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Report of the Preliminary Archaeological Reconnaissance of the Lawrence Livermore Laboratory Site 300, San Joaquin County, California

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REPORT OF THE PRELIMINARY ARCHAEOLOGICAL RECONNAISSANCE OF THE LAWRENCE LIVERMORE LABORATORY SITE 300 SAN JOAQUIN COUNTY, CALIFORNIA

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PROJECT LOCATION

The area subject to this investigation is the existing Lawrence Livermore Laboratory Site 300, located in the region north of Corral Hollow; approximately eight and one half miles southwest of Tracy, San Joaquin County, California. Cartographic location can be determined from the Tracy and Midway USGS 7.5 minute topographic quadrangles, the appropriate portions of which are herein reproduced as Maps 1 & 2. The majority of the approximate 7000 acres of the location lies within San Joaquin County. This includes all of the area arbitrarily designated the "Eastern Portion" on Map 2 and the majority of the area designated the "Western Portion" on Map 1. The remaining acreage, along the western boundary of the location, lies within Alameda County.

The area is located in the region of open rolling hills immediately north of Corral Hollow, and ranges in elevation from approximately 600 feet, on the flood plain of Corral Hollow Creek, to approximately 1700 feet in the northwest portion of the project location.

PROJECT DESCRIPTION

Proposed for the area under investigation are various, unspecified improvements or modifications to the existing Site 300 facilities. Present facilities consist of scattered

buildings, bunkers and magazines, utilized for testing and research purposes, including the necessary water, power, and transportation improvements to support them. The vast majority of the 7000 acre location is presently open space, utilized as buffer zones between test locations and as firing ranges.

PREVIOUS ARCHAEOLOGICAL RESEARCH

Prior to field reconnaissance efforts, records recently placed on file with the State of California Department of Parks and Recreation were examined to determine the locations of any previously recorded archaeological sites within the project area as outlined on Maps 1 & 2. These records have recently been transfered from the University of California at Berkeley, where for many years they have formed the central depository of site survey information, and comprise the most complete assessment of archaeological sites in the Central California area.

Examination of both Site Survey Sheets for the counties involved and the USGS topographic maps covering the area confirmed that no prehistoric aboriginal archaeological sites were known to exist within the project area.

INVESTIGATION METHOD

Subsequent to archival research of the project area, a field reconnaissance was undertaken by Mr. Stephen Dietz and

Mr. Steven Wilson of Archaeological Consulting and Research Services; with the assistance of Dr.Michael Moratto and Ms. Lynn Riley of San Francisco State University.

Considering the nature of the terrain and the size of the area to be examined, field reconnaissance was conducted on two levels simultaneously. Utilizing four-wheel drive vehicles, the entire 7000 acre location was visually examined in order to determine those areas most condusive to aboriginal habitation or utilization. Following generally accepted archaeological method, those areas of relatively gentle slope in proximity to watercourses or springs, ridgetops, rock outcrops and overhangs, and hillside "benches" were subjected to close visual examination on foot. Due to both restrictions by Lawrence Livermore Laboratory and the generally overwhelming size of the project area, no subsurface testing was employed.

INVESTIGATION RESULTS

The field reconnaissance was directed toward a close examination of the above mentioned "likely" areas with the intention of identifying those locations that manifest evidence of continual utilization or habitation by the original Indian occupants. The aboriginal Indian population were experienced hunters and gatherers who ranged over the areas surrounding their living sites in order to take advantage of the food sources available to them in each locale. It is, for the most

part, possible to identify the loci of these activities only when the activity has resulted in the deposition of some physical evidence. It is from both the discovery of this remaining evidence, as well as the indentification of changes in the natural surroundings as a result of the living activities, that prehistoric archaeological sites are located and their limits defined.

Seven archaeological sites, or evidences of aboriginal activity, were located as a result of the field reconnaissance within the boundaries of Site 300. Their locations are indicated on Maps 1 & 2, and their nature indicated below:

#16.1-Lithic tool concentration-no midden
#16.2-Lithic tool concentration-no midden
#16.3-Lithic tool concentration-no midden
#16.4-Rock Shelter with no midden deposit

#22.1-Rock Shelter with midden deposit & 3 Bedrock mortars

#28.1-Rock Shelter with possible midden deposit & 3 Bedrock mortars

#34.1-Rock Shelter with midden deposit

SITES #16.1, 16.2, & 16.3

These three sites, represented by concentrations of lithic material, are located at the upper end of Elk Ravine adjacent to the main road serving the facilities in the north central portion of Site 300.

#16.1 lies at the intersection of the main road and the

short spur serving buildings 801 to the east and M83 to the west. The site lies on a gentle slope between the main road and the bed of the intermittent stream in Elk Ravine. (Photo #1) The site was identified by, and is evidently limited to, a few scattered lithic implements and waste flakes. No cultural deposit (midden) was noted. A single chert core (figure #1) and retouched chalcedony flake (figure #2) were recovered from the surface of the disturbed area of the stream course.

#16.2 is located adjacent to the stream course in Elk Ravine alongside the paved main road. It is a flat area at the base of the hillside approximately halfway between building 802 and the intersection of the access road to the disposal pits south of the East OP. (Photo #2) It is also characterized by a light surface scatter of worked white chalcedony. A single example is illustrated herein as figure #3. No midden deposit was noted in this location.

#16.3 is located on the little "island" of land formed at the branching of the access road to the disposal pits from the main paved road. (Photo #3 & #4) As in the previous two sites, it also is characterized by scattered lithic tool material and waste flakes; no midden is evident. A single percussion flaked tool recovered from this site is illustrated herein as figure #4.

Considering the extent of grading and trenching activities in Elk Ravine, it is entirely possible that these three loci are remains of a single disturbed and scattered archaeological site in the vicinity. As previously noted, no midden deposit (accumulated through years of habitation activitiy) was observable at any of these

three locations. While it is possible that the lithic materials recovered are the remains of a quarrying site, it seems more likely, due to the lack of outcrops of suitable source material in the immediate area, that this surface scatter has been recently deposited here from another location.

SITE #16.4

This site lies on the north side of the main paved road just beyond the point where the road enters the natural cleft between the two hillsides. (Photo #3 & #4) This section of road is between the turnoff to the disposal pits access road and the Water Booster Station near building 850.

The site is a small, shallow rock shelter of outcropping conglomerate rock immediately adjacent to the road. (Photo #4 & #5) The outcropping is little different than many of the same material in the vicinity (Photo #4), and was identified as an archaeological site only by the presence of a single chert "chopper". (figure #5) The road cuts through the area in front of the rock shelter and may account for the lack of a visible midden deposit. It is possible that the lithic material from sites #16.1, #16.2, & #16.3 may have been graded from this area during construction of the roadway, and deposited as far as #16.1 by intermittent water action down Elk Ravine.

SITE #22.1

This site is located on the hillside approximately 40 meters

south of the paved road running through Elk Ravine, 100 meters south-southeast of the intersection of the access road to building 812. It is a rock shelter, oriented east-west, approximately 6 meters long, 2.5 meters deep, and 2 meters high (at the mouth), with a smoke blackened ceiling. (Photo #6 & #7) It contains part of the small, shallow midden deposit that extends a short distance down the gentle slope toward the stream course. (Photo #6)

Three bedrock mortars, used for pounding acorns into meal, were located in the rear of the shelter in the limestone base. (Photo #7 & #8) These measure: 15cm. wide x 10cm. deep, 11cm. wide x 10cm. deep and 11cm. wide x 12cm. deep respectively. (Photo #8)

SITE #28.1

This site is also a rock shelter, approximately 7 meters long, 3.5 to 4 meters deep, and 3.5 meters high at the mouth; located on the hillside below the intersection of the access road to building 849 (Radio Transmitter) and the paved road that leads to the West CP. (Map 1 & Photo #9) It is situated approximately 100 meters up the eastern slope of a small canyon above a dry creek bed. Two springs are located in the bed of the dry creek near the rock shelter (Photo#9).

Three bedrock mortars, 5 to 7cm. deep, are located on the eastern side of the shelter. As with site #22.1, a midden deposit is partly contained within the shelter itself and extends down the slope in front of the shelter opening. Numerous flakes of opalized wood, with evidence of human modification, were found on the midden surface in the vicinity of the shelter opening.

