# XI. FEATURE ANALYSIS

*Introduction*

Archaeological investigations at the Lums Pond site identified and documented a total of eleven prehistoric features, all contained in Area 2. The following presents the results of several feature studies, incorporating descriptive data, morphological analysis, and the results of a series of analyses of feature fill, including radiocarbon dating, macrobotanical analysis, and artifact analysis. Features were chosen for radiometric dating based on the amount and quality of the carbonized material contained within them, to assure the most secure dates, or due to the presence of diagnostic artifacts—projectile points or ceramics. Macrobotanical analysis was conducted only on samples from dated features. Because of the comparatively small number of features present at the site overall, each is described individually. Using the various data presented, functional interpretations are advanced.

Feature volumes were calculated using standard geometric forumlae, and for simplicity regular shapes were supposed—some error was accepted, but generally deviations were minor and did not influence volume calculations substantially. The volume of a basin-shaped feature, whether circular or elliptical in plan, was calculated as follows:

$$v = .16\pi d\left(3ab + d^2\right)$$

where a = max length/2, b = max width/2, d = depth. Steep-sided basins were treated as a basin with cylinder attached, the volume calculated as follows:

$$v = \left(\pi r^2 d\right) + \left(.16\pi d\left(3ab + d^2\right)\right)$$

where a = max length, b = max width, d = depth, r = radius (using (a+b)/2 for an ellipse). All dimensional measurements were recorded from the base of the plow zone. Since all of the features appeared to have been truncated by plowing, the dimensions calculated do not necessarily reflect complete volumes. In the absence of a reliable means of determining the original vertical extent of deposition in any particular portion of the site, it was not possible to estimate the accuracy of the volumetric calculations for individual features. Analysis presented below suggested that the features had not been truncated proportionally.

Archaeobotanical data have been abstracted from Chapter XV. A summary of the data and their implications for subsistence and paleoenvironmental reconstruction are presented following the feature descriptions. Frequency statistics for fire-cracked rock were derived from the artifact inventory included in Appendix A.

Features were given numerical designations in order of discovery in the field, and are listed here in that order. Missing numbers in the overall sequence represent features which, on excavation, were found to be natural in origin.

### *Feature Descriptions*

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*Feature 2*

**Location:**
Area 2 / Block C
N 301.5/ E 338.5
**Morphology:**
*Plan*: round
*Section Profile*: straight sided, flat bottom
**Radiocarbon Assay:**
2670±90 BP

**Dimensions:**
*Diameter*: 130cm
*Depth*: 69cm
*Volume*: 605.0 liters
**Artifacts:**
1 projectile point (Lamoka)
20 flakes
9 chips
1161.5gm fire-cracked rock (mean 32.2gm)
**Macrobotanical Remains:**
nutshell fragments (*Carya*)
charcoal (*Quercus*)

**Description**: Feature 2 consisted of a deep, cylindrical pit with a flat bottom. The uppermost portion of the feature was truncated by the plow zone, and the base lay in the coarse sandy C-horizon. Feature fill consisted of dark yellowish brown loam with no visible stratification. Lithic raw materials represented in the flaking debris included quartz, chert, argillite, jasper, ironstone, and quartzite, in frequency order. Charcoal flecks were observed throughout the fill, along with several large chunks near the base of the pit. Samples for radiocarbon dating were collected from various level proveniences. The assay reported here was run on one of the lower, concentrated samples. One small flake was recovered from the flotation sample.

*Feature 10*

**Location:**
Area 2 / Block E
N 317.5/ E 290
**Morphology:**
*Plan*: irregular oval
*Section Profile*: steep sided basin
**Radiocarbon Assay:**
1150±90 BP

**Dimensions:**
*Diameter*: 110cm x 200cm
*Depth*: 90cm
*Volume*: 1113.4 liters
**Artifacts:**
9 flakes
6 chips
290.2gm fire-cracked rock (mean 96.7gm)

**Description**: Feature 10 consisted of a wide, deep pit with steeply sloped sides and a basin-shaped bottom. The uppermost portion of the feature was truncated by the plow zone, and the base lay in the coarse sandy C-horizon. Feature fill consisted of dark yellowish brown sand loam. Although there was no visible stratification within the pit, the fill was mottled with siltier patches of the same color (dark yellowish brown) and with reddish yellow coarse sand. The latter appeared to be C-horizon material mixed into the fill through postdepositional processes. Minor charcoal flecking was noted, and samples were collected from level proveniences. Irregularities in the walls of the pit suggested a considerable amount of biological perturbation (particularly, rodent burrowing). No macrobotanical sample was taken.

*Feature 14*

**Location:**
Area 2 / Block C
N 301.5/ E 336.5
**Morphology:**
*Plan*: round
*Section Profile*: steep sided basin
**Radiocarbon Assay:**
2660±100 BP
**Dimensions:**
*Diameter*: 150cm
*Depth*: 46cm
*Volume*: 439.3 liters

**Artifacts:**
1 projectile point (Teardrop)
35 flakes
8 chips
4188.6gm fire-cracked rock (mean 24.5gm)
**Macrobotanical Remains:**
nutshell fragments (*Carya*)
charcoal (*Quercus*)
charcoal (*Carya*)

**Description**: Feature 14 consisted of a wide pit with moderately sloped sides and a basin-shaped bottom. The uppermost portion of the feature was truncated by the plow zone, and the base lay in the coarse sandy C-horizon. Feature fill was stratified. Dark brown coarse sand lay in the center of the pit to a depth of approximately 30cm, surrounded by several extensive patches of very dark grayish brown charcoal-rich loam extending to roughly the same depth. Below lay a finer grained brown silty sand, also mottled with extensive patches of very dark grayish brown charcoal-rich loam and reddish yellow coarse sand. At the base of the pit lay mottled strong brown and light brown loam and sand. The range of lithic raw material among the flaking debris included quartz, chert, Iron Hill jasper, ironstone, quartzite, jasper, and argillite, in order of frequency. Charcoal samples were collected from various stratum proveniences. The assay reported here was run on a dispersed sample from the central portion of the feature. Oak was the dominant species represented in the charcoal fragments. Two small flakes were recovered from the flotation sample.

