And finally, what was discarded and where can provide insights into how the site was used, where people lived and how they lived. As importantly, this segment also includes information about where things are found archaeologically, which provides data not only about processes of discard or deposition but about postdepositional processes, about what has happened to the site since the people who once lived there left it, about site formation processes, and ultimately about how much effort is warranted in terms of further analysis.

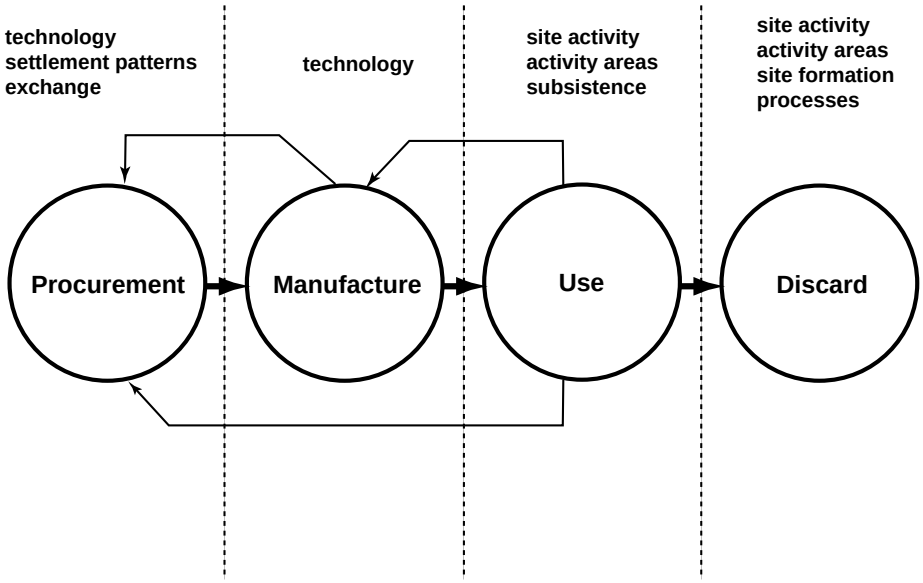

Figure 2-1. Schematic Representation of the *Chaîne Opératoire.*
(adapted from Grace 1996; the types of information potentially available at each segment are listed are above; the graphic emphasizes the linear and sequential nature of the process, while feedback loops depict both physical and cognitive breaks)

While the process as depicted is sequential, with implied linearity, there are loops, both physical and cognitive. Physically, artifacts may be used and then returned to the manufacturing process for resharpening, retooling/refurbishing, repair (for simplicity, a loop indicating the potential for scavenging and re-use or re-manufacture is not included). Cognitively, entrance to the process can be at the Use segment, in that the intended use of an item may influence the form of manufacturing technology employed (making flake tools rather than bifaces, for example), while intended use or intended manufacturing techniques may influence raw material selection (bipolar reduction of quartz pebbles for flake tools, or bifacial reduction of cobbles for quartzite points).

Lithic Technology

Research priorities identified in the original compliance documents under this topic included studies of lithic resource utilization, identification of local and non-local lithic raw materials, detailed flake attribute analysis, identification and description of decortification activities, and comprehensive descriptions of tools and subsequent tool kits (Auman 1999a; Auman

1999b). Beyond these descriptive analyses, data from the site allows a perspective on technological organization and a complete view of the life history of an artifact type, from acquisition through manufacture, use, and discard.

The intensive use of quartzite at the site, the large volume of flaking debris present, and the implications in terms of the amount of raw material and the number of finished artifacts represented are particularly interesting given the infrequency with which this material occurs in the immediate site vicinity. Like most forms of stone in Coastal Plain Delmarva, quartzite is typically found in secondary deposits of Pleistocene glacial debris (Jordan 1964). These deposits are widely distributed throughout the Delmarva area. A known benchmark size for the quartzite cobbles allows for the calculation of cortex ratios that may be used in assessing rates of primary reduction. The total mass of quartzite debitage, as well as specific attribute data, may be used to estimate the number of artifacts produced at the site.