SITE #34.1

This last archaeological site is located near the southern boundary of the property, approximately 100 meters north of Corral Hollow Road. It lies within sight of Corral Hollow Road, southeast of the M30 series structures, approximately half way between the Site 300 Headquarters entrance and the historical location of the town of Carnegie. (Map 2 & Photo #10)

This rock shelter is the largest of the four recorded during the reconnaissance effort, measuring approximately 20 meters long, 2 meters deep, and up to 6 meters high. (Photo #10 & #11) An extensive midden deposit is observable extending from the rear of the shelter at least 15 to 20 meters down the hillside and appears to be of greater depth than that noted at #22.1 or #28.1. The deposit is composed of friable sandy dark grey midden with great quantities of fire fractured rock. A single quartzite "chopper", from the surface of the site, is illustrated herein as figure #6.

From an aboriginal point of view, the site occupies an ideal location. Situated on a hillside above Corral Hollow Creek, it commands a view of the flat of Corral Hollow, is in close proximity to water (of Corral Hollow Creek) and is but a few miles from the western edge of the herd grazing grounds of the San Joaquin Valley. An additional spring, containing water during our survey in late summer, is located approximately 400 meters over the hillside to the northwest. (Map 2)

PROJECT IMPACTS UPON ARCHAEOLOGICAL RESOURCES

As specific proposed improvements or modifications have not been outlined, as indicated above, it is impossible to determine the nature of the impacts upon archaeological resources. Most certianly two broad categories of impacts must be considered; those that occur due to specific construction activities, such as new building or road construction, road improvements, trenching for underground powerlines, etc.; and those that occur due to utilization of research and testing facilities, such as explosive testing.

The first 'type' of impact is more easily predicted, and with proper planning, more easily avoided or mitigated. Taking into account the locations of known archaeological sites, construction plans can often be reorganized to bypass sensitive areas thereby completely eliminating any mitigation of potential impacts by avoiding the impact itself.

The series of archaeological sites in Section 16, labeled #16.1-#16.4, are most likely to receive this first 'type' of impact. They all lie in close proximity to the main road, and are situated in areas that are more condusive to construction of additional buildings than much of the area on the surrounding hillsides. These sites also have the most undefinable limits of any recorded during the survey. Consequently it is impossible, without test excavation, to determine their exact nature and size. As previously mentioned, it is quite likely that at least #'s 16.1, 16.2, and 16.3 represent the scattered remains of a single site,

and as such, have no real "existence" in themselves.

The second 'type' of impact is difficult to predict and, consequently, more difficult to assess. Explosive testing and subsequent fire damage rank high in this regard. Much of the acreage within the boundaries of Site 300 has been burned due to either "control burning" activities or as a result of some testing program. Continued burning in the area can completely destroy information regarding the natural environment in the vicinity of the recorded archaeological sites, rendering inter-disciplinary studies ancillary to archaeology, such as botany, zoology, and soils geology, impossible. Such information regarding the setting of the archaeological site is of prime importance in the reconstruction of prehistoric living patterns.

Additionally, such repeated burning and the subsequent charcoal deposition, is likely to skew the results of Carbon-14 dating tests on samples of charcoal of prehistoric deposition recovered from the upper levels of the midden deposits. The introduction of recent charcoal material would render dates returned from upper level material highly suspect, and consequently useless in determining the age of the archaeological site.

All the recorded sites are susceptible to this 'type' of impact, though the area in the vicinity of #'s 16.1-16.4 seems to have received more than its fair share.

MITIGATION OF IMPACTS UPON ARCHAEOLOGICAL RESOURCES

It is recommended that potential impacts of construction activities be considered early in the planning stages and every effort be undertaken to avoid those locations indicated as archaeological sites on Maps 1 & 2 herein. If construction activities of any kind must necessarily take place on or in close proximity to any of the recorded sites, it is recommended that a professional archaeologist be retained to review the plans and suggest mitigation measures necessary in face of the particular construction plans.

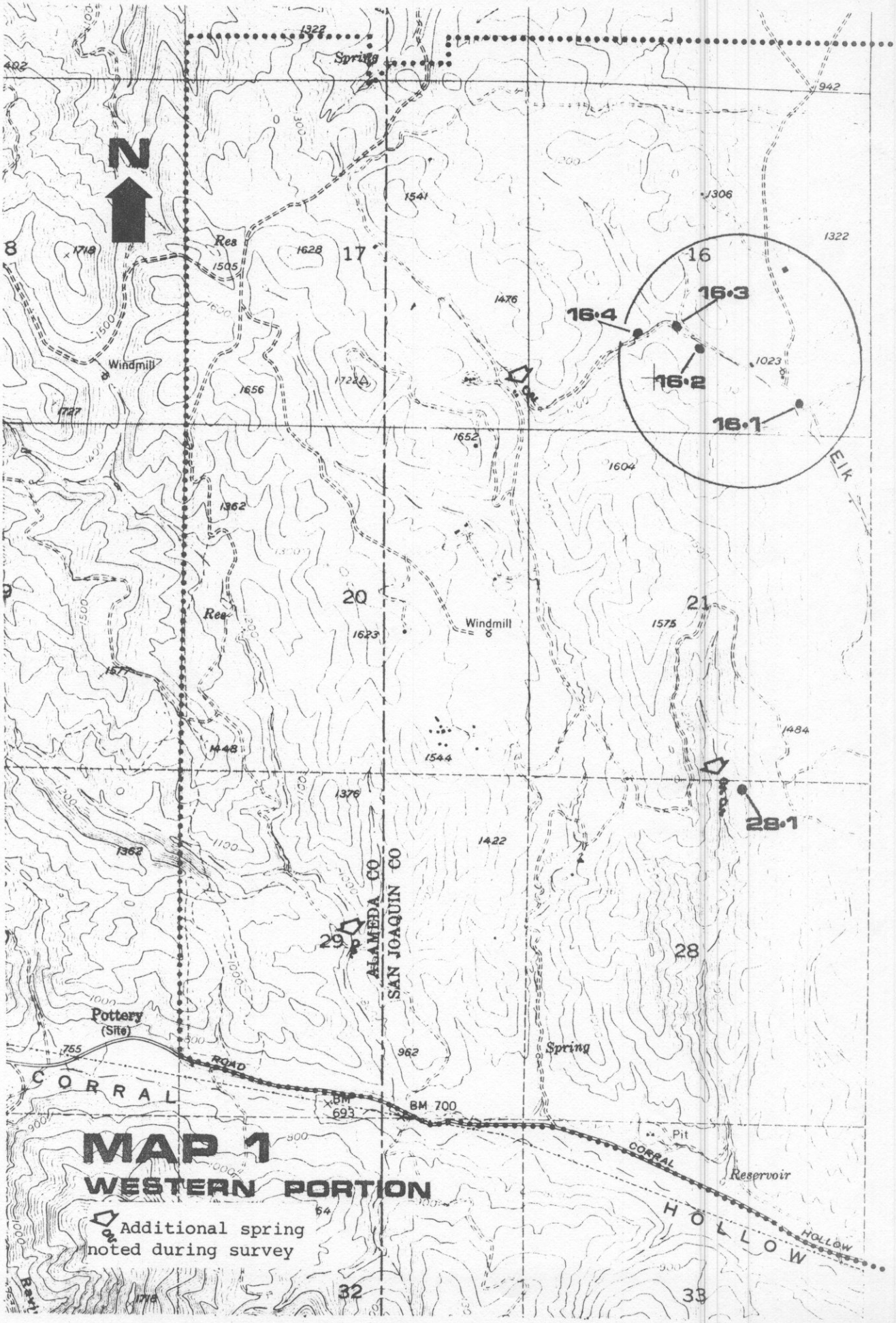
The exact nature and limits of those sites numbered 16.1, 16.2, 16.3, and 16.4 are uncertain at this time. It is recommended that in the event construction, including road widening or stream improvement, is planned for the area within the circle indicated on Map 1, a professional archaeologist be retained to accurately determine the site limits. In the event that those site limits coincide with or overlap construction limits, he should also review proposed plans and suggest mitigation as necessary.

In an attempt to avoid the second 'type' of impact upon the archaeological resources within Site 300, it is recommended that these specific locations be clearly noted during consideration of selection of firing or impact areas to be used during testing activities, and every effort be undertaken to avoid them.

