A Phase I Archaeological Survey of 1996 Rehab Areas 1-5 and 9-11, in Training Areas 8, 9, and 10, Fort Knox, Meade County, Kentucky

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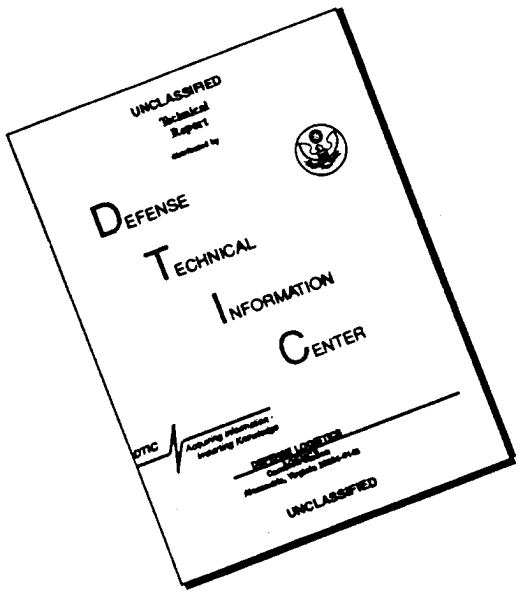

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16. Abstract (Limit 200 words)

In April-June 1996, Fort Knox contract archaeologists conducted a Phase I survey of 95.6 ha (236.3 acres) and reexamined 50.0 ha (123.5 acres) in Rehabilitation Areas 1-5 and 9-11, Training Areas 8, 9, and 10, Fort Knox, Meade County, Kentucky. Twenty-one sites (15Md387-15Md407) and eight isolates were recorded and 15Md190, 15Md196, 15Md198, 15Md217, 15Md218, 15Md221, 15Md222, 15Md231, and 15Md237 were revisited. Sites 15Md190, 15Md198, 15Md217, 15Md218, 15Md387-15Md391, 15Md393-15Md396, 15Md398-15Md401, and 15Md403-15Md407 and the isolated finds are not eligible for the National Register. No additional study is recommended for these 22 sites or the isolates. Sites 15Md196, 15Md221, 15Md222, 15Md231, 15Md237, 15Md392, 15Md397, and 15Md402 are potentially eligible for the National Register. Further research and/or protection measures are recommended at these eight sites. Sites 15Md188 and 15Md189 were not relocated in the tank trail to be rehabbed. Sites 15Md199, 15Md216, and 15Md220 were not inspected because they were inaccessible and will not be subjected to earthmoving in the current project. No archaeological work is recommended at 15Md188, 15Md189, 15Md199, 15Md216, and 15Md220, in conjunction with the rehab project, but is recommended if future undertakings will affect vegetated areas adjoining the tank

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ABSTRACT

In April-June 1996, the Fort Knox contract archaeologists conducted a Phase I survey of 95.6 ha (236.3 acres) and reexamined 50.0 ha (123.5 acres) in Rehabilitation Areas 1-5 and 9-11, in Training Areas 8, 9, and 10, Fort Knox, Meade County, Kentucky. They recorded 21 archaeological sites (15Md387-15Md407) and eight prehistoric isolated finds, and revisited nine previously recorded sites (15Md190, 15Md196, 15Md198, 15Md217, 15Md218, 15Md221, 15Md222, 15Md231, and 15Md237).

Sites 15Md190, 15Md198, 15Md217, 15Md218, 15Md387-15Md391, 15Md393-15Md396, 15Md398-15Md401, and 15Md403-15Md407 and the isolated finds are not eligible for the National Register due to severe erosion and lack of evidence for potential intact cultural deposits. No additional archaeological work is recommended for these 22 sites or the isolated finds.

Sites 15Md196, 15Md221, 15Md222, 15Md231, 15Md237, 15Md392, 15Md397, and 15Md402 are potentially eligible for the National Register. Further research and/or site protection measures are recommended at 15Md196, 15Md221, 15Md222, 15Md392, and 15Md397 in conjunction with the rehab project. Site 15Md237, outside the project area but in a possible access route, should be avoided in the rehab project. Site 15Md402, with a rare Paleoindian component, is outside the project area but actively eroding. The installation should take measures to control erosion of 15Md402 and 15Md237. Site 15Md231 is outside any rehab area and was only briefly inspected in this survey. No research is recommended in conjunction with the rehab project, but is recommended if future undertakings will affect 15Md231.

Sites 15Md188 and 15Md189 were not relocated in the tank trail to be rehabbed. No attempt was made to inspect 15Md199, 15Md216, and 15Md220 because they were inaccessible and will not be subjected to earthmoving in the current project. No archaeological work is recommended at 15Md188, 15Md189, 15Md199, 15Md216, and 15Md220, in conjunction with the rehab project. Additional investigation is recommended if future undertakings will affect vegetated areas adjoining the tank trails in which these sites were identified.

MANAGEMENT SUMMARY

In accordance with the National Historic Preservation Act and other federal laws and regulations, the Fort Knox contract archaeologists conducted a Phase I survey of 95.6 ha (236.3 acres) and reexamined 50.0 ha (123.5 acres) in Rehabilitation Areas 1-5 and 9-11, in Training Areas 8, 9, and 10, Fort Knox, Meade County, Kentucky, in April-June 1996. They recorded archaeological sites 15Md387-15Md407 and eight prehistoric isolated finds, and revisited previously recorded sites 15Md190, 15Md196, 15Md198, 15Md217, 15Md218, 15Md221, 15Md222, 15Md231, and 15Md237.

Sites 15Md190, 15Md198, 15Md217, 15Md218, 15Md387-15Md391, 15Md393-15Md396, 15Md398-15Md401, and 15Md403-15Md407 and the isolated finds are not eligible for the National Register. No additional archaeological work is recommended for these 22 sites or the isolated finds.

Sites 15Md196, 15Md221, 15Md222, 15Md231, 15Md237, 15Md392, 15Md397, and 15Md402 are potentially eligible for the National Register. Further research and/or site protection measures are recommended at 15Md196, 15Md221, 15Md222, 15Md392, and 15Md397 in conjunction with the rehab project. Sites 15Md231, 15Md237 and 15Md402 are outside the rehab project areas. The installation should take measures to control erosion on 15Md237 and 15Md402. No research at 15Md231 is recommended in conjunction with the rehab project, but is recommended if future undertakings will affect 15Md231.

Previously recorded sites 15Md188, 15Md189, 15Md199, 15Md216, 15Md220 in Rehab Area 2 were not relocated. No archaeological work is recommended at 15Md188, 15Md189, 15Md199, 15Md216, and 15Md220, in conjunction with the rehab project because the rehab activities will not affect 15Md199, 15Md216, and 15Md229 or the non-eroded portions of 15Md188 and 15Md189. Additional investigation of these sites is recommended if future undertakings will affect vegetated areas adjoining the tank trails in which these sites were identified.

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INTRODUCTION

Seventeen rehabilitation (rehab) areas, some containing more than one tract, have been defined as project areas for 1996 by the Integrated Training Area Management (ITAM) coordinator, Gail Pollock. In previous years the archaeological survey of the rehab areas scheduled for that season or year have been summarized in a single report (Schenian 1994; Schenian and Mocas 1993, 1994a). An unusually rainy spring delayed the completion of fieldwork in 1996, so the Fort Knox contract archaeology staff decided to split the rehab survey into several reports. This would allow the State Historic Preservation Officer (SHPO) to review the descriptions of and recommendations for some rehab areas while artifact analysis and report writing continued for other areas. The survey of Rehab Areas 6-8 is described in Schenian and Mocas (1996a) and the survey of Rehab Areas 12-17 is discussed in Schenian and Mocas (1996b). This report summarizes the survey of Rehab Areas 1-5 and 9-11.

In April-June 1996, the Fort Knox contract archaeology staff conducted a Phase I archaeological survey of proposed rehabilitation areas (Rehab Areas) in Training Areas (TAs) 8, 9, and 10 at Fort Knox, Meade County, Kentucky (Figures 1 through 3). Rehab Areas 1-5 and 9-11 comprise a total of approximately 145.6 ha (359.8 acres), of which 50.0 ha (123.5 acres) had been previously surveyed and 95.6 ha (236.3 acres) had not been inspected before.

Rehab Area 1, in TA 8 and Hunting Area (HA) 15, parallels the south edge of Bullion Boulevard, running from a dismounted training bleacher area to Pinwheel Road. The rehab of this area will consist of repair erosion in front (north) of the bleachers and in those sections bordering the south side of Bullion Boulevard that need it. It also will include the construction of a gravel path along the roadway. The area surveyed at Rehab Area 1 encompasses 3.9 ha (9.6 acres).

Rehab Area 2, in TA 9 and 10 and HAs 10-12, parallels the west boundary of the base. The rehab of this area will include the repair of eroded areas and revegetation of a 100 foot (30 m) buffer between Fort Knox training areas and the privately owned land to the west. Range Division will place signs along the buffer zone's east edge, designating the buffer as "off limits" to vehicle traffic. The area surveyed for Rehab Area 2 comprises 85.7 ha (211.8 acres), of which 45.2 ha (111.7 acres) had been previously surveyed (O'Malley et al. 1980) and 40.5 ha (100.1 acres) had not been surveyed previously. The previously surveyed areas were reinspected to relocate previously recorded sites.

The majority of Rehab Area 3, in TA 8 and HA 14, consists of a single heavily eroded tank trail that forks as it

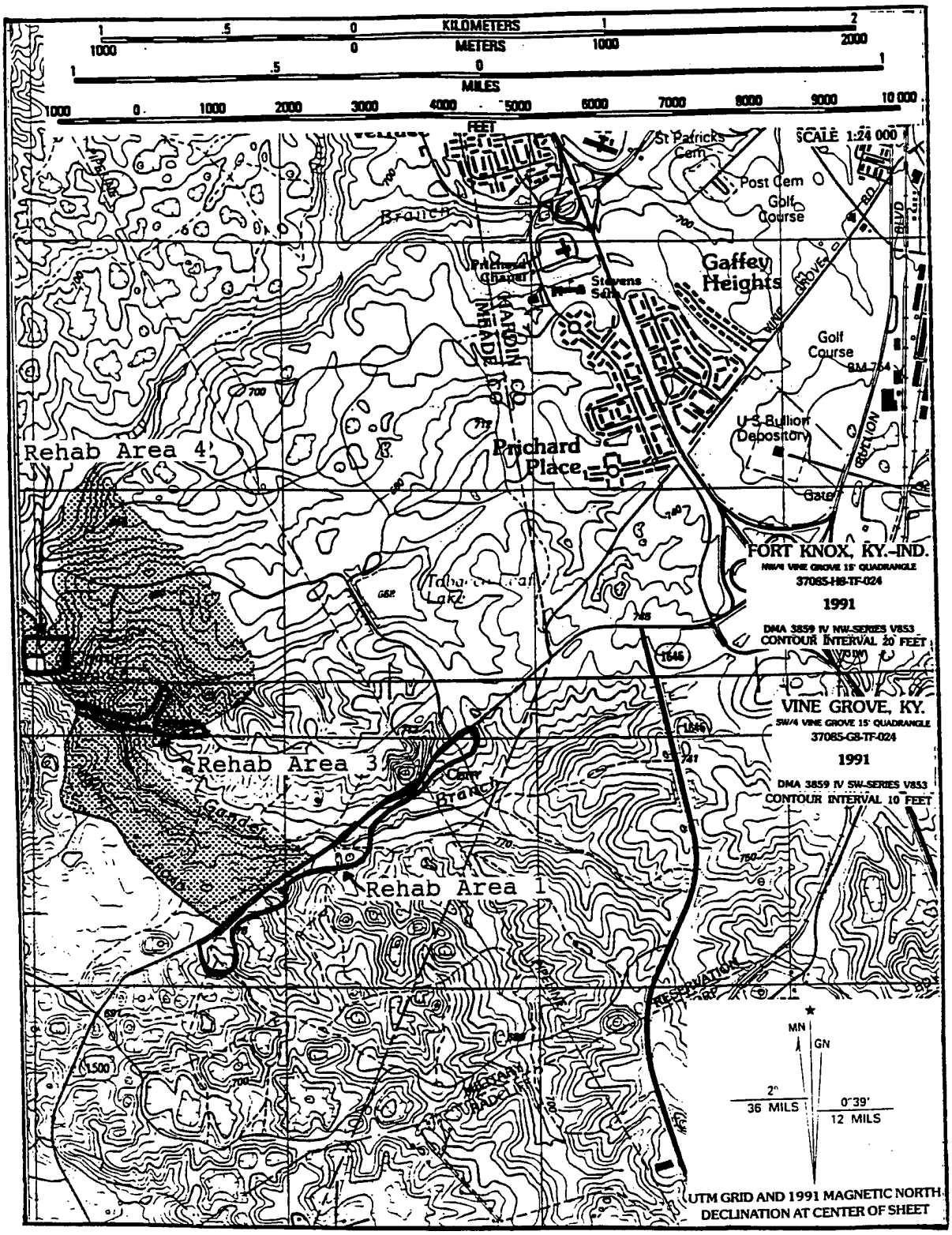

FIGURE 1. Location of Rehab Areas 1, 3, and 4 (previously surveyed areas shown in stippling).

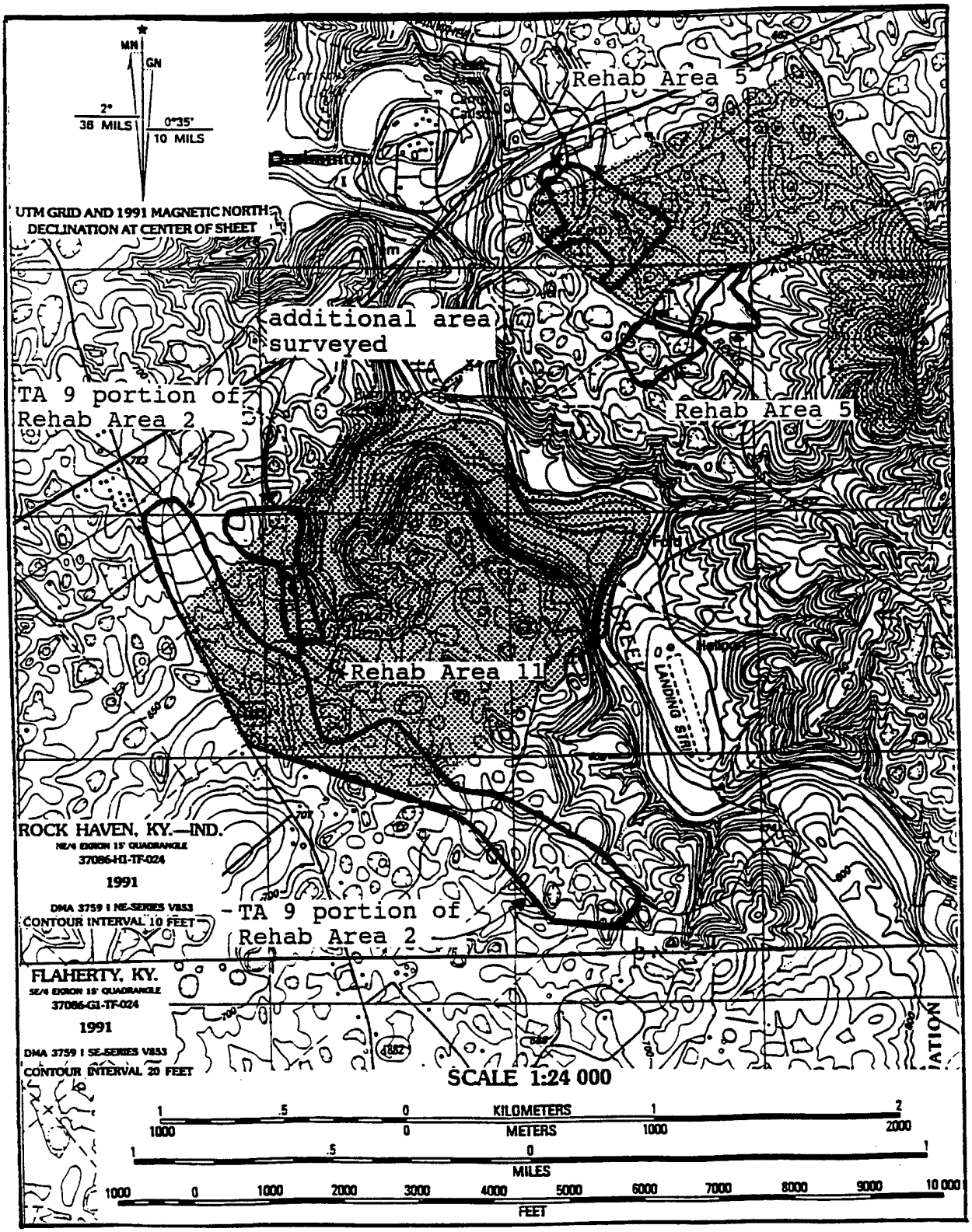

FIGURE 2. Location of Rehab Areas 5 and 11 and the TA 9 Portion of Rehab Area 2 (previously surveyed areas shown in stippling).