*Feature 16*

**Location:**
Area 2 / Block C
N 299.5/ E 336
**Morphology:**
*Plan*: sub-round
*Section Profile*: steep sided flat bottom
**Radiocarbon Assay:**
2780±60 BP
**Dimensions:**
*Diameter*: 100cm x 120cm
*Depth*: 55cm
*Volume*: 332.6 liters

**Artifacts:**
12 flakes
1 chip
2 bifaces
1 core
3 ceramic fragments
570.8gm fire-cracked rock (mean 30.0gm)
**Macrobotanical Remains:**
acorn fragments (*Quercus*)
charcoal (*Quercus*)

**Description**: Feature 16 consisted of a wide pit with straight sides and a flat base. The uppermost portion of the feature was truncated by the plow zone, and the base penetrated the coarse sandy C-horizon. Feature fill was stratified. The uppermost stratum consisted of yellowish brown silty sand extending to a depth of approximately 30cm. Below lay a mottled strong brown sand, yellowish brown sandy silt, and compact brownish yellow silt with extensive charcoal flecking. Lithic raw material represented in the flaking debris included quartz, ironstone, chert, jasper, and argillite, in frequency order. Charcoal samples were collected from various level proveniences. The assay reported here was run on a dispersed sample from the lower levels of the feature.

*Feature 17*

| | |
|---|---|
| **Location:**<br>Area 2 / Block C<br>N 302/ E 340.5<br>**Morphology:**<br>*Plan*: oval<br>*Section Profile*: steep sided flat bottom | **Dimensions:**<br>*Diameter*: 150cm x 200cm<br>*Depth*: 61cm<br>*Volume*: 804.4 liters<br>**Artifacts:**<br>22 flakes<br>2 chips<br>1300.9gm fire-cracked rock (mean 29.6gm) |

**Description**: Feature 17 consisted of a wide pit with straight sides and a flat base. The uppermost portion of the feature was truncated by the plow zone, and the base penetrated the coarse sandy C-horizon. Feature fill consisted of a relatively uniform yellowish brown sandy silt that showed no evidence of stratification. The walls of the pit sloped somewhat near the surface, perhaps an indication that the pit lay open and only partially filled for some time after abandonment allowing the edges to erode somewhat. A segment of the feature to the northwest was shallower than the rest and may have been excavated separately. This portion was also basin-shaped, roughly 80x90cm and 35cm deep, giving a volume of 116.6 liters. Fill was described as having the same color (yellowish brown) and texture (sandy silt) as the remainder of the feature, but with higher gravel content. Charcoal flecking was observed throughout the feature, and samples were collected from level proveniences. Radiocarbon and macrobotanical analyses were not undertaken.

*Feature 19*

| | |
|---|---|
| **Location:**<br>Area 2 / Block C<br>N 303.5/ E 337<br>**Morphology:**<br>*Plan*: round<br>*Section Profile*: steep sided flat bottom<br>**Radiocarbon Assay:**<br>2720±90 BP<br>**Dimensions:**<br>*Diameter*: 145cm<br>*Depth*: 75cm<br>*Volume*: 806.9 liters | **Artifacts:**<br>2 projectile points (Poplar Island, Teardrop)<br>62 flakes<br>8 chips<br>1 biface<br>1 uniface<br>1 hammerstone<br>12 ceramic fragments<br>20,189.7gm fire-cracked rock (mean 50.6gm)<br>**Macrobotanical Remains:**<br>charcoal (*Quercus*)<br>charcoal (*Carya*) |

**Description**: Feature 19 consisted of a wide pit with straight sides and a flat base. The uppermost portion of the feature was truncated by the plow zone, and the base penetrated the coarse sandy C-horizon. Feature fill was stratified. The main body of the feature consisted of yellowish brown silty sand, extending to 50cm and grading to brown with depth. Cut into this deposit was a round patch of dark brown silty sand approximately 70cm in diameter and 40cm deep. Below the main body of the feature lay dark yellowish brown silty sand to 65cm, followed by yellowish brown silty sand that was heavily charcoal-stained in places. This latter deposit began at a depth of approximately 30cm in the south half of the pit, sloping sharply downward to the north and eventually forming the base of the feature. Lithic raw material represented in the flaking debris included quartz, Iron Hill jasper, chert, ironstone, quartzite, jasper, and argillite, in frequency order. Charcoal was observed throughout the feature, and samples were collected from level proveniences. The assay reported here was run on a dispersed sample from the central portion of the feature. Oak was the dominant species among charcoal fragments. Two small flakes were recovered from the flotation sample.

*Feature 22*

**Location:**
Area 2 / Block C
N 299/ E 337
**Morphology**
*Plan*: sub-round
*Section Profile*: steep sided, flat bottom

**Dimensions**
*Diameter*: 110cm x 150cm
*Depth*: 55cm
*Volume*: 272.5 liters
**Artifacts**
23 flakes
1 biface
932.5gm fire-cracked rock (mean 84.8gm)

**Description**: Feature 22 consisted of a wide pit with an irregular round opening, straight sides, and a flat base. The uppermost portion of the feature was truncated by the plow zone, and the base penetrated the coarse sandy C-horizon. Feature fill consisted of a relatively uniform yellowish brown sandy silt mottled with strong brown sand and small gravel, the latter being redeposited subsoil. There was no evidence of stratification. Flaking debris included ironstone, chert, Iron Hill jasper, jasper, and rhyolite, in frequency order. Charcoal was observed throughout the feature, and samples were collected from level proveniences. Radiocarbon and macrobotanical analyses were not undertaken.