If "control burning" is deemed necessary in the vicinity of archaeological sites, particularly #'s 22.1, 28.1, and 34.1,

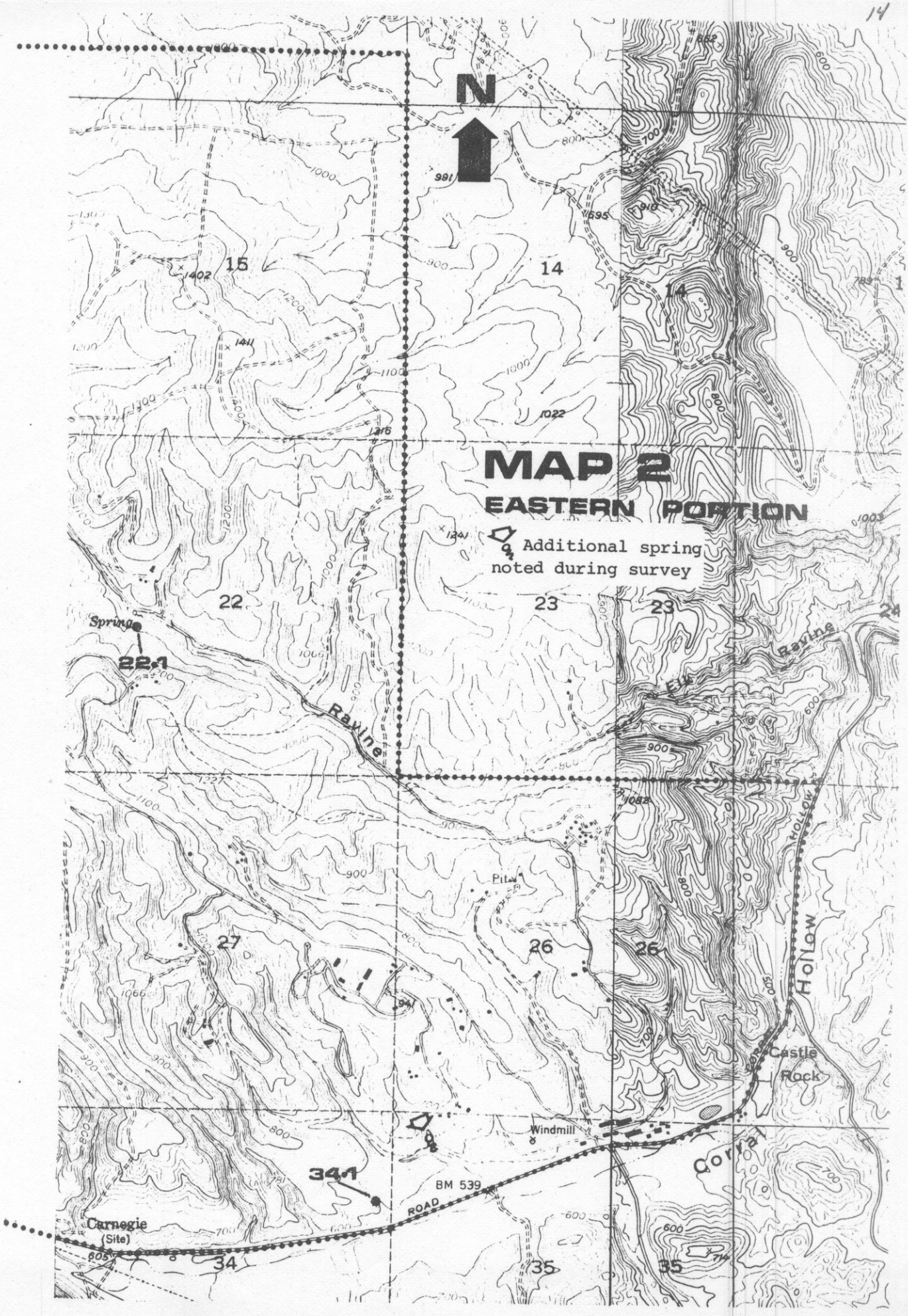
every effort should be made to avoid burning grass or scrubs or the surface of the site itself.

In general, all the areas indicated as archaeological sites on Maps 1 & 2 should be noted and, if at all possible avoided, during consideration of any plans involving construction, subsurface excavation, or disruption of the area's natural setting.



MAP 1
WESTERN PORTION

Additional spring noted during survey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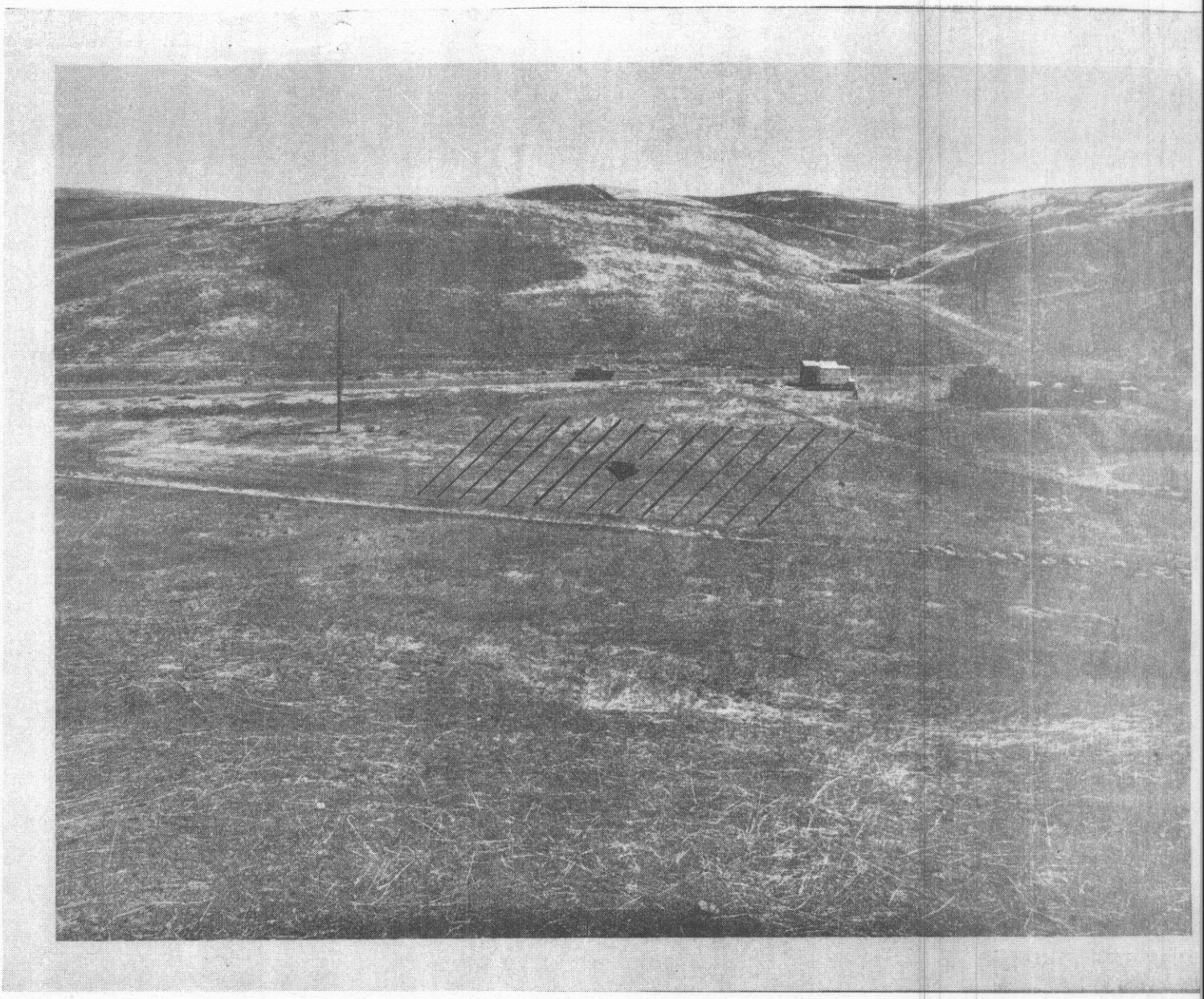
MAP 2
EASTERN PORTION
Additional spring noted during survey
Spring
22.1
34.1
Ravine
Pit
Windmill
Castle Rock
Hollow
BM 539
ROAD
Carnegie (Site)
15
14
22
23
26
27
34
35