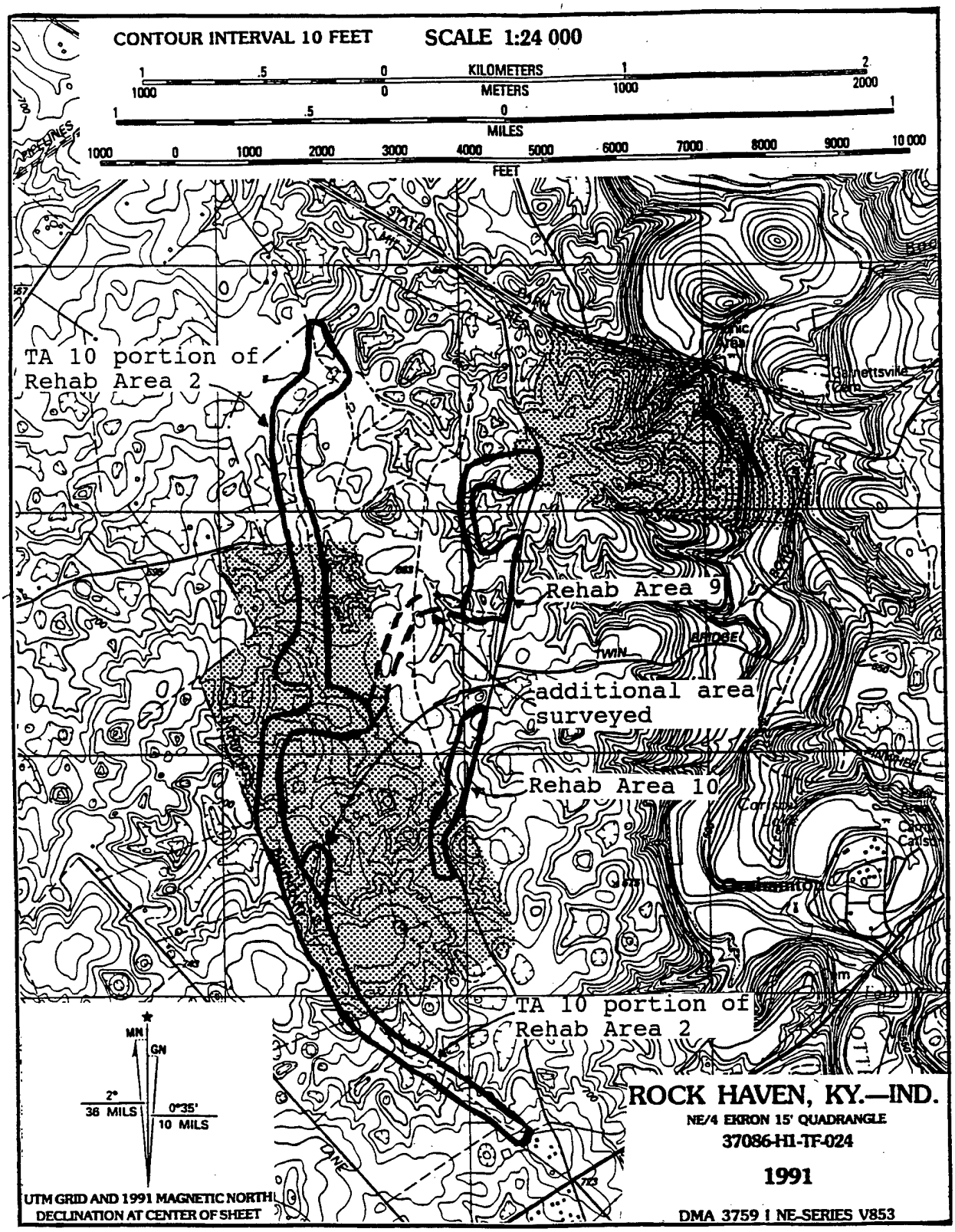

FIGURE 3. Location of Rehab Areas 9 and 10 and the TA 10 Portion of Rehab Area 2 (previously surveyed areas shown in stippling).

approaches Tobacco Leaf Road Loop, a gravel road. Rehab in this area will consist of the smoothing of gullies and reseeding of denuded areas. Rehab Area 3 includes approximately 0.4 ha (1.0 acres).

Rehab Area 4, at the boundary of TAs 8 and 9 and HAs 13 and 14, is a stream crossing. This area had been used as a ford until two years ago, when a culvert and gravel crossing was installed. This crossing washed out in a heavy rain, however, and the current rehab project will consist of the construction of a concrete crossing. The north half of the rehab area had been previously surveyed (Schenian and Mocas 1994) and the southeast quarter had also been previously surveyed (O'Malley et al. 1980). No sites had been recorded in the proposed rehab area in either survey. The southwest quarter was the only portion surveyed in the current project, and encompasses approximately 0.1 ha (0.3 acres).

Rehab Area 5, in TAs 8 and 9 and HAs 9 and 13, is a series of small areas used for tank trails and maneuvers. The areas rehabbed will include only the eroded areas with gullies. The rehab activity will consist of the repair of selected areas. It also will include the construction of a hardened parking area near a set of bleachers located just south of the tank bridge crossing Highway 60, at the northeast end of TA 9. The areas total 34.1 ha (84.3 acres).

Rehab Area 9, in TA 10 and HA 10, consists of several trails leading into the TA 10 tank maneuver area from Basham Corner Road. Rehab will consist of the construction of hardened crossings to improve access into the area. A total of 12.6 ha (31.1 acres) were surveyed in and near Rehab Area 9.

Rehab Area 10, in TA 10 and HAs 10 and 11, parallels Basham Corner Road. Rehab in this area will consist of the creation of a hardened crossing into the area, the repair of tank trails by the sinkhole, and the placement of barriers around the sinkhole. Rehab Area 10 includes 7.0 ha (17.4 acres), of which 3.0 ha (7.4 acres) had been previously surveyed and 4.0 ha (9.9 acres) had not been inspected before. The previously surveyed area was reinspected because it contained a high probability location for a site on which no site had been recorded in the O'Malley et al. (1980) study.

Rehab Area 11, in TA 9 and HA 12, is a tank trail which crosses through a former rehab site above McCracken Springs. The tank trail was smoothed and covered with gravel in 1995, but the trail has eroded or washed out in areas. The rehab activity in Rehab Area 11 will consist of the repair of the tank trail. The area surveyed for Rehab Area 11 extended north of the actual area to be rehabbed. The area encompasses 1.8 ha (4.4 acres), and had been previously surveyed. This area was resurveyed to inspect previously recorded sites.

The scheduled rehab areas are in current or former tank training areas. The goals of land rehab are to control erosion and sedimentation, to restore natural landscape and terrain suitable for further tank training, and to create noise and dust barriers along boundaries and streams. Along eroded road cuts and tank trails, rehab consists of grading paths to remove gullies and planting cutbanks in erosion controlling vegetation. In broader maneuver areas, deep gullies on ridge slopes are filled in by grading the adjoining slopes. The ridge tops and upper slopes are plowed or disked, and entire rehab areas are seeded in erosion controlling plants. Where possible, rehab activities avoid the removal of existing large trees. Rehab projects require contractors to avoid impact to vegetated areas in and around specified sinkholes. The rehab work for the current project areas is scheduled to be performed in the fall of 1996.

The archaeological survey and literature review conducted in preparation for the rehab activities were required to comply with the National Environmental Policy Act, or NEPA (Public Law 91-190), the National Historic Preservation Act of 1966, as amended (Public Law 89-665), the Archaeological Resources Protection Act of 1979 (Public Law 96-95), Presidential Executive Order 11593, and Army Regulation 420-40. In 1993, Schenian obtained all documents needed to perform Phase I literature searches for the installation (e.g., site forms, reports of previous investigations, historic maps). These are on file at the Cultural Resource Management office of the Environmental Management Division (EMD) of the Directorate of Public Works (DPW), Fort Knox, and are updated regularly. No file check was made with the Office of State Archaeology and the Kentucky Heritage Council specifically for this project.

The scheduled rehab areas lie in the Plain section of the Pennyrile cultural landscape. The area is primarily on the tops and slopes of dissected ridges and on the karst plain. Elevations in the project area range from 600 to 740 feet. Soils in the rehab area are classified as Crider-Vertrees soil association (U.S.D.A. 1975). In all the rehab areas, Nicholson silt loam soils are the predominate soil type in the upland areas and upper slopes, while Baxter or Hammack-Baxter soils predominate on the lower slopes. Drainage in all the project areas flows into tributaries of Otter Creek or into sinkholes. Otter Creek is a tributary of the Ohio River.

Gail Pollock provided maps and photocopies of aerial photographs that delineated the project boundaries and a written description of the rehab work to be conducted in each area. The surface reconnaissance of the scheduled rehab area was performed by the Cultural Resource Management office staff on April 25, May 31, June 3, June 5, June 12, and June 25, 1996. A total of 53.5 person hours were spent

in the survey of the rehab areas. Pamela Schenian, Stephen Mocas, and Michael Siefring participated in the study.

The artifacts from the survey were washed and will be catalogued by a student assistant at the University of Louisville Program of Archaeology. The prehistoric artifacts were analyzed by Mocas. The historic artifacts were analyzed by Schenian. Selected artifacts were illustrated by Schenian. The artifacts and the documentation for this project will be curated at the Program of Archaeology, University of Louisville, on a "permanent loan" basis, under contract number DABT 23-95-C-0102, for curatorial and technical support (copy of contract on file, DPW, Fort Knox, Kentucky). Duplicate copies of the documentation will be stored at DPW.

SETTING AND ENVIRONMENTAL BACKGROUND

O'Malley et al. (1980) prepared a detailed description of the setting and environmental background of the Fort Knox base as a whole. This section will concentrate on the topographic characteristics of the rehab areas inspected in the current study.

The rehab areas lie in the Mississippian Plateau physiographic region of Kentucky (McGrain and Currens 1978:35). The proposed rehab areas consist of karst uplands and narrow, dissected ridges above Otter Creek and its tributaries. Except Rehab Areas 1 and 11, all the areas contained narrow tank trails eroded up to 2 m below the original ground surface, broader denuded expanses where some to all topsoil had been eroded away, and isolated areas of dense vegetation, primarily in sinkholes. Rehab Areas 1 and 11, both rehabbed in part in 1995, had more grassy areas and no deeply entrenched tank trails.

Rehab Area 1 parallels the south edge of Bullion Boulevard. The rehab area begins on a hilltop, descends westward towards Gander Branch, crosses Gander Branch, and then climbs the east slope of a hill, ending on the hill top. Two sinkholes are present near the west end of the project area. Most of the area surveyed lies within 20 m of the road and a considerable amount of it lies 10 m or less from the road. Previous borrowing and disturbance related to the construction of Bullion Boulevard was evident. The rehab area consists of a narrow denuded or grass covered trail on the slopes, with wider denuded or sparsely vegetated areas on the hilltops and adjacent to Gander Branch. Near the sinkholes, there was only a deer path to follow. South of the narrow strip is a dense pine forest. Elevations in Rehab Area 1 vary from 650 to 700 feet.

Rehab Area 2 parallels the west boundary of the base, and includes the greatest variation in elevations of the rehab areas, ranging from 630 to 740 feet. All of Rehab Area 2 lies more than 0.5 km from a source of flowing water, and all portions of the rehab area in TA 10 lie more than 1 km from flowing water. There are many sinkholes in and near the project area, however, and it is likely that some of these held water at least seasonally.

Rehab Area 3 begins at Pinwheel Road, cuts eastward down a short, steep slope, crosses Gander Branch, and then climbs up a steep west slope, ending at Tobacco Leaf Road Loop on the crest of the hill. The hill crest was minimally eroded and in a fallow wildlife food plot field. The trail down the steep slopes was eroded up to 2 m below the original ground surface and had only occasionally patchy weeds. Beyond the trail, the slopes were forested. Elevations in Rehab Area 3 vary from 600 to 680 feet.

Rehab Area 4 is located immediately adjacent to Dry Branch at the base of facing ridge slopes. The soil in this area has built up through a combination of alluvial and colluvial processes. Rehab Area 4 is at an elevation of approximately 600 feet.

Rehab Area 5 is a series of small areas used for tank trails and maneuvers. These areas are located on the undulating karst plain, with the southernmost two areas located at the boundary of the karst plain and the toeslopes of a ridge system building towards Snow Mountain. Elevations vary from 620 to 670 feet in this rehab area.

Rehab Area 9 consists of several trails leading into the TA 10 tank maneuver area from Basham Corner Road. Most of the area surveyed was in a relatively flat area in the uplands, but one trail passed through a large, deep sinkhole. Elevations in Rehab Area 9 range from 640 to 670 feet.

Rehab Area 10 parallels Basham Corner Road. The rehab area begins on a ridge top, descends northward, and then climbs gradually as it follows the west slope of a ridge. Elevations in Rehab Area 10 range from 660 to 690 feet.

Rehab Area 11 is a tank trail which crosses through a 1995 rehab site above McCracken Springs. The trail lies approximately 10 to 30 m west of the bluff crest, from which there is a 50 foot drop to the stream formed by McCracken Springs. An intermittent drainage cuts through the project area; in times of heavy rains, it carries water to the bluff crest to form a waterfall. The drainage is washing out the tank trail. The central third of the area surveyed had been rehabbed in 1995. The trail was covered with gravel and the adjoining area in generally dense grass. The west bank of the trail had a cutbank up to 0.5 m high which was inspected, however, and the grassy area had erosional gul-

lies and bare patches. The areas which had not been rehabbed contained eroded tank trails bordering islands of vegetation. The north end of the area surveyed lies at the edge of a broad, generally heavily eroded, maneuver area. Elevations in Rehab Area 11 range from 620 to 670 feet.

PREVIOUS RESEARCH

Approximately 26,534 acres of the Fort Knox installation have been surveyed, primarily in cultural resource management (CRM) studies. Of this amount, only 6150.0 acres of which have been inspected in accordance with current standards. Schenian and Mocas (1994a) summarize the archaeological studies conducted on or near the installation through August 1994. This section focuses on the previous research conducted within a 2 km radius of the current project areas, and discusses the sites recorded within this 2 km radius.

O'Malley et al. (1980) surveyed portions of HAs 8-15, encompassing, adjoining, or near the current project areas. They recorded sites 15Md171-15Md175, 15Md177, and 15Md182 in HA 8, but no sites in HA 9. In HA 10, sites 15Md178-15Md180 and 15Md183-15Md185 were recorded. O'Malley et al. (1980) recorded 15Md186-15Md199 and 15Md216-15Md220 in HA 11 and 15Md221-15Md233 and 15Md235-15Md242 in HA 12. Sites 15Md154-15Md156 and 15Md162 were recorded in HA 13, and 15Md140-15Md143, 15Md149, and 15Md163 in HA 14. Sites 15Hd214, 15Hd215, and 15Hd272 were recorded in HA 15.

Hale's (1981) surveyed Otter Creek Park, recording a very high density of sites in the uplands near Otter Creek and the Ohio River. Hale's survey recorded sites 15Md243, 15Md252-15Md253, 15Md269-15Md270, 15Md272-15Md275, 15Md278-15Md279, 15Md283-15Md286, 15Md292, and 15Md295-15Md300.

Funkhouser and Webb (1932) reported the location of 15Md10 to the east of the Rehab Area 5 project areas. McGraw (1976) did not to record any sites in her survey of Highway 60. Fiegal (1982) recorded 15Hd403 and 15Hd404 in a road survey. Webb and Brockington (1986) recorded site 15Md307 in their survey of Highway 1638. Schenian and Mocas (1994b) recorded site 15Md382 in their survey of bridge replacements. Sites 15Md378 and 15Md379 were identified in the Schenian and Mocas (in prep.) study at Camp Carlson.

Holmberg (1991) prepared an archival study on the four mill sites (15Md164, 15Md176, 15Md185, and the Grahamton mill [part of the town of Grahamton--15Md378] recorded by O'Malley et al. (1980) in the Meade County section of the base. O'Malley (1996) reports the results of testing of the Garnettsville mill, as well as summarized documentation on other potential mill sites along Otter Creek.

Schenian and Mocas (1992) recorded historic site 15Md326 in a timber area in HA 13. A small historic, 15Md408, which had been missed in the 1992 survey was recently recorded in HA 13 but not in association with any specific undertaking.

Schenian and Mocas (1993) recorded 15Md342 in their rehab survey in HA 9, 15Md341 in HA 12, 15Md336-15Md339 in HA 13, and 15Md340 in HA 14. Schenian and Mocas (1993) also revisited 15Md140, 15Md143, 15Md163, and 15Md175. Schenian and Mocas (1994a) recorded sites 15Md347-15Md361 in HA 13 and 15Md362-15Md376 in HA 11. Sites 15Md380 and 15Md381 were recorded just outside the boundaries of that project area. Schenian and Mocas (1996a) recorded 15Md383-15Md386 and reexamined 15Md178-15Md180, 15Md184, 15Md362, and 15Md382.

Together these surveys have identified a pattern of very high site densities in the vicinity of the current rehab project areas. The sites recorded have yielded materials of Archaic through historic cultural-temporal affiliation. A number of previously recorded sites were known to lie in or near the current project areas.

The topographic quadrangle shows one historic cemetery, Cemetery #117, located near Rehab Area 1. Kempf (1993) describes the cemetery as containing one hand-inscribed marker made of fieldstone, with evidence of road construction disturbance in the vicinity. Kempf (1993) reports that only fragments of the inscription, "J.M." and "SEPT", are legible. This cemetery is separated from the Rehab Area 1 project area by a treeline.

No archaeological sites listed on the National Register are located in or immediately adjacent to the current project area, although many of the sites recorded near the current project area must be considered potentially eligible for the National Register because they have not been adequately assessed by the current standards of the profession. No standing structures listed on or eligible for listing on the National Register of Historic Places are located in or immediately adjacent to the current project area. The only structures visible from the project areas are modern range buildings.

SURVEY PREDICTIONS

Based on previous archaeological research in the area, the history of settlement, and the environmental setting of the project area, the following results were expected:

1) The rehab areas consist of former privately owned properties, most acquired by the Army in the early 1940s. The Department of the Interior had

acquired some of the land in TA 10 ca. 1925 and transferred it to the Army ca. 1940. A 1940 Army map depicts large buildings (e.g., houses, barns, etc.) in or near the project area. There is a high probability that the farmsteads, houses, or businesses represented by the buildings showing on this map exist as archaeological sites. It is possible that additional historic sites, already in ruins by the time of Army acquisition, exist as archaeological sites.