Analyses of quartzite debris, including flake size and individual flake attribute analyses, will aid in investigating the range of lithic reduction activities represented at the site. A variety of stone tool attribute analyses are conducted to provide information about the stages of manufacture represented in the artifacts, as well as to indicate the overall forms of manufacturing activity present within the industry, with the aim of differentiating between the production of finished bifaces or expedient flake tools, for example, or the maintenance of curated tools. Indications of repetitive stylistic attributes are sought as evidence of design planning or a structured decision-making process, whether socio-culturally defined or idiosyncratic.

While the association of diagnostic projectile points from the site with respect to conventional point typologies is not certain, in basic form the artifacts fall into what is generally referred to as the Late Archaic broadspear or broad-bladed point tradition, probably related to the Savannah River type. The functional role of broad-bladed points from this period is open to considerable debate. Custer (1992) has argued on the basis of breakage pattern analyses and ballistic characteristics that broad-bladed points functioned primarily as knives rather than projectiles. Others, notably Oliver (1985), have argued that points such as Savannah River primarily functioned as hunting implements. Claiming the middle ground, McLearen (1991) cited unpublished experimental work in which Callahan concluded that medium-sized, broad-bladed points similar to Savannah River can function equally well as hafted knives and projectiles. Further, many researchers now recognize that certain hafted biface types probably had multiple uses.

While the majority of the lithic material from the site consisted of a single variety of quartzite, a range of other lithic materials was present in minority frequencies. Flake and tool attributes from these materials are compared with data from the quartzite assemblage to examine evidence of differing material use, variations in reduction sequences representing different tool manufacture trajectories, or selection of specific materials for particular uses. Attribute analyses are tailored and presented, where appropriate, for comparative analysis with existing databases from the region (e.g., Riley et al. 1994; Watson and Riley 1994; Petraglia et al. 1998).

Color and Materiality

Color as a Cultural Phenomenon

Color, and its socio-cultural meaning in archaeological contexts, has received renewed interest with the recent attention paid to studies of materiality and the relationship between material culture and societies. In general terms, the perception of color is viewed as both a personal and holistic experience, based on an individual's history but drawn from the full context of visual perception and understood bodily in ways that may not be entirely conscious (Boriç 2002). As such, color is often more than a simple agent of recognition or classification. It easily imparts symbolic meaning well beyond the level of mere identification. Color animates things, it evokes space, creates brilliance or light, camouflages, identifies or connects things; it generates emotion; and it can transform (Young 2006). How we perceive and understand color has been a matter of concern in many research disciplines. As a sociological question, the cross-cultural nature of color perception has been debated for decades. Berlin and Kay (1969), in an extensive research project known as the World Color Survey, reported on color nomenclature among a wide range of languages (originally 20, later expanded to 110 [Kay et al. 2010]). Their study suggested a marked pattern regarding how colors are named. Eleven basic color categories were noted. The names themselves were abstract and generally unrelated, but the list as compiled seemed to indicate that, independent of language, colors tend to be recognized and given names in a distinct order. Not all languages identify all colors uniquely, but all languages appear to have words to denote black and white. If a third color is identified in a language, that color is red; a fourth color, green or yellow; then blue, brown, and others. From these findings the researchers proposed that there is an underlying perception of color unrelated to culture or language.

The argument regarding color perception and classification is part of a longstanding debate over language relativity, the main tenet of which is the so-called Sapir–Whorf hypothesis, which holds that language influences or even determines the way we think. The results of the color survey were seen as supporting the opposite or universalist position, that color perception is absolute, not culturally determined or specific: everyone sees and names colors the same way, if not to the same level of detail. Critics of the color survey have argued that the study was ethnocentric, assuming for example that all cultures categorize color in a way that can be directly compared with the categorization found in Indo-European languages. Other critiques involved questions about the accuracy of the translation methods used; about misguided assumptions of evolution or progress implicit in the study; and about the use of color terms removed from their context and an associated lack of in-depth understanding of the structural references specific to each language (Levinson 2000; Lucy 1997; Saunders 2000; van Brakel 2004).