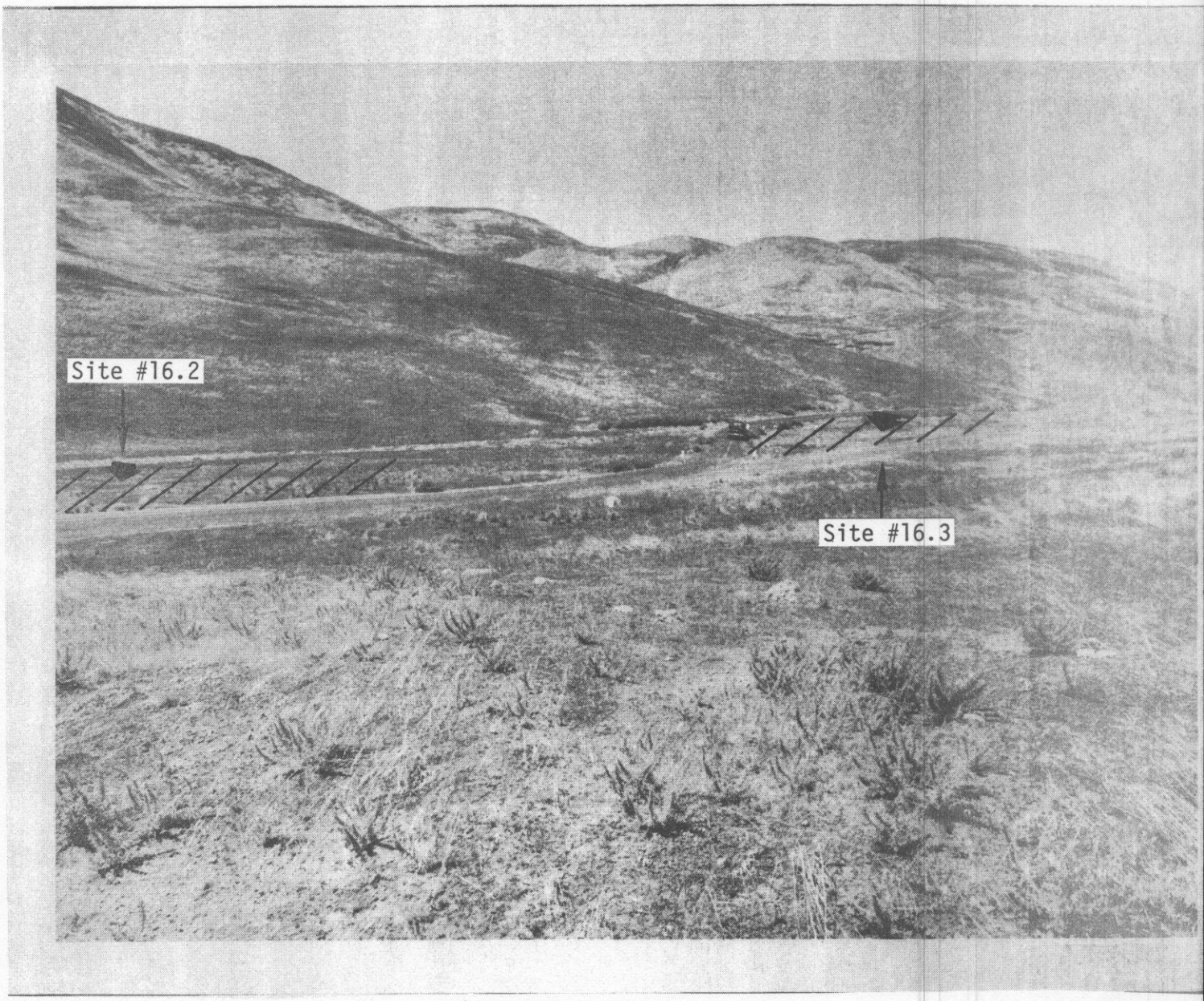


1. Location of site #16.1

   Main road up Elk Ravine runs left to right through photo. Building 801 is visible in upper right hand corner.

   Arrow indicates approximate location of artifacts recovered from the surface. Hatchering indicates extent of the area of observed waste flake material.

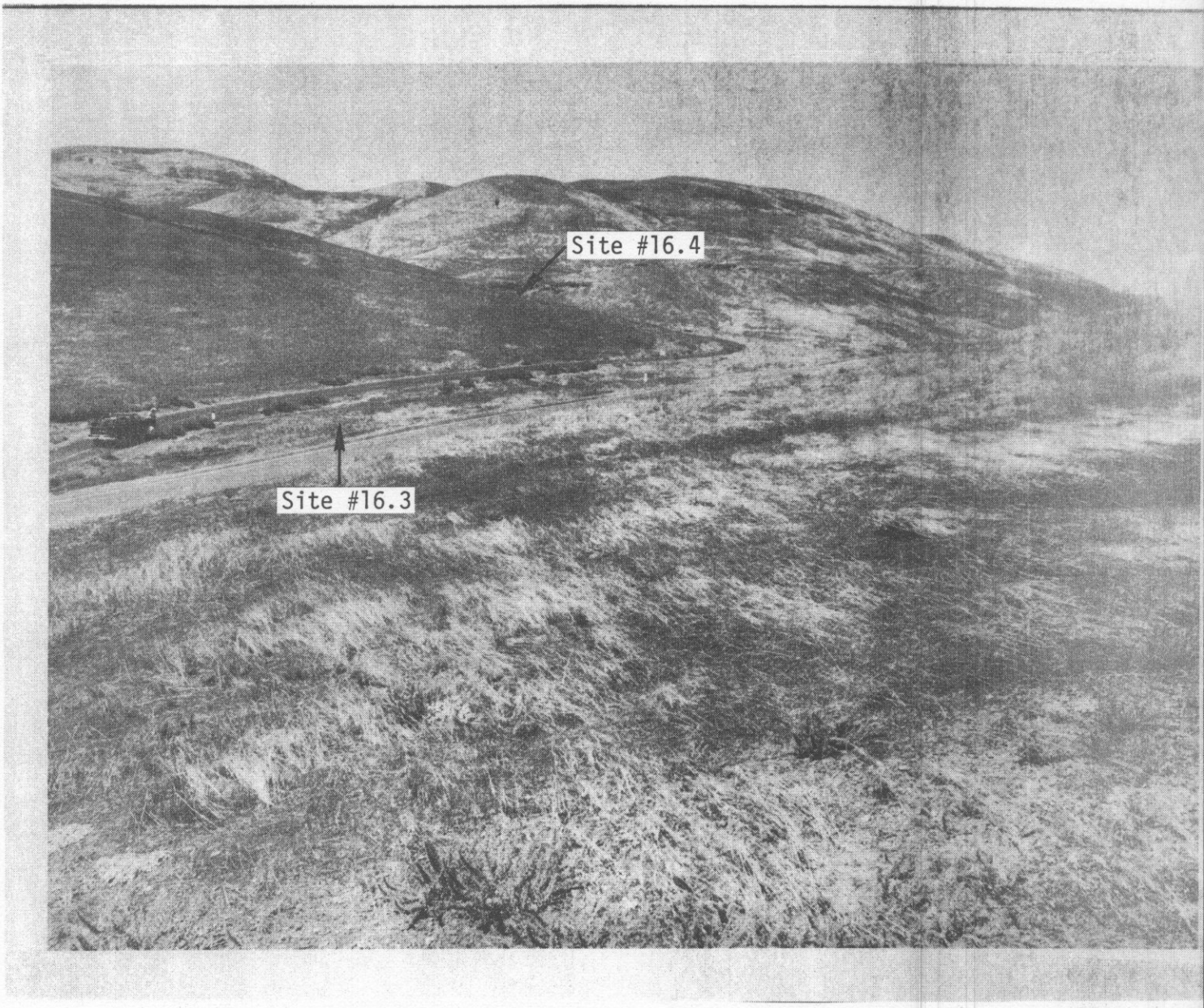
   (Photo faces northeast)



2. Location of sites #16.2 and #16.3

Photo indicates intersection of main paved road up Elk Ravine and access road to disposal pits south of the East OP. Arrows indicate approximate locations of recovered artifacts; hatchering indicates extent of site limits.