2) Some former property owners opted to relocate their structures to their new properties off the installation, and the Army removed most pre-installation standing structures for liability reasons. Therefore, few historic structural ruins are expected.

3) Portions of the survey area consist of steep ridge slopes and sinkhole sides that are unlikely habitation or activity loci.

4) The rehab areas on the tops and upper slopes of ridges have high potential for habitation in areas where water was readily accessible.

5) There is a high probability of habitation sites near Otter Creek and its drainages.

6) Studies elsewhere indicate frequent occupation and activity areas around sinkholes, but the presence of abundant flowing surface water in the vicinity lessens the importance of sinkholes as habitation loci.

7) Historic sites frequently also have prehistoric components, suggesting that certain environmental characteristics made the location desirable to both prehistoric and historic inhabitants.

8) The proposed rehab areas have been used for tank training for decades. Sites found in the tank training areas are likely to be wholly or partially disturbed.

9) Previous archaeological research in the Otter Creek drainage has demonstrated a very high density of sites in the uplands near Otter Creek. Approximately one site or isolated find was expected for each 10 acres of project area, based on these previous studies.

FIELD METHODS

In general, proposed Rehab Areas 1-5 and 9-11 were systematically walked in transects at paced 10 m intervals. Most of the project areas had been used for tank training and the ground surface was frequently eroded well into the subsoil, particularly in the tank trails. Visibility in the majority of the rehab areas was very good. In most of the rehab areas ground surface visibility was 100 percent, and only very limited areas, mostly near sinkholes and on steep slopes, had surface visibility of less than 50 percent.

If the ground surface had been obscured by vegetation for greater than 10 m within a transect, then a shovel probe would have been excavated. No areas were encountered in the rehab areas, however, that could not be adequately inspected via walkover at the site discovery level either through inspection of the ground surface or of exposed cut banks adjoining tank trails or gullies.

Upon the discovery of archaeological materials, the ground surface of the area around the find was walked in transects spaced at intervals of 5 m or less, until no additional materials were recovered for a distance of at least 20 m within a transect. Figures B-1 through B-33 in Appendix B show the locations and plans of the cultural resources encountered in the proposed rehab area. The site plans show the salient features of these sites in greater detail.

At most of the sites, subsoil was present at ground surface and no artifact concentrations or evidence of potentially intact cultural features was found. Therefore no shovel testing was conducted at these eroded sites. During the initial visit to 15Md387 (field site NTB-5) a possible zone of intact topsoil was observed in some areas of the site and so noted on the state site form. On a subsequent visit made with the intention of shovel probing the site, further inspection of the surface and erosional cutbanks proved that the perceived topsoil zone was actually an illusion caused by the differential drying of the soil after a rain shortly before the first visit and the washing of humic material down the cutbank. The entire site was determined to have subsoil at ground surface and no shovel testing was conducted.

At six sites--15Md196, 15Md221, 15Md222, 15Md237, 15Md392, and 15Md397--inspection of the ground surface and erosional cutbanks was sufficient to determine the horizontal extent of the site and to determine that artifact concentrations, intact topsoil, and probably intact cultural features existed on the sites. At each of these six sites, a section of cutbank was scraped and the soil profile examined.

In summary, the archaeological investigation of the proposed rehab area resulted in the recording of 21 new sites, which have received state site numbers 15Md387 through 15Md407, and eight isolated finds of prehistoric material. The survey also revisited nine previously recorded sites (15Md190, 15Md196, 15Md198, 15Md217, 15Md218, 15Md221, 15Md222, 15Md231, and 15Md237).

ARTIFACT TYPOLOGY AND MATERIALS RECOVERED

The following paragraphs summarize the artifact typologies used in the sorting and analysis of the artifacts recovered during this project, and describe specific artifacts recovered in greater detail. Representative prehistoric artifacts are illustrated in Figures 4 through 7. The artifact counts are summarized in Table 1.

Prehistoric Artifact Typology

Projectile point

A projectile point is a bifacially worked chipped stone tool that generally is assumed to have been hafted for use as a hunting implement, such as a spear head or arrowhead, but may have an alternate or additional use as a cutting or perforating implement. Projectile points or point preforms are shown in Figures 4a-f, 5a, and 6a, c, and d.

Biface

A biface is a chipped stone tool that has had flakes removed from two opposite surfaces along one or more edges. There is considerable variety in the size and shape and the refinement of flaking of bifaces. Bifaces may be quarry blanks or tool blanks, preforms for projectile points or other tools, cutting or chopping tools, or may serve other functions. They also represent tools broken or discarded during various stages of manufacture. A biface is shown in Figure 5c.

Scraper

A scraper is a chipped stone tool formed by the removal of a continuous series of steep flakes from a single surface of a tool. Those tools with flakes removed along one or both lateral edges are "side scrapers" and those with flakes removed from the end of the tool are "end scrapers" (Figure 6b). Occasionally, one or both lateral edges and the end were used for scraping (Figure 5b).

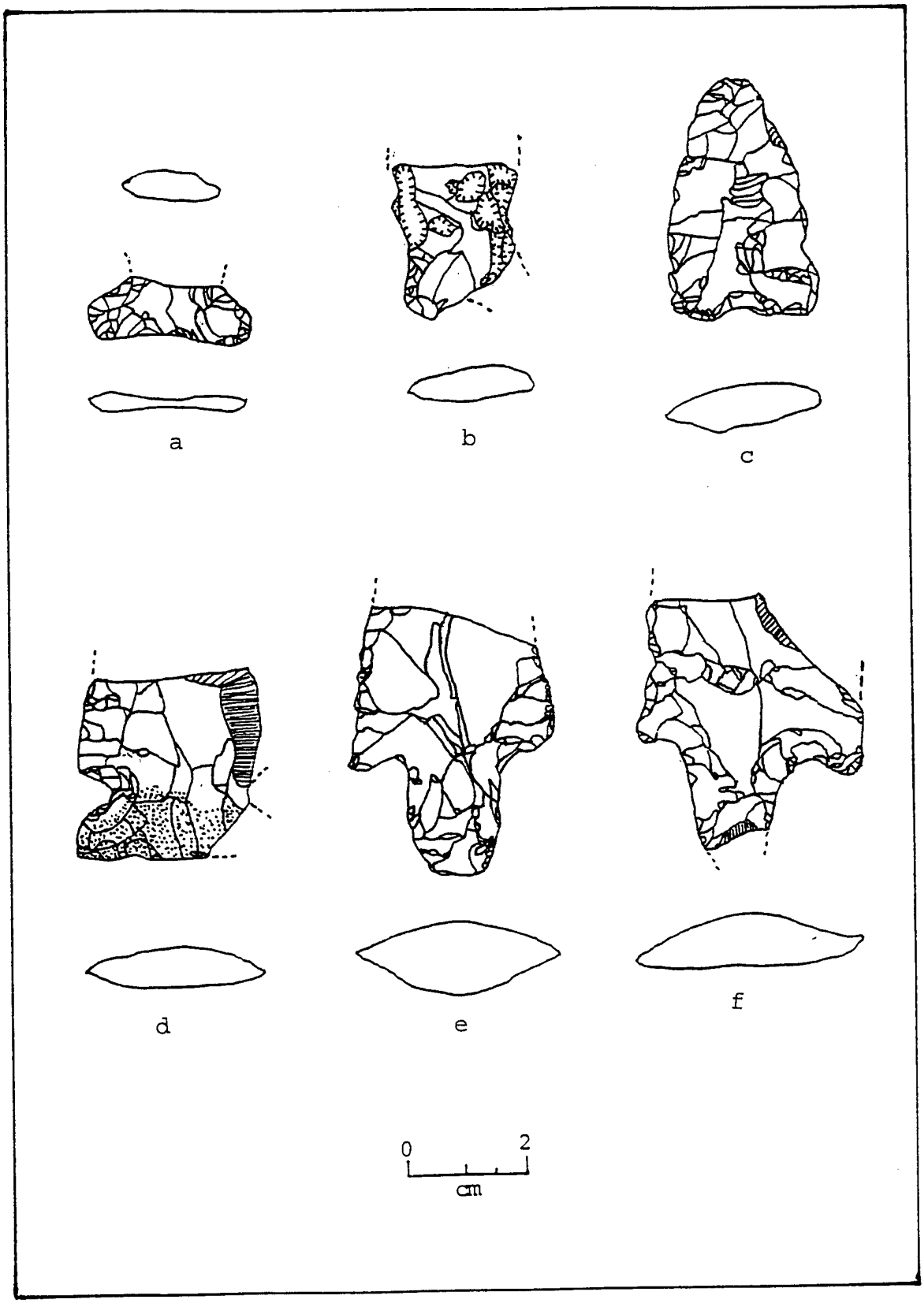

FIGURE 4. Selected Artifacts from 15Md237, 15Md388, and 15Md392.

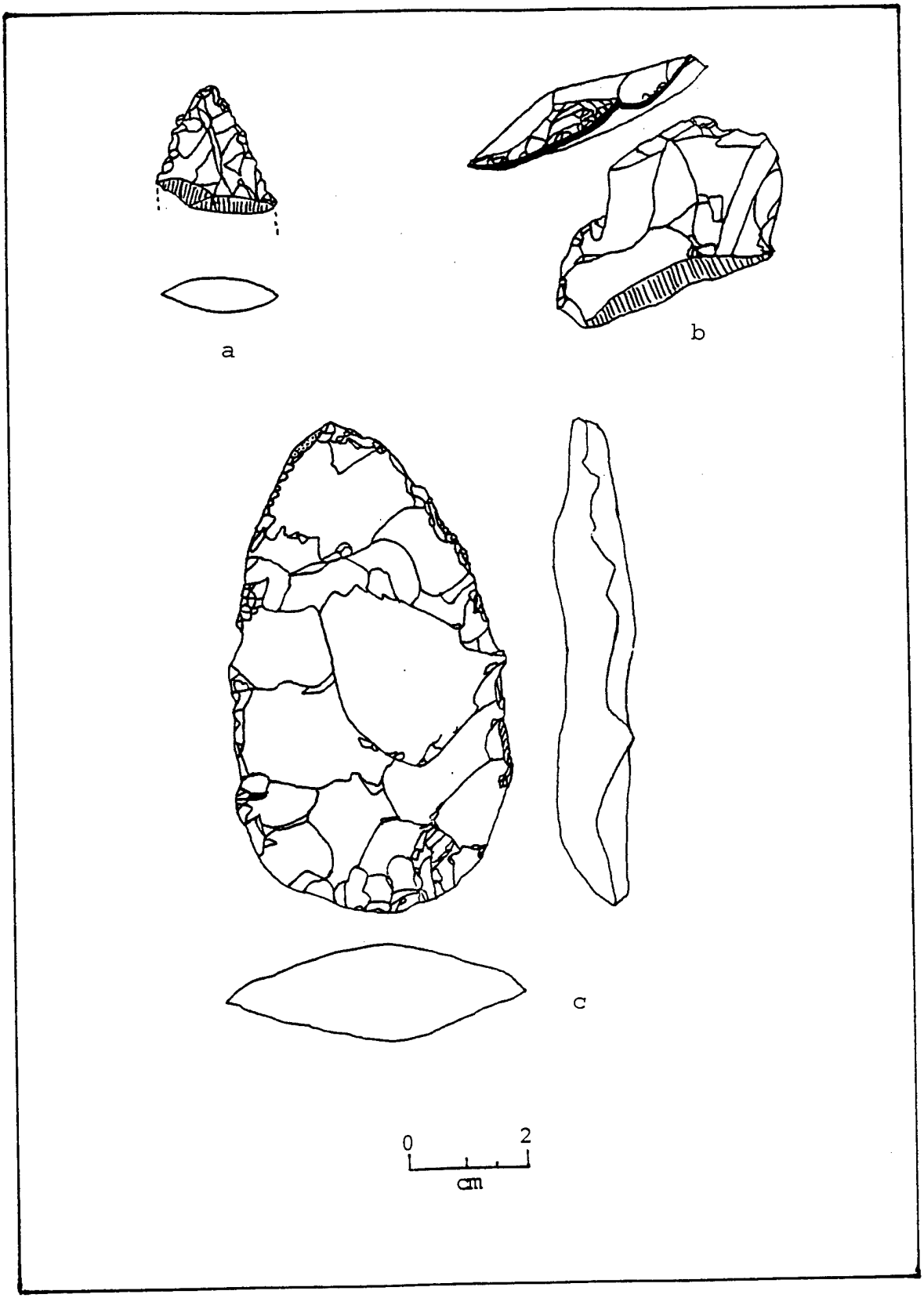

FIGURE 5. Selected Artifacts from 15Md397, 15Md407, and TA9-IF1.

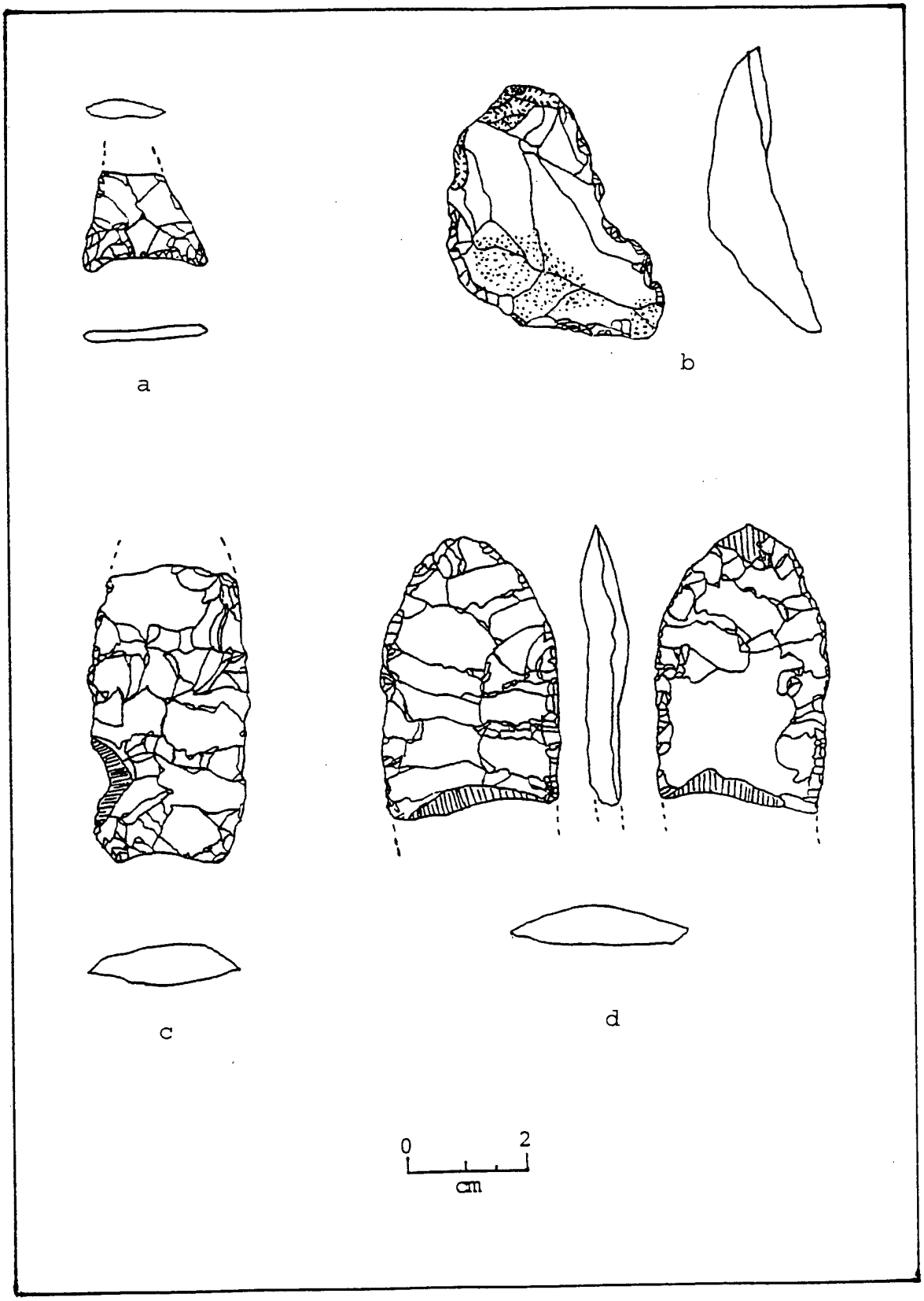

FIGURE 6. Selected Artifacts from 15Md402.