*Feature 23*

**Location:**
Area 2 / Block C
N 300/ E 334.5
**Morphology:**
*Plan*: round
*Section Profile*: steep sided, flat bottom
**Radiocarbon Assay:**
2960±60 BP
**Dimensions:**
*Diameter*: 145cm
*Depth*: 55cm
*Volume*: 519.8 liters

**Artifacts:**
29 flakes
2 chips
6 ceramic fragments
1282.7gm fire-cracked rock (mean 45.8gm)
**Macrobotanical Remains::**
nutshell fragments (*Carya*)
charcoal (*Quercus*)

**Description**: Feature 23 consisted of a wide pit with straight sides and a flat base. The uppermost portion of the feature was truncated by the plow zone, and the base penetrated the coarse sandy C-horizon. The walls of the pit sloped somewhat near the surface, perhaps an indication that the pit lay open and only partially filled for some time after abandonment allowing the edges to erode somewhat. Feature fill consisted of a relatively uniform dark yellowish brown sandy silt. There was no evidence of stratification. Lithic raw material among the flaking debris included Iron Hill jasper, quartz, jasper, chert, ironstone, and argillite, in frequency order. Charcoal was observed throughout the feature, and samples were collected from level proveniences. The assay reported here was run on a dispersed sample.

*Feature 24*

**Location:**
Area 2 / Block C
N 299/ E 339.5
**Morphology:**
*Plan*: round
*Section Profile*: steep sided flat bottom

**Dimensions:**
*Diameter*: 155cm
*Depth*: 43cm
*Volume*: 429.6 liters
**Artifacts:**
22 flakes
5 chips
1 ceramic fragment
1211.2gm fire-cracked rock (mean 75.7gm)

**Description**: Feature 24 consisted of a wide pit with straight sides and a flat base. The uppermost portion of the feature was truncated by the plow zone, and the base penetrated the coarse sandy C-horizon. Feature fill was stratified. A central area approximately 55cm in diameter and 30cm deep consisted of brown fine silty sand. Surrounding this and extending to the base of the feature lay brown sandy silt. Lenses of yellowish brown silty sand lay at the sides of the pit sloping toward the base, suggesting a period of relatively slow infilling. Flaking debris included quartz, andesite, Iron Hill jasper rhyolite, quartzite, chert, and argillite, in frequency order. Charcoal flecking was observed throughout the feature, and samples were collected from level proveniences. Radiocarbon and macrobotanical analyses were not undertaken.

*Feature 25*

**Location:**
Area 2 / Block C
N 297/ E 339
**Morphology:**
*Plan*: round
*Section Profile*: steep sided flat bottom

**Dimensions:**
*Diameter*: 140cm
*Depth*: 43cm
*Volume*: 357.9 liters
**Artifacts:**
8 flakes
3 chips
2 bifaces
1 core
137.9gm fire-cracked rock (mean 69.0gm)

**Description:** Feature 25 consisted of a wide pit with straight sides and a flat base. The uppermost portion of the feature was truncated by the plow zone, and the base penetrated the coarse sandy C-horizon. Feature fill consisted of a relatively uniform yellowish brown sandy silt that showed no evidence of stratification. Lithic raw materials included in the flaking debris consisted of quartz, ironstone, Iron Hill jasper, chert, jasper, and slate, in order of frequency. Charcoal flecking was observed throughout the feature, and samples were collected from level proveniences. Radiocarbon and macrobotanical analyses were not undertaken.

*Feature 26*

**Location:**
Area 2 / Block C
N 296.5/ E 340.5
**Morphology:**
*Plan*: sub-round
*Section Profile*: steep sided flat bottom

**Dimensions:**
*Diameter*: 140cm x 150cm
*Depth*: 50cm
*Volume*: 458.9 liters
**Artifacts:**
4 flakes
449.6gm fire-cracked rock (mean 74.9gm)

**Description:** Feature 26 consisted of a wide pit with straight sides and a flat base. The uppermost portion of the feature was truncated by the plow zone, and the base penetrated the coarse sandy C-horizon. Feature fill consisted of a relatively uniform yellowish brown sandy silt that showed no evidence of stratification, although an increase in small gravel with depth suggested extensive mixing with redeposited subsoil. Flaking debris consisted of quartz and jasper, in frequency order. Charcoal flecking was observed throughout the feature, and samples were collected from level proveniences. Radiocarbon and macrobotanical analyses were not undertaken.

### *Volumetric Analysis*

Typically, the pit features in the Area 2 cluster were large. The calculated volumes of the straight-sided pits ranged from 272.5 to 806.9 liters. Field observations suggested that shallower features lay in the southern part of the cluster and deeper features to the north. It was theorized that a major factor in the variation in volume was a loss of material resulting from plowing and erosion. This would imply that ground surface was closer to level when the site was occupied than at present, and that erosion resulting from land clearing and cultivation had cut the surface on a southward tending slope. This was considered an important issue since the validity of size comparisons between the pits depended on whether the volumes seen archaeologically were proportional to the original volumes.

To test the idea, the current surface grade for the block was mapped along with the depth of subsoil as it occurred at the base of each feature. In general, there was a correlation between grid location on a roughly north/south orientation and both surface elevation and the depth of subsoil. Both the current ground surface and subsoil sloped to the south, yet the slope of the subsoil transition was less than that of the surface grade. As calculated from transit readings on the nodes of the 5-meter area grid, the slope of the present-day surface ranged from 4 to 5 percent north/south, and a slightly greater 5 to 6 percent on a northwest/southeast line. A line connecting the bases of the features, corresponding with the transition to the sandy C-horizon, exhibited slopes ranging from 1.5 to almost 5 percent (east/west the slope was negligible, <1 percent; northwest/southeast the range was 3 to 4 percent). As the numbers indicate, the current surface sloped more sharply than the transition to sandy subsoil; i.e., surface and subsoil tended to converge to the south and southeast, suggesting that erosion, hastened by land clearing, could indeed have been a factor in the observed volumes of the features.

