INTRASITE ANALYSES

The data recovery excavations of the C. Kimmey Tenant Farm Site primarily gathered data on the historical occupation dating from the mid-nineteenth century until the 1970s. Analyses of the distribution of artifacts and soil chemicals were undertaken to identify changes in site usage that occurred during that time. Distribution maps were generated of overall artifact densities and trace element concentrations of soil chemicals. The results of the soils analyses and plow zone artifact distribution will be presented below, followed by overall intrasite interpretations based on archaeological and historical evidence.

Soil Chemical Analysis

The intrasite analysis of soils from the C. Kimmey Tenant Farm Site was undertaken because it has been shown that archaeologically derived concentration patterns of certain soil trace elements can be correlated with site activity areas (Sopko 1983:24-30; McManamon 1984; Custer, Bachman, and Grettler 1986). The chemical analyses were conducted by the Soils Laboratory of the University of Delaware College of Agriculture.

The soil chemical analysis for the C. Kimmey Tenant Farm Site consisted of determining the concentration of soil phosphates, calcium, potassium, magnesium, and soil pH across the site. The level of phosphates in soils is probably the most significant of the soils analyses that were conducted, because high phosphate levels indicate the deposition of urine, excrement, and organic refuse (Sjorberg 1976; Eidt 1977). High concentrations of calcium could result from several activities, including agricultural fertilization such as application of lime, oyster or clam shell deposition, or the presence of building materials in the soils. Magnesium levels are generally related to calcium levels. The presence of high potassium levels result from the deposition of wood ash from surface burning or from the dumping of fireplace or stove ashes. Soil pH readings of 7.0 or greater indicate alkaline soils, and readings below 7.0 are acidic. Delaware soils are naturally acidic (Matthews and Lavoie 1970) and readings above 6.0 suggest agricultural fertilization (Sopko 1983; Custer, Bachman, and Grettler 1986).

The C. Kimmey Tenant Farm Site had several extant structures when Phase III investigations began (Figure 14). Deeds, tax records, excavation data and personal communications from past owners all confirmed the designations of the structures as a house, frame barn, carriage house, milkhouse, garage, and pig barn (Figures 14 and 34). Thus, the concentrations of phosphates should be higher near the barn, carriage house, and pig barn, with smaller peaks near the milkhouse and garage. The privy (Feature 31), would be expected to show a high concentration of phosphate and possibly potassium, since it was used as a trash midden. Low pH values correlated with organically rich areas at the Wilson-Slack Site (Custer, Bachman, and Grettler 1986); therefore, the presence of more acidic soils would be expected near the barn and stable areas.

Sets of plow zone and subsoil soil samples were collected at 10-foot intervals across the site. The sampling method was used to determine the degree to which the chemical patterning of the site was altered by subsequent agricultural fertilization. It was assumed that the subsoil sample would be less likely to have been affected by post-occupational chemical contamination caused by agricultural practices than the plow zone and, therefore, more reflective of earlier intrasite soil patterns. A similar sampling scheme was successfully employed at the Whitten Road Site (Shaffer et al. 1988) and at the A. Temple Site in Ogletown (Hoseth et al. 1990).

High phosphorus concentrations indicate deposition of human or animal waste, and the C. Kimmey Tenant Farm subsoil showed two definite peaks in phosphorus and some general areas of concentrations (Figure 35). The highest concentration is west of the tenant house, near the privy (Feature 31), and obviously relates to human waste. The concentration of phosphorus in the plow zone correlates with the one in the subsoil, indicating a continuing use of the area for the disposal of organic wastes.

The carriage house and barns show concentrations that correlate with usage for animal housing. There are two high concentrations located within the carriage house foundation (Feature 2). The structure had a hard-packed dirt and sawdust floor which would have readily soaked up phosphorus-rich animal waste. Two smaller concentrations fall near the dairy barn (Feature 3) and hog barn (Feature 5). These structures had concrete floors and could be expected to have a smaller, more generalized reading than that of the carriage house, which had a dirt floor. The plow zone

samples consistently display concentrations near all the animal structures, as did the subsoil samples. A concentration just south of the hog barn (Feature 5) seems to correspond with the use of a dirt loading ramp for cattle in that area.

A concentration just south of the dairy barn (Feature 3), feed storage shed (Feature 1), and garage (Feature 8), probably relates to efforts to keep the concrete floors of these structures clean. A rectangular pattern of phosphorus just south of the tenant house seems to indicate the presence of either an animal enclosure or garden. Based on concentrations of other chemicals, the interpretation of the area as a garden seems the most likely.

The plow zone sample does not reflect the subsoil concentration just south of Features 1, 3, and 8, but does indicate two smaller concentrations within the confines of the garden area. These may represent a different disposal area for wastes from the three structures or just a more recent use of manure in/on the garden. Two of the plow zone concentrations are located nearer to the tenant house. One, closest to the northwest corner of the frame portion of the structure, corresponds to artifact distributions in that area. The area was a commonly used area for trash disposal, and probably contained a high amount of organic wastes due to its proximity to the kitchen.

The concentration north of the house may relate to the modern septic system, or possibly to the manuring of the grape vineyard located north of the tenant house in the nineteenth century.