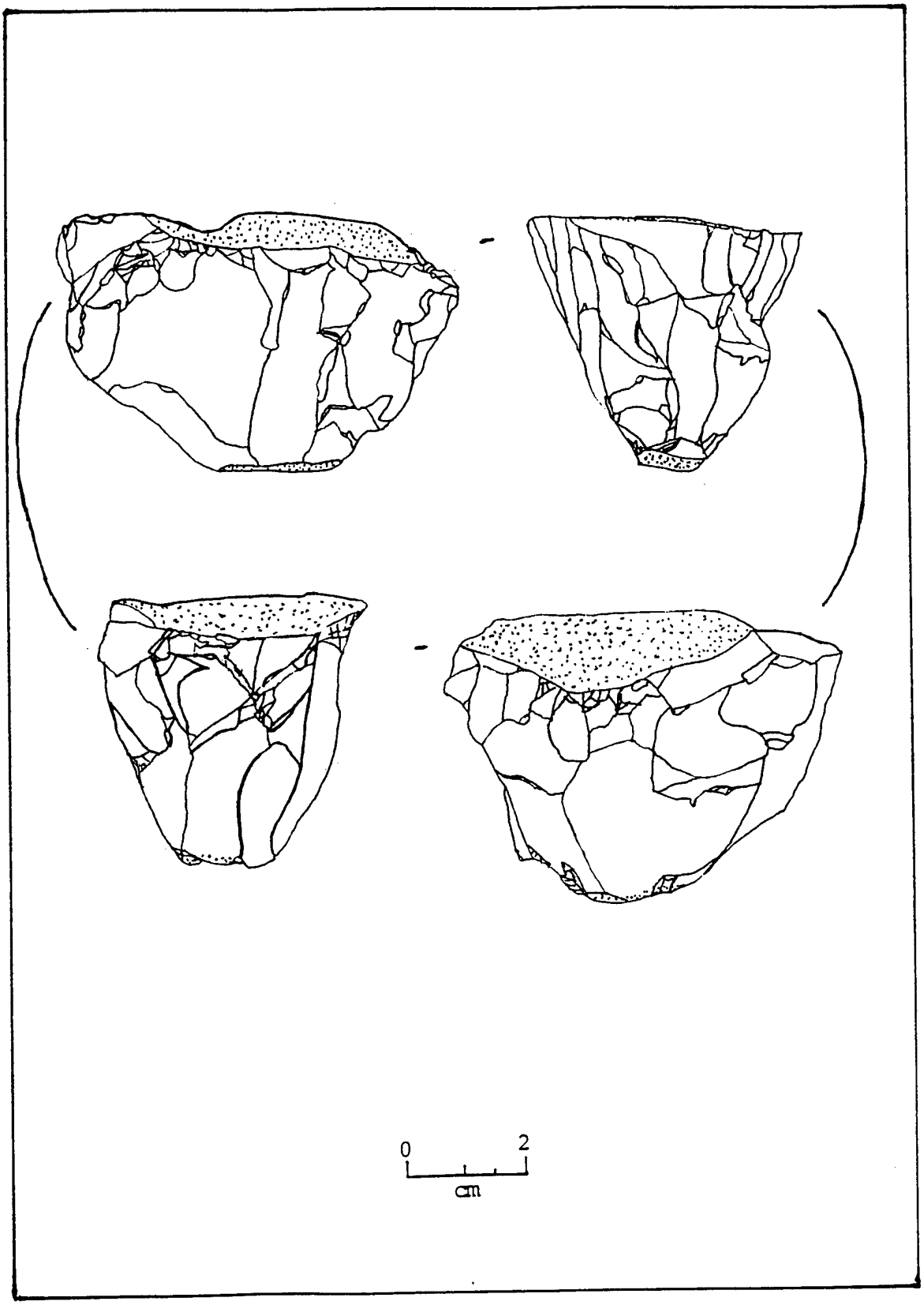

FIGURE 7. Four Views of Core from TA9-IF2.

TABLE 1. Artifacts Collected from the Project Sites.

	15 Md 190	15 Md 196	15 Md 198	15 Md 217	15 Md 218	15 Md 221	15 Md 222	15 Md 231	15 Md 237	15 Md 387	15 Md 388	15 Md 389	15 Md 390	15 Md 391	15 Md 392	15 Md 393	15 Md 394	15 Md 395	15 Md 396	15 Md 397	15 Md 398	15 Md 399	15 Md 400	15 Md 401	15 Md 402	15 Md 403	15 Md 404	15 Md 405	15 Md 406	15 Md 407	NTB IF1	TA9 IF1	TA9 IF2	TA 10 IF1	TA 10 IF2	TA 10 IF3	TA 10 IF4	TA 10 IF6	To-tal
PREHISTORIC ARTIFACTS																																						
Projectile point	0	1	0	0	0	0	0	0	4	0	1	0	0	0	2	0	0	0	0	1	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	14
Biface	0	1	0	0	0	0	0	0	6	2	1	0	0	0	1	0	0	0	0	4	0	1	1	0	2	0	0	0	1	0	0	1	0	0	0	0	0	21
Scraper	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	3
Drill/perforator	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Burin	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Graver	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Wedge	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Hammerstone	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Core	0	2	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	7
Utilized/retouched flakes	0	8	0	0	0	0	0	0	11	0	2	0	0	1	2	0	1	0	0	6	0	0	0	0	4	1	0	0	0	1	0	0	0	0	0	0	0	37
Unutilized debitage																																						
primary flake	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
secondary flake	0	18	2	0	2	0	2	1	22	6	3	0	1	5	2	3	1	2	1	85	0	0	0	1	15	0	1	0	3	1	0	1	0	0	1	0	0	179
tertiary flake	1	64	3	1	1	1	3	1	73	8	4	0	0	2	18	11	3	4	2	132	0	1	1	1	29	1	3	1	0	2	0	0	0	0	0	1	2	374
chert shatter	0	59	6	2	4	0	0	0	38	0	2	0	0	0	13	6	0	0	0	149	2	1	1	4	10	1	0	2	0	0	1	0	0	1	1	0	0	303
Prehistoric Total	1	154	11	3	7	1	5	2	164	17	14	0	1	8	38	20	5	6	3	378	3	3	4	6	65	3	4	3	4	5	1	2	1	1	1	1	2	948
HISTORIC ARTIFACTS																																						
KITCHEN GROUP																																						
Ceramics																																						
coarse earthenware																																						
redware	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
yellowware	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
refined earthenware																																						
whiteware	0	0	0	0	4	0	0	0	0	1	0	0	4	47	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
pearlware	0	0	0	0	0	0	0	0	0	1	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
stoneware																																						
brown	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
buff	0	0	1	0	2	1	0	0	0	2	0	6	10	21	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	49
gray	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
ironstone	0	0	0	0	3	0	0	0	0	6	0	4	0	24	0	0	0	0	0	5	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	43
semi-porcelain	0	0	0	0	0	0	0	0	0	2	0	5	0	3	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
porcelain	0	0	0	0	0	0	0	0	0	4	0	3	0	9	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
Bottle glass																																						
amber	0	0	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
amethyst	0	0	1	0	0	0	0	0	0	0	0	0	3	9	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
aqua	0	0	0	0	1	0	0	0	0	1	0	4	2	8	0	0	0	0	0	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
clear	0	0	0	0	3	0	0	0	0	6	0	0	8	2	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
cobalt	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
green	0	0	0	0	0	0	0	0	0	0	0	1	0	5	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
olive	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
sapphire	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
yellowish	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Dish glass																																						
amethyst	0	0	0	0	0	0	0	0	0	0	0	9	0	10	0	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
milk glass	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
yellowish	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Glass lid liner	0	0	0	0	0	0	0	0	0	0	0	1	4	3	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Glass slag, clear	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Zinc lid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
ARCHITECTURE GROUP																																						
Architectural tile	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Brick	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Window glass	0	0	0	0	1	0	0	0	0	0	0	0	0	5	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Nails	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
FURNITURE GROUP																																						
Furniture glass	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Statue	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
ENTERTAINMENT GROUP																																						
Doll	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Historic Total	0	0	2	0	14	1	0	0	0	23	0	38	41	165	0	0	0	0	0	62	0	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	352
ARTIFACT TOTAL	1	154	13	3	21	2	5	2	164	40	14	38	42	173	38	20	5	6	3	440	3	7	6	6	65	3	4	3	4	5	1	2	1	1	1	1	2	1300

Drills and Perforators

A drill is a chipped stone tool characterized by the presence of a parallel-sided or tapered shaft. This tapered shaft is formed by the bifacial removal of small flakes, and usually has a rhomboidal to circular cross-section. A perforator is a chipped stone tool with a sharp, narrow tip or point suitable for use in puncturing another object, but lacking the elongated tapering shaft and typical cross-section of a drill as defined above.

Burin

A burin is a chisel-like implement produced by striking a flake at a right angle to the edge from one or more directions to produce a thick, strong engraving edge. The tool was used to incise soft materials such as bone, antler or wood. Burins generally are used perpendicular to the surface of the flake.

Graver

A graver is a flake that has been retouched to produce an engraving point or points. The tool was used to incise or split soft materials such as wood, bone, or antler. Gravers generally are used parallel to the surface of the flake.

Wedge

A small rectangular or triangular piece of chert with bipolar flake removals, crushing, or step fractures, on one or two sets of opposed edges. These tools may have been used to split wood or bone.

Hardstone tool

Hardstone tools are formed by the grinding or pecking of stone and may be manufactured from chert, limestone, sandstone or a variety of sedimentary, igneous and metamorphic rocks. These tools may be shaped prior to use or formed through use. A hammerstone is a cobble or other piece of rock with one or more battered areas on the periphery that suggests its use for percussion.

Core

A core is chert cobble or tabular piece of chert from which flakes have been removed for later modification or use as tools. A tested cobble is a piece of chert raw material

that was flaked to ascertain its suitability for use in the manufacture of tools. Four views of one core are shown in Figure 7.

Chert debitage

Chert debitage is the lithic debris produced as a by-product in the manufacture of chipped stone tools. Debitage may be further divided into the categories of utilized and retouched and non-utilized flakes, blocky chert pieces, shatter, and microflakes. Unutilized flakes may be classified by stage of manufacture, and utilized and retouched flakes by evidence for use as informal, or expedient, tools. The following criteria were used to sort the chert debitage collected in this study:

1) Flakes are defined by the presence of a striking platform and bulb of percussion. Concentric rings or ripple marks on the ventral surface and feathered terminations also may be present. Primary flakes have 90 percent or more of the dorsal surface (the side opposite the bulb of percussion) covered by cortex; secondary flakes have one to 90 percent of the dorsal surface covered by cortex; and tertiary flakes have no cortex is present on the dorsal surface.

2) A chert piece is classified as shatter if it exhibits flake-like characteristics, but is insufficiently complete to classify it as a primary, secondary or tertiary flake. Usually, the striking platform is missing.

3) A blocky chert piece is an angular chert piece lacking flake-like characteristics, and lacking evidence of having served as a core.

4) A microflake is a complete flake less than 6 mm in length and, generally, is the product of fine retouch or resharpening of a tool.

5) A piece of chert debitage is classified as utilized if at least three contiguous small flakes have been removed from one or more edges by use rather than retouch. Retouched flakes show localized removal of a small number of flakes to produce a specialized cutting, scraping, or perforating edge.

Historic Artifact Typology

South (1977:95-95) defined a system of artifact classification based on function. Under South's system, for example, ceramics and curved glass are kitchen group artifacts, flat glass less than 4 mm thick and nails are architectural group artifacts, and horseshoes are transportation group artifacts.

KITCHEN GROUP

Ceramics

Historic ceramics are divided into coarse earthenware, stoneware, ironstone, refined earthenware, semi-porcelain, and porcelain. Coarse and refined earthenware have the most porous paste, stoneware and ironstone have less porous paste, and semi-porcelain and porcelain have the least porous paste. Each of these broad categories is further divided into more specific types based on paste texture and color, glaze characteristics, and decoration (Maples 1991).

Coarse Earthenware. Coarse earthenware includes redware, orangeware, and yellowware, with the different types distinguished by paste color. Redware was usually used for food storage and is often lead glazed. Orangeware is often unglazed and undecorated. It occurs most frequently in flowerpots. Yellowware is used for food storage and preparation, but not table service. Chamberpots also are often made of yellowware. Yellowware glaze is typically yellow or Rockingham (brown streaked).

Refined Earthenware. The refined earthenware collected in this project includes whiteware (earthenware with a white paste) and pearlware (earthenware with a white paste and a clear lead glaze with a small amount of cobalt that causes a blue or green opalescent cast). Unless decoration is mentioned, the sherd has white glaze on the exterior and interior surface, but no other decoration. Pearlware dates from 1780 to 1830 (Smith 1983:171; South 1977:212). Whiteware dates from 1830 to 1890 (Smith 1983:171). Transfer print on whiteware was most popular between 1830 and 1860 (Price 1979:31).

Stoneware. Stoneware cannot be dated to a more accurate range than nineteenth to twentieth century and vessels frequently lacked makers marks. Stoneware usually is divided into gray stoneware and buff stoneware on the basis of paste color. A dark brown paste stoneware is found with some frequency on Fort Knox historic sites, and may be the work of a

local pottery. Other color pastes are also found occasionally.

Ironstone. Ironstone most commonly has white paste, but brown and ivory paste variants are known. Ironstone dates from 1860 to 1920 (Ketchum 1983:201). Ironstone with scalloped rims and/or impressed and/or relief decoration date from ca. 1895 to 1920 (Montgomery Ward & Co. 1969; Sears, Roebuck & Co. 1920).

Semi-porcelain. Semi-porcelain has characteristics which grade between stoneware and porcelain. Semi-porcelain dates from 1880 to present (Worthy 1983:337). Semi-porcelain sometimes is found with the paste stained in pastel colors, especially in the later part of the historic period (ca. 1920-1940).

Porcelain. Porcelain is a refined ceramic with a fine grained, translucent, white paste. Porcelain will not stick in the tongue test, and is readily distinguishable from other ceramic types on the basis of visual inspection alone. Porcelain vessels typically have thinner walls than ironstone vessels.

Glass

Glass kitchen artifacts are divided into three main categories. These are bottles, dishware, and canning jar lid liners.

Bottle glass. Amethyst bottle glass dates from ca. 1880 to 1914 (Newman 1970:70-75). Amber glass dates from 1860 to present, green glass from 1865 to present, clear glass from 1875 to present and cobalt and milk glass from 1890 to present (Fike 1987:13). Yellowish glass dates from 1916 to 1930 (Baugher-Perlin 1982:261), and is the result of the solarization of clear glass containing selenium as a clarifying agent. Other colors of glass are not chronologically diagnostic.

Dish glass. Dish glass colors are dated the same as bottle glass colors, although dish glass often has recognizable pressed or cut patterns which permit more specific identification of manufacturing dates.

Lid liner. Milk glass lid liners date from 1869 to 1915 (Toulouse 1969:499). Most are milk glass.

Glass Slag. Glass slag is melted glass for which it cannot be determined if it derives from bottle glass or dish glass.

Zinc Canning Jar Lid

Zinc canning jar lids date from 1869 to the 1940s.

ARCHITECTURAL GROUP

Architectural Tile

Architectural tile may be either ceramic or slate. Slate tile is most often used for roof coverings, while ceramic architectural tile has a wider variety of uses.

Brick

Brick may be vitrified or unvitrified. Vitrified brick is burnt in the manufacturing process and has a glass-like material adhering to one or more faces. Unvitrified brick is not burnt in the manufacturing process.

Flat (window) glass

Flat glass less than 4 mm thick derives from window glass. It may be found in a variety of colors, although greenish shades are most common.

Nails

Machine cut nails have rectangular shafts and the heads may be machine headed or hand headed. Machine cut nails date from 1790 to 1880 (Smith 1975:5-7). Wire nails date from 1890-present (Nelson 1968). Wire nails have cylindrical shafts and generally have round heads.

FURNITURE GROUP

The Furniture Group includes furniture parts as well as decorative or functional home furnishings.

Furniture glass

Furniture glass comes in several varieties. Flat glass over 4 mm thick derives from the glass top of a table or other kind of furniture. Thin curved glass derives from kerosene lamp chimneys. Thicker curved or irregularly shaped glass can derive from a variety of items, including lamp shades or bases, decorative or functional bedroom or bathroom containers, and so forth.

Statues

Statue fragments found in archaeological sites are usually made of porcelain. The exterior and interior may be glazed or bisque, although interiors are typically bisque and exteriors glazed. The exterior also may have transfer print, decal, gilt, or painted decoration, in addition to a shaped body with relief decoration. Statue porcelain is generally readily distinguishable from dish porcelain by its unglazed exterior and unusual contours. Distinguishing small statue fragments from doll parts is more difficult.

ENTERTAINMENT GROUP

Doll

Doll fragments found on archaeological sites are typically made of porcelain, although plastic or rubber dolls occur in more recent historic sites. For porcelain dolls, the interior is usually bisque and the exterior is either bisque or glazed.

CULTURAL RESOURCES

The UTM coordinates of the cultural resources inspected are listed in Table B-1 in Appendix B. The site locations and plan views are shown in Figures B-1 through B-33.

Previously Recorded Archaeological Sites

15Md190

O'Malley et al. (1980:87-88) describe 15Md190 as an isolated find lying on a ridge crest at an elevation of 700 feet in the upland karstic plain. Although this site was called an isolated find in O'Malley et al. (1980:88), three flakes were reported at this locale. The site form (Webb et al. 1979) has the "X" originally marked next to the blank for "isolated artifact find", under the site type/function category, crossed out and an "X" next to "open" (site). Therefore, the description of this site as an isolated find appears to be an error. No dimensions were given for the site, and neither the report nor the site form give any information about why dimensions could not be determined from the three artifacts.

In the current survey, one tertiary flake was recovered from site 15Md190 (Figures B-1 and B-4). The site was not

intensively collected, the primary purpose of the reexamination was to confirm the location given in O'Malley et al. 1980. After it was determined that the site was outside the proposed rehab area, collection was curtailed. The cursory examination of the site area was sufficient to observe that the site vicinity was eroded to subsoil and extensively disturbed by training activities. In consideration of the small amount of material found in the two surveys, under conditions of good visibility in each case, in conjunction with the heavily eroded condition of the site vicinity, it is recommended that 15Md190 is not eligible for the National Register. No further archaeological investigation is recommended for 15Md190.