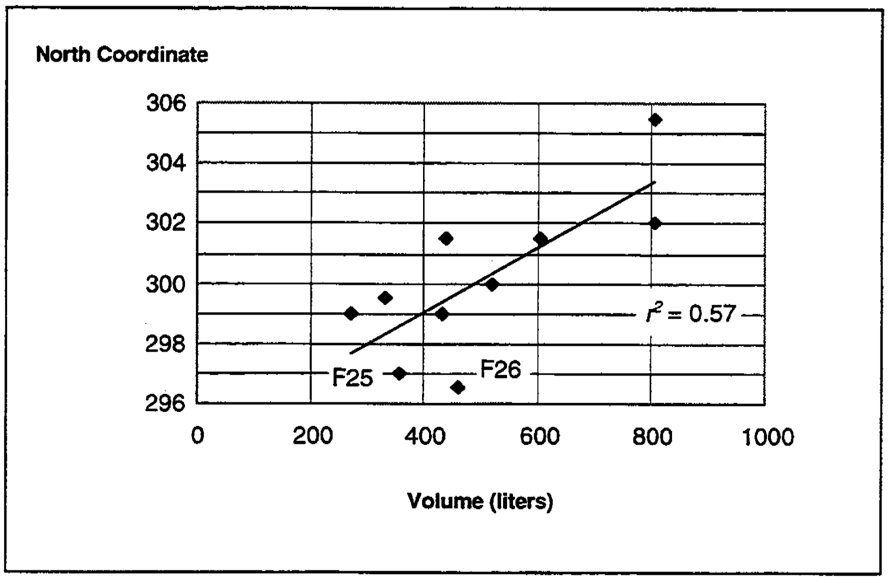


Figure 89. Area 2 Feature Cluster, Scatterplot and Analysis of the Correspondence Between Feature Volume and Location on Site Grid

To further investigate the relationship between feature size and location, volumes were plotted against grid location, with the data sorted on volume (Figure 89). Features with smaller volumes generally lay farther to the south, those with larger volumes to the north, describing a line on the chart climbing to the right. Regression analysis indicated the strength of the linear relationship between feature volume and grid location, where the correlation coefficient, $r^2$, was calculated as 0.57. Features 25 and 26, with relatively high volumes and lying in the southern part of the grid, did not follow the trend closely, weakening the relationship.

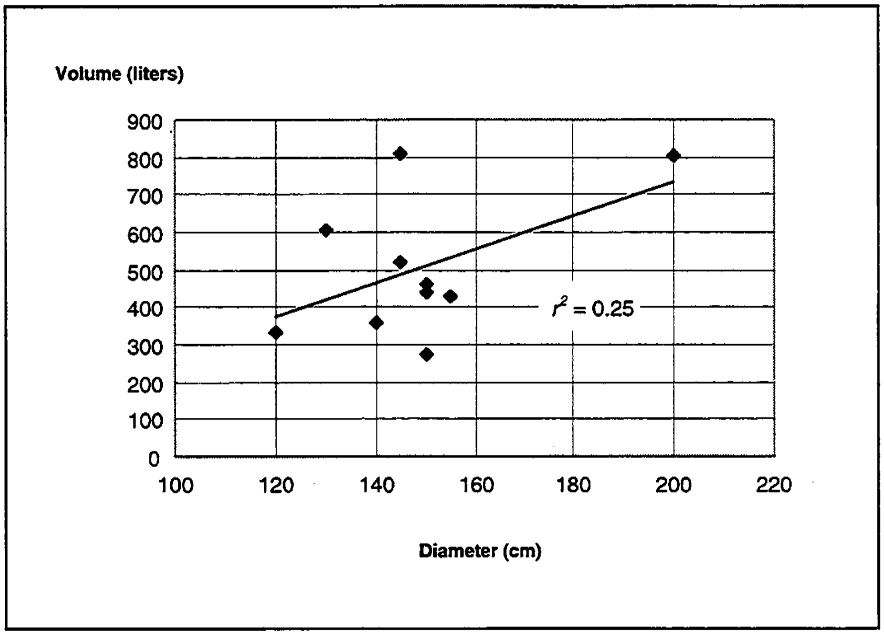


Figure 90. Area 2 Feature Cluster, Scatterplot and Analysis of the Correspondence Between Surface Opening Diameter and Feature Volume

The relationship between volume and diameter among the features was also examined. Surface openings were generally round or nearly so. In terms of variation, diameters ranged from 120cm to 200cm. Features 2 and 16 were at the low end at 120cm and 130cm respectively, and Feature 17 was at the high end at 200cm. The rest were clumped tightly around the mean of 153 (while the range was 80, the midspread or inter-quartile range—the middle 50 percent—was only 10, indicating that the few large and small features stretched an otherwise fairly tight distribution). When diameter was plotted against volume (Figure 90), there appeared to be little correlation ($r^2$=0.25). Obviously diameter is a critical factor in determining volume, since it is one of two variables used in calculating that figure. The present data implied that depth was more important than diameter in influencing the sizes of the features in Area 2, suggesting that the features were generally deep enough that variations in diameter had relatively little affect on volume.

To follow up, the depth of each feature was plotted against its grid location (Figure 91), and again a trend was apparent with deeper features occurring farther to the north in the cluster. The lengths of the lines in the figure represent feature depths, and as is apparent, deeper features lay to the north. Surface elevations tended to correlate well with grid location (r2=0.92), higher to the north reflecting the general slope of the field in which the features lay. Bases varied more, but also tended to be higher to the north, though strength of the correlation was lower (r2=0.42), and the slope to the south was less pronounced.