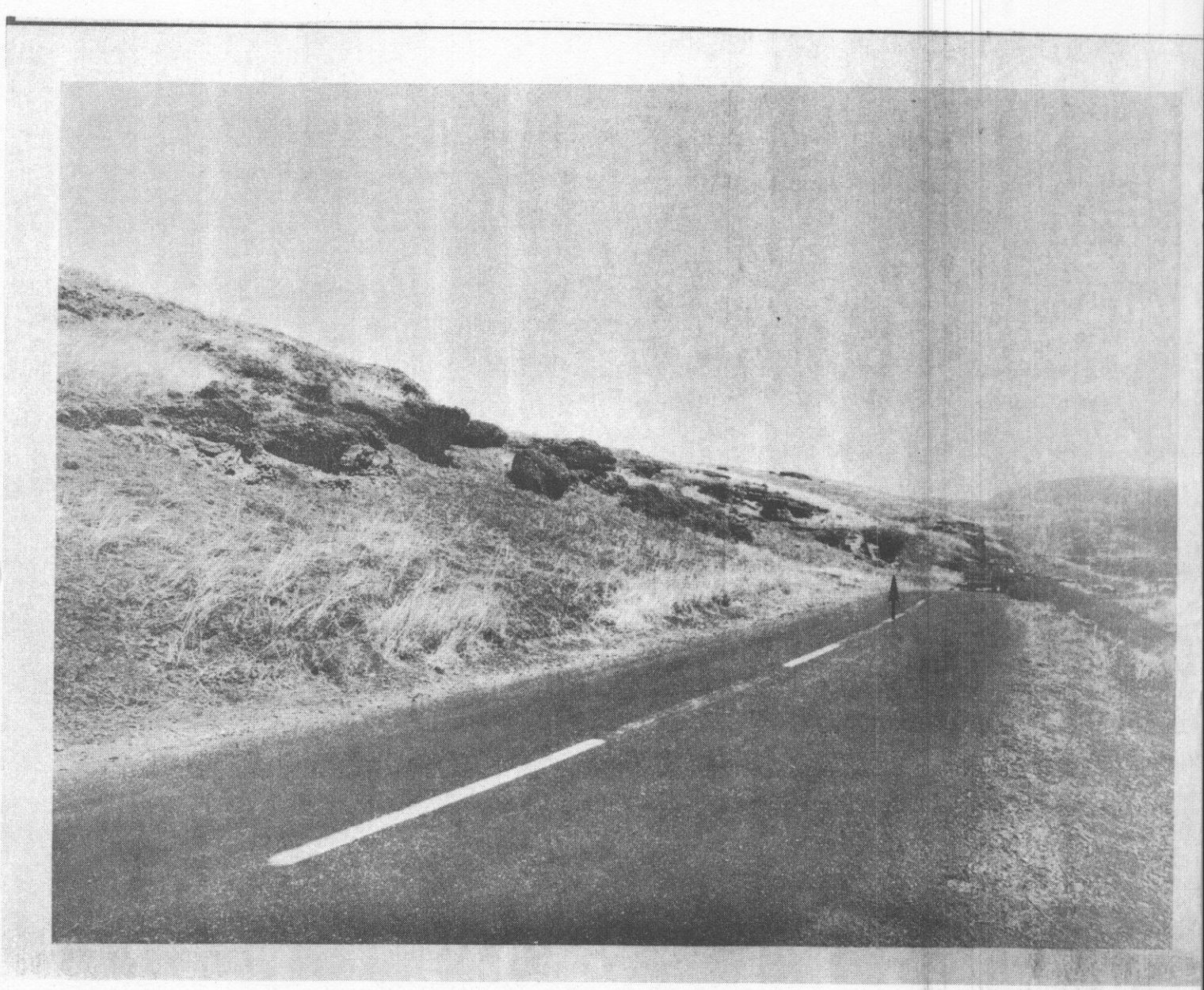
(Photo faces west)



3. Location of site #16.3 & #16.4

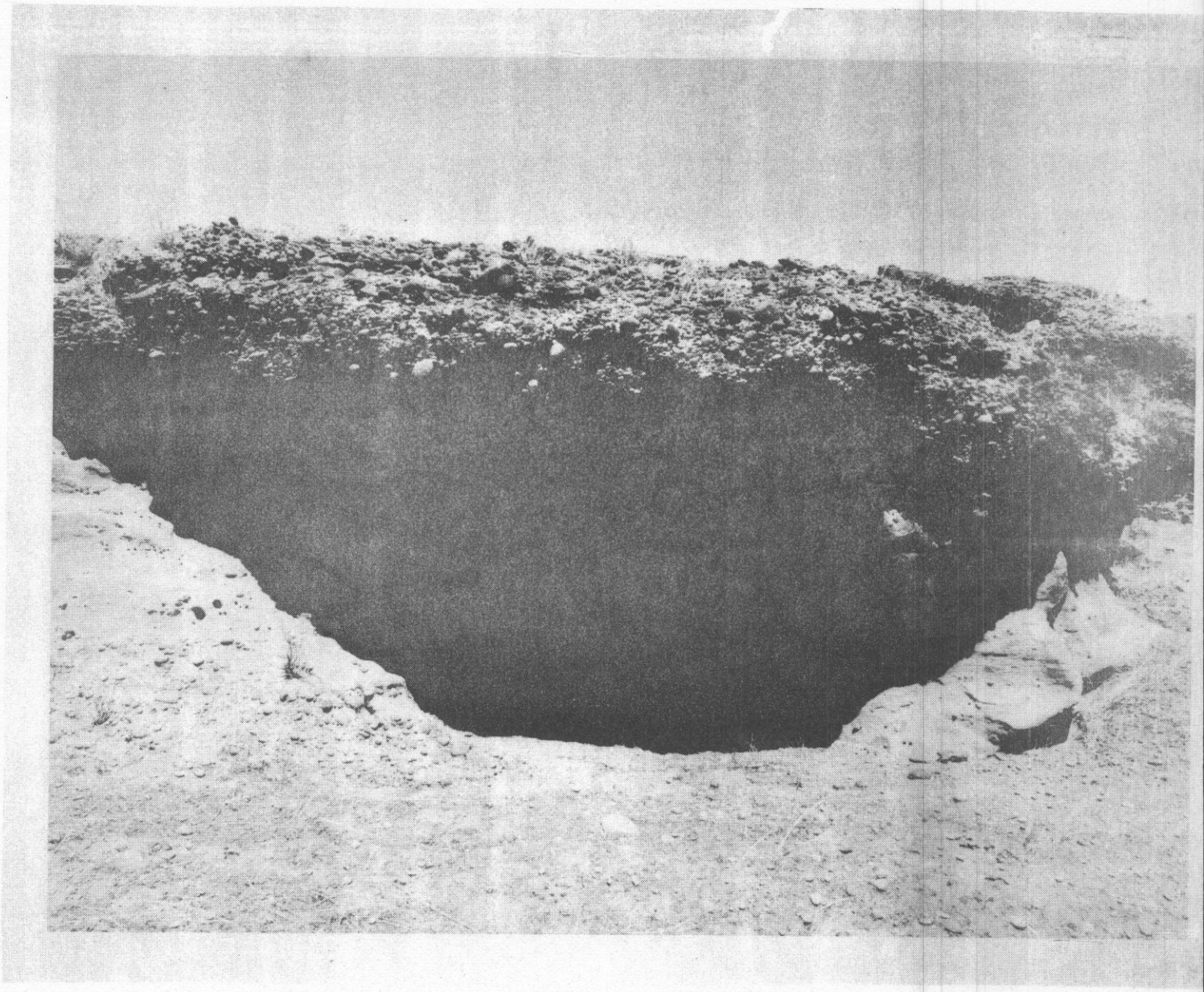
Photo indicates relationship of site #16.4 to site #16.3 in Elk Ravine.
#16.4 lies on the north side of the main paved road just beyond the point where the road enters the natural cleft between the two hillsides.

(Photo faces west)



4. Location of site #16.4 indicating the relationship of the rockshelter to the main road. Note position of stream course in right photo. Elk Ravine is visible in right background.