15Md196/15Md194

O'Malley et al. (1980:91) describe 15Md196 as a light prehistoric lithic scatter of indeterminate cultural-temporal affiliation. One piece of aqua bottle glass, attributed to military activities, was also found on the site. Site 15Md196 is on a low linear ridge spur at an elevation of 680 feet in the upland karstic plain. A total of 34 artifacts were found over a 15 m by 20 m (north-south) area, or 300 m^2, area in the O'Malley et al. survey. The artifacts consist of one projectile point fragment, four bifaces, one flaked hammerstone, three cores, one modified flake, and 24 pieces of unutilized debitage. Ground surface visibility was less than five percent in vegetated areas, with visibility confined primarily to a road cut that had 85-100 percent visibility. There is a discrepancy between the number of artifacts (n=32) reported on the site form (Jobe and Jones 1979) and the number listed in the report (n=34). Since only three bifaces are reported on the site form and one of the biface types is repeated in the artifact listing, it is possible that part of the discrepancy is due to a word processing or editing error in the report of investigations.

O'Malley et al. (1980:194) describe 15Md194 as an isolated prehistoric find at an elevation of 680 feet on an upland knob in a karstic region. The isolate is reported to be a projectile point fragment, but it was not considered to be temporally or culturally diagnostic. O'Malley et al. (1980:194) describe the find locale as in grass, with 85 to 100 percent visibility, but disturbed by tank activity. The 15Md194 site form (Grant, Stanley and Paulk 1979) states that "two flakes were within 2 meters of each other" at this site in the "site description" section, but lists one projectile point and one piece of chert debitage in the "materials collected" section.

In the current survey, a large number of chert flakes were dispersed evenly across a 115 m (north-south) by 140 m, or 16,100 m^2, area that was crisscrossed by tank trails (Figures B-1 and B-5). Areas of intact topsoil and possibly

cultural deposits were evident between the trails and in the center (between the track ruts) of a trail that passed through the site on an east-west axis. The slopes of the cutbanks made observation of the wall profiles difficult, but there appeared to be at least 10 cm of topsoil remaining over portions of the site.

Obvious chipping stations, including one with a chert hammerstone, were seen. Only a few chipped stone tools (one burnt, medial projectile point fragment and one biface fragment) were recovered from the site, despite the abundance of debitage, and none of the tools were diagnostic. Eight flakes, a small number for the total amount of debitage on the site, have been retouched or show use wear. All the utilized or retouched flakes and the unutilized debitage (18 secondary, 64 tertiary, and 59 pieces of chert shatter) is of high quality, fine-grained, blue/gray Wyandotte or St. Louis chert with few internal flaws, as are the two cores found on the site. This is the same nodular and tabular raw material found residually on the surface in the vicinity of the site, but it was not determined where it was being gathered. Many flakes are burnt and a high percentage have been crushed by the aboriginal occupants or by tanks. The debitage was from the intermediate to late stages of manufacture and refined retouch of tools, and some trim flakes from nodules are present. No large broken or discarded tools were found. This site appears to be a short-term habitation or special activity site, possibly repeatedly used for the exploitation of the resources of the nearby sinkholes.

The area collected as 15Md196 encompasses both the 15Md196 and 15Md194 locations as reported by O'Malley et al., plus the intervening space in which no cultural materials were previously reported. There was no break in the distribution of the artifacts. The area of 15Md196 as observed in the current survey greatly increases the dimensions of the site and subsumes the smaller 15Md194 location.

Site 15Md196 is potentially eligible for the National Register due to the presence of intact topsoil over portions of the site, and the presence of artifact concentrations, including at least one representing an activity area. Complete avoidance of the site in the rehab activities is not a recommended action, since the many exposed slopes on the site will continue to erode. Grading of the tank trails and plowing of the site also is not recommended, because it will damage this fragile site and is unlikely to control erosion of the site if there is heavy rain shortly after seeding. If feasible a partial rehab/partial avoidance plan should be followed, saplings or shrubs should be planted around the perimeter of the site and at the bases of the eroding slopes and the interior portion of the site carefully planted in a spreading vine or other ground cover. This alternative would serve to mark the site location and control erosion of the site without causing additional disturbance of the site.

If the partial rehab/partial avoidance alternative is not feasible, the site should be surface collected in grid squares no larger than 2 m square prior to any rehab activity. Thorough shovel probing of areas with vegetation or intact topsoil should also be conducted prior to any rehab activity. During the rehab activities, a professional archaeologist should be present to monitor the earthmoving to recover diagnostics and other cultural materials and to identify cultural features, if any exist. If any cultural features are discovered, all machine earthmoving in the vicinity of the features should cease, and the features should be excavated using standard archaeological techniques.

15Md198

O'Malley et al. (1980:92-93) describe 15Md198 as "lying on a ridge crest and slope in a karstic region" at an elevation of 700 feet. A total of 69 prehistoric artifacts and eight historic artifacts were recovered over a 30 m by 45 m, or 1350 m^2, area by O'Malley et al. Visibility was described as 85 to 100 percent in a severely eroded area in sparse grass (O'Malley et al. 1980:92). The prehistoric artifacts collected by O'Malley et al. (1980:92-23) consisted of one point fragment, four bifaces, 11 modified flakes, eight cores, 44 unutilized chert flakes, and one piece of raw material. The historic artifacts included whiteware, porcelain, stoneware, a canning jar lid liner fragment, and a piece of amethyst bottle glass (O'Malley et al. 1980:93). The site form describes the site as "almost destroyed by erosion" (Jobe, O'Malley et al. 1979).

Eleven pieces of debitage (two secondary and three tertiary flakes plus six pieces of chert shatter), one piece of buff stoneware and one piece of amethyst dish glass were recovered from a 30 m (north-south) by 20 m area of 15Md198 during a one person-hour resurvey of the site (Figures B-1 and B-6). The primary purpose of the reexamination was to confirm the location given in O'Malley et al. 1980. Visibility was apparently worse than when O'Malley et al. surveyed the site. Most of the area has scrub vegetation that limited visibility to 10 to 30 percent, but it was still obvious that a very shallow topsoil zone existed in limited patches. These patches are too small to contain potentially intact or significant cultural deposits. Deep erosional gullies were present on the west, north and east slopes of the site, especially in abandoned tank trails.

The reexamination of 15Md198 indicates that the site is not eligible for the National Register due to disturbance from tank training and severe erosion. No additional archaeological research is recommended for 15Md198.

15Md217

Site 15Md217 was originally described as a sparse lithic scatter of indeterminate cultural-temporal affiliation lying on a small upland knob in a karstic region at an elevation of 700 feet (O'Malley et al. 1980:94). O'Malley et al. recovered seven artifacts (one biface, one end scraper, one modified flake, and four unutilized flakes) from a 20 m by 20 m, or 400 m^2, area. Visibility was 100 percent, with only sparse grass on the site at the time of their survey. The site form (Jobe, Grant, Webb et al. 1979) suggests that 15Md217 may have been related to nearby 15Md218, and states that 15Md217 was "noticeably disturbed" by tank activity.

Three pieces of chert debitage were recovered from a 10 m (north-south) by 30 m, or 300 m^2, area of 15Md217 during a one-half person-hour resurvey of the site in the current project (Figures B-1 and B-7). These included one tertiary flake and two pieces of chert shatter, all small and from biface reduction. Visibility on the site was nearly 100 percent because the area was eroded by many intersecting tank trails. Almost all the site area was eroded to at least 1 m below the original ground surface, and the less eroded areas had many ruts and gullies.

The reinspection of 15Md217 indicates that the site is not eligible for the National Register due to severe erosion resulting from tank training. No additional archaeological research is recommended at 15Md217.

15Md218

O'Malley et al. (1980:94-95) describe 15Md218 as lying at an elevation of 730 feet on a ridge crest in the upland karstic plain. The site was in sparse grass at the time of their survey, with 100 percent visibility. A total of 11 artifacts were collected over a 20 m by 40 m (north-south), or 800 m^2, area. The artifacts consisted of one biface, one side scraper, and nine unutilized flakes (O'Malley et al. 1980:95). The site form (Jobe, Grant, Stanley et al. 1979) describes the site vicinity as tank-disturbed and severely eroded.

Seven pieces of debitage were recovered from a 60 m (north-south) by 50 m, or 3000 m^2, area of 15Md218 during a one-half person hour resurvey of the site (Figures B-1 and B-7). These consist of two small secondary trim flakes, one small tertiary flake resulting from biface reduction, and four pieces of chert shatter (one medium-sized, three small, and all from biface reduction).

No historic artifacts were reported in the O'Malley et al. survey, but 14 historic items were recovered in the cur-

rent survey, all from the north half of the site. These consisted of one piece of aqua bottle glass, three pieces of clear bottle glass, one piece of green flat glass, two buff stoneware sherds, three ironstone sherds, and four whiteware sherds. One whiteware body sherd has flow blue decoration, which dates from 1840-1865 (Price 1979:31). One whiteware base sherd has a painted English tea leaf decoration, with green leaves and stems, and dates from 1830-1870 (Price 1979:31). One whiteware rim has relief decoration, and the remaining whiteware and ironstone sherds are undecorated. The assemblage suggests a mid-nineteenth century to late nineteenth or early twentieth century historic occupation. This site is on a tract acquired by the Army from the Department of the Interior ca. 1940 and acquired by the Department of the Interior from unknown private landowners ca. 1925. No structures appear at this location on a 1940 Army map, suggesting any buildings were already in ruins then which fits with the artifact assemblage.

Visibility on 15Md218 was limited to 40 percent by grass and sparse weeds in the area not exposed by tank tracks and 100 percent in tank trails. The resurvey indicates that the entire site had been eroded or deflated to subsoil. Soils in this area attain a quicksand-like quality when saturated, and small ponds, with established cattails and other aquatic vegetation, had formed where tanks had become mired in low spots. No artifact concentrations were observed on the site that were not associated with erosional features.

Site 15Md218 is not eligible for the National Register, due to its severely disturbed and eroded condition. No additional archaeological research is recommended for 15Md218.

15Md221

Site 15Md221 was described by O'Malley et al. (1980:97) as a lithic scatter of Late Archaic or Early Woodland cultural-temporal affiliation. The site lies on a ridge crest and slope, at an elevation of 660 feet, in the upland karstic plain. Sixteen artifacts were collected from a 15 m by 40 m, or 600 m^2, area, in the O'Malley et al. survey. These include one Turkey-tail point, four cores, one modified flake, and 10 unutilized chert flakes. The site form states, "the site appears to be fairly well preserved, having been stabilized by vegetation and not severely impacted by tanks" (Jobe, Webb, et al. 1979).

One utilized tertiary flake and one buff stoneware sherd were recovered from 15Md221 (Figures B-2, B-8, and B-9). The site was not intensively collected, the primary purpose of visiting it was to confirm the location given in O'Malley et al. 1980. Although the narrow (3 m wide) tank trail passing through the site is eroded to subsoil, an intact topsoil zone approximately 20 cm thick was noted in the tank

trail cutbanks. On either side of the tank trail, the site is heavily vegetated. The site may extend onto the private property west of the installation boundary.

Despite the small assemblage resulting from the two surveys of the site (O'Malley et al. and current), site 15Md221 is considered potentially eligible for the National Register. Ground surface visibility was poor and the tank trail afforded the only good visibility in both surveys. The high ratio of cores to assemblage size suggests that the site may be a special activity area, which also warrants further investigation of the site. It is recommended that the grading of the trail through the site vicinity should be monitored by a professional archaeologist to recover any artifacts and document any features that might be exposed in the cutbank.

15Md222

O'Malley et al. (1980:97-98) describe 15Md222 as lying on a low ridge, at an elevation of 660 feet, in a karstic plain. They discovered the site in a secondary growth forest, with 15 to 25 percent visibility. Fourteen artifacts (two cores, 10 unutilized flakes, and two pieces of raw material) were found over a 20 m by 60 m, or 1200 m^2, area. Most of the artifacts were found in or near a road cut, and two were found in shovel tests (Grant et al. 1979). Grant et al. (1979) state that disturbance of the site vicinity was limited to the road, and that the site warranted further investigation.

Two secondary flakes and three tertiary flakes, all Wyandotte chert, were recovered from 15Md222 in the current survey (Figures B-2 and B-8). The primary purpose of the inspection was to confirm the location given in O'Malley et al. 1980. The site was not intensively collected, because ground surface visibility was generally poor except in the tank trail that passes through the site. Areas of intact topsoil and vegetation were observed that are sufficiently large that they could potentially contain intact cultural deposits.

Site 15Md222 is potentially eligible for the National Register due to field conditions not conducive to its thorough assessment. It is recommended that the grading of the trail through the 15Md222 site vicinity should be monitored by a professional archaeologist to recover any artifacts and document any features that might be exposed in the cutbank.

15Md231

Site 15Md231 lies at an elevation of 640 feet on the top and slope of a ridge near McCracken Springs (O'Malley et al.

1980:102). A total of 155 artifacts were collected from a 70 m by 80 m, or 5600 m^2, area, under conditions of good (85 to 100 percent) visibility. The artifacts collected by O'Malley et al. (1980:103) include one drill, 10 bifaces, four cores, 17 modified flakes, and 123 unutilized flakes. The site form (Jobe, Stanley, and Webb 1979) mentions the presence of a moderate concentration of cultural material in a 20 m by 20 m area.

In the current survey, two secondary and one tertiary flakes were recovered from 15Md231 (Figures B-2, B-10, and B-31). Site 15Md231 was not intensively collected in the current survey, because it lay outside any proposed rehab area. It was encountered while the crew was getting their bearings while moving from the Rehab Area 2 project area to the Rehab Area 11 project area. The primary purpose of the inspection was to confirm the location given in O'Malley et al. 1980.

Site 15Md231 is considered potentially eligible for the National Register. Although portions of the site were eroded to subsoil, stands of vegetation possibly contained intact topsoil. Since the site lay outside any proposed rehab area, no additional research is recommended in conjunction with the rehab project, but further investigation of 15Md231 is required at sometime in the future.

15Md237

O'Malley et al. (1980:105-106) describe 15Md237 as a large Late Archaic lithic scatter "located on the crest, margin and slope of the ridge overlooking McCracken Spring" (O'Malley et al. 1980:106). They collected a total of 95 artifacts over a 100 m by 100 m, or 10,000 m^2, area. The artifacts included one contracting stem point (a Rowlette [sp.]), three bifaces, one side scraper, one "flaked angular hammerstone" (probably a chert hammerstone), seven modified flakes, six cores, and 76 pieces of chert debitage. The site form (Jobe, Grant et al. 1979) suggests that these materials were collected in a 15 minute period by a crew of five.

Site 15Md237 was resurveyed during the present project for one and one-half hours by three people. There was a very consistent scatter of chert and several concentrations of debitage along the tank trails that dissected the site (Figures B-2 and B-11). Intact topsoil deposits of 20 cm or more were evident in the cutbanks of the islands of vegetation between the tank trails.

One complete St. Albans Side Notched projectile point (Figure 4c) and a heavily fire-pocked proximal fragment of another were found (Figure 4b) were recovered from 15Md237. St. Albans points are diagnostic of the Early Archaic, ca. 6900-6500 B.C. (Justice 1987:90-91). A basal fragment of an

Early or Middle Archaic projectile point (Figure 4a), possible a Big Sandy Side Notched, was also found.

Five biface fragments that were broken or discarded in early stages of manufacture and one ovate biface, possibly a gouge, also were recovered. Numerous wedges or small cores were found, and many utilized and retouched flakes with cutting, scraping, and engraving wear were identified. A hammerstone and a cluster of small flakes found near it represent a knapping station. Most of the debitage was from intermediate to late stage reduction of both nodular and tabular raw material, but little cortex was present on the flakes, perhaps an indication that quarry blanks were being worked. While there was only limited evidence of refined tools, many flakes appear to derive from bifaces in early and intermediate stages of manufacture. Wyandotte and high-quality upper St. Louis cherts were preferred, but these are found in the vicinity.

Site 15Md237 is potentially eligible for the National Register. Site 15Md237 appears to be a multi-component site that bears evidence of multiple short-term habitations and special activities. Even the portions of the site eroded to subsoil had dense artifact concentrations suggestive of either deflated midden deposits or feature remnants. The site lies outside any proposed rehab area, so no archaeological research is recommended for 15Md237 in conjunction with the rehab project. It is recommended, however, that the heavy machinery to be used to grade Rehab Area 11 should avoid using the tank trails passing through 15Md237. If funds are available, efforts should be made to protect 15Md237 by blocking the tank trails leading into the site boundaries, or otherwise marking the site as off-limits to vehicular traffic, and planting ground stabilizing cover on the more eroded portions of the site.

Newly Recorded Archaeological Sites

15Md387

Site 15Md387 is at an elevation of 660 to 680 feet at the edge of a sinkhole, about 1 km west of Otter Creek (Figures B-1 and B-12). No obvious permanent water sources were nearby, though a nearby sinkhole contained water after considerable rain. Cultural material was found over a 100 m (east-west) by 80 m, or 800 m^2, area around the top of a sinkhole. Most of the site surface was obviously eroded to subsoil from extensive tank training. Visibility in the less eroded areas was limited to less than 10 percent by scrub growth, trees, and leaves, but areas of dense vegetation were 3 m or less in width.

The prehistoric materials recovered from 15Md387 consisted of two biface fragments, one core, six secondary flakes and eight tertiary flakes. One biface fragment is the proximal fragment of a medium sized, thin, biface broken in an intermediate stage of manufacture. The other was broken early in the manufacturing process. All the secondary flakes and one of the tertiary flakes are trim flakes, and the other seven tertiary flakes are small to very small biface reduction flakes. All but three of the lithic materials are St. Louis chert, and these three, all secondary flakes, are either St. Louis or Wyandotte chert. This may be a special activity site not related to lithic manufacture. Most or all of the debitage derives from late stage reduction or retouch. None of the prehistoric materials recovered from 15Md387 is culturally or temporally diagnostic.