Potassium is highly concentrated in the carriage house area and the two highest concentrations in the subsoil are located inside the structure (Figure 35). The highly concentrated area of potassium probably is due to the packed sawdust floor of the structure. The general spread of potassium around the carriage house may be the result of carriage and later tractors scattering the sawdust with their passage.

The plow zone distribution shows a different concentration north of the house where there were phosphorus concentrations in the plow zone samples. The correlation with the plow zone phosphates indicates an established activity area that probably served as the dumping place for stove and fireplace ashes. A small concentration just south of the hog barn (Feature 5) is probably related to a more recent trash burning episode.

The calcium values follow the same general pattern as phosphorus and are concentrated in the area next to the privy (Figure 36), probably due to the practice of liming a privy to aid in decomposition and to eliminate odors. The concentrations near and within the carriage house may result from the same practice, or may indicate the presence of agricultural fertilizer stored in that building. The concentration just northeast of the carriage house may represent a location where sacks of fertilizer were stacked prior to use.

The concentration just south of the brick portion of the tenant house probably relates to the construction of the house. This area may have been where mortar was mixed for the brick structure. There are general concentrations of calcium near all of the structures, reflecting the decomposing mortared brick and concrete used in their construction.

The magnesium concentrations generally follow the same patterns as calcium, but a magnesium concentration near the house is near the brick portion instead of the frame section (Figure 36). This area may relate to different types of mortar in the building debris. High concentrations within the carriage house probably relate to the use of lime to reduce odors or possibly to the storage of fertilizer within the structure. The plow zone distribution is similar to the subsoil distribution, except for the absence of significant concentrations within the carriage house.

The distribution of pH values for both the plow zone and subsoil is shown Figure 37. The range in values falls within the generally acidic range for Delaware soils, with neutral readings of seven near the garden area. The neutral pH near the garden correlates with the higher concentrations of calcium found in the same area. Calcium neutralizes acids, and reflects the use of fertilizer on the garden. Pockets of more acidic soils near the hog barn could be a result of animal use, although phosphorus levels did not peak in those areas.

In sum, the soil chemical distributions match with the expectations based on known structure functions. This match underscores the validity of interpretations of soil chemical distributions on sites where no buildings are extant.

Distributions were plotted for eight categories of ceramics: all ceramics, mid-nineteenth century whitewares, American stoneware, redware, white granite, and yellowware. Pearlwares and creamwares constituted less than one percent of total ceramics from plow zone units, and their distributions were not plotted. The distributions of architectural artifacts, such as cut nails, wire nails, brick, and brick and mortar were also plotted along with jar glass, table glass, lamp glass, window glass, and bottle glass. The area covered by the distribution maps (Figure 38) includes the privy (Feature 31), parts of the house (Feature 142), milk shed (Feature 10), and dairy shed (Feature 11). Although only a portion of the site is represented, the artifact distributions do reveal some interesting patterns that reflect varied use of the site as a whole.

Two concentrations occur in the distribution map of all ceramics (Figure 39). One is located just southeast of the privy, and the second is located north of the frame portion of the house. The largest concentration by the privy suggests that it may have also been used as a trash midden and the second concentration suggest trash disposal in the vicinity of the vineyard. A third concentration area south of the house is seen for redwares, ironstone, American blue and gray stoneware, and utilitarian wares (Figures 39 and 40). The three concentrations noted above are spaced at regular intervals in a triangular layout, and probably represent the habitual domestic refuse areas for the house. In general, the distributions of variously dated ceramics show little change in refuse disposal patterns during the site's occupations (Figures 39 and 40). The privy area reflects the greatest amount of usage in almost all distributions. The concentrations just north and west of the house are also consistently represented.

Whitewares and refined wares are concentrated just south of the privy (Figure 39). Whitewares are significant in that they constitute 44 percent of all ceramics found in plow zone units. The highest concentration of whiteware occurred south of the privy, with a smaller one just north of the frame portion of the house. This part of the house was used as a kitchen in the twentieth century, and the location of the trash midden so close to that area suggests that garbage and other refuse was tossed out the kitchen window.

Distributions of other artifact categories also reveal some interesting patterns. The cut nail distribution shows a linear pattern of concentrations angled northwest to southeast across the site (Figure 41). These concentrations appear to reflect a possible early fenceline defined by post hole features. The fenceline is at an oblique angle to the nineteenth and twentieth century buildings and may be oriented to buildings from an earlier occupation. Wire nail concentrations near the milk shed (Feature 10) and the dairy shed (Feature 11), correspond closely with the more recent buildings (Figure 41).

All of the glass distributions (Figures 41 and 42) show concentrations near the privy, although bottle glass only shows a small concentration in that area (Figure 41). Jar and table glass have concentrations near the privy, and also just to the northwest of the house (Figure 42). These distributions fall within a pattern of disposal arcing around the west end of the house. This arc creates a horseshoe shape, rather than the clear triangle pattern developed by ceramic distributions. Window glass is distributed in and around the tenant house, rather than in concentrations at some distance from the house as the other types of glass are as would be expected (Figure 42).

In sum, the artifact distributions around the frame portion of the tenant house suggest that the back yard of the structure near the privy was the main trash disposal area. Additional trash was distributed in an arc radiating out from the west end of the frame portion of the house. No temporal changes in disposal patterns could be discerned from the artifact distributions. Thus, there were no differences in disposal patterns during either the owner or tenant occupations at the the C. Kimmey Tenant Farm Site.