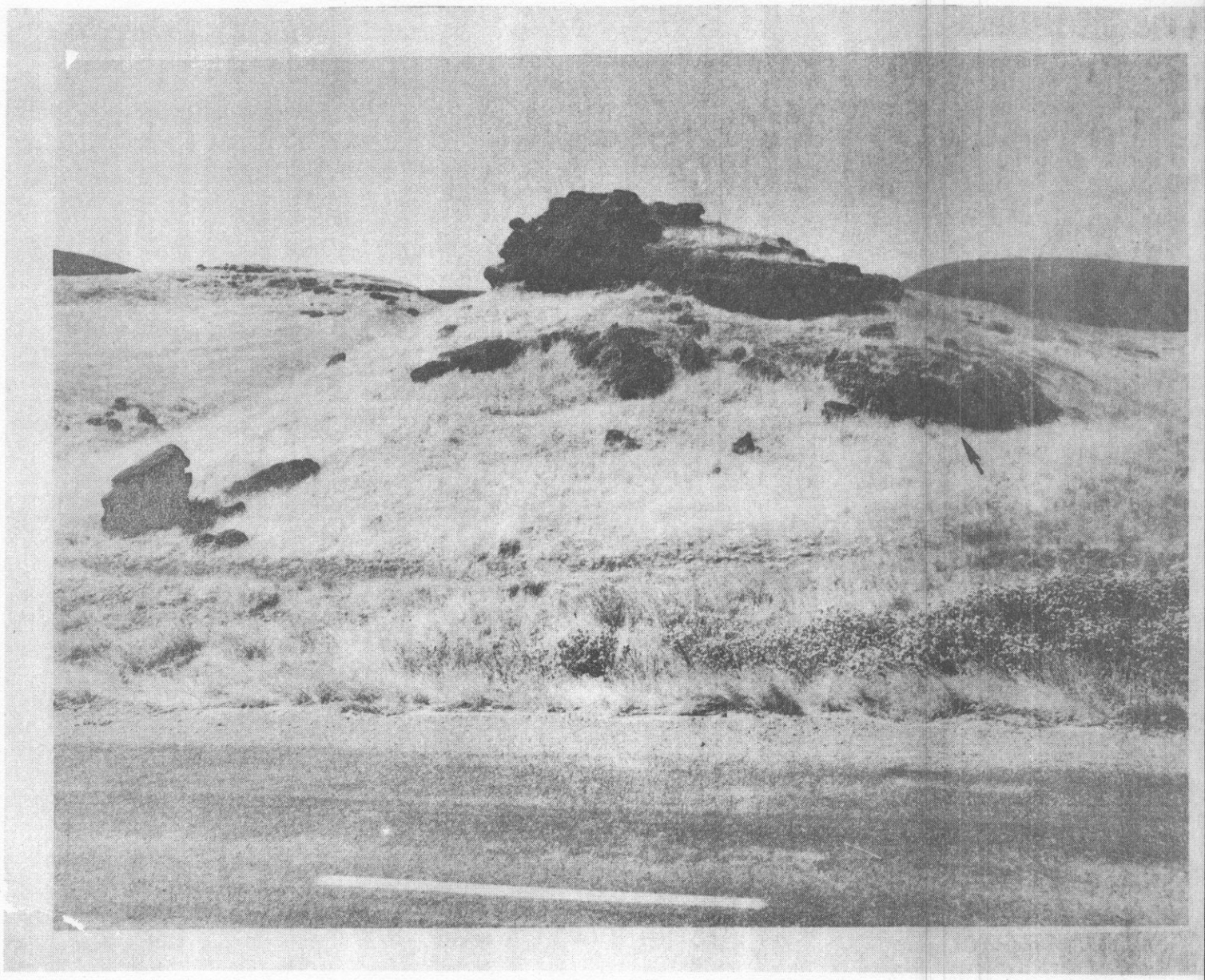
(Photo faces northeast)



5. Rock shelter of site #16.4

Decomposing conglomerate material, falling from shelter overhand, can be seen on ground surface in front of the shelter opening. Chert "chopper" was collected from site surface off the photo to the bottom right.

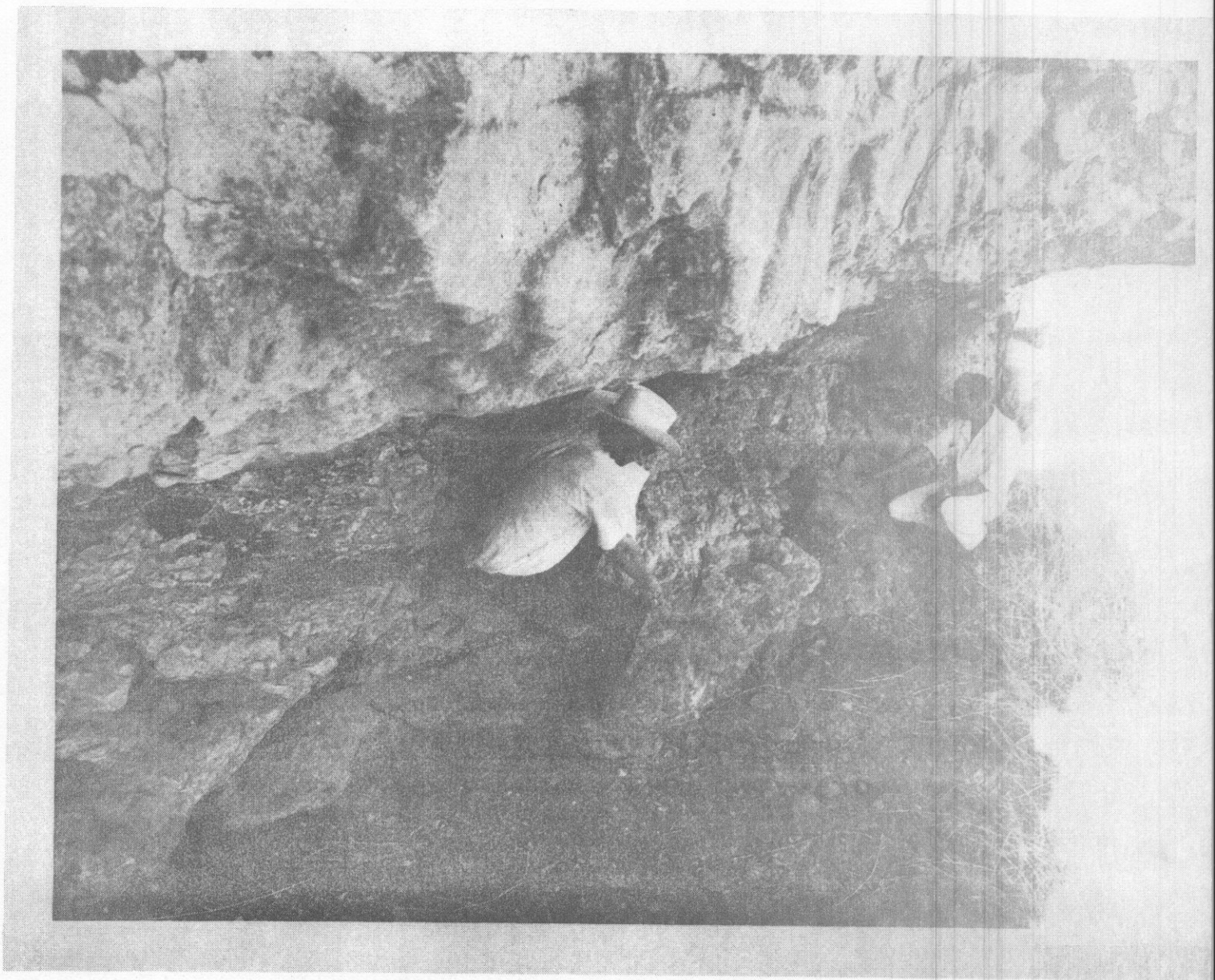
(Photo faces northwest)



6. View of rock shelter of site #22.1

Shelter opening is indicated by arrow. Note location of spring, marked by patch of thistle, at right edge of photo. Paved road is visible in photo foreground.

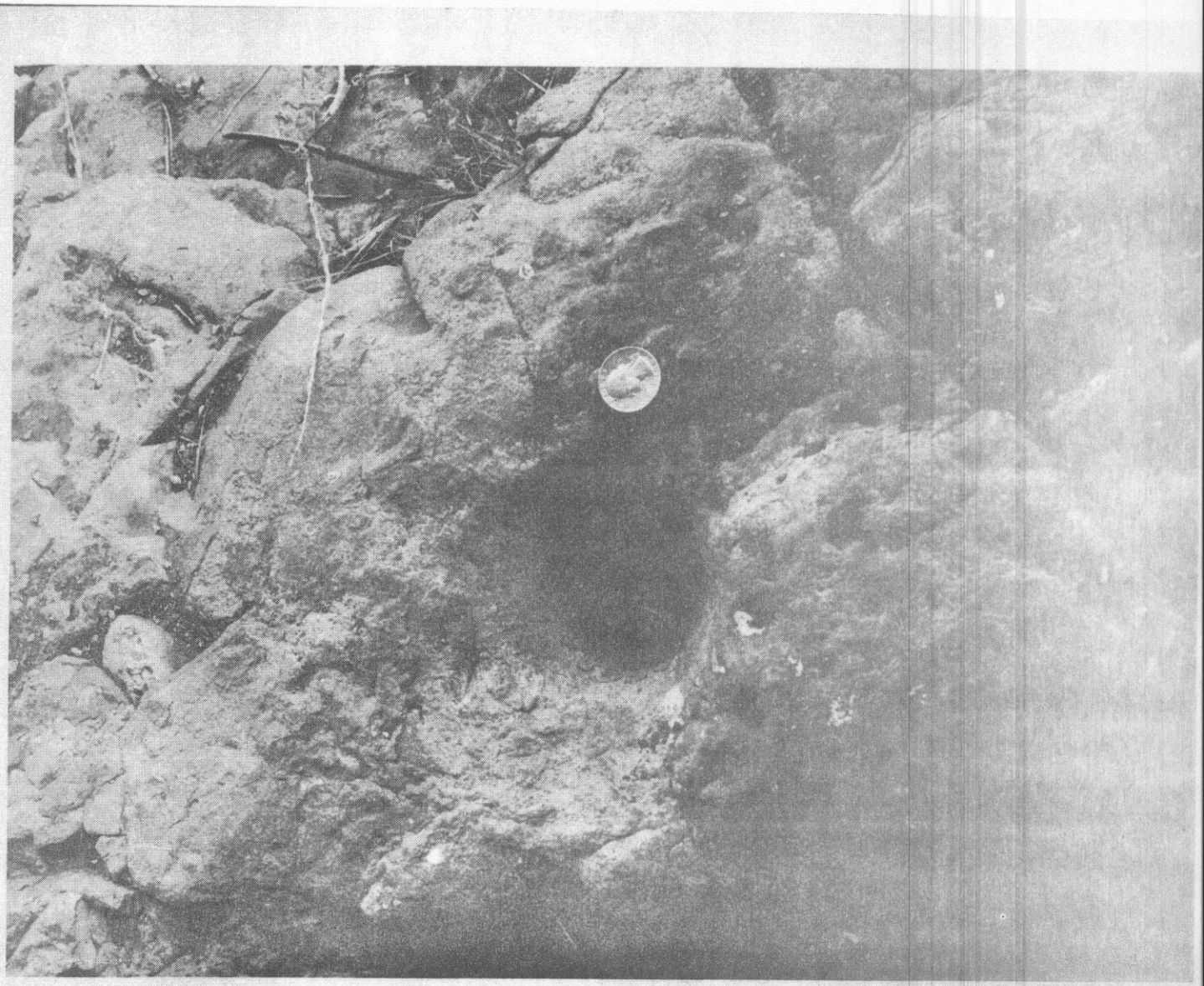
(Photo faces south)