The historic materials recovered include two buff stoneware sherds, one pearlware basal sherd, two semi-porcelain sherds, six ironstone sherds, four porcelain dish sherds, one whiteware body sherd, one piece of aqua bottle glass, and six clear glass bottle body fragments. The four porcelain dish sherds probably derive from a single vessel, although they could not be refit. Two are base sherds with a brown and green floral transferprint and two are body sherds. The semi-porcelain sherds consist of one scalloped rim with relief decoration and one base. The six ironstone sherds include one rim, two bases, and three small sherds. One of the bases is from a transferprint calendar plate, but the year was not identifiable (although review of a perpetual calendar would certainly narrow down the possibilities to those years where match the date arrangements within the months visible on the sherd). The rim recovered from 15Md387 is scalloped with relief decoration and reproduction flow blue. The remaining base has a tinge of blue, which suggests it also may be from the reproduction flow blue piece. Whole examples of reproduction flow blue displayed at antique stores (sold as real flow blue) and observed by Schenian were manufactured by the French China Company, with marks dating ca. 1898-1916 (Gates and Ormerud 1982:47-49).

No evidence of structural remains was found on the site. Site 15Md387 lies on a large tract of land acquired by the Army ca. 1940 from the Department of the Interior. The Department of the Interior acquired the land ca. 1925 from unknown private landowners. One building is shown at the 15Md387 locale on a 1940 Army map. The assemblage and acquisition information suggest a turn of the century to ca. 1925 date for the historic component of 15Md387, with a minor amount of older materials (one pearlware sherd and one whiteware sherd) in the assemblage.

After the initial visit, site 15Md387 was considered potentially eligible for the National Register due to the presence of several small, isolated areas of potentially intact topsoil, and this was noted on the state site form.

On a subsequent visit intended to conduct shovel probing, it was determined by visual examination of the cutbanks of these islands of vegetation that the perceived topsoil zone had been result of the incomplete drying of the cutbank following heavy rains the day before the initial survey. The islands of vegetation were determined to have only a thin humic zone overlying subsoil. The interiors of these islands of vegetation had tire ruts, foxholes, and pools of standing water. Thus it was determined that all areas of the site were eroded to subsoil, just some more so than others. It is therefore recommended that 15Md387 is not eligible for the National Register due to the evidence for potential intact cultural deposits. No additional archaeological research is recommended for 15Md387.

15Md388

Site 15Md388 lies at an elevation of 685 feet on a narrow spur of land above two sinkholes (Figures B-2 and B-13). The surrounding sinkholes contained water after considerable rain. Prehistoric material was found over a 70 m (northeast-southwest) by 40 m, or 2800 m^2, area between the sinkholes. Almost all of the surface was eroded to subsoil as a result of extensive tank training. Several small, isolated islands of vegetation were still intact between the three sets of converging tank trails, but were too narrow to contain intact deposits that would not have been exposed in the tank trails. Visibility in the vegetated areas was limited to less than 10 percent by scrub growth and trees.

A proximal fragment of a Raddatz or Godar Side Notched projectile point (Figure 4d) indicates Middle Archaic use of the site, and a proximal fragment of an Adena Stemmed point (Figure 4e) demonstrates Late Archaic/Early Woodland activity. A biface, possibly a backed cutting implement, was also recovered from 15Md388. Other materials recovered include two utilized flakes, a possible burin, and a small amount of unutilized chert debitage. Most or all of the debitage derives from late stage reduction or retouch. Site 15Md388 may be a special activity site not related to lithic manufacture.

Site 15Md388 is not eligible for the National Register due to severe erosion and the lack of evidence for potentially intact cultural deposits. No further investigation of 15Md388 is recommended.

15Md389

Site 15Md389 is at an elevation of 660 feet along an east-west trail on the south edge of a large sinkhole and surrounded by other sinkholes (Figures B-2 and B-14). No

obvious water sources were nearby, though the surrounding sinkholes may have contained water.

Almost all of the surface was eroded to subsoil after extensive tank training. Several small, isolated islands of vegetation were still intact and the eroded side slope of the sink may have small areas of intact soil, but the small size of these areas and steepness of the slope makes it very unlikely that any intact cultural deposits could exist in these areas. Visibility in the non-eroded areas was limited to less than 50 percent by scrub growth and grass.

The historic component of 15Md389 is represented by historic debris, but there was no evidence of structural remains. The materials recovered include bottle, lid liner, and dish glass; stoneware, ironstone, and semi-porcelain and porcelain dish sherds; and a porcelain statue fragment. The bottle glass includes one amber body fragment, one olive body fragment, one green base segment from a panel bottle, one aqua screw-top jar mouth fragment, and three aqua body fragments. The dish glass consists of two amethyst rims and seven amethyst body fragments. One gray stoneware sherd and one buff stoneware sherd have salt glaze exteriors, and the other five buff stoneware sherds have glazes in various shades of gray or brown. The ironstone sherds consist of one cup base, one other base and two rims, none with decoration. The five semi-porcelain sherds represent one large vessel with dark brown glaze (possibly a chamberpot), one molded body, one other body, one base, and one additional base with brown painted floral decoration and a partial maker's mark. This last sherd is interesting because the placement of the maker's mark and the decoration appear to be reversed from the normal placement (in other words, the decoration would be facing the table and the maker's mark the user). The maker's mark, of which too little was present to permit identification, also has brown paint streaks next to the mark, as if the artist had tested their brush stroke thickness. This sherd looks like it came from a practice piece or a factory second.

Site 15Md389 is located on property acquired by the Army from George Wolkins ca. 1918. Wolkins' farmstead is not shown at this location, however, suggesting that this site had already been abandoned and any associated structures were already in ruins by 1918. Since the artifact assemblage suggests a late nineteenth to early twentieth century date, an alternate explanation is that this is a dumping area associated with the Wolkins farmstead.

Site 15Md389 is not eligible for the National Register due to severe erosion of the tank trails, and the absence of areas of potentially intact cultural deposits. No further archaeological investigation of 15Md389 is recommended.

15Md390

Site 15Md390 lies directly west of Basham Road at an elevation of 680 feet on a narrow ridge spur to the west of a large sinkhole and to the southeast of a smaller sinkhole (Figures B-1 and B-15). No obvious water sources were nearby, though one of the surrounding sinkholes contained water after heavy rains. Almost all of the site surface was eroded to subsoil, as much as 1 m below the former surface, because of extensive tank training. The few remaining areas of topsoil were either so small that intact deposits, if any had existed, would have been exposed in the cutbanks, or else were clearly disturbed. Several small, isolated islands of vegetation existed on the site, coinciding with the areas with topsoil. Visibility was nearly 100 percent except in the vegetated areas, where ground surface visibility was nearly zero percent, but ruts, foxholes, and other disturbance were observed.

The historic component of 15Md390 consists of a scatter of historic debris over a 20 m (east-west) by 30 m, or 600 m^2, area. The historic artifacts recovered from 15Md390 include bottle, dish, lid liner, and furniture glass as well as glass slag; ceramic architectural tile; one brick fragment; buff and brown stoneware; and whiteware. One piece of dish glass, from a container lid, and the piece of furniture glass (probably a table top) are the yellowish shade indicative of the presence of selenium. One buff stoneware sherd has blue painted decoration, and the two brown stoneware sherds refit. One aqua bottle glass piece is a body fragment with embossed decoration. The whiteware sherds consist of one rim, one base, one body, and one additional body with a blue wash glaze on the exterior and interior and additional blue painted decoration on the interior. The other historic materials have no remarkable characteristics. The prehistoric material recovered from 15Md390 consists of one large chert flake found as an isolate near the west margin of the site.

No evidence of structural remains was found at 15Md390 other than the one brick fragment and one piece of architectural tile. The site is located on property acquired by the Army from J.A. Bill and wife ca. 1940. A 1940 Army map shows a building at this location, probably the Bill house. The assemblage appears to date from the turn of the century to ca. 1940.

Site 15Md390 is not eligible for the National Register due to the extremely eroded ground surface and lack of areas of potentially intact cultural deposits. No additional archaeological work is recommended for 15Md390.

15Md391

Site 15Md391 lies directly west of Basham Road at an elevation of 650 feet on a narrow ridge spur above several sinkholes (Figures B-1 and B-16). No obvious water sources were nearby, although one of the surrounding sinkholes may have contained water. Prehistoric and historic material was found over a 40 m by 40 m, or 1600 m^2, area. Almost all the site surface was eroded to subsoil as a result of extensive tank training, with tank trail bases more than 1 m below the original ground surface. Several small, isolated islands of vegetation were still possibly intact on the site. Visibility in the non-eroded areas was limited to less than 10 percent by scrub growth, trees, and leaves, but these areas were so narrow that no intact cultural deposits could exist that would not have been exposed in the cutbanks. The vegetation present in these islands consisted of small saplings and scrub growth, suggesting that the islands also had been denuded until just a few years ago.

Prehistoric cultural material at 15Md391 was limited to three unutilized flakes and one retouched flake. The tertiary flake is from biface reduction, and one of the secondary flakes is a medium trim flake. None of the prehistoric materials from 15Md391 are culturally or temporally diagnostic.

The historic component of 15Md391 is represented by a wide range of historic household artifacts. No evidence was found of structural remains other than a fragment of slate roofing tile and window glass (one aqua and four green). The other historic artifacts recovered include bottle, dish, and lid liner glass; redware, stoneware, pearlware, ironstone, porcelain, and whiteware dish sherds; and one porcelain statue sherd.

The artifact assemblage suggests that there have may have been a continuous occupation from the early nineteenth to late nineteenth century or else two occupations of 15Md391 during the historic period--one in the early to mid-nineteenth century and one in the late nineteenth to early twentieth century. Early materials recovered from the site include two redware sherds from storage vessels (crocks?), pearlware, some of the whiteware, and a green bottle base. The bottle base has a pontil mark and rough glass, dating 1810 to 1870 (Newman 1970:70-75). The eight pearlware sherds consist of two refit body, one additional body, three base sherds, one body sherd with blue painted decoration, and one base sherd with maroon bat print, probably from a memorial or historical scene. Bat print dates 1780-1810 and blue painted decoration on pearlware dates 1780-1830 (Smith 1983:171). One whiteware rim sherd has multicolor painted floral decoration dating 1830-1870 (Price 1979:31), two whiteware body and one rim sherd have transfer prints dating 1830-1860 (Price 1979:31).

The other whiteware sherds, datable only from 1830 to 1890, consist of six plain rims, one rim with relief decoration, one tea rim, 10 plain body sherds, seven chips from body sherds, one body with relief decoration, two cup bases, three saucer bases, two plate bases, three bases from unidentified vessel types, three basal chips, and three base sherds (one saucer and two plate) with maker's marks. None of the marks are complete enough to be identifiable, although one has part of the phrase "ROYAL IRONSTONE" (even though it tests out as whiteware). This phrase does not appear on dishes until the later range for whiteware (post-1860, but more likely post-1880). A porcelain statue sherd has an old appearance, but is too small to permit accurate identification.

The materials that date to the late nineteenth to early twentieth century other than the whiteware sherd labeled as ironstone, includes all the amethyst glass, two clear glass fragments from condiment jars, the milk glass lid liners, the ironstone and semi-porcelain sherds, probably the porcelain dish sherds, and most of the other glass. One aqua bottle piece is part of a "Five Minute Cough Cure" medicine bottle. This bottle was manufactured by Whitall-Tatum from 1857 to 1935 (Toulouse 1972; Fike 1987:98). The nine porcelain dish sherds consist of three bases (two saucer, one cup), two rims, two plain body, one body with remnants of stylized floral transfer print, and one body with floral transfer print. The transferprint decorations have a twentieth century feel to them. Four ironstone rim sherds (one scalloped, one unscalloped, and two too small to determine) have relief decoration and another ironstone rim has an elongated scallop, light blue underglaze at the rim, and applique slip decoration in blue in a grapevine motif (possibly a ca. 1910 Arts and Craft Movement ware). One ironstone base has remnants of transfer print in a floral pattern against an ornate background. Ornate transferprint patterns on ironstone were popular ca. 1895-1910, after which simpler patterns came into vogue. The other ironstone recovered from 15Md391 consists of three bases, 10 body sherds, and five rims, all plain. The amethyst dish glass is intriguing--three refit pieces from a lid handle plus five chips probably from the same handle, another large lid handle, and one jar stopper (all lids, no containers?). The other artifacts from 15Md391 have no remarkable or chronologically diagnostic characteristics.

Like 15Md390, site 15Md391 is located on property purchased by the Army ca. 1940 from J.A. Bill and wife, but no large buildings are shown at this location on a 1940 Army map. Based on the assemblages and map data, it appears that 15Md391 represents one or more earlier historic occupations of the property and that any associated structures were in ruins by the time of Army acquisition. The artifact assemb-

lage does not appear to contain any materials that are clearly Depression era or later.

Site 15Md391 is not eligible for the National Register due to severe erosion of the surface and the lack of areas of potentially intact topsoil. Although a large quantity of cultural material is present, the number of artifacts has been increased by fairly recent tank breakage and crushing. No additional archaeological work is recommended for 15Md391.

15Md392

Site 15Md392 is located along the west installation boundary at an elevation of 710 feet in the midst of three sinkholes (Figures B-1 and B-17). No obvious water sources were nearby, though the surrounding sinkholes may have contained water. Prehistoric material was found over a 20 m by 20 m, or 400 m^2. The tank trails were eroded below the original ground surface, but there were areas of intact topsoil between the trails and to the west of the trails, along the boundary. Visibility in the non-eroded areas was limited to less than 10 percent by scrub growth, trees, leaves, and dense stands of poison ivy, but small areas of the cutbank that were scraped revealed cultural material.

This may be a special activity site or short-term habitation site, probably related to exploitation of sinkhole resources. Most of the debitage is derived from late stage reduction or retouch. A Cogswell Contracting Stemmed projectile point (Figure 4f) and the proximal-lateral fragment of a straight stemmed or expanding stemmed point were found along the cutbank. These point types indicate a Late Archaic-Early Woodland occupation.

A band of dark soil approximately 15 m long along the west cutbank of the westernmost tank trail is believed to be intact midden deposits (Figure B-34). Most of the cultural materials were found eroding from the cutbank, and three piece of chert debitage were recovered from the 25 cm wide section of midden that was scraped. The narrow area of intact soil between the tank trails was too densely vegetated on its slopes to determine if intact cultural deposits are present in this strip, but it is likely that the midden deposits continue into this strip.

Site 15Md392 is potentially eligible for the National Register due to the presence of the presence of intact topsoil on a portion of the site. Midden deposits were exposed in a roadcut, which suggests that additional cultural features may be present. Further investigation is necessary before the site can be adequately assessed. The site may continue westward onto private property. The rehab activities in the site vicinity will include grading of the trails

and possibly the grading of the narrow intact area between the trails, but not between the west trail and the installation boundary. The site boundaries will be marked with flagging tape so it can be avoided by the heavy machinery operators until an archaeologist is on-site to monitor the earthmoving activities. The monitoring will include the recovery of any artifacts and documentation of any features that might be exposed by the earthmoving activities.

15Md393

Site 15Md393 lies along the western installation boundary on a narrow ridge spur that is in the midst of three sinkholes, at an elevation of 690 feet (Figures B-1 and B-17). No obvious water sources were nearby, though the surrounding sinkholes may have contained water. Prehistoric material (20 pieces of unutilized chert debitage) was found over a 55 m (east-west) by 5 m, or 275 m^2, area along a tank trail. Almost all the site surface, including the area presently vegetated, was eroded to subsoil by extensive tank training. Visibility in the areas with vegetation was limited to 30 percent by scrub growth, trees, and leaves, but was 100 percent in open areas. The few areas containing topsoil were so narrow that intact deposits, if any had been present, would have been exposed in the erosional cutbanks. The small debitage sample reflects that relatively refined bifaces were being made at the site.

Site 15Md393 is not eligible for the National Register due to severe erosion, lack of areas of potentially intact topsoil, and lack of evidence for potential intact cultural deposits. No further investigation of 15Md393 is recommended.

15Md394

Site 15Md394 is located on the western boundary of Fort Knox in the middle of four sinkholes at an elevation of 690 feet (Figures B-1 and B-18). No obvious water sources were nearby, though the surrounding sinkholes may have contained water. Several chert flakes (one retouched secondary flake, one unutilized secondary flake and three unutilized tertiary flakes) were found in a tank trail over a 15 m (east-west) by 5 m, or 75 m^2, area. Almost all of the site surface had been eroded to subsoil by extensive tank training. The small sinkholes near the site contained water and well-established aquatic vegetation. Several small, isolated islands of vegetation were still intact, but none were large enough to contain significant deposits that would not have been exposed in the adjoining open areas. Visibility in the non-eroded areas was limited to less than 30 percent by scrub growth, trees, and leaves, but was 100 percent on the rest of the site.

Site 15Md394 is not eligible for the National Register due to severe erosion and the lack of evidence for potential intact cultural deposits. No further investigation of 15Md394 is recommended.

15Md395

Site 15Md395 lies near the western installation boundary among several sinkholes at an elevation of 675 feet (Figures B-1 and B-19). No obvious water sources were nearby, though the surrounding sinkholes may have contained water. Several chert flakes (two secondary, four tertiary) were found within a 10 m by 10 m, or 100 m^2, area. Almost all the surface was eroded to subsoil after extensive tank training, and the remaining areas were too small to potentially contain intact cultural deposits. Visibility in the non-eroded areas was limited to less than 10 percent by scrub growth, trees, and leaves, but was 100 percent on the tank trails.

Site 15Md395 is not eligible for the National Register due to severe erosion and the lack of areas of potentially intact topsoil or cultural deposits. No further archaeological research is recommended for 15Md395.