Two features did not follow the trend. The surface of Feature 14 was high reflecting a localized rise in topography noted in the surface map of the Area 2 grid. Of more interest was the depth of the feature, which was considerably less than that of others in that part of the cluster. Feature 14 did not exhibit the same straight-sided walls as the other pit features in the cluster. Its form and the difference in depth suggested that the pit served a different function compared to the others in the group. Feature 22 was also shallower than surrounding features, which could similarly signal a variation in function. But like the other pits in the cluster, Feature 22 was relatively straight-sided and had been excavated into the sandy C-horizon. Thus the higher base of the feature may merely indicate an area of higher subsoil. And in fact undulations in the transition to the C-horizon were noted in several excavation units across the area.

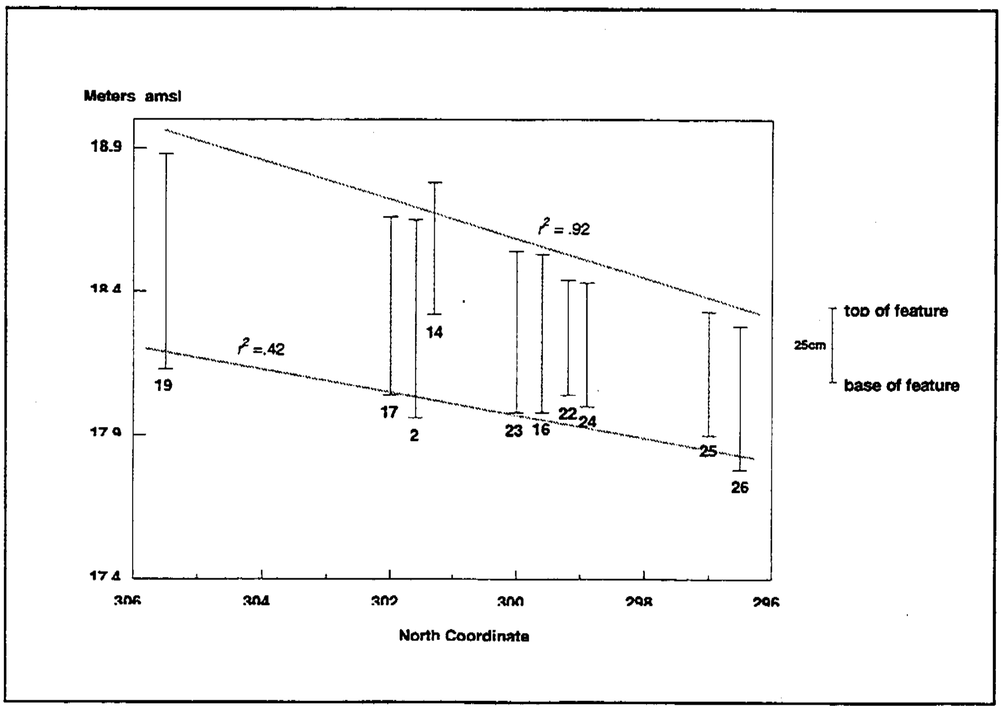


Figure 91. Relative Depths of Features in Area 2

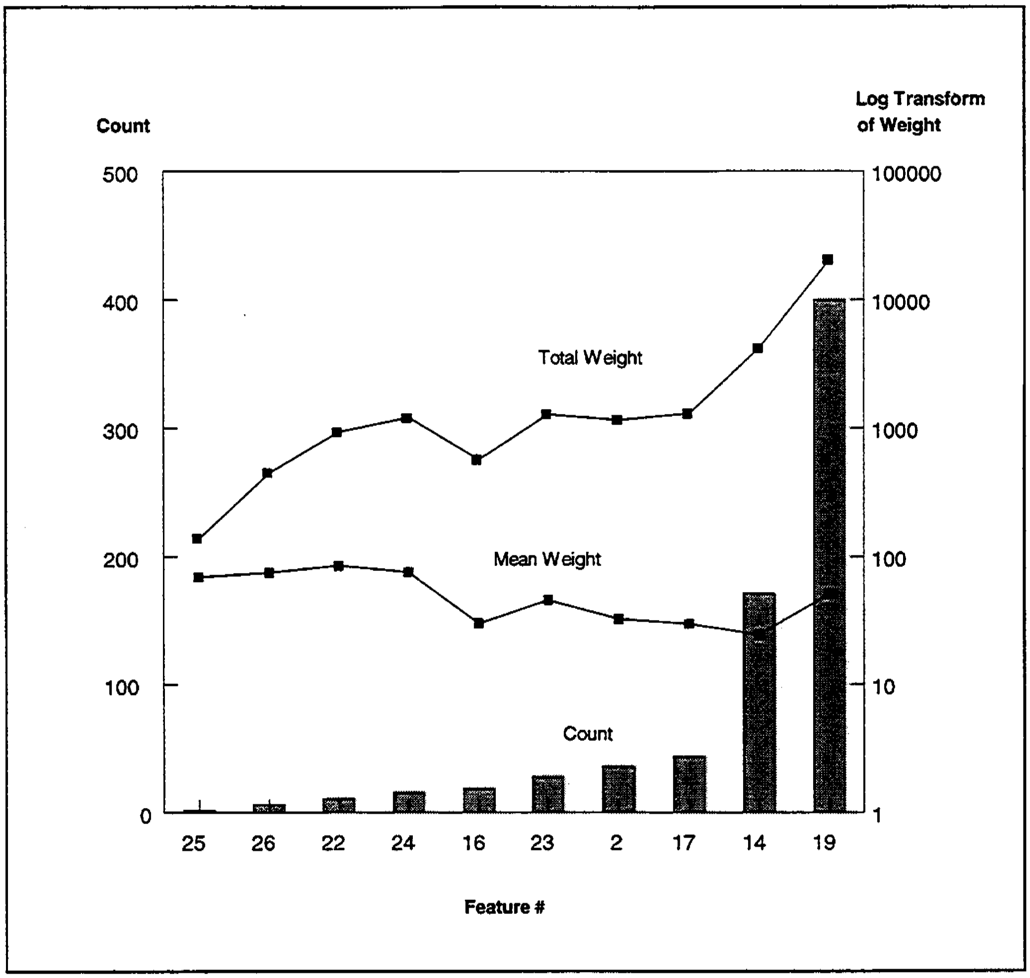


Figure 92. Comparison of Count, Weight, and Mean Weight of Fire-Cracked Rock in Pit Features in Area 2