7. View beneath overhand of rock shelter of site #22.1.

Two of the three bedrock mortars are indicated by the arrows. Note how shelter is shaded.

(Photo faces west)



8. Close-up of one of the bedrock mortars in the rear of the rock shelter of site #22.1

9. View of site #28.1 from the paved road above it to the west.

Rock shelter opening is indicated by arrow. Smaller arrow below shelter opening indicates location of one of the two springs near the rock shelter.

(Photo faces east)

10. View of rock shelter of site #34.1.

Corral Hollow Road is visible on left edge of photo. Corral Hollow Creek is visible immediately adjacent to the road (edge of creek is indicated by vegetation directly above road in photo).

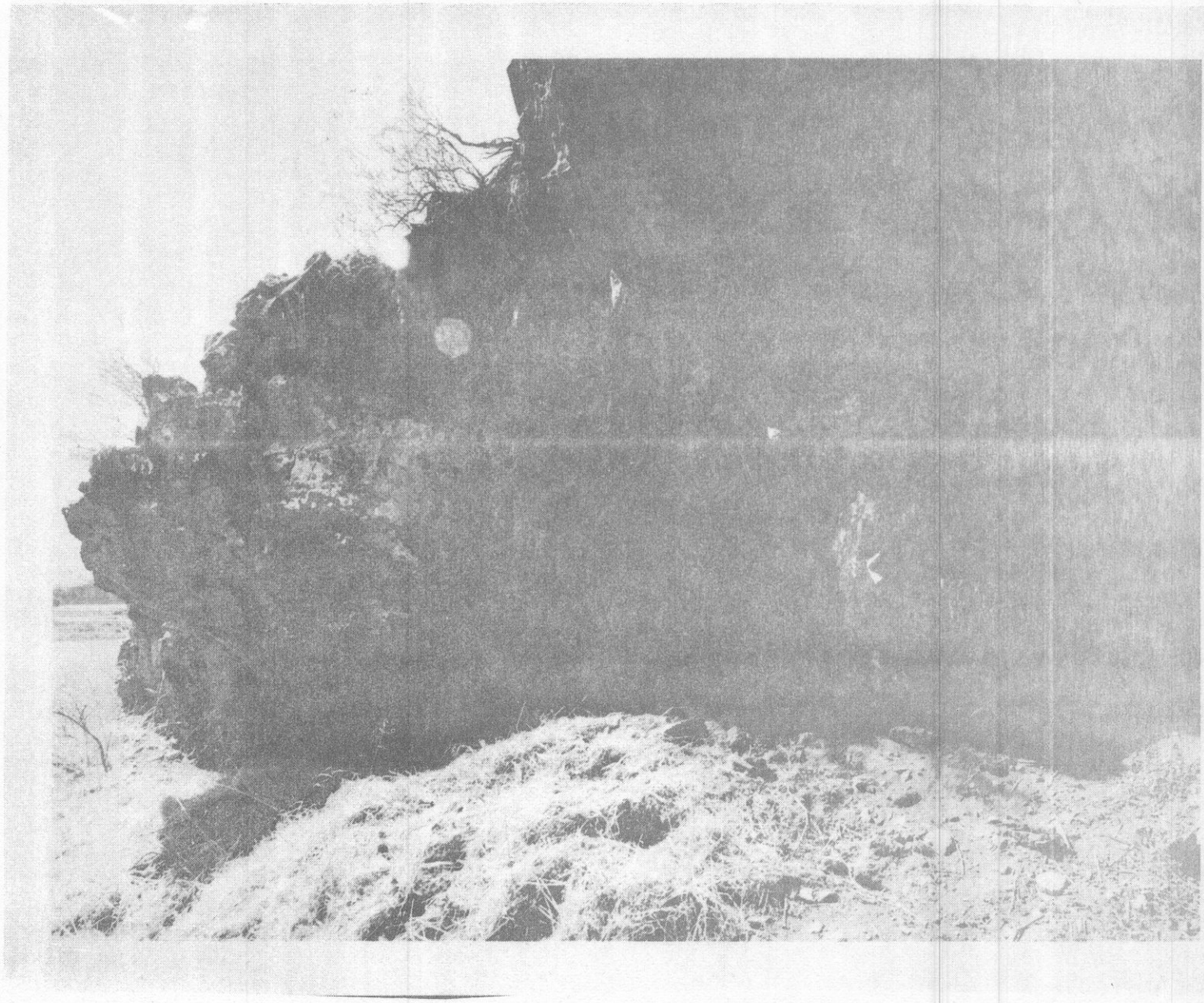
(Photo faces southwest)

11. View of rock shelter of site #34.1 facing toward Corral Hollow.

Locations of details shown in photos #12, #13, and #14 indicated by arrows designated "A", "B", and "C".

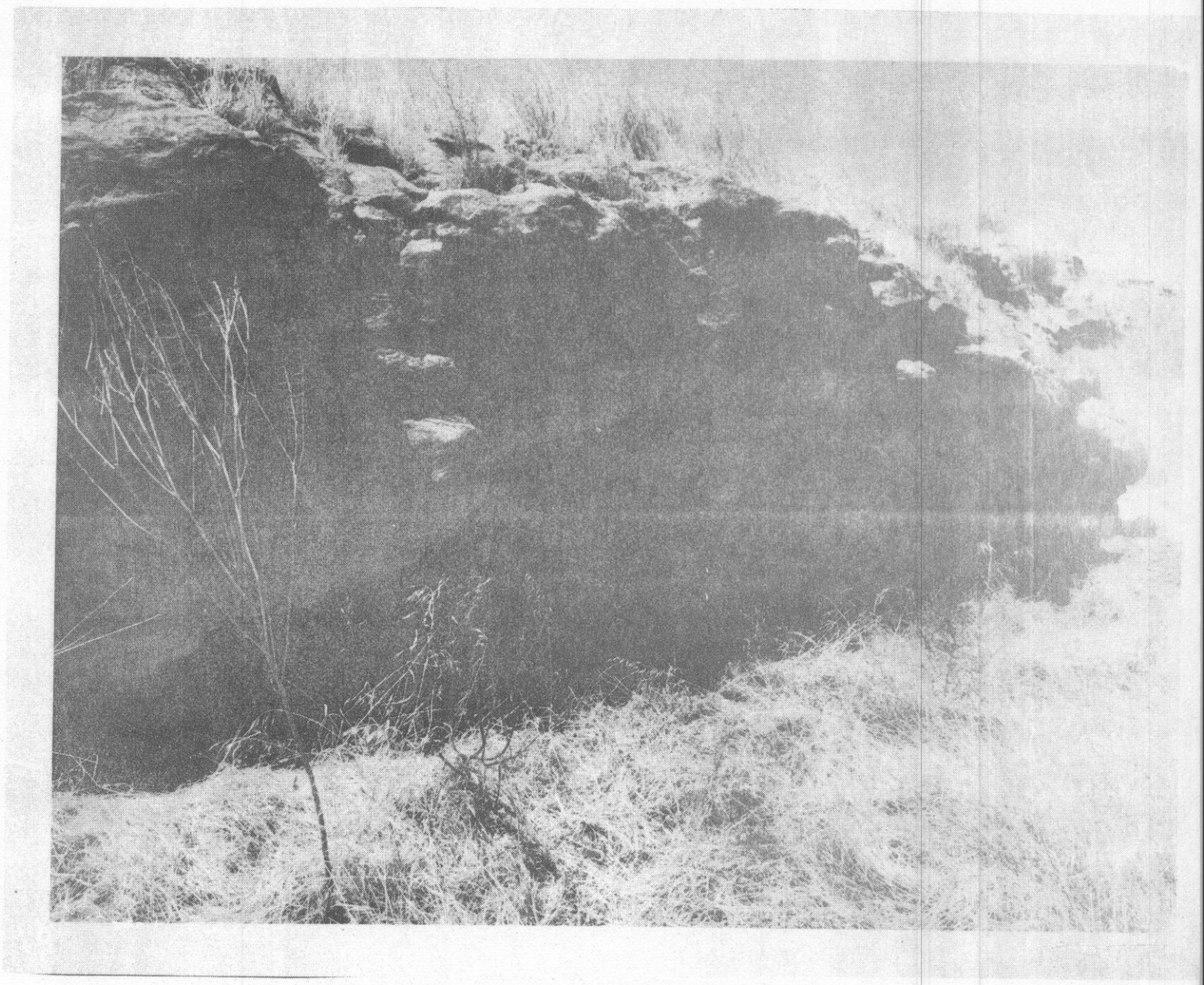
Hatchering roughly indicates midden limit-midden continues off bottom left.