Essentially agreeing with the Berlin and Kay results, Jones and MacGregor (2002) note that color is a natural phenomenon that is naturally constituted. Emphasizing the experiential aspect of color, they refer to color sense as a temporal and spatial component of the environment, noting for example that colors change throughout the day as well as the seasons:

> Equally, colours are spatial since they are associated with specific geological formations and minerals, with bodies of water, with botanical and animal

> life…as hunters-gatherers explore their environment they will experience different colours in different regions of the landscape over the course of the seasons. (Jones and MacGregor 2002:10)

Color Symbolism

Questions about perception aside, the meanings we associate with colors, and in particular our sense of color symbolism, appear to be culturally constructed. While an obvious phenomenon of nature, color is also created through the manufacture of artifacts or the construction of architecture; the selection of colors for specific purposes goes beyond decoration or adornment, extending into the realm of symbolism (Jones and MacGregor 2002). Color has meaning over and above immediate perception and is thus assigned to or is associated symbolically with various aspects of life. A pervasive form of color symbolism in Native American cultures, for example, involves applying colors to the cardinal directions (DeBoer 2005). Analysis of ethnographic literature indicates that at the simplest, this directional symbolism level involves binary systems, with an east-west axis as the most common orientation. Quaternary systems, using the cardinal directions, are seen as an elaboration on twofold systems. Whether two- or four-part, though, all systems tend to oppose light and dark colors. Taken together, the observations suggest that color/direction symbolism is often based on the passage of the sun across the sky and the resulting sensation of light and dark (De Boer 2005).

In his classic study of ritual symbolism in East African societies, Turner (1967:59-92) noted three colors—white, red and black—important in ritual among the Ndembu of what is now Zambia. In particular, red revealed an organic association with blood, both good blood (animal blood shed by hunters) and bad blood (blood of menstruation or murder). This connection is relatively easy to envision and is widespread throughout many socio-cultural configurations (Mounier 2007:10). Other attempts have been made to determine more systematic associations between color symbols and the natural world, connections beyond the generalities implied by Jones and MacGregor (2002). Mineral-based colors in Southwestern pottery types, for example, were sequenced black, white, red, brown, yellow (Oppelt 2002 in DeBoer 2005), roughly similar to the sequence observed by the Berlin-Kay language study. In contrast, a frequency ranking of colors from Moermann's survey of native North American plant use provided a sequence of red, yellow, black, blue, green, and white, a finding dissimilar to the Berlin-Kay result (Moermann 1986, 1998). White, black, and red also bore important symbolic meaning in Eastern Algonquian cosmology. White, particularly in brilliant or reflective forms in substances such as shell, pearls, crystal, galena, or pyrite, was associated with the continuity of social and biological life. Along with blood symbolism, red was associated with the animating and emotive aspects of light and life. Red further embodied the light and heat emanating from fire and, in transforming substances through fire, performed the role of translator between realms (Hamell 1983). Black served the opposite role, signaling the absence of life and harmony and being associated with darkness, inferior status, and mourning (Barwick 1999; Hamell 1983; Rountree 1989). Black was manifested in such substances as charcoal, dark stones, shell, fruits and berries, certain animals such as rattlesnakes, raccoons, and night (Hamell 1983).

2.2.2 Social Organization

Complexity

Complexity is another potentially useful, if seemingly counterintuitive, framing concept in the study and interpretation of past societies. Often wrongly equated with social hierarchy, complexity as it pertains to socio-cultural interpretation addresses the ways in which societies integrate various parts into a cohesive whole. Human societies are by their nature complex, perhaps uniquely so in that they cannot, in the classic strategy of the reductionist physical sciences, be adequately described by understanding the behavior of their parts separately (Gilbert 2004). Societies have unpredictable features related to their past histories that can significantly influence their character and development. More importantly, human societies are composed of individuals among whom interactions are often non-linear and thus seemingly random, erratic, and notoriously resistant to modeling. Societies are also dynamic. In contrast to most physical systems, which are composed of similar or identical units, societies are formed of individuals who vary greatly in their capabilities, desires, and needs. Thus they defy description on a systematical scale.

Heterarchy

As archaeological theory has extended beyond issues of culture history, systematics, and process over the last few decades, researchers have questioned existing notions of unilinear cultural evolution or the idea that there is a necessary evolutionary scale of developing complexity in socio-cultural systems (Prentiss 2008). In this view, asking questions about the apparent complexity of a culture as a means of ranking its development are seen as not relevant or pertinent to descriptions of past societies. Rather than asking how complex a culture is, assessing how it is complex is considered more to the point (Rautman 1998).