*Fire-Cracked Rock*

Several artifact analyses were conducted to determine whether there were observable difference in the contents of the features that might indicate different functions. For example, there was a wide variation in the frequency of fire-cracked rock in the features, both in terms of count data and weights (Figure 92). The variation bore no relationship to feature volume. The total weight of fire-cracked rock tended to increase proportionately with count; that is, features with high fire-cracked rock counts had high fire-cracked rock weight figures as well, suggesting a relative uniformity in the size range of pieces throughout the features. This trend held up in spite of the relatively small sample sizes at the low end of the range. Feature 16 was an exception, exhibiting a relatively low total weight in comparison to fragment count, indicating smaller fragments than in most features. Mean weights were also calculated for each feature, producing results contrary to the total weight trend. The mean weight figures tended to be negatively correlated with counts, suggesting a slight tendency for fire-cracked rock in features with high counts to be small, and thus presumably highly fragmented. Notably, the mean weight for fragments in Feature 16 was lower than the trend line for mean weight plotted against count. The mean weight for fragments in Feature 19 was slightly higher than the trend line prediction, suggesting larger fragments than in other features.

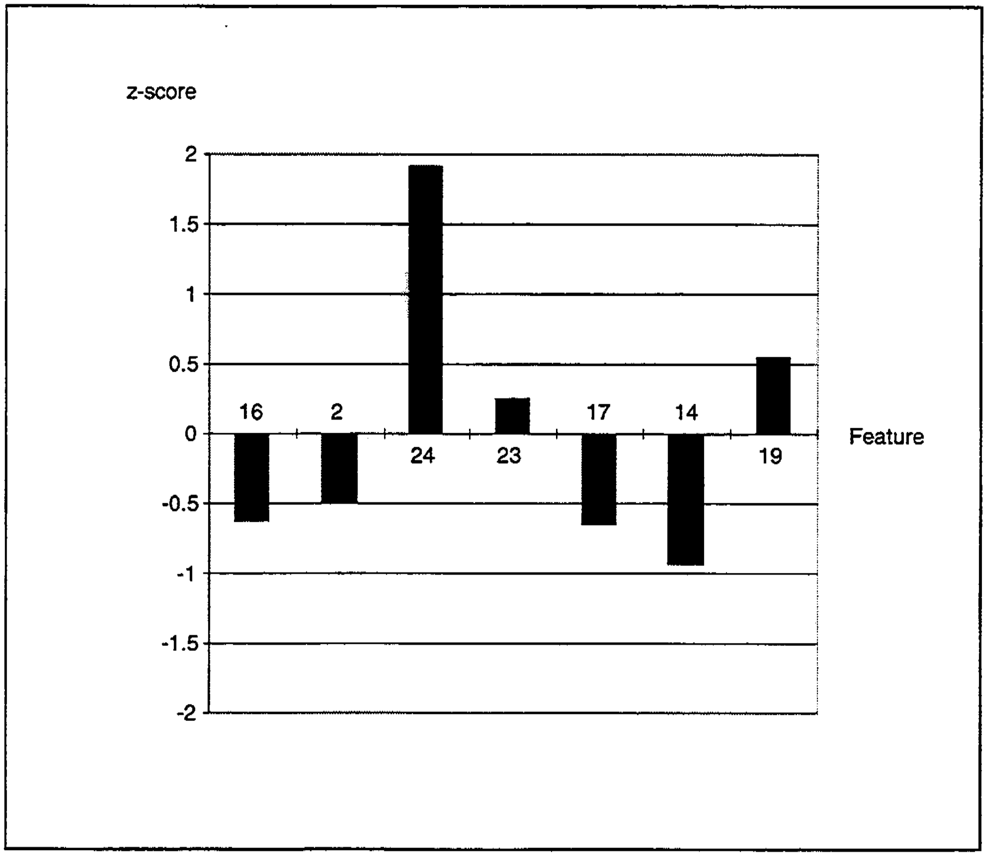


Figure 93. Mean Fire-Cracked Rock Weight Variation in Area 2 Features Expressed as Standard Scores

Fire-cracked rock distributions were analyzed further through the construction of a table of standard scores, or z-scores, of the mean weights of fire-cracked rock in each of the pits (Table 39). The table is sorted by the total weight of fire-cracked rock each feature. Z-scores denote how far from average a measure is by representing it as a factor of the standard deviation. In this case the figures indicate which features were out of the ordinary in containing either big pieces of fire-cracked rock or small pieces. Note that ordinary is a relative term, specific to this site. The z-score data are graphed in Figure 93. The length of each bar represents how different from the typical fire-cracked rock size each feature's mean fragment size is. A positive bar indicates larger fragments than was typical, a negative bar indicates smaller fragments. Note that not all of the features are represented in the analysis. To reduce the possibility of bias due to small samples, only features with samples larger than 15 were used in the calculations (there is no objective basis for choosing 15 as a cut-off).