(Photo faces south)



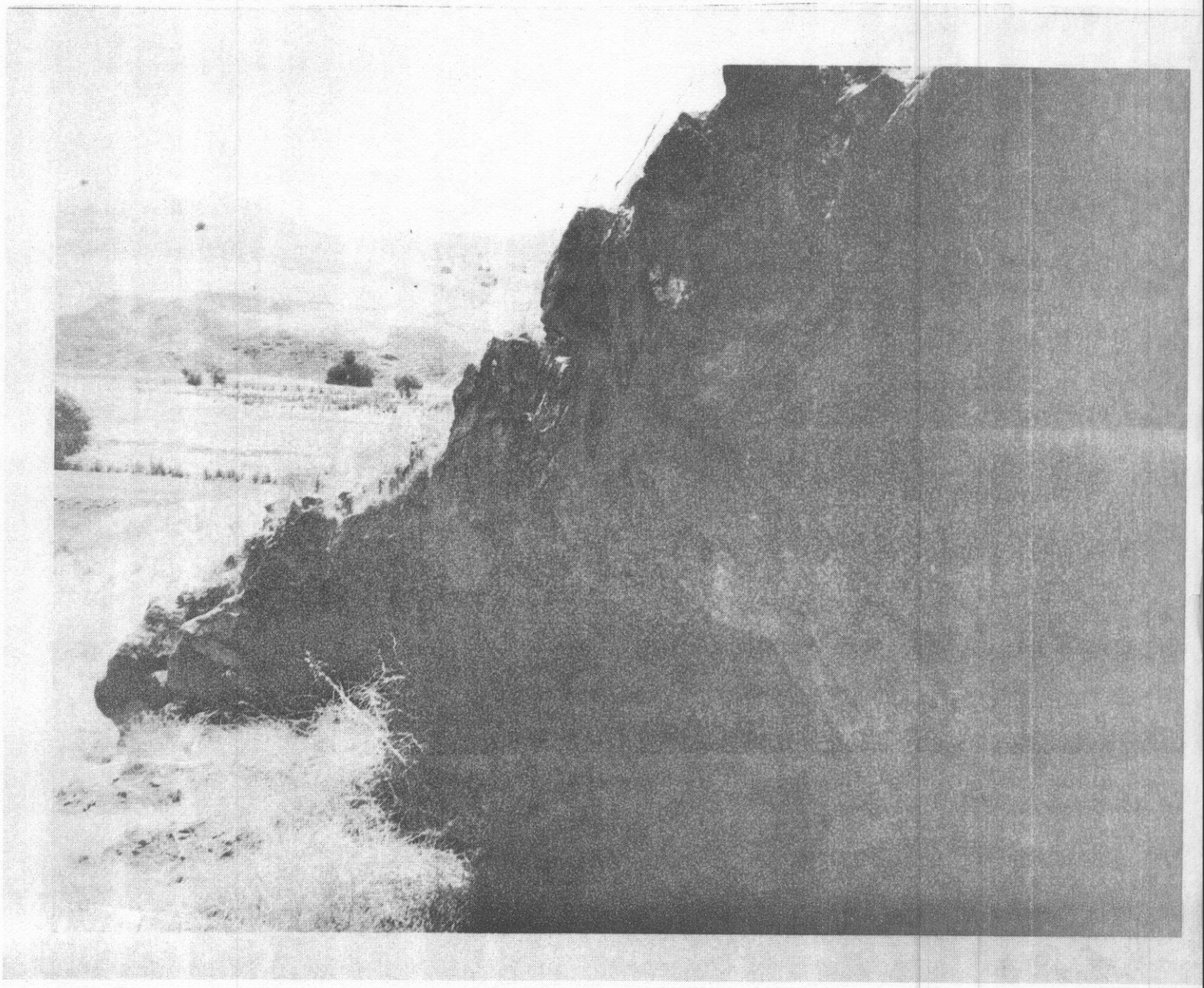
12. Detail of rock shelter of site #34.1 indicated area "A" on photo #11.

(Photo faces southwest)



13. Detail of rock shelter of site #34.1 indicated as area "B" on photo #11. Note historic graffiti on overhang face in center of photo.

(Photo faces northwest)

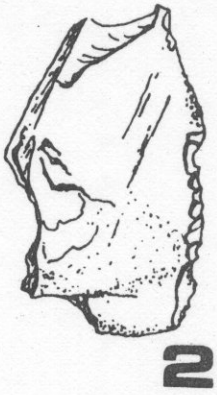


14. Detail of rock shelter of site #34.1 indicated as area "C" on photo #11. Corral Hollow Road is visible in center of left edge of photo.

(Photo faces south)

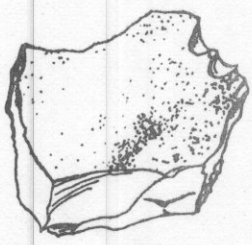
1

site #16.1



2

site #16.1



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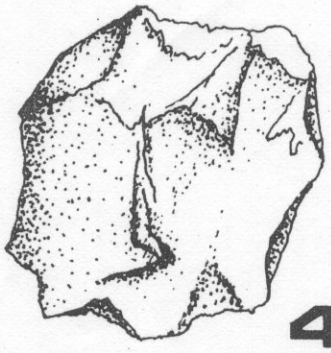
site #16.2



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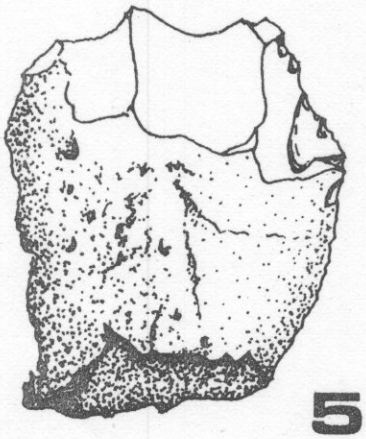
site #16.3



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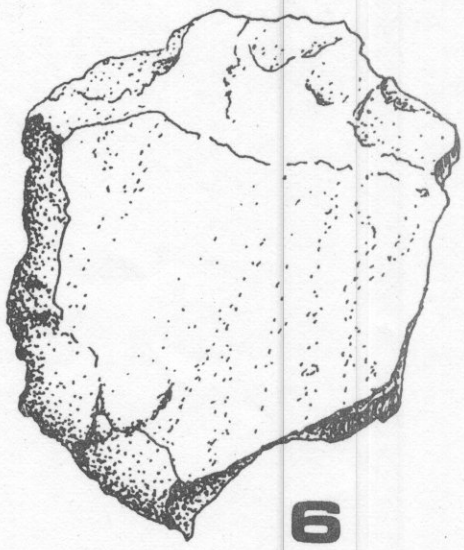
site #16.4



6

site #34.1