15Md396

Site 15Md396 is located at an elevation of 690 feet at the southwest edge of a sinkhole (Figures B-1 and B-20). No flowing water sources were nearby, but the adjacent sinkhole contained a large amount of standing water after considerable rain. Three chert flakes were found over a 25 m (east-west) by 5 m, or 125 m^2, area around the top of the sinkhole. All the surface was eroded to subsoil by extensive tank training and severe erosion, and the tank trails were well below the former surface. No intact topsoil was present on the site. Visibility was nearly 100 percent because there was almost no vegetation. High-quality, residual Wyandotte or upper St. Louis chert was abundant on the eroded surface and may have been available for exploitation by the prehistoric occupants of the site.

Site 15Md396 is not eligible for the National Register due to extreme erosion of the surface and the lack of potentially intact topsoil and cultural deposits. No additional archaeological work is recommended for 15Md396.

15Md397

Site 15Md397 is located on a long, very low, linear rise on a relatively wide level area (Figures B-1, B-21, and B-22). This upland plain includes a low area that seaso-

nally contains water to the south and in a deep sinkhole to the east of the site. Despite the extreme length of the site, it fluctuates only a few feet in elevation, averaging 685 feet. No flowing water sources are nearby, but the sinkhole to the east probably contains water for much of the year. Much of the surface was eroded or deflated to the upper level of the subsoil zone as the result of extensive tank training, but areas of trees, scrub growth, and grass remain. Several small, isolated islands of vegetation were still intact and may contain intact cultural deposits. Visibility was 90 percent in the tank trails but the vegetated areas had only about 10 percent visibility.

Prehistoric material was found over a 270 m (east-west) by 60 m, or 16,200 m^2, area. One chert concentration was found near the center of the site and extended into the vegetated area between the east-west tank trails. Another concentration was found eroding from a small pedestaled area of intact soil at the east end of the site. The debitage appears to derive from trim and bifacial reduction of nodules of high quality Wyandotte and St. Louis chert, but there is little evidence of tools in the initial stages of manufacture or late stage reduction and resharpening of tools. The lithic debris (378 pieces of unutilized debitage) was primarily small to very small edge preparation and bifacial reduction flakes from tools in intermediate stages of manufacture. Few were resharpening, fine retouch, or pressure flakes. Only six flakes show use wear or retouch. No manufacture rejects were found. Much of the debitage is burnt, and a large amount was fractured. This is not unusual in a tank training area, but the percentage of flakes with these forms of alteration seemed particularly high. It is possible that this is due in part to activity during the aboriginal occupation, rather than solely due to post-depositional processes, since many of the flakes were found on the sides of pedestaled areas of intact soil.

A serrated projectile point tip (Figure 5a), probably from a Kirk Serrated or Corner Notched point, was the only diagnostic tool recovered. Four bifaces and one scraper were also recovered. The deposits may represent one or more short-term prehistoric habitation components and repeated use of the area for special activities, perhaps related to the exploitation of sinkhole resources.

The historic component consists of several pieces of historic debris, but no evidence of structural remains was found. Historic materials are densest on the west half of the site, but historic artifacts were found throughout the site.

A total of 62 historic artifacts were recovered from the site and include bottle, dish, lid liner, window, and lamp glass; a zinc canning jar lid; yellowware, whiteware, stoneware, ironstone, semi-porcelain, and porcelain dish sherds;

one square nail; and one doll part. The yellowware rim sherd has blue spatterware decoration. The semi-porcelain and porcelain sherds are undecorated. The five whiteware sherds consist of two small rims, two body sherds, and one scalloped rim with curved, impressed, blue shell-edge decoration. This shell-edge type on whiteware dates 1830-1845 (Miller 1989; Price 1979:31). The five ironstone sherds consist of one body with a painted band, two rims; one chip; and one scalloped rim with relief decoration and a multicolor floral transfer print decoration, which is probably an early twentieth century pattern. The one piece of lamp glass is slate-colored glass from the base of a kerosene lamp. One amethyst dish glass piece is the base of a tumbler. All the other historic artifacts have no distinctive characteristics.

Site 15Md397 is located on property acquired by the Army ca. 1940 from the Department of the Interior, which had acquired it from unknown private owners ca. 1925. Two buildings are shown on the site on a 1940 map. The historic artifact assemblage together with the ownership information suggests a ca. 1850 to ca. 1925 date for the site.

Site 15Md397 is potentially eligible for the National Register due to the presence of several areas of potentially intact topsoil, the artifact density, and potential for intact cultural deposits. A dense concentration of prehistoric materials (n=122) was found along a 10-15 m length of the cutbank of one of the areas of intact topsoil, suggesting that intact cultural deposits may exist within the vegetated areas. Even a controlled surface collections of the eroded and deflated areas are likely to yield information about the chronology and activities at the site and possibly identify intact subsurface cultural features. It is recommended that additional archaeological investigations be conducted at 15Md397 prior to the rehab activities or else that the site be avoided. Due to its topography setting, 15Md397 is not in danger of extensive erosion if avoided in the rehab project.

15Md398

Site 15Md398 is at an elevation of 680 feet at the edge of a sinkhole (Figures B-1 and B-22). No obvious water sources were nearby, though one of the surrounding sinkholes may have contained water. A projectile point lateral fragment and two chert flakes were found within a 15 m by 15 m, 225 m^2, area around the edge of the sinkhole. Almost all of the surface was eroded to subsoil as a result of extensive tank training. Several trees, scrub, and sparse grass limited visibility to 80 percent. The only area of the site that has intact topsoil also contains a very large tree with a massive root system that is likely to have disturbed the topsoil zone.

Site 15Md398 is not eligible for the National Register due to erosion of the surface, small assemblage size, and the lack of potentially intact cultural deposits. Further investigation of 15Md398 is not recommended.

15Md399

Site 15Md399 lies at an elevation of 685 feet on a small, low rise at the edge of a sinkhole (Figures B-1 and B-23). No obvious water sources were nearby, but the adjacent shallow sinkhole contained water after considerable rain. The historic component consists of four items (one stoneware, one semi-porcelain, one ironstone, and one whiteware sherd). No evidence of structural remains was observed. Prehistoric material consisted of a biface distal fragment and two chert flakes found within a 10 m (north-south) by 5 m, or 50 m^2, area. Almost all the site surface was eroded to subsoil as a result of extensive tank training. Cultural material was found only in the eroded tank trail, despite 30 percent visibility in the surrounding area south of the sinkhole.

Site 15Md399 is on property acquired by the Army ca. 1940 from the Department of the Interior, which had acquired it from private landowners ca. 1925. No buildings are shown at this location on a 1940 Army map. The historic materials on 15Md399 may represent materials tracked in from 15Md397, although the setting is a plausible one for a small prehistoric site.

Site 15Md399 is not eligible for the National Register due to severe erosion and the lack of potentially intact cultural deposits. No further archaeological work is recommended at 15Md399.

15Md400

Site 15Md400 is located at an elevation of 685 feet on a low rise at the southwest edge of a sinkhole (Figures B-1 and B-23). No obvious water sources were nearby, but the adjacent sinkhole contained water after heavy rain. The historic materials recovered consist of one piece of amethyst pressed dish glass, and one gray stoneware. Prehistoric material (one biface fragment, one drill tip, and two pieces of chert debitage) was found over a 30 m (north-south) by 20 m, or 600 m^2, area. Most of the site surface had been eroded to subsoil by extensive tank training, and the trail was 1 m below the former surface in some areas. The area west of the trail was less eroded than the grass covered area to the east. The sparse grass allowed 20 percent visibility, and the scrub on the west side obscured visibility almost completely, although subsoil was observed

everywhere that the surface was visible. Visibility within the tank trail was approximately 100 percent.

Site 15Md400 is located on property acquired by the Army ca. 1940 from the Department of the Interior, which acquired it from unknown private owners ca. 1925. No buildings are shown at this location on a 1940 Army map, and no evidence was observed of potential structural remains.

Site 15Md400 is not eligible for the National Register due to severe erosion, the lack of potentially intact cultural deposits, and the sparse assemblage. No additional archaeological research is recommended for 15Md400.

15Md401

Site 15Md401 is near the western boundary of Fort Knox, located at an elevation of 675 feet at the base of a slight rise northeast of a sinkhole (Figures B-1 and B-24). No obvious water sources were nearby, but the sinkhole contained water after heavy rain. Prehistoric material (six pieces of unutilized chert debitage) was found over a 30 m by 30 m, or 900 m^2, area. Almost all the site surface was eroded to subsoil after extensive tank training. Visibility in the area around the tank trails was limited to less than 20 percent by scrub growth, small trees, and grass, and water covered parts of most trails, but considerable disturbance was observed in these areas. Ground surface visibility in the tank trails was nearly 100 percent, except in areas of standing water.

Site 15Md401 is not eligible for the National Register due to severe erosion and the lack of potentially intact cultural deposits. No further archaeological research is recommended for 15Md401.

15Md402

Site 15Md402 lies at an elevation of 675 feet on a knoll on a narrow rise between sinkholes (Figures B-1, B-25, and B-26). The closest sinkhole, about 80 m to the west, contained water and was surrounded by a swampy area. No flowing water sources were nearby, but the sinkholes contained a large amount of water after heavy rain. Prehistoric material was found over a 80 m (east-west) by 90 m, or 7200 m^2, area. Almost all the site surface was eroded or deflated to subsoil as a result of extensive tank training. Several small, isolated islands of vegetation were still intact and may have small areas of intact cultural deposits. The side of one trail, cut more than 1 m below the former surface, exposed cultural material slightly below ground surface. Visibility was 90 percent on the open area and trails and 40 percent in the areas of grass and scrub growth.

At least three components are represented in the cultural materials recovered. A distal fragment of a Clovis point (Figure 6d) represents a Paleoindian component, dating 12,000 to 8,000 B.C. (Justice 1987:18), but more probably 8,000 to 10,000 B.C. in Kentucky. One Early Archaic projectile point fragment, possibly from the Kirk Cluster was found, and a preform (Figure 6c) probably for an Early Archaic point (perhaps a Big Sandy Side Notched) were found within 2 m of each other. A proximal fragment of a Late Woodland Hamilton Incurvate point (Figure 6a) also was recovered. Bifaces broken in early and intermediate stages of manufacture, one end scraper (Figure 6b), and four utilized flakes were found. Most of the debitage derives from late stage reduction or retouch, and little initial reduction debris was present. This may have been a short term habitation site during one or more of the components and a special activity site during several occupations, probably related to exploitation of the sinkhole resources.

Site 15Md402 is potentially eligible for the National Register due to the presence of several small, isolated areas that appear to have intact topsoil. The discovery of artifact concentrations suggests that intact cultural deposits may be present. This is also only the second site on Fort Knox on which Paleoindian materials have been discovered. Site 15Md402 lies outside any proposed rehab area, so no research is recommended for the site in conjunction with the rehab project. Protection of this site, which is a tank training area and also is actively eroding, is needed as soon as possible, however.

15Md403

Site 15Md403 is located at an elevation of 675 feet on a linear rise east of a swampy area around a sinkhole that contained water (Figures B-1 and B-26). Several chert flakes were found over a 20 m (east-west) by 10 m, or 200 m^2, in an open area formed by tank trails crossing. Almost all of the surface was eroded to subsoil after extensive tank training. The site area had also possibly been scraped or shallowly borrowed during the construction of a nearby berm, which is used to hide tanks during maneuvers. Visibility in vegetated areas was limited to less than 20 percent by scrub growth and grass, but examination of small patches of soil indicated that the vegetated areas were eroded to subsoil. Visibility elsewhere was approximately 100 percent.

Site 15Md403 is not eligible for the National Register due to severe erosion, prior disturbance, and the lack of potentially intact topsoil or cultural deposits. The site is outside any proposed rehab area. No further archaeological research is recommended for 15Md403.

15Md404

Site 15Md404 lies at an elevation of 700 feet at the east edge of a sinkhole on a rise above the Gander Branch of the Dry Branch of Otter Creek (Figures B-3 and B-27). No obvious water sources were nearby, although the surrounding sinkholes may have contained water after considerable rain. Prehistoric material (four pieces of chert debitage) was found over a 40 m (east-west) by 30 m, or 1200 m^2, area along vehicle trails around the top of a sinkhole. Almost all of the surface was eroded to subsoil from extensive training. Several small areas of vegetation were present, but there was no evidence of intact deposits. Shovel probe soil profiles showed a mixture of subsoil and topsoil immediately below the thin humic zone, suggesting that these areas had been cleared and disturbed at some point. Visibility in the non-eroded areas was limited to less than 10 percent by scrub growth, trees, and leaves.

Site 15Md404 is not eligible for the National Register because of extreme erosion from tank training and probably shallow borrowing related to road construction. No potentially intact topsoil was encountered. No further archaeological work is recommended at 15Md404.

15Md405

Site 15Md405 is located at an elevation of 700 feet on a rise between two sinkholes (Figures B-3 and B-28). Three pieces of chert debitage were found over a 20 m by 10 m, or 200 m^2, area. No obvious water sources were nearby, although the surrounding sinkholes may have contained water after considerable rain. Almost all of the surface was eroded to subsoil after extensive tank training and topsoil stripping for road construction. Several small, isolated areas of vegetation were still intact, but these were very narrow and had little or no potential for containing intact deposits that would not have been exposed in the tank trails that were eroded to subsoil or in the erosional gully cutbanks. Visibility in the non-eroded areas was limited to less than 10 percent by scrub growth, trees, and leaves, but most of the site area had 100 percent ground surface visibility.

Site 15Md405 is not eligible for the National Register due to severe erosion related to training and earthmoving related to road construction. There was no evidence of potential intact deposits. No further study is recommended for 15Md405.

15Md406

Site 15Md406 lies at an elevation of 665 feet between two sinkholes (Figures B-2 and B-9). No obvious water sources were nearby, although one of the adjoining sinkholes contained water after considerable rain. Prehistoric material (one biface and three pieces of chert debitage) were found over an area 90 m (northeast-southwest) by 5 m, or 450 m^2, along the road. Almost all the narrow level area was eroded to subsoil as a result of extensive tank training, and portions were nearly 1 m below the former ground surface. Visibility was nearly 100 percent in the eroded tank trail, but in the non-eroded areas was limited to less than 10 percent by scrub growth, trees, and leaves. These non-eroded areas were only 1 to 3 m wide between the tank trails, and the areas beyond the tank trails contained standing water.

Site 15Md406 is not eligible for the National Register due to the severe erosion resulting from tank training. No areas of intact topsoil sufficiently wide to contain potential intact deposits were encountered. No further investigation is recommended for 15Md406.

15Md407

Site 15Md407 lies at an elevation of 665 feet on a narrow area above two sinkholes (Figures B-2 and B-13). Both of the surrounding sinkholes contained water after considerable rain. Prehistoric material was found over a 50 m (northwest-southeast) by 25 m, or 1250 m^2, area between the sinkholes. The materials collected include one scraper (Figure 5b), one utilized flake and three pieces of unutilized debitage. Almost all the surface was eroded to subsoil after extensive tank training, and the trail was eroded more than 1 m below the ground surface. Small, isolated islands of vegetation were still intact on either side of the trail, but were too narrow to contain intact cultural deposits that would not have been exposed in the cutbanks. Visibility in the non-eroded areas was limited to less than 10 percent by scrub growth and trees.

Site 15Md407 is not eligible for the National Register due to severe erosion resulting from tank training. No additional research is recommended for 15Md407.

Isolated Finds

NTB-IF1

Isolated find NTB-IF1 was discovered on a broad upland area between two large sinkholes at an elevation of 670 feet (Figures B-1 and B-29). The isolated find is a piece of Wyandotte chert shatter. The find vicinity was eroded to subsoil, with vegetation present only in the sinkholes. The area had many crisscrossing tank ruts. Ground surface visibility was 100 percent, except where ruts contained standing water. Isolated finds are not eligible for the National Register, and no additional archaeological work is recommended for this location.

TA9-IF1

Isolated Find TA9-IF1 was found at an elevation of 650 feet on the lower slope of a southeast-oriented ridge (Figures B-2 and B-30). The find area is just north of a very large sinkhole. TA9-IF1 consists of one biface or preform (Figure 5c) of St. Louis chert and one large Wyandotte secondary flake. These items were found within 2 m of each other on the sloping cutbank of a trail eroded up to 2 m below the original ground surface. Ground surface visibility was 100 percent in the trails and on the cutbanks, but less than 10 percent in the vegetated strip between the trails. The strip was too narrow to contain intact cultural deposits that would not have been exposed in the cutbanks. Isolated finds are not eligible for the National Register, and no additional archaeological work is recommended for this location.

TA9-IF2

TA 9-IF2 is a core (Figure 7). It was found at an elevation of 655 feet on an upland area dotted with knolls (Figures B-2 and B-31). A large sinkhole lies approximately 10 m south and southeast of the find locale, and smaller sinkholes lie 100 m west. Ground surface visibility was 100 percent in the find vicinity, which lies at the intersection of several tank trails and at the west edge of a tank maneuver area. Isolated finds are not eligible for the National Register, and no additional archaeological work is recommended for this location.

TA10-IF1

TA10-IF1 was found at an elevation of 690 feet on the north slopes of a ridge in a karstic plain (Figures B-1 and

B-17). The isolated find consists of a single medium-sized piece of Wyandotte chert shatter from a trimming sequence, and was found approximately 40 m north of 15Md392. The chert shatter was found in a tank trail that was eroded to subsoil and that had 100 percent ground surface visibility. The trail cutbanks and the surface and cutbanks of a trail 10 m east were inspected, but no additional materials were found. Isolated finds are not eligible for the National Register, and no additional archaeological work is recommended for this location.