The mean was calculated as 41.3 and standard deviation 17.9. The data suggested that none of the features was particularly far off the mean — the coefficient of variation was 0.43, indicating that the fire-cracked rock size range varied a little less than 50%. The feature displaying the greatest variation was Feature 24, with a considerably higher mean FCR weight. Notably, this was the smallest sample size among the features analyzed (n=16), and among the fragments were two weighing around 200 gm each, driving up the mean fragment weight for the feature. Feature 14 contained FCR with the smallest mean weight among the features. In general, though, each of the features contained fire-cracked rock fragments of similar size based on a calculated mean figure. The implication derived from the analysis was that the fills were similar in origin, suggesting secondary deposition.

| Feature | count | weight | mean wt | z-score |
|---|---|---|---|---|
| 16 | 19 | 570.8 | 30 | -0.631285 |
| 2 | 36 | 1161.5 | 32.3 | -0.502793 |
| 24 | 16 | 1211.2 | 75.7 | 1.921788 |
| 23 | 28 | 1282.7 | 45.8 | 0.251397 |
| 17 | 44 | 1300.9 | 29.6 | -0.653631 |
| 14 | 171 | 4188.6 | 24.5 | -0.938547 |
| 19 | 400 | 20428.5 | 51.1 | 0.547486 |

| Central Tendency Statistics | | |
|---|---|---|
| **Mn** | **StdD** | **CV** |
| 41.3 | 17.9 | 0.43 |

Table 39. Standard Scores of Mean Weights of Fire-Cracked Rock in Area 2 Features

*Chipped Stone Artifact Frequencies*

In most features, lithic raw material distributions were similar. Pit fill typically contained 30 to 50 percent quartz (sample sizes ranged from 14 to 87). Feature 22 (n=24) was unusual, containing almost 60 percent ironstone and no quartz. Feature 23 (n=31) contained 40 percent Iron Hill jasper and 20 percent quartz. This feature also contained a slightly higher percentage of ceramic vessel fragments (9 percent) in comparison with the other two features containing ceramics, Feature 16 (5 percent) and Feature 19 (1 percent).

Evidence of heating or burning of chipped stone could be confidently identified among several cryptocrystalline materials—Iron Hill jasper, jasper, or chert—by form (potlids) or color (red or gray). Using these materials and attributes as indices, the incidence of burned chipped stone in the pits was calculated and found to range from 7 to 33 percent—in most features the frequency was 15 to 20 percent. There was no correlation observed between the amount of fire-cracked rock and burned chipped stone in feature fill. For example, Feature 19, with the largest fire-cracked rock frequency, contained 24 percent burned chipped stone, while Feature 16, with a considerably lower fire-cracked rock frequency, contained 25 percent burned chipped stone. The data suggested little difference in feature contents in terms of *in situ* artifact burning.

*Radiocarbon Data*

Six features were dated radiometrically, the choice of features based on the amount and quality of the carbonized material contained within them. A radiocarbon assay was run on dispersed charcoal from a level provenience within Feature 10. The date returned was 1150±90 BP. There were relatively few artifacts recovered from the feature, none of which were chronologically diagnostic, and there was little other temporal data from surrounding deposits. Thus there was no corroborating evidence for the radiocarbon date, and no objective means of determining whether or not it was valid.

The remaining five assays were from the cluster of features exposed in the eastern portion of Area 2. The dates ranged from 2660±100 BP to 2960±60 BP, similar enough to suggest the possibility of contemporaneity. Several analyses detailed in the Radiocarbon Section of the report were conducted to examine the validity of this supposition. On the basis of the analyses it was proposed that the features were indeed contemporary. Moreover, contemporaneity was assumed for the remaining features in the cluster, judging from their mutual proximity, the general lack of physical overlap that would indicate serial use, their approximate regularity of morphology, and the general uniformity of their contents. An average date was calculated for the feature cluster as 2802±33 BP

*Geochemical Data*

Extensive geochemical analysis of feature fill provided both chronological and indirectly, functional information. Phosphate signatures from the pits were read as a relative dating tool. Similarities between the readings amont the pits in the cluster suggested that the features were contemporary, supporting the results of radiocarbon analysis. Geochemical similarities also argued that pit fill was comparatively uniform and probably not primary. The geochemical data did not conform to patterns known to result from extensive occupational activity, implying short term or even single episode site use.

*Macrobotanical Data*

*Seeds and Nuts*

Seed and nutshell remains were recovered from flotation samples taken from several of the features in Area 2. The material included both charred and uncharred remains. A variety of factors, including soil acidity and bacterial growth, render the preservation of uncharred macrobotanical materials unlikely in most archaeological contexts. Thus uncharred materials in the current samples, which included seeds of *Portulaca* (purslane) and *Polanisia* (clammy weed), were assumed to have been modern in origin. No charred seeds were recovered. Two varieties of charred nutshell were identified in the feature samples from the site: *Carya* (hickory) and *Quercus* (oak).

The nuts of several species of the genus *Carya* are known from ethnographic accounts to have been widely used throughout their geographic range, which encompasses the Northeast and Middle Atlantic regions. Hickory nuts ripen in the fall, and were probably gathered in early fall, in competition with nut collecting animals. Processing of the nuts usually entailed shelling and boiling, with the nutmeat and resulting oil used as foodstuffs. The nutshells were also burned as fuel. The most common species with edible nuts, the shagbark hickory (*Carya ovata*), is mesophytic, found in moist bottomlands along major steams, though it and other species may also be found on dry, well-drained upland slopes and ridges. Hickories often occur in groves in mixed hardwood forests (Little 1980; Peattie 1991).

The genus *Quercus* contains a number of species that occur in the Middle Atlantic and Northeast. Some of the more common species—white oak, bur oak, red oak—are typically found in rich, moist soils near streams, and often in pure stands (Little 1980:383,359; Peattie 1991:121-122). Most bear nuts, or acorns. Ethnographic accounts indicate that acorns were used prehistorically, although extensive processing was needed to remove tannin to render the meat edible. Varying by species, acorns ripen from mid-September through as late as mid-February (as in the case of black oak).