The concept of heterarchy may be useful in making this type of assessment. In Crumley's now oft-cited definition, heterarchy is a state in which organized entities are independent and situationally ordered, in contrast to the permanently ranked ordering that is characteristic of a hierarchy (Crumley 1995). Both the context and duration of relationships between elements is different between heterarchies and hierarchies, with heterarchically organized entities being autonomous and arranged on the basis of present conditions, in either a short or long-term relationship, but an essentially impermanent one that may change as the situation alters (Rautman 1998). The source of modern heterarchical theory in human cognitive studies is helpful in explaining the concept (Crumley 2005). The notion emerged with the investigation of independent cognitive structures in the brain by neurophysiologist and cyberneticist Warren S. McCulloch (1945). The brain adjusts to the re-ranking of values to contend with changing circumstances. The impermanence of the ranking describes a non-hierarchical ordering that McCulloch referred to as heterarchical, emphasizing fluidity and adaptability. Situational organization has also been described by Gearing (1958), who referred to the concept of structural poses, characterized as roles and organizational groupings that come and go depending on the tasks at hand, with the social structure of a society being the sum of the structural poses assumed by its constituents throughout the year.

In terms of Middle-Atlantic/Delmarva prehistoric settlement patterning as reflected in the occupations at the Black Diamond site, this theoretical perspective would imply replacing strict adherence to a hierarchical base-camp/support-camp or micro-band/macro-band model

with a heterarchically oriented model that embraces independent and interdependent settlements. The overall structural form of such a system would be related to the specific conditions present during the occupations, be they environmental, seasonal, social, political, ceremonial, or some combination of factors.

Landscape

> A landscape is not merely a geographic space as it has contents, not merely a container as it shapes and is shaped by what it contains, and not merely a human-modified environment as it is a holistic system in which nature and culture co-evolve. (Wu 2010:1148)

Landscape archaeology considers landscape as more than just the physical world we inhabit or the physical environment against which people must pit themselves in order to survive. Researchers and theorists have come to view landscape in a much wider sense as "the world…understood, experienced, and engaged with through human consciousness and active involvement" (Young 2006). The division between nature and culture is seen as artificial, a matter of perception. Living within a landscape, people become an integral part of it (Forman and Godron 1986). Landscape is considered in cultural as well as natural terms as a functioning, reciprocal whole—people respond to or adapt to the landscape as a physical environment, but in responding they change their surroundings. "While [the nature/culture] division is useful and even necessary in some cases, any artificial separation of constituents without a holistic unifying framework may obstruct a genuine understanding of complex adaptive systems such as landscapes" (Wu:2010:1148). As behind much of recent archaeological theory, the idea is to bring people into the picture, to fill the landscape with people by describing not just the relationship between human populations and the environment, but also the relationship between cultural landscapes and social practices (Gojda 2004).

For all of the current theoretical writing on the subject, the notion of a cultural landscape is not new but was introduced as a specific term by the German geographer Friedrich Ratzel in the 1890s and revived later by the American geographer Carl O. Sauer. The latter, referring variously to landscape morphology and cultural history, viewed landscape not as a static entity but as a process, with culture as the agent, nature as the medium, and the cultural landscape as the result (Sauer 1925). This perspective on landscape and the environment developed in part as a means of avoiding the generalizing determinism that has been associated with typing societies within a model of cultural evolution (Shanks 2008). It is wrapped up in the notion of structuration, which holds that people function in a world that is not of their own making (Bourdieu's *habitus*), but through thoughts and actions create and change that world (Giddens 1981, 1984).

Anschuetz (et al. 2001) note three general aspects of landscape archaeology that can be used to direct interpretation in a modern archaeological context: settlement ecology; ritual landscapes; and ethnic landscapes. *Settlement ecology* is closest to the standard ecological approach in archaeology, in that it tracks the ways in which people interact with the natural environment, respond to its characteristics, and adapt to changes if and when necessary. The researchers also note a more cognitive or ideational aspect in which culture and tradition