TA10-IF2

TA10-IF 2 was found at an elevation of 700 feet on a southeast-oriented ridge slope overlooking a large sinkhole (Figures B-1 and B-18). It was found in a tank trail with 100 percent ground surface visibility, except in a small pond that had formed in a low spot in the trail. The ground fell off steeply to the east, south, and west, and ascended to the north. TA10-IF2 is a burnt, medium-sized piece of Wyandotte chert shatter resulting from biface reduction. Isolated finds are not eligible for the National Register, and no additional archaeological work is recommended for this location.

TA10-IF3

TA10-IF3 is a medium sized secondary trim flake of Wyandotte chert. It was found on a lower east to southeast-oriented ridge slope at an elevation of 720 feet (Figures B-1 and B-32). Two small sinkholes lie 40 to 100 m southeast of the find location. The tank trail in which the flake was found was eroded to subsoil and had 100 percent ground surface visibility. Isolated finds are not eligible for the National Register, and no additional archaeological work is recommended for this location.

TA10-IF4

TA10-IF4 was found at an elevation of 710 feet on a northeast ridge slope (Figures B-1 and B-33). It was found in a tank trail that is eroded to subsoil and had 100 ground surface visibility. Inspection of the trail and of an adjoining trail yielded no additional materials. TA10-IF4 is a small Wyandotte tertiary flake resulting from biface reduction. Isolated finds are not eligible for the National Register, and no additional archaeological work is recommended for this location.

TA10-IF6

TA10-IF 6 was discovered in a deeply eroded tank trail circling the north edge of a large sinkhole at an elevation of 660 feet (Figures B-1 and B-7). This isolated find consists of two very small biface reduction flakes of Wyandotte chert. A large pond containing cattails and other aquatic vegetation lay south of the find spot. The area north of the trail enters a large maneuver area. Ground surface visibility was 100 percent in the trails, and approximately 30 percent in the scrub growth in the area north of the trail. Isolated finds are not eligible for the National Register, and no additional archaeological work is recommended for this location.

Sites Not Relocated

Attempts to relocate sites 15Md188 and 15Md189, which had been previously recorded in a portion of the TA 10 portion of Rehab Area 2 (Figure B-35), were not successful. The crew of three made two passes through the reported locations during the general reconnaissance without finding any materials. Mocas returned to the reported site locations later, spending 15 minutes were spent at each location to examine the areas closely, including the cutbanks of the trail. Ground surface visibility was 100 percent in the tank trail, which was eroded to subsoil. O'Malley et al. (1980:87) found only two items (a core and a flake) at 15Md188 and four items (one core and three flakes) at 15Md189. These very small sites are often difficult to relocate, because the original researchers may have collected all the materials that ever were on the site and because the 1:24,000 scale of the topographic maps usually used in archaeology do not allow for the precise mapping of the locations of very small sites.

Schenian and Mocas are confident that they were looking in the correct places for sites 15Md188 and 15Md189, because the trails have remained in the same location since the O'Malley et al. study. No materials happened to be found at these locations in the current survey. Both the O'Malley et al. survey and the current survey limited investigation of these two sites to the tank trail and trail cutbanks and did not include a thorough investigation of the vegetated areas next to the trails. Sites 15Md188 and 15Md189 therefore must be reexamined if any future undertakings will affect the vegetated areas in these areas. The rehab project will have no effect on the portion of the sites in the tank trail, which are eroded to subsoil.

Rehab Area 2 in TA 10 actually extends from the west boundary of the area surveyed to the west boundary of the

installation. From approximately 300 m southwest of 15Md395 to 200 m west of 15Md217, only a single tank trail passes through the unsurveyed area and the rest of the unsurveyed area is densely forested. The tank trail is narrow, deeply entrenched (about 2 m below ground surface), and has many pools of standing water, many with established aquatic vegetation and some tens of meters in length. The trail and its cutbanks were inaccessible because of the water. Sites 15Md199, 15Md216, and 15Md220 were previously recorded along this trail, and it is possible that other sites exist that have not yet been recorded. According to Gail Pollock, this segment of trail will not be graded in the rehab activities, because it would defeat the purposes of land rehab to destroy established habitats or remove trees to shove the banks in to fill the trail cut. The unsurveyed area therefore will remain as an unmodified buffer zone between the installation and the private landowners to the west.

CONCLUSIONS AND RECOMMENDATIONS

The Phase I archaeological investigation of 1996 Rehab Areas 1 though 5 and 9 through 11 in Training Areas 8, 9, and 10 resulted in the recording of 21 archaeological sites and eight isolated finds, plus the revisiting of nine previously recorded sites. The newly recorded archaeological sites have been assigned state site numbers 15Md387 through 15Md407 and the previously recorded sites that were revisited are 15Md190, 15Md196, 15Md198, 15Md217, 15Md218, 15Md221, 15Md222, 15Md237. The isolated finds were assigned field numbers NTB-IF1, TA9-IF1, TA9-IF2, TA10-IF1 through TA10-IF4 and TA10-IF6.

Sites 15Md404 and 15Md405 are in Rehab Area 1. Sites 15Md221, 15Md222, 15Md388, 15Md406, 15Md407, TA9-IF1, and TA9-IF2 are in the TA 9 portion of Rehab Area 2, and 15Md196, 15Md198, 15Md217, 15Md218, 15Md393-15Md401, TA10-IF1 through TA10-IF4, and TA10-IF6 are in the TA 10 portion of Rehab Area 2. No sites were found in Rehab Areas 3 or 4. Site 15Md389 is in Rehab Area 5. Site 15Md387 and NTB-IF1 are in Rehab Area 9. Sites 15Md390 and 15Md391 are in Rehab Area 10. No sites are in Rehab Area 11, although 15Md231 and 15Md231 are close to it.

Sites 15Md190, 15Md231, 15Md237, 15Md402, and 15Md403 were recorded outside any of the current rehab areas. Attempts to relocate previously recorded sites 15Md188 and 15Md189 in the TA 10 portion of Rehab Area 2 were unsuccessful. Sites 15Md199, 15Md216, and 15Md220 were previously recorded between the TA 10 portion of Rehab Area 2 surveyed and the installation west boundary. They are in a portion of the Rehab Area 2 that is densely vegetated and will not be subjected to heavy machinery modification. No attempt was made to reinspect sites 15Md199, 15Md216, and 15Md220,

because the tank trail leading to them was deeply entrenched and inaccessible due to the presence of deep standing water.

Isolated finds NTB-IF1, TA9-IF1, TA9-IF2, TA10-IF1 through TA10-IF4, and TA10-IF6 are prehistoric materials of indeterminate cultural-temporal affiliation found in areas with good ground surface visibility. Isolated finds are not eligible for the National Register. No additional archaeological research is recommended for the eight isolated find locations.

Sites 15Md190, 15Md217, 15Md218, 15Md393-15Md396, 15Md398, 15Md401, and 15Md403-15Md407 are of indeterminate prehistoric cultural-temporal affiliation. They are not eligible for the National Register due to severe erosion resulting from tank training. No additional archaeological research is recommended for 15Md190, 15Md217, 15Md218, 15Md393, 15Md394, 15Md395, 15Md396, 15Md398, 15Md401, 15Md403, 15Md404, 15Md405, 15Md406, and 15Md407.

Sites 15Md198, 15Md387, 15Md390, 15Md391, 15Md399, and 15Md400 have historic and prehistoric components. All of the prehistoric components are of indeterminate cultural-temporal affiliation. The historic components at 15Md198 and 15Md400 consist of minor amounts of late nineteenth-early twentieth century materials. The historic component at 15Md387 appears to date from ca. 1900-1925 with minor amounts of early nineteenth century material on the site. The historic component at 15Md390 dates from ca. 1900-1940. The historic component of 15Md391 dates from ca. 1800-1940, but there may be two historic components separated by a break in the mid to late nineteenth century. The historic materials at 15Md399 consist of a minor amount of late nineteenth to early twentieth century ceramics, and it is possible that this material was redeposited at this location from 15Md397. These sites are not eligible for the National Register due to severe erosion resulting from tank training. No additional archaeological research is recommended for 15Md198, 15Md387, 15Md390, 15Md391, 15Md399 and 15Md400.

Site 15Md388 is a special activity site with Middle Archaic and Late Archaic/Early Woodland components. It is not eligible for the National Register due to severe erosion and the lack of evidence for potentially intact cultural deposits. No additional archaeological research is recommended for 15Md388.

Site 15Md389 is a late nineteenth to early twentieth century historic site. It is not eligible for the National Register due to severe erosion and lack of evidence for potentially intact cultural deposits. No further research is recommended for 15Md389.

Site 15Md221 was previously reported to have a Late Archaic/Early Woodland component. The site is potentially eligible for the National Register due to the presence of intact topsoil and field conditions not conducive to a thorough examination of the site. Monitoring of the grading of the trail through 15Md221 is recommended.

Site 15Md222 is of indeterminate prehistoric cultural-temporal affiliation. It is potentially eligible for the National Register due to field conditions not conducive to a thorough examination of the iste. Monitoring of the grading of the trail through 15Md221 is recommended.

Site 15Md231 is of indeterminate prehistoric cultural affiliation. It was only briefly inspected in the current survey because it lies outside any of the proposed rehab areas. No archaeological work is recommended for the site in conjunction with the current rehab work, but additional of the site is required if future undertakings will affect the site.

Site 15Md237 has Early Archaic, Early-Middle Archaic, and Late Archaic components. The site is potentially eligible for the National Register due to the presence of dense artifact concentrations probably reflecting deflated midden deposits and feature remnants. Site 15Md237 lies outside any rehab area, but an access route to Rehab Area 11 passes through the site. It is recommended that the heavy machinery avoid driving through 15Md237 in conjunction with the rehab activities in Rehab Area 11. It is further recommended that the installation take measures to protect 15Md237 by making it off-limits to vehicle traffic and by controlling erosion on the site.

Site 15Md196 is potentially eligible for the National Register due to the presence of intact topsoil, and the presence of artifact concentrations, including at least one representing an activity area. The boundaries of 15Md196 was greatly expanded in the current survey and now encompasses site 15Md194. Complete avoidance of 15Md196 by the rehab activities is not a recommended action, since the site's exposed slopes will continue to erode. Grading of the tank trails and plowing of 15Md196 also is not recommended, because it will damage this fragile site and is unlikely to control erosion of the site if there is heavy rain shortly after seeding. If feasible a partial rehab/partial avoidance plan should be followed. Saplings or shrubs should be planted around the perimeter of the site and at the bases of the eroding slopes. The interior portion of the site should be carefully planted in a spreading vine or other ground cover. This alternative would serve to mark the site location and control erosion of the site without causing additional disturbance of the site.

If the partial rehab/partial avoidance alternative is not feasible, 15Md196 should be surface collected in grid squares no larger than 2 m square prior to any rehab activity. Thorough screened shovel probing of areas with vegetation or intact topsoil should also be conducted prior to any rehab activity. During the rehab activities, a professional archaeologist should be present to monitor the earthmoving to recover diagnostics and other cultural materials and to identify cultural features, if any exist. If any cultural features are discovered, all machine earthmoving in the vicinity of the features should cease, and the features should be excavated using standard archaeological techniques.

Site 15Md392 is a Late Archaic-Early Woodland site with intact midden deposits. Site 15Md392 is potentially eligible for the National Register due to field conditions not conducive to a thorough examination of the site. It is recommended that a professional archaeologist monitor the grading of the trail through the site.

Site 15Md397 is a large multi-component site with Early Archaic and historic (ca. 1850-1925) components. The site is eligible for the National Register due to the presence of artifact concentrations and areas of intact topsoil, high artifact density, and potential for intact cultural deposits. A controlled surface collection of even the portions of 15Md397 that are deflated to subsoil is likely to yield information about the chronology and activities at the site and may identify intact subsurface cultural features. It is recommended that earthmoving activities be avoided on 15Md397 and that 15Md397 should be included in the buffer zone through signage and allowed to revegetate naturally.

Site 15Md402 is a multi-component site with Paleoindian, Early Archaic, and Late Woodland components. The site is potentially eligible for the National Register due to the presence of areas of intact topsoil and artifact concentrations that suggest that intact cultural deposits may exist. It is also potentially eligible because Paleoindian components are rare. Site 15Md402 lies outside any proposed rehab area, so no work is recommended for the site in conjunction with the currently proposed rehab activities. The site is actively eroding, however, and it is recommended that the installation take measures to protect the site by controlling erosion.

In summary, sites 15Md190, 15Md198, 15Md217, 15Md218, 15Md387, 15Md388, 15Md390, 15Md391, 15Md393-15Md396, 15Md398, 15Md399-15Md401, and 15Md403-15Md407 and the isolated finds are not eligible for the National Register and no additional archaeological work is recommended for these locations. Sites 15Md196, 15Md221, 15Md222, 15Md231, 15Md237, 15Md392, 15Md397, and 15Md402 are considered potentially eligible for the National Register, and warrant

further archaeological research either in conjunction with this undertaking or to protect the site in accordance with Section 110 of the National Historic Preservation Act. No evidence was found of previously recorded sites 15Md188 and 15Md189, but inspection was limited to the tank trail, and no attempt was made to inspect 15Md199, 15Md216, and 15Md220 because they were inaccessible and will not be subjected to heavy machinery work in the current project. No archaeological work is recommended at 15Md188, 15Md189, 15Md199, 15Md216, and 15Md220 in conjunction with the current project but additional investigation of these sites is recommended if future undertakings will affect the vegetated areas adjoining the tank trails in which these sites were identified.

Sites 15Md395 and 15Md396 were recorded in an area previously surveyed by O'Malley et al., as were isolated finds TA9-IF1, TA9-IF2, and TA10-IF3, TA10-IF6. These are all small sites, but it points to the need to resurvey areas as field conditions change or if no sites were recorded in topographic settings with medium to high potential for archaeological sites.

If archaeological materials are discovered during the rehab activities, all work in the vicinity of the finds must cease. The SHPO (502-564-7005) and the DPW staff archaeologist (502-624-6581) should be contacted, so a representative of those agencies may evaluate the materials. Also, if human remains, regardless of age or cultural affiliation, are discovered, all work in the vicinity of the remains must cease immediately, and the state medical examiner (502-564-4545) and the appropriate local law enforcement agency (Fort Knox Law Enforcement Command, 502-624-6852) must be contacted, as stipulated in KRS 72.020.

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APPENDIX A.

RESUMES OF KEY PERSONNEL

Pamela A. Schenian
Staff Archaeologist and Project Principal Investigator

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Date and Place of Birth: January 1, 1959; Waukesha, WI.

Present Position: J.M. Waller & Associates/Fort Knox Contract Staff Archaeologist

Education:
A.B.D. in Anthropology, Northwestern University, 1984.
M.A. in Anthropology, Northwestern University, 1982.
A.B. in Anthropology, Bryn Mawr College, 1980.

Previous Employment:
Senior Staff Archeologist, Archeology Service Center, Department of Sociology, Anthropology, and Social Work, Murray State University, Murray, KY, November 1991-June 1993; Staff Archeologist, November 1983-November 1991.
Southern Illinois University, Carbondale, IL: Field Technician, November-December 1985, September-October 1984.
Illinois State Museum Society, Springfield, IL: Field Assistant II (Supervisor), summer 1983; Field Technician, summer 1981.
Center for American Archeology, Kampsville, IL: Field Technician, summer 1982.
Department of Anthropology, Northwestern University, Evanston, IL: Teaching Assistant, 1981-82 academic year.
Great Lakes Archeological Research Center, Milwaukee, WI: Field Technician, summer 1979.

Field Research Experience:
Field experience on prehistoric and historic archaeological projects in Illinois, Indiana, Kentucky, New Jersey, South Dakota, Tennessee, and Wisconsin, 1979-present.

Professional Publications, Reports, Papers and Manuscripts:
110 CRM contract reports on projects in Indiana, Kentucky, and Tennessee.
1 Homicide site excavation contract report prepared in lieu of court testimony in Illinois.
7 Papers presented at professional conferences.
6 Publications.
Doctoral candidacy qualifying paper: "A Theory of Individual Style Variation for Archeological Studies".
Ms. submitted in partial fulfillment of the M.A. requirements: "Models of Environmental-Cultural Relationships: Testing with Archeological Evidence".

Stephen T. Mocas
Contract Assistant Staff Archaeologist

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Most Recent Position: University of Louisville Program of Archaeology/Fort Knox Contract Assistant Staff Archeologist, November 1993-December 1994, September 1995-August 1996.

Education:

Completed one year of doctoral program, Southern Illinois University, Carbondale, Illinois, 1972.

B.A. in Anthropology, University of Louisville, 1971.

Previous Employment:

Indiana University, Bloomington, Indiana: Staff Archaeologist, Part-time September 1991-Present.

Fort Knox/University of Louisville: Contract Assistant Staff Archaeologist, November 1993-December 1994.

Murray State University, Murray Kentucky: Staff Archaeologist, November 1991-November 1993.

Jefferson Community College, Louisville, Kentucky. Anthropology Instructor, August 1981-December 1982.

Louisville School of Art, Louisville, Kentucky: Anthropology Instructor, January-May 1976.

University of Louisville Archaeological Survey, Louisville, Kentucky. Project Director, Field Supervisor, or Research Assistant on various projects, July 1969-January 1977.

State University of New York of Buffalo, Buffalo, New York. Senior Field Worker, June-August 1970.

Field Research Experience:

Field experience, Phase I-III, prehistoric and historic archaeological projects in the states of Illinois, Indiana, Kentucky, New York, and Tennessee, 1969-present.

Research Grants:

Six grants for fieldwork and research.

Professional Publications, Reports, Papers and Manuscripts:

2 Non-contract site reports on projects.
34 CRM contract reports on projects.
6 Chapters in additional site reports.
5 Publications.

APPENDIX B.

LOCATION OF CULTURAL RESOURCES

AND SITE PLANS