*Wood Charcoal*

The same genera recognized in nutshell from the features, *Quercus* and *Carya*, were represented in wood charcoal from the features. It is presumed that most of the wood occurring as charcoal in the pits was gathered specifically for fuel, though in some instances burning may have been incidental or occurred after the use of other parts of the plant, such as the bark, nuts, or leaves, for other purposes.

Oak was the predominant woody material represented in charcoal throughout the site, while hickory was present in some features. The characteristics and habitat ranges of the genera are discussed above. Hickory bark, particularly of the shagbark species, made excellent tinder, and the wood itself burns very hot — it has been estimated that a cord of hickory produces nearly the equivalent thermal units of a ton of anthracite coal (Peattie 1991:136). And as noted above, hickory nutshell was an equally efficient fuel.

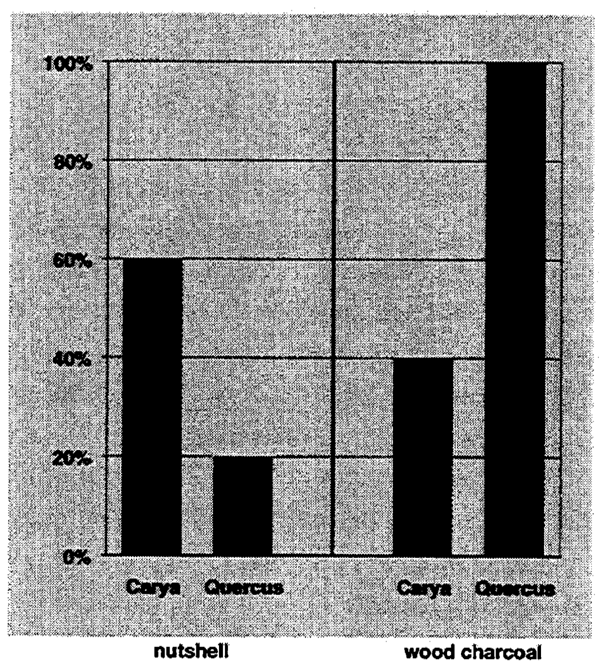


Figure 94. Results of Presence Analysis of Nutshell and Wood Charcoal in Area 2 Features

*Presence Analysis*

Presence analysis, or the calculation of an index of ubiquity (Popper 1988), records the presence or absence of each botanical taxon per sample, in this case per feature. The index or score for each taxon reflects the percentage of features throughout the site in which the material occurs. Absolute counts are thereby ignored, avoiding some of the problems associated with frequency data biased by differential rates of preservation. Analysis of this sort may indicate the potential for broad-based patterns in the relative occurrence of certain materials. The results of presence analysis are included in Figure 94. The absence of seed remains and the relatively low frequency of nutshell supported stratigraphic and artifact data that indicated feature fill was unpatterned and probably not primary. While such a finding suggests that the frequency of occurrence of some botanical materials was not necessarily representative of the intensity of their use, it does provide data on general formation processes and, by implication, feature function. That is, a number of features did not appear to have been used for acvitities such as direct, or *in situ* roasting or cooking of foodstuffs which would leave behind relatively large amounts of processed debris. The pattern displayed in the incidence charcoal provided evidence as to the availability and use of wood species at the site, suggesting that oak was a common tree in the area, and that its wood was easily obtained and widely used for fuel.

*Summary*

Most of the pits in the cluster in Area 2 were roughly silo-shaped, straight-sided and relatively deep in relation to their surface opening. All had been excavated into the coarse sandy subsoil layer, the C-horizon. Their most likely function was long-term storage, with drainage a premium quality in their construction (Table 40). Most of the features appeared to have been filled in with debris from the site after their original use. While none of the features preserved large amounts of organic material, there was wood charcoal present and occasionally, charred macrobotanical remains. Few artifacts were recovered from the pits. Two pits, Features 17 and 23, had slightly sloping walls near the surface, suggesting that they had been only partially filled for a period of time after abandonment, allowing the edges to erode somewhat. Feature 23 was also partially stratified as an indication of slower infilling.

Based on shape, all but Feature 14 served the same original purpose. Feature 14 was shallower than the other features in the cluster, was basin-shaped, and contained more concentrations of charcoal and fire-cracked rock than most of the straight-sided pits. Based on its shape and contents, it likely served as a hearth or roasting pit. Feature 19 was straight-sided, but differed in its contents, with more charcoal and higher artifact counts, especially fire-cracked rock, than the surrounding pits. While the shape of the feature suggested a similar primary function as the other silo-shaped pits, its contents implied that it had eventually been filled in deliberately with a different form refuse.

| | Shape | Primary Use | Secondary Use |
|---|---|---|---|
| *Feature 2* | silo | storage | disposal |
| *Feature 14* | basin | roasting pit, hearth | none |
| *Feature 16* | silo | storage | disposal |
| *Feature 17* | silo | storage | disposal |
| *Feature 19* | silo | storage | disposal |
| *Feature 22* | silo | storage | disposal |
| *Feature 23* | silo | storage | disposal |
| *Feature 24* | silo | storage | disposal |
| *Feature 25* | silo | storage | disposal |
| *Feature 26* | silo | storage | disposal |

Table 40. Interpretaton of Function Among Features in Area 2 Cluster

The final feature in Area 2, Feature 10, lay some distance away from the cluster of round pit features. It was a different type altogether, dissimilar in shape, size, and content. Radiocarbon and geochemical analyses indicated that it dated to a different time period. Geochemistry also implied a natural origin for the pit, as well as long-term infilling, and disturbance throughout.

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