operate as what they refer to as "additional filters in how groups structure and organize their use and occupation of places." They suggest that small-scale changes in cultural patterns may be the result of slow adaptation to environmental variation, while more rapid or systemic change may signal social-cultural transformation, "significant realignments to resolve contradictory operational and cognitive models for community interactions with their environment" (Anschuetz et al. 2001:177). *Ritual landscapes* are defined as "the products of stereotyped actions, including specific acts and sequences of acts, that represent the socially prescribed orders by which communities define, legitimize, and sustain their occupation of their traditional homelands" (Anschuetz et al. 2001:178). Archaeological documentation of ritual landscapes, according to the researchers, relies on identifying ritual features or on insights gained through the study of traditional knowledge (specifically, oral history). *Ethnic landscapes* essentially create or reinforce sociocultural identity. These constructs consist of "material culture and symbols [that] signify ethnic or cultural boundaries based on customs and shared modes of thought and expression that might have no other sanction than tradition" (Anschuetz et al. 2001:179). No concrete means of identifying an ethnic landscape are proposed, the researchers observing only that "evidence of differential ethnic representations in…morphological, stylistic, and spatial" data may be noted (Anschuetz et al. 2001:180).

Intra-Site Settlement Patterns

On a more immediate spatial level, the clustering of artifacts and the frequency of well-defined features within an archaeological site can represent significant information about how people lived at the site: how many separate occupation components might be present, how space was organized during any one occupation and, by implication, how individuals inhabited and used those spaces. An important first step in examining site structure includes determining the size of a site and the presence and arrangement of activity areas (Kent 1991). At the Black Diamond site, identification of intra-site patterning in the form of discrete artifact contexts presents an excellent opportunity to assess the presence of activity areas and the use of space. The study entails a detailed analysis of depositional relationships across horizontal surfaces, investigating evidence for both specific, localized activity areas and site-wide distributions encompassing the entire block excavations. The analyses focus on delineating evidence of debris clusters that may signal workshop areas; clear areas that may represent parts of the site maintained for domestic use; specialized activity areas recognizable on the basis of tool distributions; and the occurrence of pit features or thermally altered stone concentrations.

2.2.3 Paleoenvironmental Studies

Previously identified research priorities for paleoenvironmental studies consist of the analytical reconstruction of local environmental conditions; the examination of environmental change through time; and more specifically, describing the role of aeolian erosion and deposition in site formation and archaeological visibility (Custer 1994).

The initial goal of paleoenvironmental investigations at the Black Diamond site was to place the site and all of its constituent matrices—sedimentological, pedological and cultural—into appropriate physical context. A further goal is to assess the data in terms of the contemporary environmental setting, examining the implications for area and regional conditions and how they may have affected site selection and function. The landscape

encompassing the site area included a crescentic dune, probably of Holocene age; an eroded surface of the Columbia Formation; and a small bay/basin infilled with Holocene and perhaps Late Pleistocene sediments. The forces that shaped this landscape not only played a role in the formation and preservation the site, but also have direct behavioral implications in terms of site selection and site activities. Geoarchaeological and archaeobotanical investigations at the site were specifically aimed at studying environmental or climate trends that may have influenced local settlement patterns. Analysis of sediments within the bay/basin features was proposed as part of this investigation, as was the search for evidence of aeolian activity on the adjacent landforms. Results of these analyses were then to be synthesized with findings of paleoenviromental studies undertaken in the area (Kellogg and Custer 1994; Versar 2011a), as well as pertinent studies outside the region (Brooks et al. 1996; Brooks et al. 1998). Specific research topics to be addressed include the origin and nature of the aeolian soils capping portions of the site, and the potential role of prehistoric human activity in facilitating or promoting aeolian and colluvial soil movement.

2.2.4 Chronology

Creating a chronological framework is a critical step in organizing and interpreting the material remains generated by the people who once inhabited the Black Diamond site. As human beings, we generally understand time as sequential, and the recognition and description of temporal sequence in the archaeological data from the site gives us a familiar frame of reference on which to base our interpretations. A chronological framework enables us to examine the issues developed in this research design in a meaningful way: how people used technology and were influenced by their technologies; the nature of their social organization; and matters such as population continuity, settlement mobility, community patterns.

Three primary tools are used to create a chronological framework for the Black Diamond site occupations: modeling cultural and natural stratigraphic associations; analyzing morphological or stylistic attributes of artifacts that are presumed to have been temporally diagnostic and are reflected in established regional typologies; and, radiocarbon dating of organic remains—in this case, through the laboratory technique known as accelerator mass spectrometry (AMS). Combining these data sources provides the potential for determining and assessing depositional context—physical associations between temporally meaningful parts of the site—without which there would be little effective way of discussing the majority of the artifacts from the deposits and what they meant in the lives of the site inhabitants.